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Queensway Carleton Hospital Part 4 Expansion

Transportation Impact Assessment

Prepared for: PARKIN Architects Limited

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Queensway Carleton Hospital – Part 4 Expansion

3045 Baseline Road

Transportation Impact Assessment

Prepared By:

NOVATECH
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November 28, 2025
Revised: September 04, 2026

Novatech File: 123089
Ref: R-2025-112

NOVATECH
Engineers, Planners & Landscape Architects

September 04, 2026

Parkin Architects Limited
200 Laurier Avenue West, 3rd Floor
Ottawa, Ontario K1P 6M7

Attention: Mr. Derek Judson

Dear Mr. Judson:

Reference: Queensway Carleton Hospital – Part 4 Expansion
Transportation Impact Assessment
Our File No.: 123089

We are pleased to submit the following revised Transportation Impact Assessment (TIA) in support of Site Plan Control (SPC) application for the proposed Part 4 expansion of the above noted property. This TIA has been revised to address the city comments provided via document (City File Number: D07-12-25-0163/D02-02-25-0093) dated March 06, 2026. The structure and format of this report is in accordance with the City of Ottawa's *2017 TIA Guideline* and its 2023 revisions.

If you have any questions or comments regarding this report, please feel free to contact Brad Byvelds or the undersigned.

Yours truly,

NOVATECH



Mohammed Talha, M. Eng.
Engineering Intern | Transportation

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EXECUTIVE SUMMARY

This revised Transportation Impact Assessment (TIA) has been prepared in support of Site Plan Control (SPC) application for the proposed Queensway Carleton Hospital (QCH) Part 4 expansion in Ward 8, College, in Ottawa. The subject site is located on a National Capital Commission (NCC) parcel. The Part 4 expansion will be constructed in phases with an ultimate buildout in 2030.

The subject site has frontage on Baseline Road, Richmond Road, and John Sutherland Drive. It is located in the Greenbelt Transect as per the City's *Official Plan (OP)*. In the study area, it is classified as a greenbelt facility within Schedule B4 of the *OP*.

The subject site currently is surrounded by the following:

- Tubman Funeral Home, and Académie de la Capitale, to the north;
- An off-road multiuse trail and Baseline Road, followed by vacant lands to the south;
- Semi-detached houses followed by Sioux Crescent to the east;
- Vacant lands containing a pathway network used by the Hospital, followed by HWY416, Baseline Road, and Richmond Road to the west.

The Part 4 expansion is anticipated to be completed in 5 phases with various modifications and additions to the campus infrastructure. Some of the transportation related works include extension of West Ring Road to John Sutherland Drive, addition of a new parking garage, realignment of John Sutherland Drive east of the hospital, and modifications to loading bays. With the proposed Part 4 expansion, the capacity of the hospital is anticipated to increase to 444 beds from the existing 287 beds.

The study area for this report includes the boundary roadways Richmond Road and Baseline Road, as well as the intersections Richmond Road/Holly Acres Road/Nanaimo Drive, Richmond Road/John Sutherland Drive, Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp, Baseline Road/Cedarview Road, Baseline Road/John Sutherland Drive/Valley Stream Drive, Baseline Road/Sandcastle Drive, and all QCH access on John Sutherland Drive.

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. Analysis has been completed for the Part 4 expansion buildout year 2030 and 2035 horizon year.

The conclusions and recommendations of this TIA can be summarized as follows:

<u>Trip Generation</u>

- Based on the target modals shares, it is anticipated that the Part 4 expansion will generate 588 net new person trips (227 vehicle trips) during the AM peak and 506 net new person trips (195 vehicle trips) during the PM peak.

<u>Existing Traffic Operations</u>

- All study area intersections operate within acceptable Level of Service (LOS) during the AM and PM peaks.

- At Richmond Road/Holly Acres Road/Nanaimo Drive intersection, during the AM and PM peaks, the 95th percentile queue length of the westbound through/left turn movement exceeds the available storage length of 20m. The 95th percentile queue length of the northbound left turn movement exceeds the available storage length of 25m.

- At Richmond Road/John Sutherland Drive intersection, the 95th percentile queue length for the southbound left turn movement exceeds the available storage length of 45m during the AM peak hour.

- At Baseline Road/Cedarview Road, the 95th percentile queue length for the northbound left turn movement exceeds the available storage of 25m potentially blocking the adjacent northbound right turn lane during the AM and PM peak hours.

Background Traffic Operations

- Under the 2030 and 2035 background traffic operations, the intersection operations within the study area are anticipated to be generally consistent with the existing conditions.

Development Design

- Under the existing campus conditions, a sidewalk network is provided along the periphery of the campus buildings. As part of Part 4 expansion, pedestrian facilities near the main entrance at the south end of the building will remain unchanged.

- The existing pathways north/west of the existing parking garage will be reconfigured to accommodate the new parking garage and west ring road. The pathway on the west side of the new west ring will continue to function as part of the City's Crosstown Bikeway network. Two new uncontrolled pedestrian crossings are proposed on the west ring road to provide connectivity to the western pathway networks.

- John Sutherland Drive east of the hospital will be realigned further east to allow for the hospital expansion. As part of this, sidewalks will be provided on both sides of the road from the West Ring Road to the Emergency Department, where the sidewalk on the west side of the road continues to the Irving Greenberg Cancer Centre.

- A new off-road pedestrian pathway is proposed on the east side of John Sutherland Drive along its entire stretch. Three accesses to this pathway are proposed: one each at the extremes of John Sutherland Drive, and one to the east of Irving Greenberg Cancer Center.

- Three new uncontrolled pedestrian crossings are proposed along John Sutherland Drive to provide connectivity to the bus stops, pathways, and parking north/east of the road. It is recommended that all new uncontrolled pedestrian crossings be designed in accordance with Ontario Traffic Manual (OTM) Book 15 requirements for a PXO Type D.

- Minor modifications to the south parking lots are proposed to increase the parking supply.

- Transit will be maintained on John Sutherland Drive as part of this development. The existing bus stops and shelters near the Irving Greenberg Cancer Centre (Stops #0727 and #0728) will be maintained as part of the site plan. The existing bus stops and shelters near the emergency center (#0947 and #0950) will be relocated to the realigned roadway. The southbound bus stop (#0949) will be relocated to the intersection of John Sutherland Drive/West Ring Road.

- A total of 246 bicycle parking spaces (including the existing 44 spaces) will be provided on-site. 114 spaces will be provided within the new parking garage, 54 will be provided within the existing parking garage, 8 spaces will be provided in the landscaped area in between the propane tank loop, 10 spaces will be provided at the entrance of Irving Greenberg Cancer Center, 24 spaces will be provided within the visitors parking lot, 10 spaces will be provided at the main entrance, 16 spaces will be provided at the emergency entrance, and 10 spaces will be provided at the west entrance.

- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

Circulation and Access

- All hospital related material delivery/pickup, and garbage collection activities will take place from the material management facility's loading/unloading docks located beside Irving Greenberg Cancer Center.

- Propane gas delivery will occur within the propane tank loop.

- Diesel delivery will take place at the diesel storage tanks located between the two parking garages

- John Sutherland Drive between Richmond Road and Main QCH Access/John Sutherland Drive intersection is designated as a fire route. Whole of QCH west ring road, loading bay area, and ambulance/police bay in front of the emergency department are also designated as fire routes. All three of these fire routes meet the minimum clear width requirement of 6.0m for a fire route.

- Ambulance garage is located beside the emergency department off John Sutherland Drive. In front of the emergency department, an ambulance bay and parking for ambulance/police is also provided.

Parking

- The ratio of existing parking supply to the anticipated visits is approximately 0.66 spaces per visitor. While this parking demand has been calculated based on the current parking supply, QCH staff have advised that there is a waitlist for parking, and the current demands are not met based on the current parking supply.
- Based on the proposed site plan, Part 4 expansion will have a supply of 1714 parking spaces.

- While QCH has committed to providing TDM measures within the development to help shift modal shares, the effectiveness of measures is not known, and measures may take time to alter employee and visitor travel behaviors. Additionally, there are no major transit improvements proposed by the city to assist in shifting modal shares. As such, the proposed parking supply will meet the maximum parking demand while the modal shares from the development shift over time. As such, the proposed parking supply will be roughly midway between the anticipated parking demand based on the existing and proposed modal shares.

- The proposed number of vehicle, bicycle, and accessible parking spaces adhere to the minimum requirements of the Zoning By-law (ZBL) 2008-250.

- The proposed bicycle parking spaces fall short of the minimum required spaces per ZBL 2026-50. Relief from the ZBL 2026-50 requirements is requested.

Boundary Streets

- The results of the segment MMLOS can be summarised as follows:
  - Richmond Road does not meet the target PLOS D, but Baseline Road meets the target PLOS D;
  - Richmond Road does not meet the target BLOC C, but Baseline Road meets the target BLOS D;
  - Both the boundary streets meet the target TLOS D;

- Richmond Road can achieve the target PLOS D by providing a 2.0m wide sidewalk with a 1.5-2.99m of offset from the motor vehicle travel lane on both sides of the roadway.

- Richmond Road can only achieve the target BLOS C through the implementation of cycle tracks.

Transportation Demand Management

- TDM measures that are currently in place within the QCH hospital include:
  - Provide opportunities for staff to work from home if they have the ability.
  - Partnerships with rural hospitals, to allow doctors to travel to rural areas to provide health care services typically provided at QCH. This would reduce the number of patients visiting from rural areas outside the city.
  - Provide safe, secure, convenient, and comfortable bike parking to encourage cycling.
  - Provide a dynamic parking policy that prioritizes rural patients, carpoolers, pick up/drop off patients/employees.
  - Charge for long-term parking (daily, weekly, monthly). To reduce the incentive to drive, increase daily parking rates for employees.
  - Charge for short-term parking (hourly).
  - Provide a multi-modal travel information package for new staff.
  - Provide patients with information on specialized mobility incentives that are available to them (i.e., Para Transpo, Taxi Reimbursements, etc.)
  - Provide clinics during evenings and weekends to shift trips outside the weekday peak periods.
  - Explore opportunities for some employees to work outside peak periods.
  - Provide online links to OC Transpo information.
  - Provide on-site amenities/services to minimize mid-day errands.

- In addition to the above measures that are currently in place, the following TDM measures will be implemented within the QCH hospital:
  - Provide virtual care to reduce the number of patients who need to come to the QCH campus.
  - Provide full- or part-time staff who will be dedicated to collecting data, managing incentives, and evaluating impacts of TDM measures. This staff will liaise with various leadership groups to develop a TDM strategy.
  - Develop a TDM platform to track multimodal commute data, provide rewards and incentives, and serving as a resource/communications hub. This is overseen by the Transportation Coordinator.

  - Build a high quality, secure, indoor bike parking facility that meets the needs of cyclists and sets a cycling culture/foundation for employees.
  - Purchase or lease a fleet of bikes and e-bikes that can be rented out to employees at minimal cost.
  - Provide real-time transit display screens near main building entrances.
  - Incentivize employees to use sustainable modes by introducing cycling challenges, etc.

- The proposed TDM program will assist in achieving a higher auto passenger, transit, and cycling modal share for the hospital. The implementation of a TDM coordinator will allow the hospital to track TDM programs for effectiveness and develop an improved program over time.

Transit

- The proposed Part 4 expansion is anticipated to generate the following number of additional transit trips: 75 IN and 36 OUT in the AM peak, and 26 IN and 69 OUT in the PM peak.

- Peak period transit utilization data dated April 1, 2025, was obtained from OC Transpo. The data obtained reflects the routes and the stops they had served prior to the recent implementation (April 27, 2025) of OC Transpo initiative “New Ways to Bus”. As transit data for the new routes is not available, the specific bus loads departing QCH have not been reviewed. However, based on the anticipated transit distribution, the additional transit usage has been calculated.

Transit Priority

- The eastbound left turn movement at the Richmond Road/Holly Acres Road/Nanaimo Drive intersection and the westbound left turn movement at the Baseline Road/Richmond Road/Robertson Road intersection are not anticipated to meet the target TLOS D during the AM and PM peak hours. The City's recently approved 2025 TMP CIP includes the Robertson Road and Richmond Road Transit Priority project. Consideration should be given by the city to implementing left turn queue jump lanes at the aforementioned intersections as part of this project.

- The westbound left and right turn movements at the Richmond Road/John Sutherland Drive intersection are not anticipated to meet the target TLOS D during the PM peak hour. To provide additional capacity and improved transit operations, widening the John Sutherland Drive approach to this intersection to provide two outbound lanes is proposed.

Intersection MMLOS

- The results of the intersection MMLOS analysis can be summarized as follows:
  - All the study area intersections generally meet the target PLOS;
  - No study area intersections meet the target BLOS except for the Baseline Road/Cedarview Road intersection and Baseline Road/Sandcastle Drive intersection;
  - All the study area intersections generally meet the target TLOS;

- At all the study area intersections except for the Baseline Road/Sandcastle Drive intersection, the target BLOS can be achieved by implementation protected intersection features. At the Baseline Road/Sandcastle Drive intersection, a bike lane is sufficient on the south leg to achieve the target BLOS C.

- To improve TLOS at Richmond Road/Holly Acres Road/Nanaimo Drive, consideration should be given by the city to implement an eastbound left turn queue jump lane as part of the Robertson Road and Richmond Road Transit Priority Project.

- To improve TLOS at Richmond Road/John Sutherland Drive, consideration has been given to widen the John Sutherland Drive approach to provide two outbound lanes.

- To improve TLOS at Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp, consideration should be given by the city to implement a westbound left turn queue jump lane as part of the Robertson Road and Richmond Road Transit Priority Project.

Total Traffic Operations

- All study area intersections except for the Richmond Road/John Sutherland intersection operate within acceptable LOS during the AM and PM peaks.

- At Richmond Road/Holly Acres Road/Nanaimo Drive intersection, during the AM and PM peaks, the 95th percentile queue length of the westbound through/left turn movement exceeds the available storage length of 20m. The 95th percentile queue length of the northbound left turn movement exceeds the available storage length of 25m.

- At Richmond Road/John Sutherland Drive intersection, the 95th percentile queue length for the southbound left turn movement is anticipated to exceed the available storage length of 45m during the AM peak. The westbound approach is anticipated to operate with a LOS F during the PM peak hour.
- The proposed implementation of a permitted and protected southbound left turn phase and widening of the westbound approach to two outbound lanes is anticipated to yield a LOS A during the AM peak hour and a LOS C during the PM peak hour. The 95th percentile southbound left turn queues are anticipated to reduce during the AM peak hour and will be accommodated within the existing storage length.

- At Baseline Road/Cedarview Road, the 95th percentile queue length for the northbound left turn movement exceeds the available storage of 25m potentially blocking the adjacent northbound right turn lane during the AM and PM peak hours.

- At Baseline Road/John Sutherland Drive/Valley Stream Drive intersection, the 95th percentile queue length for the eastbound left movement is anticipated to exceed the available storage length of approximately 35m during the AM peak hour. Lengthening the left turn lane to provide 60 m storage is proposed.

The proposed development is recommended from transportation perspective.

1.0 SCREENING

1.1 Introduction

This revised Transportation Impact Assessment (TIA) has been prepared in support of Site Plan Control (SPC) application for the proposed Queensway Carleton Hospital (QCH) Part 4 expansion in Ward 8, College, in Ottawa. The subject site is located on a National Capital Commission (NCC) parcel. The subject site has frontage on Baseline Road, Richmond Road, and John Sutherland Drive. It is located in the Greenbelt Transect per the city's *Official Plan* (OP). In the study area it is classified as a greenbelt facility within Schedule B4 of the *OP*.

The subject site currently is surrounded by the following:

- Tubman Funeral Home, and Académie de la Capitale, to the north;
- An off-road multiuse trail and Baseline Road, followed by vacant lands to the south;
- Semi-detached houses followed by Sioux Crescent to the east;
- Vacant lands containing a pathway network used by the Hospital, followed by HWY416, Baseline Road, and Richmond Road to the west.

An aerial view of the subject site and its vicinity is shown in **Figure 1**.

1.2 Proposed Development

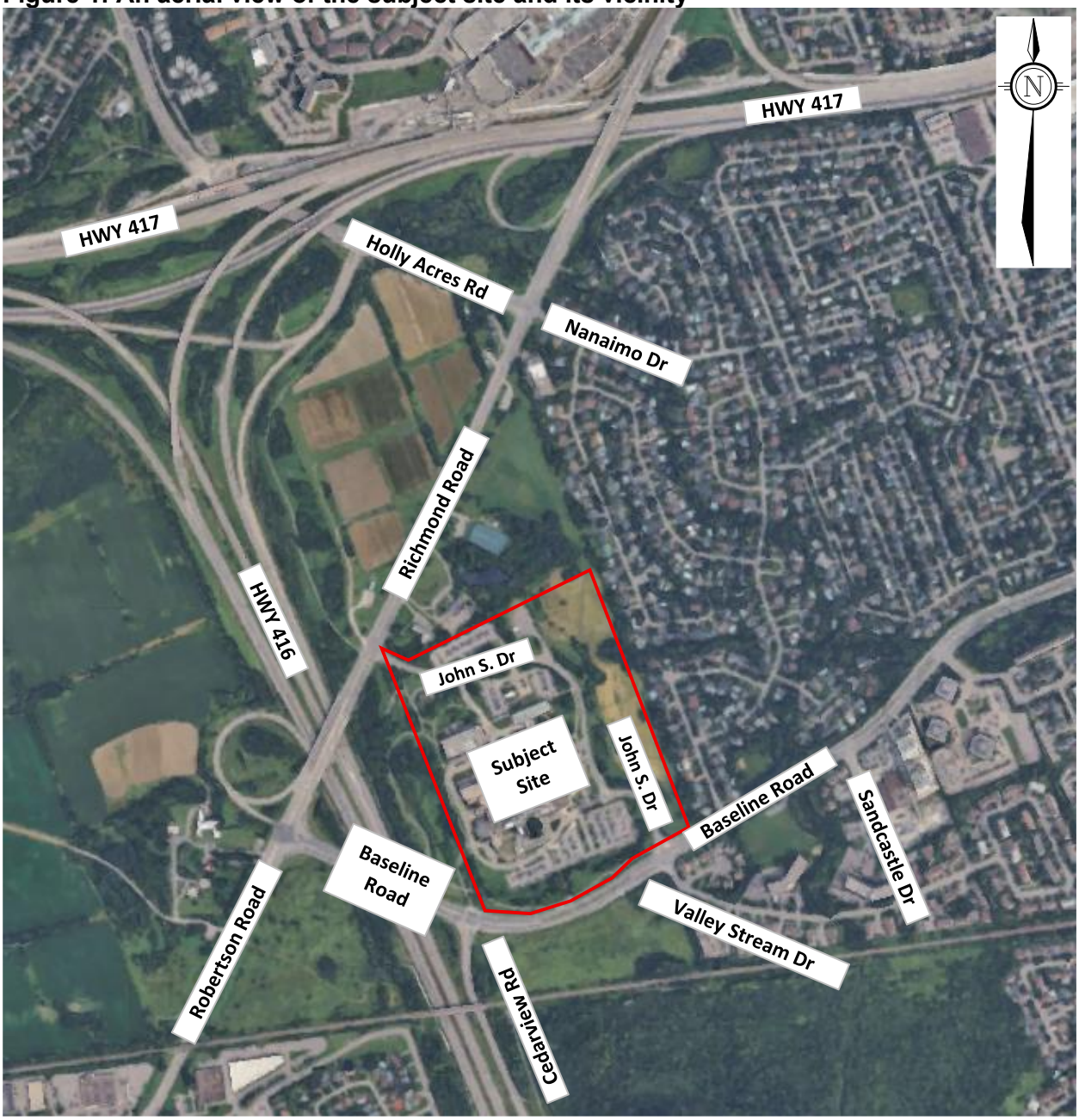
The breakdown of the proposed redevelopment and expansion works constituting Part 4 of the masterplan expansion can be summarised as follows:

- Phase 1 – Realign loading dock access road, extension of west ring road to John Sutherland Drive, addition of new parking garage, reconfiguration of the visitor parking lot 6 and parking lot 2B, construction of new electrical substation, loading bay traffic island demolition, propane tank removal, and construction of new propane tank loop and propane tank installation.
- Phase 2 (a) – Demolition of Lot TL1 and construction of interim loading docks.
- Phases 2 (b-d) – Installation of new diesel and oxygen tanks, demolition of James Beach Parking Lot, construction of new generator facility, and construction of support services and loading docks.
- Phase 3 – Construction of inpatient tower addition, widening of John Sutherland Drive to provide two outbound lanes at Richmond Road, and extension of eastbound left turn lane at Baseline Road/John Sutherland Drive intersection.
- Phase 4 (a) – Realign John Sutherland Drive east of the hospital, construction of temporary ambulance bay and new ambulatory care addition.
- Phase 4 (b-c) – Emergency department addition and ambulance garage, emergency department internal renovation, and new pathway trail along east/north side of John Sutherland Drive.
- Phase 5 – Construction of transitional care tower.

The current and future capacity of the hospital is summarized in **Table 1**. It is noteworthy that as the application evolved, the overall Gross Floor Area (GFA) for the hospital expansion has been reduced to about 783,000 ft^2. However, for the purposes of this report, the previous GFA estimate of about 1,000,000 ft^2 has been maintained.

The Part 4 expansion will be constructed in phases with an ultimate buildout in 2030. The existing site plan and the proposed Part 4 phasing plans are included in **Appendix A**.

Figure 1: An aerial view of the subject site and its vicinity



Source: Background aerial snapshotted from Google Earth.

Table 1: Existing and Forecasted Capacities of the Hospital

Independent Variable	Current Capacity	Gross Capacity after Part 4 Expansion
No of beds	287 beds	444 beds
No of full-time employees (FTE)	1337 FTE	2066 FTE
GFA	637,444 ft^2	1,023,388 ft^2

1.3 Screening Form

The city's *Revised TIA Guidelines* identify three triggers to satisfy the requirements for the need of a TIA report, including trip generation, location, and safety. The minimum criteria for each trigger are outlined in the City's TIA Screening form, which is included in **Appendix B**. The trigger results are as follows:

- Trip Generation Trigger – The development is anticipated to generate over 60 peak hour person trips; further assessment is **required** based on this trigger.
- Location Triggers – The development does not propose a new connection to a designated Rapid Transit or Transit Priority (RTTP) corridor or a Crosstown Bikeway, and is not located within a Hub, Protected Major Transit Station Area (PMTSA), or Design Priority Area (DPA); further assessment is **not required** based on this trigger.
- Safety Triggers – The subject site has frontage to a street with a posted speed limit of 80 kmph (Richmond Road); further assessment is **required** based on this trigger.

2.0 SCOPING

2.1 Existing Conditions

2.1.1 Roadways

All roadways within the study area fall under the jurisdiction of the City of Ottawa except the HWY416 ON-Ramp and HWY416 which fall under the jurisdiction of MTO.

Richmond Road is an arterial roadway that generally runs on an east-west alignment between Baseline Road and Island Park Drive. In the study area it has a four-lane cross section with a posted speed limit of 80 kmph and transitioning to 60kmph as approaching the Richmond Road/Holly Acres Road/Nanaimo Drive intersection. It is also classified as a full load truck route. Schedule C16 of the City of Ottawa's *Official Plan* identifies a Right-of-Way (ROW) protection of 49.5 m between Holly Acres Road and Baseline Road subject to the Baseline Road Rapid Transit Corridor (Bayshore Station to Heron Station) Planning and Environmental Assessment Study. South of the Richmond Road/John Sutherland Drive intersection, the ROW protection is met with some additional protections required to the north of the intersection.

Robertson Road is an arterial roadway that generally runs on an east-west alignment between Baseline Road and Eagleson Road. In the study area it has a four-lane undivided urban cross section with a posted speed limit of 80 kmph. It has paved asphalt sidewalks on both sides of the road. It is also classified as a full load truck route.

Baseline Road is an arterial roadway that generally runs on an east-west alignment between Richmond Road/Robertson Road and Prince of Wales Drive. In the study area it has a four-lane divided urban cross section with a posted speed limit of 70 kmph. It has a sidewalk on the south side and a multiuse pathway on the northside of the roadway between Cedarview Road and John Sutherland Drive which transitions to a sidewalk east of John Sutherland Drive. Baseline Road is classified as a full load truck route. Schedule C16 of the City of Ottawa's *Official Plan* identifies a Right-of-Way (ROW) protection of 36.3 m between Richmond Road and Greenbank Road.

Cedarview Road is an arterial roadway that generally runs on a north-south alignment between Baseline Road and ends in a dead-end south of Cobble Hill Drive. In the study area, it has a two-lane rural cross section with a posted speed limit of 60 kmph. It has a paved asphalt, bi-directional,

multi-use pathway on the east side of the road. Cedarview Road is classified as a truck route with seasonal load restrictions.

Valley Stream Drive is a local roadway that generally runs on an east-west alignment between Baseline Road and Gladecrest Court. In the study area, it has a two-lane urban cross section with a speed limit of 40 kmph. It has a sidewalk on the north side of the roadway.

John Sutherland Drive is a private roadway that generally runs on a north-south alignment between Baseline Road and Richmond Road within the QCH campus. In the study area, it has a two-lane urban cross section with a posted speed limit of 50 kmph. It has a sidewalk on one side of the road.

Holly Acres Road is an arterial roadway that runs on a north-east curvilinear alignment between Carling Avenue and Richmond Road. In the study area, it has a four-lane urban cross section with a posted speed limit of 60kmph. It has paved asphalt sidewalk on both the sides of the road, transitioning to concrete sidewalks north of Aero Drive. It is classified as a truck route with seasonal load restrictions.

Nanaimo Drive runs on an east-west alignment between Richmond Road and Brian Crescent and is classified as a collector roadway between Richmond Road and Queensline Drive, and a local roadway between Queensline Drive and Brian Crescent. In the study area it has a two-lane undivided urban cross section with a posted speed limit of 40kmph. No sidewalks are provided on either side of the road. Parking is generally allowed on both the sides of the road with prohibition between April 01 and Nov 30.

Sandcastle Drive is a collector roadway that runs on a north-south alignment between Baseline Road and Valley Stream Drive. In the study area, it has a two-lane undivided urban cross section with a posted speed limit of 40kmph. A sidewalk is provided on the west side for the entire length and on the east side for approximately 120m south of Baseline Road. Parking is allowed only on the east side of the road.

HWY416 is classified as a freeway within the MTO's Highway Corridor Management Manual. It is further classified as a Fully Controlled-Access Highway (1A).

2.1.2 Study Intersections

Richmond Road/Holly Acres Road/Nanaimo Drive

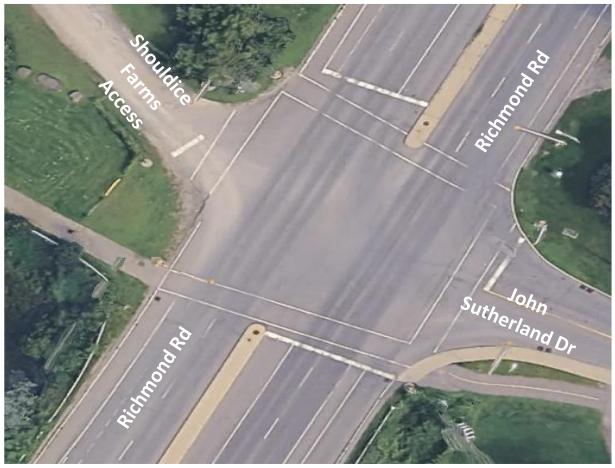
- Signalized four-legged intersection.
- Northbound Approach (Richmond Road): one left turn lane, one through lane, one through/right lane, and one bicycle lane.
- Southbound Approach (Richmond Road): one left turn lane, two through lanes, one pocket bicycle lane, and one right turn lane.
- Westbound Approach (Nanaimo Drive): one through/left lane, and one right turn lane.



- Eastbound Approach (Holly Acres Road): two left turn lanes, one through lane, one pocket bicycle lane, and one channelized right turn lane.
- Standard crosswalk on all approaches except the southbound approach. Pedestrian crossing on southbound approach is prohibited by signage.

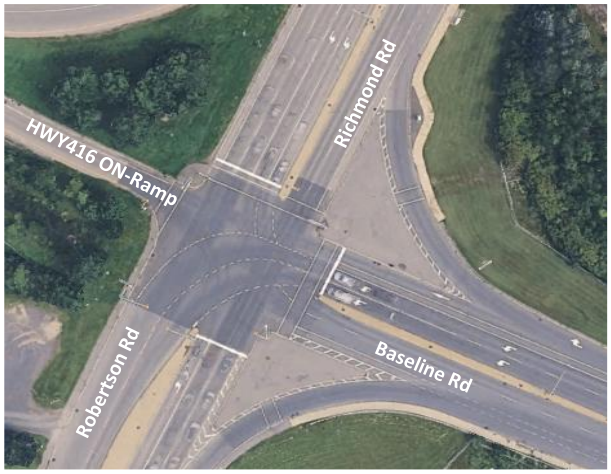
Richmond Road/John Sutherland Drive

- Signalized four-legged intersection.
- Northbound Approach (Richmond Road): one left turn lane, two through lanes, one bicycle lane, and one right turn lane.
- Southbound Approach (Richmond Road): one left turn lane, one through lane, one through/right lane, and one bicycle lane.
- Westbound Approach (John Sutherland Drive): one shared all-movement lane.
- Eastbound Approach (Shouldice Farms Access): one shared all-movement lane.
- Standard crosswalk on all approaches.



Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp

- Signalized four-legged intersection.
- Northbound Approach (Robertson Road): one left turn lane, two through lanes, and one channelized right turn lane.
- Southbound Approach (Richmond Road): two left turn lanes, two through lanes, one bicycle lane, and one channelized right turn lane.
- Eastbound Approach (HWY416 ON-Ramp): N/A.
- Westbound Approach (Baseline Road): two left turn lanes, one bicycle lane, one through lane, and one channelized right turn lane.
- Standard crosswalk on all approaches except the northbound approach.



Baseline Road/Cedarview Road

- Signalized three-legged intersection.
- Northbound Approach (Cedarview Road): one left turn lane, and one right turn lane.
- Eastbound Approach (Baseline Road): two through lanes, one bicycle lane, and one channelized right turn lane.
- Westbound Approach (Baseline Road): one left turn lane, two through lanes, and one bicycle lane.
- Ladder crosswalks on all three approaches.
- A bicycle crossride on the westbound approach.
- A two-stage turn queue box for eastbound cyclists turning left.



Baseline Road/John Sutherland Drive/Valley Stream Drive

- Signalized four-legged intersection.
- Northbound Approach (Valley Stream Drive): one left turn lane, and one through/right turn lane.
- Southbound Approach (John Sutherland Drive): one shared through/left turn lane, and one channelized right turn lane.
- Eastbound Approach (Baseline Road): one left turn lane, two through lanes, one bicycle lane, and one right turn lane.
- Westbound Approach (Baseline Road): one left turn lane, two through lanes, one bicycle lane, and one channelized right turn lane.
- Standard crosswalk on all approaches.



Baseline Road/Sandcastle Drive

- Signalized three-legged intersection.
- Northbound Approach (Sandcastle Drive): one left turn lane, and one right turn lane.
- Eastbound Approach (Baseline Road): one through lane, one through/right lane, and one bicycle lane.
- Westbound Approach (Baseline Road): one left turn lane, two through lanes, and one bicycle lane.
- Standard crosswalk on all approaches.



John Sutherland Drive/QCH West Access Road

- Unsignalized three-legged intersection.
- Stop control is provided on the southbound approach.
- Southbound Approach (John Sutherland Drive): one shared all-movement lane.
- Eastbound Approach (West Ring Road): one shared all-movement lane.
- Westbound Approach (John Sutherland Drive): one through lane, and one channelized right turn lane.
- Ladder crosswalk on southbound approach.



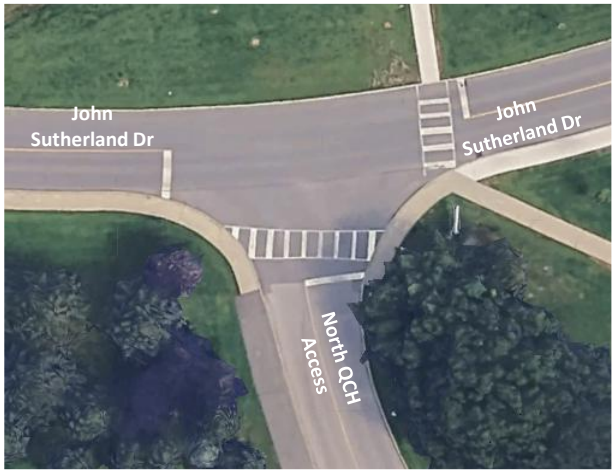
John Sutherland Drive/ Irving Greenberg Cancer Center Access

- Unsignalized three-legged intersection.
- Stop control is provided on all approaches.
- Northbound Approach (Irving Greenberg Cancer Center Access): one shared all-movement lane.
- Eastbound Approach (John Sutherland Drive): one shared all-movement lane.
- Westbound Approach (John Sutherland Drive): one shared all-movement lane.
- Ladder crosswalk on eastbound approach.



John Sutherland Drive/North QCH Access

- Unsignalized three-legged intersection.
- Stop control is provided on all approaches.
- Northbound Approach (North QCH Access): one shared all-movement lane.
- Eastbound Approach (John Sutherland Drive): one shared all-movement lane.
- Westbound Approach (John Sutherland Drive): one shared all-movement lane.
- Ladder crosswalks on westbound and northbound approaches.



John Sutherland Drive/Temporary Parking Lot TL2 Access/Private Hydro Access

- Unsignalized four-legged intersection.
- Stop control is provided on the northbound and southbound approaches.
- Northbound Approach (Private Hydro Access): one shared all-movement lane.
- Southbound Approach (Temporary Parking Lot TL2 Access): one shared all-movement lane.
- Eastbound Approach (John Sutherland Drive): one shared all-movement lane.
- Westbound Approach (John Sutherland Drive): one shared all-movement lane.



2.1.3 Driveways

A review of existing adjacent driveways along the boundary roads within approximately 200m from the development driveways are provided as follows:

John Sutherland Drive (North Side)

- One driveway to QCH Temporary Parking Lot TL2.
- One driveway to QCH snow dump area.

John Sutherland Drive (South Side)

- One private driveway to a private property (3460 Richmond Road) located on John Sutherland Drive, approximately 17m east of Richmond/John Sutherland Drive intersection.
- One driveway to hydro building.
- One driveway to North QCH Access.
- One driveway to QCH Irving Greenberg Cancer Center.
- Two driveways to QCH Emergency department entrance and ambulance garage.

Richmond Road (East Side)

- One commercial driveway to Académie de la Capitale at 3448 Richmond Road.
- Two commercial driveways to Tubman Funeral Homes at 3440 Richmond Road.
- One commercial driveway to Valleystream Pickleball Club and Soccer Field at 3412 Richmond Road.

Richmond Road (West Side)

- One private driveway to Shouldice Farms access (signalized) at 3451 Richmond Road.

Baseline Road (North Side)

- N/A

Baseline Road (South Side)

- One public driveway to Brucelands Park parking lot at 2960 Baseline Road.

2.1.4 Pedestrian and Cycling Facilities

Sidewalks

- John Sutherland Drive has a sidewalk on one side.
- Baseline road has an off-road multi-use pathway along the north side of it between Richmond Road and John Sutherland Drive; it transitions into a concrete sidewalk at John Sutherland Drive. On the south side, it has a concrete sidewalk.
- Richmond road does not have sidewalks but has paved shoulders on both the sides.
- Robertson Road has paved asphalt sidewalks on both the sides of the road.
- Cedarview Road has a paved shoulder on the west side. On the east side, it has a paved asphalt, bi-directional, multi-use pathway.
- Holly Acres Road has paved asphalt sidewalk on both sides of the road, transitioning to concrete sidewalks north of Aero Drive.
- Sandcastle Drive has sidewalk only on the west side of the road. On the east side, sidewalk is provided only along the frontage of commercial/residential development at 2940-2946 Baseline Road.

Cycling Facilities

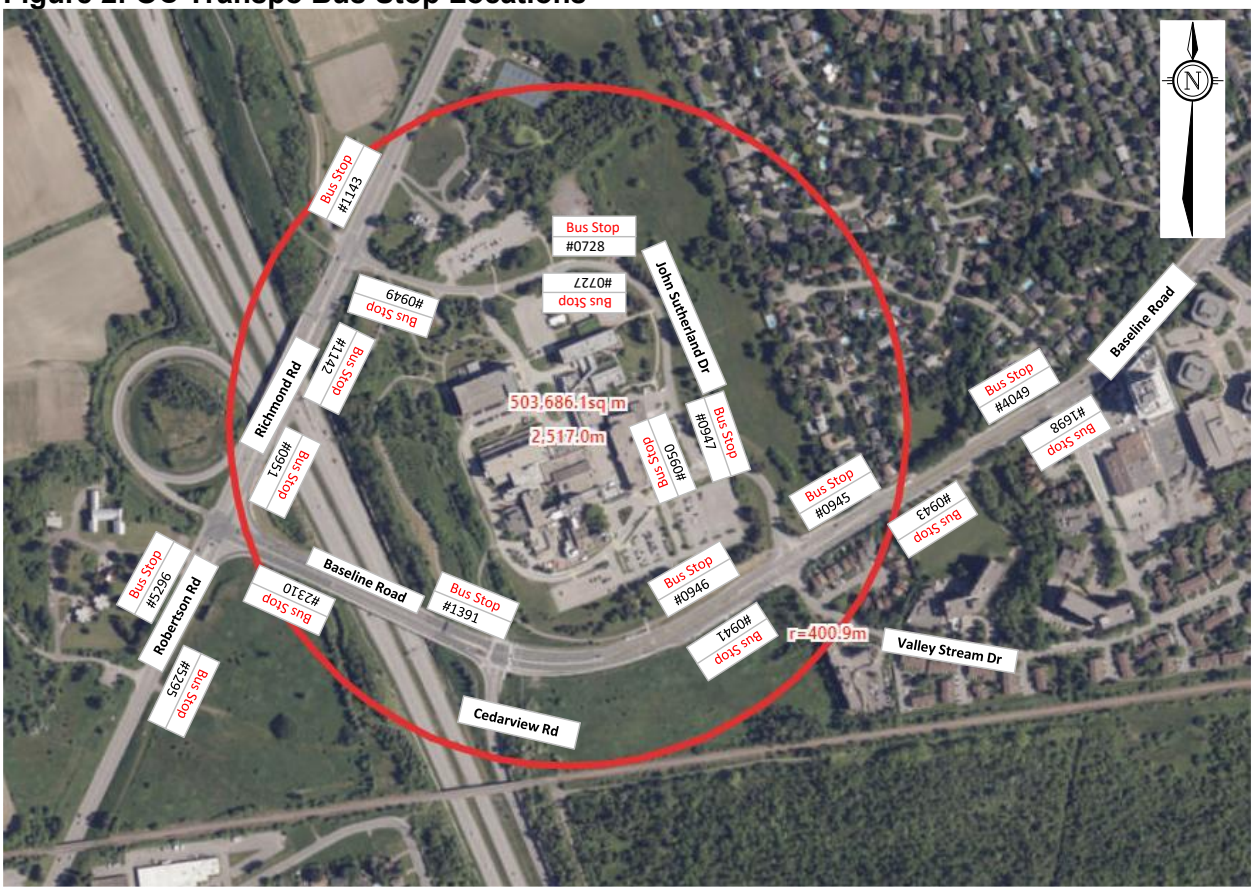
- John Sutherland Drive does not have any cycling facilities (mixed traffic).
- Baseline Road has on-road cycling lanes on both the sides of the road. In addition to this, it has an off-road multi-use pathway along the north side of it between Richmond Road and John Sutherland Drive.
- Richmond Road has on-road cycling lanes on both the sides of the road.
- Robertson Road does not have any cycling facilities (mixed traffic).
- Cedarview Road has a paved asphalt, bi-directional, multi-use pathway on the east side of the road.
- Holly Acres Road does not have any cycling facilities (mixed traffic).
- Nanaimo Drive does not have any cycling facilities (mixed traffic).
- Sandcastle Drive does not have any cycling facilities (mixed traffic).

The City's *2023 Transportation Master Plan - Part 1* identifies Richmond Road, Robertson Road, the northern part of Cedarview Road, and the western portion of the NCC lands/QCH campus connecting Cedarview Road at Baseline Road to Richmond Road at John Sutherland Drive as a cross-town bikeway.

2.1.5 Transit

There are several OC Transpo bus stops within the vicinity of the subject site. The closest bus stops (including within 400 m radius) are shown in **Figure 2**. The location of the bus stops and the including the routes they service are summarized in **Table 2**. The routes that serve the study area are summarized in **Table 3**. Detailed route information and an excerpt from the OC Transpo Map are included in **Appendix C**.

Figure 2: OC Transpo Bus Stop Locations



Source: Background aerial snapshotted from GeoOttawa.

Table 2: OC Transpo Transit Stops

Road	Side	Stop No.	Location	Routes Serviced
Robertson Road	West	5296	South of Baseline Road	57, 68, 646, 688
	East	5295	South of Baseline Road	57, 68, 646, 688
Richmond Road	East	0951	North of Baseline Road	658, 660
	East	1142	South of John Sutherland Drive	658, 660, 661, 669
	West	1143	North of John Sutherland Drive	88, 658, 660, 661, 669
Baseline Road	North	1391	West of Cedarview Road	57, 646, 658, 660, 661, 688
	North	0946	West of John Sutherland Drive	57, 646
	North	0945	East of John Sutherland Drive	68, 88, 646, 688
	North	4049	East of John Sutherland Drive	68, 88, 646, 688
	South	2310	East of Robertson Road	57, 646, 658, 660, 661, 669, 688
	South	0941	East of Valley Stream Drive	57, 646, 688
	South	0943	West of Valley Stream Drive	88, 646, 688
	South	1698	West of Valley Stream Drive	68, 88, 646, 688

Road	Side	Stop No.	Location	Routes Serviced
John Sutherland Drive	East	0947	Across from QCH Emergency Center	57, 68, 88
	East	0728	Across from QCH Irving Greenberg Cancer Center	57, 68, 88
	West	0950	In front of QCH Emergency Center	57, 68, 88
	West	0727	In front of QCH Irving Greenberg Cancer Center	57, 68, 88
	West	0949	East of Richmond Road	57, 68, 88

Table 3: OC Transpo Route Information

Route Details	Frequency
Route 57 - Rapid Bayshore/Crystal Bay ↔ Tunney's Pasture	Weekday: 15 mins headway. Every alternate bus extends to/from Carling Campus during off-peak hours, and every bus during peak hours. Weekend: 30 mins headway. Every alternate bus is from/to Carling Campus i.e., 1-hour headways.
Route 68 – Frequent Baseline ↔ Terry Fox	Weekday: 10-30 mins headway depending on peak/off-peak hours. Weekend: 15-30 mins headway depending on peak/off-peak hours.
88 – Frequent Hurdman ↔ Bayshore	Weekday: 15-25 mins or less headway depending on peak/off-peak hours. Some buses start/end at Baseline during off-peak hours. Weekend: 15-30 mins headway depending on peak/off-peak hours. Every alternate bus starts/ends at Baseline.
646 – School Route Canterbury H.S. ↔ Terry Fox	Weekday: Two consecutive buses in the morning to school at 7:37 and two consecutive buses in the afternoon at 15:34 from school. Weekend: Not Serviced.
658 – School Route Grandview ↔ Bell H.S.	Weekday: Two consecutive buses in the morning to school at 8:18 and three consecutive buses in the afternoon at 15:33 from school. Weekend: Not Serviced.
660 – School Route Bell H.S. ↔ innovation	Weekday: One bus in the morning at 8:07 to school and one bus in the afternoon at 15:36 from school. Weekend: Not Serviced.

Route Details	Frequency
661 – School Route Bell H.S. ↔ Terry Fox	Weekday: One bus in the morning at 8:14 to school and one bus in the afternoon at 15:33 from school. Weekend: Not Serviced.
669 – School Route Bell H.S. ↔ Bayshore	Weekday: Three consecutive buses in the morning at 8:28 to school and four consecutive buses in the afternoon at 15:24/15:33 from school. Weekend: Not Serviced.
688 – School Route Merivale H.S. ↔ Terry Fox	Weekday: Two buses in the morning at 7:00 and 7:05 to school and three consecutive buses in the afternoon at 14:30 from school. Weekend: Not Serviced.

*Data in the table is from OC Transpo Website accessed on April 21, 2025.

The peak period boarding/alighting/average load at departure data for transit at the nearby QCH transit stops was obtained from OC Transpo. The data provided by OC Transpo is summarized in **Table 4**. Assuming that all the transit trips listed in the table are QCH related, the peak period transit data was converted to peak hour data using the factors provided in table 4 of the *TRANS Trip Generation Manual – Summary Report* prepared by WSP. The factors for converting peak period transit trip rate to peak hour rates are given as 0.55 and 0.47 during the AM and PM peaks respectively. This peak period transit data converted to peak hour transit data is summarized in **Table 5**.

2.1.6 Area Traffic Management

Within the study area, there are no Area Traffic Management (ATM) studies that are in progress and/or completed recently.

The following ATM measures were identified at the Richmond Road/Holly Acres Road/Nanaimo Drive intersection:

- Northbound U-turn is prohibited
- Westbound trough vehicular movement onto Nanaimo Drive is prohibited between 7:00 AM and 9:00 AM on weekdays. Bicycles are permitted.
- Traffic calmed neighborhood signage posted on entrance to Nanaimo Drive; flex posts, painted lane narrowing, 40KM/HR MAX pavement markings, and speed display devices are installed. Posted speed limit is 40kmph.

Table 4: OC Transpo Peak Period Transit Data at Nearby Stops

Stop	Location	Route	Direction	AM (6:00-9:00)			PM (15:00-18:00)			24-hr		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
0727	QCH/Irving Greenberg	57	WB	0	3	13	0	0	11	0	6	9
		58	EB	0	1	14	0	0	8	0	1	7
0728	QCH/Irving Greenberg	57	EB	0	0	7	4	0	18	5	0	10
		58	WB	0	0	6	2	0	10	2	0	8
0950	QCH/ Emergency	57	WB	1	16	11	0	4	10	3	28	8
		58	EB	0	5	13	3	1	9	5	6	7
0947	QCH/ Emergency	57	EB	2	0	7	22	1	17	41	1	10
		58	WB	0	5	6	5	0	9	14	5	7
0946	Baseline/ QCH	57	WB	0	3	11	1	3	10	2	9	8
		88	WB	1	21	28	3	11	25	10	79	21
0941	Baseline/ Valley Stream	57	EB	2	0	7	9	0	15	17	1	9
		88	EB	21	5	22	14	4	38	68	13	22
Total				27	59	145	63	24	180	167	149	126

Table 5: OC Transpo Peak Period Data converted to Peak Hour Volume

Stop	Location	Route	Direction	AM Peak Hour Conversion Factor = 0.55		PM Peak Hour Conversion Factor = 0.47	
				Boardings	Alightings	Boardings	Alightings
0727	QCH/Irving Greenberg	57	WB	0	2	0	0
		58	EB	0	1	0	0
0728	QCH/Irving Greenberg	57	EB	0	0	2	0
		58	WB	0	0	1	0
0950	QCH/ Emergency	57	WB	1	9	0	2
		58	EB	0	3	1	1
0947	QCH/ Emergency	57	EB	1	0	10	1
		58	WB	0	3	2	0
0946	Baseline/ QCH	57	WB	0	2	1	1
		88	WB	1	12	1	5
0941	Baseline/ Valley Stream	57	EB	1	0	4	0
		88	EB	12	3	7	2
Total				16	35	29	12

2.1.7 Existing Traffic Volumes

Weekday traffic counts commissioned by Novatech, as well as counts obtained from the City of Ottawa were used to determine the existing pedestrian, cyclist and vehicular traffic volumes at the study area intersections. The traffic counts were completed on the following dates:

- Richmond Road & Holly Acres Road & Nanaimo Drive May 01, 2025
- Richmond Road & John Sutherland Drive Mar 05, 2025
- Richmond Road/Robertson Road & Baseline Road & HWY416 ON-Ramp Feb 13, 2024
- Baseline Road & Cedarview Road Mar 05, 2025
- Baseline Road & Stream Valley Drive & John Sutherland Drive Nov 06, 2024
- Baseline Road & Sandcastle Drive Feb 03, 2022
- Baseline Road & Sandcastle Drive Jan 12, 2017
- John Sutherland Drive & QCH West Access Road Nov 06, 2024
- John Sutherland Drive & QCH Irving Greenberg Cancer Center Nov 06, 2024
- John Sutherland Drive & QCH North Access Nov 06, 2024
- John Sutherland Drive & Parking Lot TL2 & Private Access Nov 06, 2024

The traffic count data at Baseline Road/Sandcastle Drive conducted by the City of Ottawa on February 03, 2022, was found to have significantly lower traffic volumes when compared with the traffic volumes at Baseline Road/John Sutherland Drive/Valley Stream Drive intersection. These two intersections are located beside each other, and no other road links exist between them except the Sioux Crescent on westbound movement which is a local road serving the Qualicum neighbourhood. Therefore, another traffic count was obtained from the city which was conducted on January 12, 2017 (pre-COVID) and was found to be reliable. For the purposes of this report, the through volumes at Baseline Road/Sandcastle Drive intersection were projected from the Baseline Road/John Sutherland Drive/Valley Stream Drive intersection. The traffic to/from Sandcastle Drive has been assumed from the 2017 count as it is a collector road serving the Bruce Farm neighborhood only. Comparing the google aerial imagery, only the development at 2940-2946 Baseline Road (Phase 1) occurred after 2017 traffic counts. The traffic generated from this development was added to the to/from Sandcastle Drive 2017 traffic counts to capture the traffic from this development (excerpts from the respective TIA is included in **Appendix G**).

Traffic count data is included in **Appendix D**. Traffic volumes within the study area are shown in **Figure 3**. Existing signal timing plans for the study area intersections were also obtained from the city and are included in **Appendix E**.

2.1.8 Collision History

Historical collision data from 2018-2022 was obtained from the city's Public Works and Service Department for the study area intersections. Copies of the collision summary reports are included in **Appendix F**.

The collision data has been evaluated to determine if there are any identifiable collision patterns. The number of collisions at each intersection and segment from January 1, 2018, to December 31, 2022, is summarized in **Table 6**.

Figure 3: Existing Traffic Volumes

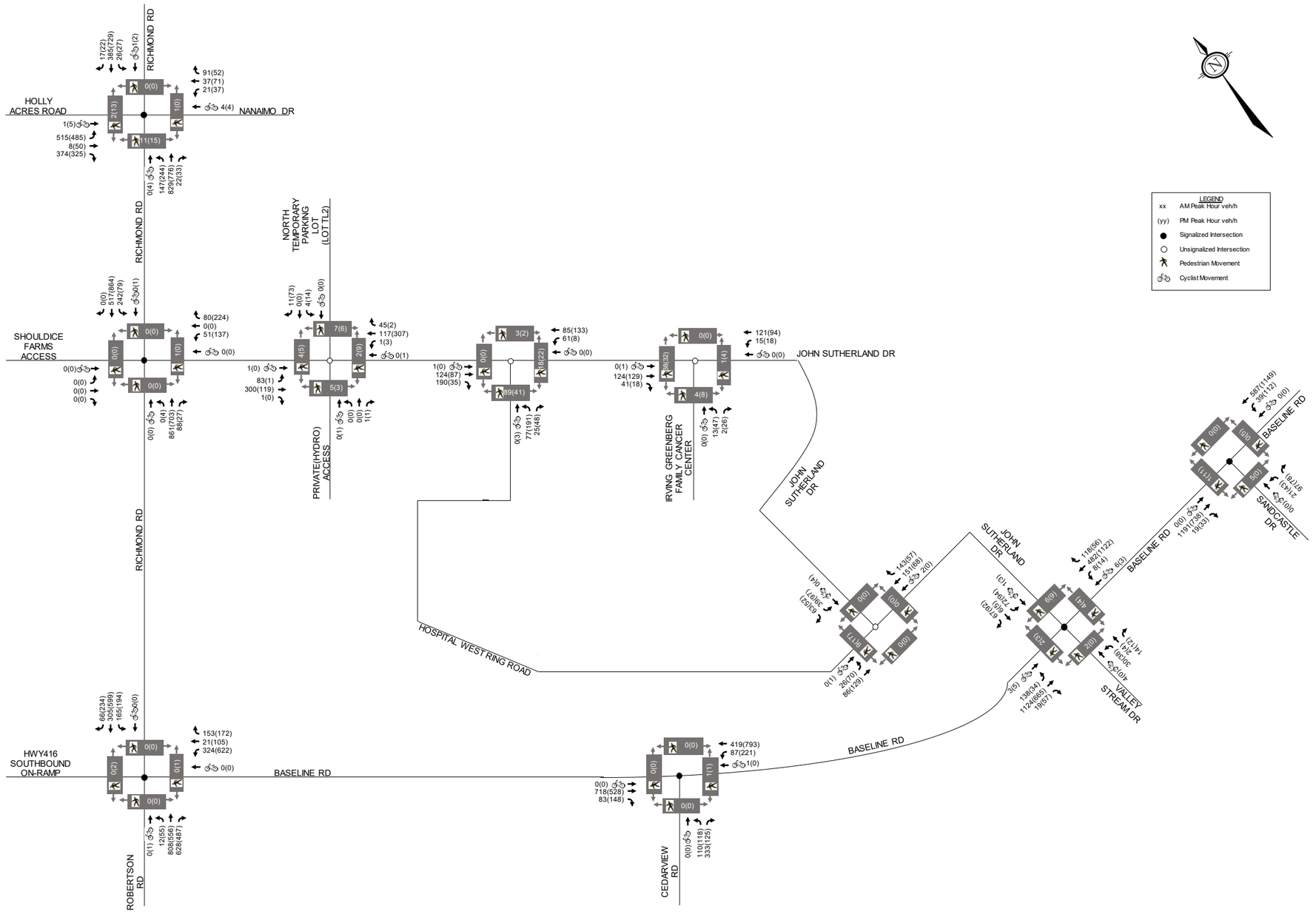


Table 6: Collision History

Intersection/ Street Segment	Impact Types						Total
	Approach	Angle	Rear End	Side-swipe	Turning Mvmt	SMV[1]/ Other	
Intersection							
Richmond Road/ Holly Acres Road/Nanaimo Drive	1	5	35	8	19	5	73
Richmond Road/ John Sutherland Drive	0	2	11	2	5	0	20
Richmond Road/Robertson Road at Baseline Road/HWY416 IC75AR3	0	0	30	8	2	5	45
Baseline Road/Cedarview Road	0	0	5	2	6	3	16
Baseline Road/John Sutherland Drive/Valley Stream Drive	0	2	4	1	7	1	15
Baseline Road/Sioux Crescent	0	3	0	0	0	0	3
Baseline Road/Sandcastle Drive	0	1	4	1	3	0	9
Street Segment							
Richmond Road b/w John Sutherland Drive & Holly Acres Road	0	0	3	1	0	3	7
Richmond Road b/w HWY416 IC75A & John Sutherland Drive	0	0	3	0	0	2	5
Baseline Road b/w Richmond Road/Robertson Road & Cedarview Road	0	0	1	2	0	2	5
Baseline Road b/w Cedarview Road & John Sutherland Drive	0	0	0	1	0	0	1
Baseline Road b/w Sioux Cr & Sandcastle Drive	0	0	1	0	0	1	2

1. SMV = Single Motor Vehicle

Richmond Road & Holly Acres/Nanaimo Drive

Fifteen of the Seventy-three collisions caused injuries, but none caused fatalities. One collision involved a cyclist, and none involved a pedestrian.

Of the seventy-three collisions, fifty-eight occurred during clear conditions, nine in rain conditions, five in snow conditions, and one in freezing rain conditions. Additionally, fifty-one occurred in daylight conditions, one in dawn, five in dusk, and sixteen in dark conditions.

Of the rear-end collisions:

- four of the vehicles were heading northbound;
- fourteen of the vehicles were heading southbound;
- eleven of the vehicles were heading eastbound; and,
- six of the vehicles were heading westbound.

The southbound approach has a downgrade, and the high number of collisions may be attributable to the downgrade.

Of the turning-movement collisions:
- two involved northbound left turning vehicles;
- one involved southbound left turning vehicle;
- seven involved eastbound left turning vehicles; and,
- five involved westbound left turning vehicles.

One of the turning movement collisions involved a northbound left turning vehicle and a southbound traveling cyclist. This collision occurred in clear daylight conditions and resulted in non-fatal injuries.

Of the sideswipe collisions:
- two involved southbound vehicles;
- five involved eastbound vehicles; and,
- one involved westbound vehicle.

Richmond Road & John Sutherland Drive
Three of the twenty collisions caused injuries, but none caused fatalities. None of the collisions involved a cyclist or a pedestrian.

Of the twenty collisions, fourteen occurred during clear conditions, five in rain conditions, and one in snow conditions. Additionally, fifteen occurred in daylight conditions, two in dawn, and three in dark conditions.

Of the rear-end collisions:
- four of the vehicles were heading northbound;
- one of the vehicles was heading southbound;
- one of the vehicles was heading eastbound; and,
- five of the vehicles were heading westbound.

Richmond Road/Robertson Road & Baseline Road/HWY416 ON-Ramp
Eight of the forty-five collisions caused injuries, but none caused fatalities. One collision involved a cyclist, and none involved a pedestrian.

Of the forty-five collisions, thirty-seven occurred during clear conditions, five in rain conditions, two in snow conditions, and one in fog, mist, smoke, dust conditions. Additionally, twenty-six occurred in daylight conditions, one in dawn, three in dusk, and seven in dark conditions.

The collision involving the cyclist was intersection related sideswipe collision while heading westbound. The car involved was changing lanes when it collided with the cyclist and caused a non-fatal injury. This collision may be attributable to improper lane change and failure to check blind spots.

Of the rear-end collisions:
- thirteen of the vehicles were heading northbound;
- two of the vehicles were heading southbound;
- six of the vehicles were heading eastbound; and,
- nine of the vehicles were heading westbound.

As there are clear sight lines on the northbound approach to the intersection, the rear-end collision pattern on this approach is likely attributable to high traffic volumes.

Of the sideswipe collisions:
- two involved northbound vehicles;
- three involved southbound vehicles; and,
- three involved westbound vehicles.

Baseline Road & Cedarview Road
Five of the sixteen collisions caused injuries, but none caused fatalities. One collision involved a cyclist, and one involved a pedestrian.

Of the sixteen collisions, thirteen occurred during clear conditions, and one in snow conditions. Additionally, thirteen occurred in daylight conditions, two in dusk, and one in dark condition.

The collision involving the cyclist occurred at the intersection and was described as a turning movement collision. The cyclist was heading northbound, and the vehicle was making a northbound left turn maneuver. This collision may be attributable to vehicle making northbound left maneuver failed to see the cyclist in its blind spot; or the cyclist suddenly entered the intersection while failing to dismount and walk the bicycle to cross the intersection.

Of the turning-movement collisions:
- one involved northbound left turning vehicles; and,
- five involved westbound left turning vehicles

Baseline Road & John Sutherland Drive/Valley Stream Drive
Five of the fifteen collisions caused injuries, but none caused fatalities. None of the collisions involved a cyclist or a pedestrian.

Of the fifteen collisions, eleven occurred during clear conditions, two in rain conditions, one in snow conditions, and one in fog, mist, smoke, dust conditions. Additionally, eleven occurred in daylight conditions, one in dawn, and three in dark condition.

Of the turning-movement collisions:
- six involved eastbound left turning vehicles; and,
- one involved westbound left turning vehicle.

Baseline Road & Sioux Crescent
None of the three collisions caused injuries/fatalities. And none of the collisions involved a cyclist or a pedestrian.

Baseline Road & Sandcastle Drive
Four of the nine collisions caused injuries, but none caused fatalities. None of the collisions involved a cyclist or a pedestrian.

Richmond Road between Holly Acres Road & John Sutherland Drive
None of the seven collisions caused injuries/fatalities. None of the collisions involved a cyclist or a pedestrian.

Richmond Road between John Sutherland Drive & Baseline Road/HWY416 ON-Ramp
None of the five collisions caused injuries/fatalities. None of the collisions involved a cyclist or a pedestrian.

Baseline Road between Richmond/Roberson Road & Cedarview Road
One of the five collisions caused injuries, but none caused fatalities. None of the collisions involved a cyclist or a pedestrian.

Baseline Road between Cedarview Road & John Sutherland Drive
The only collision did not cause injuries/fatalities. And it did not involve a cyclist or a pedestrian.

Baseline Road between Sioux Crescent & Sandcastle Drive
None of the two collisions caused injuries/fatalities. And none of the collisions involved a cyclist or a pedestrian.

2.2 Planned Conditions

2.2.1 Transportation Projects

The City's 2013 *Transportation Master Plan (TMP),* and the recently approved *2025 TMP Capital Infrastructure Plan (CIP)* identify the following planned transportation projects that influence the study area.

Baseline Transitway – Median Bus Rapid Transit
The 2013 TMP affordable network plan identifies an at-grade Bus Rapid Transit (BRT) project from Baseline Station to Heron Station, while the network concept plan identifies it from Bayshore Station to St. Laurent Station. The Baseline Road Bus Rapid Transit (BRBRT) Environmental Project Report (EPR) was prepared by Parsons in July 2017. Based on the EPR, it is understood that the BRBRT project will be implemented in 3 phases, with phase 1 being Greenbank/Baseline intersection interim transit priority measures, phase 2 being Algonquin Station to Heron Station BRT, and phase 3 being Algonquin Station to Bayshore BRT. Relevant excerpts of the functional design within the study area are included in **Figure 4** to **Figure 7**.

Within the recently approved *2025 TMP CIP,* needs based network identifies the project extents from Bayshore Station to St. Laurent Station via Heron Station. Priority Transit Network identifies the extents from Algonquin College to Billings Bridge. Based on the CIP, there is no timeframe available for implementation of the BRBRT through the study area.

Robertson Road/Richmond Road – Transit Priority Project
The 2013 TMP affordable and network concept identify transit signal priority and queue jump lanes between Eagleson Road and Holly Acres Road.

The recently approved *2025 TMP CIP* Needs Based Network, and the Priority Network identifies Robertson Road from Mill Hill Road to Baseline Road and Richmond Road from Holly Acres Road to Carling Avenue as Transit Priority Corridors.

Active Transportation Projects
The recently approved TMP CIP identifies the implementation of a new sidewalk along Nanaimo Drive from Richmond Road to the Nanaimo Park. This project is scheduled for implementation as part of the first phase.

The TMP CIP also identifies the implementation of separated cycling facilities and/or bike lanes on Richmond Road from Carling Avenue to Holly Acres Road. The proposed cycling facilities will be implemented through two separate projects, which are both identified for implementation as part of the first phase.

Figure 4: Baseline Transitway Functional Design STA 18+925 to 19+520

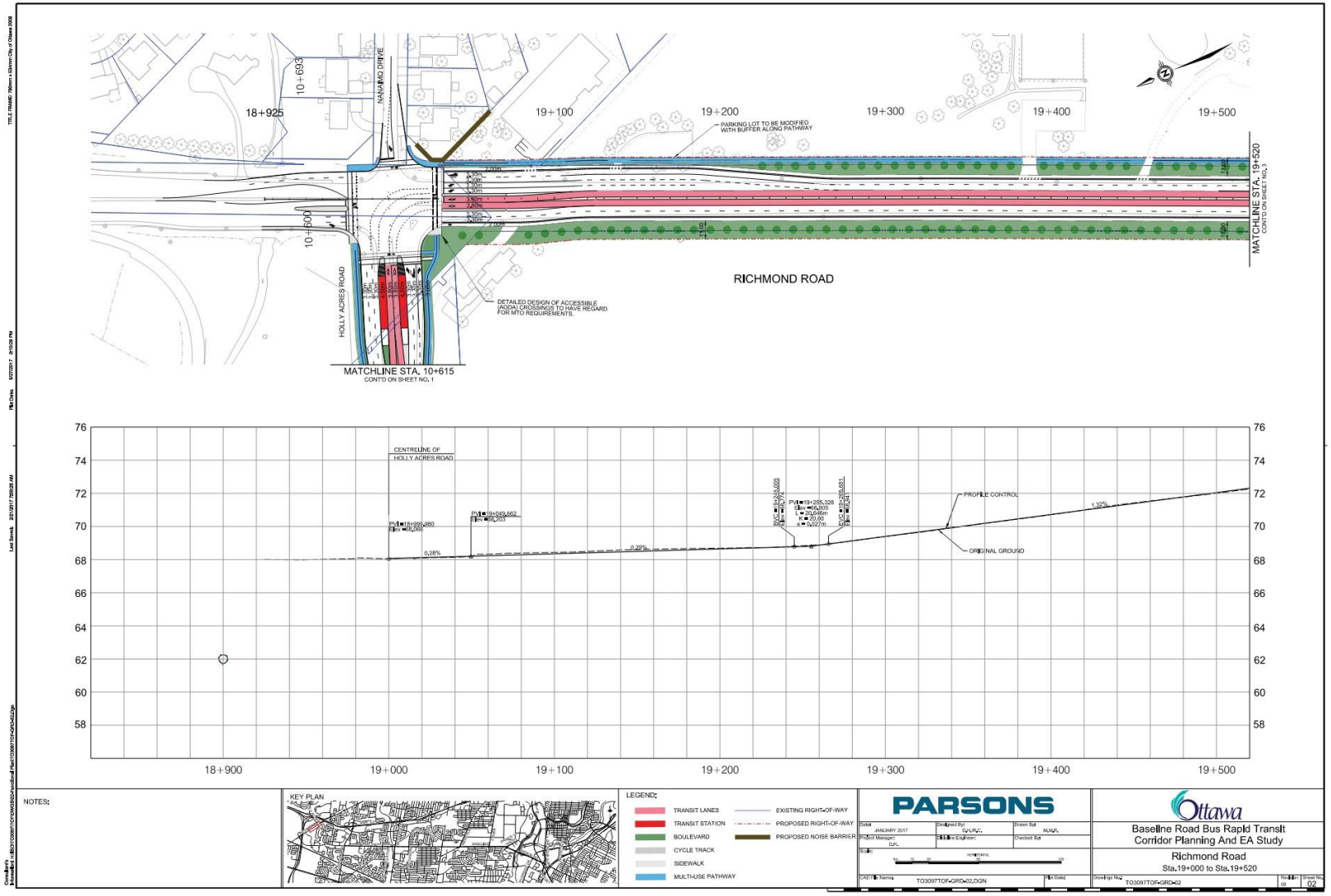


Figure 5: Baseline Transitway Functional Design STA 19+520 to 30+100

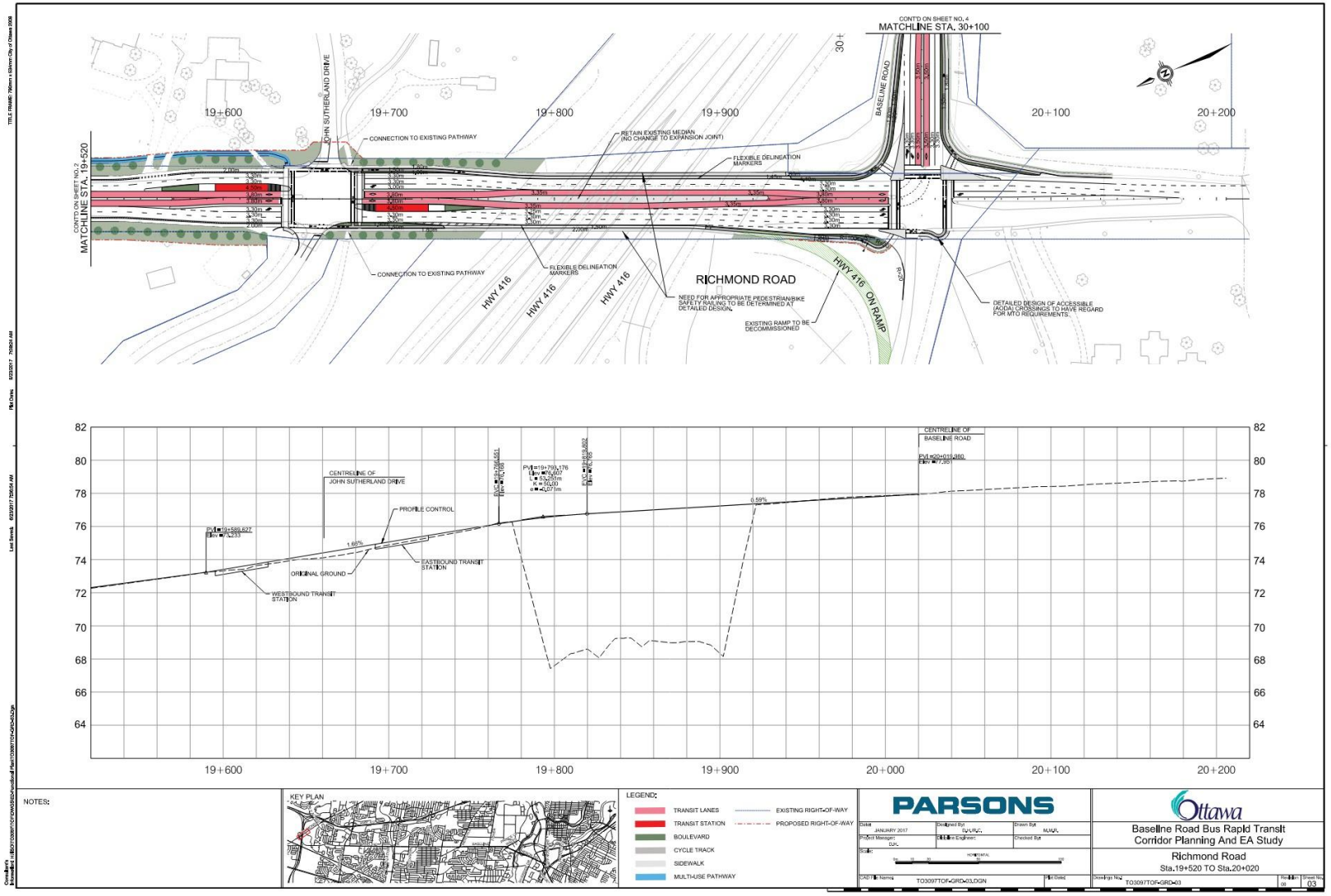


Figure 6: Baseline Transitway Functional Design STA 19+920 to 30+600

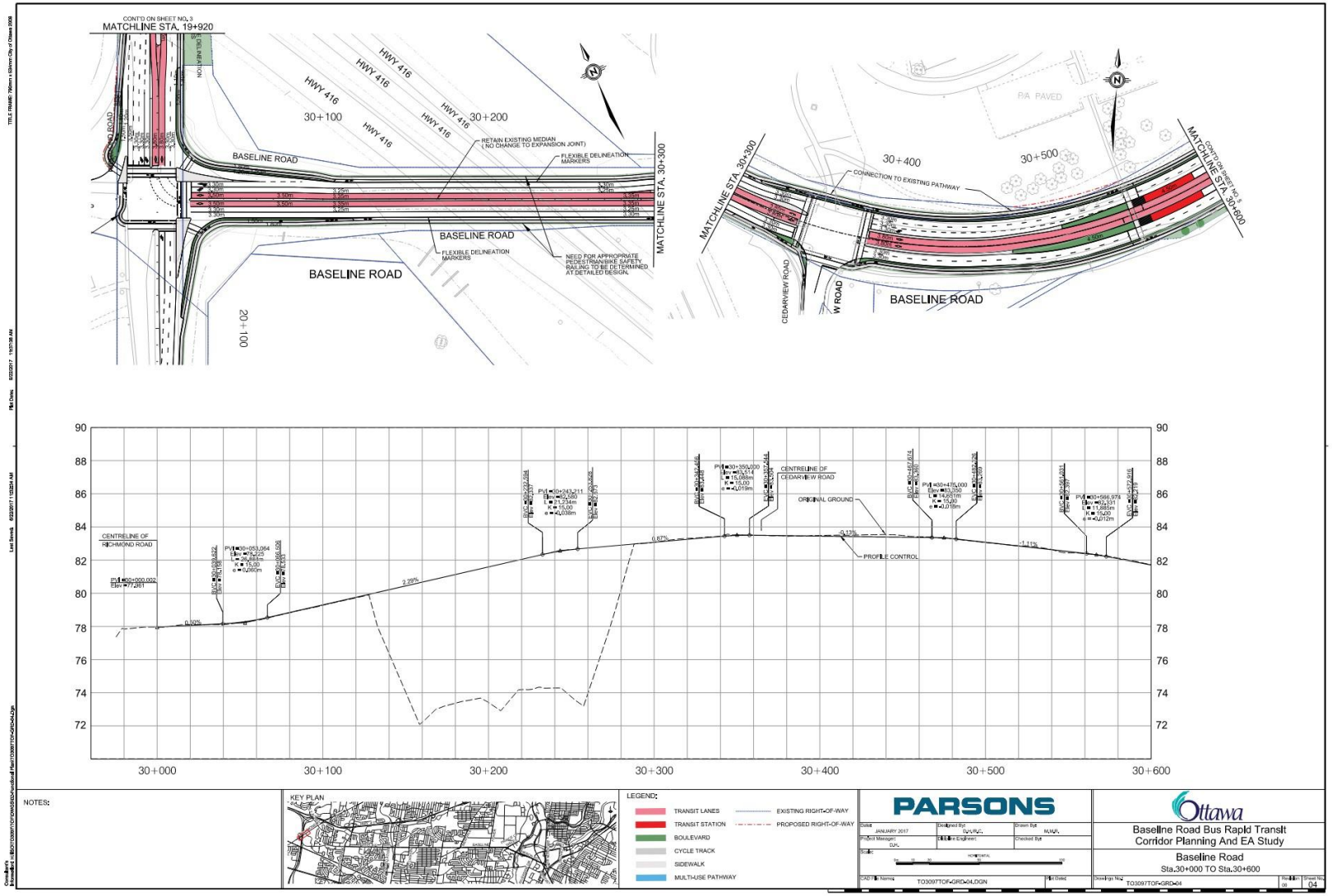
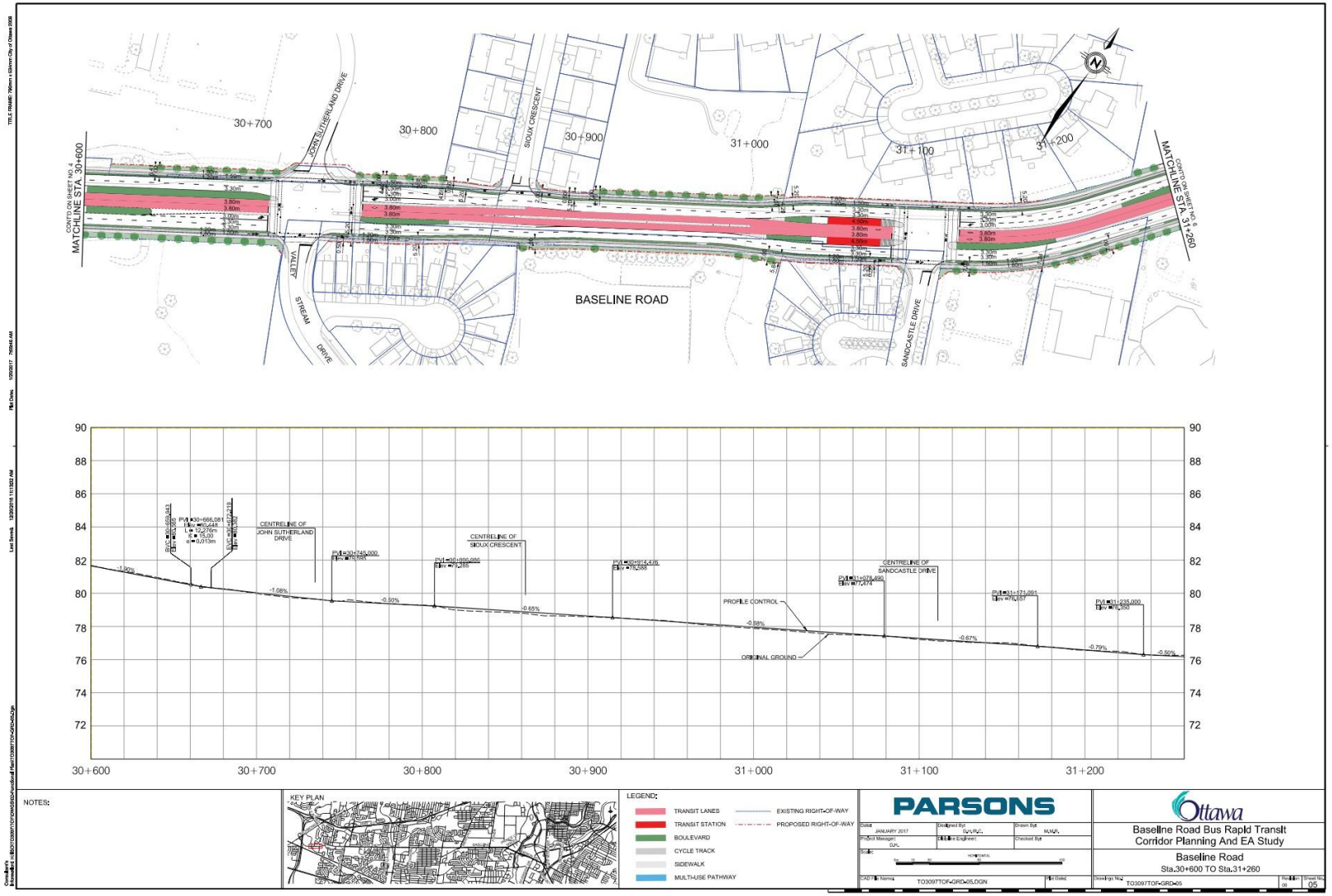


Figure 7: Baseline Transitway Functional Design STA 30+600 to 31+260



2.2.2 Other Area Developments

In the vicinity of the subject site, the following developments were identified that are under construction, approved, or in the approval process. Relevant excerpts from the respective TIAs are included in **Appendix G**.

42 Northside Road
The proposed development will consist of five-storey apartment building, with a total of 51 dwellings. A TIA was prepared by Stantec in May 2022, in support of Site Plan Control application. Per the TIA, the anticipated buildout year was 2023.

1987 Robertson Road & 295 Moodie Drive
The proposed development will consist of eight high-rise buildings and one mid-rise building, with a total of 1,925 dwellings and approximately 41,657 ft^2 GFA of commercial space. A TIA was prepared by CGH in September 2021, in support of Official Plan Amendment and Zoning By-Law Amendment applications. Per the TIA, the development will be built in five phases, with an ultimate buildout year 2029.

2940-2946 Baseline Road
A TIA was prepared by Parsons in July 2024 for the remaining phases of the proposed residential development. At the time of the report Tower 1 was built and occupied, and Tower 2 was under construction. The report studied the impacts of Towers 4, 5, and 6.

2165 Robertson Road
The proposed development will consist of a single-storey warehouse and a single-storey building with three restaurant units. In total, the development will include approximately 11,757 ft^2 GFA of warehouse space and 6,017 ft^2 GFA of restaurant space. A TIA and a subsequent addendum were prepared by Parsons in December 2018 and December 2020, respectively, in support of a Site Plan Control application. The TIA had originally anticipated a buildout year of 2019.

1826 Robertson Road
The proposed mixed-use development is expected to generate 150 and 141 vehicle trips during the AM and PM peak hours, respectively. The site was anticipated to be completed in 2024.

2.3 Study Area and Time Periods

The study area for this report includes the boundary roadways Baseline Road and Richmond Road, as well as the following intersections:

- Richmond Road and Holly Acres Road and Nanaimo Drive
- Richmond Road and John Sutherland Drive
- Richmond Road/Robertson Road and Baseline Road/HWY416 ON-Ramp
- Baseline Road and Cedarview Road
- Baseline Road and John Sutherland Drive/Valley Stream Drive
- Baseline Road and Sandcastle Drive
- John Sutherland Drive and Main QCH Access
- John Sutherland Drive and Irving Greenberg Cancer Center Access
- John Sutherland Drive and North QCH Access
- John Sutherland Drive and TL2 Parking Lot Access/Private Access

The selected time periods for the analysis are the weekday AM and PM peak hours, as they represent the 'worst case' combination of site generated traffic and adjacent street traffic. Analysis has been completed for the Part 4 expansion ultimate buildout year 2030 and 2035 horizon year.

2.4 Development Generated Travel Demand

2.4.1 Trip Generation

The trip generation rates from the *ITE Trip Generation Manual 11th Edition* were first considered and were compared with the QCH's local trip generation rate based on the turning movement counts (TMC) commissioned by Novatech at the Richmond Road/John Sutherland Drive and Baseline Road/John Sutherland Drive/Valley Stream Drive intersections. These two intersections encompass the QCH campus and are assumed to represent the traffic generated by the hospital, since all the other intersections on John Sutherland Drive lead to QCH related land use.

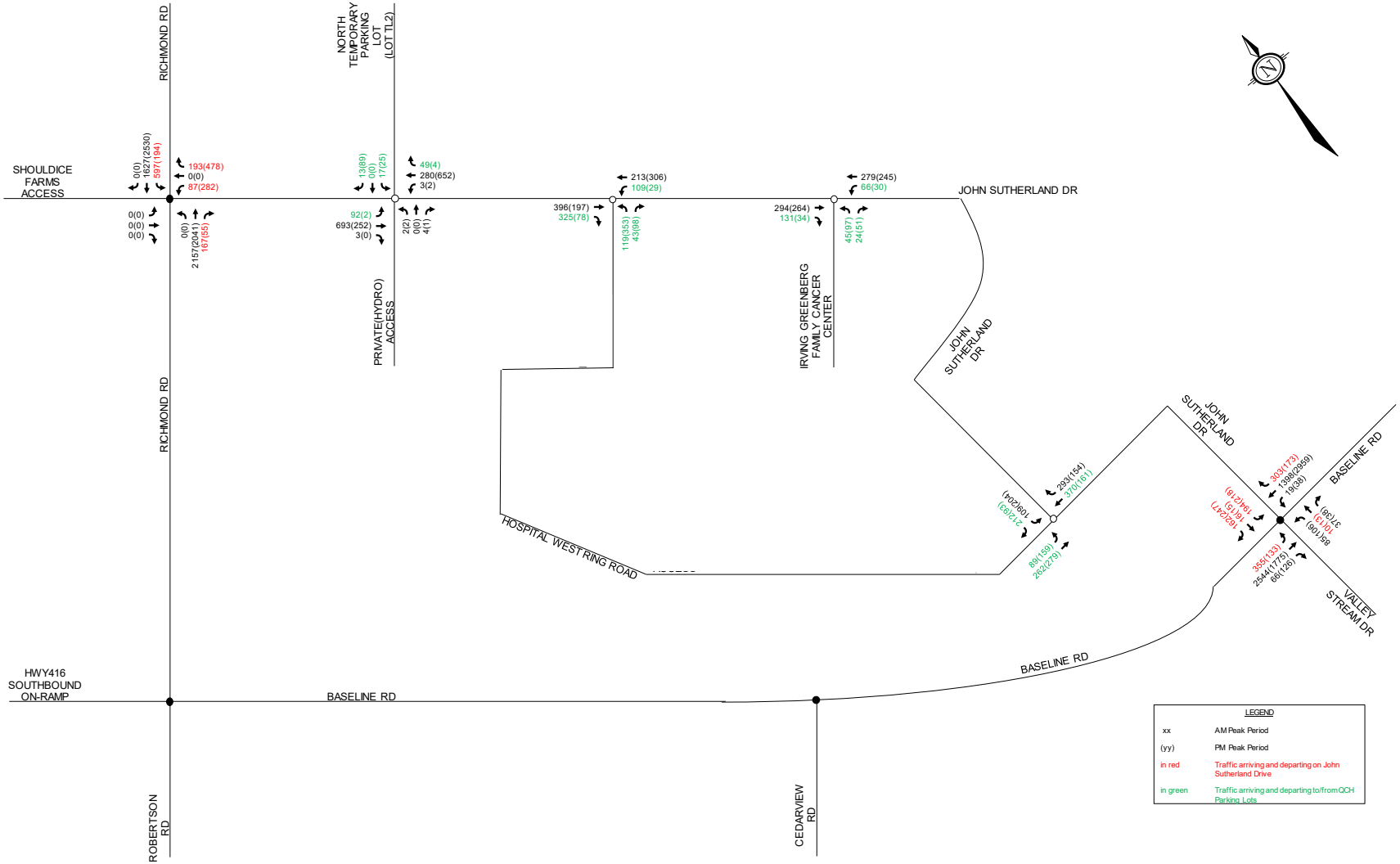
Concerns regarding cut-through traffic were raised by the QCH. The concern was that the traffic utilizes John Sutherland Drive to cut-through between Richmond Road and Baseline Road. To estimate the percentage of cut-through traffic on John Sutherland Drive, the difference between the AM and PM peak period traffic volumes entering/exiting the QCH parking lots and the traffic entering/exiting the boundary intersections of QCH i.e., John Sutherland Drive/Richmond Road and John Sutherland Drive/Baseline Road/Valley Stream Drive was determined. This is shown in **Figure 8**. It is assumed that the cut-through traffic would only use John Sutherland Drive, and the traffic on the west ring road are destined to/from either the parking garage, the James Beach parking lot, or the front public parking lot.

From **Figure 8**, 2,084 vehicles arrived/departed QCH during the AM period (7am-10am) and 1,808 vehicles arrived/departed QCH during the PM period (3pm-6pm); and 1,966 vehicles arrived/departed parking lots during the AM period and 1,582 vehicles arrived/departed parking lots during the PM period. Detailed estimation of cut-through traffic is shown in **Table 7**.

Table 7: Estimation of Cut-through Traffic

Traffic Direction	AM Peak Period		PM Peak Period	
	Total Volume	Cut-through Volume	Total Volume	Cut-through Volume
Traffic Entering from Richmond Road and Exiting on Baseline Road				
Total IN from Richmond Road	764 veh.	764 – 760 = 4 veh.	249 veh.	249 – 207 = 42 veh.
Total into Parking Lots	760 veh.		207 veh.	
Total OUT from Parking Lots	346 veh.	372 – 346 = 26 veh.	453 veh.	480 – 453 = 27 veh.
Total OUT onto Baseline Road	372 veh.		480 veh.	
Total IN/OUT Volume Cutting through from Richmond Road to Baseline Road	4 + 26 = 30 veh.		42 + 27 = 69 veh.	
Traffic Entering from Baseline Road and Exiting on Richmond Road				
Total IN from Baseline Road	668 veh.	668 – 594 = 74 veh.	319 veh.	319 – 224 = 95 veh.
Total into Parking Lots	594 veh.		224 veh.	
Total OUT from Parking Lots	266 veh.	280 – 266 = 14 veh.	698 veh.	760 – 698 = 62 veh.
Total OUT onto Richmond Road	280 veh.		760 veh.	
Total IN/OUT Volume Cutting through from Baseline Road to Richmond Road	74 + 14 = 88 veh.		95 + 62 = 157 veh.	
Total Two-way Cut-through Traffic Volume				
	(30+88)/2 = 59 veh.		(69+157)/2 = 113 veh	

Figure 8: Estimation of Cut-through Traffic on John Sutherland Drive



Based on **Table 7**, it is estimated that 59 and 113 vehicles may have cut through the QCH campus during the AM and PM peak periods respectively. Since the calculations consider the traffic both in/out of John Sutherland Drive and in/out of the parking lots, this equates to a cut through rate of 3% during the AM period and 6% during the PM period. For the purposes of this report, an averaged cut-through rate of 5% is assumed for both the AM and PM peak hours.

Table 8 summarizes the TMCs at the QCH encompassing intersections.

Table 8: Vehicles Trips Generated by QCH under Existing Conditions

Intersections	Movement	AM Peak Hour of Adjacent Street	PM Peak Hour of Adjacent Street
Richmond Road/John Sutherland Drive & Baseline Road/John Sutherland Drive/Valley Stream Drive	Vehicles into QCH	588 vehicles	200 vehicles
	Vehicles out from QCH	276 vehicles	552 vehicles
	Total Two-Way	864 vehicles	752 vehicles
Accounting for estimated cut-through traffic at rate of 5%			
Total Two-Way		821 vehicles	714 vehicles

The ITE trip generation manual for land use code 610 – Hospital, uses three independent variables for defining trip generation rates, viz., number of beds, number of employees, and GFA of the hospital. The QCH local trip generation rates were also defined based on these three variables to keep the approach consistent and to rationalize the comparison of ITE and QCH local trip rates. The trip generation rates obtained from the *ITE Vehicle Trip Generation Manual 11th Edition* are summarized in **Table 9**, and the QCH local trip generation rates are summarized in **Table 10**.

It is noted that the GFA of the Part 4 expansion in the previous iterations of the site plan was estimated at a higher valuer than the current version of the site plan. The trip generation has been kept as estimated earlier and is considered to be conservative.

Table 9: Vehicle Trip Generation Rates from ITE Trip Generation Manual 11th Edition

Independent Variable	Value	AM Peak ITE Avg Rate	PM Peak ITE Avg Rate
No of Beds	287 beds	1.79	1.69
No of Employees	1337 employees	0.28	0.28
GFA	637,444 ft^2	0.82	0.86

Table 10: QCH Local Vehicle Trip Generation Rates

Independent Variable	Value	AM Peak QCH Local Rate	PM Peak QCH Local Rate
No of Beds	287 beds	2.86	2.49
No of Full-Time Employees	1337 employees	0.61	0.53
GFA	637,444 ft^2	1.29 per 1000 ft^2	1.12 per 1000 ft^2

Comparing the trip generation rates in **Table 9** and **Table 10**, it is evident that the QCH local trip generation rates are considerably higher than the ITE trip generation rates. This may be because the ITE rates are based on the surveys for US hospitals, which operate differently than the medical system in Canada. The US has many private hospitals and public hospitals whereas Canada relies only on limited number of public hospitals. Hence, for the purposes of this report, QCH local trip generation rates were used as they are more representative of the traffic generated by this site.

As mentioned earlier in section 2.1.5, the peak period boarding/alighting/average load at departure data for transit at the nearby QCH transit stops was obtained from OC Transpo. This data was used to understand the existing transit modal share for the trips generated due to QCH. The data provided by OC Transpo is summarized in **Table 4** and the peak period transit data converted to peak hour transit data is summarized in **Table 5**.

The transit ridership analysis within the BRBRT EAS report was carried out by Parsons with the data obtained from OC Transpo. It was concluded in the report that the transit ridership is higher within the eastern segment of the study area, i.e., east of Woodroffe Avenue, and that the passenger volumes were generally lower towards the western end of the corridor. It must be noted that the QCH falls at the very end of the western corridor. Table 2-3 of the report summarizes the transit passenger volumes on Baseline Road and is included in **Appendix H**. This is consistent with the low transit ridership as seen in **Table 4** and **Table 5**.

From **Table 5**, the total peak hour transit trips generated by QCH are 51 and 41, during the AM and PM peak hours respectively.

Table 12 of the *TRANS Trip Generation Manual – Summary Report* lists out the employment generator mode share by district during the AM peak period. For Bayshore/Cedarview district, the modal shares are given as:

- Auto Driver: 77%
- Auto Passenger: 6%
- Walking: 4%
- Transit: 10%
- Cycling: 3%

Since the available transit data is evidence of lower transit trip rate in the case of QCH, and people receiving medical care are more often dropped off/picked up, the existing modal shares for QCH have been assumed as below for the purposes of this report:

- Auto Driver: 80%
- Auto Passenger: 10%
- Transit: 5%
- Cycling and Walking: 5%

From **Table 10**, the vehicle trip generation rates can be converted to person trip generation rates based on the assumed 80% auto modal share for QCH. Hence, the QCH local person trip generation rates are derived and are summarized in the **Table 11**.

Table 11: QCH Person Trip Generation Rates

Independent Variable	Value	AM Peak QCH Local Rate	PM Peak QCH Local Rate
No of Beds	287 beds	3.58	3.11
No of Full-Time Employees	1337 employees	0.77	0.67
GFA	637,444 ft^2	1.62 per 1000 ft^2	1.40 per 1000 ft^2

From **Table 11,** it can be observed that the trip generation rates vary significantly based on the independent variable used. An average of all the three variables was considered to reduce the dependency on any one of the variables. The net person trips generated by the QCH Part 4 expansion thus can be estimated and is summarized in **Table 12**. The directional distribution is based on the existing QCH pattern, which is 68% in and 32% out during the AM peak and 27% in and 73% out during the PM peak.

Table 12: Net Person Trips Generated by Proposed QCH Expansion

Land Use	Independent Variable	Value	AM Peak			PM Peak		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Existing Person Trips								
Total Existing			*698*	*329*	*1027*	*241*	*652*	*893*
QCH Part 4 Expansion								
Hospital	No of Beds	444 beds	1081	509	1590	373	1008	1381
	No of Employees	2066 employees	1082	509	1591	374	1010	1384
	GFA	1,023,388 ft^2	1127	531	1658	387	1046	1433
Part 4 Expansion Average			1097	516	1613	378	1021	1399
Net New Person Trips Added by Part 4 Expansion			*399*	*187*	*586*	*137*	*369*	*506*

To reduce the number of trips generated by auto driver mode, a shift towards active modes of transport and increase in transit modal share is being targeted as part of the expansion. This is planned to be achieved through implementation of Transportation Demand Management (TDM) measures and a reduced parking ratio as the QCH campus develops. The proposed shift in modal shares will assist in reducing the parking demand to achieve the proposed parking supply. Detailed parking demand calculations are provided in the section 4.2 of the report.

As mentioned in section 2.1.5 that the transit service in the west end of the Baseline corridor is limited, it is anticipated that the increase in transit modal shift can be achieved through the years. Also, it may be noted that early implementation of Baseline BRT phase 3 (Algonquin to Bayshore stretch), or improved transit service is desirable to provide better transit services at the west end of Baseline corridor. It is acknowledged that the recently launched New Ways to Bus initiative by OC Transpo has resulted in route 88 Bayshore↔Hurdman (frequent service) providing service to QCH via John Sutherland Drive, which earlier used Baseline Road as its route. Route 88 also provides connectivity to LRT Line 1 and Line 2. New OC Transpo route, route 68 Terry Fox↔Baseline (frequent service) has been implemented as part of New Ways to Bus initiative. It provides connectivity to locations west of QCH, and route 88 provides connectivity to locations east of QCH. With now improved east-west transit connectivity, it is anticipated that the target transit modal shares can be achieved overtime.

The cycling facilities (MUP, paved shoulder, bike lane etc.) surrounding QCH are advantageous and are anticipated to promote the shift towards active modes of transportation.

The target modal shares for Part 4 expansion are as follows:

- Auto Driver: 65%
- Auto Passenger: 15%
- Transit: 10%
- Cycling and Walking: 10%

The net new trips added to the network based on the assumed target modal shares for QCH Part 4 expansion are summarized in **Table 13**.

Table 13: Part 4 Expansion Net New Person Trips Based on Assumed QCH Modal Shares

Modal Split	Modal Share	Net New Person Trips Added					
		AM Peak			PM Peak		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Existing							
Auto Driver	80%	559	263	822	193	521	714
Auto Passenger	10%	70	33	103	24	65	89
Transit	5%	35	16	51	12	33	45
Cycling and Walking	5%	35	16	51	12	33	45
Adjustment of Existing Trips due to Shift in Modal Shares towards Non-auto Modes							
Auto Driver	65%	454	214	668	157	423	580
Auto Passenger	15%	105	49	154	36	98	134
Transit	10%	70	33	103	24	65	89
Cycling and Walking	10%	70	33	103	24	65	89
Person Trips Added by QCH Part 4 Expansion							
Auto Driver	65%	259	122	381	89	240	329
Auto Passenger	15%	60	28	88	21	55	76
Transit	10%	40	19	59	14	37	51
Cycling and Walking	10%	40	19	59	14	37	51
Net New Trips Added by QCH Part 4 Expansion							
Auto Driver	65%	154	73	227	53	142	195
Auto Passenger	15%	95	44	139	33	88	121
Transit	10%	75	36	111	26	69	95
Cycling and Walking	10%	75	36	111	26	69	95

2.4.2 Trip Distribution

The number of patient visits in 2024 to QCH from postal code areas for the Ottawa and surrounding regions was provided by QCH. This data was analyzed and was assigned a to/from direction based on the relative location of QCH to the Forward Sortation Area (FSA) segment of the postal code, i.e., the first three characters of the postal code. As per this method, the trip distribution was found to be:

- to/from north: 5%
- to/from south: 15%
- to/from east: 40%
- to/from west: 40%

The travel pattern based on the *2011 TRANS OD-Survey* for Bayshore/Cedarview district was determined as:

- to/from north: 5%
- to/from south: 15%
- to/from east: 50%
- to/from west: 30%

The to/from north and south distribution is same in both the cases, however the to/from east and west trips vary by 10%. This may be because the patient visits by postal code data was available for areas outside of the areas that are considered in the TRANS OD-Survey. Since the hospital experiences trips both for visits by the patients and its employees, a blended trip distribution was used for the purposes of this report. The trip distribution derived is as follows:

- to/from north: 5%
- to/from south: 15%
- to/from east: 45%
- to/from west: 35%

2.4.3 Trip Assignment

Based on the existing traffic patterns of QCH, 65% of the traffic is assigned through the Richmond/John Sutherland Drive intersection, and the remaining 35% is assigned through the Baseline/John Sutherland Drive/Valley Stream Drive intersection. All new trips have been routed through the QCH campus and assigned to the proposed parking garage addition. The trips assignment in percentages for Part 4 expansion is shown in **Figure 9**. Site generated vehicle trips are shown in **Figure 10**.

2.5 Exemptions Review

As per the city's 2023 Revisions to the TIA Guidelines, **Table 14** summarizes the exemptions applicable to the subject site.

Figure 9: Trip Assignment

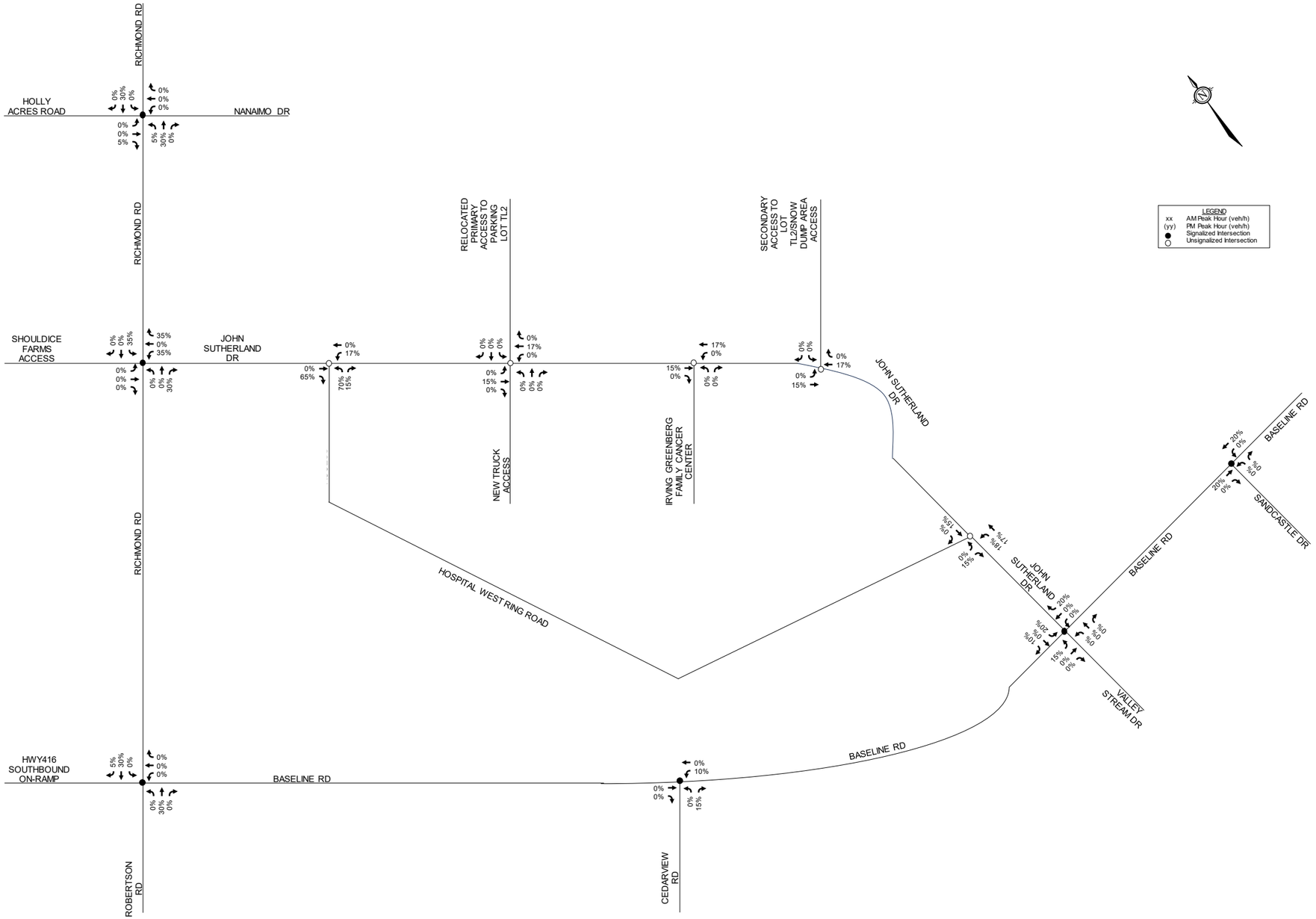


Figure 10: Site Generated Traffic Volumes

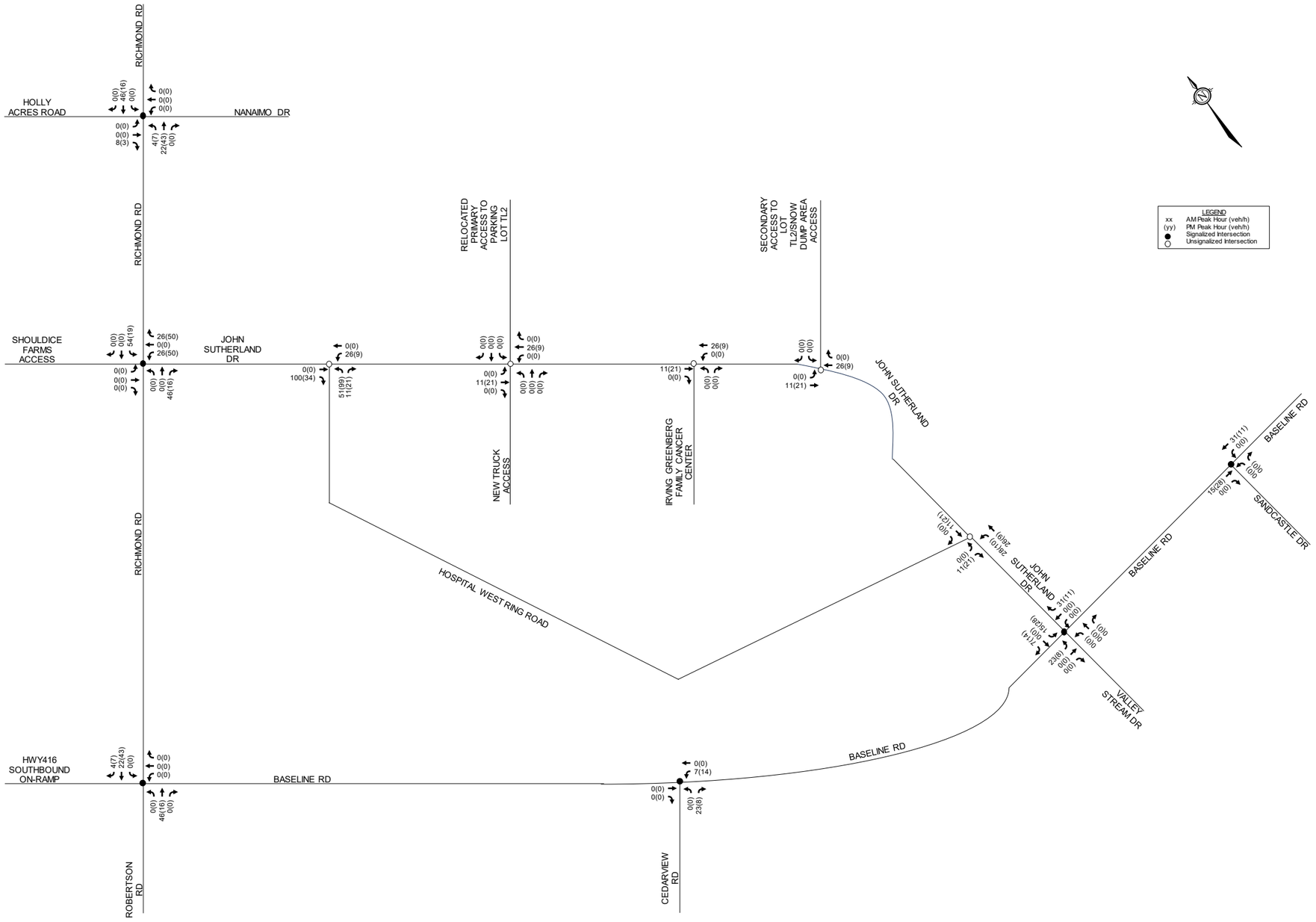


Table 14: TIA Exemptions

Module	Element	Exemption Criteria	Status
Design Review Component			
4.1 Development Design	*4.1.1* Design for Sustainable Modes.	Required for all.	Not Exempt
	4.1.2 Circulation and Access	Required for site plan and zoning by-law applications.	Not Exempt
	4.1.3 New Street Networks	Required for plans of subdivision.	Exempt
4.2 Parking	*All elements*	Required for site plan and zoning by-law applications.	Not Exempt
4.3 Boundary Street Design	*All elements*	Required for all.	Not Exempt
Network Impact Component			
4.5 Transportation Demand Management	*All Elements*	Required for all.	Not Exempt
4.6 Neighbourhood Traffic Calming	*All elements*	Required if all the below criteria are met: 1. Access is provided to a collector or local roadway. 2. Application is for zoning by-law amendment or draft plan of subdivision. 3. Proposed development generates more than 75 vehicle trips. 4. Site trip infiltration is expected, and site-generated traffic will increase peak hour volumes by 50%+ along the route between the site and an arterial road. ○ The subject street segment is adjacent to two or more of the following significant sensitive land uses: School (within 250m walking distance); Park; Retirement/older adult facility; Licensed childcare centre; Community centre; 50+% of adjacent properties along the route(s) are occupied by residential lands and at least ten dwellings are occupied.	Exempt
4.7 Transit	*4.7.1* Transit Route Capacity	Required when the proposed development generates more than 75 transit trips.	Not Exempt
	4.7.2 Transit Priority Requirements	Required when the proposed development generates more than 75 vehicle trips.	Not Exempt
4.8 Network Concept	*All elements*	Required when the proposed development generates >200 person trips during the peak hour in excess of the equivalent volume permitted by the established zoning.	Exempt
4.9 Intersection Design	*All elements*	Required when the proposed development generates more than 75 vehicle trips.	Not Exempt

3.0 FORECASTING

3.1 Background Traffic

3.1.1 Other Area Developments

As discussed in section 2.2.2, there are multiple development applications for sites in proximity of the subject site that are under construction, approved, or in approval process. Traffic generated by these developments have been accounted for as background traffic. Relevant excerpts from respective transportation studies of each development listed below are included in **Appendix G**.

42 Northside Road
The proposed development will consist of five-storey apartment building, with a total of 51 dwellings. A TIA was prepared by Stantec in May 2022, in support of Site Plan Control application. Per the TIA, the anticipated buildout year was 2023. The site generated traffic has been added to the background traffic at all relevant intersections within the study area for this TIA.

1987 Robertson Road & 295 Moodie Drive
The proposed development will consist of eight high-rise buildings and one mid-rise building, with a total of 1,925 dwellings and approximately41,657 ft2 GFA of commercial space. A TIA was prepared by CGH in September 2021, in support of Official Plan Amendment and Zoning By-Law Amendment applications. Per the TIA, the development will be built in five phases, with an ultimate buildout year 2029. The site generated traffic has been added to the background traffic at all relevant intersections within the study area for this TIA.

2940-2946 Baseline Road
A TIA was prepared by Parsons in July 2024 for the remaining phases of the proposed residential development. At the time of the report Tower 1 was built and occupied, and Tower 2 was under construction. The report studied the impacts of Towers 4, 5, and 6. Traffic from towers 2, 4, 5, and 6 has been added to the background traffic conditions at all relevant intersections within the study area for this TIA, as stated within the TIA report Tower 3 was altered to be included within Tower 4.

2165 Robertson Road
The proposed development will consist of a single-storey warehouse and a single-storey building with three restaurant units. In total, the development will include approximately 11,757 ft2 GFA of warehouse space and 6,017 GFA of restaurant space. A TIA and a subsequent addendum were prepared by Parsons in December 2018 and December 2020, respectively, in support of a Site Plan Control application. The TIA had originally anticipated a buildout year of 2019. The site generated traffic has been added to the background traffic at all relevant intersections within the study area for this TIA.

1826 Robertson Road
The proposed mixed-use development is expected to generate 150 and 141 vehicle trips during the AM and PM peak hours, respectively. The site was anticipated to be completed in 2024, and the site generated traffic has been added to the background traffic at all relevant intersections within the study area for this TIA.

3.1.2 Background Growth Rate

A rate of background growth has been established through a review of snapshots of the City's Strategic Long-Range Model (comparing 2022 and 2046 AM peak volumes). The snapshots are included in **Appendix I**. The snapshots suggest negligible growth along Robertson Road/Richmond Road and Baseline Road; and suggest a growth of 5% along Cedarview Road. However, comparing two traffic counts at the Baseline Road/Cedarview Road intersection dated January 15, 2019, and March 05, 2025, it suggests that the traffic declined in 2025.

From other recent traffic reports within the study area, growth rates between 0.5% and 1% were used in most of the previous reports. To ensure a conservative analysis and to be consistent with previous studies in the vicinity of the subject site, a background growth rate of 0.5% per annum was applied to Holly Acres Road, Richmond Road, Robertson Road, and Baseline Road, and 2% was applied to Cedarview Road.

3.1.3 Future Traffic Conditions

3.1.3.1 Background Traffic Redistribution due to Site Modifications

Within the Part 4 phasing plans, the proposed site modifications include the construction of the west ring road, demolition of parking lot TL1, the removal of access to the parking garage from the existing loading area to the new west ring road, and realignment of John Sutherland Drive and reconfiguration of the John Sutherland Drive/West Ring Road intersection. These modifications will affect the traffic flow within QCH campus.

These modifications have been accounted for and is shown in **Figure 13**. It is noted that the traffic volume figures show traffic to/from the temporary parking lot. This is reflective of the previous phasing plans in which the temporary parking lot was not being removed. The revised phasing plans include the removal of the parking lot. The traffic volume redistribution within the QCH campus has not been updated as it only impacts traffic flow within the QCH campus and is expected to have negligible effects.

The figures listed below present the following future traffic conditions:

- Part 4 expansion:
  - Background traffic volumes in 2030 are shown in **Figure 11**.
  - Background traffic volumes in 2035 are shown in **Figure 12**.
  - Site redistributed traffic volumes are shown in **Figure 13**.
  - Site generated traffic volumes are shown in **Figure 10**.
  - Total traffic volumes in 2030 are shown in **Figure 14**.
  - Total traffic volumes in 2035 are shown in **Figure 15**.

Figure 11: Background 2030 Traffic Volumes

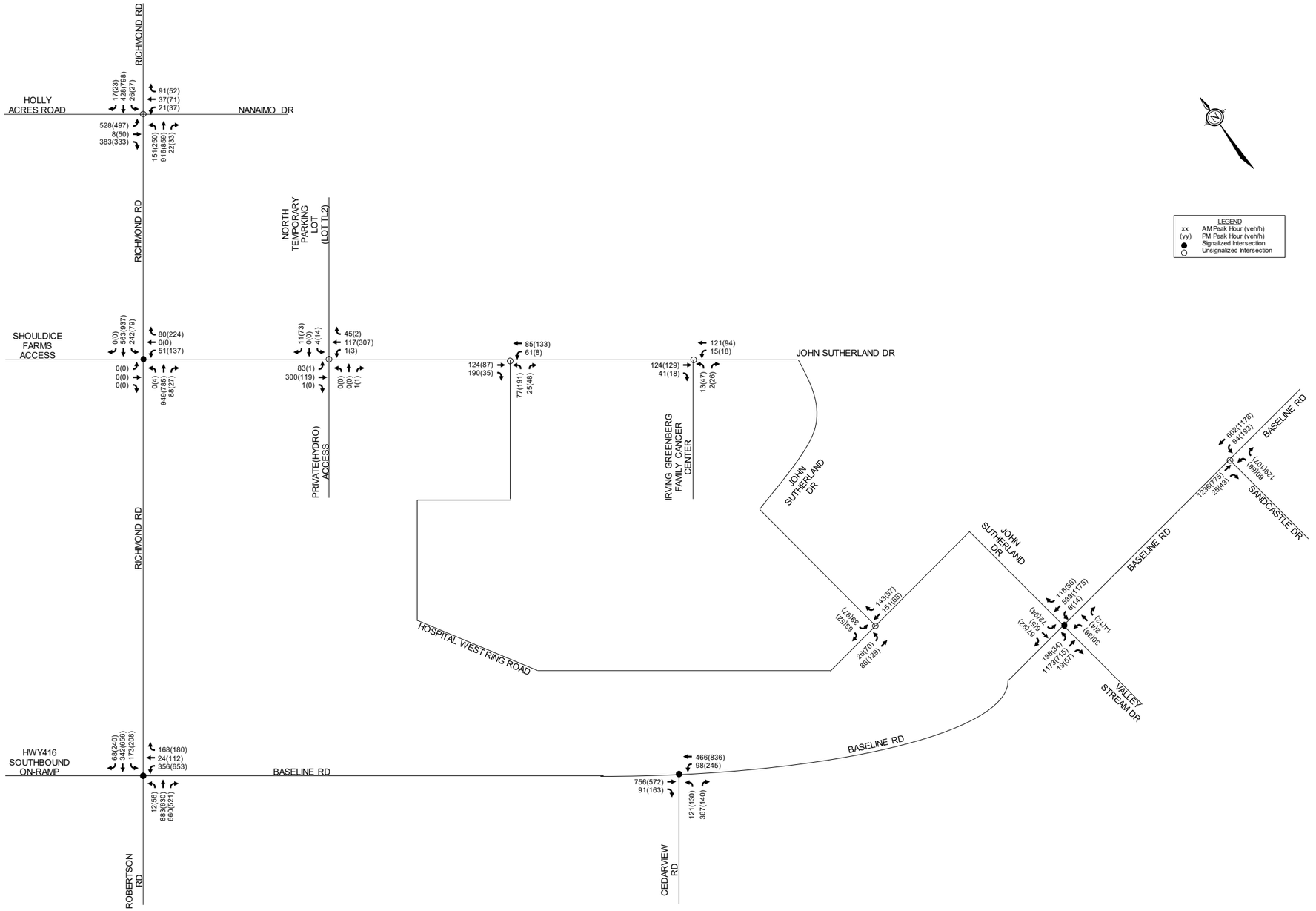


Figure 12: Background 2035 Traffic Volumes

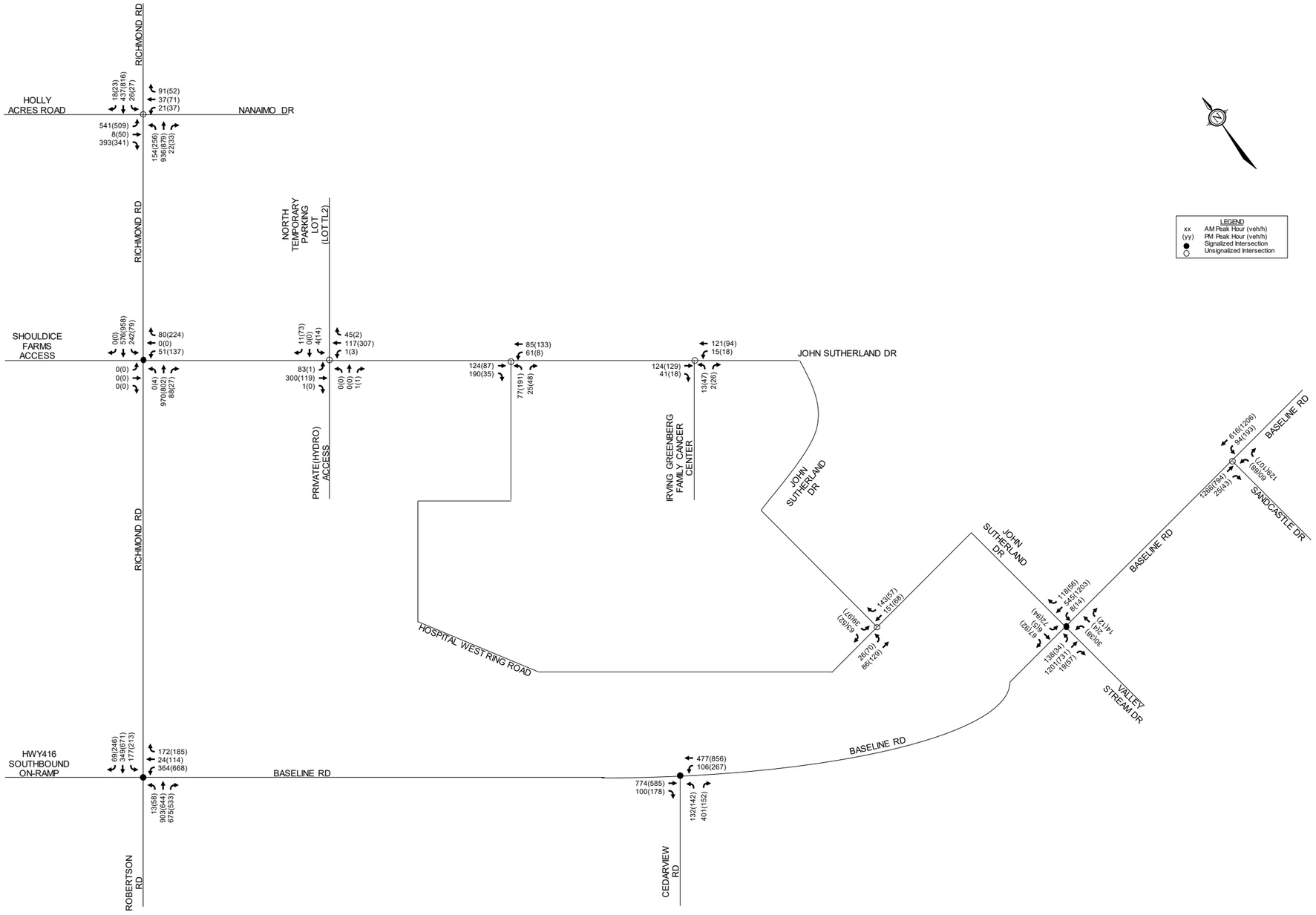


Figure 13: Site Redistributed Traffic Volumes

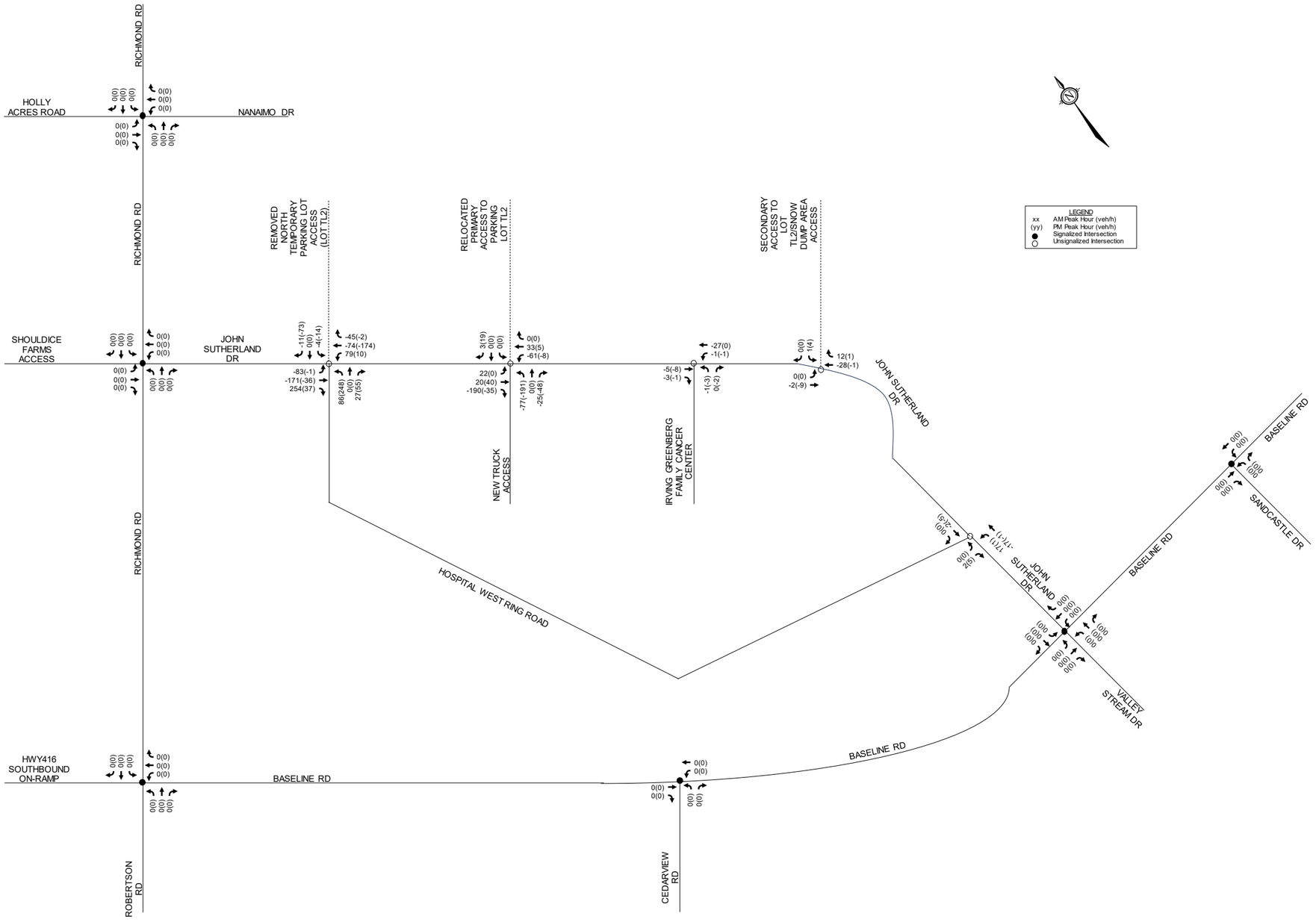


Figure 14: Total 2030 Traffic Volumes

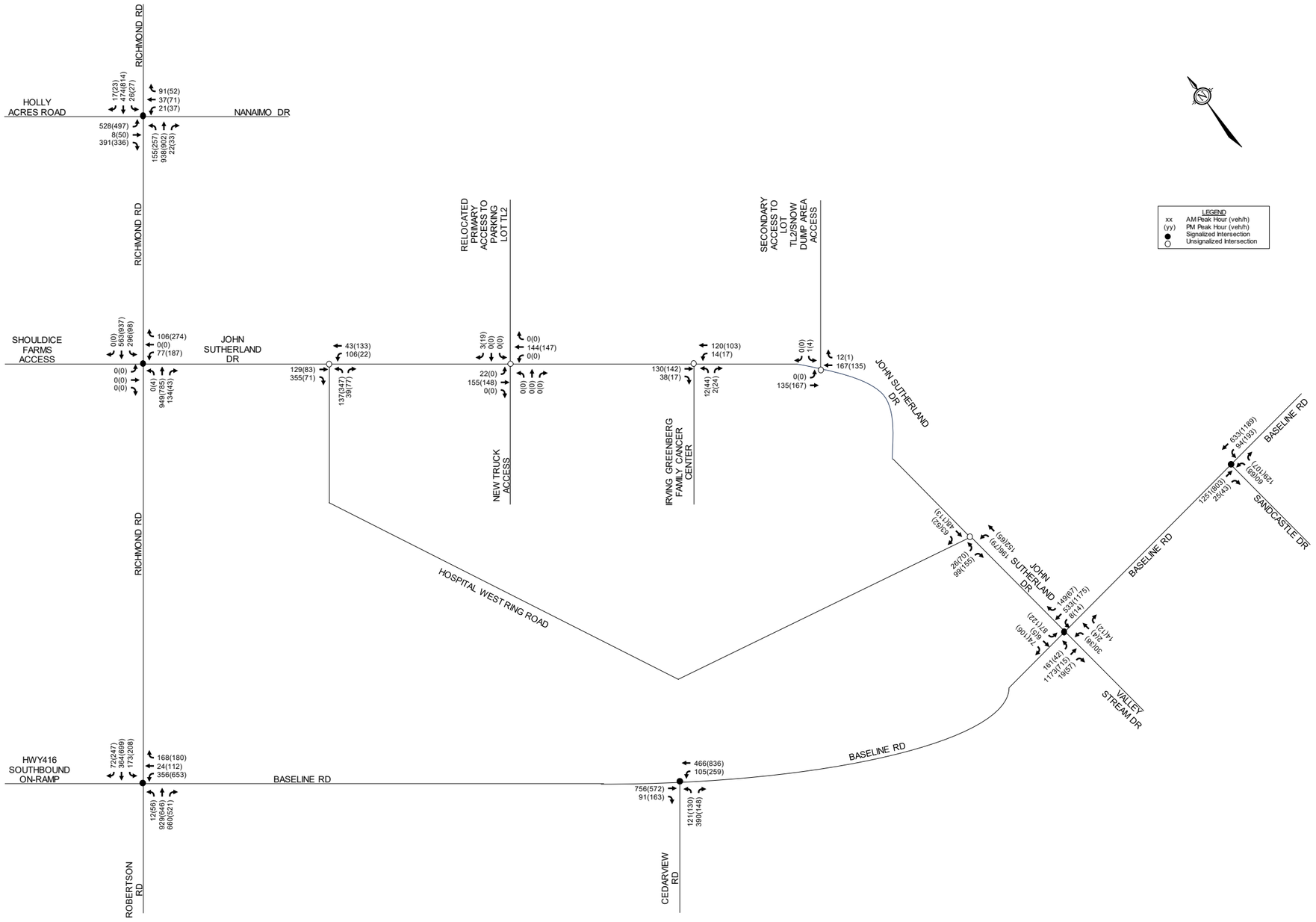
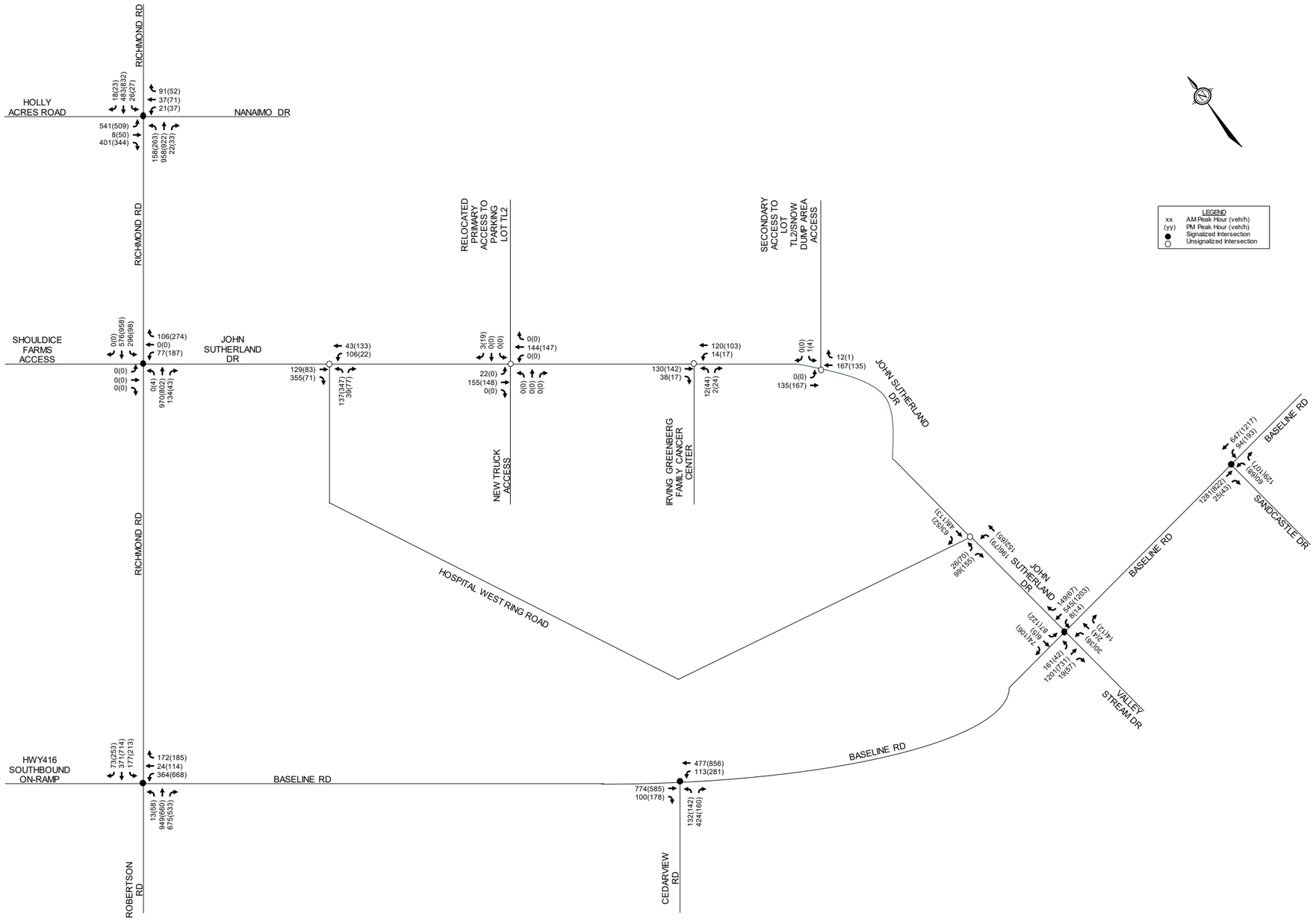


Figure 15: Total 2035 Traffic Volumes



3.2 Demand Rationalization

A review of the existing and background intersection operations has been conducted to determine if and when traffic volumes exceed capacity within the study area. Intersection parameters in the analysis are consistent with the City's 2017 TIA guidelines (saturation flow rate: 1800 vphpl, existing conditions PHF: 0.9, future conditions PHF: 1.0).

Per the City's 2024 TMP Part 1, the city-wide target vehicular level of service (Auto LOS) is an Auto LOS E, which equates to a maximum v/c ratio of 1.0 for signalized intersections or delay of 50 seconds at unsignalized intersections.

3.2.1 Existing Conditions

Intersection capacity analysis has been completed for the existing traffic volumes (See **Figure 3**) and is summarized in **Table 15**. Detailed Synchro 11 analysis reports for existing conditions are included in **Appendix J**.

Table 15: Existing Conditions Intersection Operations

Intersection	AM Peak			PM Peak		
	Max V/C or Delay	LOS	Mvmt	Max V/C or Delay	LOS	Mvmt
Richmond Road /Holly Acres Road/Nanaimo Drive	0.75	C	EBL	0.88	D	NBL
Richmond Road/John Sutherland Drive	0.71	C	SBL	0.97	E	WB
Richmond Road/Robertson Road/Baseline Road/HWY416 On-Ramp	0.65	B	WBL	0.87	D	WBL
Baseline Road/Cedarview Road	0.55	A	EBT	0.67	B	NBL
Baseline Road/Valley Stream Drive/John Sutherland Drive	0.56	A	EBT	0.73	C	SB
Baseline Road/Sandcastle Drive	0.53	A	EB	0.48	A	WBT
John Sutherland Drive/West Ring Road (South)	11 sec	B	SB	13 sec	B	SB
John Sutherland Drive/QCH Irving Greenberg Cancer Center	8 sec	A	WB	8 sec	A	EB
John Sutherland Drive/West Ring Road (North)	10 sec	A	EB	10 sec	A	NB
John Sutherland Drive/QCH Lot TL2	11 sec	B	SB	12 sec	B	SB

The following summarizes the results from **Table 15** based on the synchro analysis, for the existing traffic conditions:

Richmond Road/Holly Acres Road/Nanaimo Drive
All movements operate with a LOS C or better during the AM peak and a LOS D or better during the PM peak. During the AM and PM peaks, the 95th percentile queue length of the westbound through/left turn movement is approximately 25m and 50m respectively, exceeding the available storage length of 20m. The 95th percentile queue length of the northbound left turn movement is approximately 35m and 65m respectively, exceeding the available storage length of 25m.

Richmond Road/John Sutherland Drive
All movements operate with a LOS C or better during the AM peak hour and a LOS E or better during the PM peak hour.

The 95th percentile queue length for the southbound left turn movement is approximately 80m during the AM peak hour, exceeding the available storage length of 45m.

Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp
All movements operate with a LOS B or better during the AM peak and a LOS D or better during the PM peak hour.

Baseline Road/Cedarview Road
All movements operate with a LOS A during the AM peak and a LOS B or better during the PM peak hour. The 95th percentile queue length for the northbound left turn movement is approximately 40m and 45m under the AM and PM peaks respectively, exceeding the available storage of 25m potentially blocking the adjacent northbound right turn lane.

Baseline Road/John Sutherland Drive/Valley Stream Drive
All movements operate with a LOS A during the AM peak and a LOS C or better during the PM peak hour.

Baseline Road/Sandcastle Drive
All movements operate with a LOS A during the AM and PM peaks.

All QCH accesses on John Sutherland Drive
All accesses operate with a LOS B or better during the AM and PM peak hours.

3.2.2 2030 Background Traffic Operations

Intersection capacity analysis has been conducted for the 2030 background traffic volumes (See **Figure 11**) and summarized in **Table 16**. Detailed Synchro 11 analysis reports for background conditions are included in **Appendix K**.

Table 16: 2030 Background Traffic Operations

Intersection	AM Peak			PM Peak		
	Max V/C or Delay	LOS	Mvmt	Max V/C or Delay	LOS	Mvmt
Richmond Road/Holly Acres Road/Nanaimo Drive	0.73	C	EBL	0.80	C	EBL
Richmond Road/John Sutherland Drive	0.63	B	SBL	0.92	E	WB
Richmond Road/Robertson Road/Baseline Road/HWY416 On-Ramp	0.65	B	WBL	0.84	D	WBL
Baseline Road/Cedarview Road	0.52	A	EBT	0.67	B	NBL
Baseline Road/Valley Stream Drive/John Sutherland Drive	0.52	A	EBT	0.69	B	SB
Baseline Road/Sandcastle Drive	0.53	A	EB	0.47	A	WBT
John Sutherland Drive/West Ring Road (South)	11 sec	B	SB	12 sec	B	SB
John Sutherland Drive/QCH Irving Greenberg Cancer Center	8 sec	A	WB	8 sec	A	EB
John Sutherland Drive/West Ring Road (North)	9 sec	A	EB	10 sec	B	NB
John Sutherland Drive/QCH Lot TL2	11 sec	B	SB	11 sec	B	SB

The intersection operations within the study area are anticipated to be generally consistent with the existing conditions. It is noteworthy that due to the change in the peak hour factor associated with future conditions, operations and queues for some movements may have improved slightly compared to the existing conditions analysis. The following summarizes the results from **Table 16** based on the synchro analysis, for the background 2030 traffic conditions:

Richmond Road/Holly Acres Road/Nanaimo Drive

All movements operate with a LOS C or better during the AM peak and PM peak. During the AM and PM peaks, the 95th percentile queue length of the westbound through/left movement is approximately 25m and 45m respectively exceeding the available storage of 20m. The 95th percentile queue length of the northbound left turn movement is 35m and 55m respectively, exceeding the available storage length of 25m.

Richmond Road/John Sutherland Drive

All movements operate with a LOS C or better during the AM peak hour and a LOS E or better during the PM peak hour. The 95th percentile queue length for the southbound left turn movement is approximately 50m, exceeding the available storage length of 45m.

Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp

Similar to the existing conditions, all movements operate with a LOS B or better during the AM peak and a LOS D or better during the PM peak hour.

Baseline Road/Cedarview Road
Similar to the existing conditions, all movements operate with a LOS A during the AM peak and a LOS B or better during the PM peak hour. The 95th percentile queue length for the northbound left turn movement is approximately 40m and 45m under the AM and PM peaks respectively, exceeding the available storage of 25m and potentially blocking the adjacent northbound right turn lane.

Baseline Road/John Sutherland Drive/Valley Stream Drive
All movements operate with a LOS A during the AM peak and a LOS B or better during the PM peak hour.
Baseline Road/Sandcastle Drive
All movements operate with a LOS A during the AM and PM peaks.

All QCH accesses on John Sutherland Drive
All accesses operate with a LOS B or better during the AM and PM peak hours.

3.2.3 2035 Background Traffic Operations

Intersection capacity analysis has been conducted for the 2035 background traffic volumes (See **Figure 12**) and summarized in **Table 17**. Detailed Synchro 11 analysis reports for background conditions are included in **Appendix K**.

Table 17: 2035 Background Traffic Operations

Intersection	AM Peak			PM Peak		
	Max V/C or Delay	LOS	Mvmt	Max V/C or Delay	LOS	Mvmt
Richmond Road/Holly Acres Road/Nanaimo Drive	0.74	C	EBL	0.83	C	NBL
Richmond Road/John Sutherland Drive	0.64	B	SBL	0.92	E	WB
Richmond Road/Robertson Road/Baseline Road/HWY416 On-Ramp	0.65	B	WBL	0.85	D	WBL
Baseline Road/Cedarview Road	0.54	A	EBT	0.69	B	NBL
Baseline Road/Valley Stream Drive/John Sutherland Drive	0.53	A	EBT	0.69	B	SB
Baseline Road/Sandcastle Drive	0.54	A	EB	0.48	A	WBT
John Sutherland Drive/West Ring Road (South)	11 sec	B	SB	12 sec	B	SB
John Sutherland Drive/QCH Irving Greenberg Cancer Center	8 sec	A	WB	8 sec	A	EB
John Sutherland Drive/West Ring Road (North)	9 sec	A	EB	10 sec	B	NB
John Sutherland Drive/QCH Lot TL2	11 sec	B	SB	11 sec	B	SB

Based on the foregoing, the intersection operations within the study area are anticipated to be generally consistent with the 2030 background traffic conditions.

4.0 ANALYSIS

4.1 Development Design

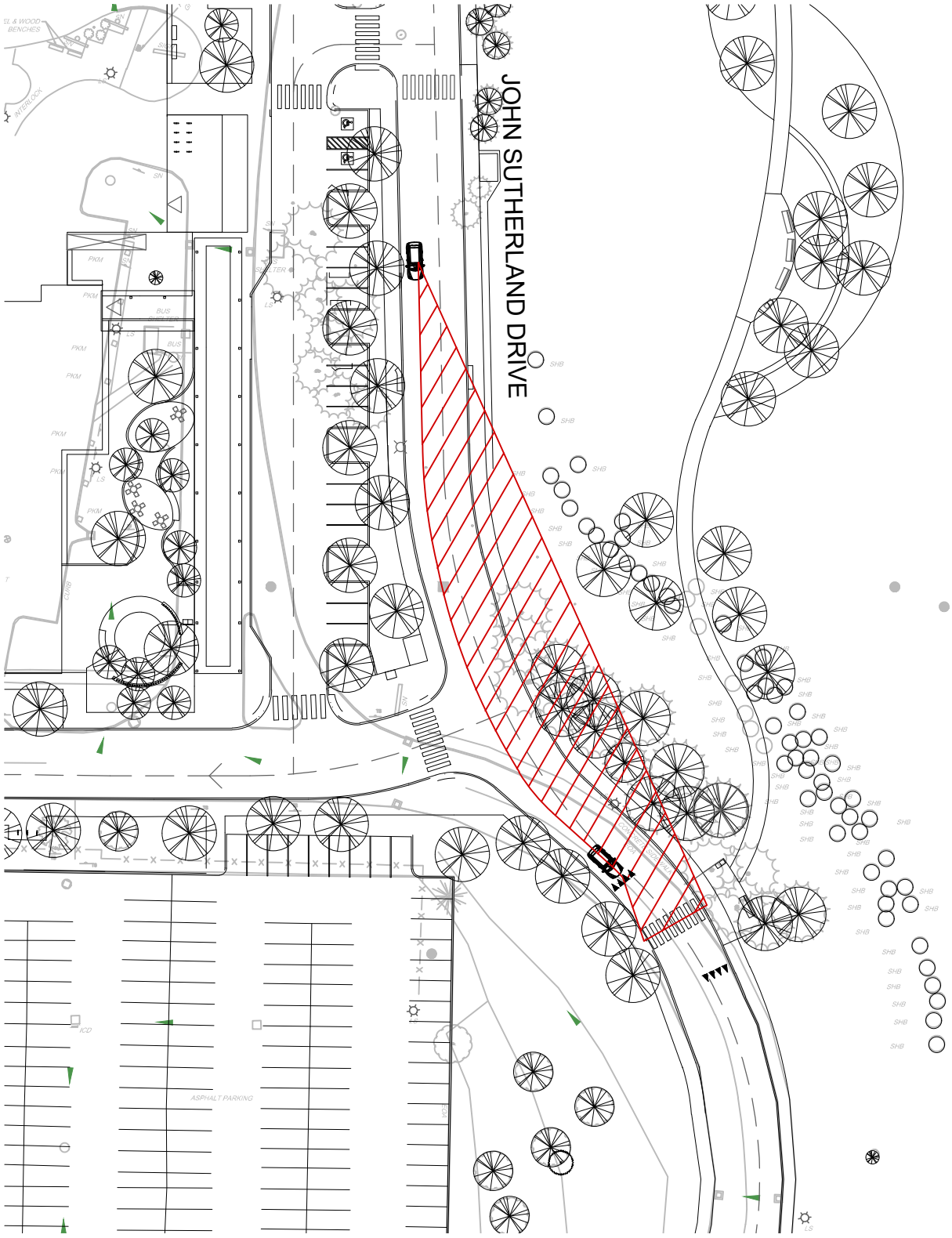
4.1.1 Design for Sustainable Modes

Under the existing campus conditions, a sidewalk network is provided along the periphery of the campus buildings. As part of Part 4 expansion, pedestrian facilities near the main entrance at the south end of the building will remain unchanged. Minor modifications to the south parking lots are proposed to increase the parking supply. The existing pathways north/west of the existing parking garage will be reconfigured to accommodate the new parking garage and west ring road. The pathway on the west side of the new west ring will continue to function as part of the City's Crosstown Bikeway network. Two new pedestrian crossings are proposed on the west ring road to provide connectivity to the western pathway networks.

John Sutherland Drive east of the hospital will be realigned further east to allow for the hospital expansion. As part of this, sidewalks will be provided on both sides of the road from the West Ring Road to the Emergency Department, where the sidewalk on the west side of the road continues to the Irving Greenberg Cancer Centre. A new off-road pedestrian pathway is proposed on the east side of John Sutherland Drive along its entire stretch. Three accesses to this pathway are proposed: one each at the extremes of John Sutherland Drive, and one to the east of Irving Greenberg Cancer Center. Three new pedestrian crossings are proposed along John Sutherland Drive to provide connectivity to the bus stops, pathways, and parking north/east of the road. It is recommended that all new pedestrian crossings be designed in accordance with Ontario Traffic Manual (OTM) Book 15 requirements for a PXO Type D.

Driver sight lines to the proposed pedestrian crossings on the new west ring road and the two northern crossings on John Sutherland Drive are not anticipated to be impacted by landscaping or the horizontal alignment of the road. However, since the southern PXO on John Sutherland Drive is located near an S-bend in the road with existing coniferous trees to the east, a detailed review of sight lines has been conducted. The Stopping Sight Distance (SSD) at this pedestrian crossing has been evaluated using a design speed of 60 kmph. Table 2.5.2 of the Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads (GDG) identifies an SSD of 85 m for a design speed of 60 kmph. SSD sightlines at the proposed pedestrian crossing are shown in **Figure 16** and **Figure 17**. Based on the sight line figures, the existing coniferous trees along the east side of the road will obstruct driver sight lines. To maintain clear sight lines to the pedestrian crossing, it is recommended that these trees be pruned to 2m in height.

Transit will be maintained on John Sutherland Drive as part of this development. The existing bus stops and shelters near the Irving Greenberg Cancer Centre (Stops #0727 and #0728) will be maintained as part of the site plan. The existing bus stops and shelters near the emergency center (#0947 and #0950) will be relocated to the realigned roadway. The southbound bus stop (#0949) will be relocated to the intersection of John Sutherland Drive/West Ring Road.



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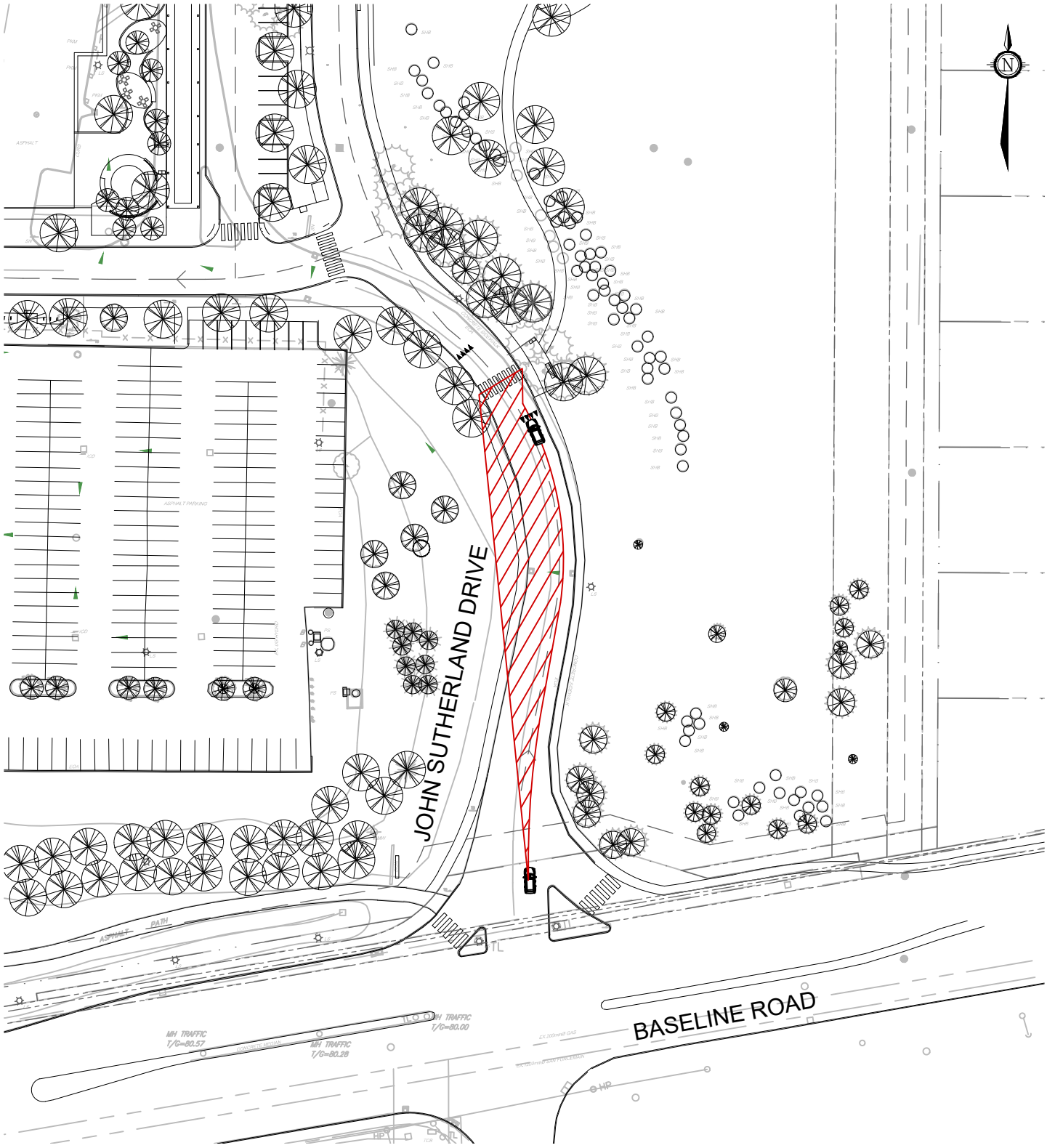
STOPPING SIGHT DISTANCE

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STOPPING SIGHT DISTANCE

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A total of 246 bicycle parking spaces (including the existing 44 spaces) will be provided on-site at the following locations:

- 114 spaces will be provided within the new parking garage.
- 54 will be provided within the existing parking garage.
- 8 spaces will be provided in the landscaped area in between the propane tank loop.
- 10 spaces will be provided at the entrance of Irving Greenberg Cancer Center.
- 24 spaces will be provided within the visitors parking lot.
- 10 spaces will be provided at the main entrance.
- 16 spaces will be provided at the emergency entrance.
- 10 spaces will be provided at the west entrance.

The Part 4 expansion of the QCH campus has been assessed using the Transportation Demand Management (TDM) – Supportive Development Design and Infrastructure Checklist. A copy of the TDM checklist is included in **Appendix L**. In addition to the required measures, the proposed development also meets the following 'basic' or 'better' measures on the checklist:

- Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations.
- Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort.
- Provide safe, direct and attractive walking routes from building entrances to nearby transit stops.
- Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible.
- Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails.
- Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious).
- Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists.
- Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25% extra) to encourage other cyclists in peak cycling season.
- Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met).
- Provide shower and change facilities for the use of active commuters.
- Provide shelters, lighting and benches at any on-site transit stops.
- Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up without using fire lanes or other no-stopping zones.
- Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa).
- Provide on-site amenities to minimize mid-day or mid-commute errands.

Supportive commentary is provided for appropriate TDM items within the TDM checklist.

4.1.2 Circulation and Access

Material Management/Garbage Collection/Gas Delivery
All hospital related material delivery/pickup, and garbage collection activities will take place from the material management facility's loading/unloading docks located beside Irving Greenberg Cancer Center. Propane gas delivery will occur within the propane tank loop. Diesel delivery will take place at the diesel storage tanks located between the two parking garages.

Ultimate turning movements for a WB-20 Tractor Semitrailer, accessing/egressing the campus from the Richmond Road/John Sutherland Drive intersection, entering/exiting and maneuvering within the material management facility are shown from **Figure 18** to **Figure 25**. Interim turning movements (during the phased construction) are shown from **Figure 26 to Figure 28**.

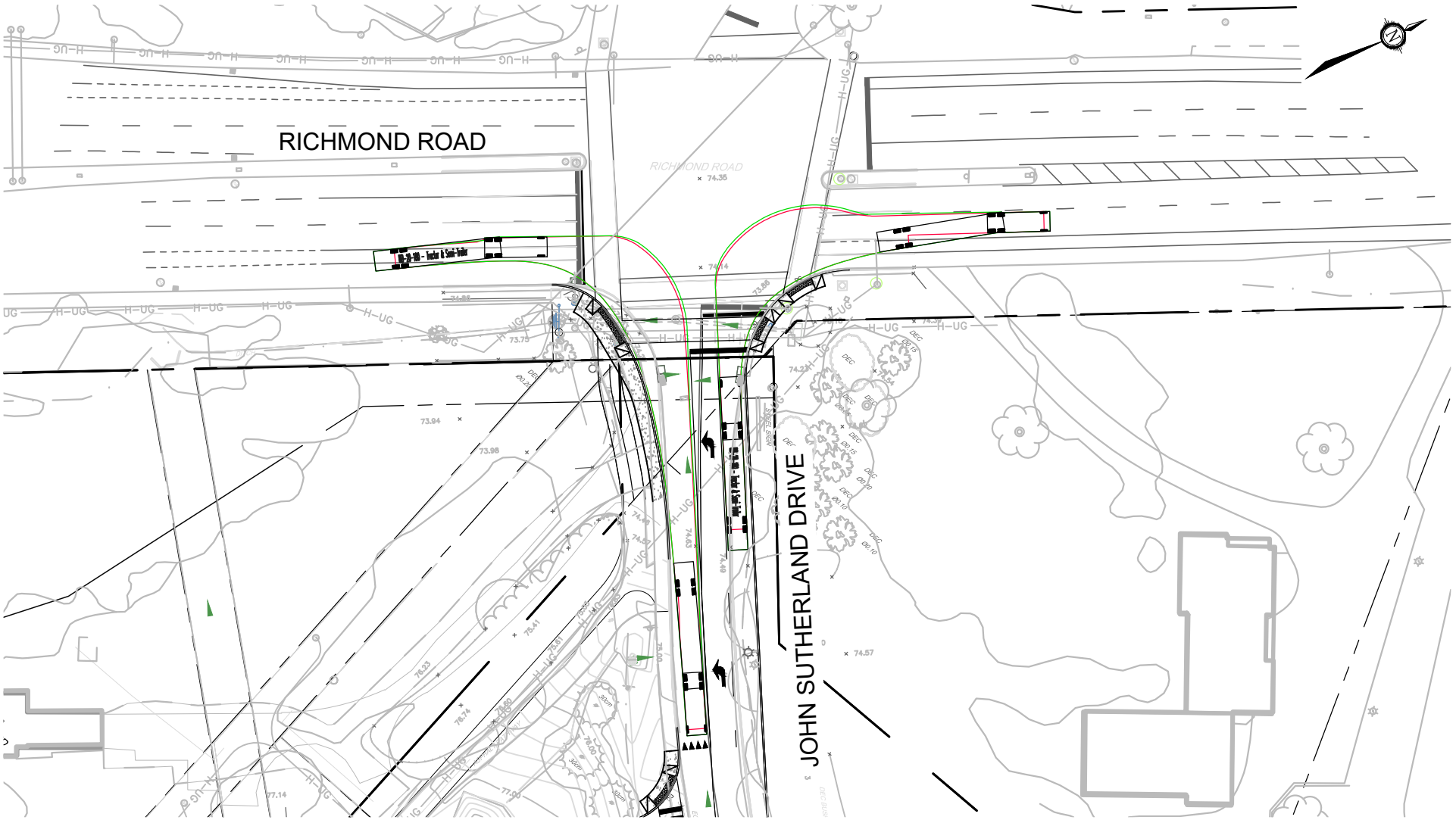
Ultimate turning movements for a WB-20 Tractor Semitrailer entering/exiting the propane tank loop are shown from **Figure 29** to **Figure 31**.

Turning movement for a 7000 WD Standard Tanker (fuel delivery truck) at the diesel storage tanks is shown in **Figure 32**.

Ambulance Garage and Ambulance/Police Bay
Ambulance garage is located beside the emergency department off John Sutherland Drive. In front of the emergency department, an ambulance bay and parking for ambulance/police is also provided. Interim turning movements at the ambulance bay is shown in **Figure 33**. Ultimate turning movements at the ambulance bay and the ambulance garage are shown in **Figure 34** and **Figure 35** respectively.

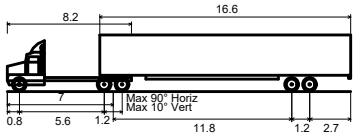
Design Vehicle Turning Movements
Passenger car has been used as a design vehicle within the QCH campus. Turning movements for a passenger within the visitor parking lot are shown in **Figure 36** and **Figure 37**.

Fire Routes
John Sutherland Drive between Richmond Road and Main QCH Access/John Sutherland Drive intersection is designated as a fire route. Whole of QCH west ring road, loading bay area, and ambulance/police bay in front of the emergency department are also designated as fire routes. All three of these fire routes meet the minimum clear width requirement of 6.0m for a fire route.



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WB-20 - Tractor & Semi-Trailer

Overall Length	22.700m
Overall Width	2.600m
Overall Body Height	3.730m
Min Body Ground Clearance	0.435m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

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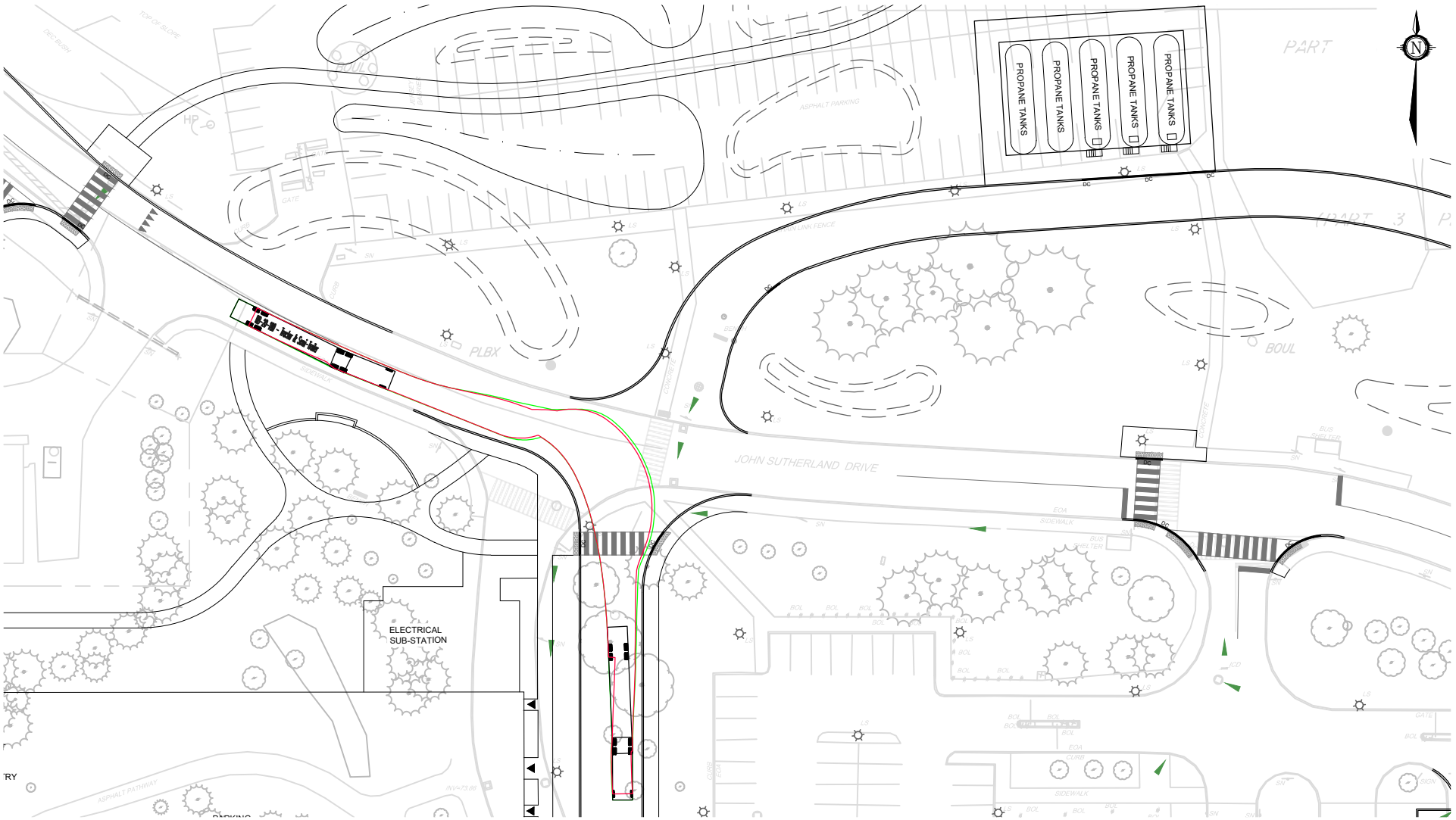
TURNING MOVEMENTS (WB-20)

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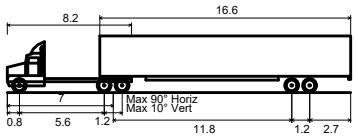
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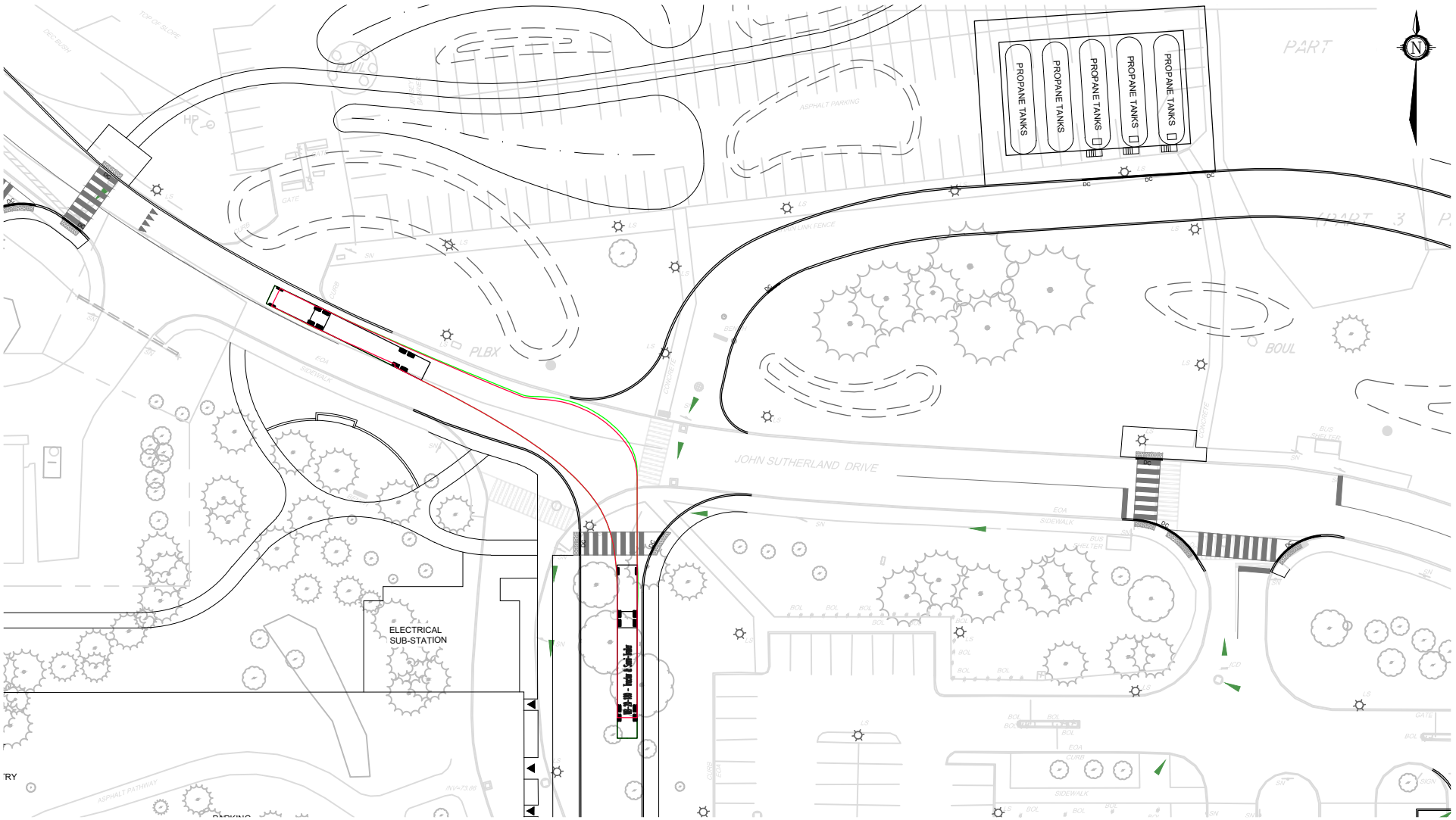
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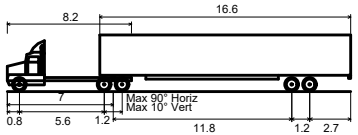
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Min Body Ground Clearance	0.435m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

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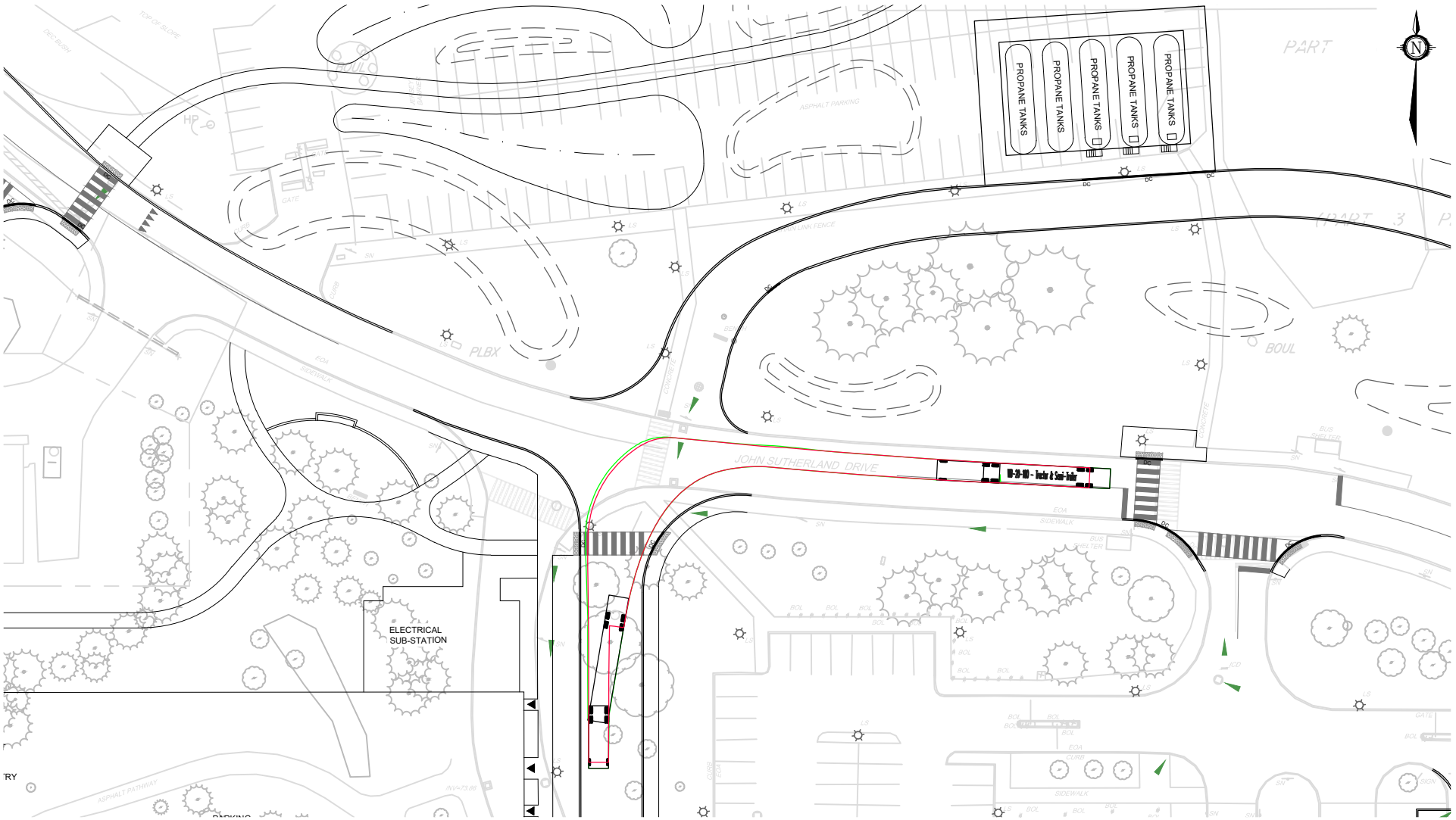
TURNING MOVEMENTS (WB-20)

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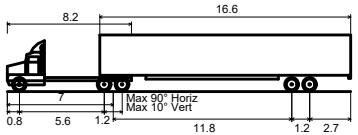
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Track Width	2.600m
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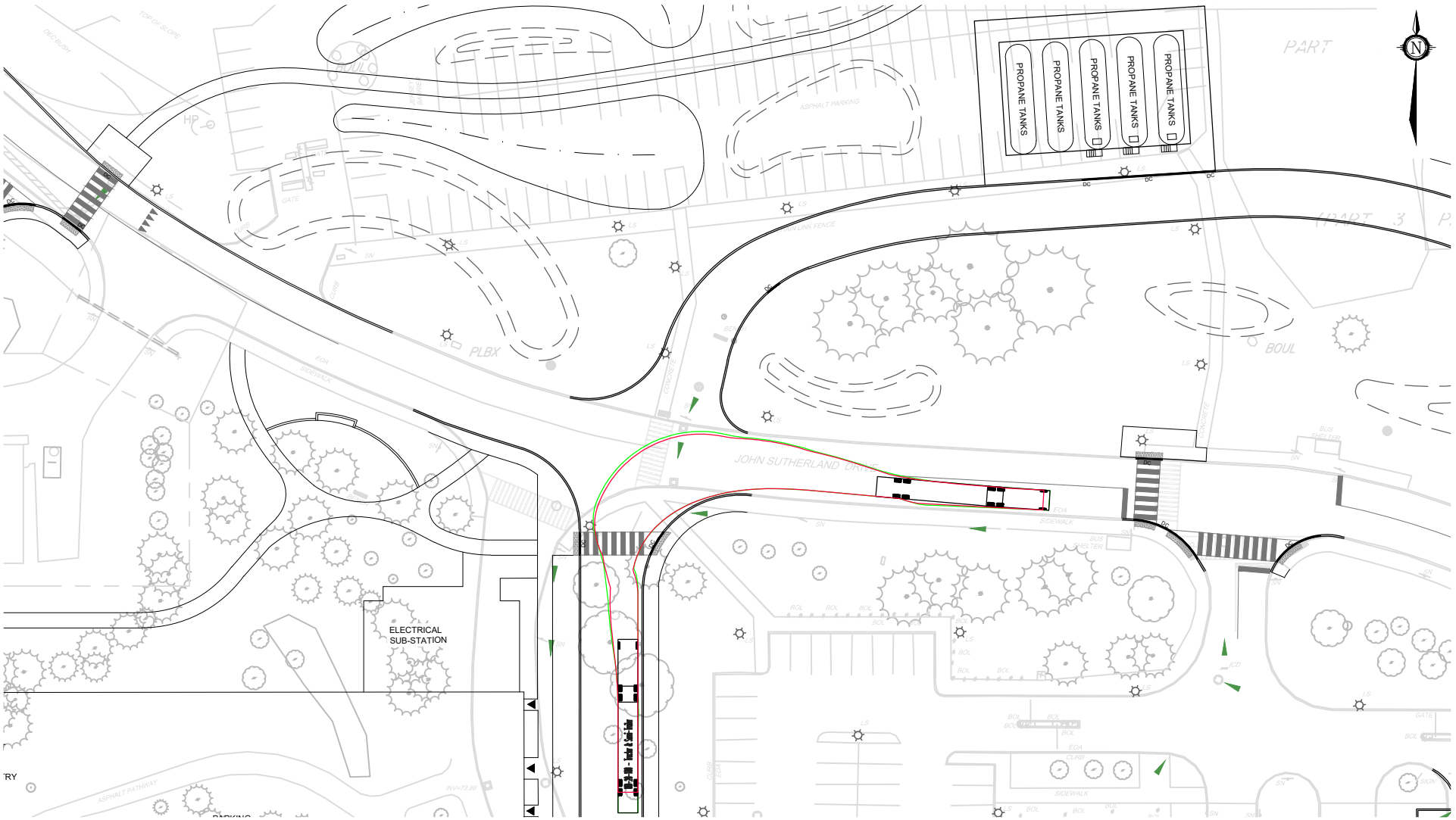
TURNING MOVEMENTS (WB-20)

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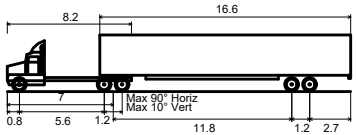


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Curb to Curb Turning Radius	14.300m

QUEENSWAY CARLETON HOSPITAL - ULTIMATE

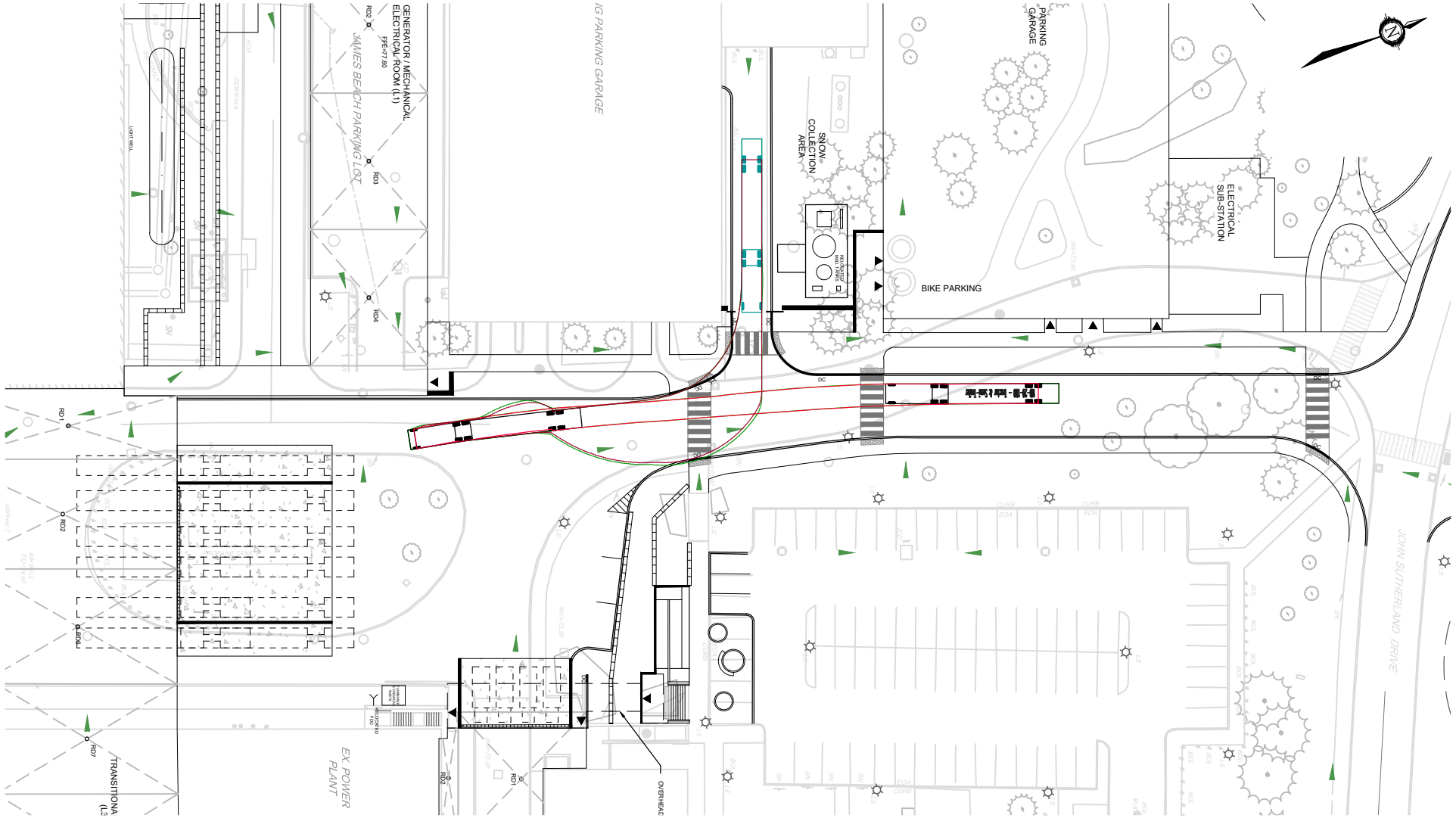
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0, 10, 20, 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 22

SHT8X11.DWG - 216mmx279mm

M:\2023\123089\CAD\civil\Figures\Traffic\Sept 2026 Submission\123089-TM-Ultimate2.dwg, FIG 22, Sep 02, 2026 - 3:40pm, cvisser

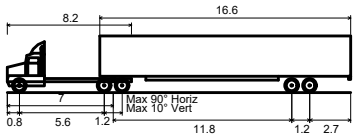


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Website	www.novatech-eng.com



WB-20 - Tractor & Semi-Trailer

Overall Length	22.700m
Overall Width	2.600m
Overall Body Height	3.730m
Min Body Ground Clearance	0.435m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

QUEENSWAY CARLETON HOSPITAL - ULTIMATE

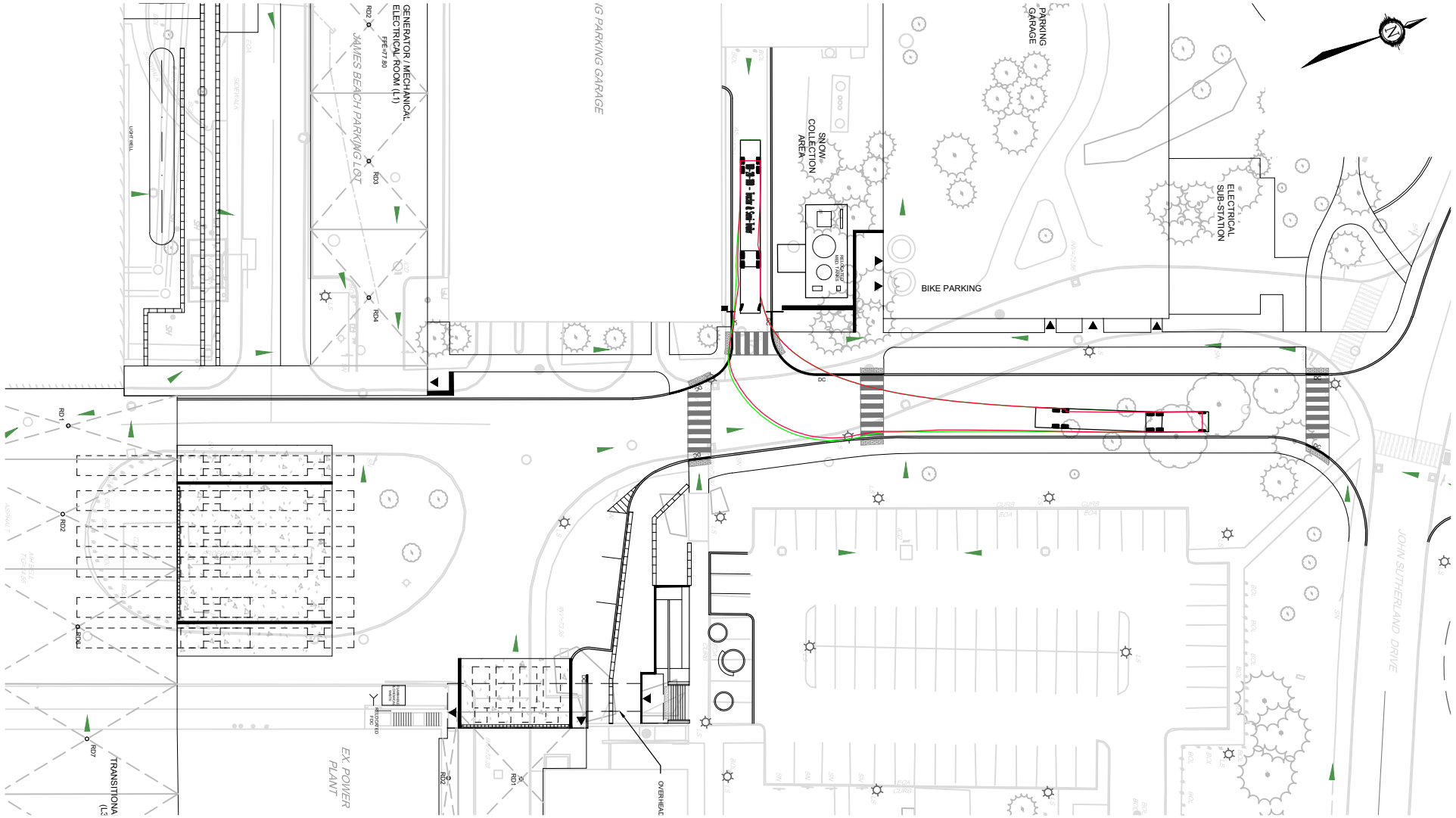
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0, 10, 20, 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 23

M:\2023\123089\CAD\civil\Figures\Traffic\Sept 2026 Submission\123089-TM-Ultimate2.dwg, FIG 23, Sep 02, 2026 - 3:56pm, cvisser

SHT8X11.DWG - 216mmx279mm

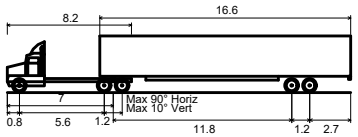


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QUEENSWAY CARLETON HOSPITAL - ULTIMATE

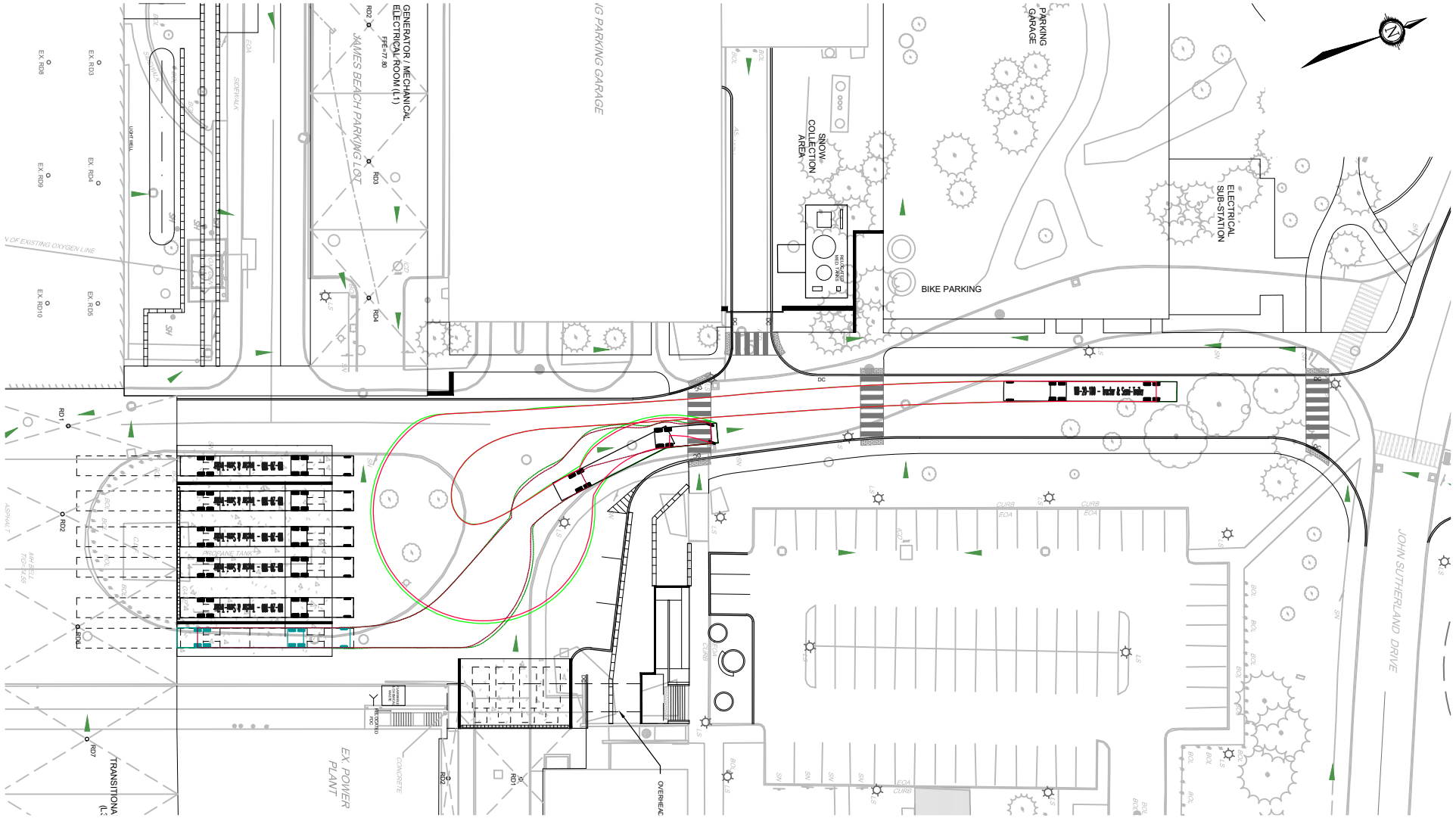
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0 10 20 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 24

SHT8X11.DWG - 216mmx279mm

M:\2023\123089\CAD\civil\Figures\Traffic\Sept 2026 Submission\123089-TM-Ultimate2.dwg, FIG 24, Sep 02, 2026 - 3:56pm, cvisser

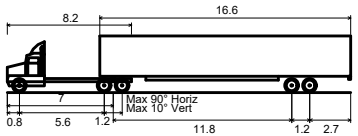


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QUEENSWAY CARLETON HOSPITAL - ULTIMATE

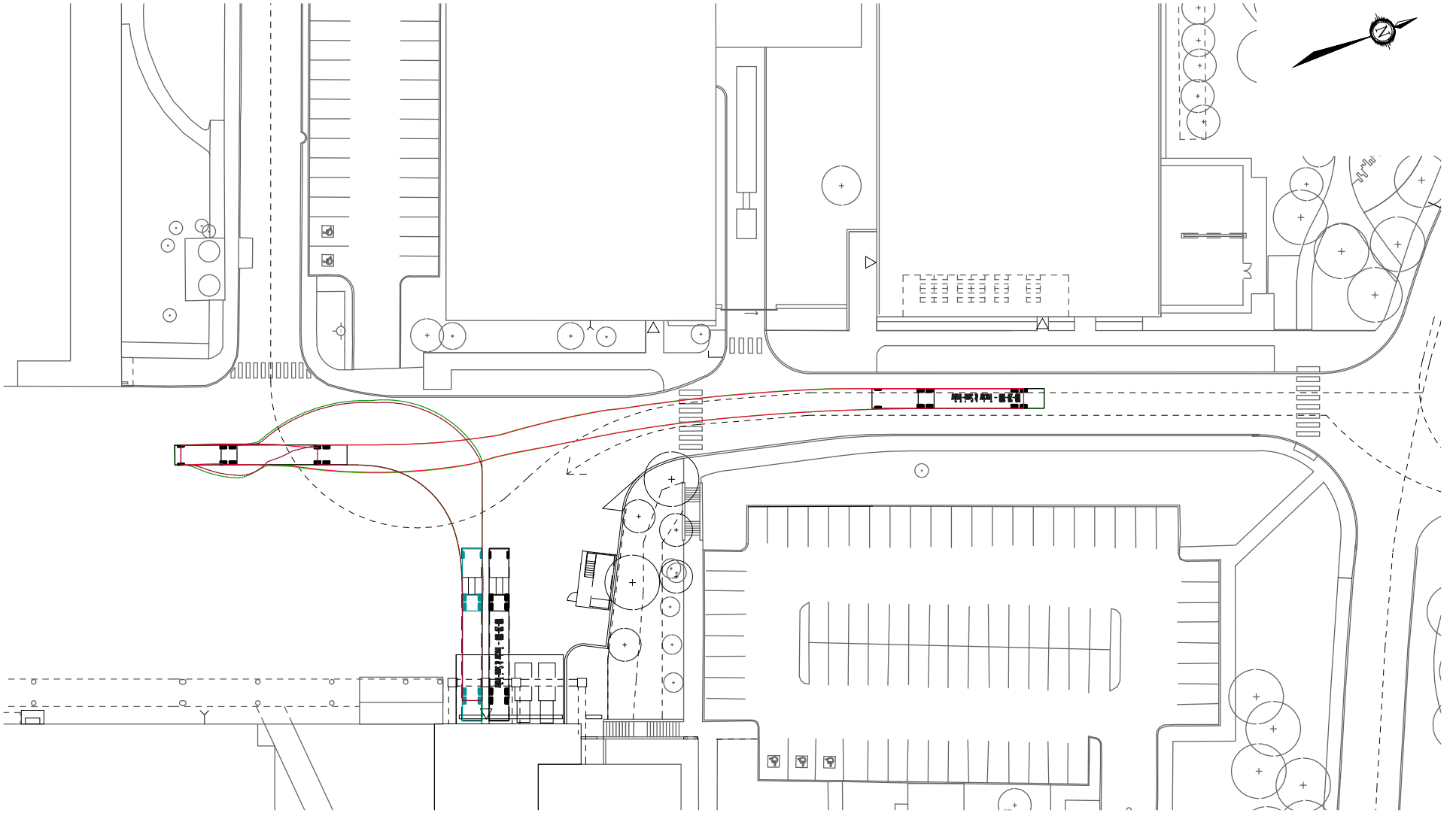
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0 10 20 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 25

SHT8X11.DWG - 216mmx279mm

M:\2023\123089\CAD\Civil\Figures\Traffic\Sept 2026 Submission\123089-TM-Ultimate.dwg, FIG 25, Sep 02, 2026 - 3:47pm, cvisser

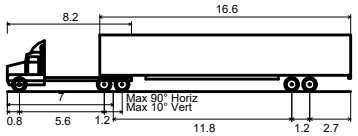


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Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

QUEENSWAY CARLETON HOSPITAL - INTERIM - PH2A

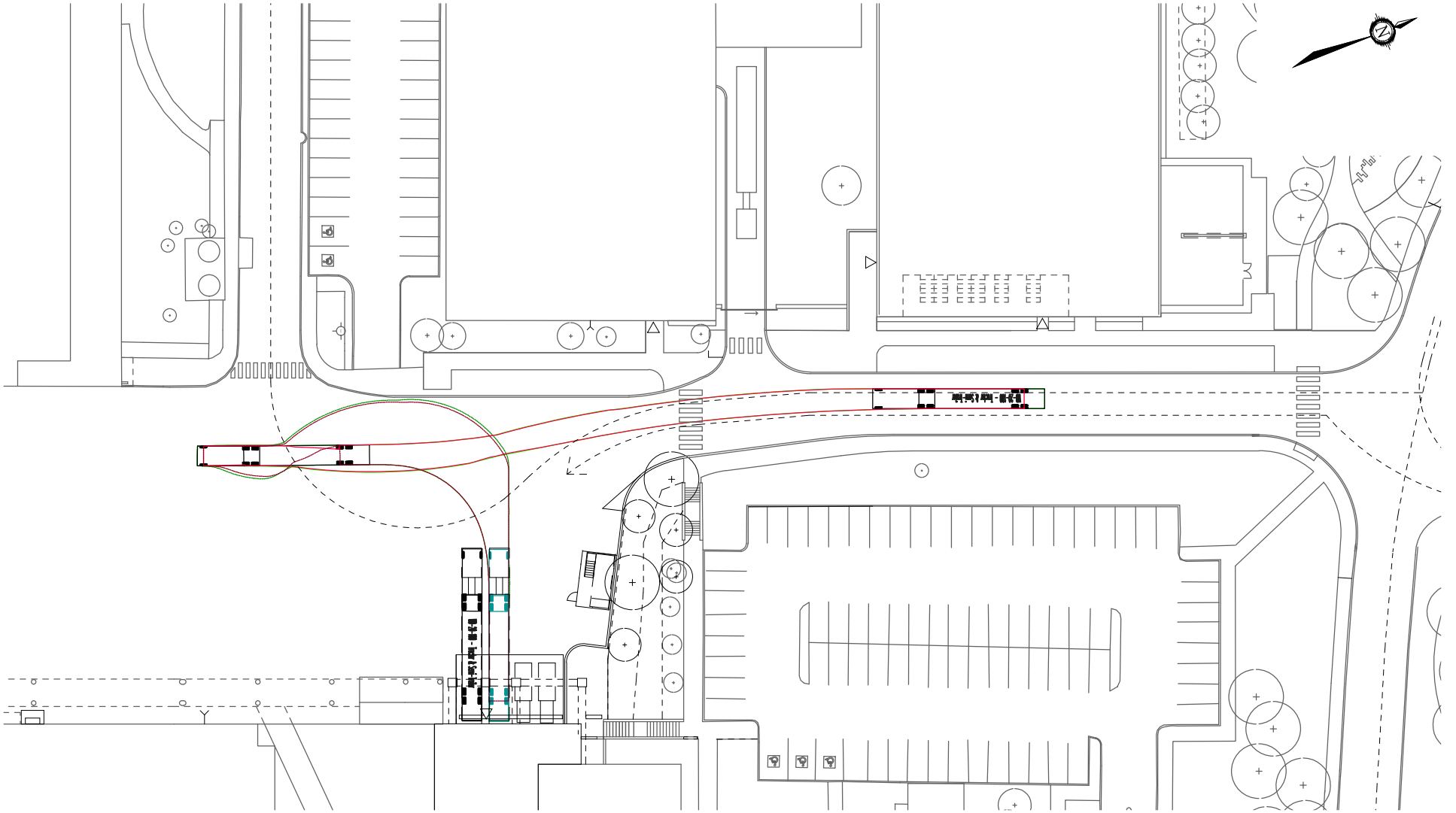
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0, 10, 20, 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 26

M:\2023\123089\CAD\civil\Figures\Traffic\Sept 2026 Submission\123089-TM-InterimPh2A.dwg, FIG 26, Sep 03, 2026 - 11:36am, bbyvelds

SHT8X11.DWG - 216mmx279mm

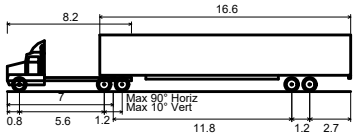


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Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

QUEENSWAY CARLETON HOSPITAL - INTERIM - PH2A

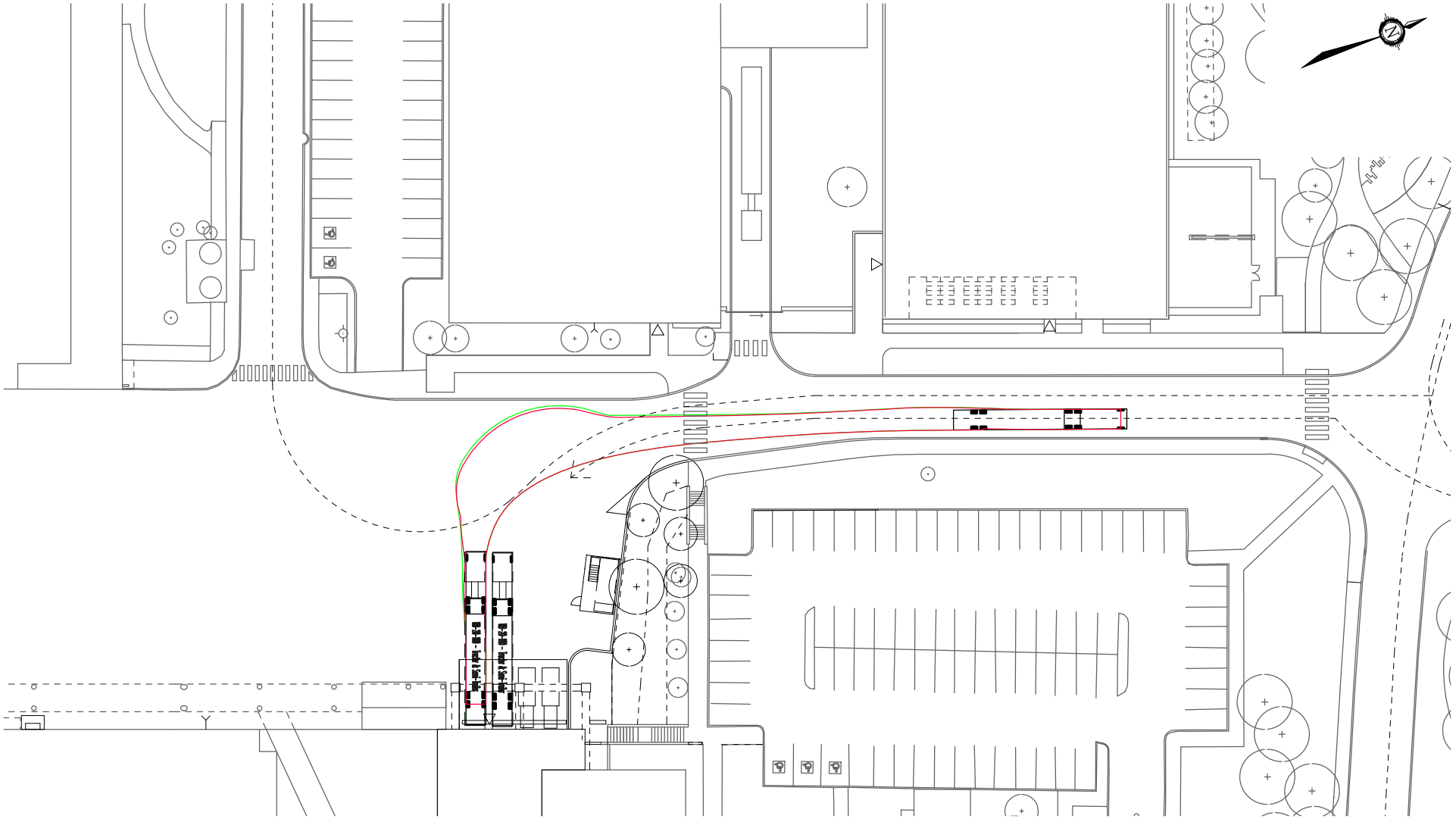
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0 10 20 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 27

SHT8X11.DWG - 216mmx279mm

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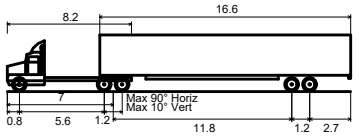


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Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

QUEENSWAY CARLETON HOSPITAL - INTERIM - PH2A

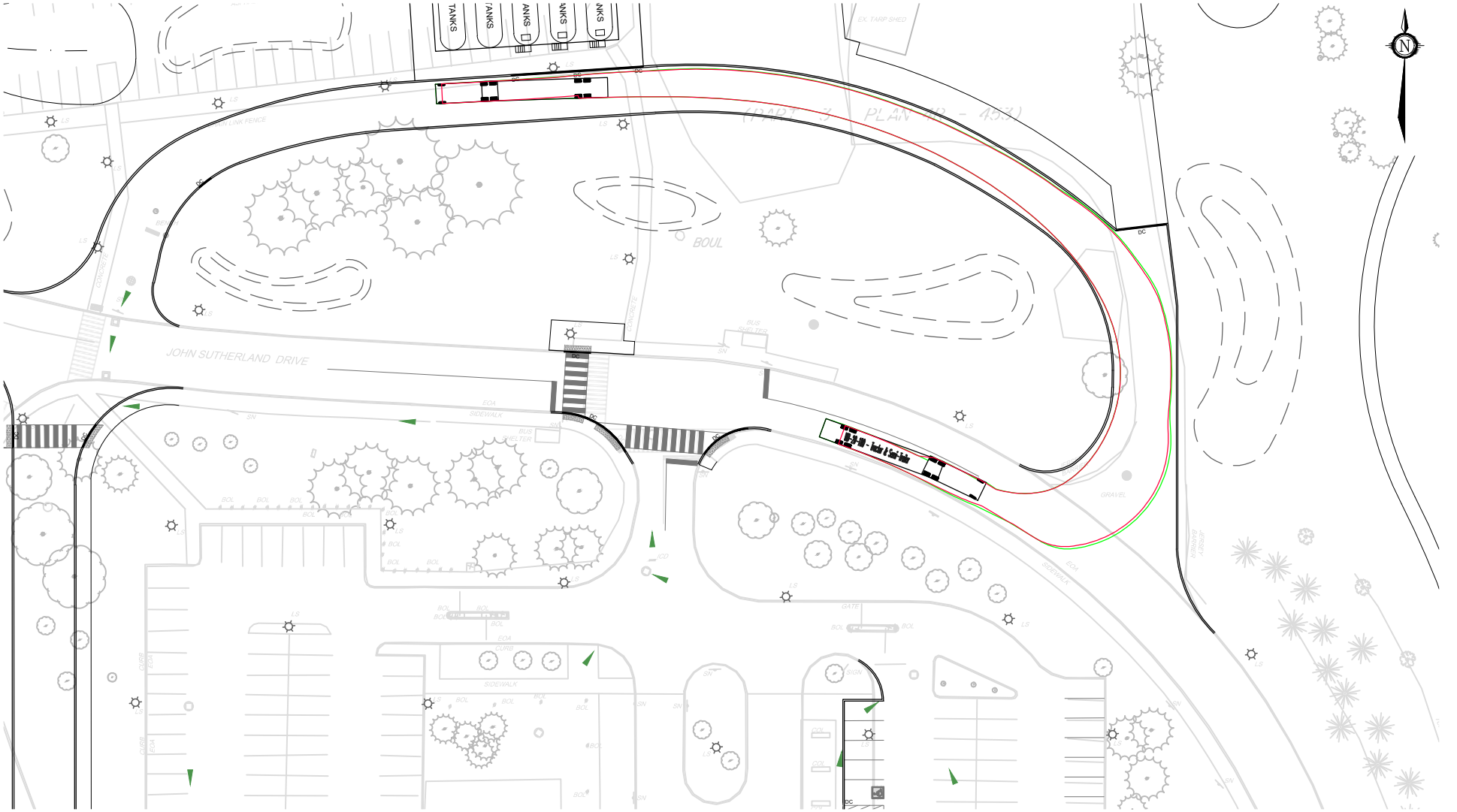
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0 10 20 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 28

SHT8X11.DWG - 216mmx279mm

M:\2023\123089\CAD\civil\Figures\Traffic\Sept 2026 Submission\123089-TM-InterimPh2A.dwg, FIG 28, Sep 03, 2026 - 12:04pm, cvisser

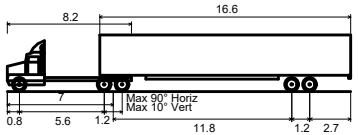


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Curb to Curb Turning Radius	14.300m

QUEENSWAY CARLETON HOSPITAL - ULTIMATE

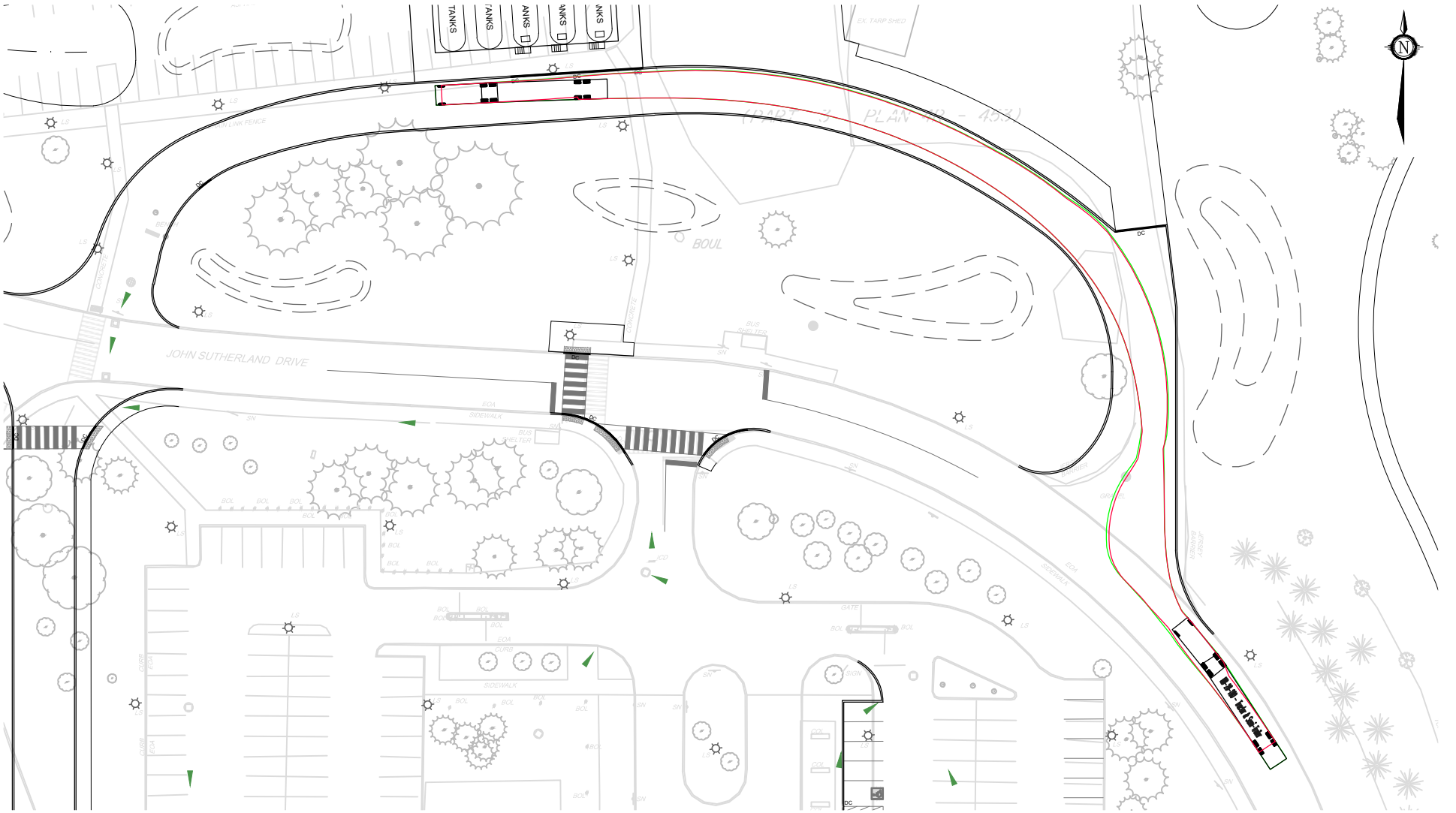
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0, 10, 20, 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 29

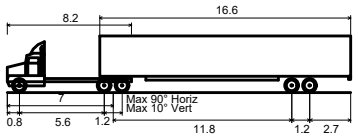
SHT8X11.DWG - 216mmx279mm

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Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

QUEENSWAY CARLETON HOSPITAL - ULTIMATE

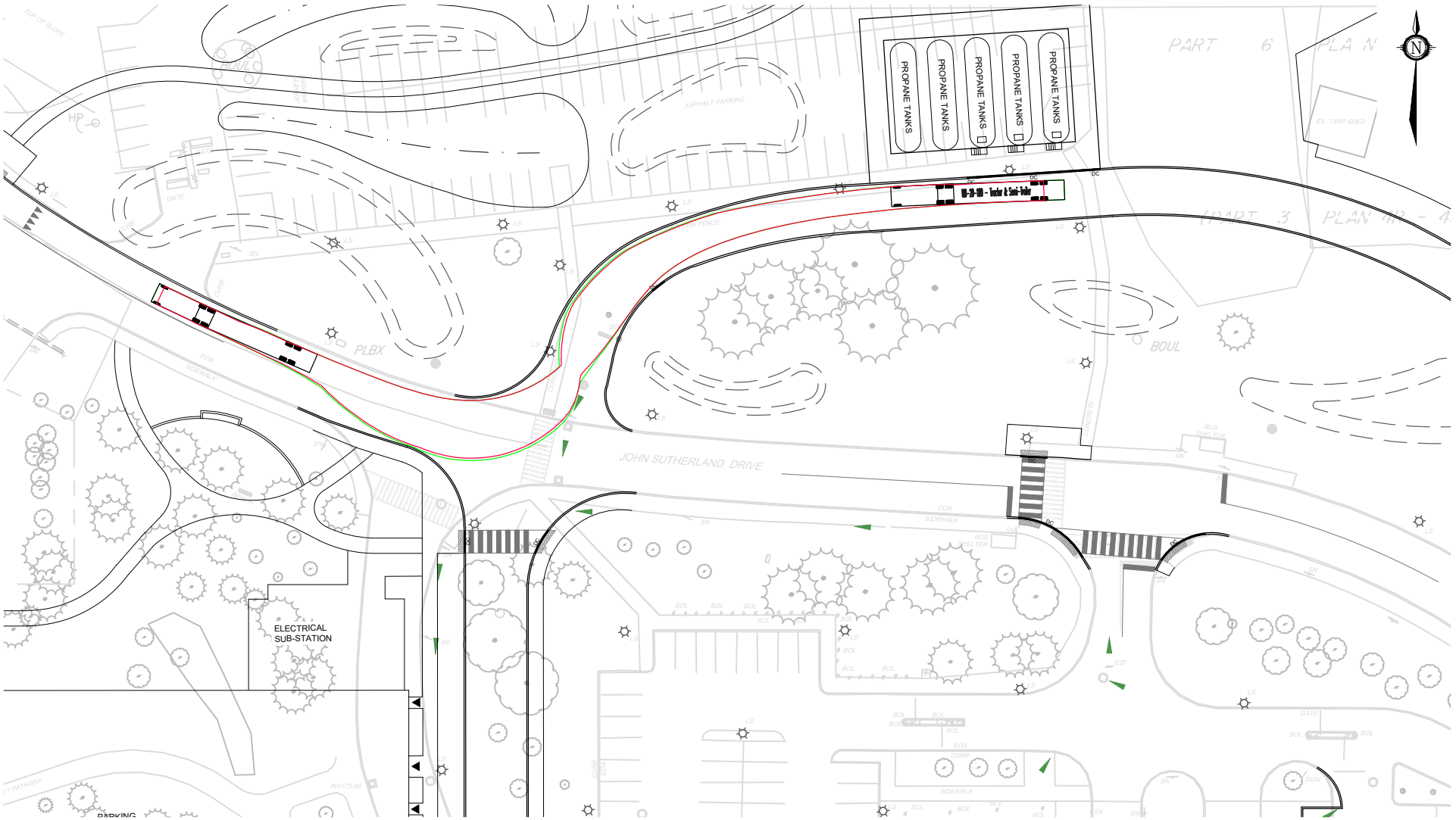
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0 10 20 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 30

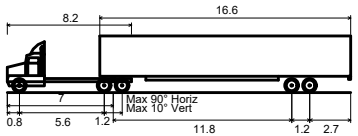
SHT8X11.DWG - 216mmx279mm

M:\2023\123089\CAD\civil\Figures\Traffic\Sept 2026 Submission\123089-TM-Ultimate2.dwg, FIG 30, Sep 02, 2026 - 3:40pm, cvisser



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WB-20 - Tractor & Semi-Trailer

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Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

QUEENSWAY CARLETON HOSPITAL - ULTIMATE

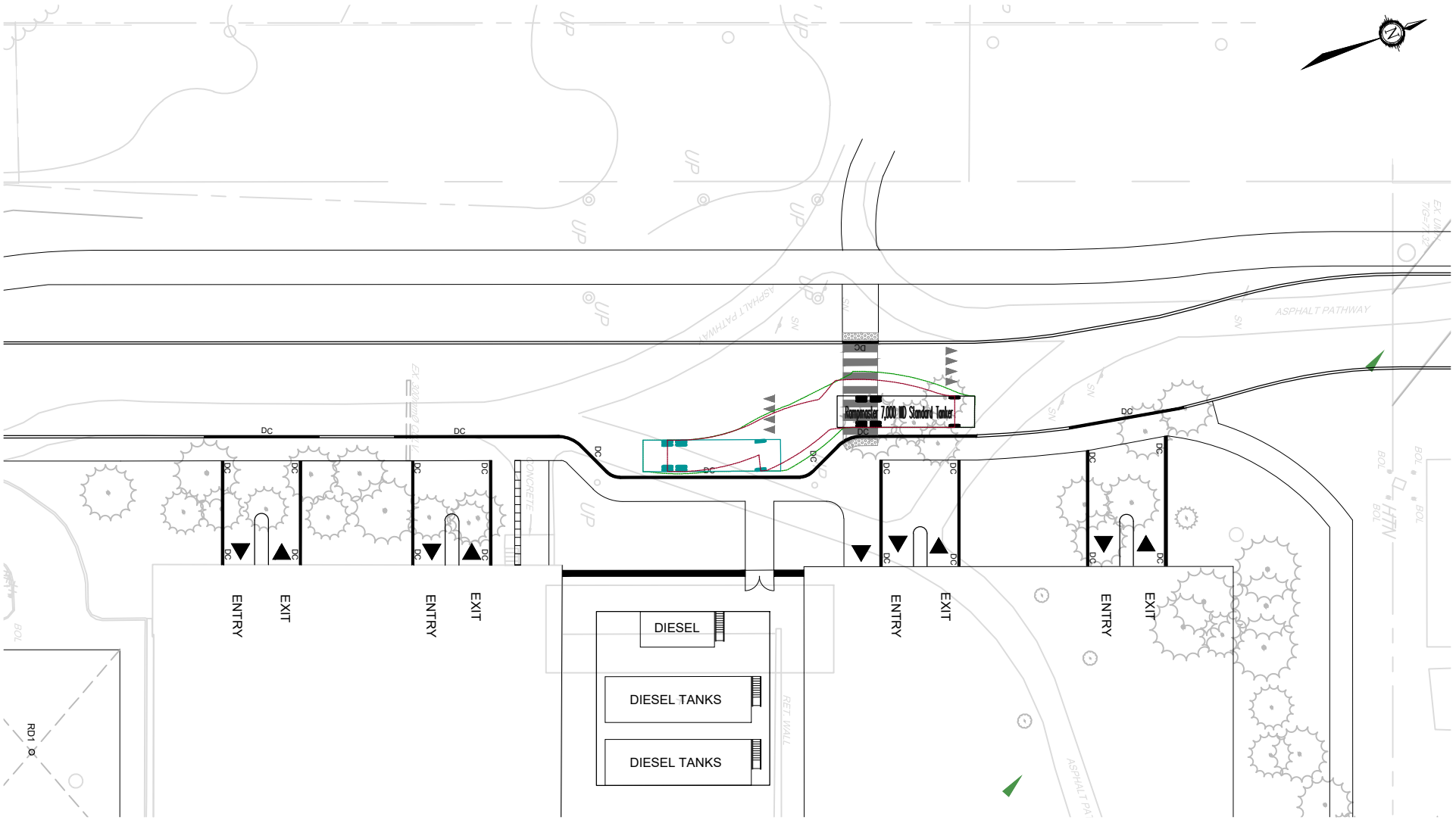
TURNING MOVEMENTS (WB-20)

SCALE 1 : 750 (0 10 20 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 31

M:\2023\123089\CAD\civil\Figures\Traffic\Sept 2026 Submission\123089-TM-Ultimate2.dwg, FIG 31, Sep 02, 2026 - 3:40pm, cvisser

SHT8X11.DWG - 216mmx279mm

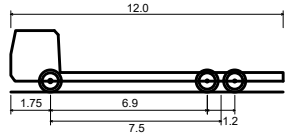


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7000 WD STANDARD TANKER

Overall Length	12.014m
Overall Width	2.743m
Overall Body Height	2.704m
Min Body Ground Clearance	0.470m
Track Width	2.743m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	16.154m

QUEENSWAY CARLETON HOSPITAL - ULTIMATE

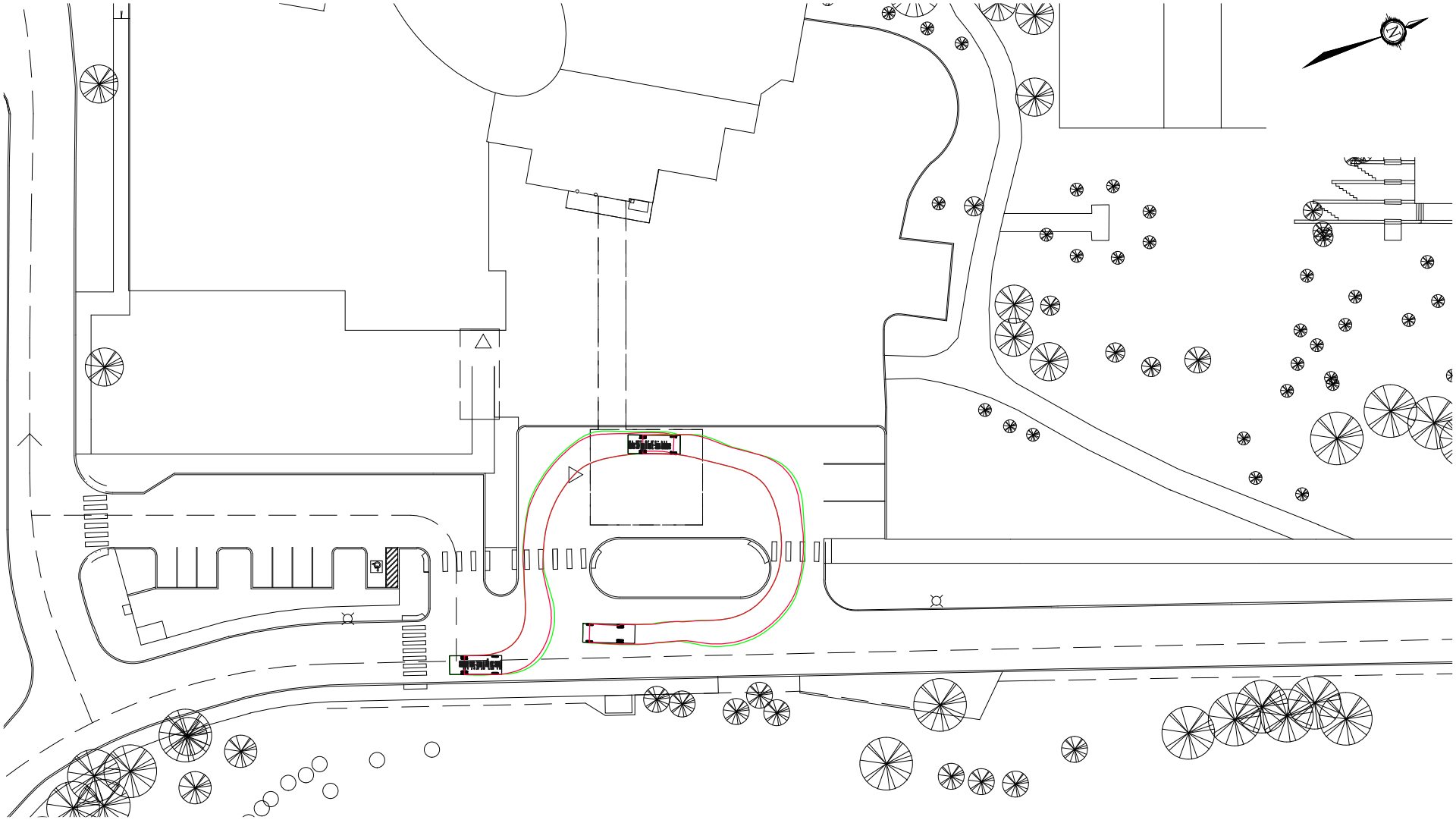
TURNING MOVEMENTS (TANK TRUCK)

SCALE 1 : 500 (0, 5m, 10m, 20m)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 32

SHT8X11.DWG - 216mmx279mm

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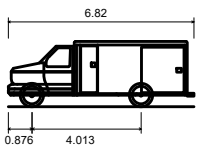


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Horton 553 Type III - Ford E Ambulance

Overall Length	6.82m
Overall Width	2.445m
Overall Body Height	2.394m
Min Body Ground Clearance	0.386m
Track Width	2.445m
Lock-to-lock time	5.00s
Curb to Curb Turning Radius	8.352m

QUEENSWAY CARLETON HOSPITAL - INTERIM - PH4A

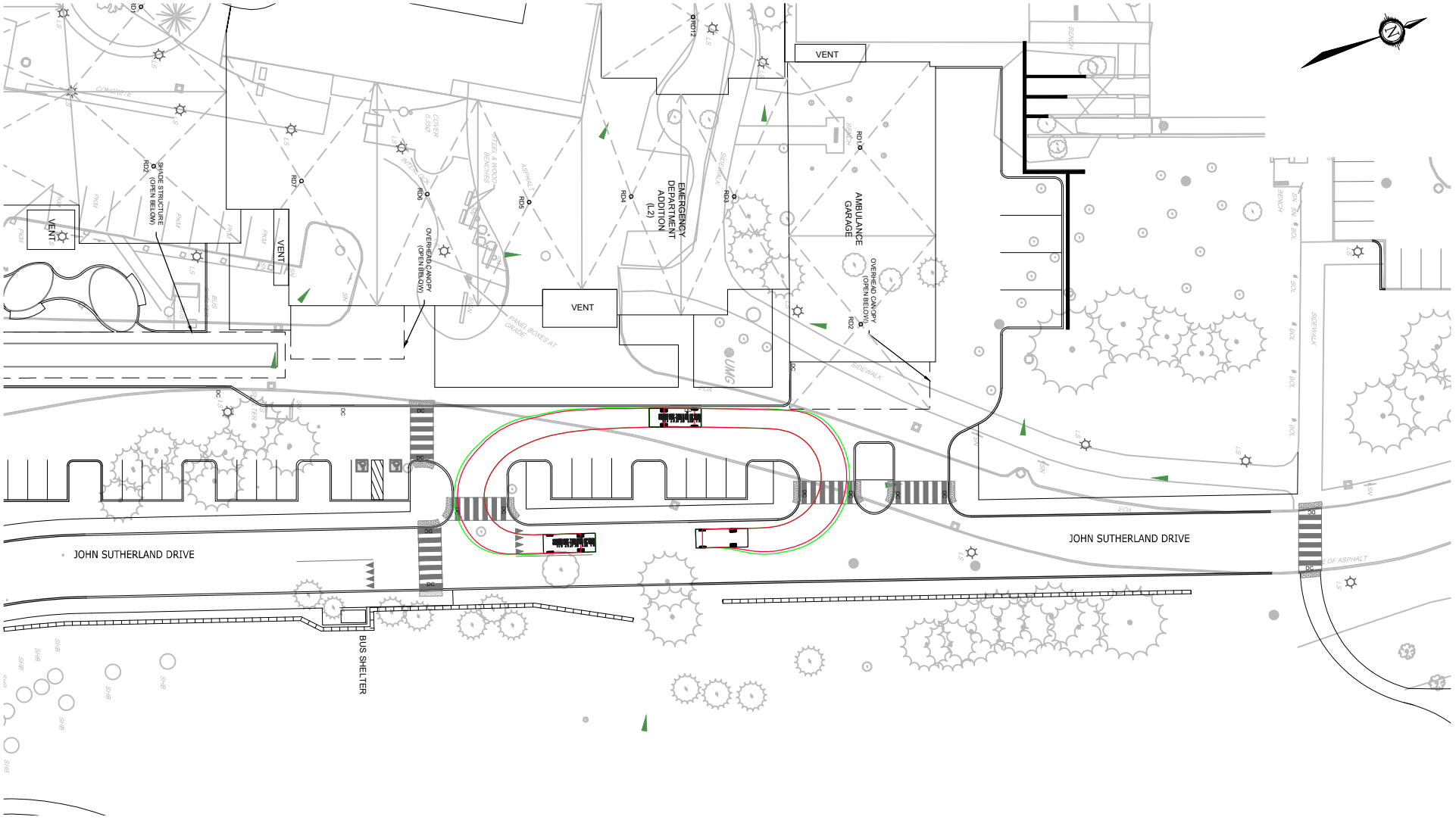
TURNING MOVEMENTS (AMBULANCE)

SCALE 1 : 750 (0 10 20 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 33

SHT8X11.DWG - 216mmx279mm

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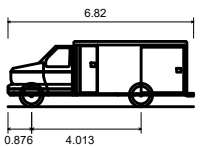


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QUEENSWAY CARLETON HOSPITAL - ULTIMATE

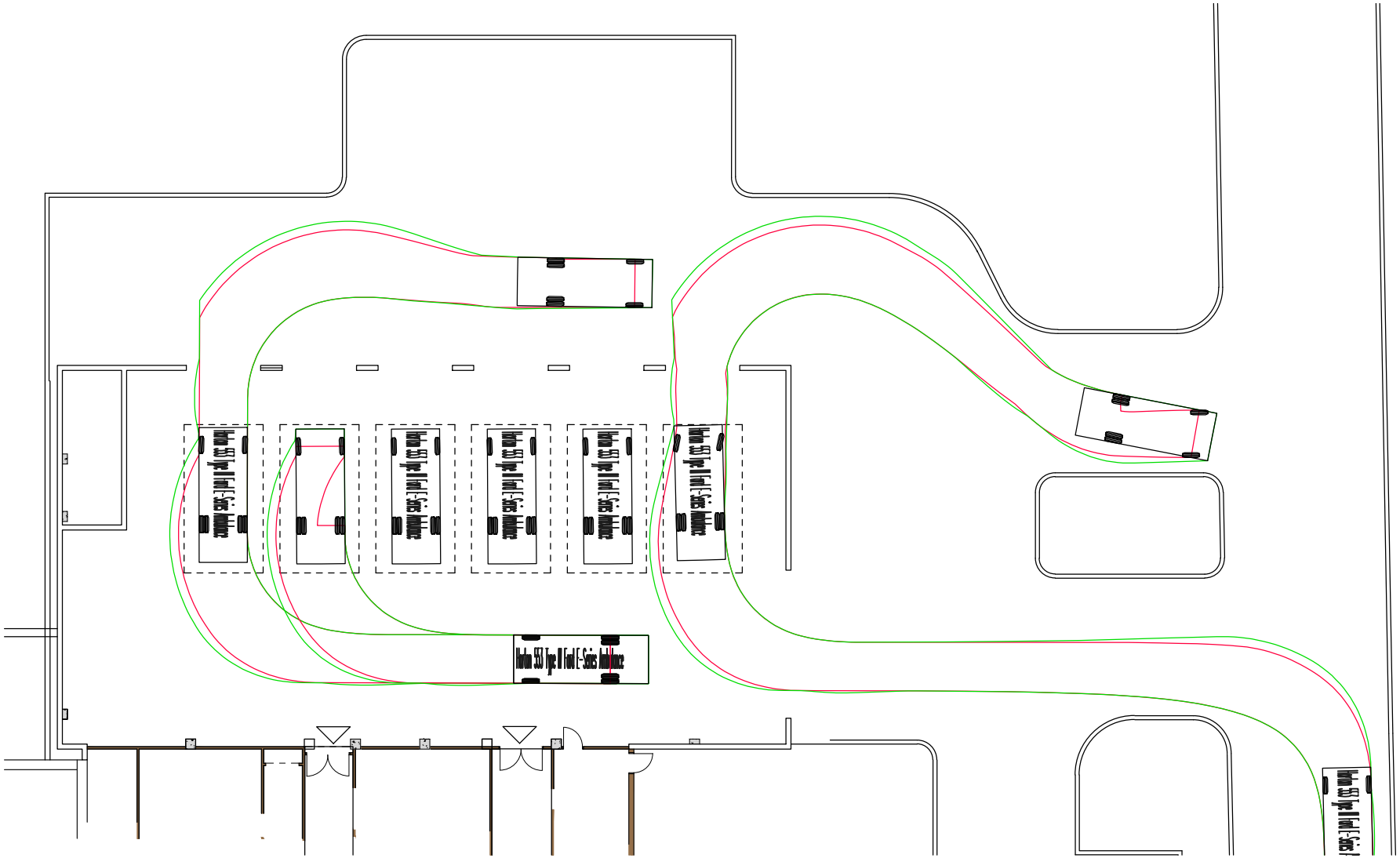
TURNING MOVEMENTS (AMBULANCE)

SCALE 1 : 750 (0 10 20 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 34

SHT8X11.DWG - 216mmx279mm

M:\2023\123089\CAD\Civil\Figures\Traffic\Sept 2026 Submission\123089-TM-Ultimate.dwg, FIG 34, Sep 02, 2026 - 3:47pm, cvisser

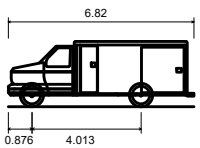


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QUEENSWAY CARLETON HOSPITAL - ULTIMATE

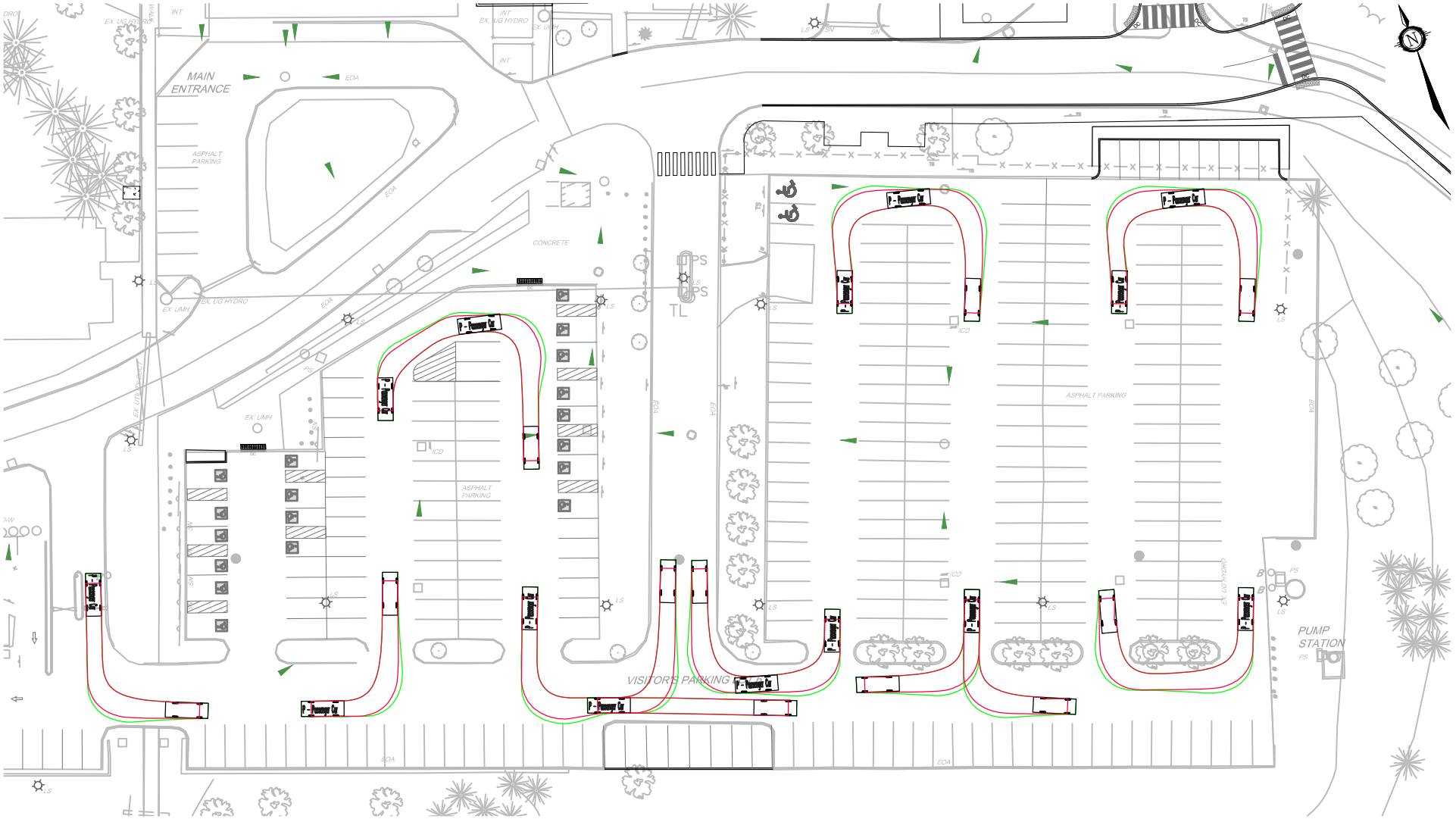
TURNING MOVEMENTS - AMBULANCE GARAGE

SCALE 1 : 300 (0, 3, 6, 9, 12)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 35

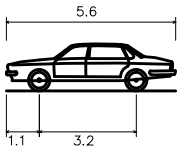
M:\2023\123089\CAD\CIVIL\FIGURES\TRAFFIC\SEPT 2026 SUBMISSION\123089-TM-AMBULANCEGARAGE.DWG 9/2/2026 4:02 PM - CVISSER

SHT8X11.DWG - 216mmx279mm



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P - Passenger Car

Overall Length	5.600m
Overall Width	2.000m
Overall Body Height	1.555m
Min Body Ground Clearance	0.340m
Track Width	2.000m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

QUEENSWAY CARLETON HOSPITAL - ULTIMATE

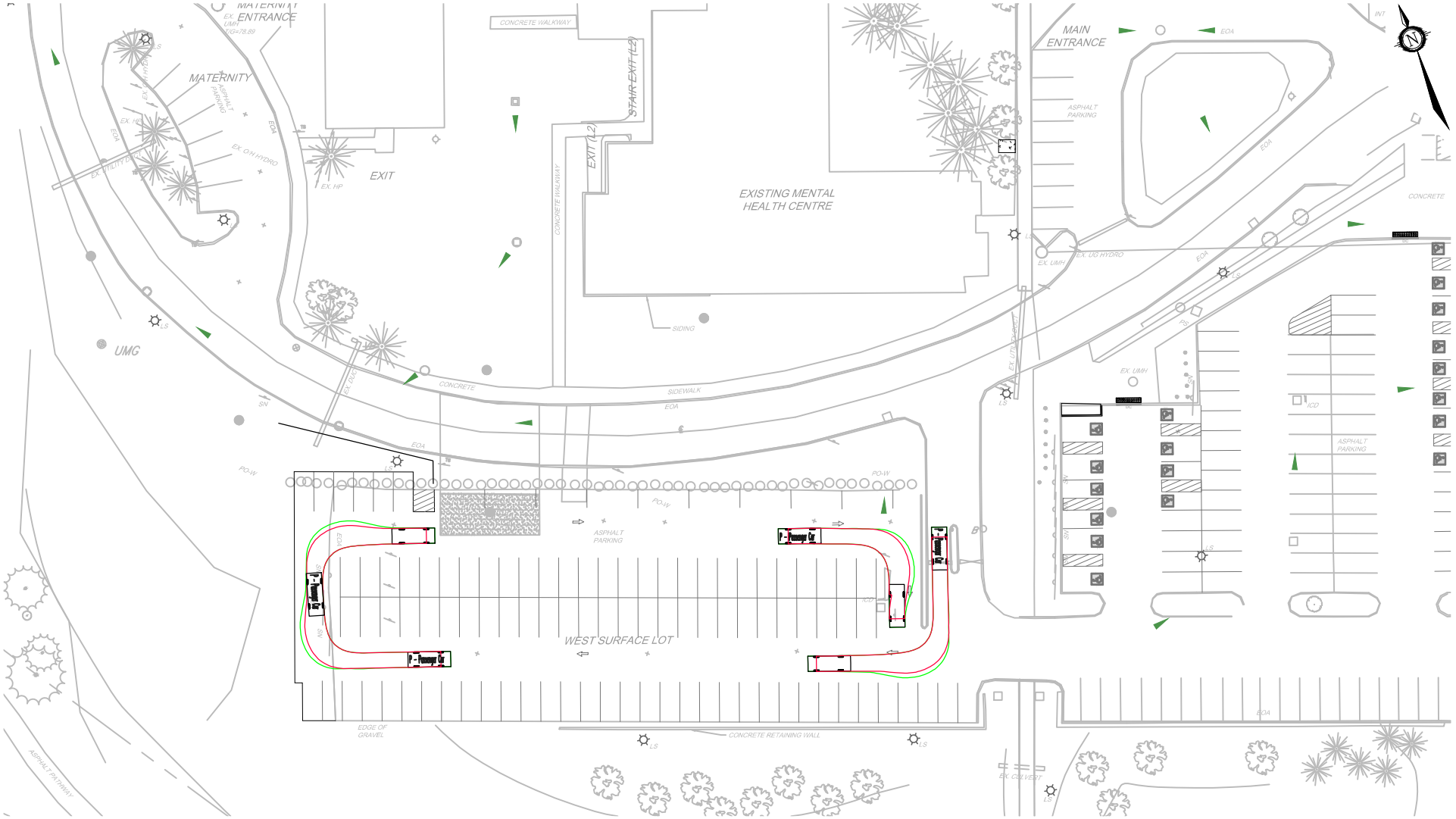
TURNING MOVEMENTS (P-CAR)

SCALE 1 : 750 (0, 10, 20, 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 36

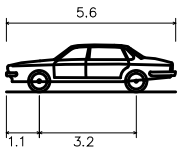
SHT8X11.DWG - 216mmx279mm

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Website www.novatech-eng.com



P - Passenger Car

Overall Length	5.600m
Overall Width	2.000m
Overall Body Height	1.555m
Min Body Ground Clearance	0.340m
Track Width	2.000m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

QUEENSWAY CARLETON HOSPITAL - ULTIMATE

TURNING MOVEMENTS (P-CAR)

SCALE 1 : 750 (0, 10, 20, 30)

DATE SEPT 2026 | JOB 123089 | FIGURE FIGURE 37

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4.2 Parking

4.2.1 Existing Parking Supply

The existing estimated parking supply for staff, visitors, and patients is approximately 1320 parking spaces. A summary of the existing parking supply is provided in **Table 18**.

Table 18: Existing Campus Parking Supply

Parking Lot	Users	Type of Facility	Number of Spaces
Existing Parking Garage	Staff	Parking Garage	582
James Beach Parking Lot	Staff	Surface Lot	47
West Layby	Staff/Visitor	Surface	4
Maternity	Staff/Visitor	Surface	7
Visitors Parking Lot	Visitors	Surface Lot	346
Main Entrance	Staff/Visitor	Surface	7
Short Term Parking	Staff/Visitor	Surface	17
Irving Greenberg Lot 2A	Staff	Surface Lot	82
Irving Greenberg Lot 2B	Staff	Surface Lot	38
Temporary Lot TL2	Staff	Surface Lot	163
Total Existing Number of Parking Spaces			**1283**

Derivation of Existing Parking Ratio

Currently QCH has a supply of approximately 1280 parking spaces including those for employees and visitors. Based on the existing aggregate auto modal share of 80% (estimated in section 2.4.1), it has been assumed that under existing conditions the employee trips auto modal share is 80%, planned patient visits auto modal share is 80%, and unplanned (emergency) patient visits auto modal share is 95%. Based on the information provided by the QCH, approximately 1945 staff and patients are expected to drive to the hospital over the course of a day. The ratio of existing parking supply to the anticipated visits is approximately 0.66 spaces per visitor. While this parking demand has been calculated based on the current parking supply, QCH staff have advised that there is a wait list for parking and the current parking demands are not met based on the current parking supply.

4.2.2 Part 4 Expansion Parking

The proposed parking supply for staff, visitors and patients for Part 4 expansion is 1760 parking spaces. A summary of the proposed parking supply is provided in **Table 19**.

Table 19: Part 4 Expansion Parking Supply

Parking Lot	Users	Type of Facility	Number of Spaces
New Parking Garage	Staff	Parking Garage	553
Existing Parking Garage	Staff	Parking Garage	582
West Layby	Staff/Visitor	Surface	4
Maternity	Staff/Visitor	Surface	7
Visitors Parking Lot	Visitors	Surface Lot	399
Main Entrance	Staff/Visitor	Surface	7
Short Term Parking	Staff/Visitor	Surface	18
Irving Greenberg Lot 2A	Staff	Surface Lot	82
Irving Greenberg Lot 2B	Staff	Surface Lot	51
Total Proposed Number of Parking Spaces			**1714**

Zoning By-Law 2008-250

The subject site is located in Area C of Schedule 1 and Schedule 1A of the City of Ottawa Zoning By-Law (ZBL) 2008-250. Section 101, 102, and 111 of the ZBL sets out the minimum required vehicle, visitor vehicle, and bicycle parking space rates respectively for various land uses. Section 112 of the Traffic and Parking By-law sets out the required rates of accessible parking spaces from the total number of parking spaces provided. The minimum number of required parking spaces as per the city's ZBL 2008-250 requirements are summarized in **Table 20**.

Table 20: Part 4 Expansion Minimum Required Parking Spaces per ZBL 2008-250

Land Use	Parking Space Rate	GFA (m^2)	Min. Spaces Required	Spaces Provided
Part 4 Expansion				
Minimum Vehicle Parking				
Hospital	Min. required by-law rate = 1.4 per 100 m^2 of GFA	72,731 m^2	1018 spaces	1714 spaces
Minimum Bicycle Parking				
Hospital	1 per 1000 m^2 of GFA	72,731 m^2	73	246
Minimum Accessible Parking				
Hospital	11 + 1% of total parking spaces	-	28	49

Based on the foregoing, the proposed vehicle and bicycle parking for the Part 4 expansion adhere to the requirements of the City's ZBL.

To understand the future parking demand for the Part 4 expansion, a review of planned employee and patient visits has been completed using data from QCH. Detailed parking calculations are included in **Appendix M**. Based on the data provided, it is estimated that approximately 2,835 staff and patients will drive to visit the hospital over the course of a day if the existing modal shares are maintained. Applying the existing parking ratio of 0.66 spaces per visitor to the proposed visitors results in a parking demand for approximately 1,870 parking spaces.

Assuming the proposed modal shares in section 2.4.1 are met, it is estimated that approximately 2,360 staff and patients will drive to visit the hospital over the course of a day. Applying the existing parking ratio of 0.66 spaces per visitor to the proposed visitors results in a parking demand for approximately 1,560 parking spaces.

However, as noted previously the existing parking supply falls short of the current parking demand for the site. While QCH has committed to providing Transportation Demand Management (TDM) measures within the development to help shift modal shares, the effectiveness of measures is not known, and measures may take time to alter employee and visitor travel behaviors. Additionally, there are no major transit improvements proposed by the city to assist in shifting modal shares. As such, the proposed parking supply will be roughly midway between the anticipated parking demand based on the existing and proposed modal shares.

Zoning By-Law 2026-50

The subject site is located in Area D of Schedule A1 and Greenbelt Area of Schedule A3 of the city's ZBL 2026-50. Minimum vehicular parking space requirements are not identified under the ZBL 2026-50. Section 613 of the ZBL identifies bicycle parking rates. The minimum number of required parking spaces as per the city's ZBL 2026-50 requirements are summarized in **Table 21**.

Table 21: Part 4 Expansion Minimum Required Parking Spaces per ZBL 2026-50

Land Use	Parking Space Rate	GFA (m^2)	Min. Spaces Required	Spaces Provided
Part 4 Expansion				
Minimum Vehicle Parking				
Hospital	N/A	72,731 m^2	N/A	1714 spaces
Minimum Bicycle Parking				
Hospital	ST = 10 spaces with an additional 1 space per 250 m^2 above 2,000 m^2, up to a maximum of 150 spaces LT: 1 space per 250 m^2, up to a maximum of 500 spaces	72,731 m^2	ST: 150 LT: 291	ST: 126 LT: 120

Note: ST = Short-term; LT = Long-term.

Based on the foregoing, the minimum required number of short-term and long-term bicycle parking spaces are not met. Relief from the ZBL 2026-50 requirements is requested.

4.3 Boundary Streets

A review of the study area boundary streets Baseline Road, and Richmond Road was conducted for existing conditions based on the city's complete street principles. The city's *2025 MMLOS Guidelines* were used to evaluate the levels of service for each alternative mode of transportation on the boundary streets.

PLOS along Baseline Road and Richmond Road have been evaluated based on the targets for Greenbelt transect, as listed in the Exhibit 2 of the *MMLOS Guidelines*. BLOS along Richmond Road has been evaluated based on the target for a crosstown bikeway, whereas Baseline Road has been evaluated based on the target for a local route (elsewhere/no crosstown bikeway). Detailed MMLOS analysis is included in **Appendix N**. A summary of the segment MMLOS analysis for Baseline Road and Richmond Road is provided in **Table 22**.

Table 22: Segment MMLOS Summary

Segment	PLOS		BLOS		TLOS		PRLOS
	Actual	Target	Actual	Target	Actual	Target[1]	Actual
Richmond Road	F (F)	D	D (E)	C	C	D	D
Baseline Road	B (C)		D (D)	D	C		B

1. TLOS target has been increased to TLOS D from TLOS E as frequent routes serve these segments.
2. Actual (Critical)

Richmond Road between John Sutherland Drive and Holly Acres Road/Nanaimo Drive

Richmond Road does not achieve the target PLOS and BLOS. It achieves the target TLOS. The stretch of Richmond Road between John Sutherland Drive and Baseline Road has a bridge that passes over HWY416 and limits the width of the roadway and hence has not been evaluated for PLOS.

To achieve the target PLOS D, a 2.0m wide sidewalk and an offset of 1.5-2.99m is required from the motor vehicle travel lane on both sides of the roadway.

To achieve the target BLOS C, implementation of cycle tracks is required on both sides of the roadway.

As Richmond Road is a rural arterial roadway, the above pedestrian and cycling improvements are identified for the city's consideration as part of future roadway projects.

Baseline Road between Cedarview Road and John Sutherland Drive/Valley Stream Drive
Baseline Road meets the target PLOS, BLOS, and TLOS.

4.4 Transportation Demand Management

4.4.1 Context for TDM

Comparison of Modal Shares
The existing modal shares of the QCH were estimated based on the data collected locally. This is described in detail in section 2.4.1. The existing modal shares are as follows:

- Auto Driver: 80%
- Auto Passenger: 10%
- Transit: 5%
- Cycling and Walking: 5%

Table 12 of the *TRANS Trip Generation Manual – Summary Report* lists out the employment generator mode share by district during the AM peak period. For Bayshore/Cedarview district, the modal shares are given as:

- Auto Driver: 77%
- Auto Passenger: 6%
- Walking: 4%
- Transit: 10%
- Cycling: 3%

As stated in section 2.4.1, as part of the expansion, a shift in modals shares towards non-auto modal share is being targeted. The target modal shares for the expansion are as follows:
Part 4 Expansion:

- Auto Driver: 65%
- Auto Passenger: 15%
- Transit: 10%
- Cycling and Walking: 10%

Development Operation
The QCH campus currently employs around 1337 full-time employees and observes an estimated 789 planned visits and 255 unplanned (emergency) visits daily. With the proposed QCH expansion, these numbers are anticipated to increase as follows:

- Part 4 Expansion:
  - Number of full-time employees: 2066 employees;
  - Number of daily planned visits: 1118 visits;
  - Number of daily unplanned visits: 303 visits;

4.4.2 Need and Opportunity

As stated in the above section, a shift in non-auto modal shares is being targeted as part of the expansion. To achieve the proposed target modal shares, a focus on the measures tailored to improve transit, walking and cycling are required.

The improved east-west transit connectivity with the recently implemented OC Transpo routes 68 and 88 are anticipated to promote transit usage and help achieve the target transit modal share. The active transportation infrastructure (MUP, crosstown bikeway etc.) are anticipated to promote the target active modal shares.

4.4.3 TDM Program

Discussions were held with QCH to understand the existing TDM program and develop a planned program to assist in shifting modal shares. While the City of Ottawa TDM measures checklist for non-residential developments was used as a basis for the TDM discussions, additional hospital specific measures were discussed. A copy of the city's TDM checklist summarizing the existing and planned TDM program is included in **Appendix L**. A comprehensive list, including hospital specific measures is summarized below.

TDM measures that are currently in place within the QCH hospital include:

- Provide opportunities for staff to work from home if they have the ability.
- Partnerships with rural hospitals, to allow doctors to travel to rural areas to provide health care services typically provided at QCH. This would reduce the number of patients visiting from rural areas outside the city.
- Provide safe, secure, convenient, and comfortable bike parking to encourage cycling.
- Provide a dynamic parking policy that prioritizes rural patients, carpoolers, pick up/drop off patients/employees.
- Charge for long-term parking (daily, weekly, monthly). To reduce the incentive to drive, increase daily parking rates for employees.
- Charge for short-term parking (hourly).
- Provide a multi-modal travel information package for new staff.
- Provide patients with information on specialized mobility incentives that are available to them (i.e., Para Transpo, Taxi Reimbursements, etc.).
- Provide clinics during evenings and weekends to shift trips outside the weekday peak periods.
- Explore opportunities for some employees to work outside peak periods.
- Provide online links to OC Transpo information.
- Provide on-site amenities/services to minimize mid-day errands.

In addition to the above measures that are currently in place, the following TDM measures will be implemented within the QCH hospital:

- Provide virtual care to reduce the number of patients who need to come to the QCH campus.
- Provide full- or part-time staff who will be dedicated to collecting data, managing incentives, and evaluating impacts of TDM measures. This staff will liaise with various leadership groups to develop a TDM strategy.
- Develop a TDM platform to track multimodal commute data, provide rewards and incentives, and serving as a resource/communications hub. This is overseen by the Transportation Coordinator.
- Build a high quality, secure, indoor bike parking facility that meets the needs of cyclists and sets a cycling culture/foundation for employees.
- Purchase or lease a fleet of bikes and e-bikes that can be rented out to employees at minimal cost.
- Provide real-time transit display screens near main building entrances.
- Incentivize employees to use sustainable modes by introducing cycling challenges, etc.

The proposed TDM program will assist in achieving a higher auto passenger, transit, and cycling modal share for the hospital. The implementation of a TDM coordinator will allow the hospital to track TDM programs for effectiveness and develop an improved program over time.

4.5 Neighborhood Traffic Calming

This element is exempt from the analysis as the minimum criteria for neighbourhood traffic calming is not met.

4.6 Transit

4.6.1 Transit Capacity

Based on the trip generation estimates in section 2.4.1, the proposed development is anticipated to generate the following number of additional transit trips:

- Part 4 Expansion: 75 IN and 36 OUT in the AM peak, and 26 IN and 69 OUT in the PM peak.

All site-generated transit trips are anticipated to arrive or depart the study area via OC Transpo Routes 57, 68, and 88. All trips will utilize the stops on John Sutherland Drive (stops #0950, #0727, #0947, and #0728). The transit trip distribution is anticipated to follow the travel pattern based on the *2011 TRANS OD-Survey* for Bayshore/Cedarview district determined as:

- 35% will travel to/from the east via Route 57.
- 10% will travel to/from the west via Route 57.
- 10% will travel to/from the east via Route 68.
- 10% will travel to/from the west via Route 68.
- 35% will travel to/from the east via Route 88.

Peak period transit utilization data dated April 1, 2025, was obtained from OC Transpo and is included in **Appendix C**. This peak period data was converted to peak hour data in section 2.1.5. The data obtained reflects the routes and the stops they had served prior to the recent implementation (April 27, 2025) of OC Transpo initiative “New Ways to Bus”. The changes are as follows:

- Route 57: Remains unchanged.
- Route 58: Has changed to run between Crystal Bay and Bayshore Station and is not serving QCH anymore.
- Route 68: This is a new route implemented to run between Terry Fox and Baseline Stations. Runs on John Sutherland Drive to directly serve QCH campus.
- Route 88: Changed to run between Bayshore and Hurdman Stations. Service west of QCH has been removed and replaced with route 68. Has been changed to run from QCH on John Sutherland Drive, Richmond Road, and Holly Acres Road. Previously, it had served stops #0946 and #0941 at Baseline Road/John Sutherland Drive, which are interpreted as QCH related stops.

As transit data for the new routes is not available, the specific bus loads departing QCH have not been reviewed. However, based on the anticipated transit distribution, the additional transit usage is summarized in **Table 23**.

Table 23: Part 4 Expansion Addition Transit Usage

Route	Direction	AM Peak		PM Peak	
		IN	OUT	IN	OUT
57	EB	8	13	3	24
	WB	26	4	9	7
68	EB	8	4	3	7
	WB	8	4	3	7
88	EB	0	13	0	24
	WB	26	0	9	0

4.6.2 Transit Priority

Within the study area, the delays that the transit buses experience will be that of what the auto drivers will experience since all buses are in mixed traffic lanes.

The delays prior to Part 4 expansion along the transit movements within the study are summarized in **Table 24** based on the control delays obtained from Synchro Analysis. The target TLOS within the study area as mentioned in section 4.8.1 is TLOS D based on the 2017 MMLOS guidelines.

Table 24: Transit Delays – 2030 Background Traffic Conditions

Intersection	Transit Mvmt	AM Peak Hour		PM Peak Hour	
		Delay (sec.)	LOS	Delay (sec.)	LOS
Richmond Road/Holly Acres Road/Nanaimo Drive	EBL	**46**	**F**	**53**	**F**
	EBR	8	B	10	B
	NBL	19	C	35	E
	SBR	0	B	0	B
Richmond Road/John Sutherland Drive	WBL	28	D	**66**	**F**
	WBR	28	D	**66**	**F**
	NBR	0	B	1	B
	SBL	16	C	11	C
Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp	WBL	**44**	**F**	**54**	**F**
	NBT	18	C	21	D
	NBR	4	B	4	B
	SBT	7	B	11	C
Baseline Road/Cedarview Road	EBT	21	D	11	C
	WBT	10	B	5	B
Baseline Road/John Sutherland Drive/Valley Stream Drive	EBL	10	B	10	B
	WBR	7	B	0	B
	SBL	24	D	40	E
	SBR	24	D	40	E
Baseline Road/Sandcastle Drive	EBT	2	B	5	B
	WBT	6	B	7	B

Based on the foregoing, the eastbound left turn movement at the Richmond Road/Holly Acres Road/Nanaimo Drive intersection and the westbound left turn movement at the Baseline Road/Richmond Road/Robertson Road intersection are not anticipated to meet the target TLOS D during the AM and PM peak hours. As identified in section 2.2.1, the City's recently approved 2025 TMP CIP includes the Robertson Road and Richmond Road Transit Priority project.

Consideration should be given by the city to implementing left turn queue jump lanes at the aforementioned intersections as part of this project.

The westbound left and right turn movements at the Richmond Road/John Sutherland Drive intersection are not anticipated to meet the target TLOS D during the PM peak hour. To provide additional capacity and improved transit operations, consideration should be given to widening the John Sutherland Drive approach to this intersection to provide two outbound lanes. A further review of intersection operations will be provided in the following sections.

4.7 Network Concept

This module is exempt as no changes to the Transportation Master Plan concepts for auto or transit networks are required to accommodate the development-generated travel demands.

4.8 Intersection Design

4.8.1 Existing Intersection MMLOS Review

A review of the signalized study area intersections was conducted for existing conditions based on the City's complete street principles. The *2025 MMLOS Guidelines* were used to evaluate the levels of service for each alternative mode of transportation at the intersections.

MMLOS targets have been selected based on the transects in which the intersections are located. The study area intersections are distributed between the greenbelt transect (Schedule B4 of the *OP*) and outer urban/suburban transect (Schedule B3 of the *OP*). Exhibit 2 of the *MMLOS Guidelines* lists out the MMLOS targets. Detailed MMLOS analysis is included in **Appendix N**. A summary of the intersection MMLOS results for Baseline Road and Richmond Road is provided in **Table 25**.

Table 25: Intersection MMLOS Summary

Intersection	PLOS		BLOS		TLOS		AutoLOS	
	Actual	Target	Actual	Target	Actual	Target[1]	Actual	Target
Richmond Road/Holly Acres Road/Nanaimo Drive	C (C)	C	E (E)	B	C (C)	D	B (C)	E
Richmond Road/John Sutherland Drive	B (C)	D	D (E)	C	B (C)		A (A)	D
Richmond Road/Robertson Road/Baseline Road/HWY419 ON-Ramp	D (D)	D	D (D)	C	B (C)		A (B)	
Baseline Road/Cedarview Road	C (C)	D	C (C)	D	B (A)		A (A)	
Baseline Road/John Sutherland Drive/Valley Stream Drive	C (C)	D	E (E)	D	B (B)		A (A)	
Baseline Road/Sandcastle Drive	B (B)	B	C (C)	C	A (A)		A (A)	E

1. TLOS target has been increased to TLOS D from TLOS E as frequent routes serve these intersections.
Note: AM Peak (PM Peak)

Richmond Road/Holly Acres Road/Nanaimo Drive
This intersection does not meet the target BLOS.

None of the approaches meet the target BLOS B. A protected intersection design (protected corners/crossrides) would be required for all approaches to meet the target BLOS.

The intersection as a whole achieves a TLOS C meeting the target TLOS D. All the transit movements meet the target TLOS D except for the eastbound left movement which achieves a TLOS E during the PM peak hour. As identified in section 4.6.2, consideration should be given by the city to implementing an eastbound right left turn queue jump lane at this intersection as part of the Robertson Road and Richmond Road Transit Priority project.

Richmond Road/John Sutherland Drive
This intersection does not meet the target BLOS.

None of the intersection legs except for the west leg meet the target BLOS C. A protected intersection design (protected corners/crossrides) would be required for all approaches to meet the target BLOS.

The intersection as a whole achieves a TLOS C meeting the target TLOS D. All the transit movements meet the target TLOS D except for the westbound movement which achieves a TLOS E during the PM peak hour. As identified in section 4.6.2, to provide additional capacity and improved transit operations, consideration should be given to widening the John Sutherland Drive approach to this intersection to provide two outbound lanes. A further review of intersection operations is provided in the following sections of this report.

Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp
This intersection does not meet the target BLOS.

None of the approaches meet the target BLOS C. A protected intersection design (protected corners/crossrides) would be required for all approaches to meet the target BLOS.

The intersection as a whole achieves a TLOS C meeting the target TLOS D. All the transit movements meet the target TLOS D except for the westbound movement which achieves a TLOS E during the PM peak hour. As identified in section 4.6.2, consideration should be given by the city to implementing a westbound left turn queue jump lane at this intersection as part of the Robertson Road and Richmond Road Transit Priority project.

Baseline Road/Cedarview Road
This intersection meets all the MMLOS targets.

Baseline Road/John Sutherland Drive/Valley Stream Drive
This intersection does not meet the target BLOS.

None of the approaches meet the target BLOS D. A protected intersection design (protected corners/crossrides) would be required for all approaches to meet the target BLOS.

Baseline Road/Sandcastle Drive
This intersection meets all the MMLOS targets.

4.8.2 2030 Total Intersection Operations

Intersection capacity analysis has been conducted for the 2030 total traffic conditions. The results of the analysis are summarised in **Table 26** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix O**.

Table 26: 2030 Total Intersection Operations

Intersection	AM Peak			PM Peak		
	Max V/C or Delay	LOS	Mvmt	Max V/C or Delay	LOS	Mvmt
Richmond Road/Holly Acres Road/Nanaimo Drive	0.73	C	EBL	0.83	D	NBL
Richmond Road/John Sutherland Drive	0.82	D	SBL	**1.11**	**F**	**WBT**
Richmond Road/Robertson Road/Baseline Road/HWY416 On-Ramp	0.65	B	WBL	0.84	D	WBL
Baseline Road/Cedarview Road	0.53	A	EBT	0.67	B	NBL
Baseline Road/Valley Stream Drive/John Sutherland Drive	0.58	A	SB	0.77	C	SB
Baseline Road/Sandcastle Drive	0.54	A	EBT	0.34	A	EBT
John Sutherland Drive/West Ring Road (South)	11 sec.	B	EB	12 sec.	B	EB
John Sutherland Drive/QCH Irving Greenberg Cancer Center	11 sec.	B	NB	11 sec.	B	NB
John Sutherland Drive/West Ring Road (North)	17 sec.	C	NB	18 sec.	C	NB
John Sutherland Drive/QCH Lot TL2	9 sec.	A	SBR	9 sec.	A	SBR

The following summarizes the results from **Table 26** based on the synchro analysis, for the total 2030 traffic conditions:

Richmond Road/Holly Acres Road/Nanaimo Drive
Operations at this intersection are generally consistent with the 2030 background traffic conditions. All movements operate with a LOS C or better during the AM peak and a LOS D or better during the PM peak.

During the AM and PM peaks, the 95th percentile queue length of the westbound through/left movement is approximately 25m and 45m respectively exceeding the available storage of 20m. The 95th percentile queue length of the northbound left movement is approximately 35m and 60m respectively exceeding the available storage length of 25m.

Richmond Road/John Sutherland Drive
This intersection is anticipated to operate with a LOS D during the AM peak hour. However, the 95th percentile southbound left turn queues are anticipated to increase from approximately 55m to 95m, exceeding the existing storage of 45m.

The westbound approach is anticipated to operate with a LOS F during the PM peak hour.

To improve operations at this intersection, consideration has been given to a permitted and protected southbound left turn phase and widening of the westbound approach to two outbound lanes. Mitigated intersection operations are presented in **Table 27**.

Table 27: Mitigated Intersection Operations at Richmond Road & John Sutherland Drive

Turn Type	Mvmt	2030 Total AM Peak		2030 Total PM Peak	
		v/c	LOS	v/c	LOS
Permitted	WBL	0.48	A	0.74	C
Permitted	WBT/R	0.21	A	0.53	A
Protected + Permitted	SBL	0.59	A	0.23	A

The aforementioned mitigation measures are anticipated to yield a LOS A during the AM peak hour and a LOS C during the PM peak hour. The 95th percentile southbound left turn queues are anticipated to reduce to approximately 30m during the AM peak hour and will be accommodated within the existing storage length.

Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp
Operations at this intersection are generally consistent with the 2030 background traffic conditions. All movements operate with a LOS B or better during the AM peak and a LOS D or better during the PM peak hour.

Baseline Road/Cedarview Road
Operations at this intersection are generally consistent with the 2030 background traffic conditions. All movements operate with a LOS A during the AM peak and a LOS B or better during the PM peak hour. The 95th percentile queue length for the northbound left turn movement is approximately 40m and 45m under the AM and PM peaks respectively, exceeding the available storage of 25m potentially blocking the adjacent northbound right turn lane.

Baseline Road/John Sutherland Drive/Valley Stream Drive
Operations at this intersection are generally consistent with the 2030 background traffic conditions. All movements operate with a LOS A during the AM peak and a LOS C or better during the PM peak hour.

Baseline Road/Sandcastle Drive
Operations at this intersection are generally consistent with the 2030 background traffic conditions. All movements operate with a LOS A during the AM and PM peaks.

All QCH accesses on John Sutherland Drive
All accesses operate with a LOS C or better during the AM and PM peak hours.

4.8.3 2035 Total Intersection Operations

Intersection capacity analysis has been conducted for the 2035 total traffic conditions. The results of the analysis are summarised in **Table 28** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix O**.

Table 28: 2035 Total Intersection Operations

Intersection	AM Peak			PM Peak		
	Max V/C or Delay	LOS	Mvmt	Max V/C or Delay	LOS	Mvmt
Richmond Road/Holly Acres Road/Nanaimo Drive	0.74	C	EBL	0.87	D	NBL
Richmond Road/John Sutherland Drive	0.84	D	SBL	**1.11**	**F**	**WBT**

Intersection	AM Peak			PM Peak		
	Max V/C or Delay	LOS	Mvmt	Max V/C or Delay	LOS	Mvmt
Richmond Road/Robertson Road/Baseline Road/HWY416 On-Ramp	0.65	B	WBL	0.85	D	WBL
Baseline Road/Cedarview Road	0.55	A	EBT	0.69	B	NBL
Baseline Road/Valley Stream Drive/John Sutherland Drive	0.58	A	SB	0.77	C	SB
Baseline Road/Sandcastle Drive	0.55	A	EBT	0.49	A	WBT
John Sutherland Drive/West Ring Road (South)	11 sec.	B	EB	12 sec.	B	EB
John Sutherland Drive/QCH Irving Greenberg Cancer Center	11 sec.	B	NB	11 sec.	B	NB
John Sutherland Drive/West Ring Road (North)	17 sec.	C	NB	18 sec.	C	NB
John Sutherland Drive/QCH Lot TL2	9 sec.	A	SBR	9 sec.	A	SBR

Based on the foregoing, the intersection operations within the study area are anticipated to be generally consistent with the 2030 total traffic conditions.

As identified above, a permitted and protected southbound left turn phase and widening of the westbound approach to two outbound lanes is anticipated to improve operations at the Richmond Road/John Sutherland Drive intersection. Mitigated intersection operations are presented in **Table 29**.

Table 29: Mitigated Intersection Operations at Richmond Road & John Sutherland Drive

Turn Type	Mvmt	2035 Total AM Peak		2035 Total PM Peak	
		v/c	LOS	v/c	LOS
Permitted	WBL	0.48	A	0.74	C
Permitted	WBT/R	0.22	A	0.53	A
Protected + Permitted	SBL	0.60	A	0.24	A

Based on the foregoing, mitigation measures are recommended for implementation as part of Part 4 expansion. A function design of the proposed roadway modifications is included in **Appendix P**.

4.8.4 Total 2035 Operations with Mainstreet Protected Left Turns at Richmond Road/John Sutherland Drive and Baseline Road/John Sutherland Drive

Per the request of the city, a scenario where fully protected left-turn movements are provided at northbound and southbound movements on Richmond Road at John Sutherland Drive and eastbound and westbound movements on Baseline Road at John Sutherland Drive intersections have been analysed. For the purposes of this assessment, it is assumed that the recommended two outbound lanes on John Sutherland Drive have been implemented. The results from the analysis are summarized in **Table 30**. Synchro Analysis Reports are included in **Appendix Q**.

Table 30: Analysis Results for Protected Mainstreet Left Turns at QCH intersections

Intersection	TOTAL 2035 AM Peak			TOTAL 2035 PM Peak		
	Max v/c	LOS	Mvmt	Max v/c	LOS	Mvmt
Richmond Road/John Sutherland Drive	0.72	C	SBL	0.58	A	SBL
Baseline Road/Valley Stream Drive/John Sutherland Drive	0.62	B	EBL	0.77	C	SBT

The following summarizes the results from **Table 30** based on the synchro analysis:

Richmond Road/John Sutherland Drive
All movements are anticipated to operate with LOS C or better during the AM and PM peaks.

During the AM peak, the 95th percentile queue length for the southbound left movement is anticipated to increase to approximately 70m from 30m, exceeding the available storage length of approximately 45m. The LOS is anticipated to decrease to LOS C from LOS A.

Based on the collision records presented in section 2.1.8, three turning movement collisions involving southbound left turning vehicles occurred over a five-year period. The previously proposed protected and permitted phasing will provide additional capacity for this movement and may reduce the number of southbound left turn collisions at this intersection going forward. As such, it is recommended that the city monitor this intersection following the QCH development to confirm if a fully protected phase is warranted based on the future collision patterns.

Baseline Road/John Sutherland Drive/Valley Stream Drive
All movements are anticipated to operate with LOS B or better during the AM peak and LOS C or better during the PM peak.

During the AM peak, the 95th percentile queue length for the eastbound left movement is anticipated to increase to approximately 55m from 30m, exceeding the available storage length of approximately 35m. The LOS is anticipated to decrease to LOS B from LOS A.

Based on the collision records presented in section 2.1.8, six turning movement collisions involving eastbound left turning vehicles occurred over a five-year period. Should fully protected eastbound and westbound left turn phases be desired by the city to address an existing or future collision pattern, an additional 20m of storage is recommended for the eastbound left turn lane. There is sufficient space within the existing grass median to extend the eastbound left turn lane to accommodate the protected phasing. This is identified for the City's consideration.

It is noted that post the first submission of this TIA, the city has implemented protected phases for the eastbound left turn and westbound left turn movements. Subsequently, a memorandum was submitted to the city containing the intersection analysis using the city's new signal timing plan. Based on the analysis within the memorandum, a 60 m storage lane is required for the eastbound left turn movement. The extension to the existing 35 m storage length will be completed as part of the proposed development. A functional design of the proposed modifications to Baseline Road is included in **Appendix P**.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations of this TIA can be summarized as follows:

Trip Generation

- Based on the target modals shares, it is anticipated that the Part 4 expansion will generate 588 net new person trips (227 vehicle trips) during the AM peak and 506 net new person trips (195 vehicle trips) during the PM peak.

Existing Traffic Operations

- All study area intersections operate within acceptable Level of Service (LOS) during the AM and PM peaks.

- At Richmond Road/Holly Acres Road/Nanaimo Drive intersection, during the AM and PM peaks, the 95th percentile queue length of the westbound through/left turn movement exceeds the available storage length of 20m. The 95th percentile queue length of the northbound left turn movement exceeds the available storage length of 25m.
- At Richmond Road/John Sutherland Drive intersection, the 95th percentile queue length for the southbound left turn movement exceeds the available storage length of 45m during the AM peak hour.

- At Baseline Road/Cedarview Road, the 95th percentile queue length for the northbound left turn movement exceeds the available storage of 25m potentially blocking the adjacent northbound right turn lane during the AM and PM peak hours.

Background Traffic Operations

- Under the 2030 and 2035 background traffic operations, the intersection operations within the study area are anticipated to be generally consistent with the existing conditions.

Development Design

- Under the existing campus conditions, a sidewalk network is provided along the periphery of the campus buildings. As part of Part 4 expansion, pedestrian facilities near the main entrance at the south end of the building will remain unchanged.

- The existing pathways north/west of the existing parking garage will be reconfigured to accommodate the new parking garage and west ring road. The pathway on the west side of the new west ring will continue to function as part of the City's Crosstown Bikeway network. Two new uncontrolled pedestrian crossings are proposed on the west ring road to provide connectivity to the western pathway networks.

- John Sutherland Drive east of the hospital will be realigned further east to allow for the hospital expansion. As part of this, sidewalks will be provided on both sides of the road from the West Ring Road to the Emergency Department, where the sidewalk on the west side of the road continues to the Irving Greenberg Cancer Centre.

- A new off-road pedestrian pathway is proposed on the east side of John Sutherland Drive along its entire stretch. Three accesses to this pathway are proposed: one each at the extremes of John Sutherland Drive, and one to the east of Irving Greenberg Cancer Center.

- Three new uncontrolled pedestrian crossings are proposed along John Sutherland Drive to provide connectivity to the bus stops, pathways, and parking north/east of the road. It is recommended that all new uncontrolled pedestrian crossings be designed in accordance with Ontario Traffic Manual (OTM) Book 15 requirements for a PXO Type D.

- Minor modifications to the south parking lots are proposed to increase the parking supply.

- Transit will be maintained on John Sutherland Drive as part of this development. The existing bus stops and shelters near the Irving Greenberg Cancer Centre (Stops #0727 and #0728) will be maintained as part of the site plan. The existing bus stops and shelters near the emergency center (#0947 and #0950) will be relocated to the realigned roadway. The southbound bus stop (#0949) will be relocated to the intersection of John Sutherland Drive/West Ring Road.

- A total of 246 bicycle parking spaces (including the existing 44 spaces) will be provided on-site. 114 spaces will be provided within the new parking garage, 54 will be provided within the existing parking garage, 8 spaces will be provided in the landscaped area in between the propane tank loop, 10 spaces will be provided at the entrance of Irving Greenberg Cancer Center, 24 spaces will be provided within the visitors parking lot, 10 spaces will be provided at the main entrance, 16 spaces will be provided at the emergency entrance, and 10 spaces will be provided at the west entrance.

- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

Circulation and Access

- All hospital related material delivery/pickup, and garbage collection activities will take place from the material management facility's loading/unloading docks located beside Irving Greenberg Cancer Center.

- Propane gas delivery will occur within the propane tank loop.

- Diesel delivery will take place at the diesel storage tanks located between the two parking garages

- John Sutherland Drive between Richmond Road and Main QCH Access/John Sutherland Drive intersection is designated as a fire route. Whole of QCH west ring road, loading bay area, and ambulance/police bay in front of the emergency department are also designated as fire routes. All three of these fire routes meet the minimum clear width requirement of 6.0m for a fire route.

- Ambulance garage is located beside the emergency department off John Sutherland Drive. In front of the emergency department, an ambulance bay and parking for ambulance/police is also provided.

Parking

- The ratio of existing parking supply to the anticipated visits is approximately 0.66 spaces per visitor. While this parking demand has been calculated based on the current parking supply, QCH staff have advised that there is a waitlist for parking, and the current demands are not met based on the current parking supply.

- Based on the proposed site plan, Part 4 expansion will have a supply of 1714 parking spaces.

- While QCH has committed to providing TDM measures within the development to help shift modal shares, the effectiveness of measures is not known, and measures may take time to alter employee and visitor travel behaviors. Additionally, there are no major transit improvements proposed by the city to assist in shifting modal shares. As such, the proposed parking supply will meet the maximum parking demand while the modal shares from the development shift over time. As such, the proposed parking supply will be roughly midway between the anticipated parking demand based on the existing and proposed modal shares.

- The proposed number of vehicle, bicycle, and accessible parking spaces adhere to the minimum requirements of the Zoning By-law (ZBL) 2008-250.

- The proposed bicycle parking spaces fall short of the minimum required spaces per ZBL 2026-50. Relief from the ZBL 2026-50 requirements is requested.

Boundary Streets

- The results of the segment MMLOS can be summarised as follows:
    - Richmond Road does not meet the target PLOS D, but Baseline Road meets the target PLOS D;
    - Richmond Road does not meet the target BLOC C, but Baseline Road meets the target BLOS D;
    - Both the boundary streets meet the target TLOS D;

- Richmond Road can achieve the target PLOS D by providing a 2.0m wide sidewalk with a 1.5-2.99m of offset from the motor vehicle travel lane on both sides of the roadway.

- Richmond Road can only achieve the target BLOS C through the implementation of cycle tracks.

Transportation Demand Management

- TDM measures that are currently in place within the QCH hospital include:
    - Provide opportunities for staff to work from home if they have the ability.
    - Partnerships with rural hospitals, to allow doctors to travel to rural areas to provide health care services typically provided at QCH. This would reduce the number of patients visiting from rural areas outside the city.
    - Provide safe, secure, convenient, and comfortable bike parking to encourage cycling.
    - Provide a dynamic parking policy that prioritizes rural patients, carpoolers, pick up/drop off patients/employees.
    - Charge for long-term parking (daily, weekly, monthly). To reduce the incentive to drive, increase daily parking rates for employees.
    - Charge for short-term parking (hourly).
    - Provide a multi-modal travel information package for new staff.
    - Provide patients with information on specialized mobility incentives that are available to them (i.e., Para Transpo, Taxi Reimbursements, etc.)
    - Provide clinics during evenings and weekends to shift trips outside the weekday peak periods.

  - Explore opportunities for some employees to work outside peak periods.
  - Provide online links to OC Transpo information.
  - Provide on-site amenities/services to minimize mid-day errands.

- In addition to the above measures that are currently in place, the following TDM measures will be implemented within the QCH hospital:
  - Provide virtual care to reduce the number of patients who need to come to the QCH campus.
  - Provide full- or part-time staff who will be dedicated to collecting data, managing incentives, and evaluating impacts of TDM measures. This staff will liaise with various leadership groups to develop a TDM strategy.
  - Develop a TDM platform to track multimodal commute data, provide rewards and incentives, and serving as a resource/communications hub. This is overseen by the Transportation Coordinator.
  - Build a high quality, secure, indoor bike parking facility that meets the needs of cyclists and sets a cycling culture/foundation for employees.
  - Purchase or lease a fleet of bikes and e-bikes that can be rented out to employees at minimal cost.
  - Provide real-time transit display screens near main building entrances.
  - Incentivize employees to use sustainable modes by introducing cycling challenges, etc.

- The proposed TDM program will assist in achieving a higher auto passenger, transit, and cycling modal share for the hospital. The implementation of a TDM coordinator will allow the hospital to track TDM programs for effectiveness and develop an improved program over time.

Transit

- The proposed Part 4 expansion is anticipated to generate the following number of additional transit trips: 75 IN and 36 OUT in the AM peak, and 26 IN and 69 OUT in the PM peak.

- Peak period transit utilization data dated April 1, 2025, was obtained from OC Transpo. The data obtained reflects the routes and the stops they had served prior to the recent implementation (April 27, 2025) of OC Transpo initiative “New Ways to Bus”. As transit data for the new routes is not available, the specific bus loads departing QCH have not been reviewed. However, based on the anticipated transit distribution, the additional transit usage has been calculated.

Transit Priority

- The eastbound left turn movement at the Richmond Road/Holly Acres Road/Nanaimo Drive intersection and the westbound left turn movement at the Baseline Road/Richmond Road/Robertson Road intersection are not anticipated to meet the target TLOS D during the AM and PM peak hours. The City's recently approved 2025 TMP CIP includes the Robertson Road and Richmond Road Transit Priority project. Consideration should be given by the city to implementing left turn queue jump lanes at the aforementioned intersections as part of this project.

- The westbound left and right turn movements at the Richmond Road/John Sutherland Drive intersection are not anticipated to meet the target TLOS D during the PM peak hour. To provide additional capacity and improved transit operations, widening the John Sutherland Drive approach to this intersection to provide two outbound lanes is proposed.

Intersection MMLOS

- The results of the intersection MMLOS analysis can be summarized as follows:
    - All the study area intersections generally meet the target PLOS;
    - No study area intersections meet the target BLOS except for the Baseline Road/Cedarview Road intersection and Baseline Road/Sandcastle Drive intersection;
    - All the study area intersections generally meet the target TLOS;

- At all the study area intersections except for the Baseline Road/Sandcastle Drive intersection, the target BLOS can be achieved by implementation protected intersection features. At the Baseline Road/Sandcastle Drive intersection, a bike lane is sufficient on the south leg to achieve the target BLOS C.

- To improve TLOS at Richmond Road/Holly Acres Road/Nanaimo Drive, consideration should be given by the city to implement an eastbound left turn queue jump lane as part of the Robertson Road and Richmond Road Transit Priority Project.

- To improve TLOS at Richmond Road/John Sutherland Drive, consideration has been given to widen the John Sutherland Drive approach to provide two outbound lanes.

- To improve TLOS at Richmond Road/Robertson Road/Baseline Road/HWY416 ON-Ramp, consideration should be given by the city to implement a westbound left turn queue jump lane as part of the Robertson Road and Richmond Road Transit Priority Project.

Total Traffic Operations

- All study area intersections except for the Richmond Road/John Sutherland intersection operate within acceptable LOS during the AM and PM peaks.

- At Richmond Road/Holly Acres Road/Nanaimo Drive intersection, during the AM and PM peaks, the 95th percentile queue length of the westbound through/left turn movement exceeds the available storage length of 20m. The 95th percentile queue length of the northbound left turn movement exceeds the available storage length of 25m.

- At Richmond Road/John Sutherland Drive intersection, the 95th percentile queue length for the southbound left turn movement is anticipated to exceed the available storage length of 45m during the AM peak. The westbound approach is anticipated to operate with a LOS F during the PM peak hour.
- The proposed implementation of a permitted and protected southbound left turn phase and widening of the westbound approach to two outbound lanes is anticipated to yield a LOS A during the AM peak hour and a LOS C during the PM peak hour. The 95th percentile southbound left turn queues are anticipated to reduce during the AM peak hour and will be accommodated within the existing storage length.

- At Baseline Road/Cedarview Road, the 95th percentile queue length for the northbound left turn movement exceeds the available storage of 25m potentially blocking the adjacent northbound right turn lane during the AM and PM peak hours.

- At Baseline Road/John Sutherland Drive/Valley Stream Drive intersection, the 95th percentile queue length for the eastbound left movement is anticipated to exceed the available storage length of approximately 35m during the AM peak hour. Lengthening the left turn lane to provide 60 m storage is proposed.

The proposed development is recommended from transportation perspective.

NOVATECH

Prepared by:



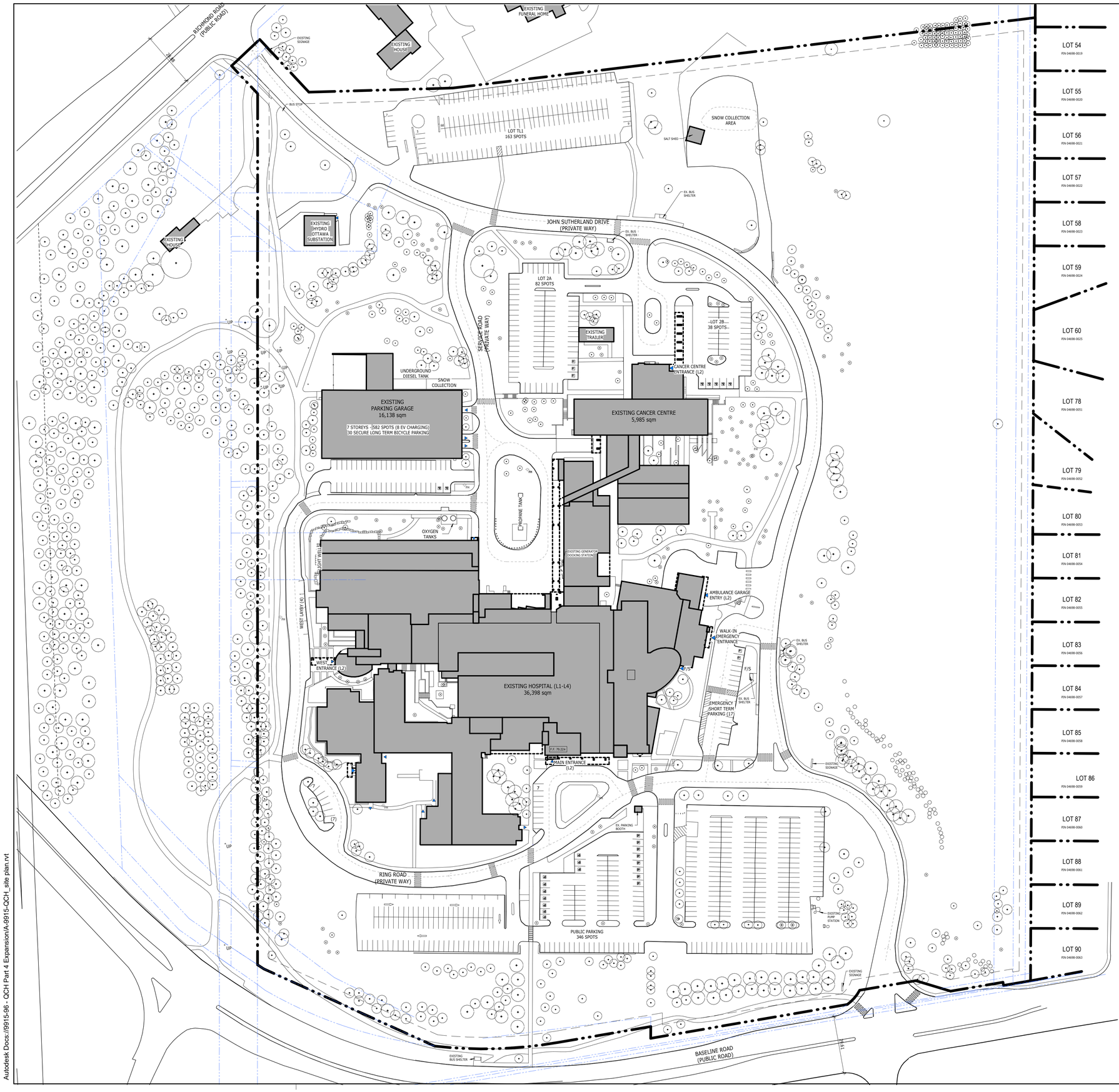
Mohammed Talha, M. Eng.
Engineering Intern | Transportation

Reviewed by:



Brad Byvelds, P. Eng.
Senior Project Manager | Transportation

Appendix A: Existing Site Plan & Part 4 Phasing Plans



SITE LEGEND

- PROPERTY LINE
- SETBACK LINE
- EASEMENT LINE
- FIRE ROUTE
- MATERIALS ACCESS ROUTE
- CHAIN-LINK FENCE
- CONTRACTOR'S STAGING AREA
- EXISTING BUILDING
- NEW BUILDING ADDITION
- INTERIOR RENOVATION
- P PUBLIC ENTRANCE
- E EXIT
- S STAFF ENTRANCE
- F-S FIREFIGHTER/STAFF ENTRANCE
- CONCRETE CURB
- PAINTED PARKING LINES
- PAVING
- NEW SIDEWALK/ PEDESTRIAN PATHS
- GRAVEL SURFACE
- CAST IRON TACTILE WALKING SURFACE INDICATOR
- ASPHALT PAVING PEDESTRIAN TRAIL/BIKE PATH
- ASPHALT
- EXISTING TREES
- NEW TREES
- BENCH
- EXISTING FIRE HYDRANT
- NEW FIRE HYDRANT
- BIKE RACK
- 79.25± ELEVATIONS

GROSS FLOOR AREA (m²)

	EXISTING	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
LEVEL 1	13,127	2,264	-	-	1,555	16,946
LEVEL 2	15,316	-	-	6,243	2,753	24,312
LEVEL 3	8,947	-	-	-	2,724	11,671
LEVEL 4	4,996	-	-	-	-	4,996
LEVEL 5	-	-	2,188	-	2,728	4,916
LEVEL 6	-	-	2,188	-	2,728	4,916
LEVEL 7	-	-	2,188	-	2,728	4,916
TOTAL	42,386	2,264	6,564	6,243	15,216	**72,731.2**

PARKING TYPES

- 3400 x 5200 mm TYPE A ACCESSIBLE PARKING SPACE C/W 1500 mm WIDE AISLE
- 2,600 x 5,200 mm STANDARD PARKING SPACE
- 2400 x 5200 mm TYPE B ACCESSIBLE PARKING SPACE C/W 1500 mm WIDE AISLE
- 1800mm x 600mm BICYCLE PARKING SPACE

PARKING SUMMARY

VEHICULAR PARKING COUNT

PHASE	STANDARD	ACCESSIBLE
EXISTING	1248	35
PHASE 1	+609	+8
PHASE 2	-200	-2
PHASE 3	0	0
PHASE 4	+13	0
PHASE 5	-5	0
TOTAL:	**1665**	**49**

BICYCLE PARKING COUNT

PHASE	LONG-TERM	SHORT-TERM	COUNT
EXISTING	30	28	44
PHASE 1	+90	+66	+156
PHASE 2	0	0	0
PHASE 3	0	+10	+10
PHASE 4	0	+22	+38
PHASE 5	0	0	0
TOTAL:	**120**	**126**	**246**

ACCESSIBLE PARKING COUNT

PHASES	TYPE A	TYPE B	SUB-TOTAL
EXISTING	-	-	37
PHASE 1	20	18	52
PHASE 2	-	-	50
PHASE 3	-	-	50
PHASE 4	1	1	50
PHASE 5	-	-	50
TOTAL	**21**	**19**	**50**

LOT COVERAGE

PHASE	PROPOSED FOOTPRINT	TOTAL FOOTPRINT	LOT COVERAGE
EXISTING	N/A	26,247.8 m²	13.0 %
PHASE 1	+2736.3 m²	28,984.1 m²	14.4%
PHASE 2	+2361.3 m²	31,345.4 m²	15.5 %
PHASE 3	-	31,345.4 m²	15.5 %
PHASE 4	+6155.7 m²	37,501.1 m²	18.6 %
PHASE 5	+1106.6 m²	38,607.7 m²	19.1 %

NOTES:

1. SURVEY INFORMATION TAKEN FROM SURVEYS AND TOPOGRAPHICAL PLAN DRAWING NO. "161611160-111-QCH-Rev18-TOPO 36X48 e - signed", PREPARED BY STANTEC GEOMATICS LTD, DATED SEPTEMBER 2, 2026.
2. REFER TO CIVIL DRAWINGS FOR FINISHED GRADING, SITE SERVICES, CURBS, CONCRETE AND EXTENT OF ASPHALT PAVING.
3. REFER TO LANDSCAPE DRAWINGS FOR LANDSCAPE AND SIDEWALK LAYOUT AND DETAILS
4. REFER TO ELECTRICAL DRAWINGS FOR SITE LIGHTING AND POWER DISTRIBUTION.
5. ALL DIMENSIONS ARE IN MILLIMETRES
6. PROPERTY BOUNDARIES AND EASEMENTS SHOWN ARE BASED ON THE REFERENCED SURVEY AND REGISTERED PLANS. REFER TO SURVEY AND LEGAL DOCUMENTS FOR EXACT DESCRIPTIONS.
7. BUILDING AREAS ON PLAN ARE PRESENTED AS BUILDING GROSS SQUARE FOOT/AREA. FOR GROSS FLOOR AREA FIGURES, REFER TO TABLE GROSS FLOOR AREA (m²).

PIN: 04698 - 0083

SITE AREA:

CALCULATED LOT AREA : **201,975m² (2174041 ft²) (20.19 ha)**

Owner:
Queensway Carleton Hospital
3045 BASELINE RD, OTTAWA, ON, K2H 8P4, 613-721-2000

Architect:
PARKIN
PARKIN ARCHITECTS LIMITED
200 LAURIER ST W, SUITE 300, OTTAWA, ON, K1P 6M7, 613-739-7700

Civil Engineer:
NOVATECH ENGINEERING CONSULTANTS
240 MICHAEL COWPLAND DR, OTTAWA, ON, K2M 1P6, 613-254-9643

Surveyor:
Stantec
STANTEC GEOMATICS LTD.
1331 CLYDE AVE, OTTAWA, ON, K2C 3G4, 613-722-4420

Landscape Architect:
CSW
CORUSH SUNDERLAND WRIGHT
319 McRAE AVE, OTTAWA, ON, K1Z 0B9, 613-729-4536

Mechanical/Electrical Engineers:
VR ENGINEERING FORWARD
VANDERWESTEN & RUTHERFORD ASSOCIATES INC.
1130 MORRISON DR, OTTAWA, ON, K2H 9N6, 613-563-2100

Norths:

TRUE NORTH PROJECT NORTH

NO.	ISSUED	DATE
4	Issued for SPA Resubmission 1	2026-09-04
3	Issued for Siteplan Application	2025-11-28
2	Stage 2.1 Submission Block Schematic	2025-10-31
1	Issued for Costing	2025-02-28

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

Drawn by: DB/RR
Checked by: DJ
Project No: 9915-96
Scale: 1 : 1000

First issued: 2025-11-28
Current issue: 4
Issue date: 2026-09-04

Project Name:

QUEENSWAY CARLETON HOSPITAL PART 4 EXPANSION

Project Adress:
3045 BASELINE ROAD, OTTAWA, ON, K2H 8P4 613-721-2000
PROPERTY IDENTIFICATION NO. 04698-0083 (LT)

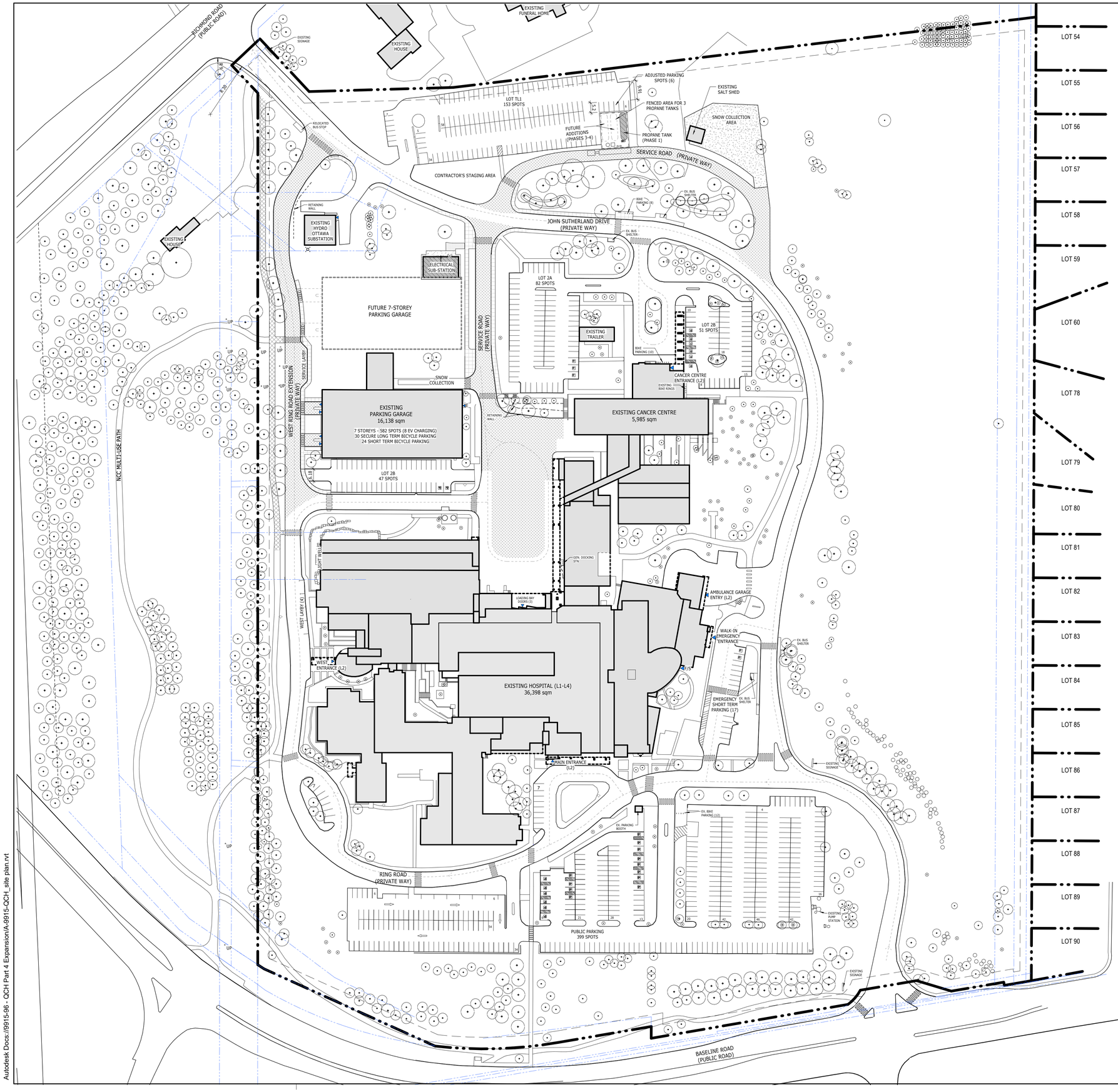
Sheet Title:

Site Plan - Existing

Drawing No.:

A030

2026-09-04 11:51:17 AM
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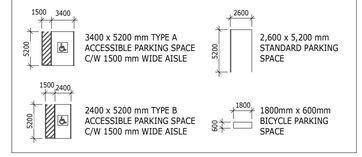
SITE LEGEND

- PROPERTY LINE
- SETBACK LINE
- EASEMENT LINE
- FIRE ROUTE
- MATERIALS ACCESS ROUTE
- CHAIN-LINK FENCE
- CONTRACTOR'S STAGING AREA
- EXISTING BUILDING
- NEW BUILDING ADDITION
- INTERIOR RENOVATION
- P PUBLIC ENTRANCE
- E EXIT
- S STAFF ENTRANCE
- F-S FIREFIGHTER/STAFF ENTRANCE
- CONCRETE CURB
- PAINTED PARKING LINES
- PAVING
- NEW SIDEWALK/ PEDESTRIAN PATHS
- GRAVEL SURFACE
- CAST IRON TACTILE WALKING SURFACE INDICATOR
- ASPHALT PAVING PEDESTRIAN TRAIL/BIKE PATH
- ASPHALT
- EXISTING TREES
- NEW TREES
- BENCH
- EXISTING FIRE HYDRANT
- NEW FIRE HYDRANT
- BIKE RACK
- 79.25± ELEVATIONS

GROSS FLOOR AREA (m²)

	EXISTING	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
LEVEL 1	13,127	2,264	-	-	1,555	16,946
LEVEL 2	15,316	-	-	6,243	2,753	24,312
LEVEL 3	8,947	-	-	-	2,724	11,671
LEVEL 4	4,996	-	-	-	-	4,996
LEVEL 5	-	-	2,188	-	2,728	4,916
LEVEL 6	-	-	2,188	-	2,728	4,916
LEVEL 7	-	-	2,188	-	2,728	4,916
TOTAL	42,386	2,264	6,564	6,243	15,216	**72,731.2**

PARKING TYPES



PARKING SUMMARY

VEHICULAR PARKING COUNT

PHASE	STANDARD	ACCESSIBLE
EXISTING	1248	35
PHASE 1	+609	+8
PHASE 2	-200	-2
PHASE 3	0	0
PHASE 4	+13	0
PHASE 5	-5	0
TOTAL:	**1665**	**49**

BICYCLE PARKING COUNT

PHASE	LONG-TERM	SHORT-TERM	COUNT
EXISTING	30	28	44
PHASE 1	+90	+66	+156
PHASE 2	0	0	0
PHASE 3	0	+10	+10
PHASE 4	0	+22	+38
PHASE 5	0	0	0
TOTAL:	**120**	**126**	**246**

ACCESSIBLE PARKING COUNT

PHASES	TYPE A	TYPE B	SUB-TOTAL
EXISTING	-	-	37
PHASE 1	20	18	52
PHASE 2	-	-	50
PHASE 3	-	-	50
PHASE 4	1	1	50
PHASE 5	-	-	50
TOTAL	**21**	**19**	**50**

LOT COVERAGE

PHASE	PROPOSED FOOTPRINT	TOTAL FOOTPRINT	LOT COVERAGE
EXISTING	N/A	26,247.8 m²	13.0 %
PHASE 1	+2736.3 m²	28,984.1 m²	14.4%
PHASE 2	+2361.3 m²	31,345.4 m²	15.5 %
PHASE 3	-	31,345.4 m²	15.5 %
PHASE 4	+6155.7 m²	37,501.1 m²	18.6 %
PHASE 5	+1106.6 m²	38,607.7 m²	19.1 %

NOTES:

1. SURVEY INFORMATION TAKEN FROM SURVEYS AND TOPOGRAPHICAL PLAN DRAWING NO. "161611160v-111-QCH-Rev16-TOPO 36X48 e - signed", PREPARED BY STANTEC GEOMATICS LTD, DATED SEPTEMBER 2, 2026.
2. REFER TO CIVIL DRAWINGS FOR FINISHED GRADING, SITE SERVICES, CURBS, CONCRETE AND EXTENT OF ASPHALT PAVING.
3. REFER TO LANDSCAPE DRAWINGS FOR LANDSCAPE AND SIDEWALK LAYOUT AND DETAILS
4. REFER TO ELECTRICAL DRAWINGS FOR SITE LIGHTING AND POWER DISTRIBUTION.
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PIN: 04698 - 0083

SITE AREA:

CALCULATED LOT AREA : **201,975m² (2174041 ft²) (20.19 ha)**

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Civil Engineer:
NOVATECH ENGINEERING CONSULTANTS
240 MICHAEL COWPLAND DR, OTTAWA, ON, K2M 1P6, 613-254-9643

Surveyor:
Stantec
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Do not scale drawings

Drawn by: DB/RR
Checked by: DJ
Project No: 9915-96
Scale: 1 : 1000

First issued: 2025-11-28
Current issue: 4
Issue date: 2026-09-04

Project Name:

QUEENSWAY CARLETON HOSPITAL PART 4 EXPANSION

Project Adress:
3045 BASELINE ROAD, OTTAWA, ON, K2H 8P4 613-721-2000
PROPERTY IDENTIFICATION NO. 04698-0083 (LT)

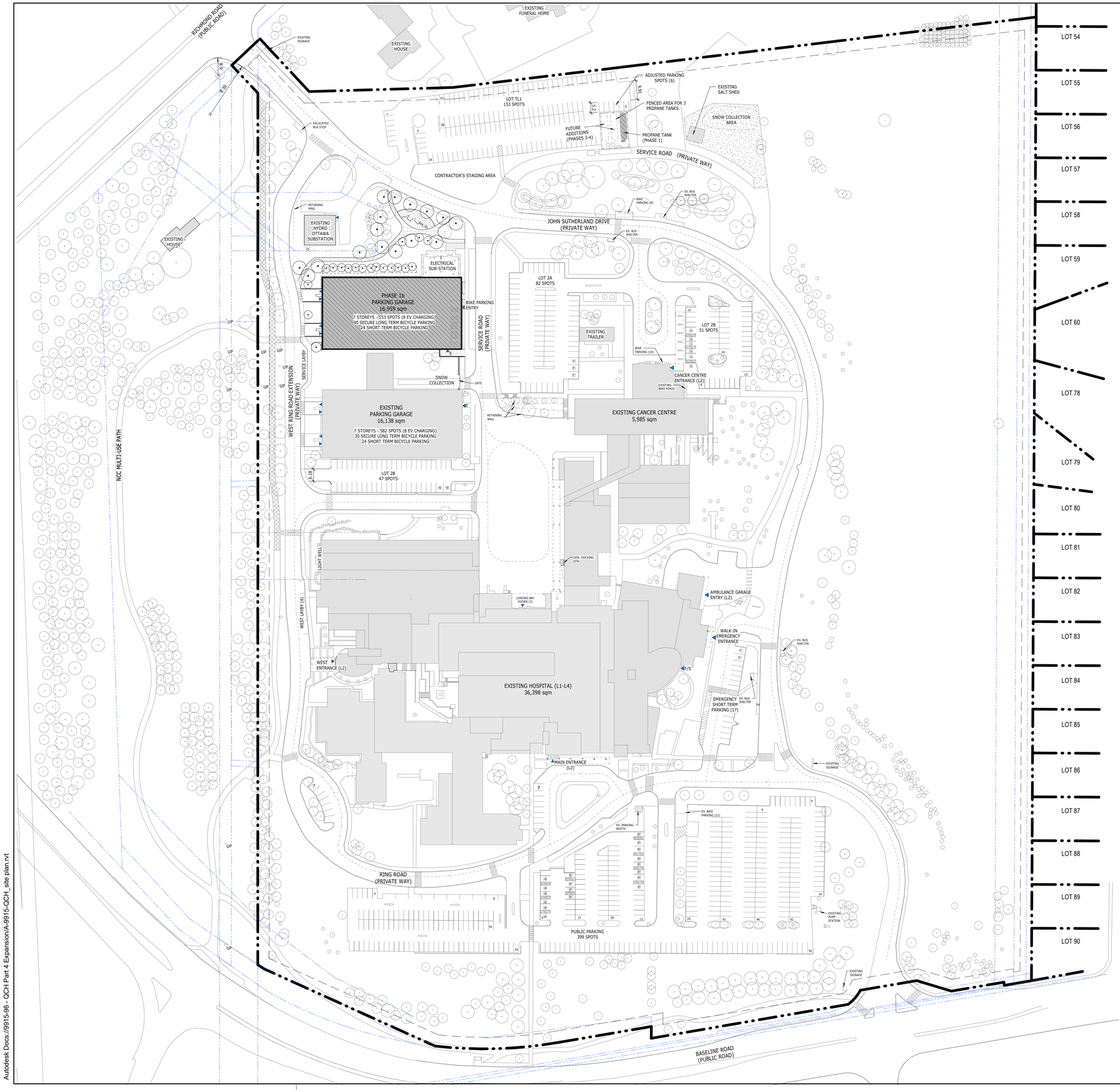
Sheet Title:

Site Plan - Phase 1a Civil Infrastructure

Drawing No.:

A031a

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Autodesk Docs://9915-96 - QCH Part 4 Expansion/A-9915-QCH_site plan.rvt



SITE LEGEND

- PROPERTY LINE
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GROSS FLOOR AREA (m²)

	EXISTING	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
LEVEL 1	13,127	2,264	-	-	1,555	16,946
LEVEL 2	15,316	-	-	6,243	2,753	24,312
LEVEL 3	8,947	-	-	-	2,724	11,671
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LEVEL 6	-	-	2,188	-	2,728	4,916
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TOTAL	42,386	2,264	6,564	6,243	15,216	**72,731.2**

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PARKING SUMMARY

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PHASE	STANDARD	ACCESSIBLE
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PHASE 1	+609	+8
PHASE 2	-200	-2
PHASE 3	0	0
PHASE 4	+13	0
PHASE 5	-5	0
TOTAL:	**1665**	**49**

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PHASE	LONG-TERM	SHORT-TERM	COUNT
EXISTING	30	28	44
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TOTAL	**21**	**19**	**50**

LOT COVERAGE

PHASE	PROPOSED FOOTPRINT	TOTAL FOOTPRINT	LOT COVERAGE
EXISTING	N/A	26,247.8 m²	13.0 %
PHASE 1	+2736.3 m²	28,984.1 m²	14.4%
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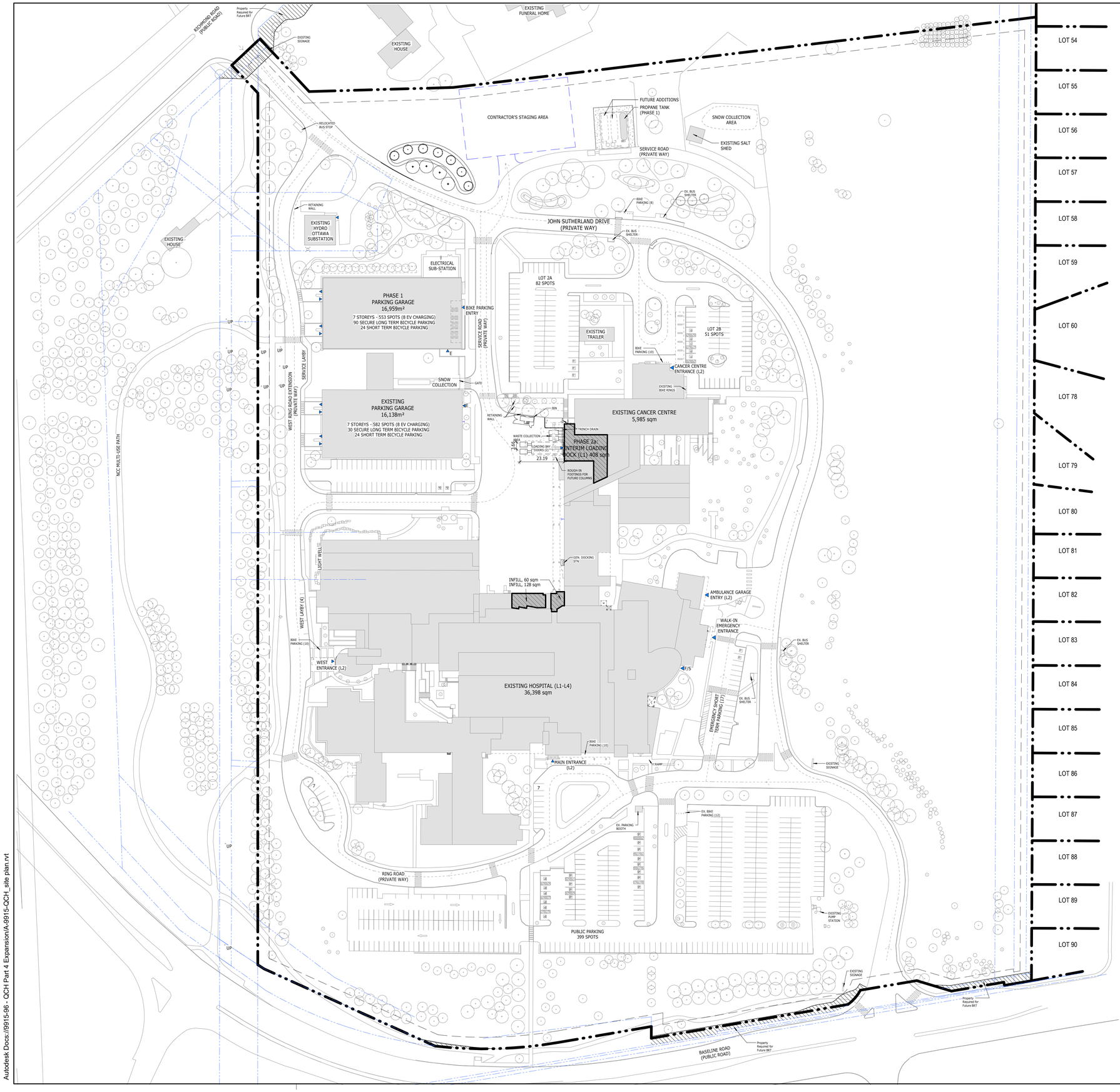
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Project Adress:
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PROPERTY IDENTIFICATION NO. 04698-0083 (LT)

Sheet Title:
Site Plan - Phase 1b Parking Garage

Drawing No.:
A031b

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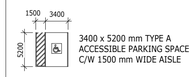
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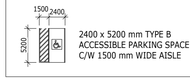
PARKING TYPES



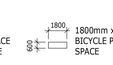
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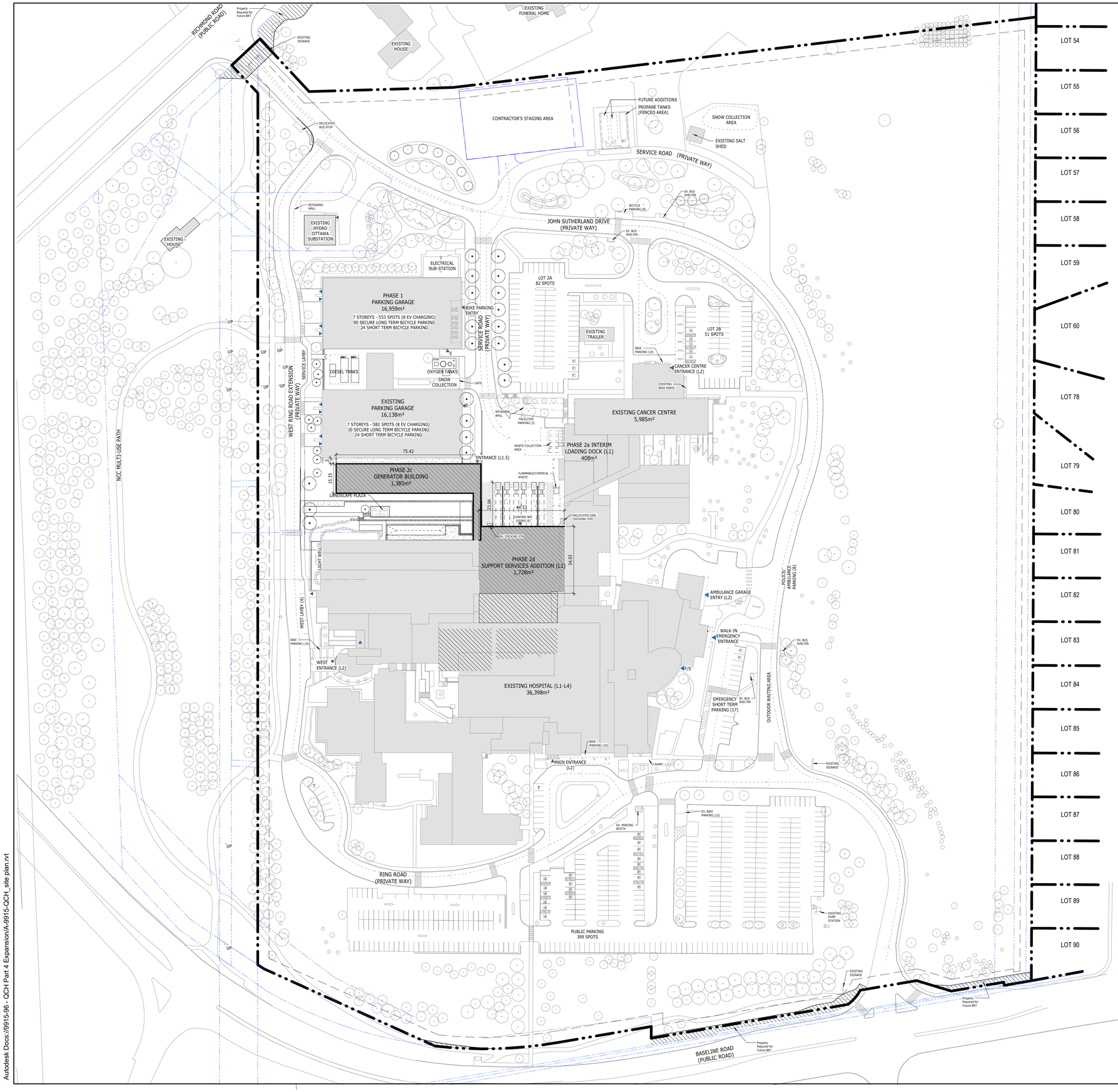
Sheet Title:

Site Plan - Phase 2 Support Services 2a Loading Dock

Drawing No.:

A032a

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Autodesk Docs://9915-96 - QCH Part 4 Expansion/A-9915-QCH_site plan.rvt



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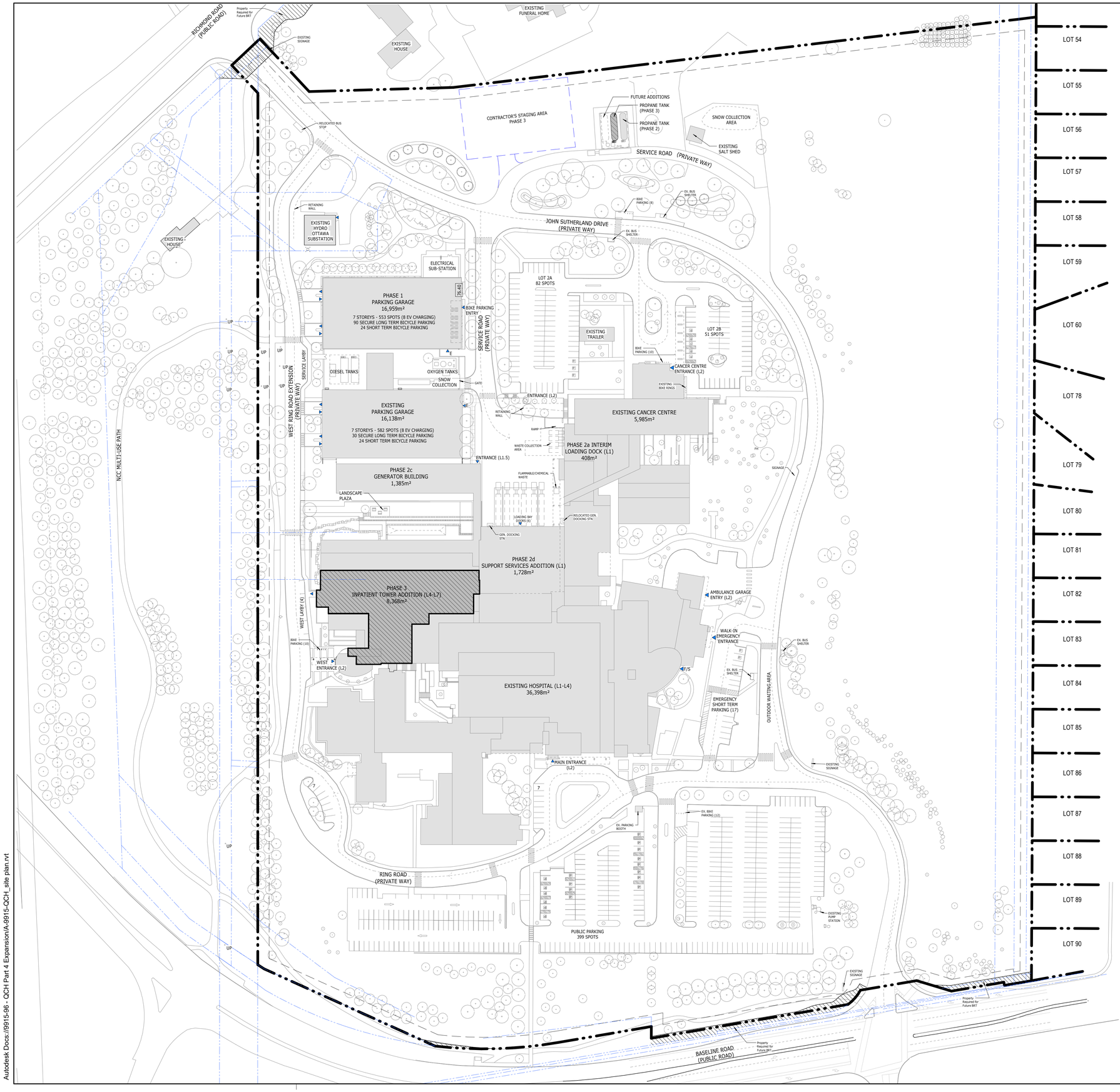
Sheet Title:

Site Plan - Phase 2 Support Services 2b-2d - Generator room, M.M., EVS & F.S.

Drawing No.:

A032b

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Autodesk Docs://9915-96 - QCH Part 4 Expansion/A-9915-QCH_site plan.rvt



SITE LEGEND

- PROPERTY LINE
- SETBACK LINE
- EASEMENT LINE
- FIRE ROUTE
- MATERIALS ACCESS ROUTE
- CHAIN-LINK FENCE
- CONTRACTOR'S STAGING AREA
- EXISTING BUILDING
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- INTERIOR RENOVATION
- P PUBLIC ENTRANCE
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- NEW TREES
- BENCH
- EXISTING FIRE HYDRANT
- NEW FIRE HYDRANT
- BIKE RACK
- 79.25± ELEVATIONS

GROSS FLOOR AREA (m²)

	EXISTING	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
LEVEL 1	13,127	2,264	-	-	1,555	16,946
LEVEL 2	15,316	-	-	6,243	2,753	24,312
LEVEL 3	8,947	-	-	-	2,724	11,671
LEVEL 4	4,996	-	-	-	-	4,996
LEVEL 5	-	-	2,188	-	2,728	4,916
LEVEL 6	-	-	2,188	-	2,728	4,916
LEVEL 7	-	-	2,188	-	2,728	4,916
TOTAL	42,386	2,264	6,564	6,243	15,216	**72,731.2**

PARKING TYPES

- 3400 x 5200 mm TYPE A ACCESSIBLE PARKING SPACE C/W 1500 mm WIDE AISLE
- 2,600 x 5,200 mm STANDARD PARKING SPACE
- 2400 x 5200 mm TYPE B ACCESSIBLE PARKING SPACE C/W 1500 mm WIDE AISLE
- 1800mm x 600mm BICYCLE PARKING SPACE

PARKING SUMMARY

VEHICULAR PARKING COUNT

PHASE	STANDARD	ACCESSIBLE
EXISTING	1248	35
PHASE 1	+609	+8
PHASE 2	-200	-2
PHASE 3	0	0
PHASE 4	+13	0
PHASE 5	-5	0
TOTAL:	**1665**	**49**

BICYCLE PARKING COUNT

PHASE	LONG-TERM	SHORT-TERM	COUNT
EXISTING	30	28	44
PHASE 1	+90	+66	+156
PHASE 2	0	0	0
PHASE 3	0	+10	+10
PHASE 4	0	+22	+38
PHASE 5	0	0	0
TOTAL:	**120**	**126**	**246**

ACCESSIBLE PARKING COUNT

PHASES	TYPE A	TYPE B	SUB-TOTAL
EXISTING	-	-	37
PHASE 1	20	18	52
PHASE 2	-	-	50
PHASE 3	-	-	50
PHASE 4	1	1	50
PHASE 5	-	-	50
TOTAL	**21**	**19**	**50**

LOT COVERAGE

PHASE	PROPOSED FOOTPRINT	TOTAL FOOTPRINT	LOT COVERAGE
EXISTING	N/A	26,247.8 m²	13.0 %
PHASE 1	+2736.3 m²	28,984.1 m²	14.4%
PHASE 2	+2361.3 m²	31,345.4 m²	15.5 %
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PIN: 04698 - 0083

SITE AREA:

CALCULATED LOT AREA : **201,975m² (2174041 ft²) (20.19 ha)**

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Queensway Carleton Hospital
3045 BASELINE RD, OTTAWA, ON, K2H 8P4, 613-721-2000

Architect:
PARKIN
PARKIN ARCHITECTS LIMITED
200 LAURIER ST W, SUITE 300, OTTAWA, ON, K1P 6M7, 613-739-7700

Civil Engineer:
NOVATECH ENGINEERING CONSULTANTS
240 MICHAEL COWPLAND DR, OTTAWA, ON, K2M 1P6, 613-254-9643

Surveyor:
Stantec
STANTEC GEOMATICS LTD.
1331 CLYDE AVE, OTTAWA, ON, K2C 3G4, 613-722-4420

Landscape Architect:
CSW
CORUSH SUNDERLAND WRIGHT
319 McRAE AVE, OTTAWA, ON, K1Z 0B9, 613-729-4536

Mechanical/Electrical Engineers:
VR ENGINEERING FORWARD
VANDERWESTEN & RUTHERFORD ASSOCIATES INC.
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Norths:

TRUE NORTH PROJECT NORTH

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Do not scale drawings

Drawn by: DB/RR
Checked by: DJ
Project No: 9915-96
Scale: 1 : 1000

First issued: 2025-11-28
Current issue: 4
Issue date: 2026-09-04

Project Name:

QUEENSWAY CARLETON HOSPITAL PART 4 EXPANSION

Project Adress:
3045 BASELINE ROAD, OTTAWA, ON, K2H 8P4 613-721-2000
PROPERTY IDENTIFICATION NO. 04698-0083 (LT)

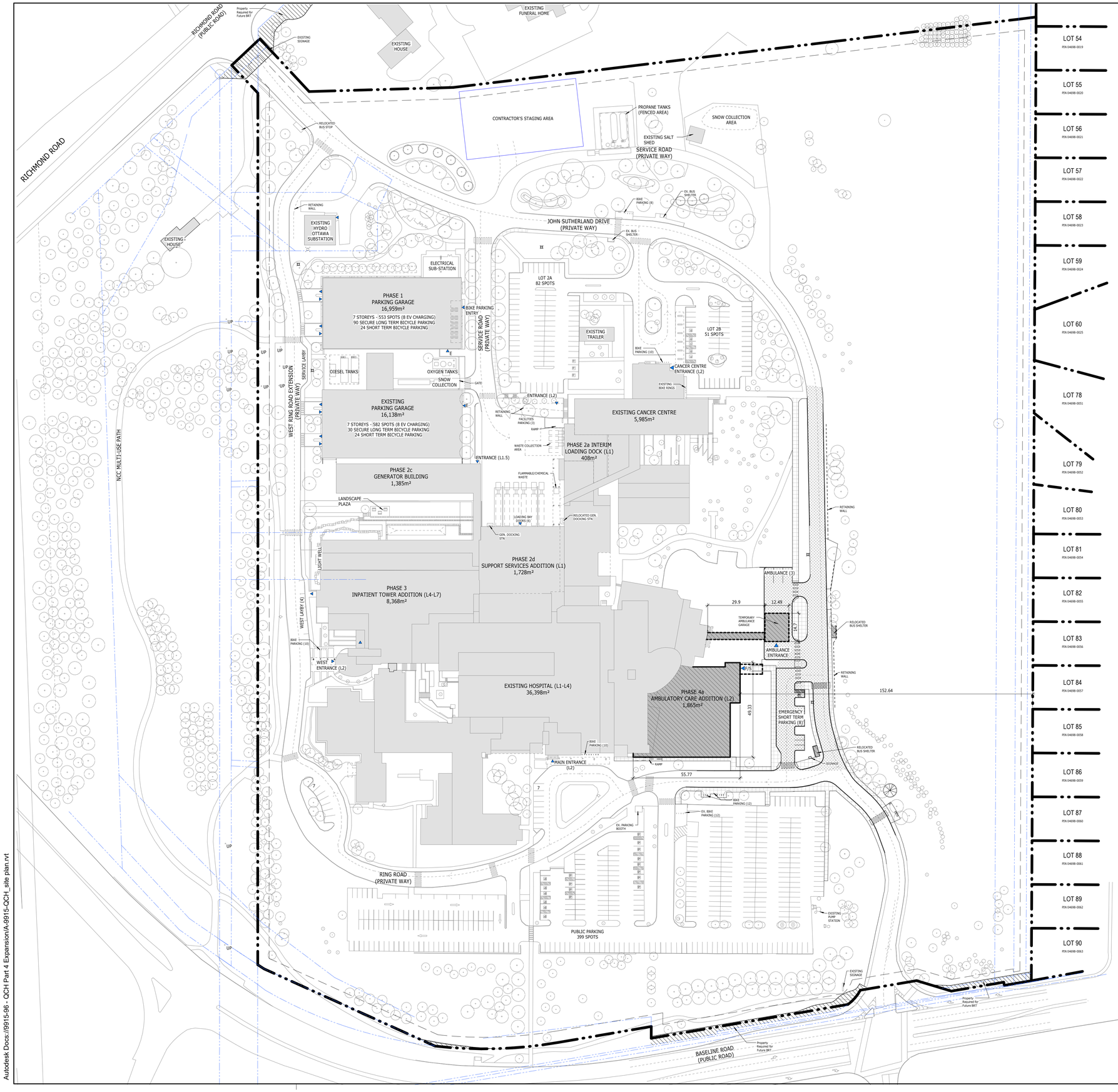
Sheet Title:

Site Plan, Phase 3, Medical/Surgical Inpatient Expansion

Drawing No.:

A033

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Drawn by: DB/RR
Checked by: DJ
Project No: 9915-96
Scale: 1 : 1000

First issued: 2025-11-28
Current issue: 4
Issue date: 2026-09-04

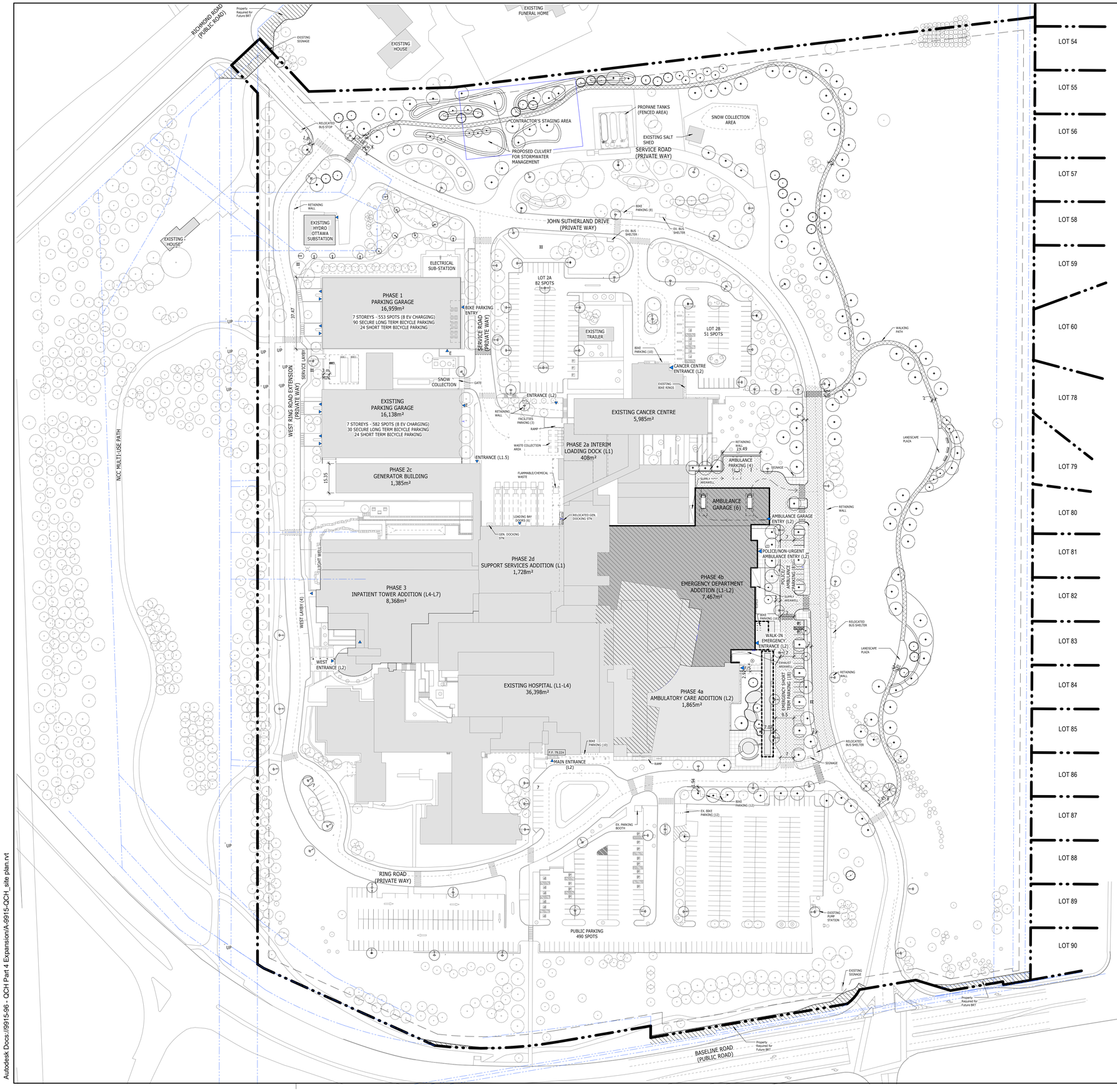
Project Name:
QUEENSWAY CARLETON HOSPITAL PART 4 EXPANSION

Project Adress:
3045 BASELINE ROAD, OTTAWA, ON, K2H 8P4 613-721-2000
PROPERTY IDENTIFICATION NO. 04698-0083 (LT)

Sheet Title:
Site Plan - Phase 4 Emergency Dept. Expansion - 4a Ambulatory Care & Temporary Entrance

Drawing No.:
A034a

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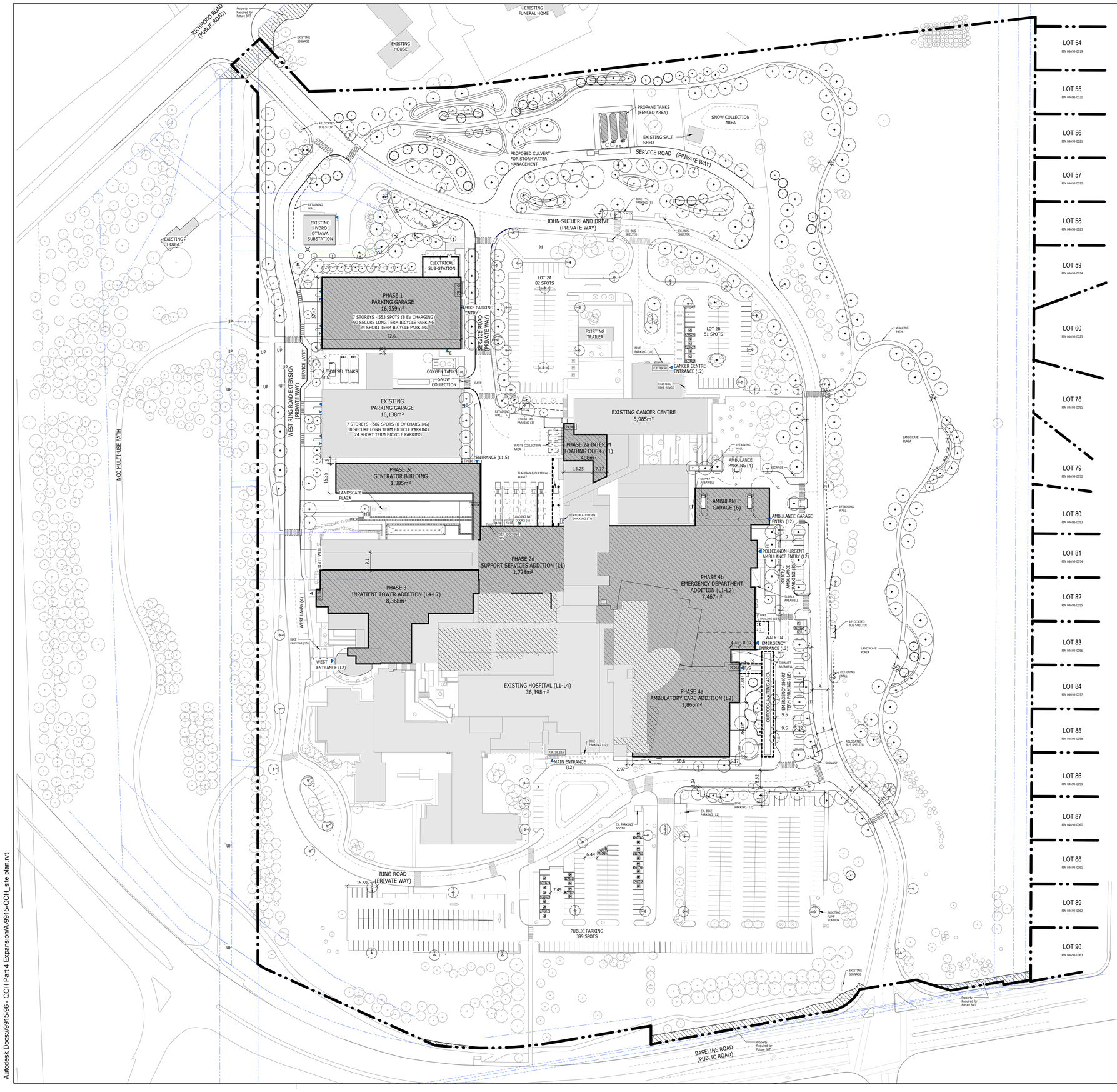
Sheet Title:

Site Plan - Phase 4 Emergency Dept. Expansion - 4b & 4c Emergency Services

Drawing No.:

A034b

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PIN: 04698 - 0083

SITE AREA:

CALCULATED LOT AREA : **201,975m² (2174041 ft²) (20.19 ha)**

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Queensway Carleton Hospital
3045 BASELINE RD, OTTAWA, ON, K2H 8P4, 613-721-2000

Architect:
PARKIN
PARKIN ARCHITECTS LIMITED
200 LAURIER ST W, SUITE 300, OTTAWA, ON, K1P 6M7, 613-739-7700

Civil Engineer:
NOVATECH ENGINEERING CONSULTANTS
240 MICHAEL COWPLAND DR, OTTAWA, ON, K2M 1P6, 613-254-9643

Surveyor:
Stantec
STANTEC GEOMATICS LTD.
1331 CLYDE AVE, OTTAWA, ON, K2C 3G4, 613-722-4420

Landscape Architect:
CSW
CORUSH SUNDERLAND WRIGHT
319 McRAE AVE, OTTAWA, ON, K1Z 0B9, 613-729-4536

Mechanical/Electrical Engineers:
VR ENGINEERING FORWARD
VANDERWESTEN & RUTHERFORD ASSOCIATES INC.
1130 MORRISON DR, OTTAWA, ON, K2H 9N6, 613-563-2100

Norths:
TRUE NORTH
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NO.	ISSUED	DATE
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3	Issued for Siteplan Application	2025-11-28
2	Stage 2.1 Submission Block Schematic	2025-10-31
1	Issued for Costing	2025-02-28

Issues

All measurements are to be checked and verified on site by the contractor before proceeding with work

Do not scale drawings

Drawn by: DB/RR
Checked by: DJ
Project No: 9915-96
Scale: 1 : 1000

First issued: 2025-11-28
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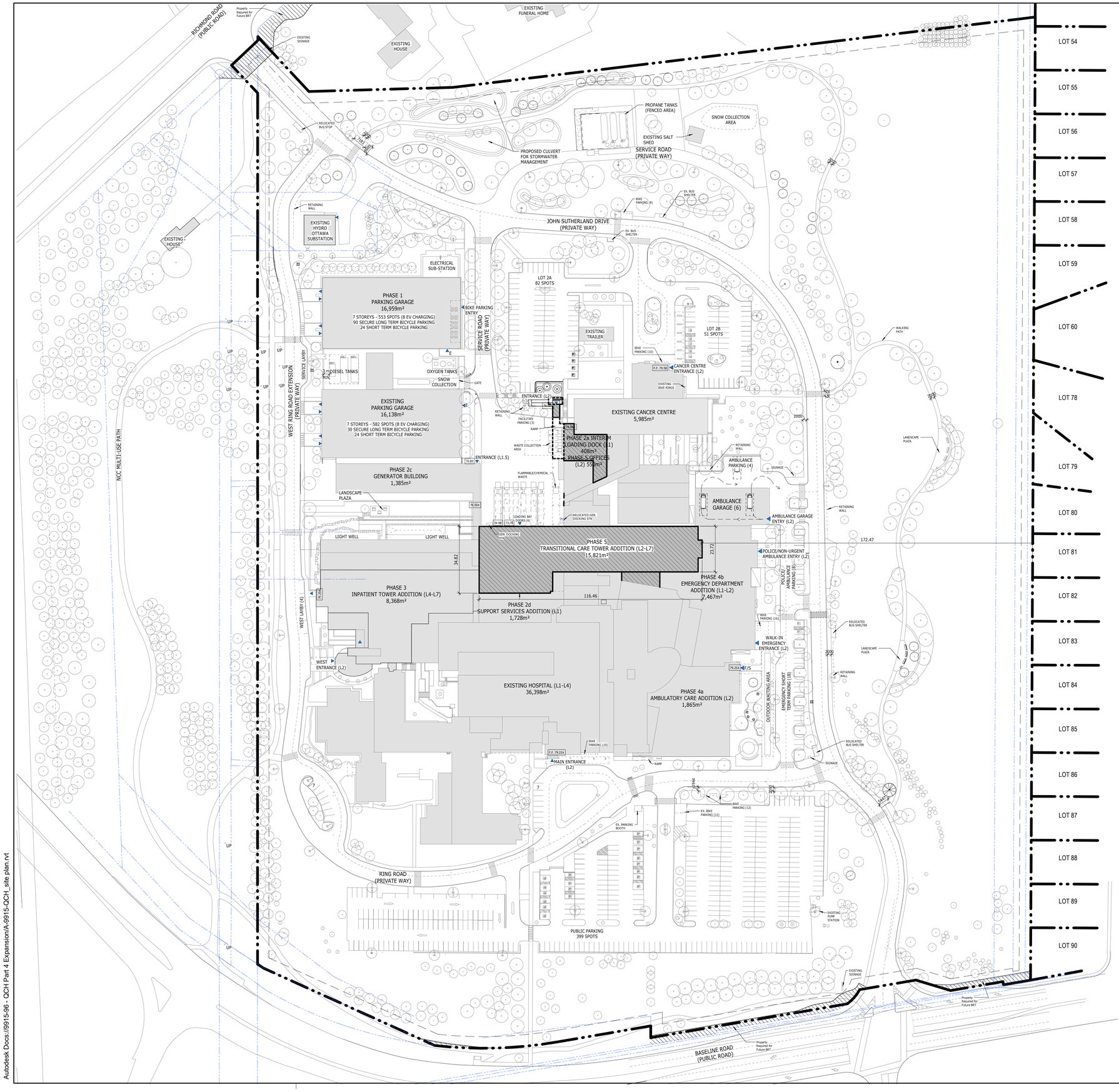
Project Name:
QUEENSWAY CARLETON HOSPITAL PART 4 EXPANSION

Project Adress:
3045 BASELINE ROAD, OTTAWA, ON, K2H 8P4 613-721-2000
PROPERTY IDENTIFICATION NO. 04698-0083 (LT)

Sheet Title:
Site Plan - Phase 4 Complete (Phases 1-4)

Drawing No.:
A035

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SITE LEGEND

- PROPERTY LINE
- SETBACK LINE
- EASEMENT LINE
- FIRE ROUTE
- MATERIALS ACCESS ROUTE
- CHAIN-LINK FENCE
- CONTRACTOR'S STAGING AREA
- EXISTING BUILDING
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- INTERIOR RENOVATION
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- S STAFF ENTRANCE
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- NEW TREES
- BENCH
- EXISTING FIRE HYDRANT
- NEW FIRE HYDRANT
- BIKE RACK
- 79.25± ELEVATIONS

GROSS FLOOR AREA (m²)

	EXISTING	PHASE 2	PHASE 3	PHASE 4	PHASE 5	TOTAL
LEVEL 1	13,127	2,264	-	-	1,555	16,946
LEVEL 2	15,316	-	-	6,243	2,753	24,312
LEVEL 3	8,947	-	-	-	2,724	11,671
LEVEL 4	4,996	-	-	-	-	4,996
LEVEL 5	-	-	2,188	-	2,728	4,916
LEVEL 6	-	-	2,188	-	2,728	4,916
LEVEL 7	-	-	2,188	-	2,728	4,916
TOTAL	42,386	2,264	6,564	6,243	15,216	**72,731.2**

PARKING TYPES

- 3400 x 5200 mm TYPE A ACCESSIBLE PARKING SPACE C/W 1500 mm WIDE AISLE
- 2,600 x 5,200 mm STANDARD PARKING SPACE
- 2400 x 5200 mm TYPE B ACCESSIBLE PARKING SPACE C/W 1500 mm WIDE AISLE
- 1800mm x 600mm BICYCLE PARKING SPACE

PARKING SUMMARY

VEHICULAR PARKING COUNT

PHASE	STANDARD	ACCESSIBLE
EXISTING	1248	35
PHASE 1	+609	+8
PHASE 2	-200	-2
PHASE 3	0	0
PHASE 4	+13	0
PHASE 5	-5	0
TOTAL:	**1665**	**49**

BICYCLE PARKING COUNT

PHASE	LONG-TERM	SHORT-TERM	COUNT
EXISTING	30	28	44
PHASE 1	+90	+66	+156
PHASE 2	0	0	0
PHASE 3	0	+10	+10
PHASE 4	0	+22	+38
PHASE 5	0	0	0
TOTAL:	**120**	**126**	**246**

ACCESSIBLE PARKING COUNT

PHASES	TYPE A	TYPE B	SUB-TOTAL
EXISTING	-	-	37
PHASE 1	20	18	52
PHASE 2	-	-	50
PHASE 3	-	-	50
PHASE 4	1	1	50
PHASE 5	-	-	50
TOTAL	**21**	**19**	**50**

LOT COVERAGE

PHASE	PROPOSED FOOTPRINT	TOTAL FOOTPRINT	LOT COVERAGE
EXISTING	N/A	26,247.8 m²	13.0 %
PHASE 1	+2736.3 m²	28,984.1 m²	14.4%
PHASE 2	+2361.3 m²	31,345.4 m²	15.5 %
PHASE 3	-	31,345.4 m²	15.5 %
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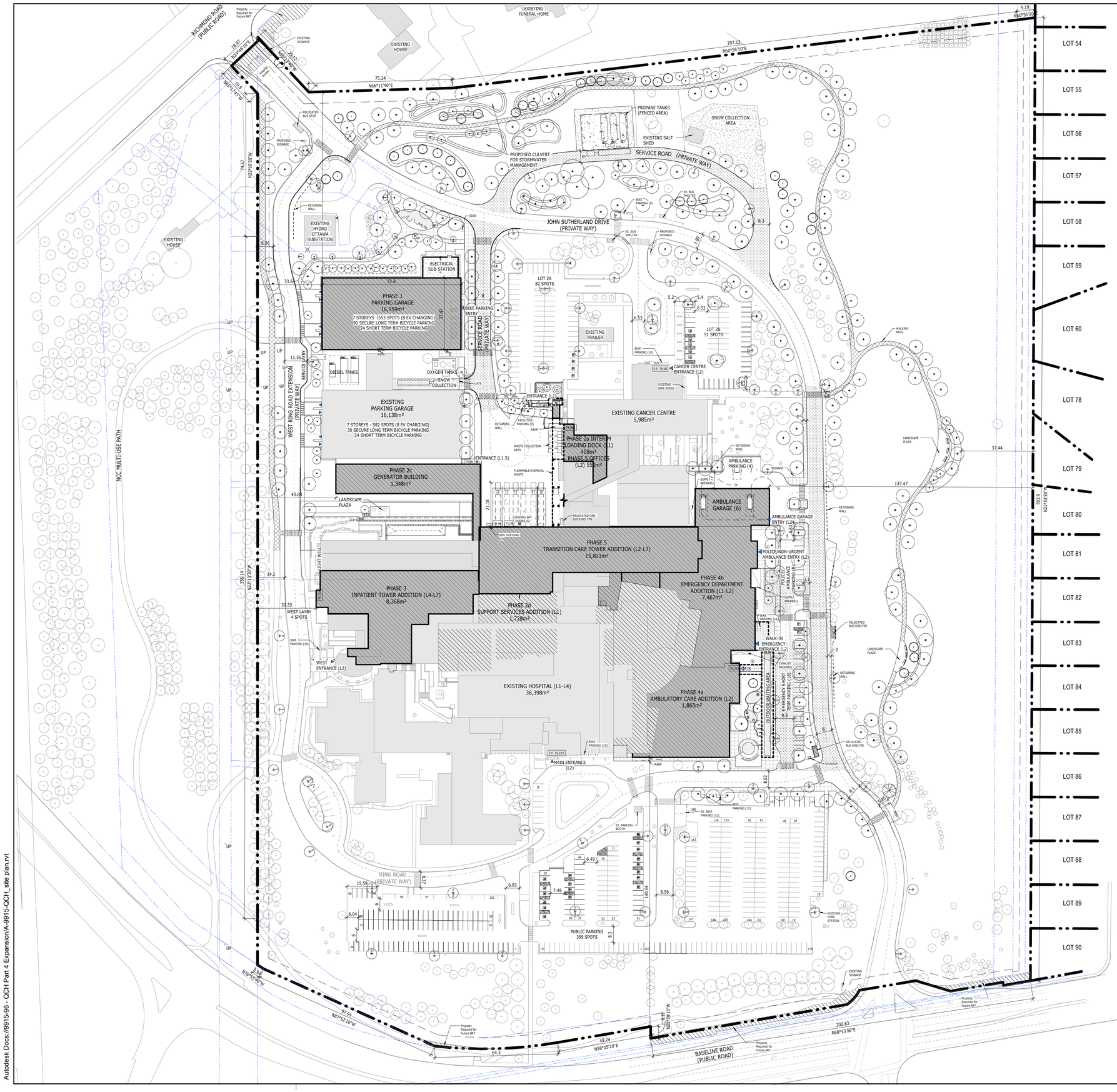
Sheet Title:

Site Plan - Phase 5 ICU and Transitional Care Inpatient Tower

Drawing No.:

A036

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Autodesk Docs://9915-96 - QCH Part 4 Expansion/A-9915-QCH_site plan.rvt



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Project Adress:
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PROPERTY IDENTIFICATION NO. 04698-0083 (LT)

Sheet Title:

Site Plan, Part 4, Complete (Phases 1-5)

Drawing No.:

A037

2026-09-04 11:51:27 AM
Autodesk Docs://9915-96 - QCH Part 4 Expansion/A-9915-QCH_site plan.rvt

Appendix B: TIA Screening Form

City of Ottawa 2017 TIA Guidelines TIA Screening

1. Description of Proposed Development

Municipal Address	3045 Baseline Road
Description of Location	Northeast corner of Richmond Rd & Baseline Rd
Land Use Classification	Hospital
Development Size (units)	
Development Size square metre (m^2)	35,866
Number of Accesses and Locations	Makes use of existing
Phase of Development	5 Sub-Phases
Buildout Year	2030

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.

Table notes:

1. Table 2, Table 3 & Table 4 TRANS Trip Generation Manual
2. Institute of Transportation Engineers (ITE) Trip Generation Manual 11.1 Ed.

Land Use Type	Minimum Development Size
Single-family homes	**60 units**
Multi-Use Family (Low-Rise)[1]	**90 units**
Multi-Use Family (High-Rise)[1]	**150 units**
Office[2]	**1,400 m^2**
Industrial[2]	**7,000 m^2**
Fast-food restaurant or coffee shop[2]	**110 m^2**
Destination retail[2]	**1,800 m^2**
Gas station or convenience market[2]	**90 m^2**

If the proposed development size is equal to or 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 Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?	☐	☑
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)?[2]	☐	☑

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 kilometers per hour (km/h) or greater?	☑	☐
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?	☐	☑
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 metre [m] of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	☐	☑
Is the proposed driveway within auxiliary lanes of an intersection?	☐	☑
Does the proposed driveway make use of an existing median break that serves an existing site?	☐	☑

[2] Hubs are identified in Schedules B1 to B8 of the City of Ottawa Official Plan. PMTSAs are identified in Schedule C1 of the Official Plan. DPAs are identified in Schedule C7A and C7B of the Official. See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA.

	Yes	No
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?	☐	☑
Does the development include a drive-thru facility?	☐	☑

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

5. Summary

Results of Screening	Yes	No
Does the development satisfy the Trip Generation Trigger?	☑	☐
Does the development satisfy the Location Trigger?	☐	☑
Does the development satisfy the Safety Trigger?	☑	☐

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 C: OC Transpo Maps

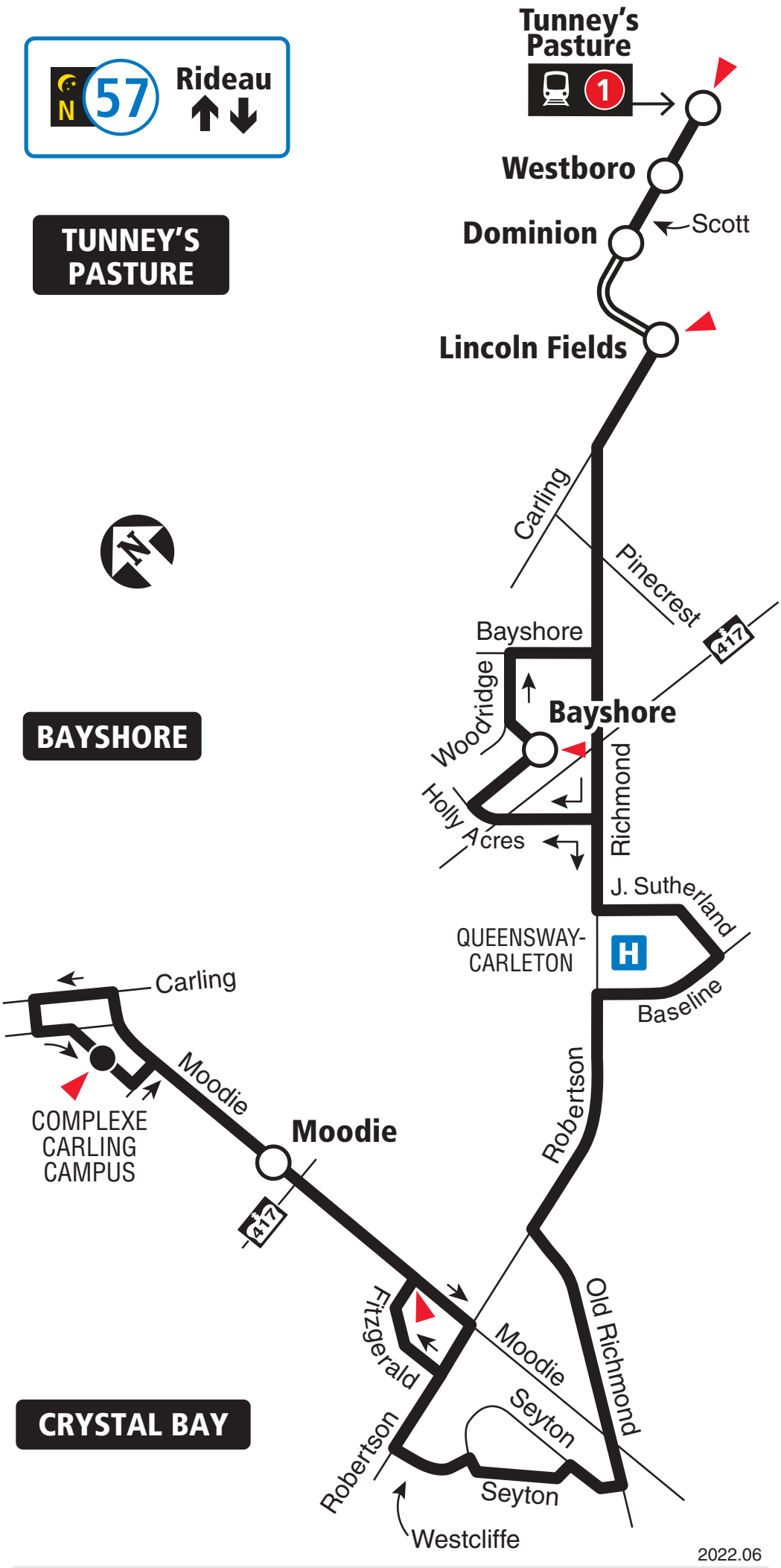
57 Rapide

BAYSHORE
CRYSTAL BAY
TUNNEY'S PASTURE

7 days a week / 7 jours par semaine

All day and limited overnight service
Service toute la journée et limité la nuit

TUNNEY'S PASTURE



BAYSHORE

CRYSTAL BAY

2022.06

Transitway & Station

Timepoint | Heures de passage



When O-Train Line 1 is not running overnight, Route 57 will be extended downtown to Rideau Station. / Lorsque la Ligne 1 de l'O-Train ne circule pas la nuit, le circuit 57 sera prolongée au centre-ville jusqu'à la station Rideau.

2022.06

Schedule / Horaire 613-560-1000
Text / Texto* 560560
plus your four digit bus stop number / *plus* votre numéro d'arrêt à quatre chiffres

*Standard message rates may apply / Les tarifs réguliers de messagerie texte peuvent s'appliquer

Customer Service
Service à la clientèle **613-560-5000**

Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité **613-741-2478**

Effective June 26, 2022
En vigueur 26 juin 2022

OC Transpo

INFO 613-560-5000
octranspo.com

68

Fréquent

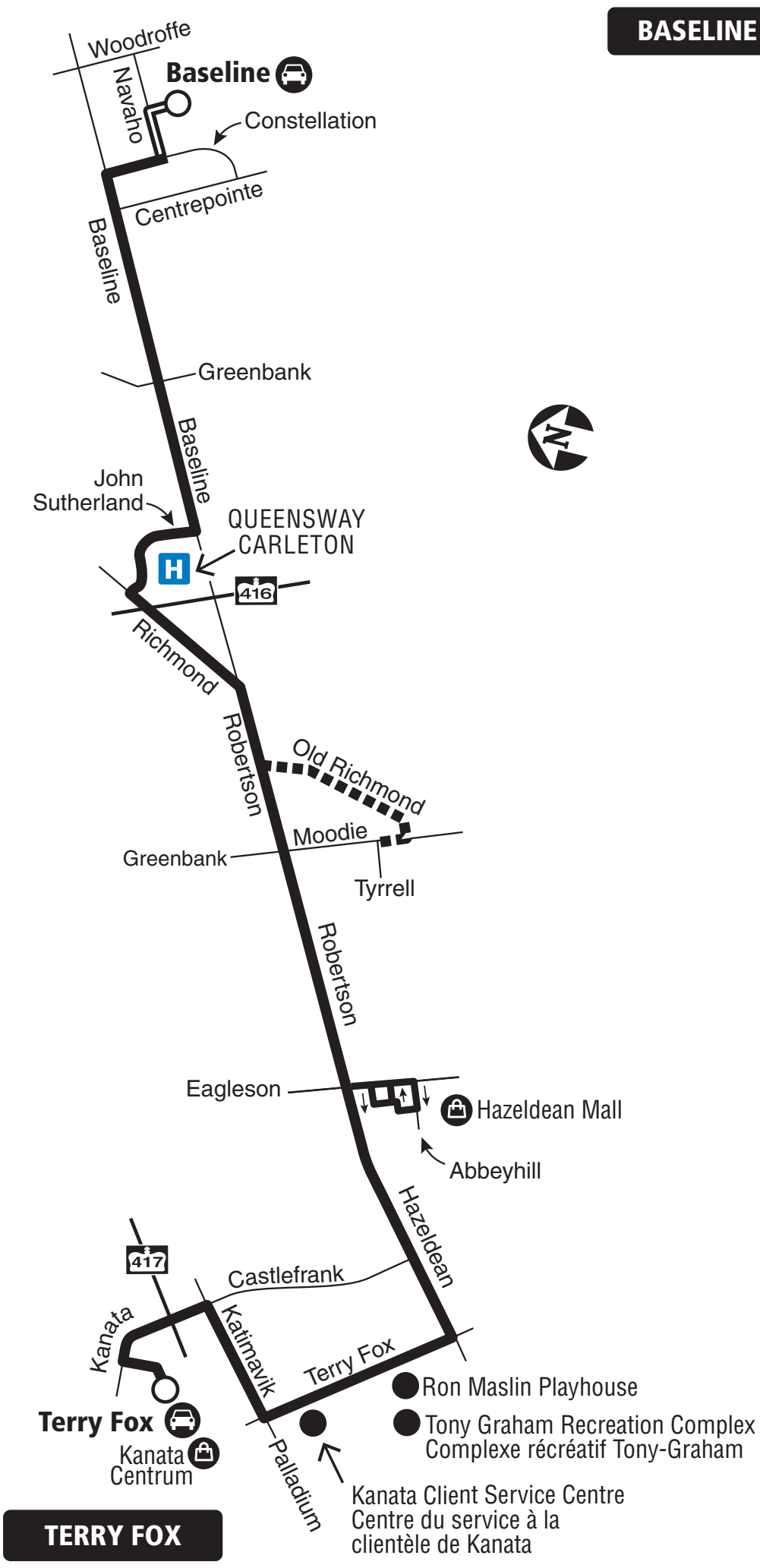
BASELINE

TERRY FOX

7 days a week / 7 jours par semaine

All day service

Service toute la journée



04.2025

- Transitway & Station
- Some trips / Quelques trajets
- Park & Ride / Parc relais
- Shopping Centre / Centre commercial

2025.04

This route starts on April 27, 2025 when the New Ways to Bus network comes into effect.

Ce circuit sera mis en service le 27 avril 2025, lorsque le réseau L'autobus réinventé entrera en vigueur.

Customer Service / Service à la clientèle **613-560-5000**

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OC Transpo **octranspo.com**

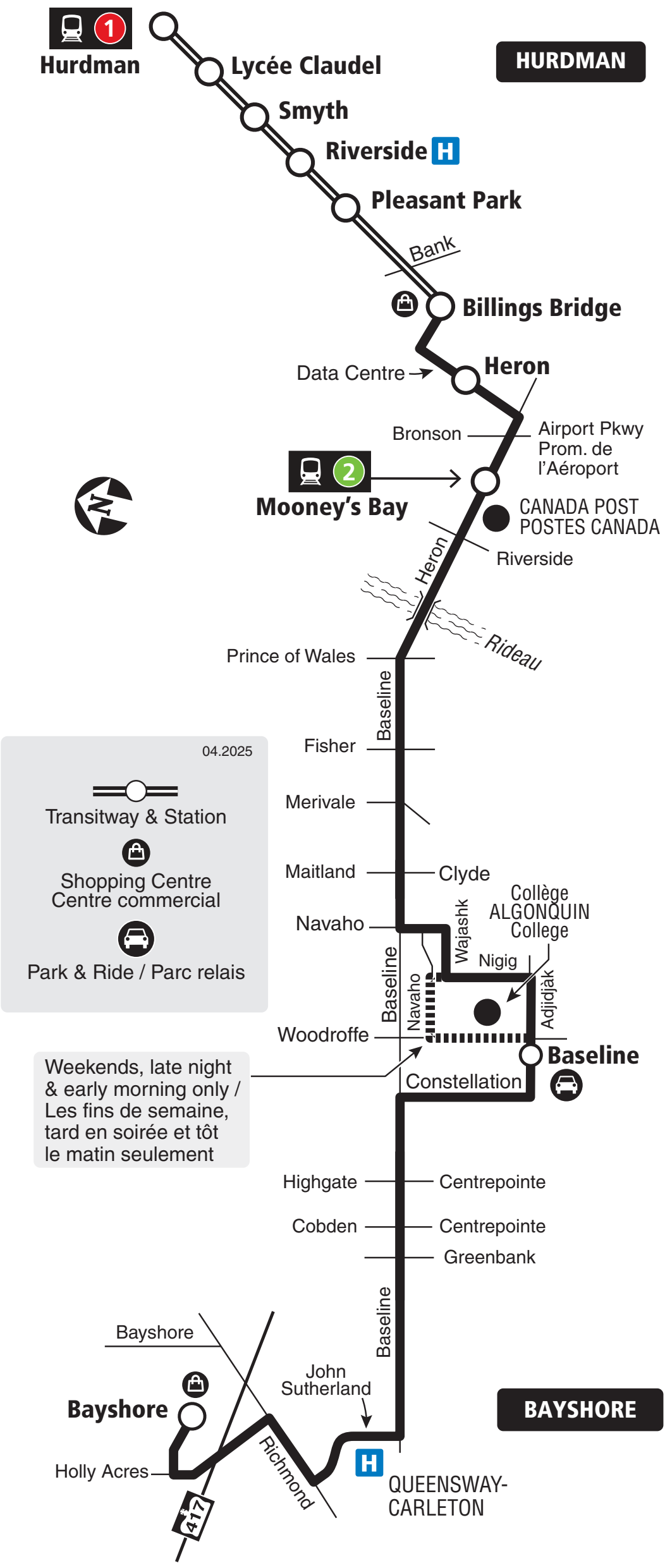
88

Fréquent

HURDMAN
BAYSHORE

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04.2025

Transitway & Station

Shopping Centre
Centre commercial

Park & Ride / Parc relais

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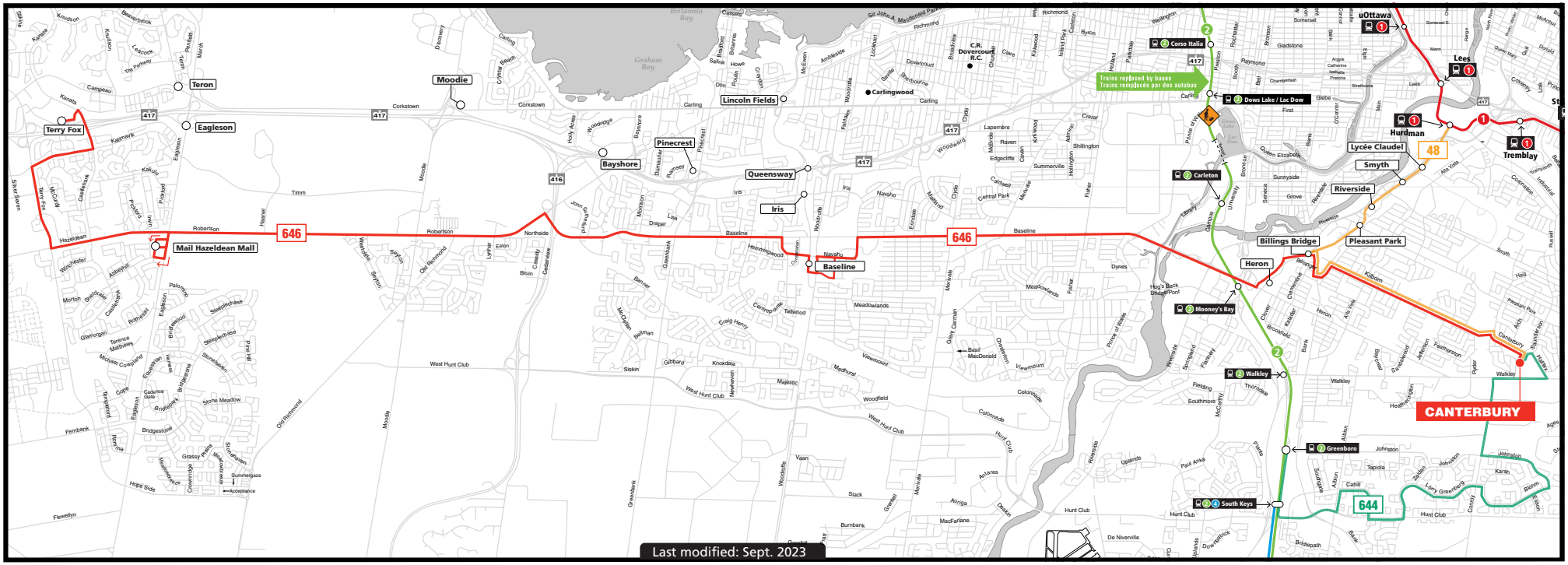
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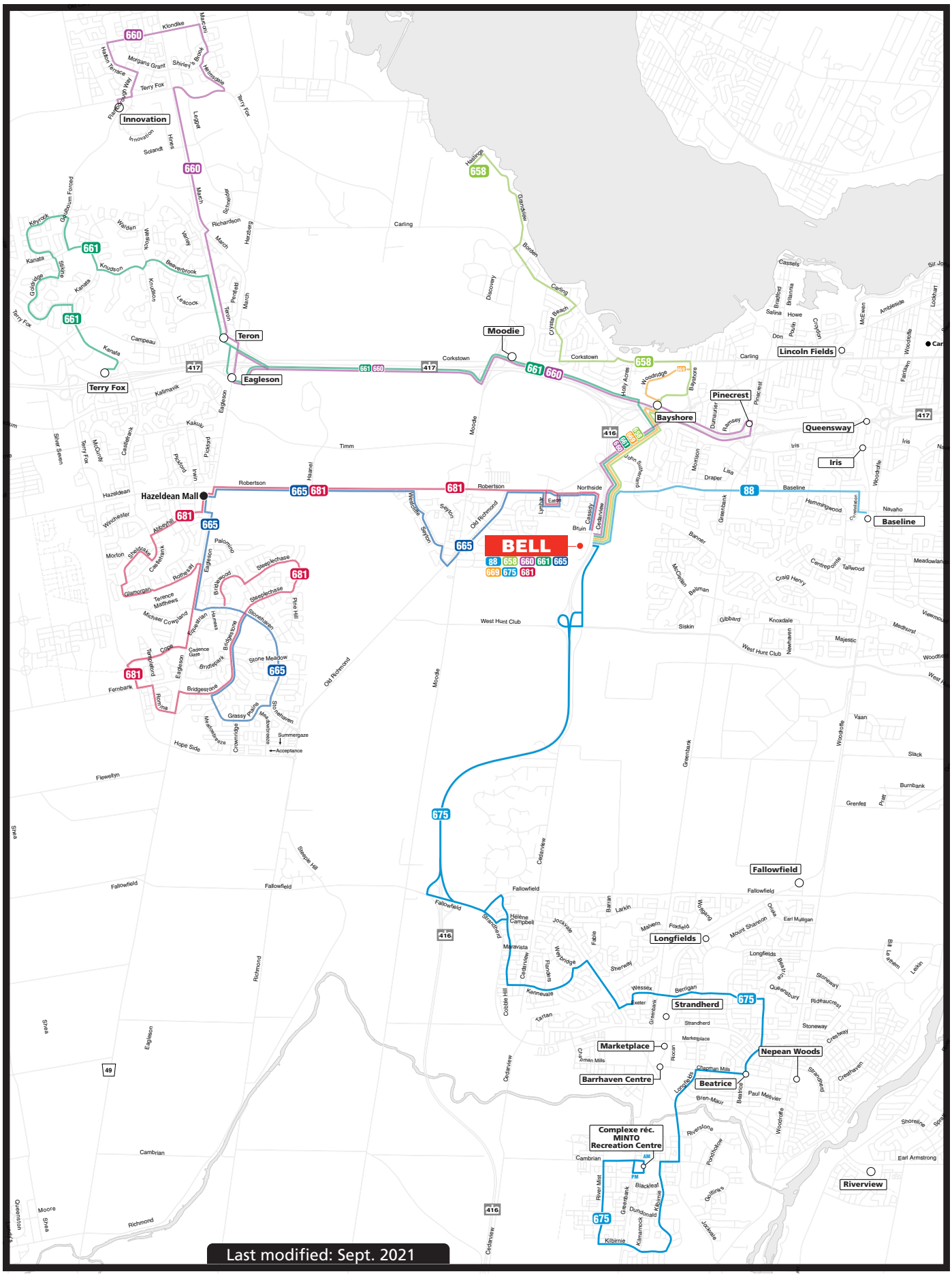
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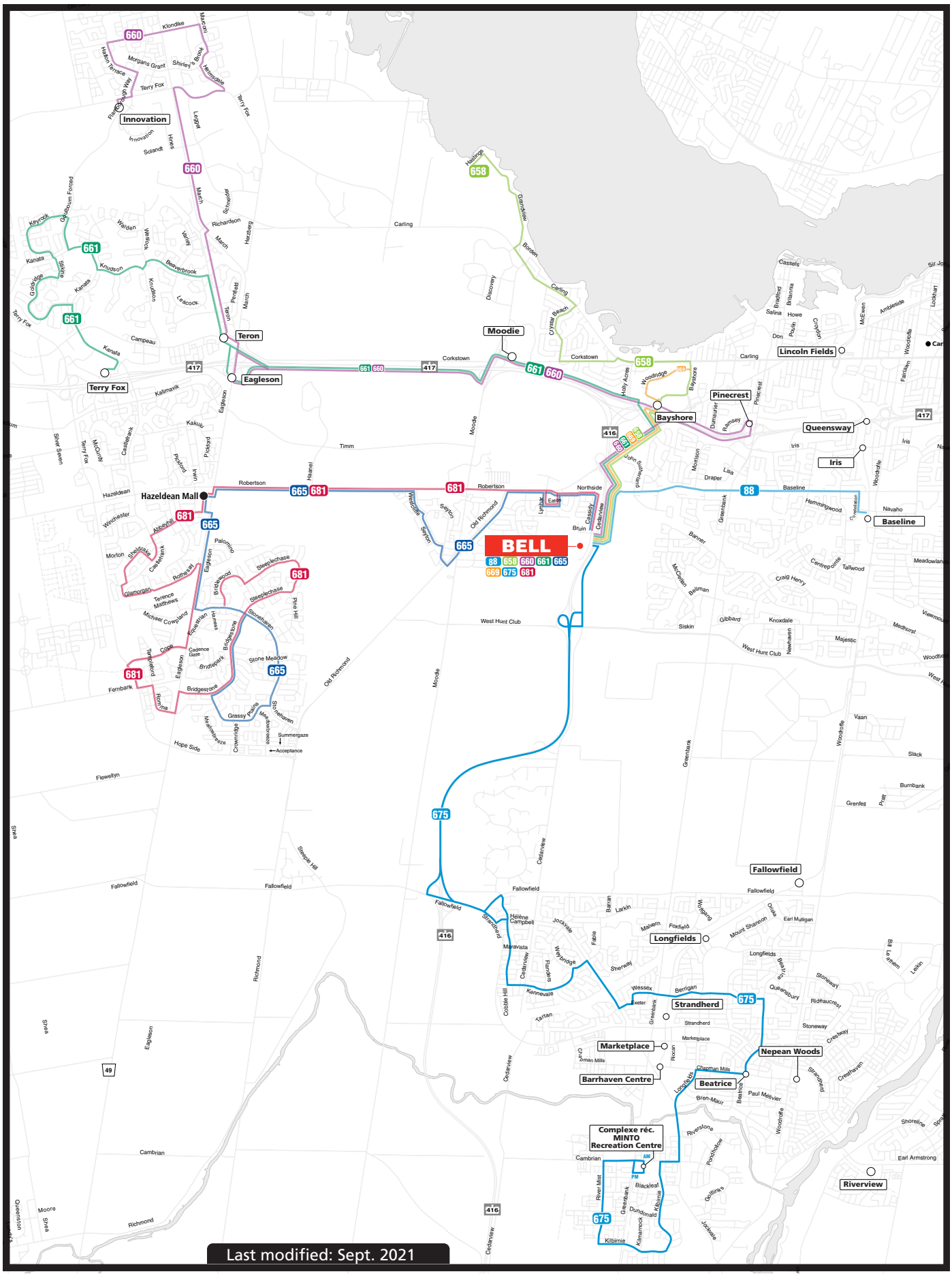
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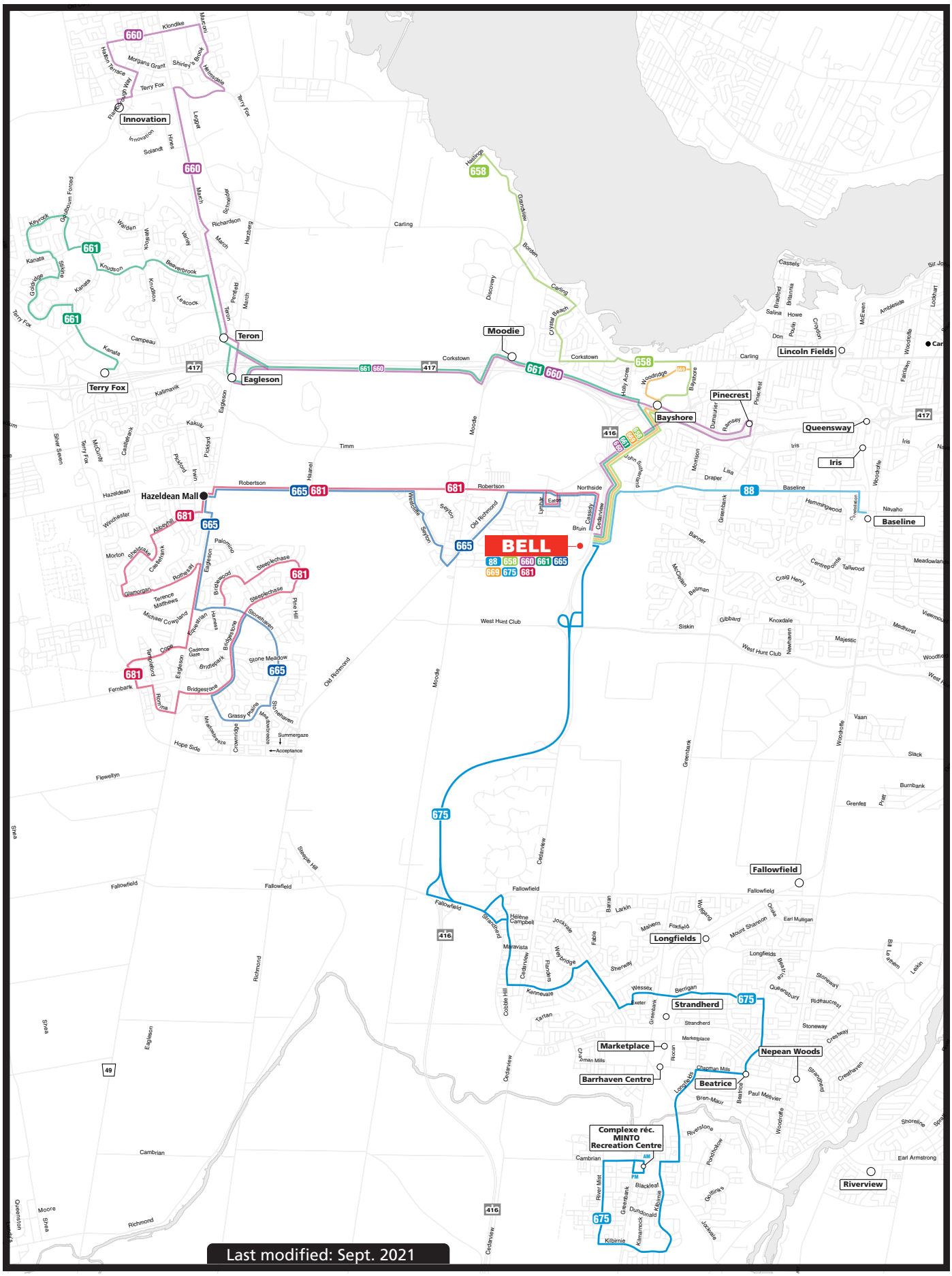
Security / Sécurité **613-741-2478**

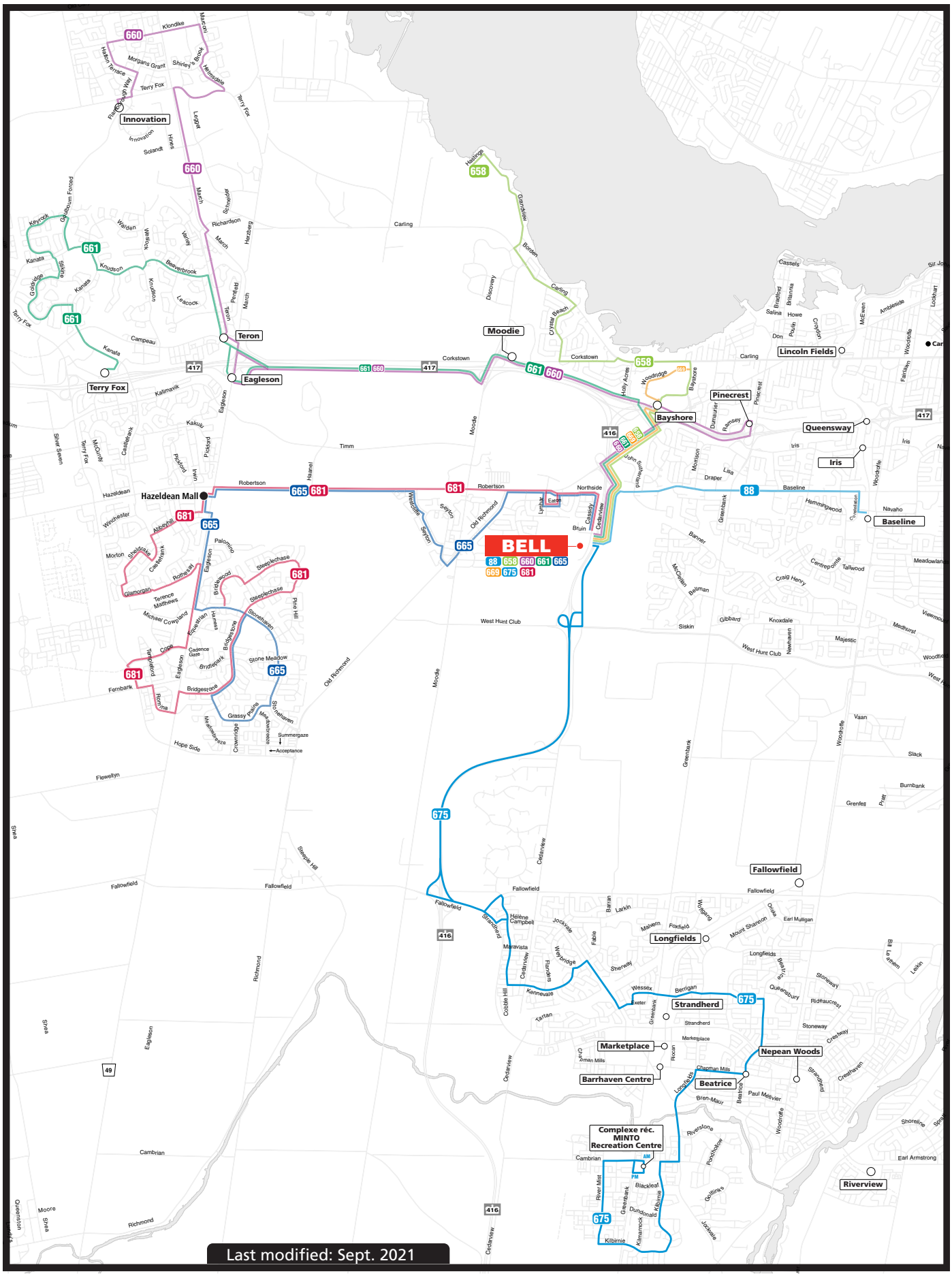
OC Transpo **octranspo.com**


Terry Fox
Eagleson
Teron
Moodie
Corkstown
Lincoln Fields
Carlingwood
Bayshore
Pinecrest
Queensway
Iris
Baseline
Mail Hazeldean Mall
646
417
416
Carling
Dovercourt
C.R. Dovercourt R.C.
Trains replaced by buses
Trains remplacés par des autobus
Corso Italia
Dows Lake / Lac Dow
Carleton
Mooney's Bay
Walkley
Greenboro
South Keys
uOttawa
Lees
Hurdman
Tremblay
Lycée Claudel
Smyth
Riverside
Pleasant Park
Billings Bridge
Heron
48
644
CANTERBURY
Last modified: Sept. 2023


Innovation
Teron
Eagleson
Terry Fox
Moodie
Corkstown
Carling
Lincoln Fields
Pinecrest
Bayshore
Queensway
Iris
Baseline
Navaho
Hazeldean Mall
BELL
88 658 660 661 665
669 675 681
Fallowfield
Longfields
Strandherd
Marketplace
Barrhaven Centre
Nepean Woods
Beatrice
Complexe réc. MINTO Recreation Centre
Riverview
West Hunt Club
Cambrian
Richmond
Last modified: Sept. 2021


Innovation
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Beatrice
Complexe réc. MINTO Recreation Centre
Riverview
West Hunt Club
Cambrian
Richmond
Last modified: Sept. 2021

Outlook

RE: Transit Data Request: QCH (123089)

From Rathwell, Graham <graham.rathwell@ottawa.ca>
Date Tue 4/1/2025 3:09 PM
To Trevor VanWiechen <t.vanwiechen@novatech-eng.com>
Cc Brad Byvelds <B.Byvelds@novatech-eng.com>; Mohammed Talha <m.talha@novatech-eng.com>

Hi Trevor, thanks for your patience. The requested data is provided in the table below.

Stop	Location	Route	Dir	AM (06:00-09:00)			PM (15:00-18:00)			24-hr		
				Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure	Boardings	Alightings	Avg Load at Departure
0727	Queensway Carleton / Irving Greenberg	57	WB	0	3	13	0	0	11	0	6	9
		58	EB	0	1	14	0	0	8	0	1	7
0728	Queensway Carleton / Irving Greenberg	57	EB	0	0	7	4	0	18	5	0	10
		58	WB	0	0	6	2	0	10	2	0	8
0950	Queensway Carleton / Emergency	57	WB	1	16	11	0	4	10	3	28	8
		58	EB	0	5	13	3	1	9	5	6	7
0947	Queensway Carleton / Emergency	57	EB	2	0	7	22	1	17	41	1	10
		58	WB	0	5	6	5	0	9	14	5	7
0946	Baseline / Q.C.H.	57	WB	0	3	11	1	3	10	2	9	8
		88	WB	1	21	28	3	11	25	10	79	21
0941	Baseline / Valley Stream	57	EB	2	0	7	9	0	15	17	1	9
		88	EB	21	5	22	14	4	38	68	13	22

Graham Rathwell

Transit Planner, Network Service Design
Service Planning Branch
Transit Services Department
OC Transpo | City of Ottawa

Classified as City of Ottawa - Internal / Ville d'Ottawa - classé interne

From: Trevor VanWiechen <t.vanwiechen@novatech-eng.com>
Sent: March 31, 2025 11:21 AM
To: Rathwell, Graham <graham.rathwell@ottawa.ca>
Cc: Brad Byvelds <B.Byvelds@novatech-eng.com>; Mohammed Talha <m.talha@novatech-eng.com>
Subject: RE: Transit Data Request: QCH (123089)

Hi Graham,

I wanted to follow up on the below request to see if there has been any progress. If possible, can we get the data ASAP as we are approaching some submission deadlines for this project soon.

Thank you,

Trevor Van Wiechen, P.Eng., Project Engineer | Transportation
NOVATECH
Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200, Ottawa, ON, K2M 1P6 | Tel: 613.254.9643 Ext. 336
The information contained in this email message is confidential and is for exclusive use of the addressee.

From: Trevor VanWiechen
Sent: Tuesday, February 11, 2025 10:11 AM
To: Rathwell, Graham <graham.rathwell@ottawa.ca>
Cc: Brad Byvelds <B.Byvelds@novatech-eng.com>
Subject: Transit Data Request: QCH (123089)

Hi Graham,

I'm preparing a transportation Study at the Queensway Carleton Hospital. The study area is generally bound by:

- Richmond Road/Robertson Road to the west;
- Baseline Road, Valley Stream Drive, and Cedarview Road to the south; and
- John Sutherland Drive.

To understand the modal share of transit users travelling to and from the hospital I would like to request the peak period boarding/alighting/average load at departure information for the nearby stops. Please let me know if you think there are any additional existing or planned stops that should be considered.

Stops that I think are relevant include: 0727, 0728, 0941, 0946, 0947, 0950

Appendix D: Traffic Count Data

Transportation Services - Traffic Services

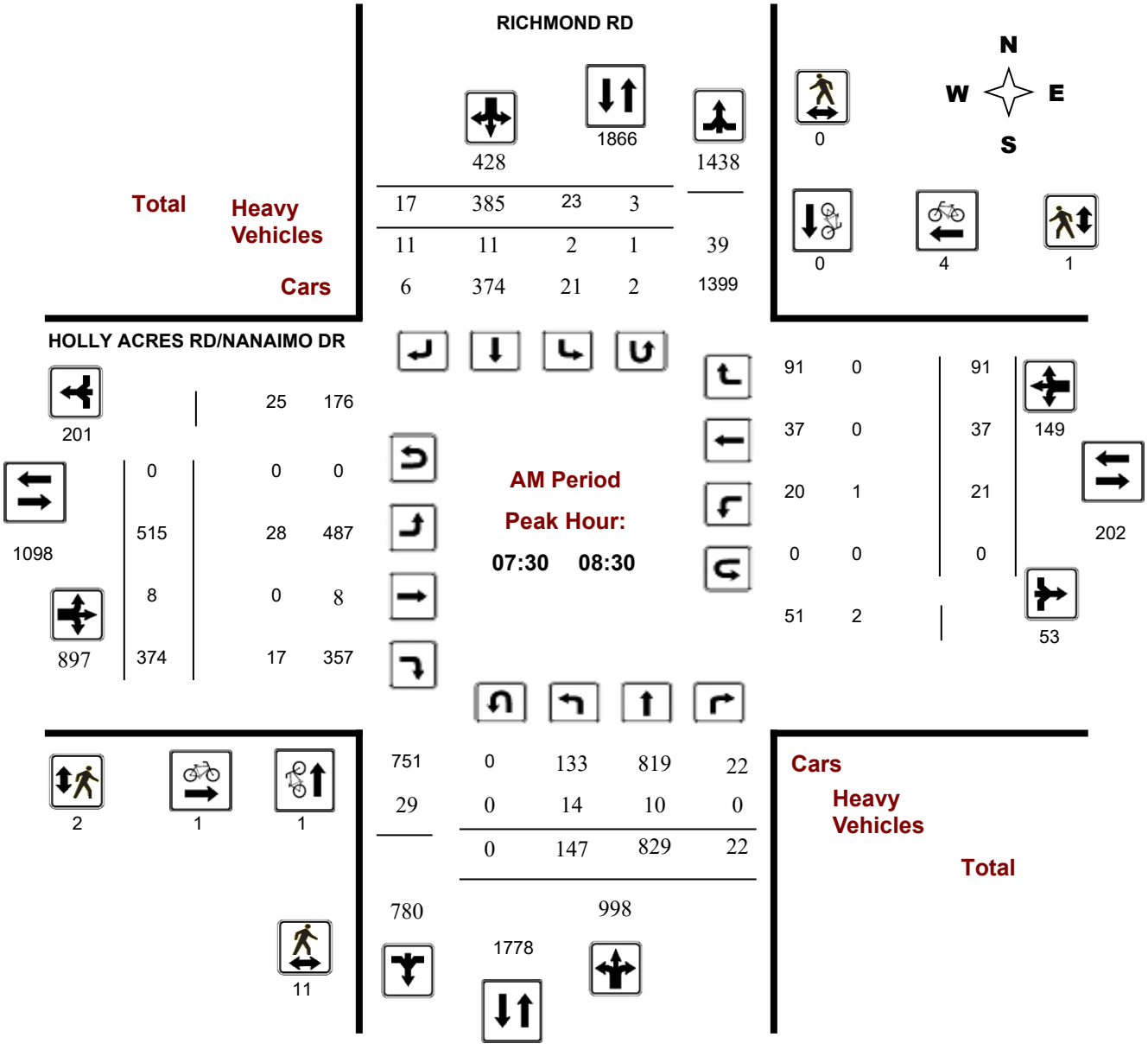
Turning Movement Count - Study Results

RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Survey Date: Thursday, May 01, 2025 **WO No:** 42876

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

AM Period Peak Hour Diagram



Transportation Services - Traffic Services

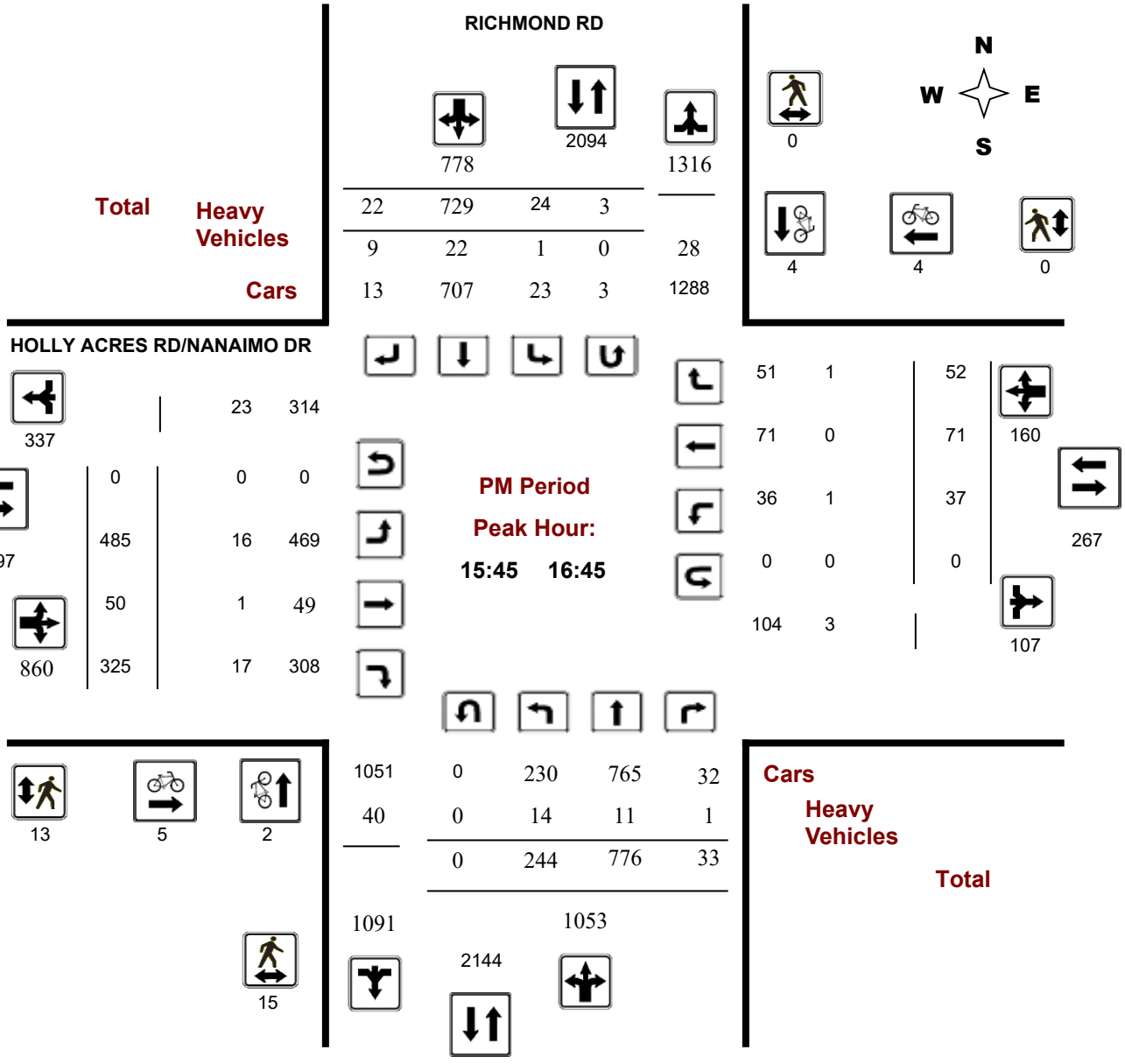
Turning Movement Count - Study Results

RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Survey Date: Thursday, May 01, 2025 **WO No:** 42876

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

PM Period Peak Hour Diagram

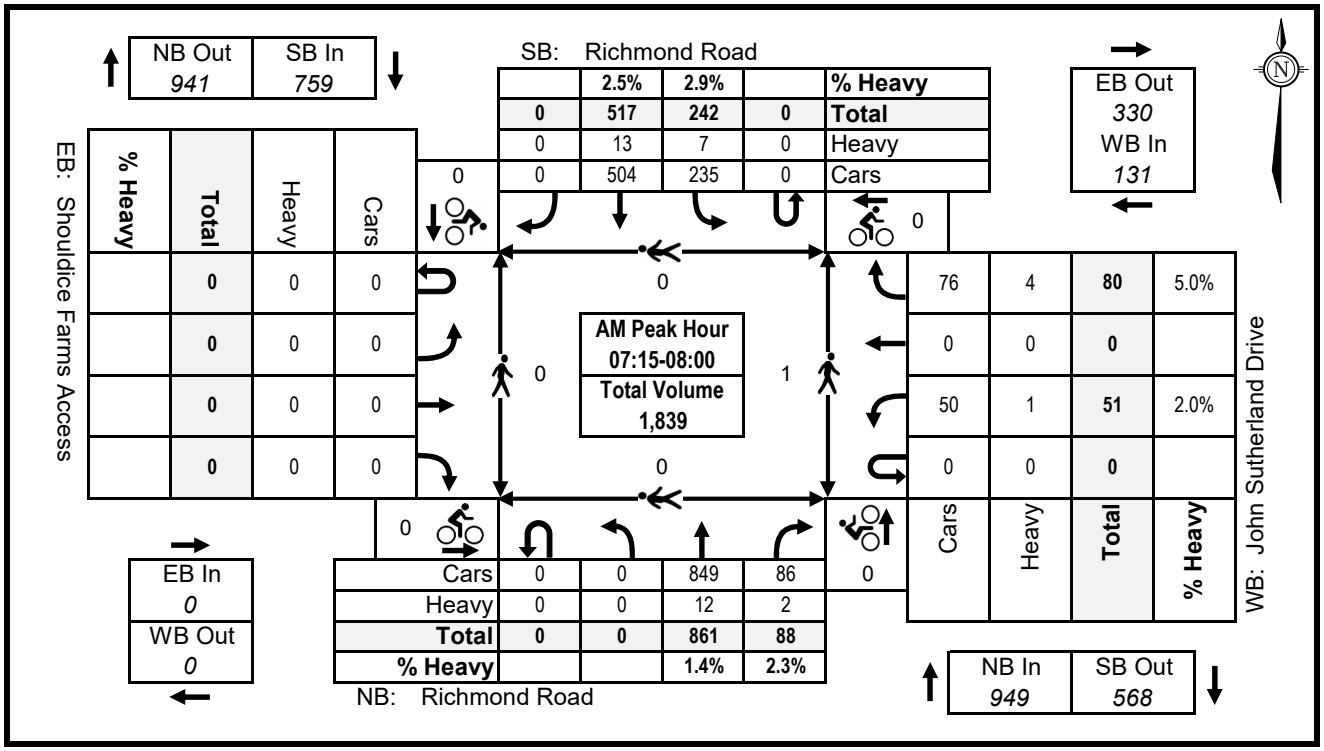


NOVATECH
Engineers, Planners & Landscape Architects

Richmond Road & John Sutherland Drive

TURNING MOVEMENT COUNT
PEAK HOUR SUMMARIES

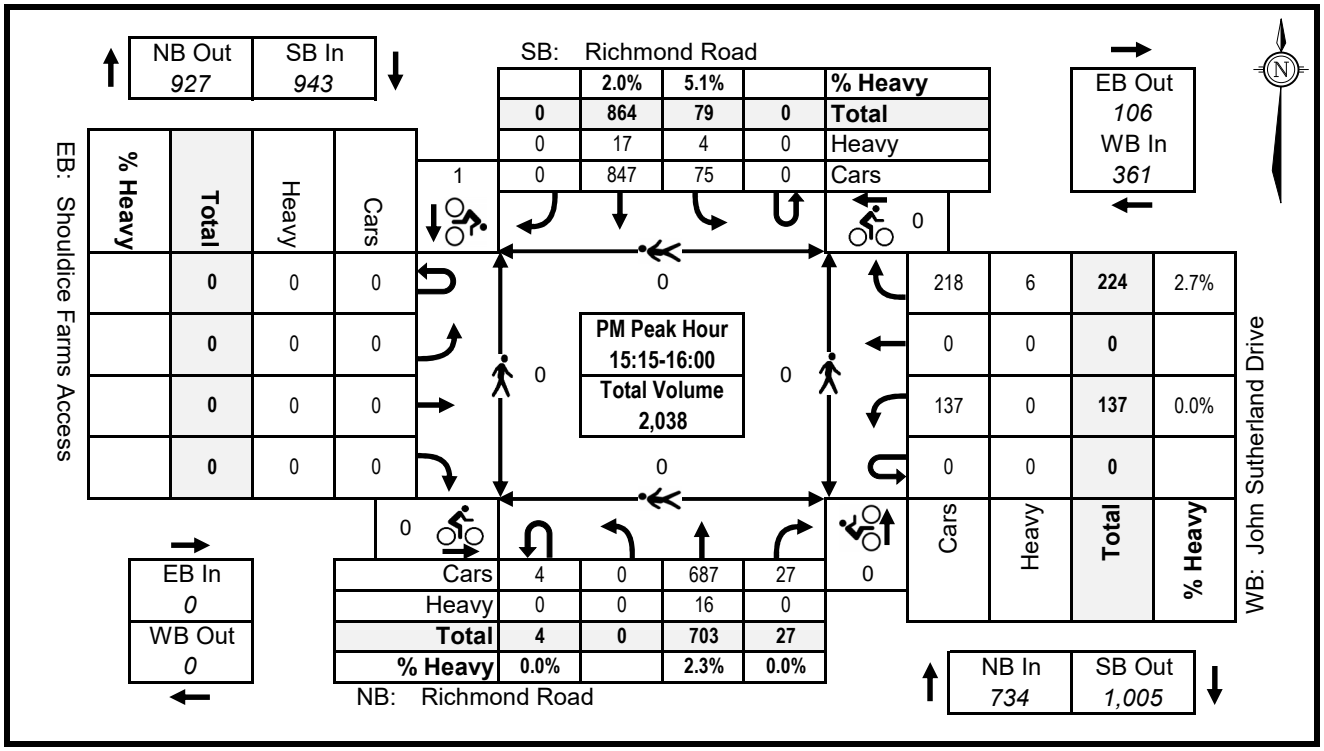
Date: Wednesday, March 05, 2025
Survey Hours: 07:00-10:00, 11:30-13:30, 15:00-18:00
Surveyor(s): Joshua Morris & Bob Cameron



		2.5%	2.9%		% Heavy
	0	517	242	0	Total
	0	13	7	0	Heavy
	0	504	235	0	Cars

% Heavy	Total	Heavy	Cars				
	0	0	0	76	4	80	5.0%
	0	0	0	0	0	0	
	0	0	0	50	1	51	2.0%
	0	0	0	0	0	0	

Cars	0	0	849	86	0
Heavy	0	0	12	2	
Total	0	0	861	88	
% Heavy			1.4%	2.3%	



		2.0%	5.1%		% Heavy
	0	864	79	0	Total
	0	17	4	0	Heavy
	0	847	75	0	Cars

% Heavy	Total	Heavy	Cars				
	0	0	0	218	6	224	2.7%
	0	0	0	0	0	0	
	0	0	0	137	0	137	0.0%
	0	0	0	0	0	0	

Cars	4	0	687	27	0
Heavy	0	0	16	0	
Total	4	0	703	27	
% Heavy	0.0%		2.3%	0.0%	

Transportation Services - Traffic Services

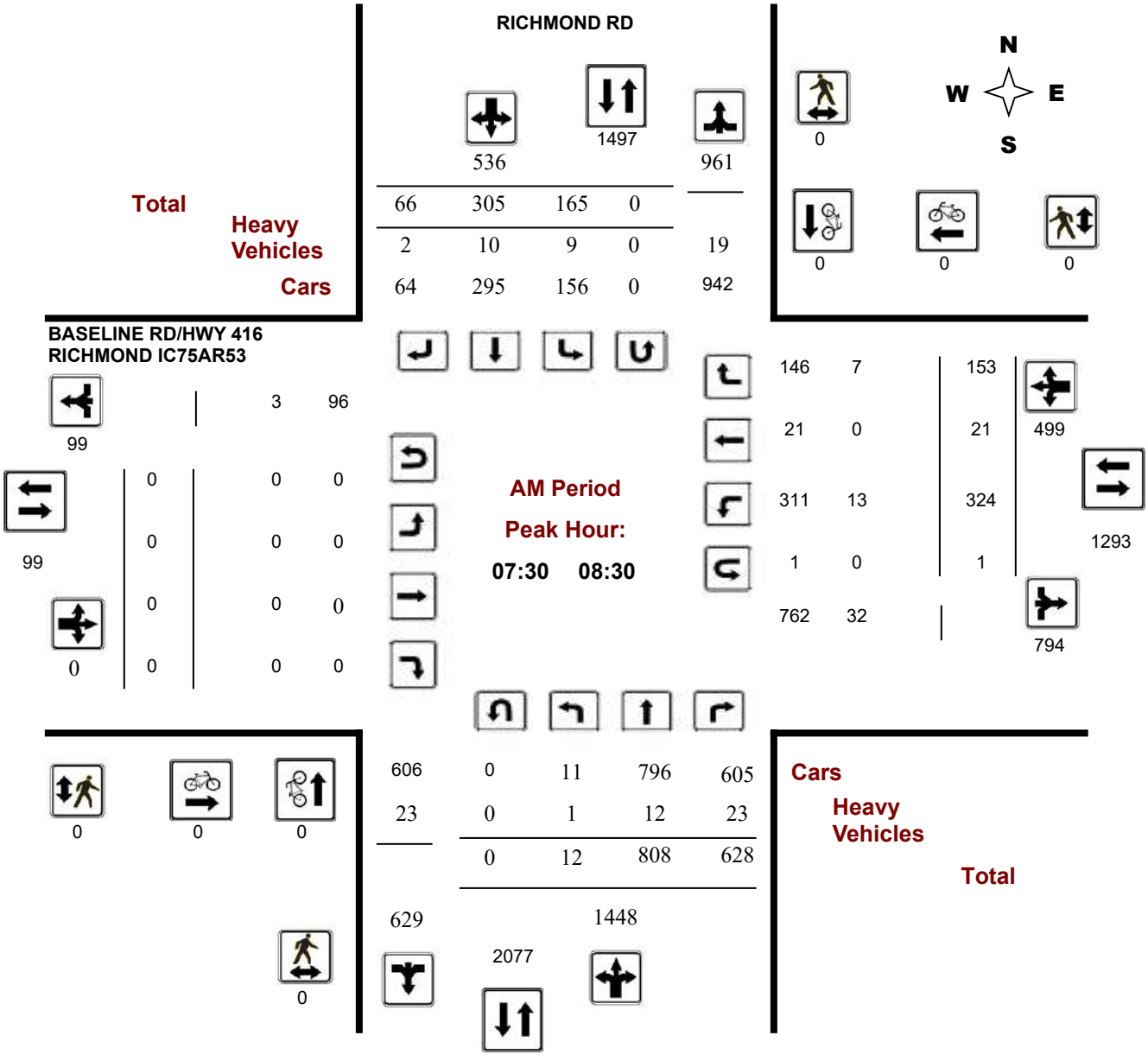
Turning Movement Count - Study Results

BASELINE RD/HWY 416 RICHMOND IC75AR53 @ RICHMOND RD

Survey Date: Tuesday, February 13, 2024 **WO No:** 42074

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

AM Period Peak Hour Diagram



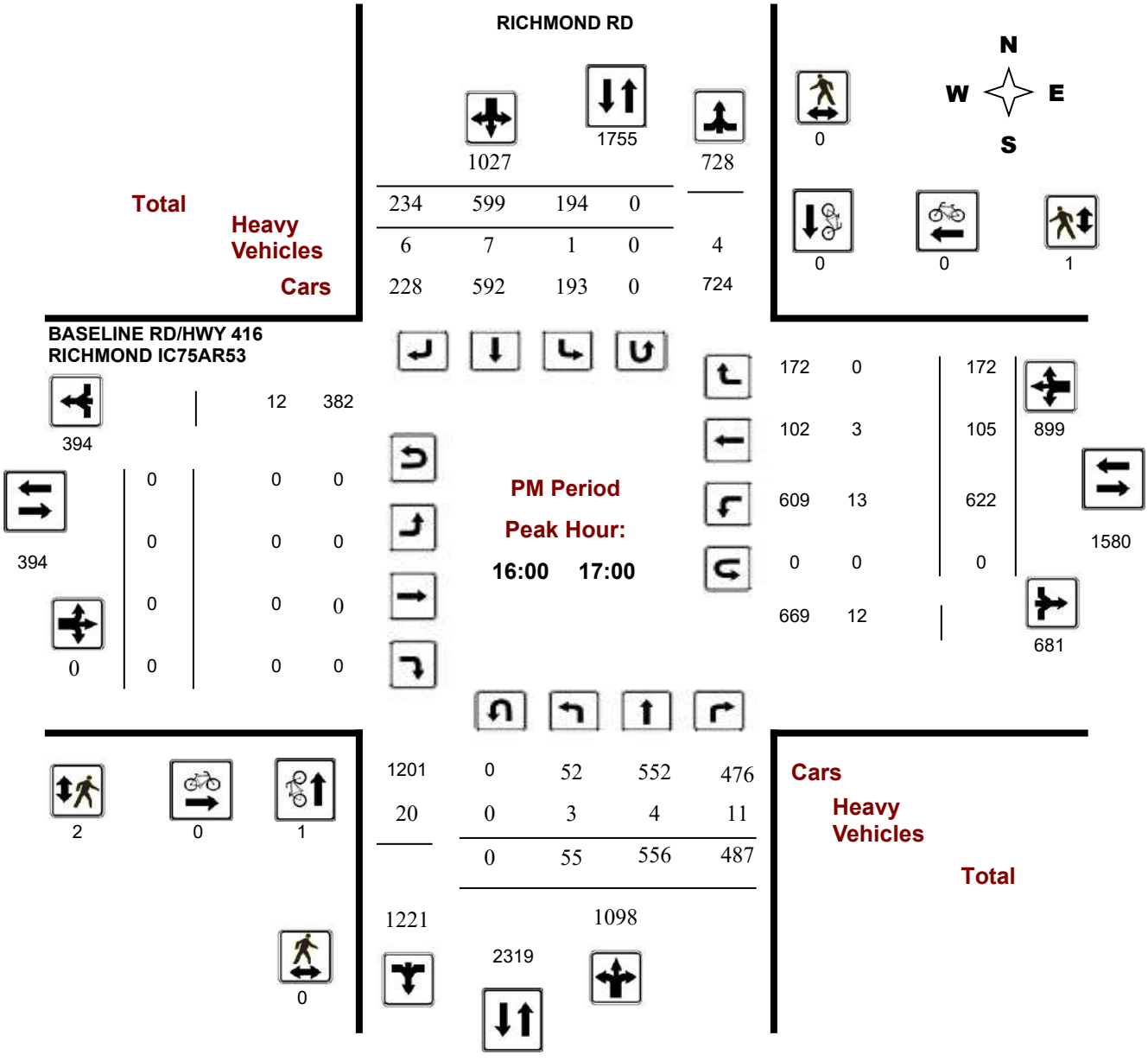
Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD/HWY 416 RICHMOND IC75AR53 @ RICHMOND RD

Survey Date: Tuesday, February 13, 2024
Start Time: 07:00
WO No: 42074
Device: Miovision

PM Period Peak Hour Diagram

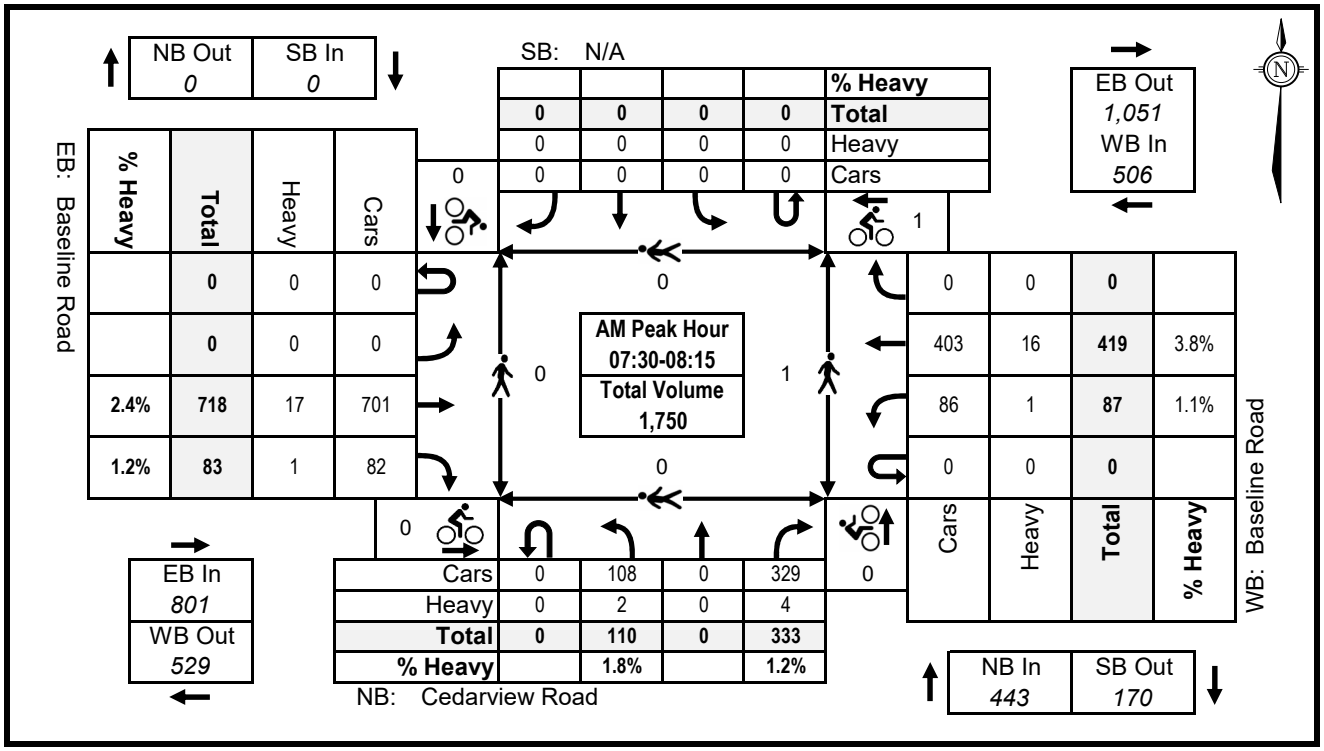


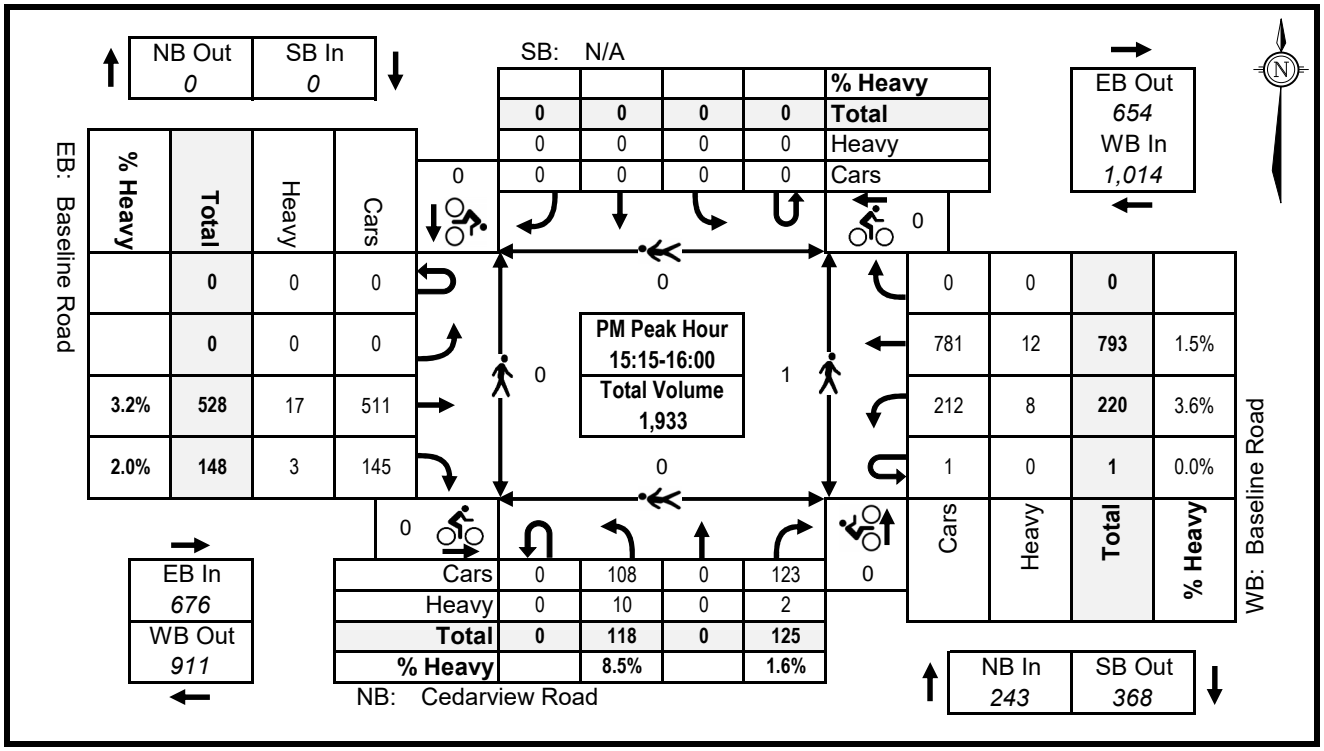
NOVATECH
Engineers, Planners & Landscape Architects

Baseline & Cedarview

TURNING MOVEMENT COUNT
PEAK HOUR SUMMARIES

Date: Wednesday, March 05, 2025
Survey Hours: 07:00-10:00, 11:30-13:30, 15:00-18:00
Surveyor(s): Joshua Morris and Bob Cameron





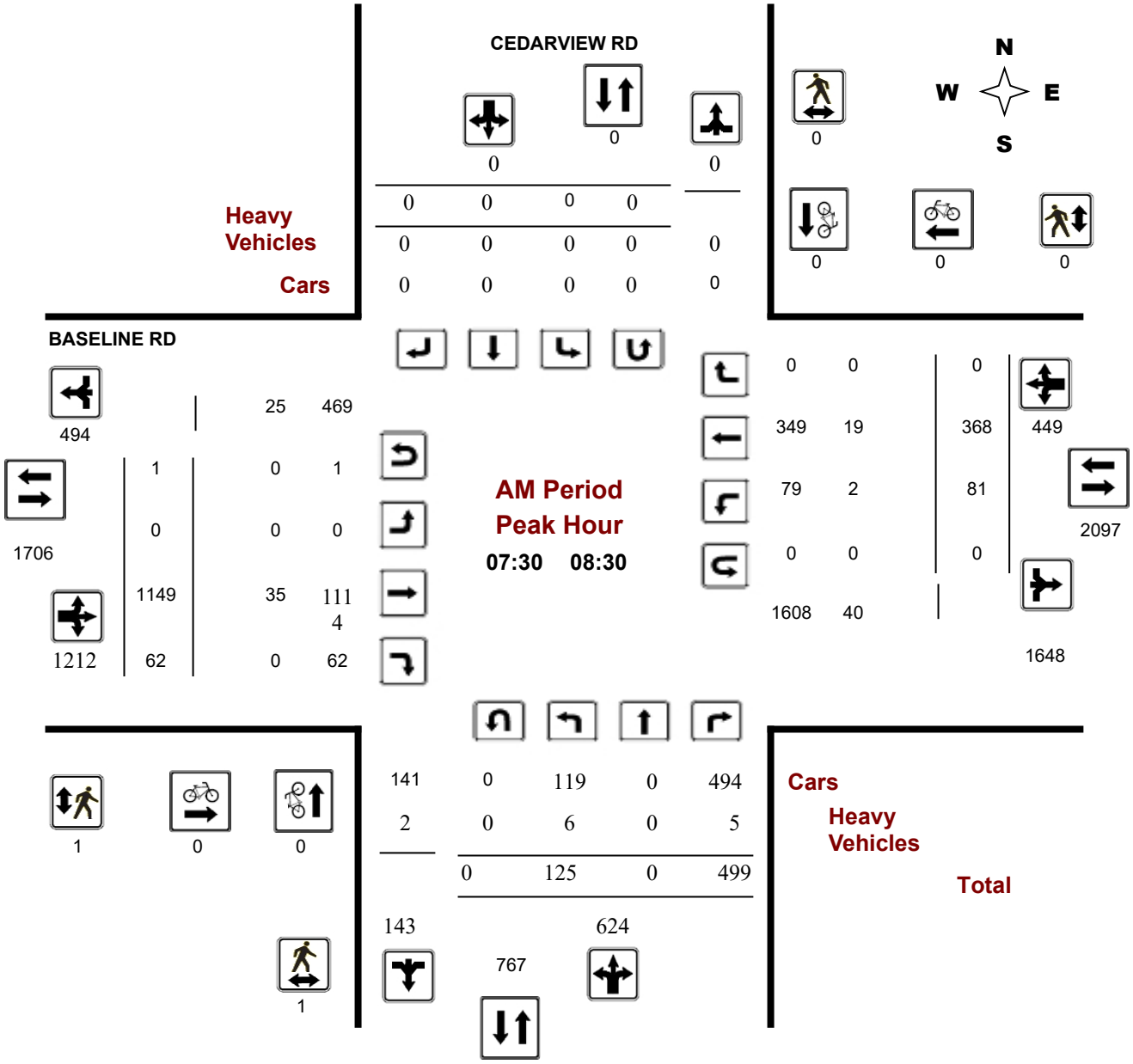
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BASELINE RD @ CEDARVIEW RD

Survey Date: Tuesday, January 15, 2019 **WO No:** 38256

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



Comments

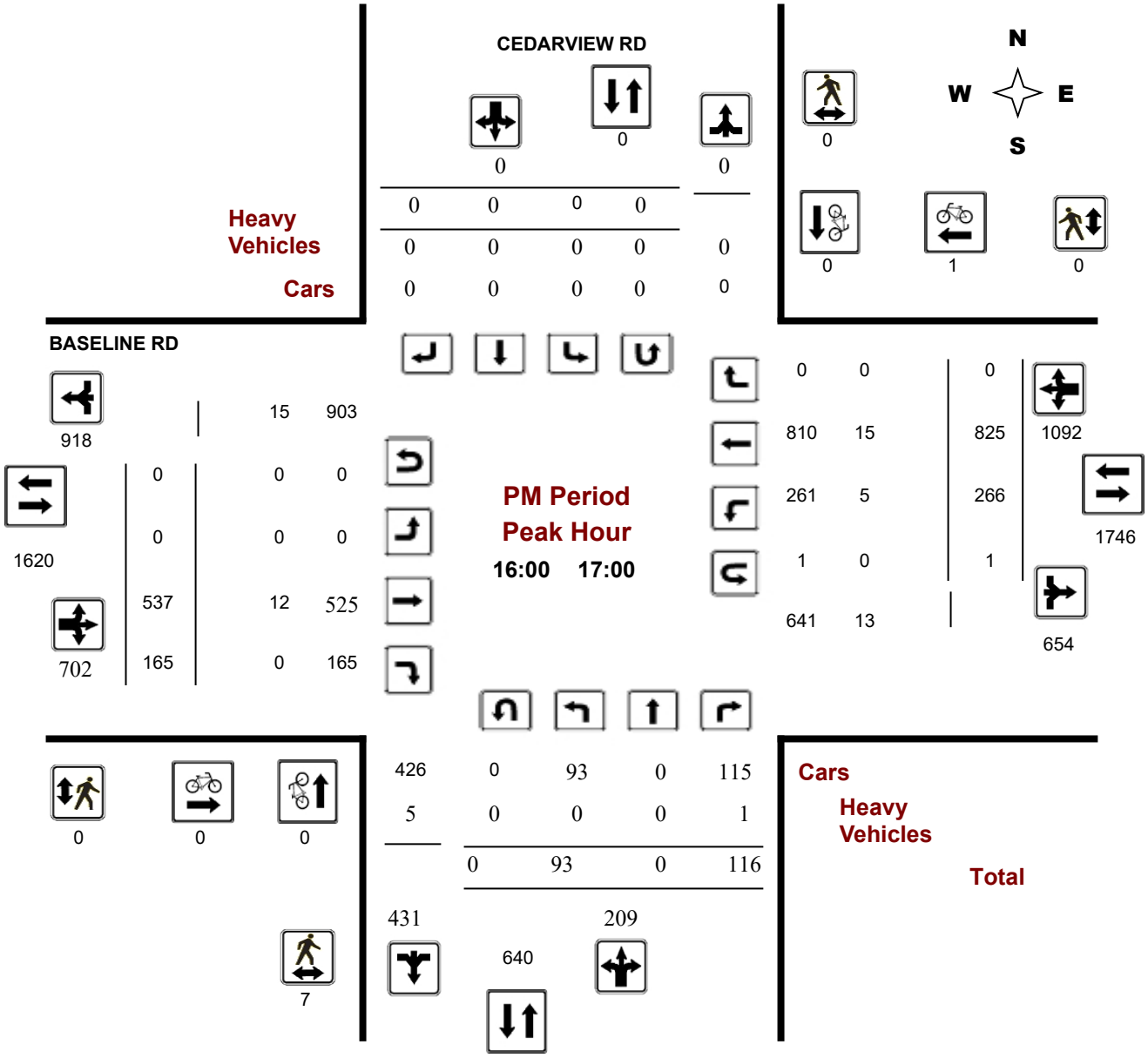
Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

BASELINE RD @ CEDARVIEW RD

Survey Date: Tuesday, January 15, 2019 **WO No:** 38256

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



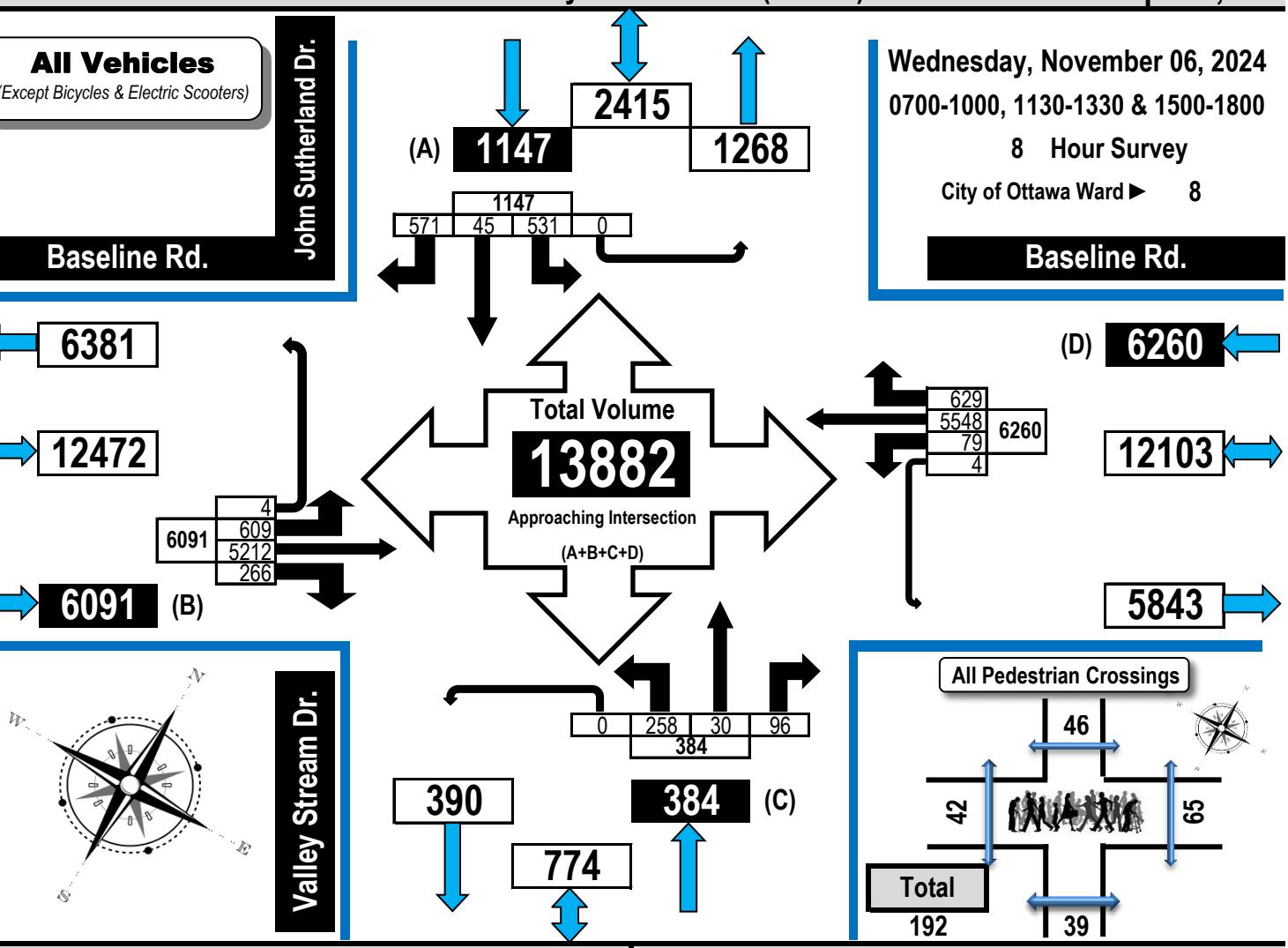
Comments

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

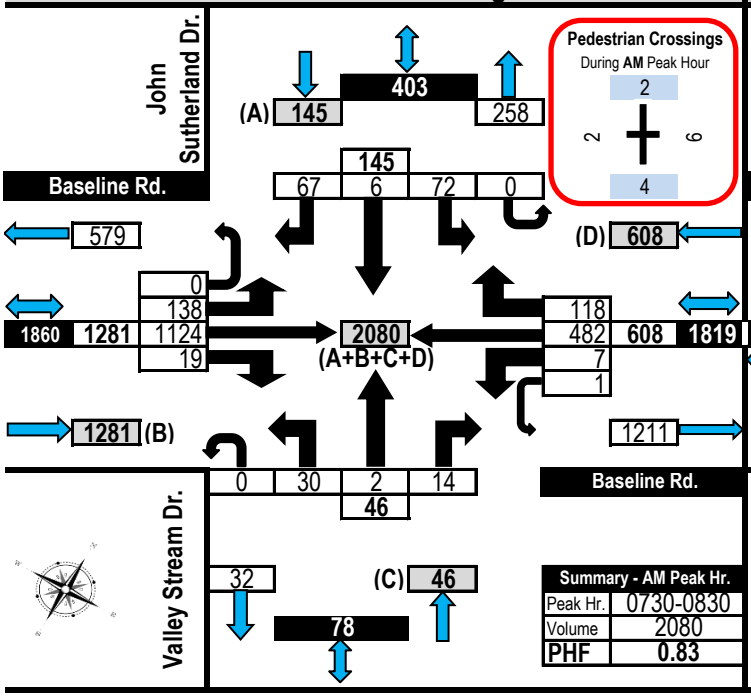
Baseline Road & John Sutherland Drive/Valley Stream Drive (Loc 01) — **Nepean, ON**

All Vehicles
(Except Bicycles & Electric Scooters)

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8

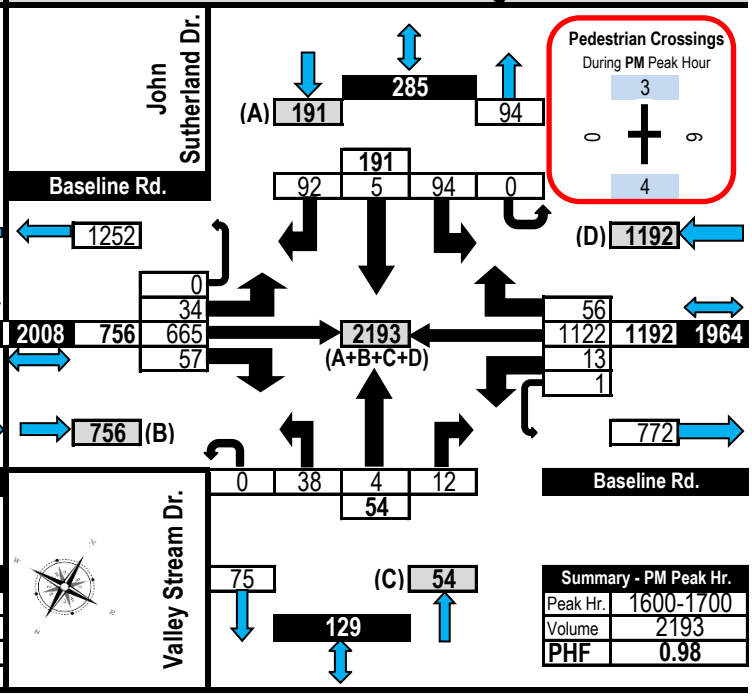


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0730-0830
Volume	2080
PHF	0.83

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1600-1700
Volume	2193
PHF	0.98

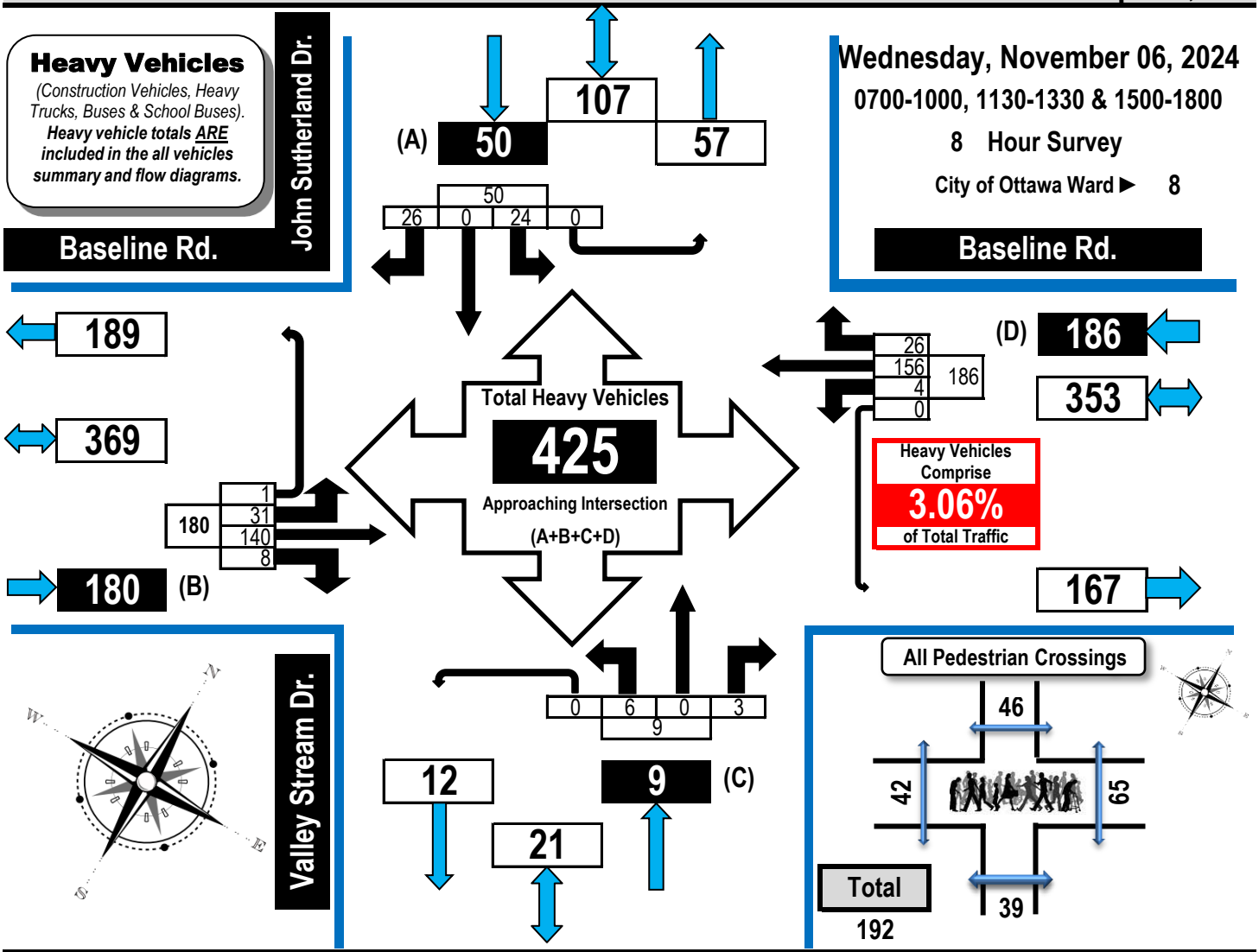
Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram



Baseline Road & John Sutherland Drive/Valley Stream Drive (Loc 01) — **Nepean, ON**

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

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8



	Baseline Rd.					Baseline Rd.					Valley Stream Dr.					John Sutherland Dr.					
	Eastbound					Westbound					Northbound					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	5	37	3	0	45	1	13	3	0	17	0	0	1	0	1	5	0	4	0	9	72
0800-0900	2	24	1	0	27	0	18	3	0	21	1	0	0	0	1	2	0	6	0	8	57
0900-1000	7	15	0	1	23	0	21	2	0	23	1	0	1	0	2	5	0	3	0	8	56
1130-1230	1	12	1	0	14	0	21	4	0	25	1	0	1	0	2	2	0	2	0	4	45
1230-1330	3	15	2	0	20	3	23	4	0	30	2	0	0	0	2	2	0	3	0	5	57
1500-1600	4	20	1	0	25	0	27	2	0	29	1	0	0	0	1	2	0	2	0	4	59
1600-1700	4	12	0	0	16	0	17	4	0	21	0	0	0	0	0	4	0	4	0	8	45
1700-1800	5	5	0	0	10	0	16	4	0	20	0	0	0	0	0	2	0	2	0	4	34
Totals	**31**	**140**	**8**	**1**	**180**	**4**	**156**	**26**	**0**	**186**	**6**	**0**	**3**	**0**	**9**	**24**	**0**	**26**	**0**	**50**	**425**

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 51.29% of the heavy vehicle traffic. Many pedestrians crossing Baseline Road do so on red with some having to stop on the narrow median before completing their crossing.

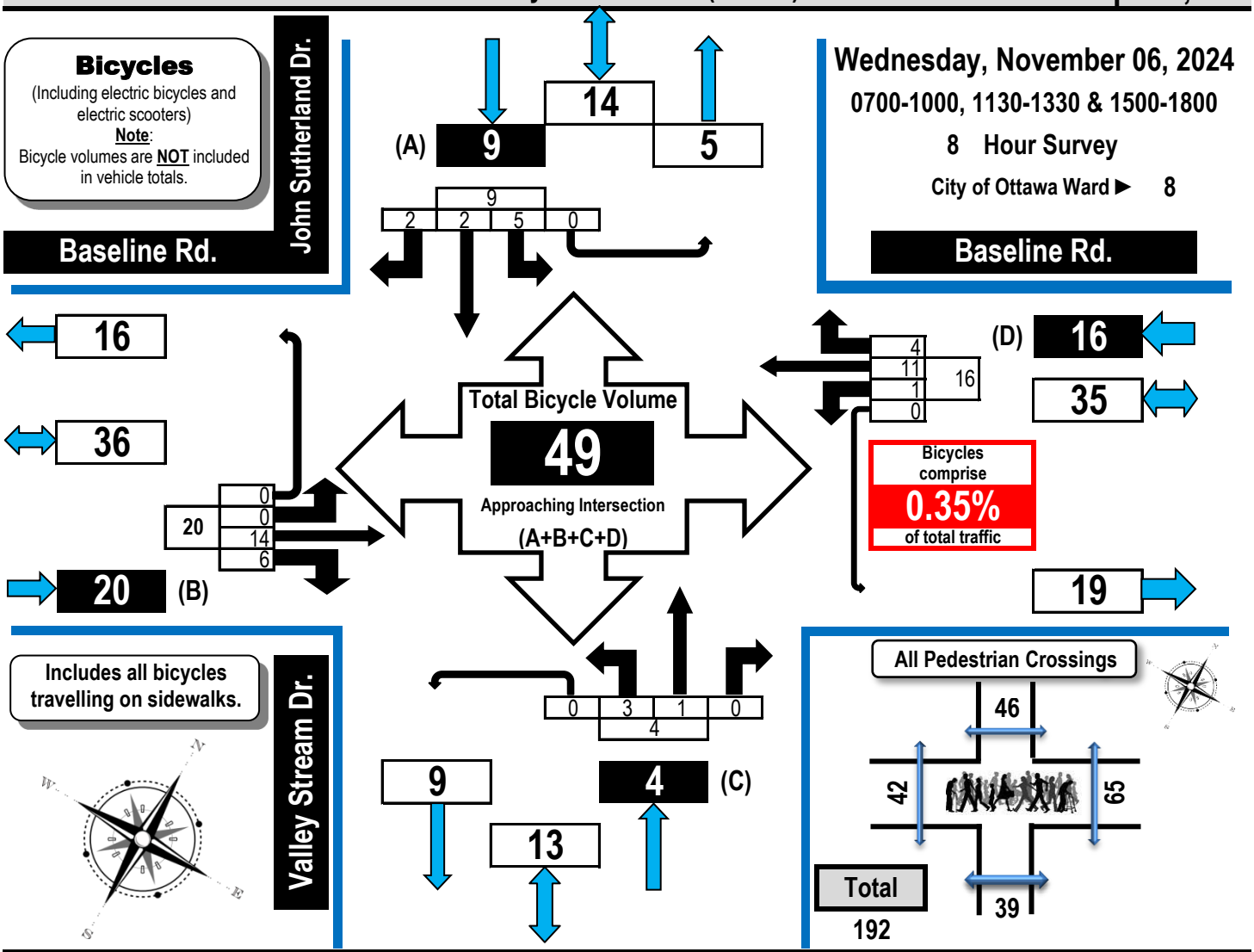
Turning Movement Count
Bicycle Summary
Flow Diagram



Baseline Road & John Sutherland Drive/Valley Stream Drive (Loc 01) — **Nepean, ON**

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are NOT included in vehicle totals.

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8



	Baseline Rd. Eastbound					Baseline Rd. Westbound					Valley Stream Dr. Northbound					John Sutherland Dr. 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	1	0	0	1	0	4	2	0	6	2	0	0	0	2	0	0	0	0	0	9
0800-0900	0	2	0	0	2	0	0	0	0	0	1	1	0	0	2	0	1	0	0	1	5
0900-1000	0	2	0	0	2	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	4
1130-1230	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1230-1330	0	0	1	0	1	0	1	1	0	2	0	0	0	0	0	1	1	0	0	2	5
1500-1600	0	2	2	0	4	1	1	0	0	2	0	0	0	0	0	3	0	0	0	3	9
1600-1700	0	4	1	0	5	0	3	0	0	3	0	0	0	0	0	1	0	2	0	3	11
1700-1800	0	2	2	0	4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	5
Totals	0	14	6	0	20	1	11	4	0	16	3	1	0	0	4	5	2	2	0	9	49

Comments:
OC Transpo and Para Transpo buses, private buses and school buses comprise 51.29% of the heavy vehicle traffic. Many pedestrians crossing Baseline Road do so on red with some having to stop on the narrow median before completing their crossing.

Transportation Services - Traffic Services

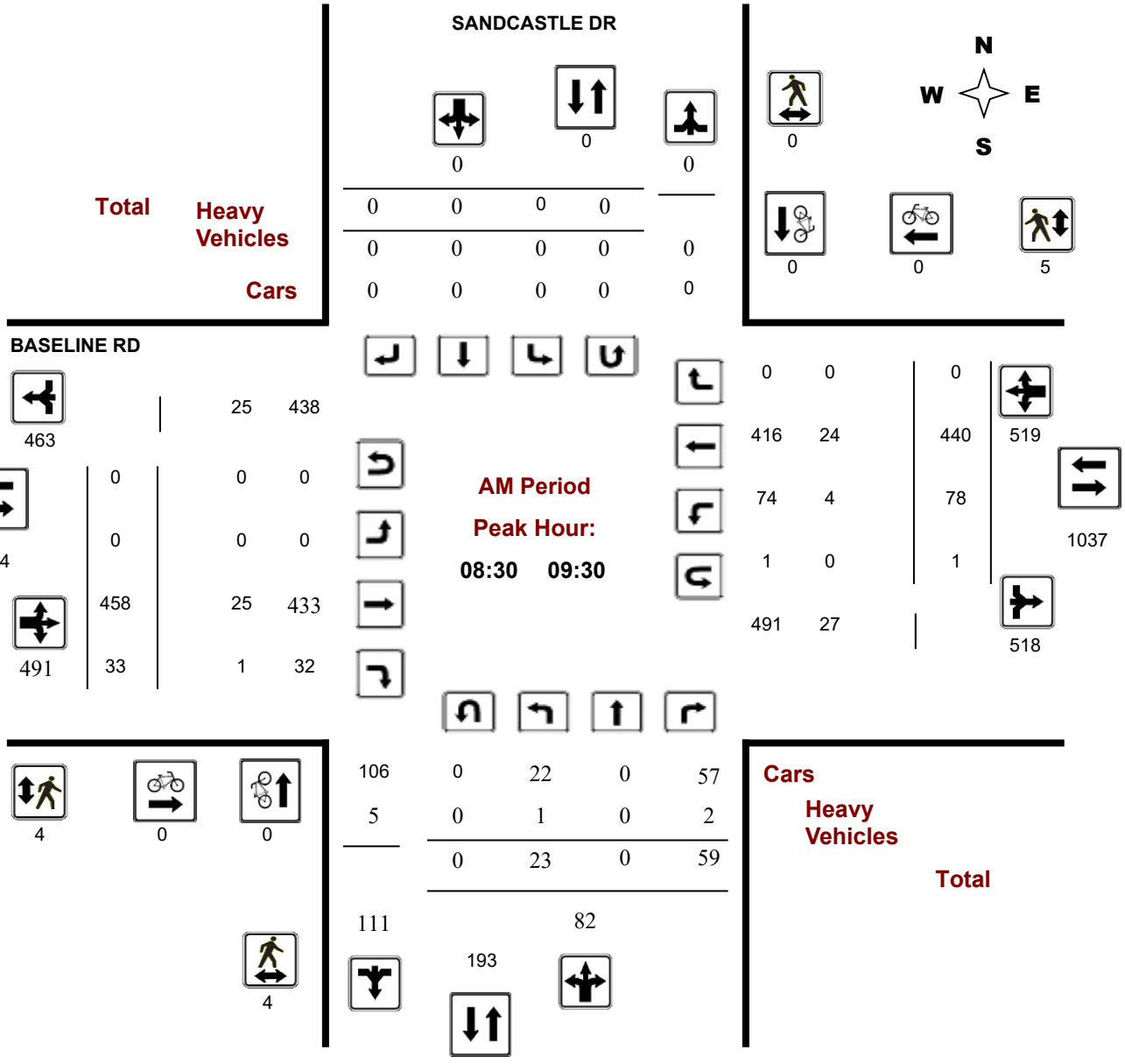
Turning Movement Count - Study Results

BASELINE RD @ SANDCASTLE DR

Survey Date: Thursday, February 03, 2022 **WO No:** 40081

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

AM Period Peak Hour Diagram



Transportation Services - Traffic Services

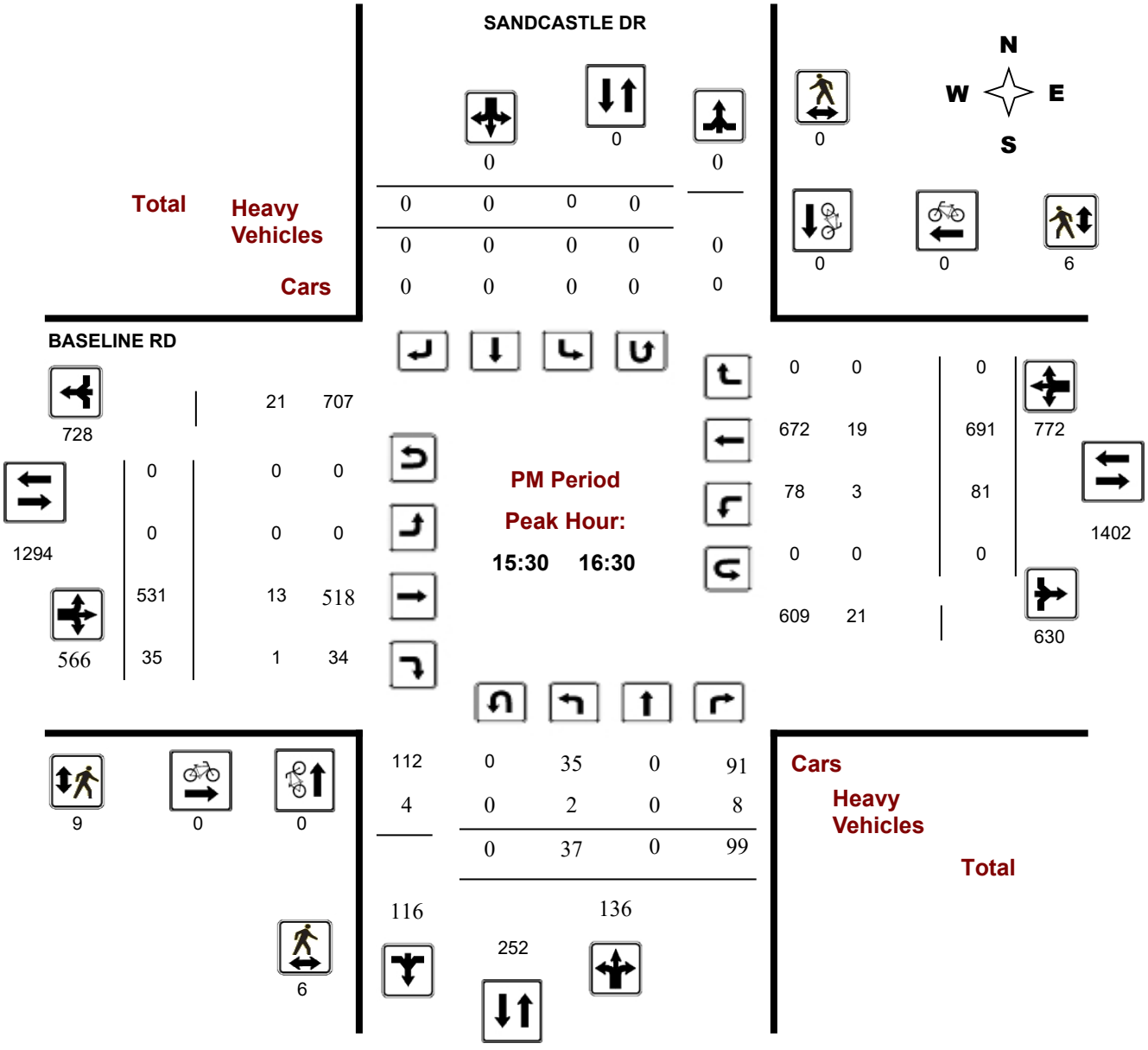
Turning Movement Count - Study Results

BASELINE RD @ SANDCASTLE DR

Survey Date: Thursday, February 03, 2022 **WO No:** 40081

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

PM Period Peak Hour Diagram



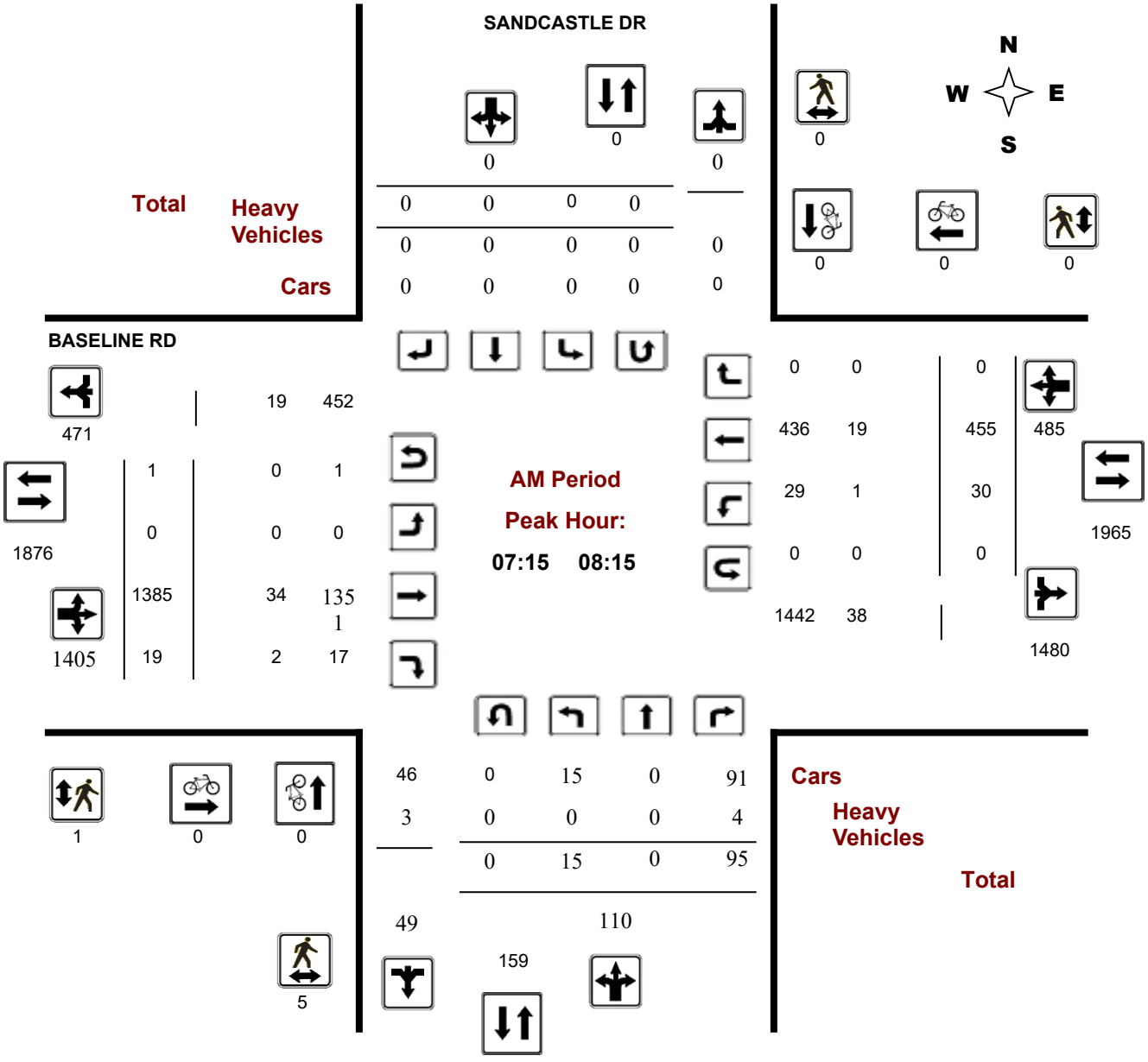
Transportation Services - Traffic Services

Turning Movement Count - Study Results

BASELINE RD @ SANDCASTLE DR

Survey Date: Thursday, January 12, 2017
Start Time: 07:00
WO No: 36634
Device: Miovision

AM Period Peak Hour Diagram



Transportation Services - Traffic Services

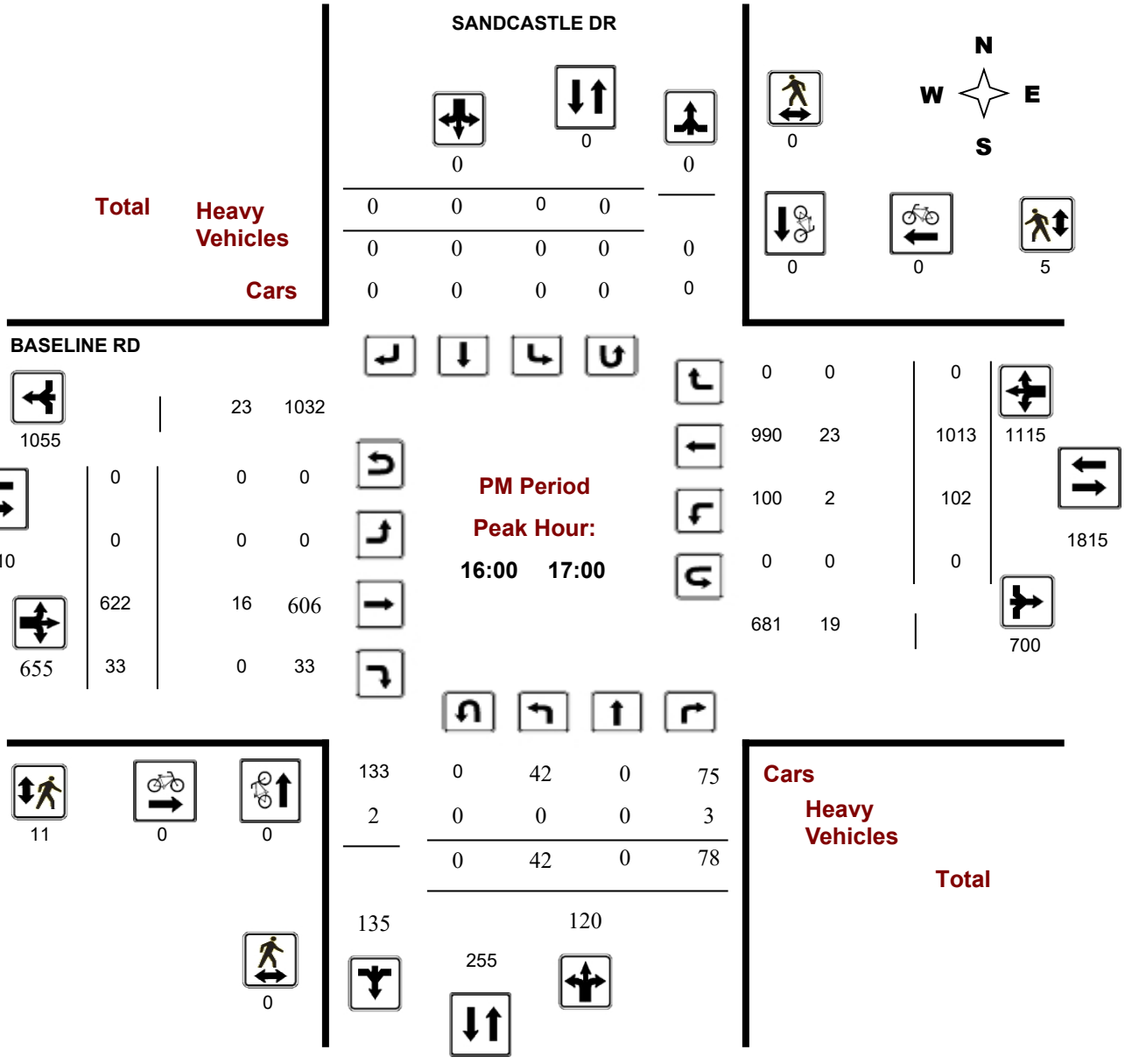
Turning Movement Count - Study Results

BASELINE RD @ SANDCASTLE DR

Survey Date: Thursday, January 12, 2017 **WO No:** 36634

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

PM Period Peak Hour Diagram



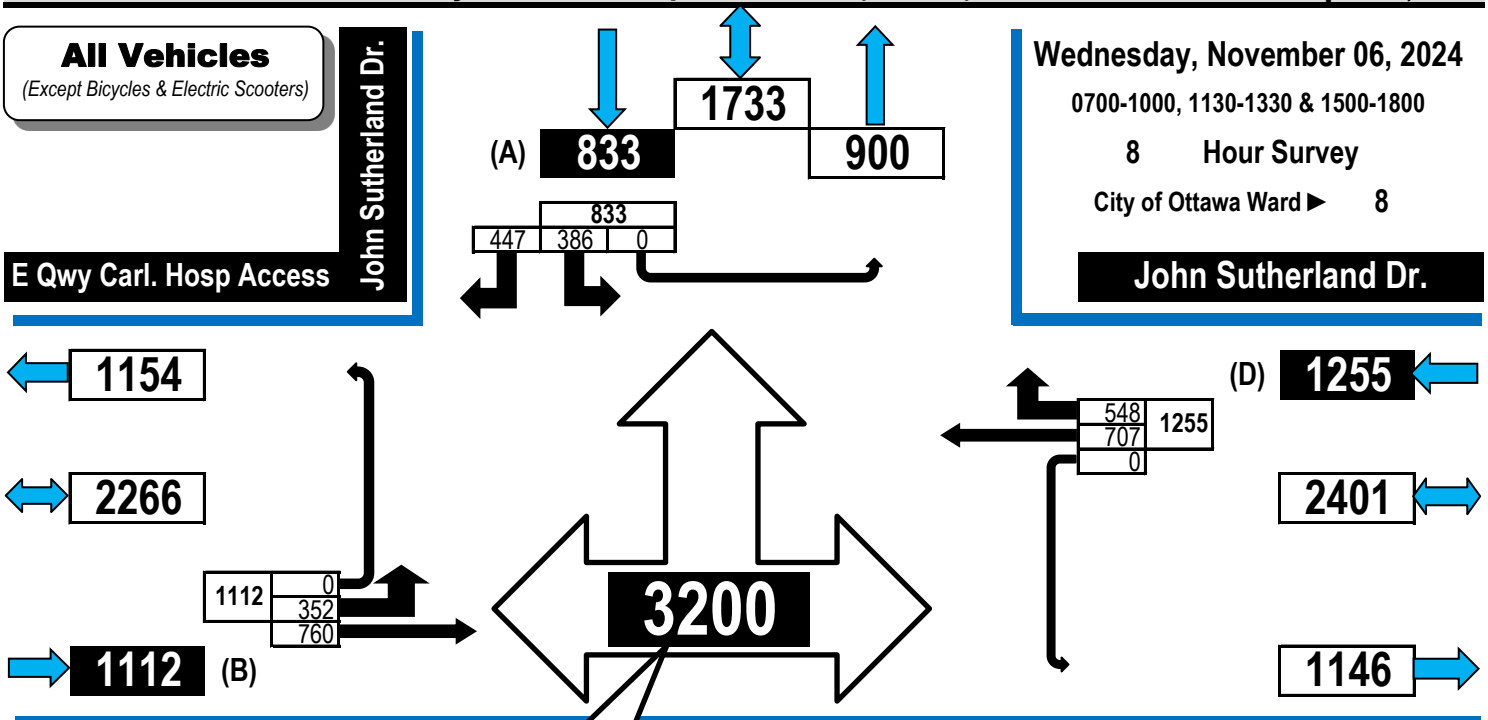
Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles



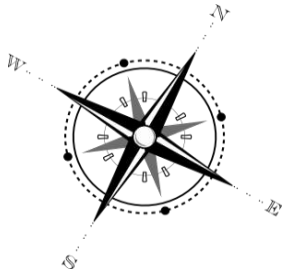
John Sutherland Drive & E Qwy Carleton Hospital Access (Loc 05) — Nepean, ON

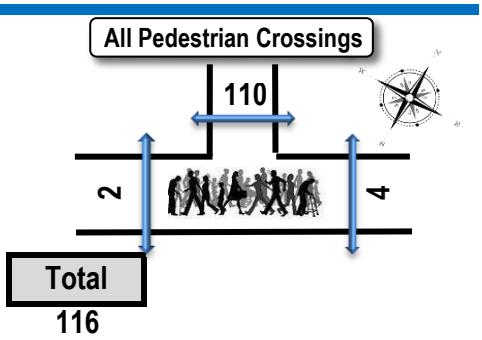
All Vehicles
(Except Bicycles & Electric Scooters)

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
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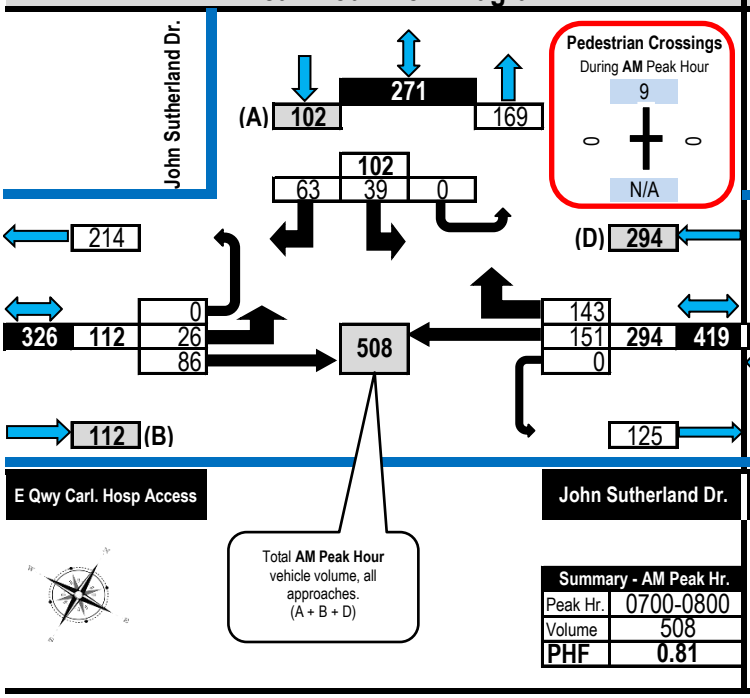


Total vehicle volume, all approaches. (A + B + D)





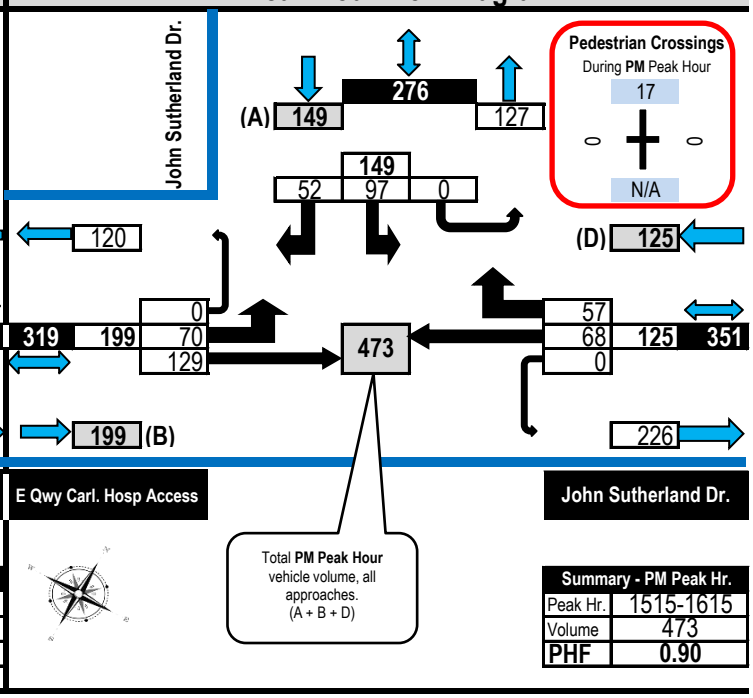
AM Peak Hour Flow Diagram



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

Summary - AM Peak Hr.	
Peak Hr.	0700-0800
Volume	508
PHF	0.81

PM Peak Hour Flow Diagram



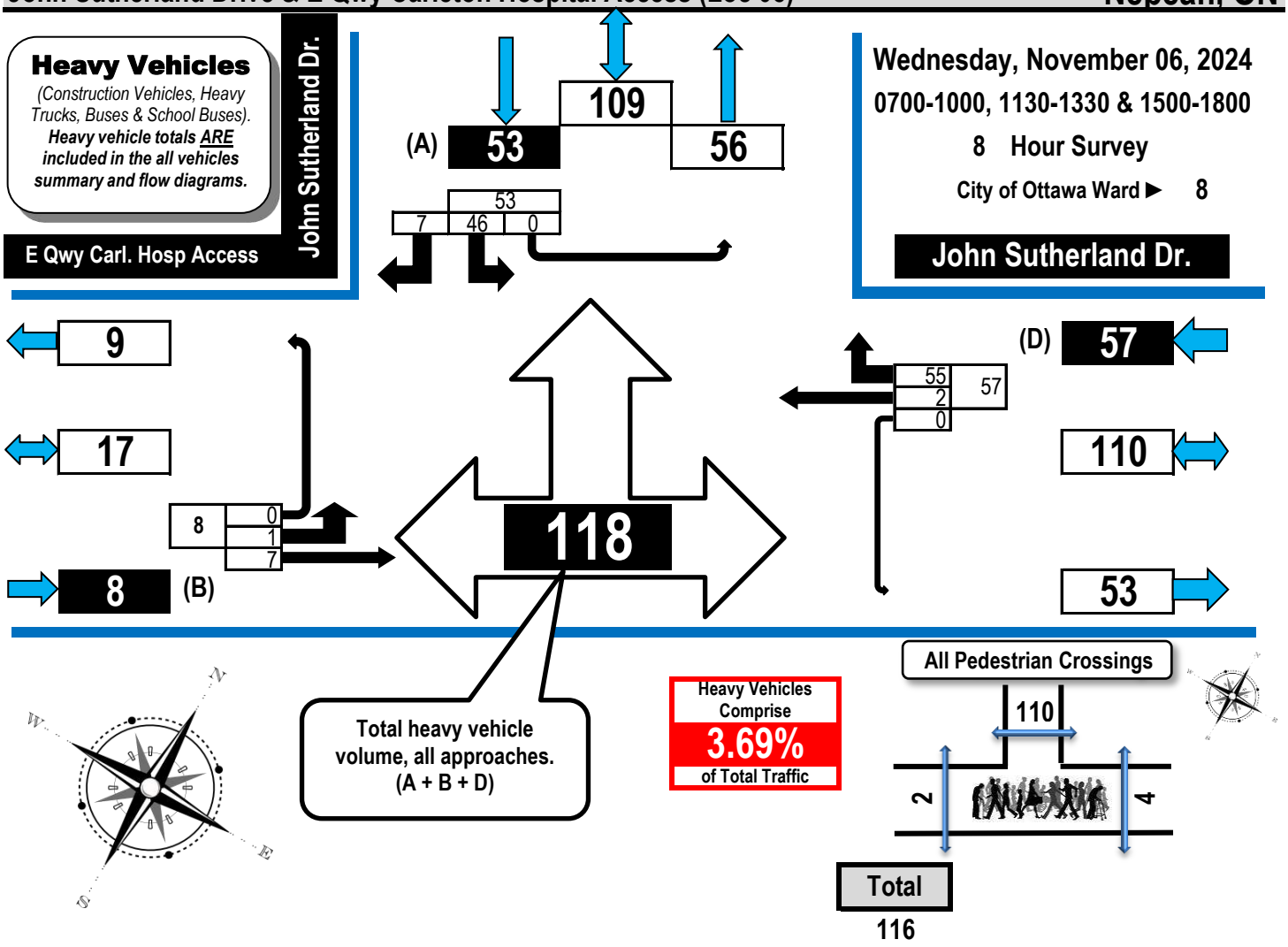
Total **PM Peak Hour** vehicle volume, all approaches. (A + B + D)

Summary - PM Peak Hr.	
Peak Hr.	1515-1615
Volume	473
PHF	0.90

Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram

John Sutherland Drive & E Qwy Carleton Hospital Access (Loc 05) — **Nepean, ON**

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



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John Sutherland Dr.

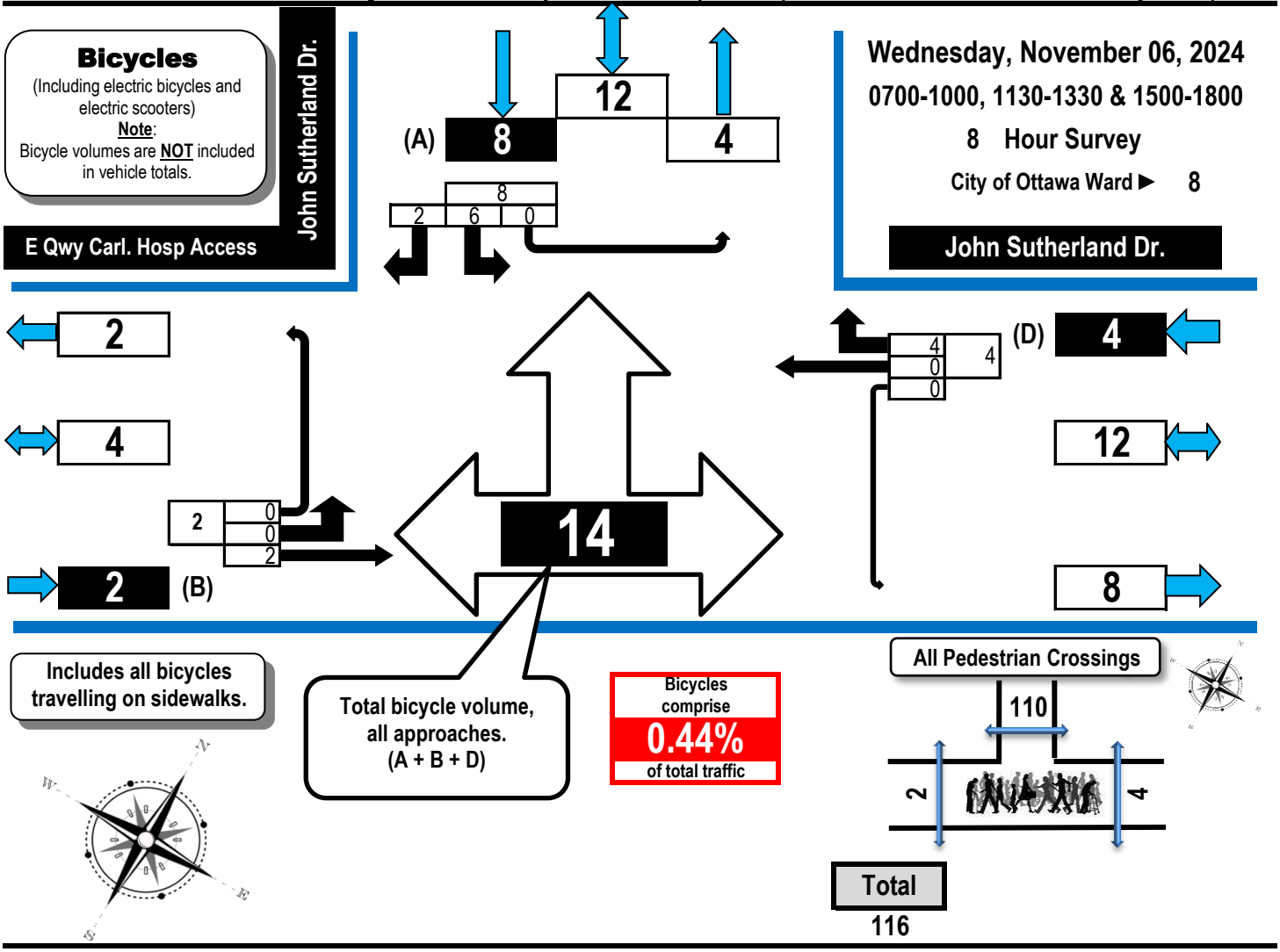
	E Qwy Carl. Hosp Access					John Sutherland Dr.					N/A					John Sutherland Dr.					
	Eastbound					Westbound					Northbound					Southbound					
Time Period	LT	ST	RT	UT	EB Tot	LT	ST	RT	UT	WB Tot	LT	ST	RT	UT	NB Tot	LT	ST	RT	UT	SB Tot	GR Tot
0700-0800	0	0		0	0		0	8	0	8						9		0	0	9	17
0800-0900	1	2		0	3		0	5	0	5						6		4	0	10	18
0900-1000	0	2		0	2		1	7	0	8						7		0	0	7	17
1130-1230	0	1		0	1		1	5	0	6						5		1	0	6	13
1230-1330	0	0		0	0		0	7	0	7						4		1	0	5	12
1500-1600	0	1		0	1		0	6	0	6						5		1	0	6	13
1600-1700	0	1		0	1		0	8	0	8						6		0	0	6	15
1700-1800	0	0		0	0		0	9	0	9						4		0	0	4	13
Totals	1	7		0	8		2	55	0	57						46		7	0	53	118

Comments:
OC Transpo and Para Transpo buses comprise 70.34% of the heavy vehicle traffic.

Turning Movement Count
Bicycle Summary
Flow Diagram

John Sutherland Drive & E Qwy Carleton Hospital Access (Loc 05) — **Nepean, ON**

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are **NOT** included in vehicle totals.



	E Qwy Carl. Hosp Access					John Sutherland Dr.					N/A					John Sutherland Dr.					
	Eastbound					Westbound					Northbound					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	2	0	2						0		0	0	0	2
0800-0900	0	1		0	1		0	0	0	0						0		0	0	0	1
0900-1000	0	0		0	0		0	1	0	1						0		0	0	0	1
1130-1230	0	0		0	0		0	0	0	0						0		0	0	0	0
1230-1330	0	0		0	0		0	1	0	1						2		1	0	3	4
1500-1600	0	0		0	0		0	0	0	0						3		1	0	4	4
1600-1700	0	1		0	1		0	0	0	0						1		0	0	1	2
1700-1800	0	0		0	0		0	0	0	0						0		0	0	0	0
Totals	0	2		0	2		0	4	0	4						6		2	0	8	14

Comments:
OC Transpo and Para Transpo buses comprise 70.34% of the heavy vehicle traffic.

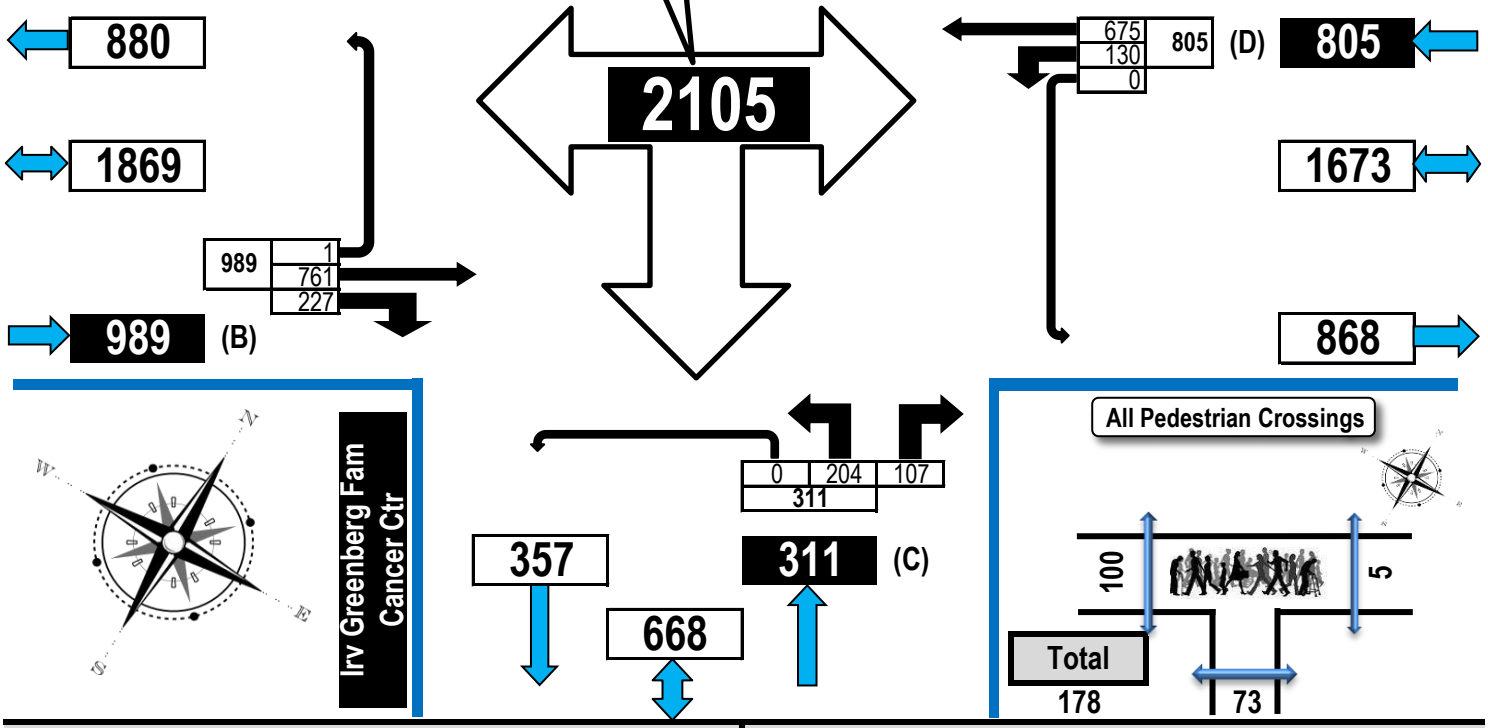
Turning Movement Count
Summary, AM and PM Peak Hour Flow Diagrams
All Vehicles Except Bicycles

John Sutherland Drive & N Irving Greenberg Fam Cancer Ctr. (Loc 04) — **Nepean, ON**

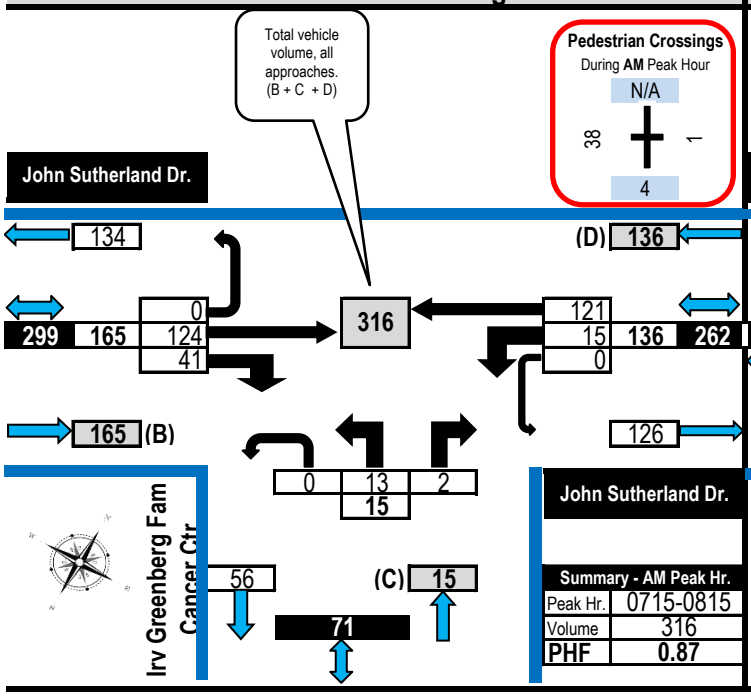
All Vehicles
(Except Bicycles & Electric Scooters)

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

Wednesday, November 06, 2024
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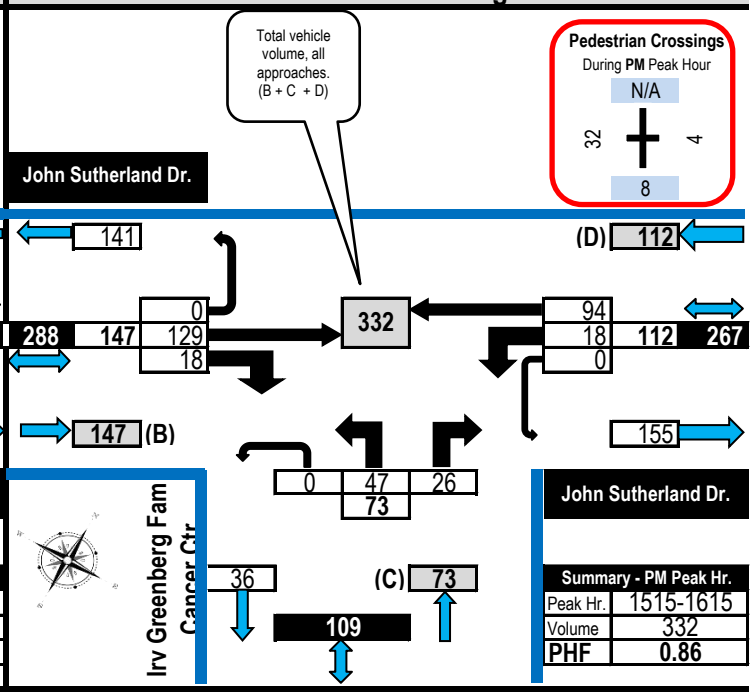


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0715-0815
Volume	316
PHF	0.87

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1515-1615
Volume	332
PHF	0.86

Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4 to 13)
Flow Diagram

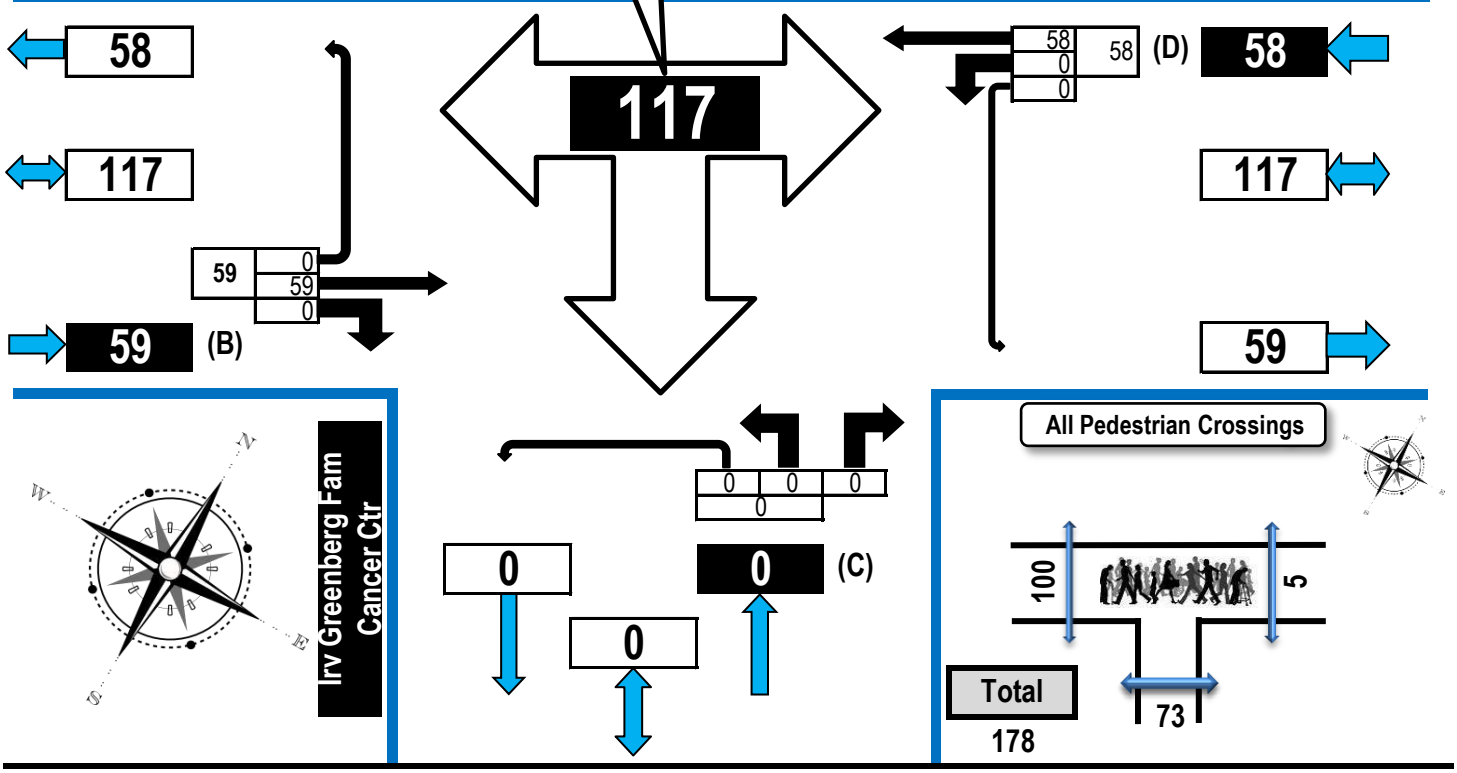
John Sutherland Drive & N Irving Greenberg Fam Cancer Ctr. (Loc 04) — **Nepean, ON**

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

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

Heavy Vehicles Comprise **5.56%** of Total Traffic

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0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8



	John Sutherland Dr.					John Sutherland Dr.					Irv Greenberg Fam Cancer Ctr					N/A					
	Eastbound					Westbound					Northbound					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		11	0	0	11	0	5		0	5	0		0	0	0						16
0800-0900		8	0	0	8	0	6		0	6	0		0	0	0						14
0900-1000		11	0	0	11	0	9		0	9	0		0	0	0						20
1130-1230		8	0	0	8	0	7		0	7	0		0	0	0						15
1230-1330		5	0	0	5	0	10		0	10	0		0	0	0						15
1500-1600		6	0	0	6	0	5		0	5	0		0	0	0						11
1600-1700		4	0	0	4	0	8		0	8	0		0	0	0						12
1700-1800		6	0	0	6	0	8		0	8	0		0	0	0						14
Totals		59	0	0	59	0	58		0	58	0		0	0	0						117

Comments:
OC Transpo and Para Transpo buses comprise 65.81% of the heavy vehicle traffic.

Turning Movement Count
Bicycle Summary
Flow Diagram

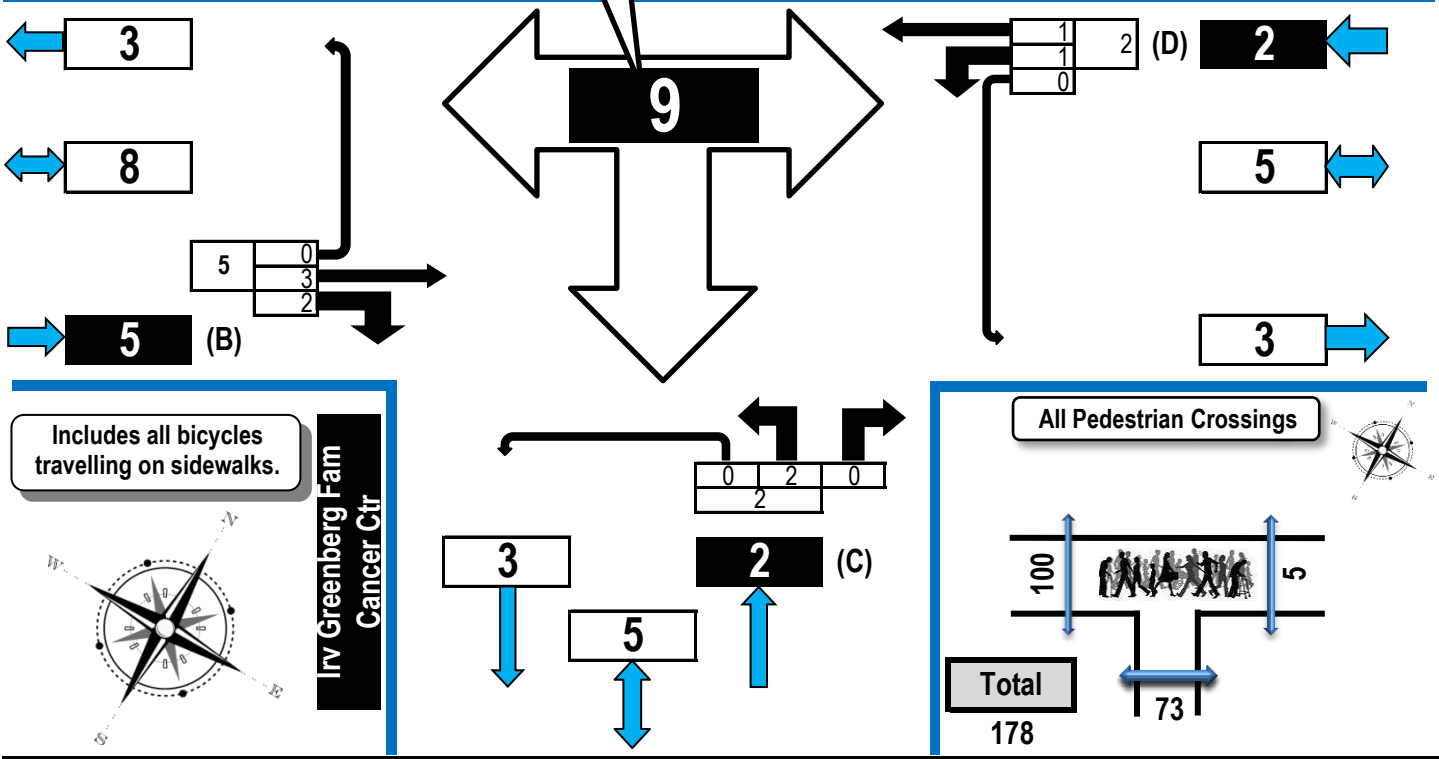
John Sutherland Drive & N Irving Greenberg Fam Cancer Ctr. (Loc 04) — **Nepean, ON**

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are **NOT** included in vehicle totals.

Total bicycle volume, all approaches. (B + C + D)

Bicycles comprise **0.43%** of total traffic

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0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8



	John Sutherland Dr.					John Sutherland Dr.					Irv Greenberg Fam Cancer Ctr					N/A					
	Eastbound					Westbound					Northbound					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	0	0		0	0	0		0	0	0						0
0900-1000		0	0	0	0	1	0		0	1	0		0	0	0						1
1130-1230		0	2	0	2	0	0		0	0	2		0	0	2						4
1230-1330		2	0	0	2	0	1		0	1	0		0	0	0						3
1500-1600		0	0	0	0	0	0		0	0	0		0	0	0						0
1600-1700		1	0	0	1	0	0		0	0	0		0	0	0						1
1700-1800		0	0	0	0	0	0		0	0	0		0	0	0						0
Totals		3	2	0	5	1	1		0	2	2		0	0	2						9

Comments:
OC Transpo and Para Transpo buses comprise 65.81% of the heavy vehicle traffic.

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

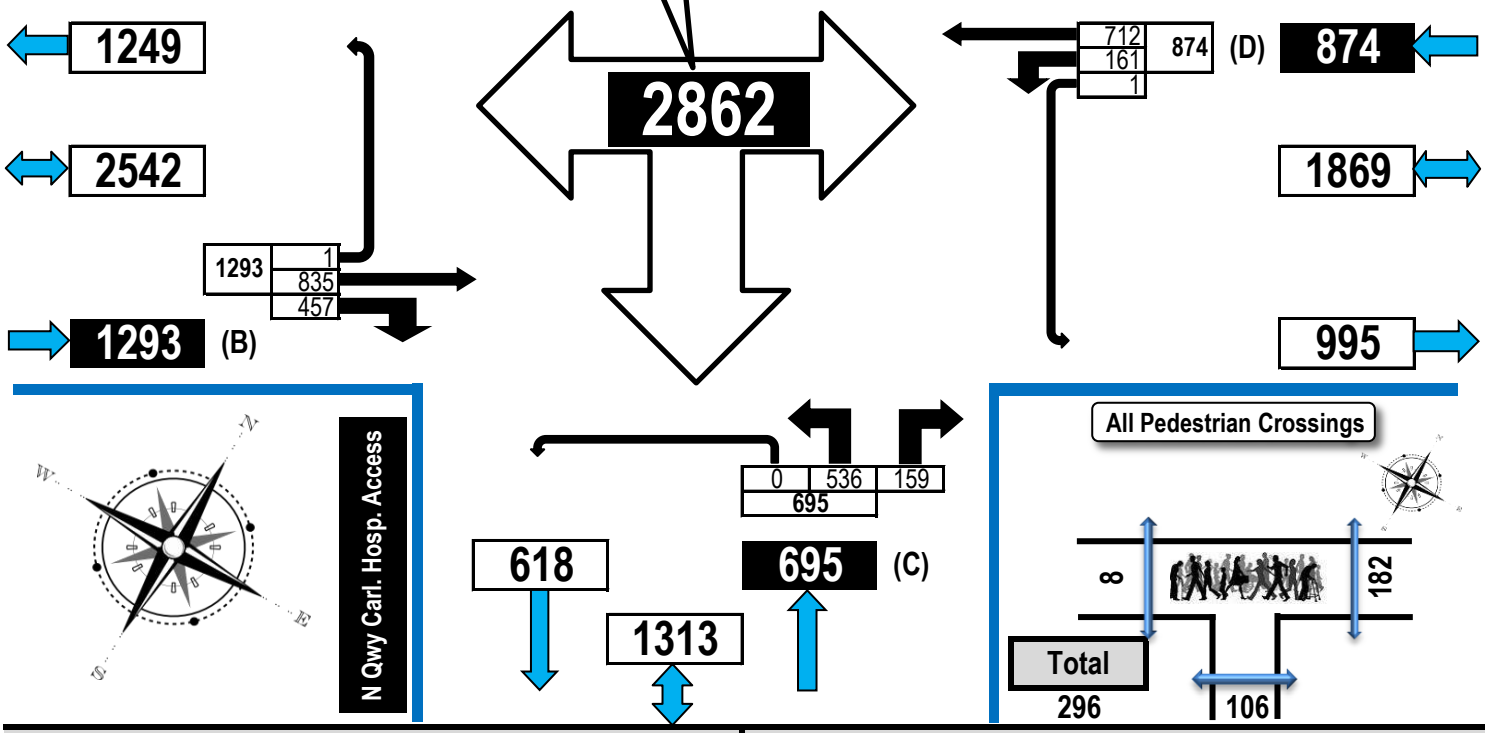


John Sutherland Drive & N Qwy Carleton Hospital Access (Loc 03) — Nepean, ON

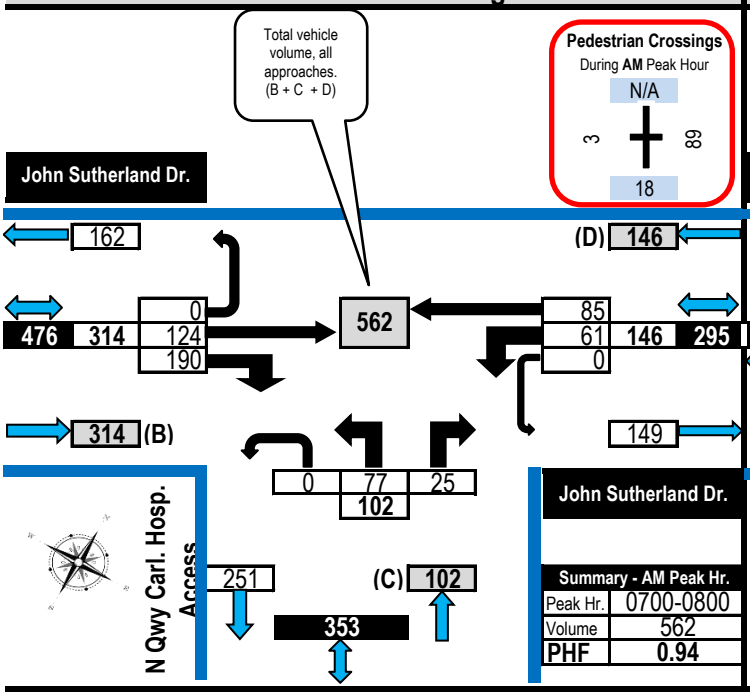
All Vehicles
(Except Bicycles & Electric Scooters)

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

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ▶ 8

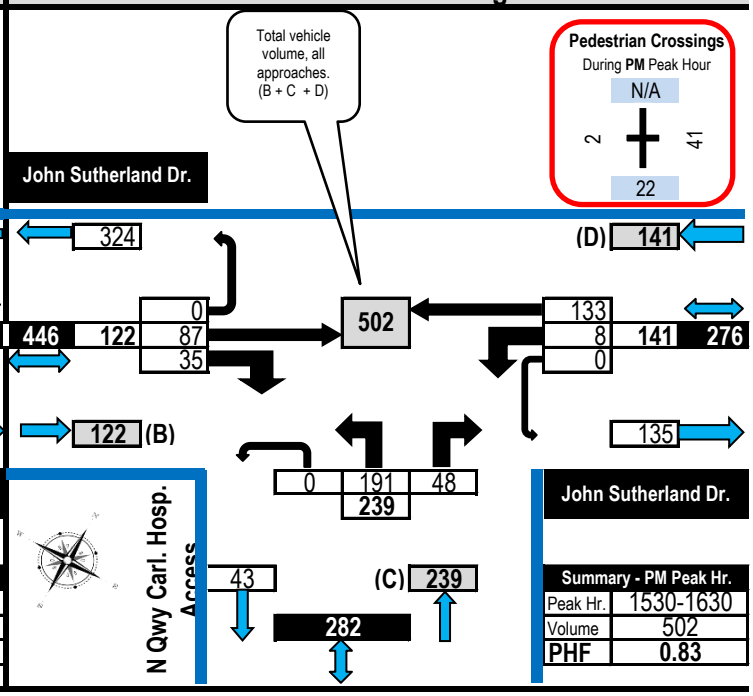


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0700-0800
Volume	562
PHF	0.94

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1530-1630
Volume	502
PHF	0.83

Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4 to 13)
Flow Diagram

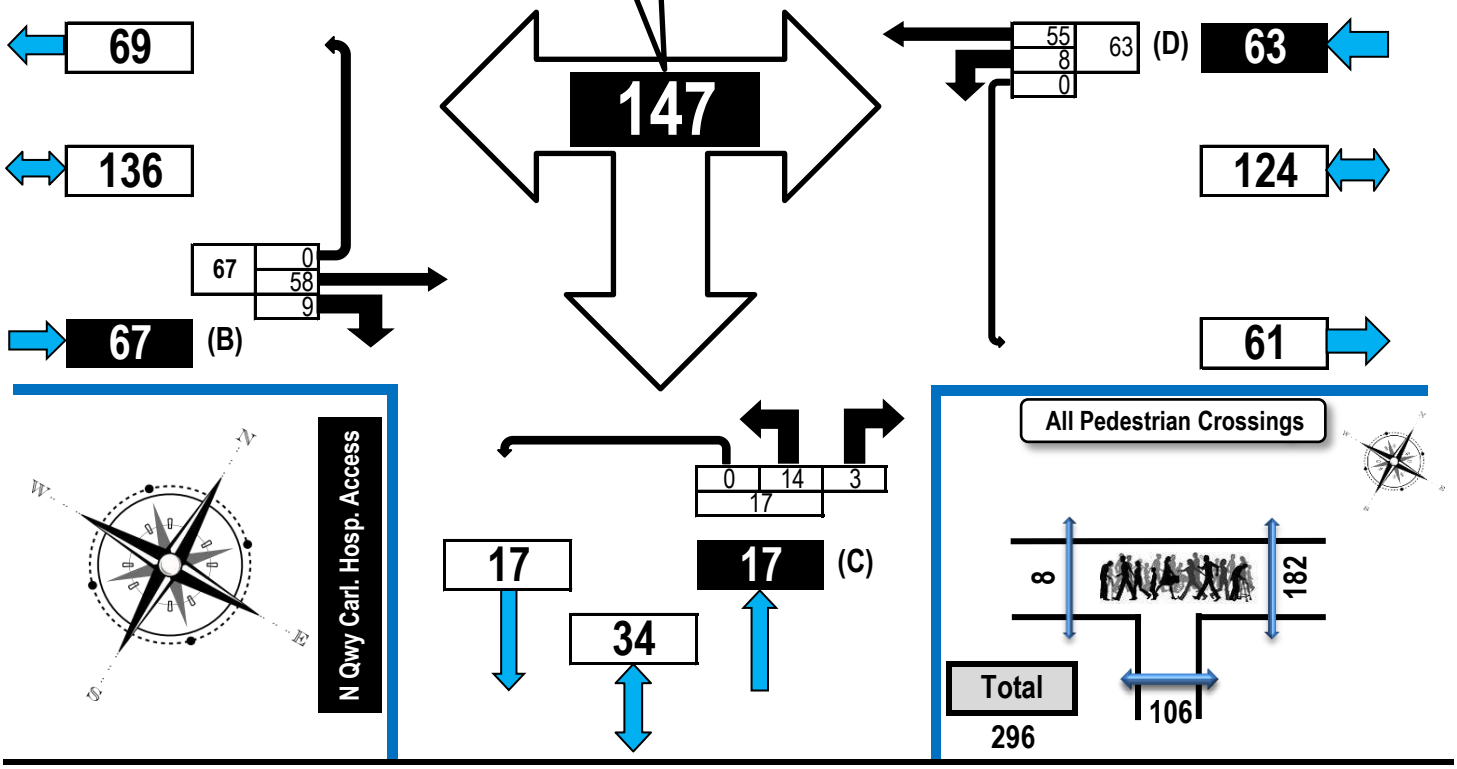
John Sutherland Drive & N Qwy Carleton Hospital Access (Loc 03) — **Nepean, ON**

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

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

Heavy Vehicles Comprise **5.14%** of Total Traffic

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8



	John Sutherland Dr.					John Sutherland Dr.					N Qwy Carl. Hosp. Access					N/A					
	Eastbound					Westbound					Northbound					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		9	2	0	11	1	4		0	5	2		1	0	3						19
0800-0900		10	1	0	11	1	6		0	7	1		0	0	1						19
0900-1000		8	1	0	9	2	7		0	9	2		2	0	4						22
1130-1230		9	3	0	12	1	6		0	7	4		0	0	4						23
1230-1330		6	0	0	6	2	8		0	10	2		0	0	2						18
1500-1600		6	0	0	6	0	7		0	7	0		0	0	0						13
1600-1700		4	1	0	5	0	9		0	9	1		0	0	1						15
1700-1800		6	1	0	7	1	8		0	9	2		0	0	2						18
Totals		58	9	0	67	8	55		0	63	14		3	0	17						147

Comments:
OC Transpo and Para Transpo buses comprise 61.90% of the heavy vehicle traffic.

Turning Movement Count
Bicycle Summary
Flow Diagram

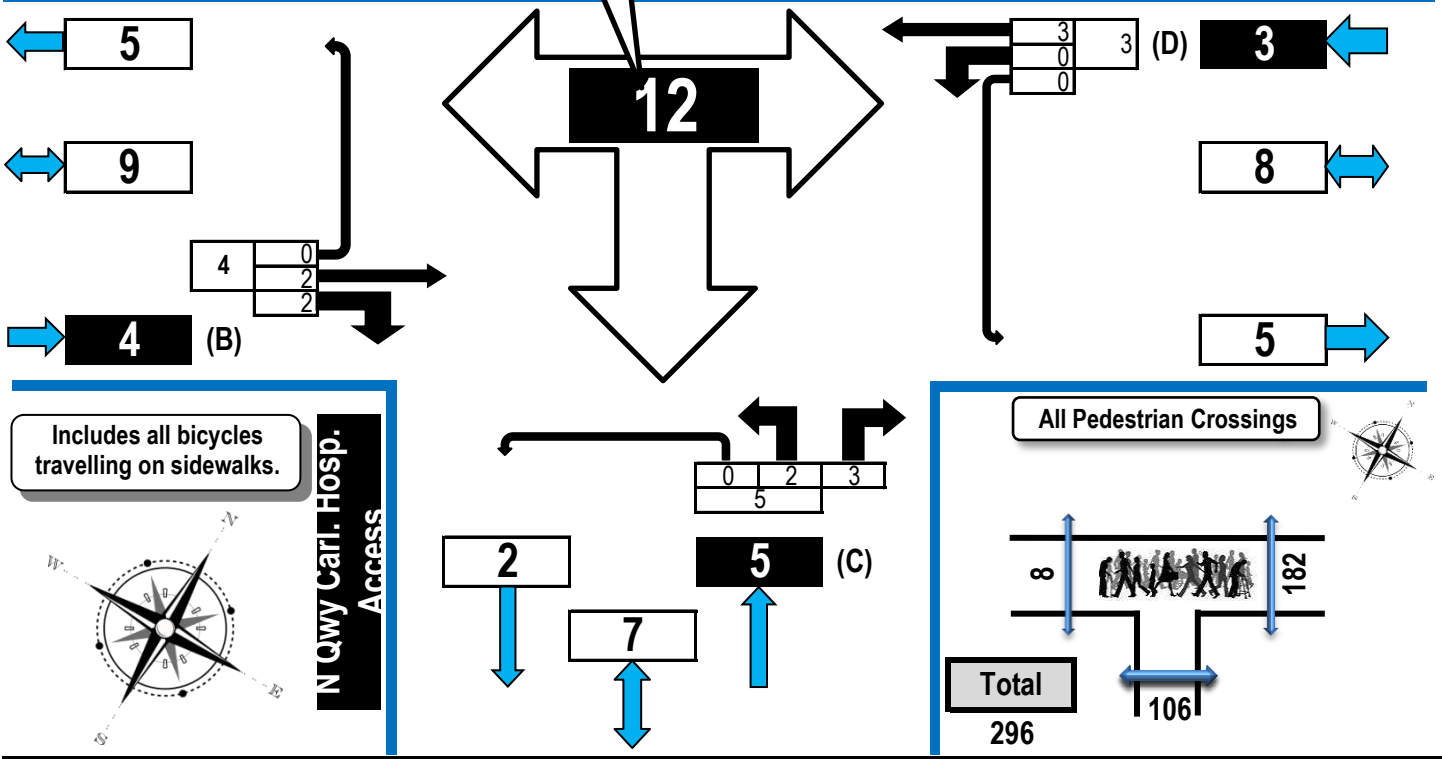
John Sutherland Drive & N Qwy Carleton Hospital Access (Loc 03) — **Nepean, ON**

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are **NOT** included in vehicle totals.

Total bicycle volume, all approaches. (B + C + D)

Bicycles comprise **0.42%** of total traffic

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8



	John Sutherland Dr.					John Sutherland Dr.					N Qwy Carl. Hosp. Access					N/A					
	Eastbound					Westbound					Northbound					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	1	0	1	0	0		0	0	0		0	0	0						1
0800-0900		0	0	0	0	0	0		0	0	0		0	0	0						0
0900-1000		0	0	0	0	0	0		0	0	0		0	0	0						0
1130-1230		0	1	0	1	0	2		0	2	0		2	0	2						5
1230-1330		2	0	0	2	0	1		0	1	0		0	0	0						3
1500-1600		0	0	0	0	0	0		0	0	0		1	0	1						1
1600-1700		0	0	0	0	0	0		0	0	2		0	0	2						2
1700-1800		0	0	0	0	0	0		0	0	0		0	0	0						0
Totals		2	2	0	4	0	3		0	3	2		3	0	5						12

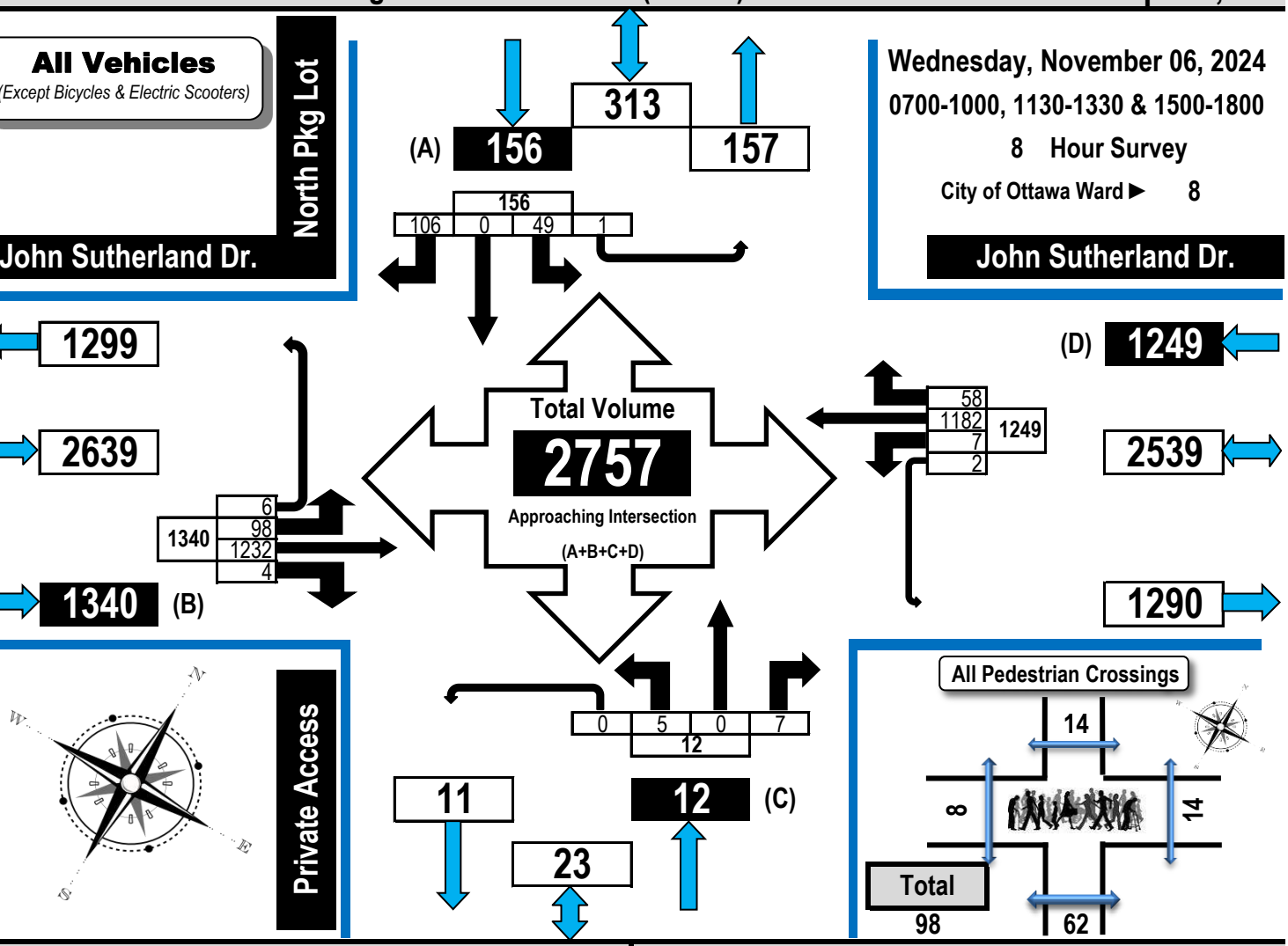
Comments:
OC Transpo and Para Transpo buses comprise 61.90% of the heavy vehicle traffic.

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

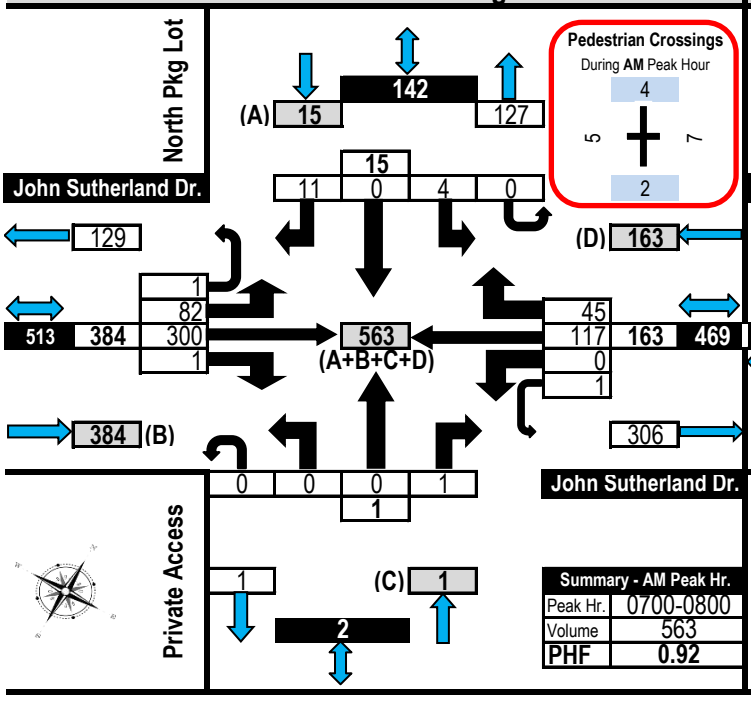
John Sutherland Drive & N Pkg Lot/Private Access (Loc 02) — **Nepean, ON**

All Vehicles
(Except Bicycles & Electric Scooters)

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ▶ 8

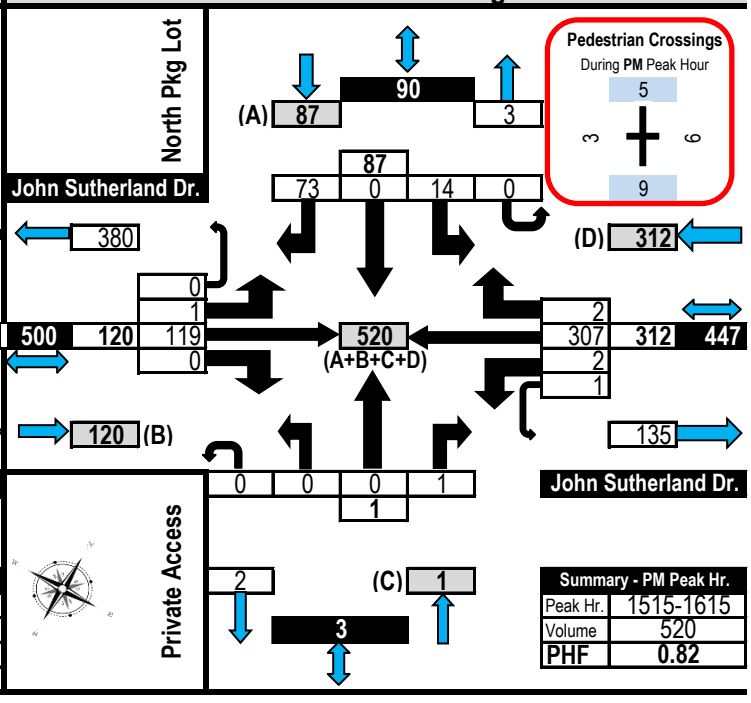


AM Peak Hour Flow Diagram



Summary - AM Peak Hr.	
Peak Hr.	0700-0800
Volume	563
PHF	0.92

PM Peak Hour Flow Diagram



Summary - PM Peak Hr.	
Peak Hr.	1515-1615
Volume	520
PHF	0.82

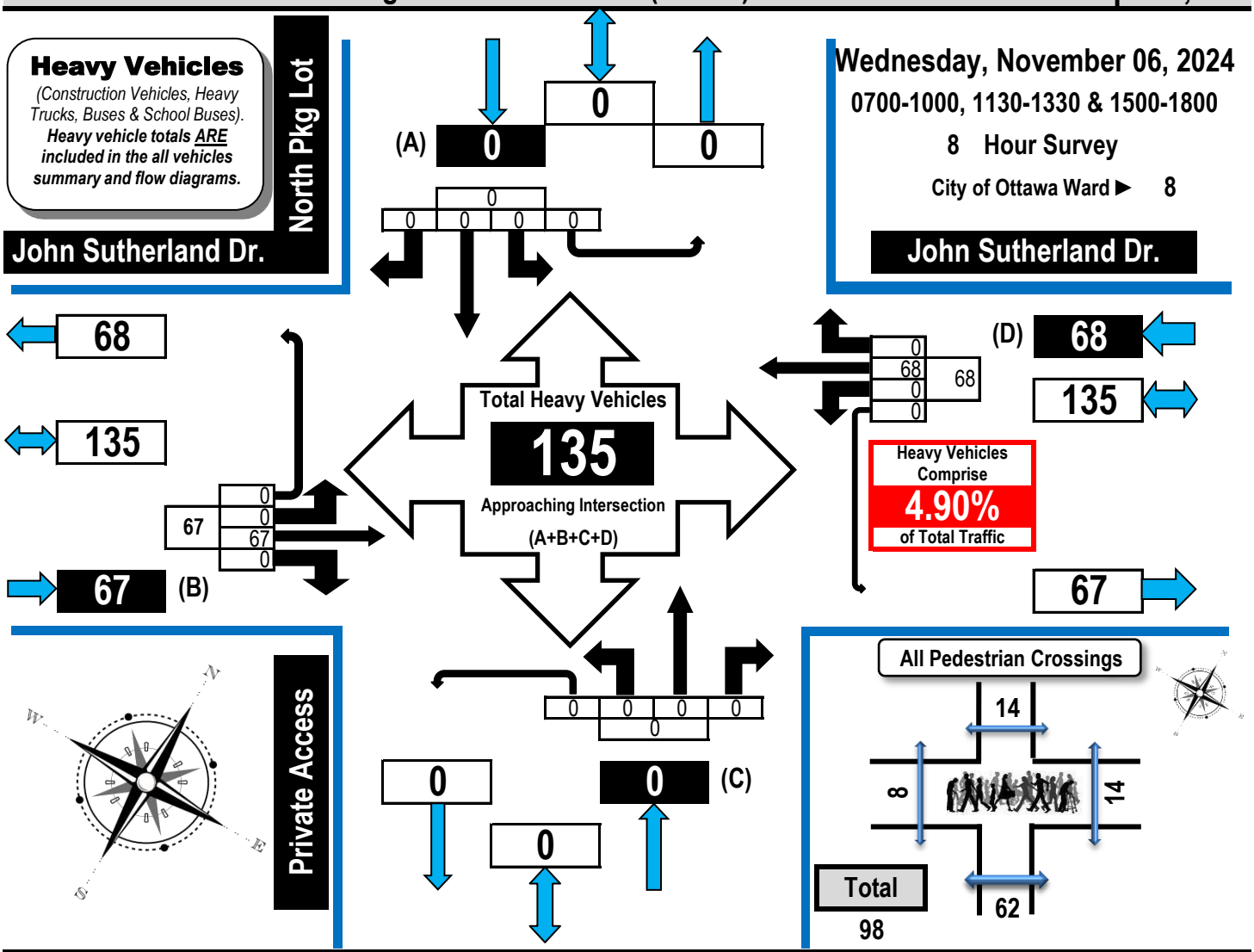
Turning Movement Count
Heavy Vehicle Summary (FHWA Class 4-13)
Flow Diagram



John Sutherland Drive & N Pkg Lot/Private Access (Loc 02) — **Nepean, ON**

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

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8



	John Sutherland Dr.					John Sutherland Dr.					Private Access					North Pkg Lot					
	Eastbound					Westbound					Northbound					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	11	0	0	11	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	17
0800-0900	0	11	0	0	11	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	18
0900-1000	0	9	0	0	9	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	18
1130-1230	0	11	0	0	11	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	21
1230-1330	0	6	0	0	6	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	16
1500-1600	0	6	0	0	6	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	13
1600-1700	0	6	0	0	6	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0	16
1700-1800	0	7	0	0	7	0	9	0	0	9	0	0	0	0	0	0	0	0	0	0	16
Totals	0	67	0	0	67	0	68	0	0	68	0	0	0	0	0	0	0	0	0	0	135

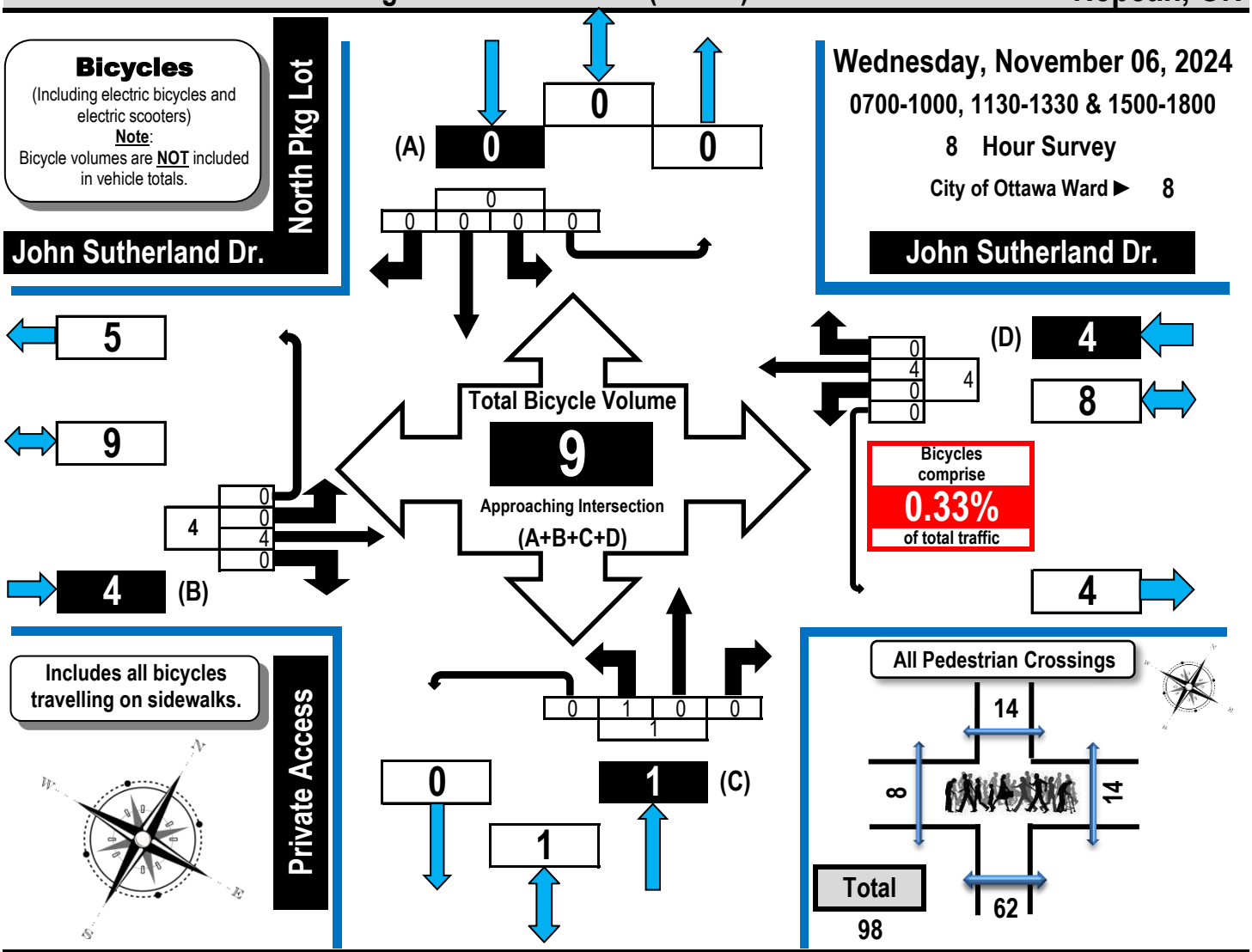
Comments:
OC Transpo and Para Transpo buses comprise 67.41% of the heavy vehicle traffic.

Turning Movement Count
Bicycle Summary
Flow Diagram

John Sutherland Drive & N Pkg Lot/Private Access (Loc 02) — **Nepean, ON**

Bicycles
(Including electric bicycles and electric scooters)
Note:
Bicycle volumes are **NOT** included in vehicle totals.

Wednesday, November 06, 2024
0700-1000, 1130-1330 & 1500-1800
8 Hour Survey
City of Ottawa Ward ► 8



	John Sutherland Dr. Eastbound					John Sutherland Dr. Westbound					Private Access Northbound					North Pkg Lot 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	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0800-0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0900-1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1130-1230	0	1	0	0	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	3
1230-1330	0	2	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
1500-1600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-1700	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	2
1700-1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	4	0	0	4	0	4	0	0	4	1	0	0	0	1	0	0	0	0	0	9

Comments:
OC Transpo and Para Transpo buses comprise 67.41% of the heavy vehicle traffic.

Appendix E: Signal Timing Plans

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

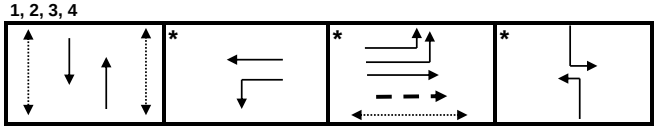
Intersection:	***Main:*** Richmond	***Side:***	Holly Acres / Nanaimo
Controller:	**MS 3200**	**TSD:**	**5643**
Author:	Kymen Kwan	**Date:**	07-Jul-2025

Existing Timing Plans†

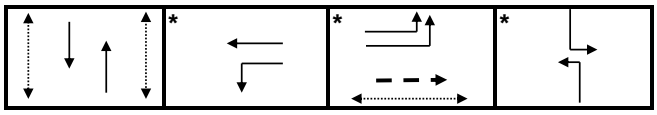
	Plan					Ped Minimum Time		
	AM Peak	**Off Peak**	**PM Peak**	**Night**	**AM Bylaw**	***Walk***	***DW***	***A+R***
	1	2	3	4	47			
Cycle	100	100	110	90	110			
Offset	49	X	X	X	49			
NB Thru	42	42	47	32	33	7	17	3.7+2.6
SB Thru	42	42	47	32	33	7	17	3.7+2.6
WB Thru/Left	17	17	17	17	20	-	-	3.0+3.7
EB Left (fp)	29	29	29	29	45	-	-	3.7+2.9
EB Thru	29	29	29	29	-	-	-	3.7+2.9
EB Ped/Bike	29	29	29	29	45	7	15	3.7+2.9
NB Left	12	12	17	12	12	-	-	3.7+2.3
SB Left	12	12	17	12	12	-	-	3.7+2.3

Phasing Sequence‡

Plan: 1, 2, 3, 4



Plan: 47



Notes: 1) The NB U-Turn movement is prohibited
2) The EB Thru movement is prohibited weekdays 7:00-9:00 with bicycles excepted

Schedule

Weekday

Time	Plan
0:15	4
6:30	1
7:00	47
9:00	1
9:30	2
15:00	3
18:30	2
21:30	4

Saturday

Time	Plan
0:15	4
9:00	2
22:00	4

Sunday

Time	Plan
0:15	4
9:00	2
19:00	4

Notes

†: Time for each direction includes amber and all red intervals
‡: Start of first phase should be used as reference point for offset
Asterisk (*) Indicates actuated phase
(fp): Fully Protected Left Turn
◄·····► Pedestrian signal

Cost is $63.94 ($56.58 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

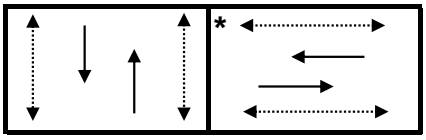
Intersection:	***Main:*** Richmond	***Side:***	John Sutherland / Hospital
Controller:	**MS 3200**	**TSD:**	**5662**
Author:	Kymen Kwan	**Date:**	29-Oct-2024

Existing Timing Plans†

	Plan				**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	***Walk***	***DW***	***A+R***
Cycle	100	80	120	80			
Offset	92	X	82	X			
NB Thru	62	42	82	42	7	16	4.6+1.8
SB Thru	62	42	82	42	7	16	4.6+1.8
EB Thru	38	38	38	38	7	24	3.3+3.3
WB Thru	38	38	38	38	7	24	3.3+3.3

Phasing Sequence‡

Plan: All



Notes: 1) The SB U-Turn is prohibited

Schedule

Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:30	2
21:30	4

Saturday

Time	Plan
0:15	4
9:00	3
18:00	2
22:00	4

Sunday

Time	Plan
0:15	4
9:00	2
19:00	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $62.38 ($55.20 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

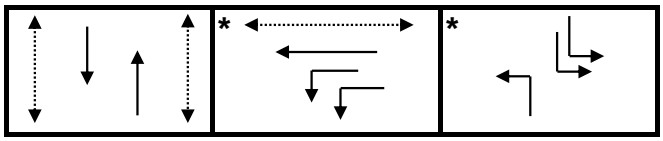
Intersection:	***Main:***	Richmond/Robertson	***Side:***	Baseline
Controller:	**ATC 3**		**TSD:**	**5638**
Author:	Kymen Kwan		**Date:**	29-Oct-2024

Existing Timing Plans†

	Plan				**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	***Walk***	***DW***	***A+R***
Cycle	100	100	120	90			
Offset	93	93	108	X			
NB Thru	44	44	51	31	7	17	4.6+2.0
SB Thru	44	44	51	31	7	17	4.6+2.0
WB Thru	37	37	37	37	11	19	4.2+2.6
NB Left (fp)	19	19	32	22	-	-	4.6+2.0
SB Left (fp)	19	19	32	22	-	-	4.6+2.0

Phasing Sequence‡

Plan: All



Schedule

Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:30	2
21:30	4

Saturday

Time	Plan
0:15	4
9:00	3
18:00	2
22:00	4

Sunday

Time	Plan
0:15	4
9:00	2
19:00	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $62.38 ($55.20 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

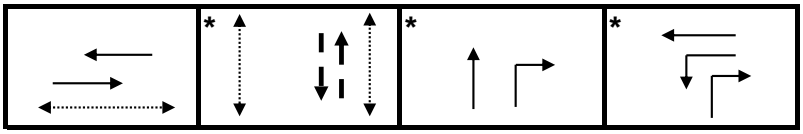
Intersection:	***Main:*** Baseline	***Side:***	Cedarview
Controller:	**ATC 3**	**TSD:**	**5572**
Author:	Kymen Kwan	**Date:**	30-Oct-2024

Existing Timing Plans†

	Plan					**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	***Walk***	***DW***	***A+R***
Cycle	130	105	130	105	105			
Offset	X	22	11	X	22			
EB Thru	34	28	49	28	28	7	14	4.2+1.9
WB Thru	34	39	64	28	39	-	-	4.2+1.9
NS Bike	36	36	36	36	36	7	23	3.7+2.5
NB Thru	45	30	30	30	30	-	-	3.7+2.5
NB Right	60	41	45	41	41	-	-	3.7+2.5
WB Left	15	11	15	11	11	-	-	4.2+1.9

Phasing Sequence‡

Plan: All



Notes: 1) If the NS pedestrian phase is not actuated, the NS Bike phase will receive a maximum green time of 15s

Schedule

Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:45	2
21:30	4

Saturday

Time	Plan
0:15	4
8:30	5
22:30	4

Sunday

Time	Plan
0:15	4
8:30	5
22:30	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $62.38 ($55.20 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

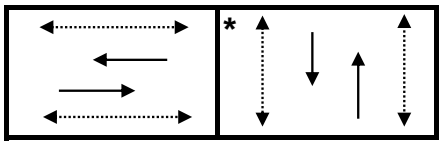
Intersection:	***Main:*** Baseline	***Side:***	Valley Stream / John Sutherland
Controller:	**ATC 3**	**TSD:**	**5708**
Author:	Kymen Kwan	**Date:**	29-Oct-2024

Existing Timing Plans†

	Plan					**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	***Walk***	***DW***	***A+R***
Cycle	85	75	100	70	75			
Offset	37	25	77	X	25			
EB Thru	47	37	62	32	37	7	19	4.2+2.0
WB Thru	47	37	62	32	37	7	19	4.2+2.0
NB Thru	38	38	38	38	38	7	24	3.3+3.2
SB Thru	38	38	38	38	38	7	24	3.3+3.2

Phasing Sequence‡

Plan: All



Schedule

Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:45	2
21:30	4

Saturday

Time	Plan
0:15	4
8:30	5
22:30	4

Sunday

Time	Plan
0:15	4
12:00	2
22:30	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $62.38 ($55.20 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

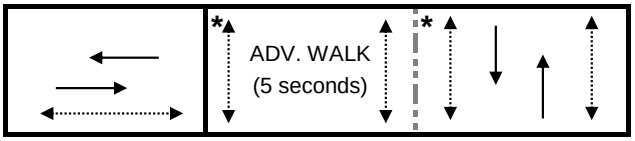
Intersection:	***Main:*** Baseline	***Side:***	Sandcastle
Controller:	**MS 3200**	**TSD:**	**5944**
Author:	Kymen Kwan	**Date:**	07-Jul-2025

Existing Timing Plans†

	Plan					**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	***Walk***	***DW***	***A+R***
Cycle	85	75	100	65	75			
Offset	55	59	62	X	59			
EB Thru	47	37	62	27	37	7	11	4.2+1.7
WB Thru	47	37	62	27	37	-	-	4.2+1.7
NB Thru	38	38	38	38	38	7	24	3.0+3.5

Phasing Sequence‡

Plan: **All**



Notes: 1) The EB U-Turn movement is prohibited

Schedule

Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:45	2
21:30	4

Weekend

Time	Plan
0:15	4
8:30	5
22:30	4

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $63.94 ($56.58 + HST)

Appendix F: Collision Data

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD @ 180 E OF CEDARVIEW RD

Traffic Control: MPS **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Mar-11, Wed,09:27	Clear	Sideswipe	P.D. only	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Truck and trailer	Other motor vehicle	

Location: BASELINE RD @ CEDARVIEW RD

Traffic Control: Traffic signal **Total Collisions:** 16

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Feb-02, Fri,16:55	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-Mar-19, Mon,11:16	Clear	SMV other	P.D. only	Dry	West	Turning left	Pick-up truck	Pole (utility, power)	0
2018-Mar-25, Sun,18:55	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	
2018-Mar-31, Sat,16:34	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-May-15, Tue,15:27	Clear	Turning movement	Non-fatal injury	Dry	North	Going ahead	Bicycle	Other motor vehicle	0
					North	Turning left	Passenger van	Cyclist	
2018-Jun-14, Thu,17:12	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jul-11, Wed,17:30	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-Apr-09, Tue,13:35	Snow	Sideswipe	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Dec-15, Sun,10:07	Clear	Turning movement	P.D. only	Slush	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD @ CEDARVIEW RD

Traffic Control: Traffic signal **Total Collisions:** 16

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Mar-03, Tue,07:17	Clear	Rear end	P.D. only	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2021-Oct-21, Thu,15:19	Clear	Sideswipe	P.D. only	Dry	West	Other	Automobile, station wagon	Other motor vehicle	0
					West	Other	Automobile, station wagon	Other motor vehicle	
2021-Dec-18, Sat,15:50	Snow	Other	P.D. only	Loose snow	East	Reversing	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Jan-10, Mon,19:47	Clear	SMV other	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Pedestrian	1
2022-Jan-29, Sat,16:19	Clear	Rear end	P.D. only	Wet	East	Turning right	Pick-up truck	Other motor vehicle	0
					East	Turning right	Pick-up truck	Other motor vehicle	
2022-Feb-03, Thu,16:36	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Feb-08, Tue,16:55	Snow	Turning movement	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	

Location: BASELINE RD @ JOHN SUTHERLAND DR/VALLEY STREAM DR

Traffic Control: Traffic signal **Total Collisions:** 15

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Jan-15, Mon,17:43	Clear	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-30, Tue,13:30	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-Apr-02, Tue,14:37	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	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD @ JOHN SUTHERLAND DR/VALLEY STREAM DR

Traffic Control: Traffic signal **Total Collisions:** 15

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Oct-01, Tue,07:45	Fog, mist, smoke, dust	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-Dec-11, Wed,17:50	Snow	Rear end	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jan-30, Thu,08:50	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Feb-24, Mon,17:54	Clear	Turning movement	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Mar-10, Tue,11:28	Rain	Angle	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2020-Jul-23, Thu,09:57	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2020-Oct-13, Tue,07:21	Rain	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Feb-05, Fri,12:42	Clear	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Apr-08, Thu,16:32	Clear	SMV other	Non-fatal injury	Dry	East	Turning right	Automobile, station wagon	Ran off road	0
2022-Jun-08, Wed,15:29	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	
2022-Aug-11, Thu,11:18	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Municipal transit bus	Other motor vehicle	
2022-Dec-14, Wed,10:20	Clear	Angle	P.D. only	Dry	South	Turning left	Municipal transit bus	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD @ SANDCASTLE DR

Traffic Control: Traffic signal **Total Collisions:** 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-May-30, Wed,22:02	Clear	Angle	P.D. only	Dry	East	Going ahead	Unknown	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Jun-18, Mon,11:58	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	
2019-Nov-11, Mon,13:40	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2020-Feb-25, Tue,07:57	Clear	Rear end	P.D. only	Wet	East	Slowing or stopping	Passenger van	Other motor vehicle	0
					East	Slowing or stopping	School bus	Other motor vehicle	
2020-Oct-30, Fri,12:33	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Passenger van	Other motor vehicle	
2021-Feb-18, Thu,13:29	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Sep-27, Mon,16:50	Clear	Rear end	P.D. only	Dry	East	Going ahead	Unknown	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2022-Feb-25, Fri,20:49	Clear	Turning movement	Non-fatal injury	Loose snow	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Oct-18, Tue,08:30	Clear	Turning movement	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: BASELINE RD @ SIOUX CRES

Traffic Control: Stop sign **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Jan-29, Tue,15:59	Snow	Angle	P.D. only	Slush	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD @ SIOUX CRES

Traffic Control: Stop sign **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2022-Jan-17, Mon,20:26	Snow	Angle	P.D. only	Ice	West	Turning right	Pick-up truck	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2022-Dec-23, Fri,18:30	Freezing Rain	Angle	P.D. only	Ice	South	Stopped	Pick-up truck	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	

Location: BASELINE RD btwn CEDARVIEW RD & JOHN SUTHERLAND DR/VALLEY STREAM DR

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2021-Jun-21, Mon,09:16	Clear	Sideswipe	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	0
					West	Going ahead	Passenger van	Other motor vehicle	

Location: BASELINE RD btwn RICHMOND RD/ROBERTSON RD & CEDARVIEW RD

Traffic Control: No control **Total Collisions:** 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Aug-28, Wed,00:37	Clear	SMV other	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Ran off road	0
2020-Dec-16, Wed,03:56	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Curb	0
2021-Aug-03, Tue,14:00	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	
2022-Mar-14, Mon,12:30	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	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Oct-07, Fri,13:45	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD btwn SIOUX CRES & SANDCASTLE DR

Traffic Control: No control **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Mar-30, Fri,00:40	Rain	SMV other	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Ran off road	0
2021-Dec-17, Fri,14:29	Clear	Rear end	P.D. only	Dry	West	Going ahead	Passenger van	Other motor vehicle	0
					West	Stopped	Municipal transit bus	Other motor vehicle	

Location: BASELINE RD/HWY 416 RICHMOND IC75AR53 @ RICHMOND RD

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Jan-03, Wed,13:20	Clear	Rear end	P.D. only	Packed snow	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-01, Fri,17:33	Clear	Sideswipe	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Jul-14, Sat,17:15	Clear	Sideswipe	P.D. only	Dry	South	Overtaking	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-21, Sat,22:30	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Oct-11, Thu,07:13	Rain	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-12, Fri,09:13	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	
2018-Oct-27, Sat,14:14	Clear	Rear end	P.D. only	Dry	North	Merging	Automobile, station wagon	Other motor vehicle	0
					North	Merging	Automobile, station wagon	Other motor vehicle	
2019-Mar-09, Sat,14:14	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Unknown	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD/HWY 416 RICHMOND IC75AR53 @ RICHMOND RD

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Apr-30, Tue,12:00	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	
2019-Aug-20, Tue,16:48	Clear	Sideswipe	Non-fatal injury	Dry	West	Changing lanes	Automobile, station wagon	Cyclist	0
					West	Going ahead	Bicycle	Other motor vehicle	
2019-Sep-22, Sun,15:30	Clear	Sideswipe	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Oct-02, Wed,16:03	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Nov-05, Tue,07:10	Clear	Rear end	P.D. only	Wet	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-18, Mon,16:30	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-29, Fri,08:11	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-Dec-06, Fri,14:41	Clear	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2020-Jan-18, Sat,18:30	Snow	SMV other	P.D. only	Packed snow	West	Turning left	Automobile, station wagon	Skidding/sliding	0
2020-Feb-25, Tue,16:10	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	
2020-Jun-24, Wed,08:44	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jul-27, Mon,12:15	Clear	Other	P.D. only	Dry	South	Reversing	Unknown	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD/HWY 416 RICHMOND IC75AR53 @ RICHMOND RD

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Aug-17, Mon,11:30	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2020-Nov-05, Thu,19:00	Clear	Rear end	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2021-Mar-04, Thu,15:12	Clear	Rear end	P.D. only	Dry	North	Unknown	Unknown	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2021-Mar-31, Wed,11:35	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Pick-up truck	Other motor vehicle	
2021-Jun-15, Tue,08:27	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2021-Jun-18, Fri,17:21	Rain	Rear end	P.D. only	Wet	West	Unknown	Unknown	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	
2021-Jul-27, Tue,10:00	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2021-Sep-14, Tue,20:01	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2021-Sep-16, Thu,15:19	Clear	Rear end	Non-fatal injury	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Pick-up truck	Other motor vehicle	
2021-Sep-24, Fri,08:25	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Unknown	Other motor vehicle	
2021-Sep-28, Tue,01:49	Clear	SMV other	P.D. only	Dry	North	Turning right	Pick-up truck	Pole (sign, parking meter)	0
2021-Nov-24, Wed,05:39	Clear	SMV other	P.D. only	Dry	West	Going ahead	Pick-up truck	Ran off road	0
2021-Dec-09, Thu,20:37	Clear	Turning movement	Non-fatal injury	Dry	East	Going ahead	Passenger van	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD/HWY 416 RICHMOND IC75AR53 @ RICHMOND RD

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2022-Jan-02, Sun,11:29	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	
					North	Stopped	Pick-up truck	Other motor vehicle	
2022-Jan-19, Wed,10:30	Clear	Rear end	P.D. only	Packed snow	West	Unknown	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Jan-24, Mon,14:30	Clear	Sideswipe	P.D. only	Packed snow	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Feb-01, Tue,17:50	Clear	Rear end	P.D. only	Slush	North	Unknown	Unknown	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Apr-25, Mon,14:15	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-May-15, Sun,00:31	Clear	SMV other	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Curb	0
2022-Jul-27, Wed,15:24	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Aug-31, Wed,18:25	Rain	Turning movement	P.D. only	Wet	West	Turning right	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2022-Nov-04, Fri,16:59	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Parked	Passenger van	Unattended vehicle	
2022-Dec-09, Fri,15:30	Clear	Rear end	P.D. only	Dry	West	Stopped	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Dec-11, Sun,11:00	Snow	Rear end	P.D. only	Slush	North	Stopped	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: BASELINE RD/HWY 416 RICHMOND IC75AR53 @ RICHMOND RD

Traffic Control: Traffic signal **Total Collisions:** 45

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2022-Dec-31, Sat,15:30	Fog, mist, smoke, dust	Rear end	P.D. only	Wet	East	Stopped	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: JOHN SUTHERLAND DR @ RICHMOND RD

Traffic Control: Traffic signal **Total Collisions:** 20

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Mar-05, Mon,12:30	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	
2018-May-01, Tue,18:04	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	
2018-Aug-04, Sat,13:26	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-22, Mon,06:45	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	
2018-Nov-12, Mon,06:56	Snow	Angle	P.D. only	Ice	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Municipal transit bus	Other motor vehicle	
2019-Jun-07, Fri,14:07	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-Jun-14, Fri,12:41	Rain	Rear end	Non-fatal injury	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2019-Aug-13, Tue,11:10	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Oct-10, Thu,10:13	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: JOHN SUTHERLAND DR @ RICHMOND RD

Traffic Control: Traffic signal **Total Collisions:** 20

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Oct-19, Sat,15:28	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Dec-19, Thu,15:12	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2020-Sep-20, Sun,17:33	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	
2020-Oct-21, Wed,14:06	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	Automobile, station wagon	Other motor vehicle	
2021-Jun-29, Tue,14:00	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Jul-12, Mon,18:50	Clear	Angle	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Jul-27, Tue,11:33	Rain	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2021-Oct-14, Thu,18:20	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Jul-29, Fri,22:30	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	
2022-Aug-25, Thu,11:50	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: JOHN SUTHERLAND DR @ RICHMOND RD

Traffic Control: Traffic signal **Total Collisions:** 20

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2022-Dec-30, Fri,18:39	Rain	Rear end	Non-fatal injury	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	

Location: KIRKWOOD AVE btwn LYMAN ST & MULVIHILL AVE

Traffic Control: No control **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Mar-04, Sun,17:01	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Dec-28, Sat,11:50	Clear	Angle	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Passenger van	Other motor vehicle	
2022-Sep-01, Thu,15:45	Clear	Angle	P.D. only	Dry	North	Merging	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: KIRKWOOD AVE btwn RICHMOND RD & LYMAN ST

Traffic Control: No control **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2021-Jul-16, Fri,13:00	Clear	Sideswipe	P.D. only	Dry	South	Unknown	Unknown	Other motor vehicle	0
					South	Going ahead	Truck - open	Other motor vehicle	
2021-Aug-16, Mon,07:25	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Delivery van	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Jan-07, Fri,20:10	Clear	Sideswipe	P.D. only	Loose snow	North	Unknown	Unknown	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: KIRKWOOD AVE btwn WILBER AVE & RICHMOND RD

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2021-Apr-27, Tue,15:58	Clear	Sideswipe	P.D. only	Dry	South	Pulling away from shoulder or curb	Delivery van	Other motor vehicle	0
					South	Going ahead	Truck - open	Other motor vehicle	

Location: RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Traffic Control: Traffic signal **Total Collisions:** 73

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Jan-24, Wed,10:31	Clear	Turning movement	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Jan-28, Sun,12:40	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Skidding/sliding	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Mar-01, Thu,08:54	Clear	Rear end	P.D. only	Dry	South	Stopped	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Apr-13, Fri,17:31	Clear	Turning movement	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2018-May-06, Sun,12:40	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	
2018-May-09, Wed,17:24	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	
2018-May-25, Fri,15:30	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-23, Mon,14:34	Clear	Turning movement	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

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From: January 1, 2018 **To:** December 31, 2022

Location: RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Traffic Control: Traffic signal **Total Collisions:** 73

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Sep-17, Mon,07:46	Clear	Rear end	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Oct-20, Sat,08:50	Clear	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-Nov-10, Sat,09:33	Clear	SMV other	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Pole (utility, power)	0
2018-Nov-20, Tue,15:32	Clear	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	
2019-Feb-04, Mon,08:43	Freezing Rain	Sideswipe	P.D. only	Loose snow	South	Going ahead	Truck - tractor	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Feb-09, Sat,17:37	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Mar-05, Tue,07:45	Clear	Rear end	P.D. only	Loose snow	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Mar-25, Mon,20:20	Clear	Turning movement	Non-fatal injury	Dry	West	Making "U" turn	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Apr-20, Sat,20:46	Clear	Sideswipe	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Passenger van	Other motor vehicle	
2019-May-20, Mon,13:39	Clear	SMV other	P.D. only	Dry	East	Turning right	Pick-up truck	Pole (utility, power)	0
2019-Jun-11, Tue,16:30	Clear	Rear end	Non-fatal injury	Dry	South	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning right	Passenger van	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Traffic Control: Traffic signal **Total Collisions:** 73

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Jun-27, Thu,19:15	Clear	Turning movement	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Passenger van	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jul-27, Sat,22:19	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-Aug-27, Tue,13:09	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Oct-16, Wed,12:42	Rain	Rear end	P.D. only	Wet	East	Going ahead	Truck - closed	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Oct-23, Wed,16:00	Clear	Rear end	P.D. only	Dry	South	Turning right	Motorcycle	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Oct-24, Thu,06:45	Clear	Rear end	P.D. only	Dry	South	Changing lanes	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-03, Sun,23:51	Clear	Rear end	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Nov-08, Fri,15:05	Clear	Other	P.D. only	Dry	North	Reversing	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-11, Mon,16:50	Snow	Rear end	P.D. only	Loose snow	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Dec-08, Sun,19:10	Clear	Sideswipe	P.D. only	Dry	East	Turning left	Passenger van	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Traffic Control: Traffic signal **Total Collisions:** 73

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Dec-09, Mon,19:53	Rain	Rear end	P.D. only	Wet	East	Stopped	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Dec-12, Thu,17:00	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	
2020-Jan-06, Mon,09:30	Snow	Sideswipe	P.D. only	Loose snow	West	Changing lanes	Ambulance	Other motor vehicle	0
					West	Stopped	School bus	Other motor vehicle	
2020-Jan-21, Tue,11:30	Clear	Turning movement	P.D. only	Loose snow	West	Turning left	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jan-21, Tue,14:10	Clear	Rear end	P.D. only	Dry	North	Unknown	Unknown	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2020-Jan-24, Fri,17:15	Clear	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2020-Feb-05, Wed,17:02	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2020-Feb-27, Thu,12:24	Snow	Rear end	Non-fatal injury	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jun-12, Fri,17:26	Clear	Sideswipe	P.D. only	Dry	East	Overtaking	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Aug-10, Mon,10:00	Clear	Angle	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Aug-14, Fri,14:40	Clear	Rear end	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2020-Aug-21, Fri,13:23	Clear	Rear end	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Traffic Control: Traffic signal **Total Collisions:** 73

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Sep-08, Tue,16:00	Rain	Rear end	P.D. only	Wet	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2020-Sep-27, Sun,10:35	Clear	Turning movement	P.D. only	Dry	East	Turning left	Municipal transit bus	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2020-Dec-18, Fri,14:00	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2021-Feb-23, Tue,18:20	Clear	Turning movement	P.D. only	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Mar-10, Wed,14:15	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	
2021-Mar-12, Fri,07:42	Clear	Turning movement	Non-fatal injury	Dry	South	Turning left	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2021-Mar-30, Tue,08:19	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2021-Apr-20, Tue,16:15	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Jun-17, Thu,17:00	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Automobile, station wagon	Cyclist	0
					South	Going ahead	Bicycle	Other motor vehicle	
2021-Jun-30, Wed,19:14	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2021-Jul-28, Wed,17:09	Clear	Rear end	P.D. only	Dry	South	Turning right	Passenger van	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2021-Sep-11, Sat,16:01	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Motorcycle	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Traffic Control: Traffic signal **Total Collisions:** 73

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2021-Sep-23, Thu,08:50	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Sep-23, Thu,14:37	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2021-Oct-26, Tue,18:42	Rain	Rear end	P.D. only	Wet	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Pick-up truck	Other motor vehicle	
2021-Oct-28, Thu,16:03	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Stopped	Pick-up truck	Other motor vehicle	
2021-Oct-30, Sat,19:12	Rain	SMV other	P.D. only	Wet	West	Going ahead	Pick-up truck	Skidding/sliding	0
2021-Nov-24, Wed,09:05	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Dec-15, Wed,14:38	Snow	Other	P.D. only	Wet	South	Turning left	Pick-up truck	Other motor vehicle	0
					North	Turning left	Pick-up truck	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2022-May-15, Sun,15:45	Rain	Rear end	P.D. only	Wet	West	Unknown	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2022-May-28, Sat,10:45	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Passenger van	Other motor vehicle	
2022-Jun-12, Sun,08:24	Rain	Angle	Non-fatal injury	Wet	South	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2022-Aug-25, Thu,13:10	Clear	Sideswipe	P.D. only	Dry	East	Overtaking	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	

Location: RICHMOND RD @ HOLLY ACRES RD/NANAIMO DR

Traffic Control: Traffic signal **Total Collisions:** 73

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2022-Oct-18, Tue,18:30	Clear	Turning movement	P.D. only	Wet	East	Turning left	Unknown	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
2022-Nov-16, Wed,06:33	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
					East	Stopped	Municipal transit bus	Other motor vehicle	
2022-Nov-18, Fri,18:10	Clear	Rear end	P.D. only	Dry	East	Stopped	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2022-Nov-19, Sat,15:40	Clear	Rear end	P.D. only	Wet	West	Stopped	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2022-Dec-07, Wed,18:30	Rain	Rear end	P.D. only	Wet	North	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2022-Dec-12, Mon,16:40	Clear	Turning movement	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2022-Dec-13, Tue,06:35	Clear	Rear end	P.D. only	Dry	South	Stopped	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Dec-19, Mon,17:30	Clear	Approaching	P.D. only	Other	South	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2022-Dec-20, Tue,05:30	Clear	Angle	P.D. only	Dry	South	Merging	Automobile, station wagon	Other motor vehicle	0
					West	Merging	Pick-up truck	Other motor vehicle	

Location: RICHMOND RD btwn BASELINE RD/HWY416 IC75A RAMP53 & HWY416 IC75A RAMP63

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: RICHMOND RD btwn BASELINE RD/HWY416 IC75A RAMP53 & HWY416 IC75A RAMP63

Traffic Control: No control **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Jan-20, Mon,14:30	Clear	Sideswipe	P.D. only	Slush	East	Merging	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Passenger van	Other motor vehicle	

Location: RICHMOND RD btwn CLIFTON RD & KIRKWOOD AVE

Traffic Control: No control **Total Collisions:** 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Oct-29, Mon,12:17	Clear	Sideswipe	P.D. only	Dry	East	Pulling onto shoulder or toward curb	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Municipal transit bus	Other motor vehicle	
2019-May-04, Sat,09:52	Clear	Sideswipe	P.D. only	Dry	East	Pulling away from shoulder or curb	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Nov-05, Tue,17:05	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Passenger van	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Aug-20, Thu,16:40	Clear	Sideswipe	P.D. only	Dry	East	Pulling away from shoulder or curb	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: RICHMOND RD btwn HWY416 IC75A RAMP63 & JOHN SUTHERLAND DR

Traffic Control: No control **Total Collisions:** 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Jan-17, Wed,23:12	Clear	SMV other	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Pole (utility, power)	0
2018-Jan-20, Sat,18:03	Clear	Rear end	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Automobile, station wagon	Other motor vehicle	
2019-May-18, Sat,18:37	Clear	Rear end	P.D. only	Dry	East	Merging	Passenger van	Other motor vehicle	0
					East	Merging	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: RICHMOND RD btwn HWY416 IC75A RAMP63 & JOHN SUTHERLAND DR

Traffic Control: No control **Total Collisions:** 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Jan-15, Wed,16:00	Snow	Other	P.D. only	Wet	West	Going ahead	Pick-up truck	Debris falling off vehicle	0
					West	Unknown	Unknown	Other	
2022-Nov-04, Fri,02:15	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Unknown	Unknown	Other motor vehicle	

Location: RICHMOND RD btwn JOHN SUTHERLAND DR & HOLLY ACRES RD

Traffic Control: No control **Total Collisions:** 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Sep-10, Mon,20:02	Rain	SMV other	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Animal - wild	0
2019-Apr-02, Tue,07:15	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Oct-08, Tue,07:56	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	
2020-Jan-29, Wed,23:58	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Skidding/sliding	0
2021-Nov-04, Thu,12:06	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	
2022-Mar-08, Tue,06:06	Snow	SMV other	P.D. only	Packed snow	South	Going ahead	Automobile, station wagon	Pole (utility, power)	0
2022-Apr-28, Thu,15:00	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Unknown	Other motor vehicle	

Location: RICHMOND RD btwn KIRKWOOD AVE & HILSON AVE

Traffic Control: No control **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: RICHMOND RD btwn KIRKWOOD AVE & HILSON AVE

Traffic Control: No control **Total Collisions:** 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Apr-19, Thu,10:06	Clear	Sideswipe	Non-fatal injury	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Feb-13, Thu,18:10	Clear	Angle	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Feb-11, Fri,10:50	Clear	SMV unattended vehicle	P.D. only	Dry	East	Unknown	Unknown	Unattended vehicle	0

Location: RICHMOND RD btwn MCRAE AVE & CLIFTON RD

Traffic Control: No control **Total Collisions:** 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-Mar-25, Sun,14:26	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	Automobile, station wagon	Other motor vehicle	
2019-May-16, Thu,19:44	Clear	Sideswipe	Non-fatal injury	Dry	East	Stopped	Automobile, station wagon	Cyclist	0
					East	Going ahead	Bicycle	Other motor vehicle	
2019-Aug-07, Wed,20:23	Clear	Angle	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Oct-02, Sat,10:30	Rain	SMV other	P.D. only	Wet	South	Turning left	Pick-up truck	Fire Hydrant	0

Appendix G: Other Background Development Excerpts

1.3 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?		✘
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone? *		✘

**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.

1.4 SAFETY TRIGGERS

	Yes	No
Are posted speed limits on a boundary street 80 km/hr or greater?		✘
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		✘
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)?	✓	
Is the proposed driveway within auxiliary lanes of an intersection?		✘
Does the proposed driveway make use of an existing median break that serves an existing site?		✘
Is there a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		✘
Does the development include a drive-thru facility?		✘

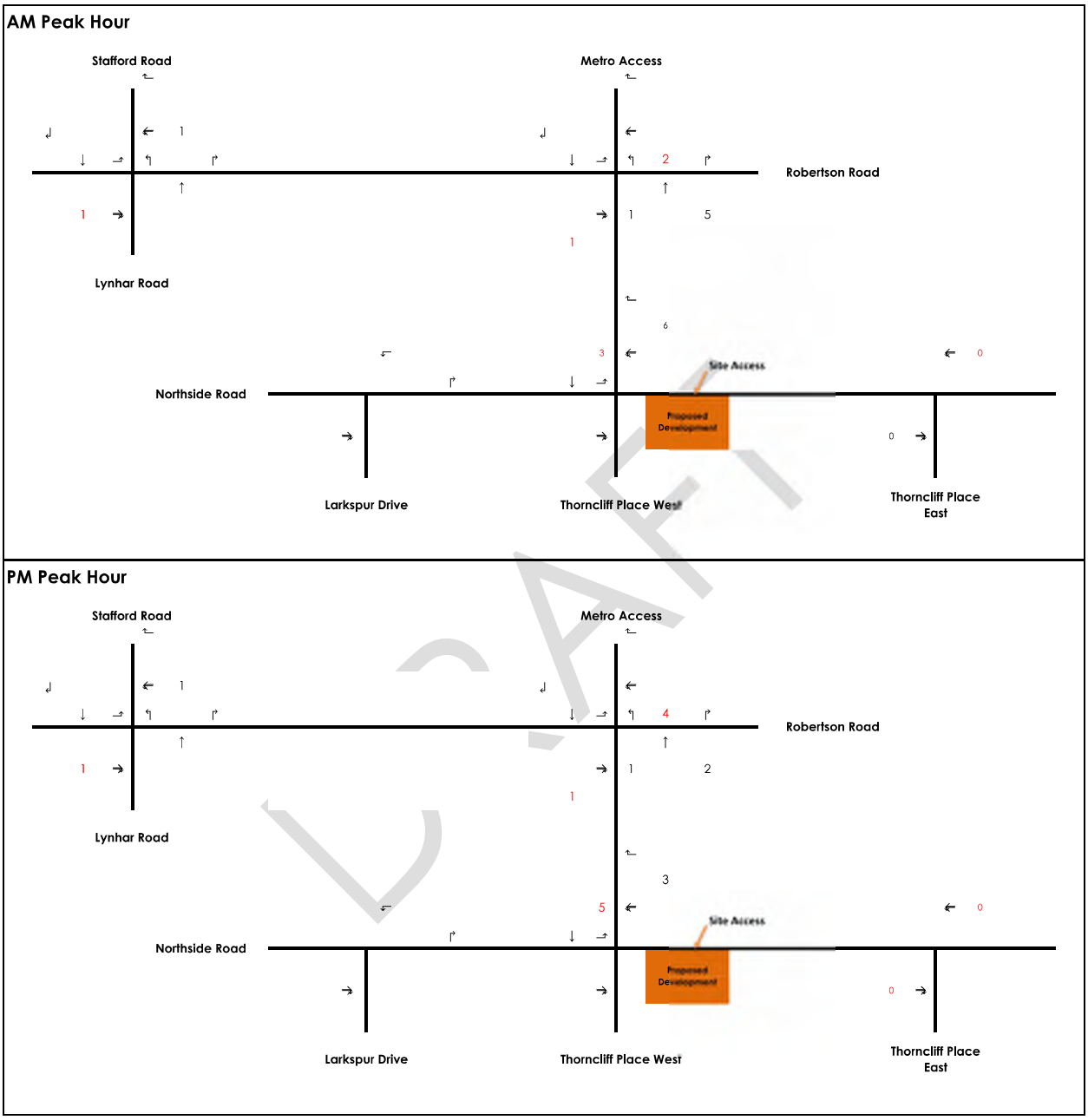
If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

1.5 SUMMARY

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

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).

Figure 10 - Site Trips



DRAFT

1 Screening

This study has been prepared according to the City of Ottawa's 2017 Transportation Impact Assessment (TIA) Guidelines. Accordingly, a Step 1 Screening Form has been prepared and is included as Appendix A, along with the Certification Form for the TIA Study PM. As shown in the Screening Form, a TIA is required including the Design Review component and the Network Impact Component. This report is part of an Official Plan amendment/zoning by-law amendment.

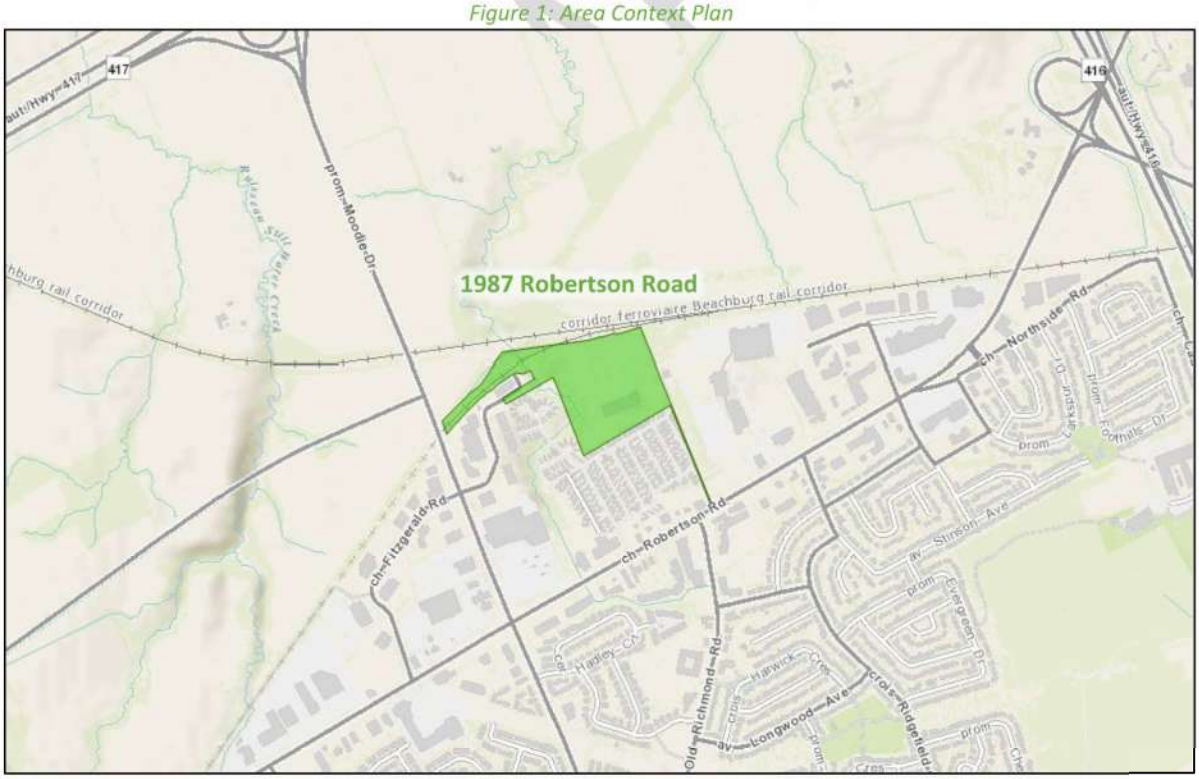
2 Existing and Planned Conditions

2.1 Proposed Development

The existing site, zoned primarily as Business Park Industrial Zone (IP2 with minor portions as IP[1530], IPS)) and with minor portions of the site area zoned as Agricultural (AG), General Mixed Use (GM18 F(1.0) H(34)), and Arterial Mainstreet (AM) currently consists of a warehouse and industrial yard, and includes an electrical utility transmission corridor and decommissioned rail corridor. The proposed development includes eight high-rise buildings on six-storey podiums and one six-storey building comprising a total of 1,925 units and 41,657 ft^2 of commercial space, all to be built-out in five phases by 2029. The site is proposed as accessing Moodie Drive via a new east leg of the intersection with Timm Drive, and proposes 1,778 vehicle parking spaces. A MUP is also proposed along the eastern channel of the site connecting to the pedestrian facilities on Robertson Road.

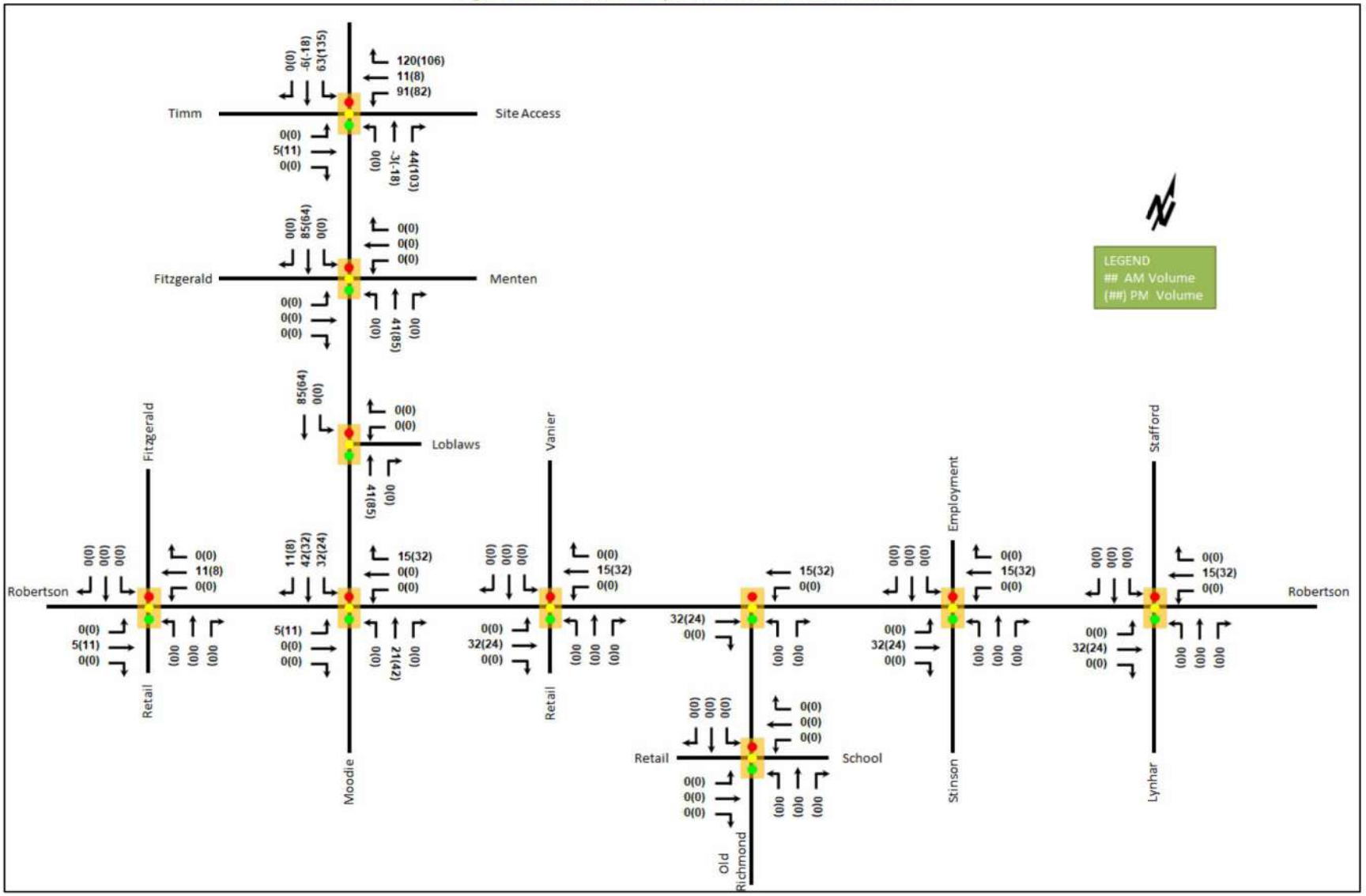
Figure 1 illustrates the study area context. Figure 2 illustrates the proposed concept plan.

Figure 1: Area Context Plan



Source: http://maps.ottawa.ca/geoOttawa/ Accessed: March 12, 2021

Figure 12: New and Pass-By Site Generation Auto Volumes



TIA Final Report

Parsons has been retained by Brigil to prepare a Transportation Impact Assessment (TIA) in support of a Zoning By-Law Amendment (ZBLA) and a Site Plan Application (SPA) for a residential development located at 2946 Baseline Road in Bayshore/Cedarview district. **The previous submission on May 30, 2023 focused on Phases/Towers 4, 5 and 6 as Phases/Towers 1, 2 and 3 were already approved. At this time, Tower 1 has been constructed and fully occupied, while Tower 2 is under construction. The previously approved Tower 3 is now being integrated with Tower 4 as part of a new vision for the development site. Therefore, the new development proposal will contain a total of five phases/towers, and this application is being provided in support of Phases 3-5.** For the purpose of this report, "Phase 3-4" will be referred to as "Phase 4".

The following document has been prepared for three additional phases/towers, which follows the new TIA process, as outlined in the City Transportation Impact Assessment (TIA) Guidelines (2017). The following report represents Step 5 – TIA Final Report.

1. Screening Form

The screening form confirmed the need for a TIA Report based on the following:

- The Trip Generation trigger. Phases 4 to 5 consist of three mixed-use buildings with approximately 890 residential apartment units and 2,180 m^2 (23,480 ft^2) of commercial space.
- The Location trigger has also been triggered, given that the development is located within a transit priority corridor and spine cycling route.
- The Safety trigger given that the proposed driveway is within the influence of an adjacent traffic signal at Sandcastle/Baseline.

The Screening Form and responses to City of Ottawa comments have been provided in **Appendix A**.

2. Scoping Report

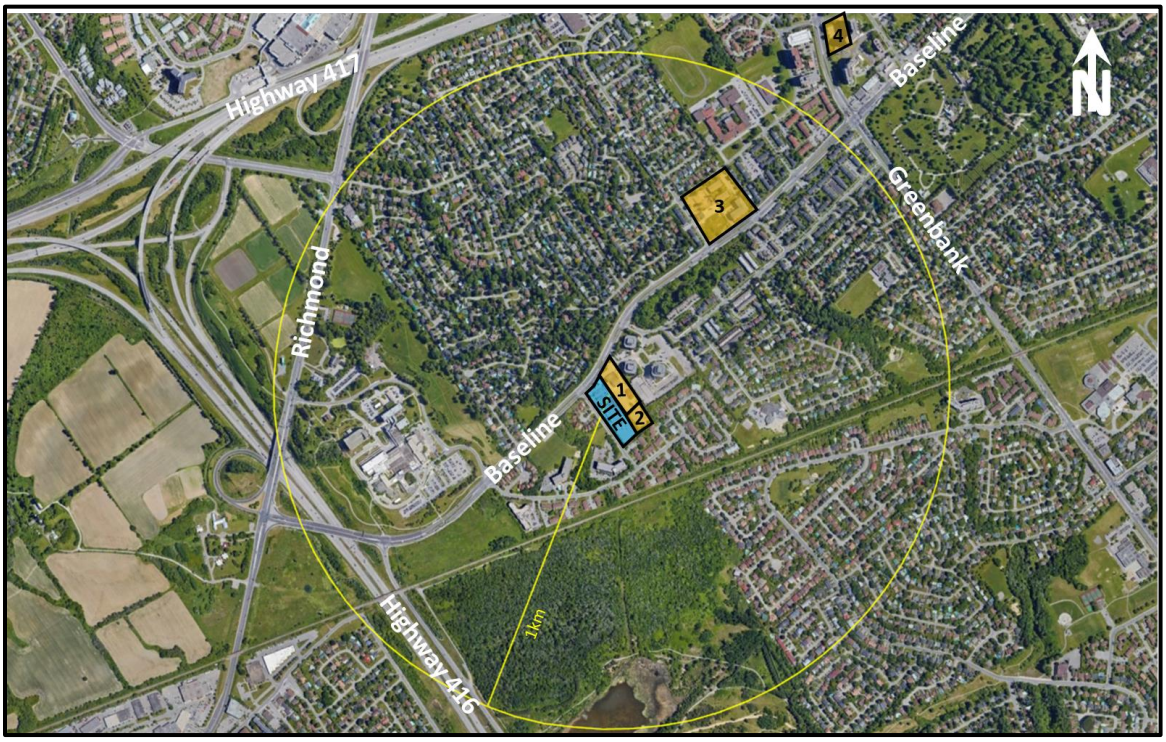
2.1. Existing and Planned Conditions

2.1.1. PROPOSED DEVELOPMENT

The subject site is located at the municipal addresses of 2946 and 2940 Baseline Road on the southeast corner of the Sandcastle/Baseline intersection. The previous Phases 1-3 was approved under a separate development application, "2940 Baseline Road Community Transportation Study" by Delcan, submitted on October 21, 2011, and supported by an updated Memo TIA by Parsons submitted to the City on June 16, 2021. Since then, Phases 1 and 2 have been constructed, and the previous Phase 3 tower has been integrated within the current development proposal. Therefore, this TIA is being provided in support of Phases 4, 5 and 6 (note that Phase 3 has been incorporated into Phase 4).

The existing site has a small shopping plaza and surface parking which will be redeveloped to a high-density residential mixed used site. The proposed study area includes the intersections of Cedarview/Baseline, Valley Stream/Baseline, Sandcastle/Baseline, Monterey/Baseline, Morrison/Baseline, and roadway segments adjacent to site or between intersections as shown in **Figure 1**. More details regarding the study area can be found in **Section 2.1.2**.

Figure 10: Other Area Developments



1 – 2940 Baseline Road (Phase 1 and 2)

A TIA was prepared by Delcan and submitted on October 21, 2011 in support of three residential Phases within this greater development. Phase 1 has been built and is occupied; Phase 2 is almost complete its construction. An on-site traffic count and vehicle trip generation associated with Phase 1 was conducted on June 20th, 2024. It was observed that approximately 32 and 24 vehicles two-way were generated by Phase 1 for the AM and PM peak hours. It is forecasted that Phase 2 will generate approximately 35 and 26 new two-way vehicle trips based on proportionate development size compared to Phase 1, which will be added to background conditions.

2 – 2940 Baseline Road (Phase 3)

Phase 3 has since been redesigned and incorporated as part of this packaged submission. Formerly the greater site proposed 6 towers, which have now been reduced to 5 towers, with tower 3 and 4 becoming one. The Site Plans refer to this combined tower as Tower 3-4, but for the purpose of this report, it is being referred to as Phase 4.

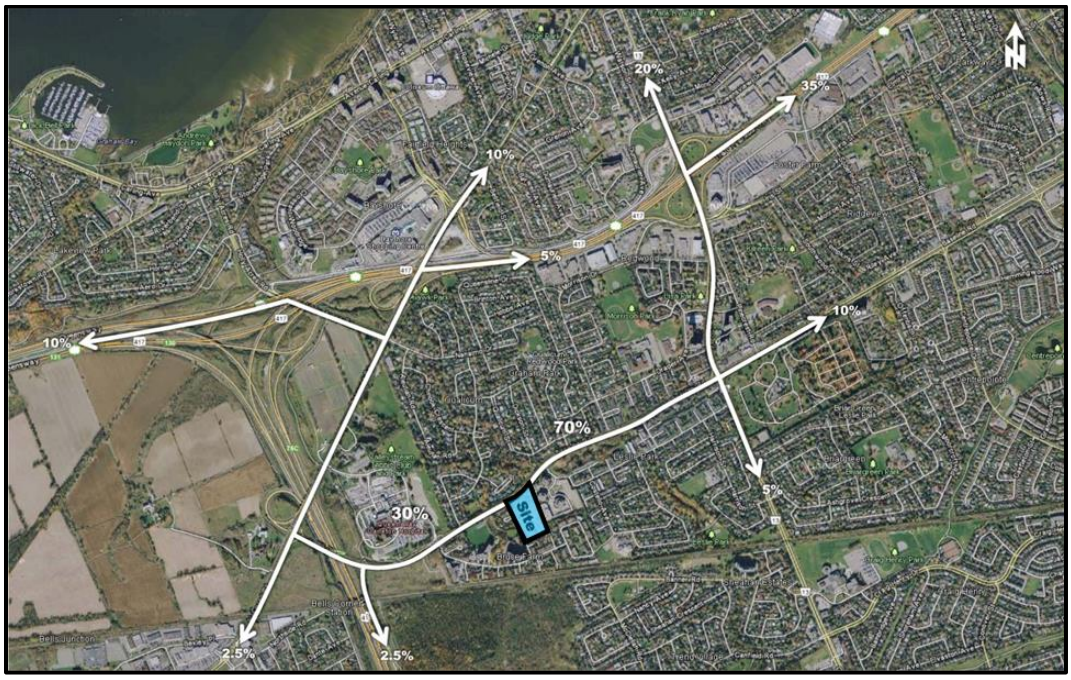
3 – 2785 Baseline Road

The site envisions a mixture of residential, commercial, and medical land uses. The latest ZBLA according to the City's Development Application tool proposes 66 units in Building D, 80 units in Building E, 81 units and medical uses in Building F, which is an increase of approximately 31 units from the original proposal. A TIA from Castleglenn date June 18th, 2019 was found. The majority of the development has already been built. No further TIA's were found. For this TIA, the projected volumes from the Castleglenn TIA will be layered on to future background conditions.

4 – 1300 McWaters Road

Proposed 25-storey 235-unit residential development. The TIA by GHD Limited projects 36 two-way trips in the AM peak and 37 two-way trips in the PM peak. Although this development is located further than 1km away, for completeness, trips forecasted on Baseline Road will be layered on to future background conditions.

Figure 13: Site Generated Traffic Percent Distribution



3.1.4. TRIP ASSIGNMENT

The site, including Phases 1 through 6 will all share three accesses to the surrounding network. The three accesses include a RIRO to Baseline Road approximately 70m east of Sandcastle Drive and two full movement accesses to Sandcastle Drive located approximately 40m and 170m south of Baseline Road. The 'new' site-generated vehicle trips provided in **Table 11,** were assigned to the study area network as shown in **Figure 14**.

Figure 14: 'New' Site-Generated Traffic Phase 4-6

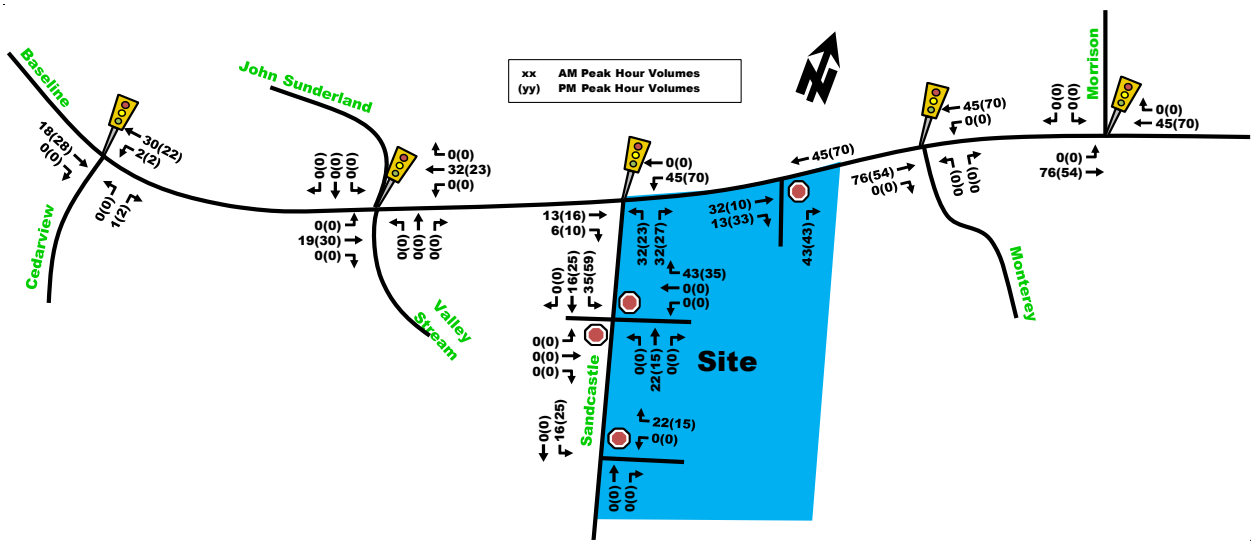
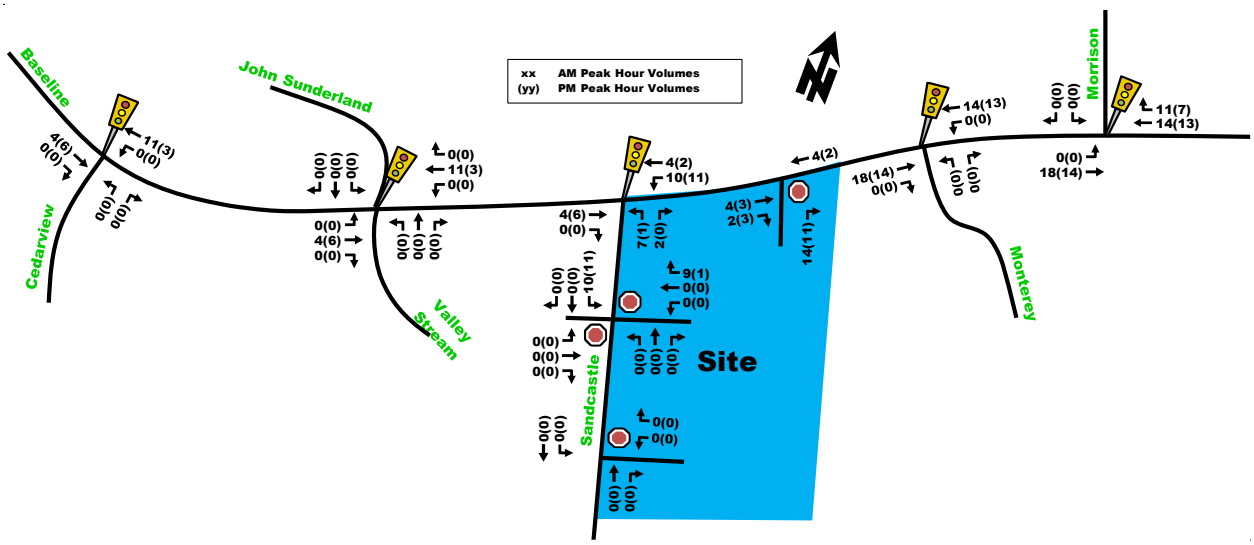


Figure 15: Other Area Development Background Volumes



3.3. Demand Rationalization

The following **Table 13** provides a summary of the existing traffic operations at the study area intersection based on the Synchro (V11) traffic analysis software. The subject intersections were assessed in terms of the volume-to-capacity (v/c) ratio and the corresponding Level of Service (LoS) for the critical movement(s). The Synchro model outputs of existing conditions are provided within **Appendix F** and the volumes used were obtained from **Figure 6**.

Table 13: Existing Intersection Performance

Intersection	Weekday AM Peak (PM Peak)					
	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Cedarview/Baseline	B(B)	0.66(0.61)	NBL(NBL)	13.2(11.4)	A(A)	0.54(0.40)
Valley Stream/Baseline	A(A)	0.59(0.52)	EBT(SBT)	10.0(10.4)	A(A)	0.56(0.44)
Sandcastle/Baseline	B(A)	0.64(0.51)	EBT(NBL)	9.1(7.3)	B(A)	0.62(0.45)
Monterey/Baseline	A(A)	0.59(0.43)	EBT(WBT)	10.5(8.7)	A(A)	0.57(0.42)
Morrison/Baseline	A(B)	0.54(0.61)	EBT(SBL)	6.8(11.0)	A(A)	0.53(0.52)

Note: Analysis of signalized intersections assumes a PHF of 0.9 and a saturation flow rate of 1800 veh/h/lane. U = Unsignalized.

As seen in **Table 13** all intersections operate overall at very good LoS 'B' or better with critical movements operating at LoS 'B' or better during the existing conditions. The Synchro analysis confirms that the overall network is expected to operate well, with ample capacity remaining.

Although a 1% annual growth rate is proposed for future horizon years based on historical traffic counts, it is anticipated to gradually taper as city wide initiatives aimed at reducing auto-usage take place. Some of the more relevant initiatives for this study area include the Baseline BRT corridor which would provide improved transit connectivity from the site to Baseline Station on Woodroffe Road. Baseline Station, along with nearby Bayshore Station will both become LRT stations as part of the Stage 2 LRT expansion which will add 44kms of new rail and 24 new LRT stations by 2026.

Given the city-wide initiatives to promote alternate modes of transportation, including advancements to the greater transit network such as LRT Stage 2 and the transit network adjacent to the site with the Baseline BRT

TIA Screening and Scoping Report

1. SCREENING FORM

The Screening Form, in conjunction with the Scoping Report for the subject development, was submitted to the City of Ottawa staff for review and confirmation of the need for a Transportation Impact Assessment (TIA). Trip Generation triggers were met based on the type and size of the development. The Location triggers were met based on the site's location in the Robertson Arterial Mainstreet Design Priority Area (DPA) and fronting a designated Cycling Spine Route. The Safety trigger was met based on the proposed drive through facility and also on the site's proposed driveway location, which is within close proximity to Robertson/Fitzgerald signalized intersection. The Screening Form is provided as Appendix A.

2. SCOPING REPORT

2.1. EXISTING AND PLANNED CONDITIONS

2.1.1. PROPOSED DEVELOPMENT

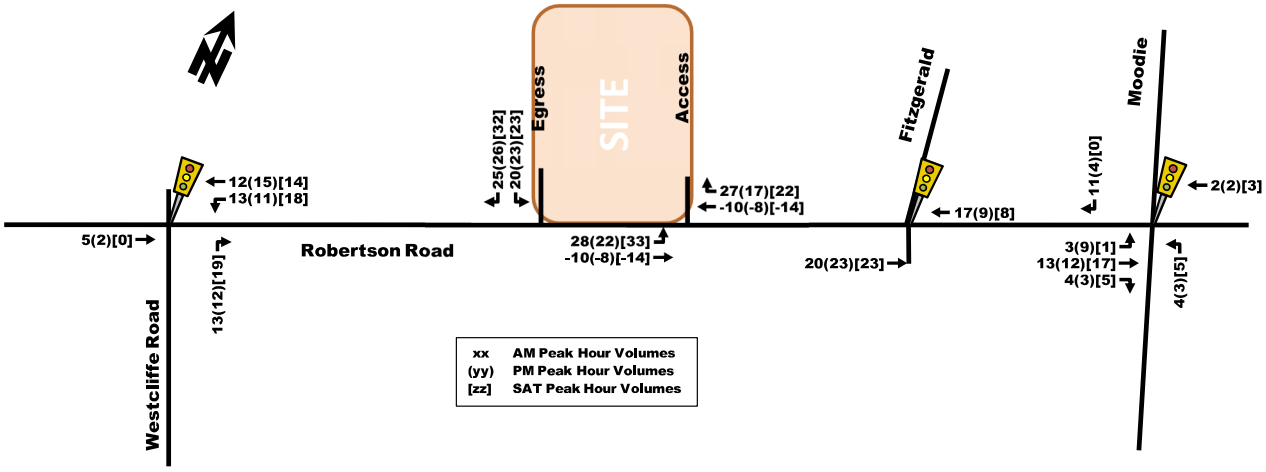
Based on the Site Plan provided by Lawrence Architect Incorporated, it is our understanding that the proponent is proposing a retail/warehouse complex at the rear of the site with drive-thru restaurant at the front of the site located at 2165 Robertson Road. The expected date of occupancy is 2019. The proposed single-phase development will consist of a 1,092 m^2 of Warehouse (ITE 150), a 232 m^2 of Fast-Food Restaurant with drive-thru (ITE 934) and 74 surface parking spaces. Of these spaces, 39 are for the warehouse and 35 are for the restaurant. . Access to the site is proposed via two one-way driveways on Robertson Road. The restaurant building has been located forward on the site with the parking and drive through at the rear of the building. The site is currently occupied by warehousing and parking, which has one 8.0m wide two-way driveway connection to Robertson Road. It is zoned as AM – Arterial Mainstreet Zone. The local context of the site is provided as Figure 1 and the proposed Site Plan is provided as Figure 2.

Figure 1: Local Context



and 175m west of Fitzgerald Road, respectively. Given these driveway configurations, 'new' and 'pass-by' site-generated vehicle trips are assigned to the study area network and illustrated as Figure 8.

Figure 8: 'New', 'Pass-by' and Multi-Purpose Site-Generated Traffic



3.2. BACKGROUND NETWORK TRAVEL DEMANDS

3.2.1. TRANSPORTATION NETWORK PLANS

Refer to section 2.1.3 Planned Conditions – Planned Study Area Transportation Network Changes.

3.2.2. BACKGROUND GROWTH

According to the City of Ottawa intersection traffic growth rates, background growth at the Robertson/Moodie signalized intersection has ranged between 0.2% to 2% per annum. To be conservative and considering ongoing development at Stittsville and Kanata South, a 2% per annum background growth on Robertson Road will be used. To account for the traffic generated by the previously identified area developments, the corresponding volumes have been added to the study area intersections as per corresponding traffic studies or existing intersection vehicle movement proportions. Other area development-generated traffic is included in Appendix E. The resultant 2019 and 2024 background traffic volumes are depicted as Figure 9 and Figure 10 respectively.

Figure 9: 2019 Background Traffic Volumes

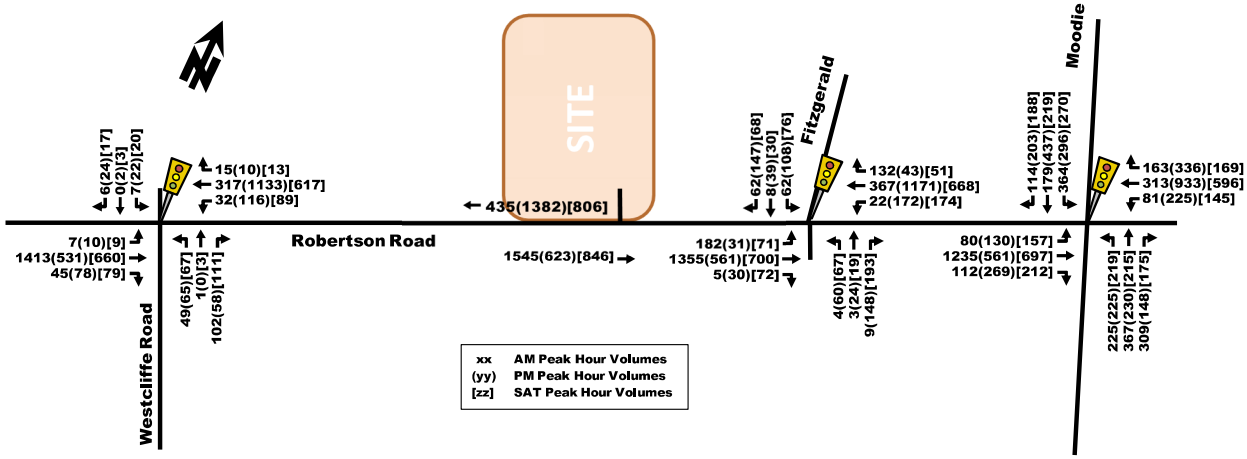
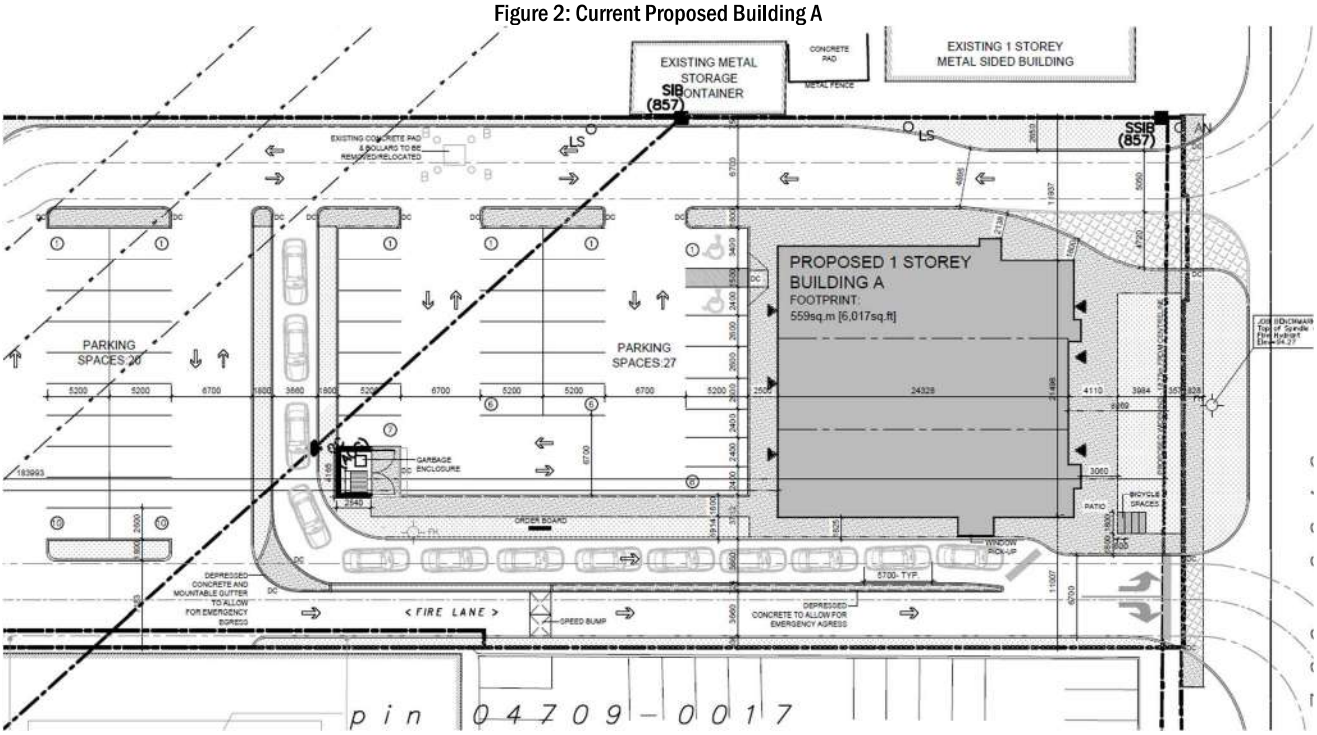


Figure 2: Current Proposed Building A



SITE TRIP GENERATION CHANGES

Within the original 2018 Traffic Impact Study for the whole site estimated a two-way total peak hour traffic generation of approximately 95 veh/h during weekday morning, 90 veh/h during weekday afternoon, and 110 during Saturday peak hours, excluding pass-by reductions. With regard to the previous Buildings A, it's 2,500 ft^2 drive-through restaurant, was estimated to generate two-way traffic of approximately 80 veh/h during the weekday morning, 65 during the weekday evening and 110 veh/h during the Saturday peak hours, excluding pass-by reductions. These volumes comprised, on average, approximately 80% of the overall site's total vehicular traffic generation for morning, afternoon and Saturday peaks.

The current Site Plan modifications reduces the drive through by ~(-)520 ft^2 and adds ~4,040 ft^2 of Fast Casual Restaurant. The following Table 1, Table 2, and Table 3 summarize the peak hour traffic generation comparisons between the Building A's new floor area plus added land uses, and includes the estimated net difference. As shown in Table 3, the estimated net difference in two-way traffic flow is a decrease of approximately 15 veh/h during the morning peak hour, an increase of approximately 30 veh/h during the afternoon peak hour and an increase of 85 veh/h during the Saturday peak hour. These additional volumes equate to approximately one more vehicle entering/leaving the site every 45 seconds during the Saturday peak hour, and for less frequently during the weekday peak hours.

Table 1: Previous Specialty Retail Peak Hour Traffic Generation

Land Use	Data Source	Area (ft^2)	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)			SAT Peak (Person Trips/hr)		
			In	Out	Total	In	Out	Total	In	Out	Total
Drive-through (Fast-Food)$_1$	934	2,500	39	39	78	33	31	64	54	53	107
Updated Drive-through (Fast-Food)$_2$	934	0	0	0	0	0	0	0	0	0	0
Fast Casual Restaurant$_2$	930	0	0	0	0	0	0	0	0	0	0
Total Vehicle Trips			**39**	**39**	**78**	**33**	**31**	**64**	**54**	**53**	**107**

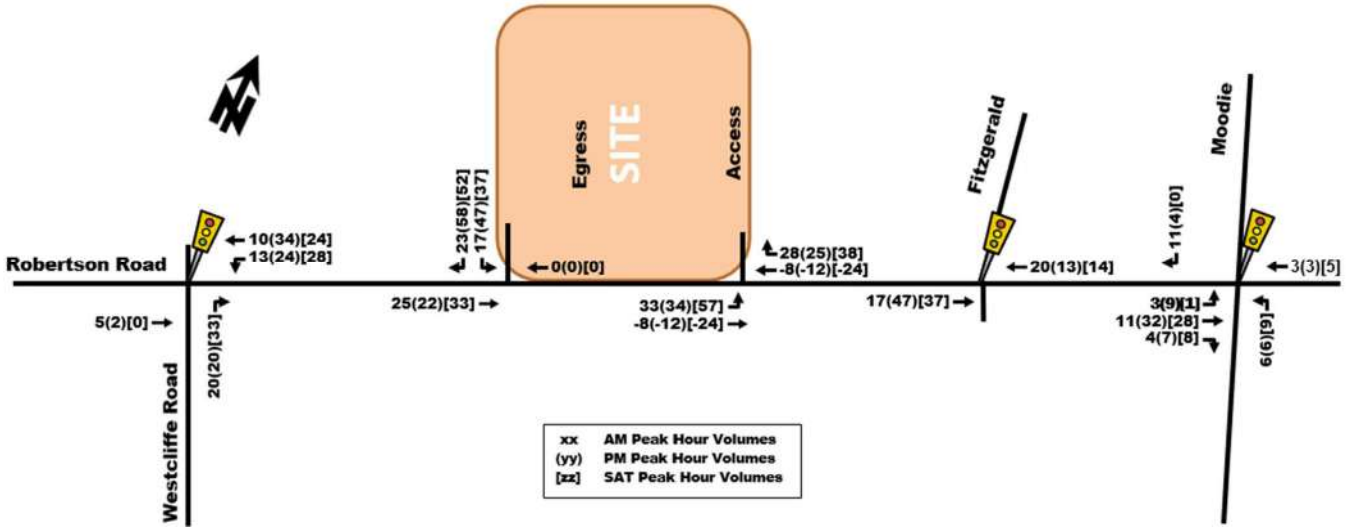
1.) Accounts for Drive-through (fast food) in the original TIA
2.) Accounts for the updated Site Plan's Fast-Food Restaurant
3.) Accounts for the updated Site Plan that includes Fast Casual Restaurant (Note that this type of restaurant is closed weekday morning peak hours and that the Saturday ITE study sample study size is small for the Saturday Peak Hour of Generator rates).

The updated total site generated traffic volumes including pass-by trips and the multi-purpose trip reduction is summarized in Table 4 and the subsequent network distribution is displayed in Figure 4.

Table 4: Updated Total Site Vehicle Trip Generation

Land Use	AM Peak (veh/h)			PM Peak (veh/h)			SAT Peak (veh/h)		
	In	Out	Total	In	Out	Total	In	Out	Total
Fast-Food w/Drive-Through Trip Generation	32	30	62	26	24	50	42	42	84
Fast Casual Restaurant Trip Generation	0	0	0	24	21	45	59	49	108
Retail/Warehousing Trip Generation	16	6	22	6	17	23	0	1	1
Fast-Food w/ Drive-Through Pass-by (50%)	-16	-16	-32	-13	-13	-26	-21	-21	-42
Fast Casual Restaurant Pass-by (50%)	0	0	0	-11	-11	-22	-27	-27	-54
Retail/Warehousing Pass-by (0%)	0	0	0	0	0	0	0	0	0
Multi-purpose Trips (10%)	-3	-2	-5	-3	-4	-7	-6	-4	-10
Total 'New' Auto Trips	**29**	**18**	**47**	**29**	**34**	**63**	**47**	**40**	**87**

Figure 4: 'New', 'Pass-by' and Multi-Purpose Site-Generated Traffic



As displayed in Figure 4, each of projected turning movements are approximately 60 veh/h or less during the peak hours, which on averages equates to 1 vehicle every minute. The site provides ~45m of throat length, ~90m of internal drive-through queueing space, and that there is a shared center right-turn/left-turn lane on Robertson Road for eastbound left turning vehicles to wait for breaks in oncoming traffic to enter. As described within the foregoing, the impacts of the increase in traffic volumes produced by the additional restaurant floor area when compared to the original TIA, are anticipated to be minor.

1.0 SCREENING

1.1 Introduction

This Transportation Impact Assessment (TIA) has been prepared in support of a Site Plan Control application for the property located at 1826 Robertson Road**.** The site is currently occupied by a shopping centre (referred to as 'Lynwood Centre').

The subject site is surrounded by the following:

- Robertson Road and Northside Road, followed by a shopping centre to the north;
- A retirement residence, followed by Eaton Street to the south;
- Larkspur Drive, followed by commercial and residential uses to the east;
- Lynhar Road, Virgil Road, and Ellery Crescent, followed by commercial and residential uses to the west.

A view of the subject site is provided in **Figure 1**.

1.2 Proposed Development

The proposed development is a single-storey retail pad, and will include 2,370 ft^2 (220 m^2) gross floor area (GFA) of drive-through restaurant space and 6,135 ft^2 (570 m^2) GFA of retail space at the northwest corner of the subject site. No changes to the existing Lynwood Centre building or its accesses are proposed. At full buildout, a total of 208 parking spaces will be provided on the entire site. Access to the proposed development will be provided via the existing Lynwood Centre accesses to Lynhar Road and Larkspur Drive**.** It is anticipated that the development will be constructed in a single phase, with full occupancy in 2024**.**

The proposed development is located within the Outer Urban Transect, and is designated as 'Corridor – Mainstreet' (Robertson Road) in Schedule B3 of the City of Ottawa's Official Plan. The existing zoning for the subject site is 'Arterial Mainstreet' (AM). The proposed drive-through restaurant and retail uses are permitted under the existing AM zoning**.**

A copy of the site plan is included in **Appendix A**.

1.3 Screening

The City's *2023 Revised TIA Guidelines* identify three triggers for completing a TIA report, including trip generation, location, and safety**.** The criteria for each trigger are outlined in the City's TIA Screening Form (included in **Appendix B**). The trigger results are as follows:

- Trip Generation Trigger – The development is anticipated to generate over 60 peak hour person trips; further assessment is **required** based on this trigger.

- Location Triggers **–** The development is located within a Design Priority Area; further assessment is **required** based on this trigger.

- Safety Triggers **–** The proposed development includes a drive-through facility; further assessment is **required** based on this trigger.

Figure 10: Net Additional Site-Generated Primary Traffic

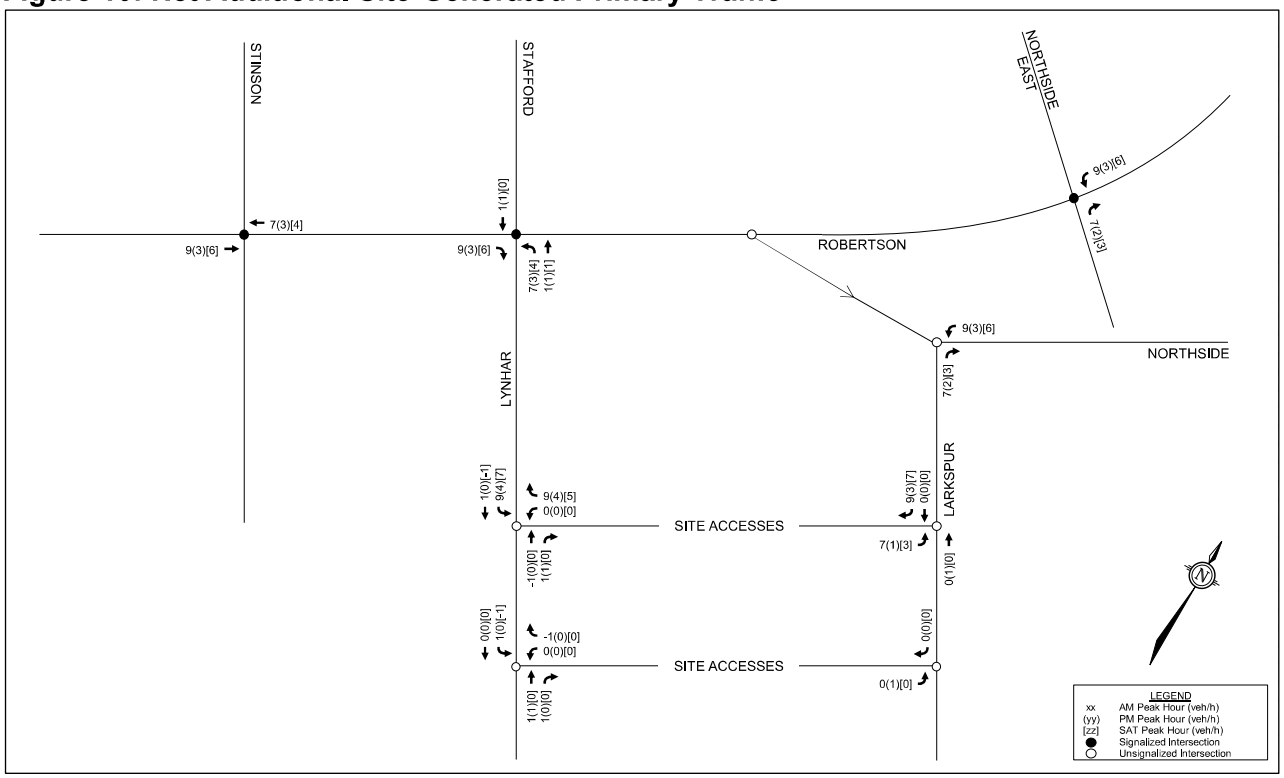
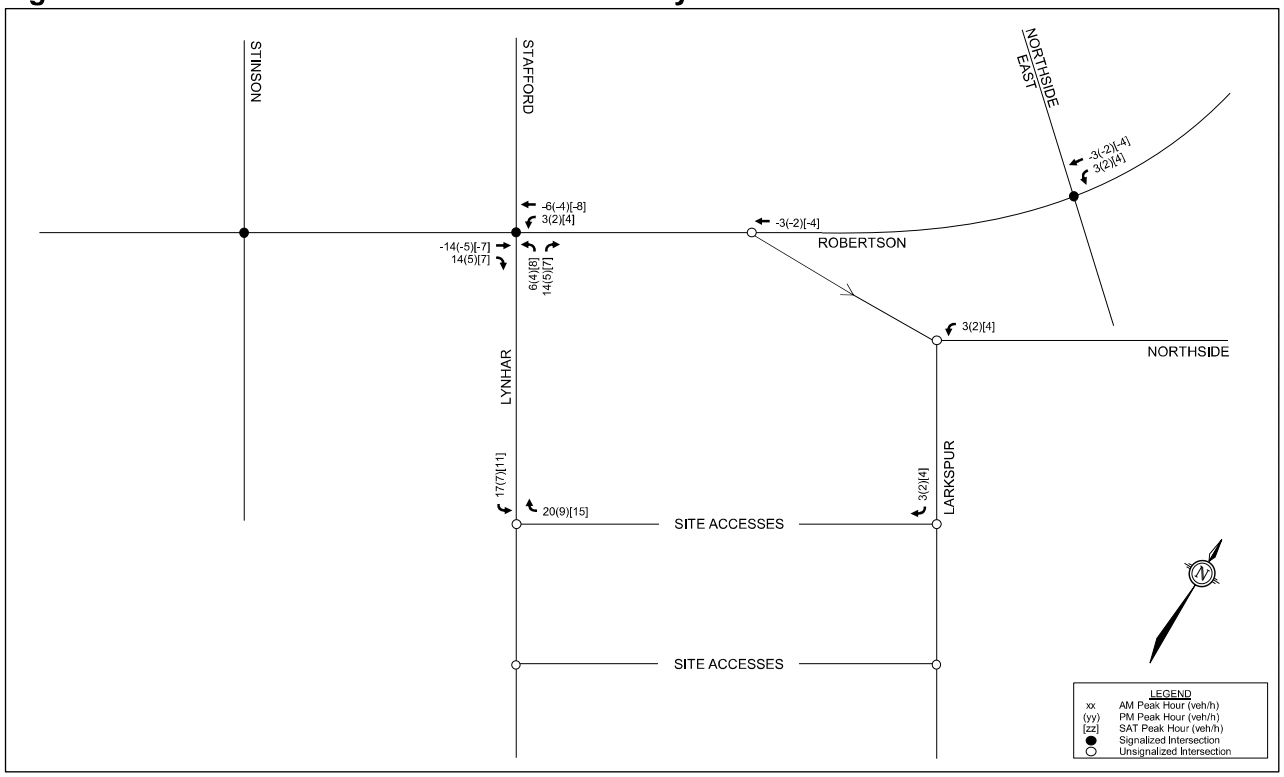


Figure 11: Net Additional Site-Generated Pass-By Traffic



Appendix H: BRBRT EAS Excerpts

1.3 STUDY OVERVIEW

The BRBRT corridor is a component of the City of Ottawa's planned Rapid Transit Network, as identified and supported by the policies and objectives of the City's Transportation Master Plan (TMP) and Official Plan (OP). Based on these documents, the City of Ottawa initiated a Planning and Environmental Assessment Study to develop and evaluate alternative designs and to assess the impacts of transit infrastructure required to support implementation of this facility.

The study area boundary for the BRBRT study encompasses the Baseline-Heron Road corridor between Richmond Road in the west and Data Centre Road in the east. Initially the study only extended to Prince of Wales Drive in the east, but was extended in 2014 to include section of Heron Road to Data Centre Road providing a connection to the Southeast Transitway at Heron Station. Further in the west, the study area boundary extends north from the Baseline Road/Richmond Road intersection to north of Highway 417 to provide for a connection to Bayshore Station. Figure 1-3 highlights the study area.

The study will ultimately recommend and assess a preferred alignment and design for transit infrastructure between Bayshore Station and Data Centre Road. Within the study area, a range of alternative corridor alignments and designs will be examined, including on-street bus lanes (e.g. median or curbside) and transit priority measures. To ensure that all options are being considered, the study area also includes additional area around Bayshore Station and the Baseline Road/Richmond Road intersection in the west and Baseline Station/Centrepointe Town Centre/Algonquin College in the central part of the study area.

Some tasks will require examination of a broader area beyond the study area boundaries to address environmental impacts, operational issues (transit and other modes), co-ordinate with other on-going studies and projects, and to study possible future network connections.

Figure 1-3: Overview of Baseline Road Rapid Transit Corridor Study Area



Analysis of peak load points also reflected the greater volumes of traffic towards the eastern end of the study area on Baseline Road. In the weekday morning peak hour, the peak load points were located at Lexington Street in the eastbound direction (~380 passengers), and at Clyde Avenue (~440 passengers) in the westbound direction. In the weekday afternoon peak hour, the peak load points were located at Pender St. in the eastbound direction (~370 passengers), and at Prince of Wales Dr. (~360 passengers) in the westbound direction. In comparison, passenger volumes between Valley Stream Drive and Sioux Crescent, in the western end of the study area, was in the range of 120-230 passengers per direction during the peak hours. All-day passenger volumes on Baseline Road are displayed in Table 2-3, by screenlines.

Table 2-3: Baseline Road Passenger Volume by (Screenline (OC Transpo, April/May 2012): Baseline Road Passenger

Screenline Description		Screenline #		AM Peak Hour		PM Peak Hour		24 Hour Total		
Eastbound	*Westbound*	*EB*	*WB*	*EB*	*WB*	*EB*	*WB*	*EB*	*WB*	*Total*
Valley Stream Dr.	Sioux Cres.	SL09	SL16	173	153	123	232	1738	1737	3475
Sandcastle Dr.	Monterey Dr.	SL10	SL17	194	163	178	299	1974	2039	4013
Cobden Rd.	Cobden Rd.	SL11	SL18	305	168	210	312	2445	2360	4805
Deerfield Dr.	Cordova St.	SL12	SL19	296	435	365	350	3256	3165	6421
Pender St.	Clyde Ave.	SL13	SL20	318	437	370	348	3372	3267	6639
Farlane Blvd.	Zena St.	SL14	SL21	356	405	342	351	3330	3232	6562
Lexington St.	Prince of Wales	SL15	SL22	380	423	353	357	3442	3183	6625

Figure 3-1: Baseline Road Rapid Transit Corridor Study Area



Appendix I: Long Range Model Snapshots

TRANS Regional Model

Version 1.01 - Assigned December 09, 2024

AM Peak Hour Total Traffic Volume

Queensway Carleton Hospital

2022 Model

User Initials: AJ
Plot Prepared: April 04, 2025
EMME Scenario: 22002

TRANS

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

N

Distance (m)

50 100 150 200 250

Valleystream Park

Chinook Crescent

Okanagan Drive

Esquimalt Avenue

416

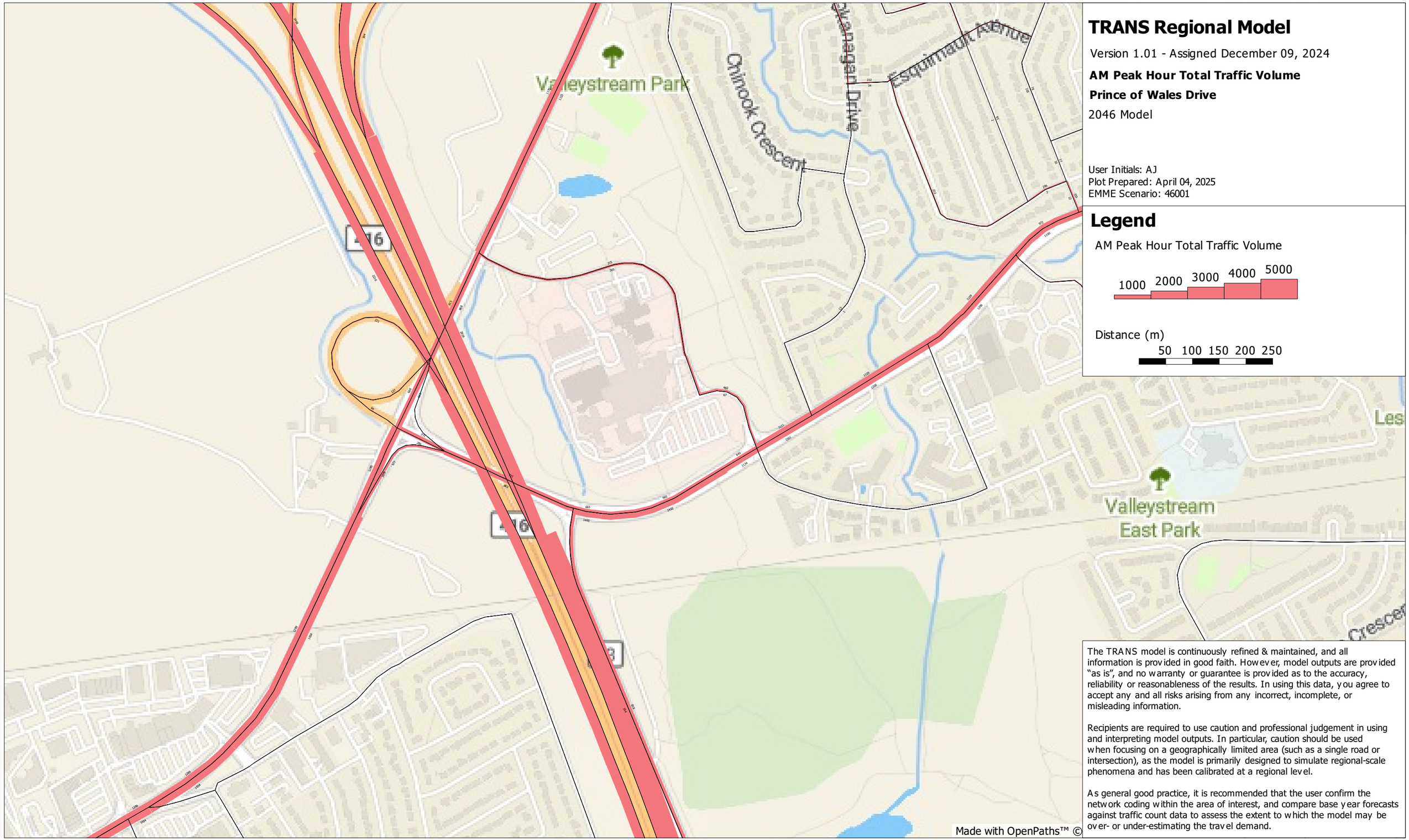
Valleystream East Park

Made with OpenPaths™ ©

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

Recipients are required to use caution and professional judgement in using and interpreting model outputs. In particular, caution should be used when focusing on a geographically limited area (such as a single road or intersection), as the model is primarily designed to simulate regional-scale phenomena and has been calibrated at a regional level.

As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.



TRANS Regional Model

Version 1.01 - Assigned December 09, 2024

AM Peak Hour Total Traffic Volume

Prince of Wales Drive

2046 Model

User Initials: AJ
Plot Prepared: April 04, 2025
EMME Scenario: 46001

Legend

AM Peak Hour Total Traffic Volume

1000 2000 3000 4000 5000

Distance (m)

50 100 150 200 250

The TRANS model is continuously refined & maintained, and all information is provided in good faith. However, model outputs are provided "as is", and no warranty or guarantee is provided as to the accuracy, reliability or reasonableness of the results. In using this data, you agree to accept any and all risks arising from any incorrect, incomplete, or misleading information.

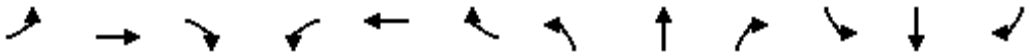
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As general good practice, it is recommended that the user confirm the network coding within the area of interest, and compare base year forecasts against traffic count data to assess the extent to which the model may be over- or under-estimating the travel demand.

Appendix J: Synchro Analysis Reports for Existing Conditions

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	515	8	374	21	37	91	147	829	22	26	385	17
Future Volume (vph)	515	8	374	21	37	91	147	829	22	26	385	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.97		0.99	0.98	1.00	1.00				0.98
Frt			0.850			0.850		0.996				0.850
Flt Protected	0.950				0.982		0.950			0.950		
Satd. Flow (prot)	3195	1784	1473	0	1734	1517	1572	3375	0	1544	3357	943
Flt Permitted	0.950				0.982		0.379			0.197		
Satd. Flow (perm)	3195	1784	1431	0	1724	1487	626	3375	0	320	3357	929
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			416			158		2				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		86.1			158.8			660.2			233.5	
Travel Time (s)		5.2			14.3			39.6			14.0	
Confl. Peds. (#/hr)			11	11			2		1	1		2
Confl. Bikes (#/hr)			1			4						1
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	2%	5%	5%	2%	2%	10%	2%	2%	12%	3%	64%
Adj. Flow (vph)	572	9	416	23	41	101	163	921	24	29	428	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	572	9	416	0	64	101	163	945	0	29	428	19
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

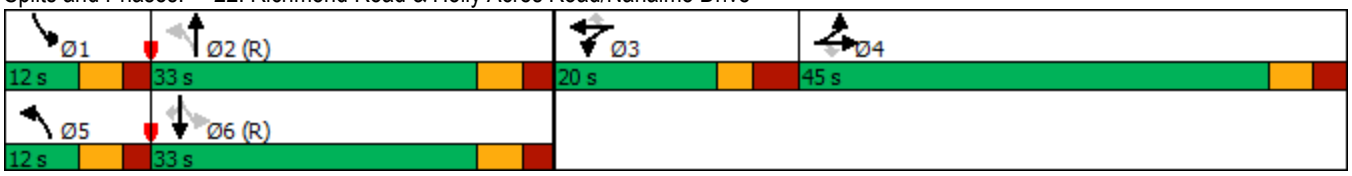
Richmond Rd/Holly Acres Rd/Nanaimo Dr
Existing AM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	45.0	45.0	45.0	20.0	20.0	20.0	12.0	33.0		12.0	33.0	33.0
Total Split (%)	40.9%	40.9%	40.9%	18.2%	18.2%	18.2%	10.9%	30.0%		10.9%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	26.4	26.4	26.4		10.8	10.8	52.8	45.2		43.0	36.0	36.0
Actuated g/C Ratio	0.24	0.24	0.24		0.10	0.10	0.48	0.41		0.39	0.33	0.33
v/c Ratio	0.75	0.02	0.63		0.38	0.35	0.41	0.68		0.15	0.39	0.05
Control Delay	44.7	28.9	7.7		52.9	4.8	21.5	32.5		19.7	31.7	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	44.7	28.9	7.7		52.9	4.8	21.5	32.5		19.7	31.7	0.2
LOS	D	C	A		D	A	C	C		B	C	A
Approach Delay		29.1			23.5			30.9			29.7	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	53.9	1.4	0.0		12.2	0.0	17.7	84.3		2.9	34.4	0.0
Queue Length 95th (m)	65.5	4.6	21.3		23.8	3.2	35.3	#143.1		8.8	53.3	0.0
Internal Link Dist (m)		62.1			134.8			636.2			209.5	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	1115	622	770		209	318	397	1387		201	1098	413
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.51	0.01	0.54		0.31	0.32	0.41	0.68		0.14	0.39	0.05

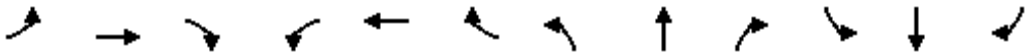
Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 29.6		Intersection LOS: C	
Intersection Capacity Utilization 70.2%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	485	50	325	37	71	52	244	776	33	27	729	22
Future Volume (vph)	485	50	325	37	71	52	244	776	33	27	729	22
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.96		0.99	0.98	1.00	1.00				0.97
Frt			0.850			0.850		0.994				0.850
Flt Protected	0.950				0.983		0.950			0.950		
Satd. Flow (prot)	3257	1784	1473	0	1748	1517	1631	3365	0	1662	3357	1097
Flt Permitted	0.950				0.983		0.199			0.253		
Satd. Flow (perm)	3257	1784	1415	0	1736	1484	340	3365	0	443	3357	1063
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			331			158		4				162
Link Speed (k/h)		60			40			60			50	
Link Distance (m)		86.1			158.8			660.2			233.5	
Travel Time (s)		5.2			14.3			39.6			16.8	
Confl. Peds. (#/hr)			15	15			13					13
Confl. Bikes (#/hr)			5			4			4			2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	2%	5%	3%	2%	2%	6%	2%	3%	4%	3%	41%
Adj. Flow (vph)	539	56	361	41	79	58	271	862	37	30	810	24
Shared Lane Traffic (%)												
Lane Group Flow (vph)	539	56	361	0	120	58	271	899	0	30	810	24
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	97		97	97		97	97		97	97		97
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Richmond Rd/Holly Acres Rd/Nanaimo Dr
Existing PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	29.0	29.0	29.0	17.0	17.0	17.0	17.0	47.0		17.0	47.0	47.0
Total Split (%)	26.4%	26.4%	26.4%	15.5%	15.5%	15.5%	15.5%	42.7%		15.5%	42.7%	42.7%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Act Effct Green (s)	21.3	21.3	21.3		10.2	10.2	56.8	50.0		47.5	40.7	40.7
Actuated g/C Ratio	0.20	0.20	0.20		0.09	0.09	0.52	0.46		0.44	0.37	0.37
v/c Ratio	0.85	0.16	0.66		0.73	0.21	0.88	0.58		0.11	0.65	0.05
Control Delay	55.6	37.5	12.6		74.3	1.6	47.0	25.0		14.0	31.3	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	55.6	37.5	12.6		74.3	1.6	47.0	25.0		14.0	31.3	0.2
LOS	E	D	B		E	A	D	C		B	C	A
Approach Delay		38.3			50.6			30.1			29.8	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	52.8	9.2	4.9		23.5	0.0	29.1	73.3		2.7	69.2	0.0
Queue Length 95th (m)	#74.2	19.2	31.7		#49.1	0.0	#67.4	95.1		6.9	88.4	0.0
Internal Link Dist (m)		62.1			134.8			636.2			209.5	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	670	367	553		165	283	308	1547		335	1255	499
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.80	0.15	0.65		0.73	0.20	0.88	0.58		0.09	0.65	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 108.9			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 33.6		Intersection LOS: C	
Intersection Capacity Utilization 72.6%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive



Richmond Rd/John Sutherland Dr
Existing AM Peak

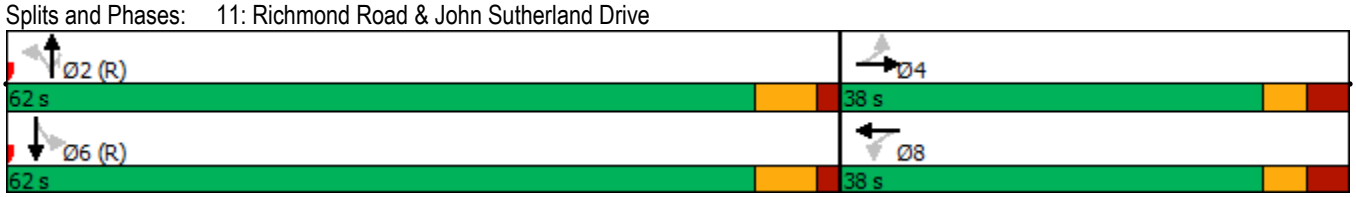
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	51	0	80	0	861	88	242	517	0
Future Volume (vph)	0	0	0	51	0	80	0	861	88	242	517	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt					0.918				0.850			
Flt Protected					0.981					0.950		
Satd. Flow (prot)	0	1784	0	0	1579	0	1784	3390	1517	1679	3390	0
Flt Permitted					0.872					0.286		
Satd. Flow (perm)	0	1784	0	0	1403	0	1784	3390	1517	505	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					82				95			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			660.2	
Travel Time (s)		7.0			8.7			16.2			29.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	0	0	0	57	0	89	0	957	98	269	574	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	146	0	0	957	98	269	574	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	

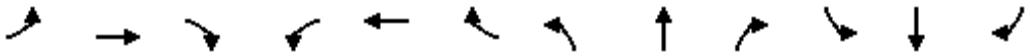
Richmond Rd/John Sutherland Dr
Existing AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		62.0	62.0	62.0	62.0	62.0	
Total Split (%)	38.0%	38.0%		38.0%	38.0%		62.0%	62.0%	62.0%	62.0%	62.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					12.0			75.0	75.0	75.0	75.0	
Actuated g/C Ratio					0.12			0.75	0.75	0.75	0.75	
v/c Ratio					0.61			0.38	0.08	0.71	0.23	
Control Delay					30.3			1.3	0.2	21.1	4.3	
Queue Delay					0.0			0.0	0.0	0.0	0.0	
Total Delay					30.3			1.3	0.2	21.1	4.3	
LOS					C			A	A	C	A	
Approach Delay					30.3			1.2			9.6	
Approach LOS					C			A			A	
Queue Length 50th (m)					10.9			2.7	0.0	19.2	12.1	
Queue Length 95th (m)					27.2			9.8	0.1	#78.9	22.8	
Internal Link Dist (m)		73.1			97.2			335.3			636.2	
Turn Bay Length (m)									35.0	40.0		
Base Capacity (vph)					496			2542	1161	378	2542	
Starvation Cap Reductn					0			0	0	0	0	
Spillback Cap Reductn					0			0	0	0	0	
Storage Cap Reductn					0			0	0	0	0	
Reduced v/c Ratio					0.29			0.38	0.08	0.71	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 92 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 6.7		Intersection LOS: A	
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

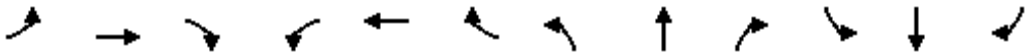
Splits and Phases: 11: Richmond Road & John Sutherland Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	137	0	224	4	703	27	79	864	0
Future Volume (vph)	0	0	0	137	0	224	4	703	27	79	864	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00		0.98	1.00		
Frt					0.916				0.850			
Flt Protected					0.981		0.950			0.950		
Satd. Flow (prot)	0	1784	0	0	1594	0	1695	3390	1517	1647	3390	0
Flt Permitted					0.875		0.256			0.325		
Satd. Flow (perm)	0	1784	0	0	1421	0	456	3390	1482	563	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					67				33			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			660.2	
Travel Time (s)		7.0			8.7			16.2			29.7	
Confl. Peds. (#/hr)							2		1	1		2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	0	0	0	152	0	249	4	781	30	88	960	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	401	0	4	781	30	88	960	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Richmond Rd/John Sutherland Dr
Existing PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		82.0	82.0	82.0	82.0	82.0	
Total Split (%)	31.7%	31.7%		31.7%	31.7%		68.3%	68.3%	68.3%	68.3%	68.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					30.8		76.2	76.2	76.2	76.2	76.2	
Actuated g/C Ratio					0.26		0.64	0.64	0.64	0.64	0.64	
v/c Ratio					0.97		0.01	0.36	0.03	0.25	0.45	
Control Delay					74.1		6.0	6.0	0.9	11.9	12.1	
Queue Delay					0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay					74.1		6.0	6.0	0.9	11.9	12.1	
LOS					E		A	A	A	B	B	
Approach Delay					74.1			5.8			12.0	
Approach LOS					E			A			B	
Queue Length 50th (m)					73.7		0.1	14.9	0.0	7.8	52.6	
Queue Length 95th (m)					#130.2		m0.5	23.7	0.3	16.1	65.3	
Internal Link Dist (m)		73.1			97.2			335.3			636.2	
Turn Bay Length (m)							40.0		35.0	40.0		
Base Capacity (vph)					421		289	2152	952	357	2152	
Starvation Cap Reductn					0		0	0	0	0	0	
Spillback Cap Reductn					0		0	0	0	0	0	
Storage Cap Reductn					0		0	0	0	0	0	
Reduced v/c Ratio					0.95		0.01	0.36	0.03	0.25	0.45	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 20.8		Intersection LOS: C	
Intersection Capacity Utilization 72.3%		ICU Level of Service C	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Richmond Road & John Sutherland Drive



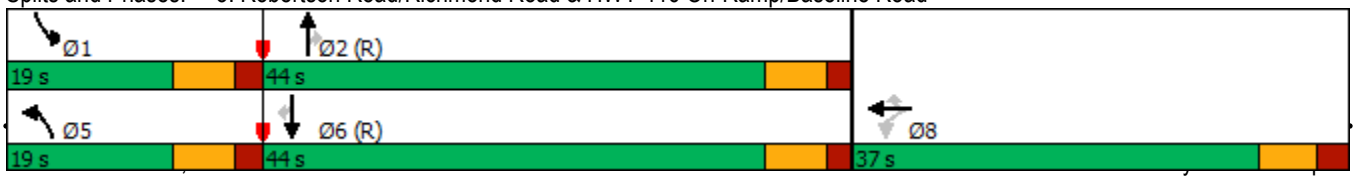
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	324	21	153	12	808	628	165	305	66
Future Volume (vph)	0	0	0	324	21	153	12	808	628	165	305	66
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						170			698			113
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	4%	2%	5%	8%	2%	4%	5%	3%	3%
Adj. Flow (vph)	0	0	0	360	23	170	13	898	698	183	339	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	360	23	170	13	898	698	183	339	73
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	

Richmond Rd/Robertson Rd/Baseline Rd
Existing AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	19.0	44.0	44.0	19.0	44.0	44.0
Total Split (%)				37.0%	37.0%	37.0%	19.0%	44.0%	44.0%	19.0%	44.0%	44.0%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				17.2	17.2	17.2	6.4	51.8	51.8	11.0	66.5	66.5
Actuated g/C Ratio				0.17	0.17	0.17	0.06	0.52	0.52	0.11	0.66	0.66
v/c Ratio				0.65	0.08	0.43	0.13	0.51	0.63	0.52	0.15	0.07
Control Delay				43.9	33.1	8.9	46.3	18.2	4.3	52.0	7.0	0.5
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				43.9	33.1	8.9	46.3	18.2	4.3	52.0	7.0	0.5
LOS				D	C	A	D	B	A	D	A	A
Approach Delay					32.7			12.4			20.0	
Approach LOS					C			B			C	
Queue Length 50th (m)				31.1	3.5	0.0	2.3	53.1	0.0	17.4	9.1	0.0
Queue Length 95th (m)				41.5	9.1	14.8	7.6	81.7	19.5	27.0	17.7	1.1
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				973	538	563	198	1756	1107	407	2233	1037
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.37	0.04	0.30	0.07	0.51	0.63	0.45	0.15	0.07

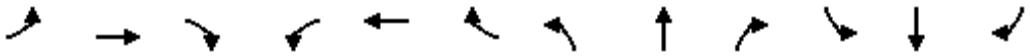
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 93 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 57.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	622	105	172	55	556	487	194	599	234
Future Volume (vph)	0	0	0	622	105	172	55	556	487	194	599	234
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00		0.99	1.00		0.98
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3288	1767	1517	1647	3390	1517	3288	3390	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3288	1767	1517	1643	3390	1495	3286	3390	1465
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						191			541			260
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	5%	2%	2%	2%	2%	3%
Adj. Flow (vph)	0	0	0	691	117	191	61	618	541	216	666	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	691	117	191	61	618	541	216	666	260
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Richmond Rd/Robertson Rd/Baseline Rd
Existing PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	32.0	51.0	51.0	32.0	51.0	51.0
Total Split (%)				30.8%	30.8%	30.8%	26.7%	42.5%	42.5%	26.7%	42.5%	42.5%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				29.0	29.0	29.0	9.8	57.8	57.8	13.2	63.7	63.7
Actuated g/C Ratio				0.24	0.24	0.24	0.08	0.48	0.48	0.11	0.53	0.53
v/c Ratio				0.87	0.27	0.37	0.46	0.38	0.54	0.60	0.37	0.29
Control Delay				56.3	38.5	7.2	62.4	21.3	3.9	72.3	11.5	0.9
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				56.3	38.5	7.2	62.4	21.3	3.9	72.3	11.5	0.9
LOS				E	D	A	E	C	A	E	B	A
Approach Delay					44.8			15.6			20.6	
Approach LOS					D			B			C	
Queue Length 50th (m)				73.4	20.4	0.0	12.8	44.4	0.0	24.7	23.4	0.0
Queue Length 95th (m)				#95.2	35.3	16.1	24.7	61.1	17.8	m34.5	m29.8	m1.7
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				827	444	524	348	1632	1000	695	1799	899
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.84	0.26	0.36	0.18	0.38	0.54	0.31	0.37	0.29

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 26.0		Intersection LOS: C	
Intersection Capacity Utilization 61.2%		ICU Level of Service B	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	718	83	87	419	110	333	
Future Volume (vph)	718	83	87	419	110	333	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.98			1.00		
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3390	1517	1695	3325	1695	1517	
Flt Permitted			0.218		0.950		
Satd. Flow (perm)	3390	1482	389	3325	1693	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		85				370	
Link Speed (k/h)	70			70	60		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	26.5		
Confl. Peds. (#/hr)		1	1		1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	2%	2%	2%	4%	2%	2%	
Adj. Flow (vph)	798	92	97	466	122	370	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	798	92	97	466	122	370	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

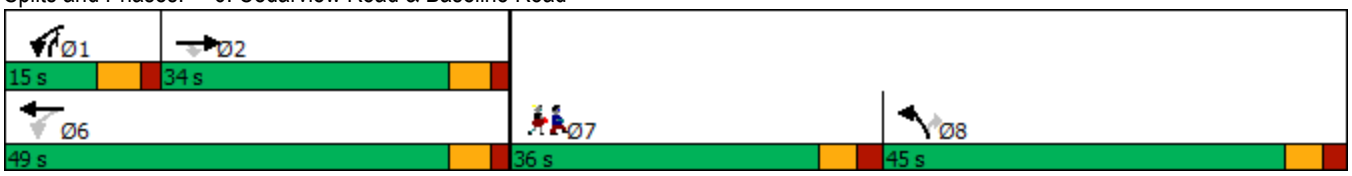


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	11.2	11.1	34.2
Total Split (s)	34.0	34.0	15.0	49.0	45.0	15.0	36.0
Total Split (%)	26.2%	26.2%	11.5%	37.7%	34.6%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	None	None	None
Act Effct Green (s)	31.1	31.1	44.7	44.7	10.7	24.4	
Actuated g/C Ratio	0.43	0.43	0.61	0.61	0.15	0.33	
v/c Ratio	0.55	0.14	0.26	0.23	0.49	0.49	
Control Delay	21.3	7.1	12.2	9.9	38.0	5.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.3	7.1	12.2	9.9	38.0	5.2	
LOS	C	A	B	A	D	A	
Approach Delay	19.8			10.3	13.3		
Approach LOS	B			B	B		
Queue Length 50th (m)	31.3	0.4	3.3	9.0	12.6	0.0	
Queue Length 95th (m)	#109.2	12.2	21.6	43.9	37.6	19.2	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	1445	680	404	2039	940	786	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.55	0.14	0.24	0.23	0.13	0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 72.9			
Natural Cycle: 85			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 52.9%		ICU Level of Service A	
Analysis Period (min) 15			

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

Splits and Phases: 6: Cedarview Road & Baseline Road



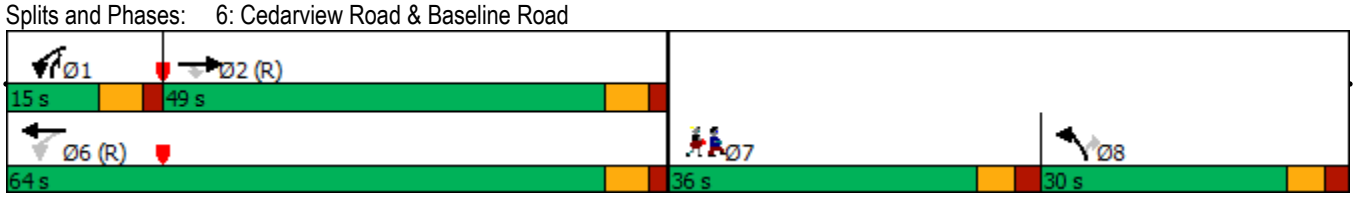
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	528	148	221	793	118	125	
Future Volume (vph)	528	148	221	793	118	125	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.96	0.99				
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3357	1517	1662	3390	1601	1517	
Flt Permitted			0.384		0.950		
Satd. Flow (perm)	3357	1454	668	3390	1601	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		164				139	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		7	7				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	3%	2%	4%	2%	8%	2%	
Adj. Flow (vph)	587	164	246	881	131	139	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	587	164	246	881	131	139	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

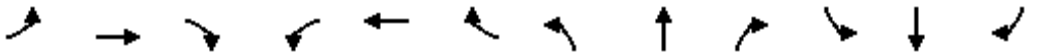
Baseline Rd/Cedarview Rd
Existing PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	11.2	11.1	34.2
Total Split (s)	49.0	49.0	15.0	64.0	30.0	15.0	36.0
Total Split (%)	37.7%	37.7%	11.5%	49.2%	23.1%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	83.5	83.5	101.8	101.8	15.9	34.3	
Actuated g/C Ratio	0.64	0.64	0.78	0.78	0.12	0.26	
v/c Ratio	0.27	0.17	0.40	0.33	0.67	0.28	
Control Delay	11.3	2.1	6.0	4.9	70.5	6.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	11.3	2.1	6.0	4.9	70.5	6.5	
LOS	B	A	A	A	E	A	
Approach Delay	9.3			5.1	37.5		
Approach LOS	A			A	D		
Queue Length 50th (m)	29.4	0.0	12.5	27.1	30.0	0.0	
Queue Length 95th (m)	46.4	8.7	23.9	42.4	47.2	12.9	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	2157	992	615	2653	293	502	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.27	0.17	0.40	0.33	0.45	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 11 (8%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 10.7		Intersection LOS: B	
Intersection Capacity Utilization 52.7%		ICU Level of Service A	
Analysis Period (min) 15			

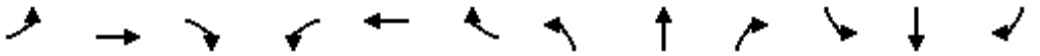
Splits and Phases: 6: Cedarview Road & Baseline Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	1124	19	8	482	118	30	2	14	72	6	67
Future Volume (vph)	138	1124	19	8	482	118	30	2	14	72	6	67
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		0.99			0.99	
Frt			0.850			0.850		0.958			0.938	
Flt Protected	0.950			0.950				0.969			0.976	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1642	0	0	1579	0
Flt Permitted	0.453			0.183				0.747			0.816	
Satd. Flow (perm)	784	3357	1461	317	3357	1446	0	1265	0	0	1317	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			131		16			57	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			376.3			325.9			172.9	
Travel Time (s)		19.2			19.4			29.3			12.4	
Confl. Peds. (#/hr)	2		4	4		2	2		6	6		2
Confl. Bikes (#/hr)			1			6			2			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	153	1249	21	9	536	131	33	2	16	80	7	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	153	1249	21	9	536	131	0	51	0	0	161	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

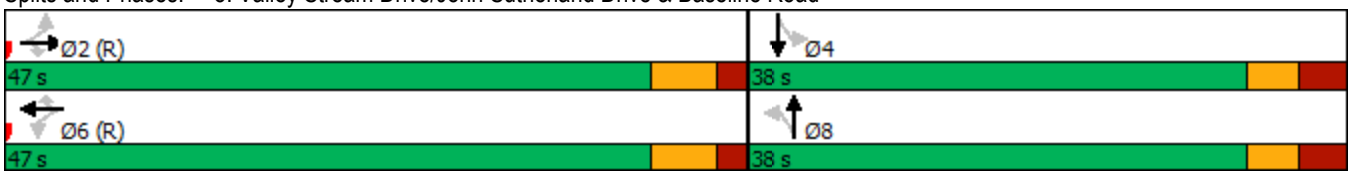
Baseline Rd/John Sutherland Dr/Valley Stream Dr
Existing AM Peak

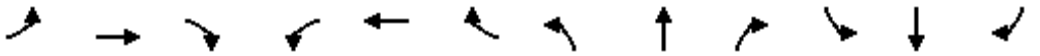


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	38.0	38.0		38.0	38.0	
Total Split (%)	55.3%	55.3%	55.3%	55.3%	55.3%	55.3%	44.7%	44.7%		44.7%	44.7%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	56.6	56.6	56.6	56.6	56.6	56.6		15.7			15.7	
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67		0.18			0.18	
v/c Ratio	0.29	0.56	0.02	0.04	0.24	0.13		0.21			0.56	
Control Delay	10.2	10.5	1.4	17.8	11.6	7.3		20.9			25.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	10.2	10.5	1.4	17.8	11.6	7.3		20.9			25.9	
LOS	B	B	A	B	B	A		C			C	
Approach Delay		10.3			10.9			20.9			25.9	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	7.0	38.7	0.0	0.4	11.9	0.0		4.7			14.7	
Queue Length 95th (m)	28.1	100.1	1.3	m4.6	50.2	20.4		9.9			23.8	
Internal Link Dist (m)		349.9			352.3			301.9			148.9	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	522	2236	988	211	2236	1006		478			523	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.29	0.56	0.02	0.04	0.24	0.13		0.11			0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 37 (44%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 11.8		Intersection LOS: B	
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	665	57	14	1122	56	38	4	12	94	5	92
Future Volume (vph)	34	665	57	14	1122	56	38	4	12	94	5	92
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		1.00			0.99	
Frt			0.850			0.850		0.970			0.935	
Flt Protected	0.950			0.950				0.966			0.976	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1661	0	0	1572	0
Flt Permitted	0.184			0.357				0.658			0.814	
Satd. Flow (perm)	319	3357	1456	617	3357	1446	0	1131	0	0	1306	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			63			38		13			49	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			376.3			325.9			172.9	
Travel Time (s)		19.2			19.4			29.3			12.4	
Confl. Peds. (#/hr)	3		4	4		3			9	9		
Confl. Bikes (#/hr)			5			3						3
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	38	739	63	16	1247	62	42	4	13	104	6	102
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	739	63	16	1247	62	0	59	0	0	212	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	62.0	62.0	62.0	62.0	62.0	62.0	38.0	38.0		38.0	38.0	
Total Split (%)	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	38.0%	38.0%		38.0%	38.0%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	68.1	68.1	68.1	68.1	68.1	68.1		19.2			19.2	
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.68	0.68		0.19			0.19	
v/c Ratio	0.18	0.32	0.06	0.04	0.55	0.06		0.26			0.73	
Control Delay	10.8	8.1	2.5	3.0	5.4	0.6		28.0			42.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	10.8	8.1	2.5	3.0	5.4	0.6		28.0			42.5	
LOS	B	A	A	A	A	A		C			D	
Approach Delay		7.8			5.2			28.0			42.5	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	2.1	24.2	0.0	0.3	55.2	0.2		7.1			28.0	
Queue Length 95th (m)	9.1	47.8	4.9	m0.5	12.0	0.0		14.8			43.2	
Internal Link Dist (m)		349.9			352.3			301.9			148.9	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	217	2286	1011	419	2286	996		365			444	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.18	0.32	0.06	0.04	0.55	0.06		0.16			0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 77 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 58.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road



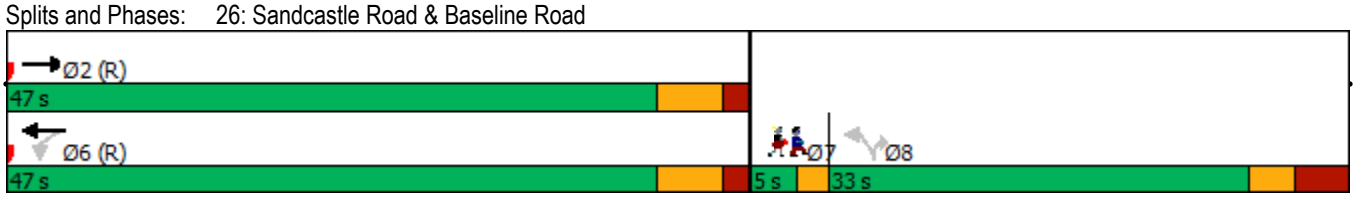
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	1191	19	39	587	21	97	
Future Volume (vph)	1191	19	39	587	21	97	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	1.00				1.00		
Frt	0.998					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3349	0	1695	3357	1695	1488	
Flt Permitted			0.170		0.950		
Satd. Flow (perm)	3349	0	303	3357	1693	1488	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	3					98	
Link Speed (k/h)	50			70	50		
Link Distance (m)	376.3			243.7	303.8		
Travel Time (s)	27.1			12.5	21.9		
Confl. Peds. (#/hr)		5	5		1		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	1323	21	43	652	23	108	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1344	0	43	652	23	108	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

Baseline Rd/Sandcastle Dr
Existing AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Perm	Perm	
Protected Phases	2			6			7
Permitted Phases			6		8	8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	47.0		47.0	47.0	33.0	33.0	5.0
Total Split (%)	55.3%		55.3%	55.3%	38.8%	38.8%	6%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	64.8		64.8	64.8	10.4	10.4	
Actuated g/C Ratio	0.76		0.76	0.76	0.12	0.12	
v/c Ratio	0.53		0.19	0.25	0.11	0.40	
Control Delay	4.0		10.4	5.9	30.0	12.2	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.0		10.4	5.9	30.0	12.2	
LOS	A		B	A	C	B	
Approach Delay	4.0			6.1	15.3		
Approach LOS	A			A	B		
Queue Length 50th (m)	14.0		1.3	10.7	3.3	1.4	
Queue Length 95th (m)	29.9		11.2	42.4	7.2	11.0	
Internal Link Dist (m)	352.3			219.7	279.8		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2552		231	2557	527	531	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.53		0.19	0.25	0.04	0.20	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 55 (65%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 5.4		Intersection LOS: A	
Intersection Capacity Utilization 52.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 26: Sandcastle Road & Baseline Road



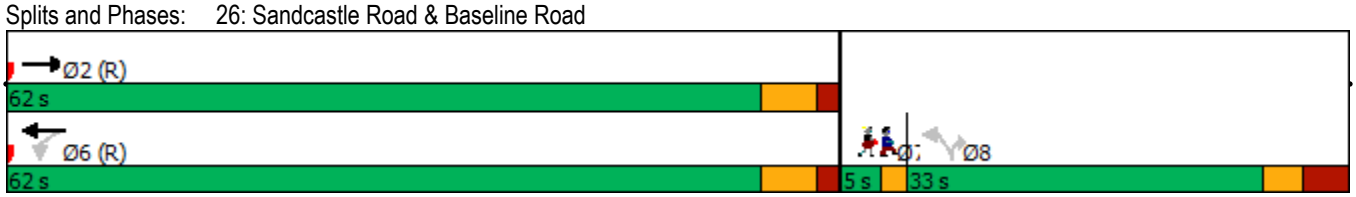
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	738	33	112	1149	43	78	
Future Volume (vph)	738	33	112	1149	43	78	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor					0.99	0.98	
Frt	0.994					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3339	0	1695	3357	1695	1488	
Flt Permitted			0.319		0.950		
Satd. Flow (perm)	3339	0	569	3357	1674	1461	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	7					87	
Link Speed (k/h)	70			70	50		
Link Distance (m)	376.3			243.7	303.8		
Travel Time (s)	19.4			12.5	21.9		
Confl. Peds. (#/hr)					11	5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	820	37	124	1277	48	87	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	857	0	124	1277	48	87	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		97	97		97	97	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

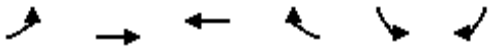
Baseline Rd/Sandcastle Dr
Existing PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Perm	Perm	
Protected Phases	2			6			7
Permitted Phases			6		8	8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	62.0		62.0	62.0	33.0	33.0	5.0
Total Split (%)	62.0%		62.0%	62.0%	33.0%	33.0%	5%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	78.9		78.9	78.9	11.2	11.2	
Actuated g/C Ratio	0.79		0.79	0.79	0.11	0.11	
v/c Ratio	0.32		0.28	0.48	0.26	0.36	
Control Delay	4.3		8.3	7.0	40.6	11.7	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.3		8.3	7.0	40.6	11.7	
LOS	A		A	A	D	B	
Approach Delay	4.3			7.1	22.0		
Approach LOS	A			A	C		
Queue Length 50th (m)	14.7		4.5	30.8	8.3	0.0	
Queue Length 95th (m)	36.9		24.4	99.7	14.7	10.3	
Internal Link Dist (m)	352.3			219.7	279.8		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2637		449	2650	443	451	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.32		0.28	0.48	0.11	0.19	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 62 (62%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 7.0		Intersection LOS: A	
Intersection Capacity Utilization 53.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 26: Sandcastle Road & Baseline Road

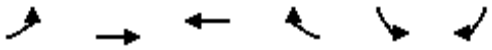




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	86	151	143	39	63
Future Volume (Veh/h)	26	86	151	143	39	63
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	96	168	159	43	70
Pedestrians					9	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			173			
pX, platoon unblocked						
vC, conflicting volume	177				410	256
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	177				410	256
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	98				92	91
cM capacity (veh/h)	1386				561	775

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	125	327	113
Volume Left	29	0	43
Volume Right	0	159	70
cSH	1386	1700	677
Volume to Capacity	0.02	0.19	0.17
Queue Length 95th (m)	0.4	0.0	4.2
Control Delay (s)	1.9	0.0	11.4
Lane LOS	A		B
Approach Delay (s)	1.9	0.0	11.4
Approach LOS			B

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	129	68	57	97	52
Future Volume (Veh/h)	70	129	68	57	97	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	78	143	76	63	108	58
Pedestrians					17	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			173			
pX, platoon unblocked						
vC, conflicting volume	93				424	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	93				424	124
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	95				80	94
cM capacity (veh/h)	1475				529	910

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	221	139	166
Volume Left	78	0	108
Volume Right	0	63	58
cSH	1475	1700	620
Volume to Capacity	0.05	0.08	0.27
Queue Length 95th (m)	1.2	0.0	7.5
Control Delay (s)	3.0	0.0	12.9
Lane LOS	A		B
Approach Delay (s)	3.0	0.0	12.9
Approach LOS			B

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	124	41	15	121	13	2
Future Volume (vph)	124	41	15	121	13	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	138	46	17	134	14	2

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	184	151	16
Volume Left (vph)	0	17	14
Volume Right (vph)	46	0	2
Hadj (s)	-0.04	0.16	0.13
Departure Headway (s)	4.1	4.3	4.8
Degree Utilization, x	0.21	0.18	0.02
Capacity (veh/h)	875	830	702
Control Delay (s)	8.1	8.2	7.9
Approach Delay (s)	8.1	8.2	7.9
Approach LOS	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	129	18	18	94	47	26
Future Volume (vph)	129	18	18	94	47	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	143	20	20	104	52	29

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	163	124	81
Volume Left (vph)	0	20	52
Volume Right (vph)	20	0	29
Hadj (s)	0.05	0.17	-0.05
Departure Headway (s)	4.3	4.4	4.5
Degree Utilization, x	0.19	0.15	0.10
Capacity (veh/h)	820	781	751
Control Delay (s)	8.3	8.2	8.0
Approach Delay (s)	8.3	8.2	8.0
Approach LOS	A	A	A

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	124	190	61	85	77	25
Future Volume (vph)	124	190	61	85	77	25
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	138	211	68	94	86	28

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	349	162	114
Volume Left (vph)	0	68	86
Volume Right (vph)	211	0	28
Hadj (s)	-0.30	0.20	0.05
Departure Headway (s)	4.1	4.8	5.1
Degree Utilization, x	0.40	0.21	0.16
Capacity (veh/h)	852	721	651
Control Delay (s)	9.8	9.1	9.0
Approach Delay (s)	9.8	9.1	9.0
Approach LOS	A	A	A

Intersection Summary			
Delay	9.5		
Level of Service	A		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	87	35	8	133	191	48
Future Volume (vph)	87	35	8	133	191	48
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	97	39	9	148	212	53

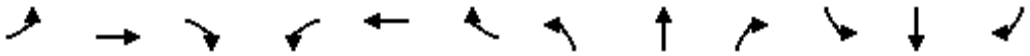
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	136	157	265
Volume Left (vph)	0	9	212
Volume Right (vph)	39	0	53
Hadj (s)	-0.08	0.14	0.09
Departure Headway (s)	4.7	4.9	4.7
Degree Utilization, x	0.18	0.21	0.35
Capacity (veh/h)	713	690	729
Control Delay (s)	8.7	9.2	10.2
Approach Delay (s)	8.7	9.2	10.2
Approach LOS	A	A	B

Intersection Summary			
Delay	9.6		
Level of Service	A		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	300	1	1	117	45	0	0	1	4	0	11
Future Volume (Veh/h)	83	300	1	1	117	45	0	0	1	4	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	92	333	1	1	130	50	0	0	1	4	0	12
Pedestrians		5			7			2			4	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		121										
pX, platoon unblocked				0.97			0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	184			336			694	706	342	686	681	164
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			297			667	679	304	659	654	164
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			100	100	100	99	100	99
cM capacity (veh/h)	1385			1221			333	335	706	340	347	872

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	426	181	1	16
Volume Left	92	1	0	4
Volume Right	1	50	1	12
cSH	1385	1221	706	627
Volume to Capacity	0.07	0.00	0.00	0.03
Queue Length 95th (m)	1.5	0.0	0.0	0.5
Control Delay (s)	2.2	0.1	10.1	10.9
Lane LOS	A	A	B	B
Approach Delay (s)	2.2	0.1	10.1	10.9
Approach LOS			B	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	48.1%	ICU Level of Service	A	
Analysis Period (min)	15			

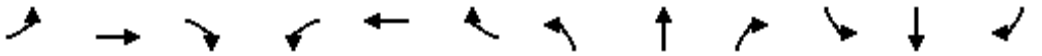


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	119	0	3	307	2	0	0	1	14	0	73
Future Volume (Veh/h)	1	119	0	3	307	2	0	0	1	14	0	73
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	132	0	3	341	2	0	0	1	16	0	81
Pedestrians		3			6			9			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		121										
pX, platoon unblocked												
vC, conflicting volume	348			141			575	497	147	494	496	350
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	348			141			575	497	147	494	496	350
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	97	100	88
cM capacity (veh/h)	1205			1429			369	466	886	473	467	688

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	133	346	1	97
Volume Left	1	3	0	16
Volume Right	0	2	1	81
cSH	1205	1429	886	640
Volume to Capacity	0.00	0.00	0.00	0.15
Queue Length 95th (m)	0.0	0.0	0.0	3.7
Control Delay (s)	0.1	0.1	9.1	11.6
Lane LOS	A	A	A	B
Approach Delay (s)	0.1	0.1	9.1	11.6
Approach LOS			A	B

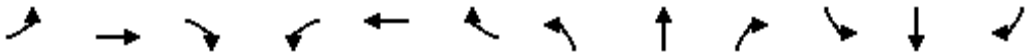
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	38.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Appendix K: Synchro Analysis Reports for Background Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	528	8	383	21	37	91	151	916	22	26	428	17
Future Volume (vph)	528	8	383	21	37	91	151	916	22	26	428	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.97		0.99	0.98	1.00	1.00				0.98
Frt			0.850			0.850		0.996				0.850
Flt Protected	0.950				0.982		0.950			0.950		
Satd. Flow (prot)	3195	1784	1473	0	1734	1517	1572	3375	0	1544	3357	943
Flt Permitted	0.950				0.982		0.397			0.220		
Satd. Flow (perm)	3195	1784	1431	0	1723	1487	656	3375	0	358	3357	929
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			383			158		2				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		88.7			195.5			655.9			232.4	
Travel Time (s)		5.3			17.6			39.4			13.9	
Confl. Peds. (#/hr)			11	11			2		1	1		2
Confl. Bikes (#/hr)			1			4						1
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
Heavy Vehicles (%)	5%	2%	5%	5%	2%	2%	10%	2%	2%	12%	3%	64%
Adj. Flow (vph)	528	8	383	21	37	91	151	916	22	26	428	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	528	8	383	0	58	91	151	938	0	26	428	17
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

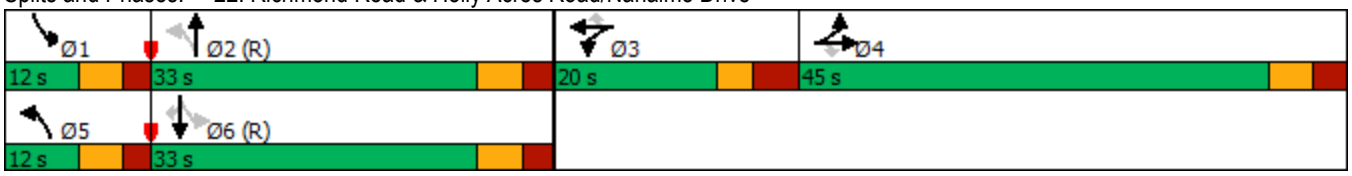
Holly Acres Rd/Richmond Rd/Nanaimo Dr
2030 BG AM Peak

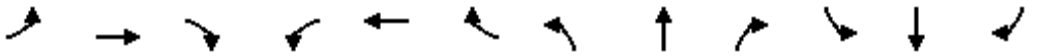


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	45.0	45.0	45.0	20.0	20.0	20.0	12.0	33.0		12.0	33.0	33.0
Total Split (%)	40.9%	40.9%	40.9%	18.2%	18.2%	18.2%	10.9%	30.0%		10.9%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	24.8	24.8	24.8		10.6	10.6	58.3	50.4		48.4	41.5	41.5
Actuated g/C Ratio	0.23	0.23	0.23		0.10	0.10	0.53	0.46		0.44	0.38	0.38
v/c Ratio	0.73	0.02	0.62		0.35	0.32	0.35	0.61		0.11	0.34	0.04
Control Delay	45.5	30.0	8.0		52.3	3.2	18.5	28.7		18.1	28.7	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	45.5	30.0	8.0		52.3	3.2	18.5	28.7		18.1	28.7	0.2
LOS	D	C	A		D	A	B	C		B	C	A
Approach Delay		29.8			22.3			27.3			27.1	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	50.4	1.3	0.0		11.0	0.0	15.6	80.2		2.5	32.7	0.0
Queue Length 95th (m)	61.4	4.6	20.8		22.3	0.9	31.7	#133.0		7.8	53.3	0.0
Internal Link Dist (m)		64.7			171.5			631.9			208.4	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	1115	622	748		209	318	437	1548		230	1267	451
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.47	0.01	0.51		0.28	0.29	0.35	0.61		0.11	0.34	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 27.8		Intersection LOS: C	
Intersection Capacity Utilization 70.8%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

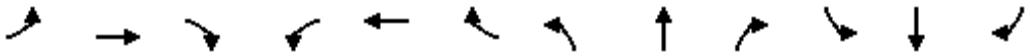
Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	497	50	333	37	71	52	250	859	33	27	798	23
Future Volume (vph)	497	50	333	37	71	52	250	859	33	27	798	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.96		0.99	0.98	1.00	1.00				0.97
Frt			0.850			0.850		0.994				0.850
Flt Protected	0.950				0.983		0.950			0.950		
Satd. Flow (prot)	3257	1784	1473	0	1748	1517	1631	3366	0	1662	3357	1097
Flt Permitted	0.950				0.983		0.206			0.259		
Satd. Flow (perm)	3257	1784	1415	0	1736	1484	352	3366	0	453	3357	1063
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			333			158		4				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		88.7			195.5			655.9			232.4	
Travel Time (s)		5.3			17.6			39.4			13.9	
Confl. Peds. (#/hr)			15	15			13					13
Confl. Bikes (#/hr)			5			4			4			2
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
Heavy Vehicles (%)	3%	2%	5%	3%	2%	2%	6%	2%	3%	4%	3%	41%
Adj. Flow (vph)	497	50	333	37	71	52	250	859	33	27	798	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	497	50	333	0	108	52	250	892	0	27	798	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	97		97	97		97	97		97	97		97
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Holly Acres Rd/Richmond Rd/Nanaimo Dr
2030 BG PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	29.0	29.0	29.0	17.0	17.0	17.0	17.0	47.0		17.0	47.0	47.0
Total Split (%)	26.4%	26.4%	26.4%	15.5%	15.5%	15.5%	15.5%	42.7%		15.5%	42.7%	42.7%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Act Effct Green (s)	20.6	20.6	20.6		10.2	10.2	56.9	50.1		47.4	40.7	40.7
Actuated g/C Ratio	0.19	0.19	0.19		0.09	0.09	0.53	0.46		0.44	0.38	0.38
v/c Ratio	0.80	0.15	0.62		0.65	0.18	0.79	0.57		0.10	0.63	0.05
Control Delay	52.6	37.4	9.7		67.2	1.4	35.3	24.5		13.8	30.7	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	52.6	37.4	9.7		67.2	1.4	35.3	24.5		13.8	30.7	0.2
LOS	D	D	A		E	A	D	C		B	C	A
Approach Delay		35.5			45.9			26.9			29.3	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	47.9	8.2	0.0		21.0	0.0	26.4	72.4		2.5	67.8	0.0
Queue Length 95th (m)	64.6	17.7	22.9		#42.6	0.0	#55.2	94.0		6.3	86.8	0.0
Internal Link Dist (m)		64.7			171.5			631.9			208.4	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	675	369	557		166	284	315	1562		341	1264	501
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.74	0.14	0.60		0.65	0.18	0.79	0.57		0.08	0.63	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 108.2			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 31.1		Intersection LOS: C	
Intersection Capacity Utilization 75.3%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive



Richmond Rd/John Sutherland Dr
2030 BG AM Peak

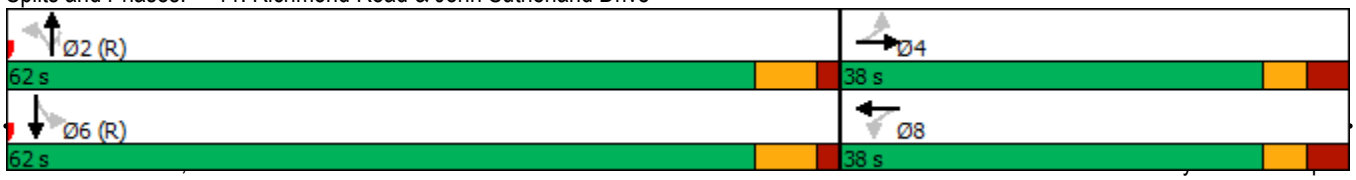
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	51	0	80	0	949	88	242	563	0
Future Volume (vph)	0	0	0	51	0	80	0	949	88	242	563	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt					0.918				0.850			
Flt Protected					0.981					0.950		
Satd. Flow (prot)	0	1784	0	0	1579	0	1784	3390	1517	1679	3390	0
Flt Permitted					0.872					0.289		
Satd. Flow (perm)	0	1784	0	0	1403	0	1784	3390	1517	511	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					80				86			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	0	0	0	51	0	80	0	949	88	242	563	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	131	0	0	949	88	242	563	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	

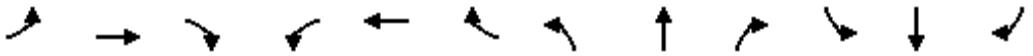
Richmond Rd/John Sutherland Dr
2030 BG AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		62.0	62.0	62.0	62.0	62.0	
Total Split (%)	38.0%	38.0%		38.0%	38.0%		62.0%	62.0%	62.0%	62.0%	62.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					11.5			75.5	75.5	75.5	75.5	
Actuated g/C Ratio					0.12			0.76	0.76	0.76	0.76	
v/c Ratio					0.56			0.37	0.08	0.63	0.22	
Control Delay					27.8			1.2	0.2	15.5	4.0	
Queue Delay					0.0			0.0	0.0	0.0	0.0	
Total Delay					27.8			1.2	0.2	15.5	4.0	
LOS					C			A	A	B	A	
Approach Delay					27.8			1.1			7.5	
Approach LOS					C			A			A	
Queue Length 50th (m)					8.7			2.7	0.0	15.2	11.7	
Queue Length 95th (m)					24.2			9.6	0.1	52.0	21.1	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)									35.0	40.0		
Base Capacity (vph)					495			2559	1166	385	2559	
Starvation Cap Reductn					0			0	0	0	0	
Spillback Cap Reductn					0			0	0	0	0	
Storage Cap Reductn					0			0	0	0	0	
Reduced v/c Ratio					0.26			0.37	0.08	0.63	0.22	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 92 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 5.5		Intersection LOS: A	
Intersection Capacity Utilization 66.3%		ICU Level of Service C	
Analysis Period (min) 15			

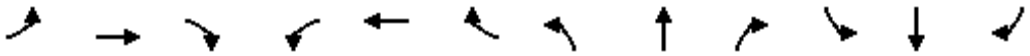
Splits and Phases: 11: Richmond Road & John Sutherland Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	137	0	224	4	785	27	79	937	0
Future Volume (vph)	0	0	0	137	0	224	4	785	27	79	937	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00		0.98	1.00		
Frt					0.916				0.850			
Flt Protected					0.981		0.950			0.950		
Satd. Flow (prot)	0	1784	0	0	1594	0	1695	3390	1517	1647	3390	0
Flt Permitted					0.875		0.268			0.327		
Satd. Flow (perm)	0	1784	0	0	1421	0	478	3390	1482	566	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					66				33			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
Confl. Peds. (#/hr)							2		1	1		2
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	0	0	0	137	0	224	4	785	27	79	937	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	361	0	4	785	27	79	937	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Richmond Rd/John Sutherland Dr
2030 BG PM Peak

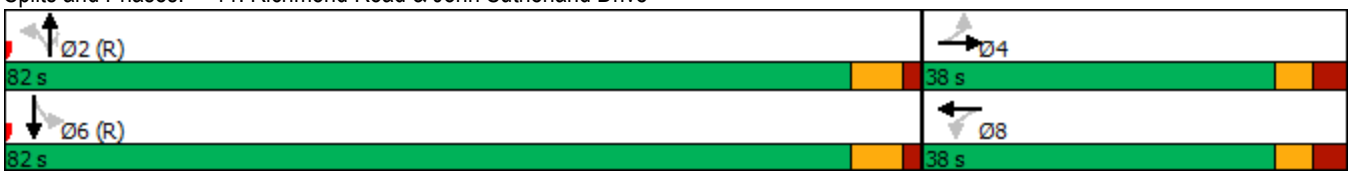


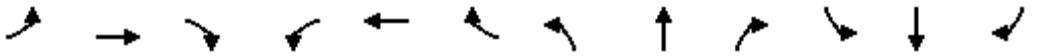
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		82.0	82.0	82.0	82.0	82.0	
Total Split (%)	31.7%	31.7%		31.7%	31.7%		68.3%	68.3%	68.3%	68.3%	68.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					28.9		78.1	78.1	78.1	78.1	78.1	
Actuated g/C Ratio					0.24		0.65	0.65	0.65	0.65	0.65	
v/c Ratio					0.92		0.01	0.36	0.03	0.21	0.42	
Control Delay					65.8		5.5	5.6	0.6	11.1	11.2	
Queue Delay					0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay					65.8		5.5	5.6	0.6	11.1	11.2	
LOS					E		A	A	A	B	B	
Approach Delay					65.8			5.4			11.2	
Approach LOS					E			A			B	
Queue Length 50th (m)					62.5		0.1	14.6	0.0	6.9	50.8	
Queue Length 95th (m)					#110.4		m0.5	23.1	0.3	14.3	63.3	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)							40.0		35.0	40.0		
Base Capacity (vph)					420		311	2207	976	368	2207	
Starvation Cap Reductn					0		0	0	0	0	0	
Spillback Cap Reductn					0		0	0	0	0	0	
Storage Cap Reductn					0		0	0	0	0	0	
Reduced v/c Ratio					0.86		0.01	0.36	0.03	0.21	0.42	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 18.1		Intersection LOS: B	
Intersection Capacity Utilization 74.4%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Richmond Road & John Sutherland Drive





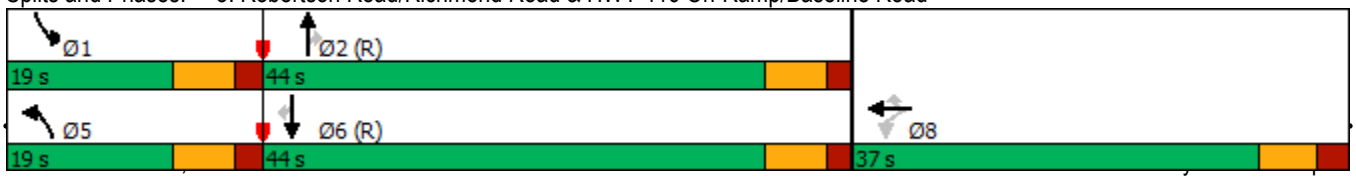
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	356	24	168	12	883	660	173	342	68
Future Volume (vph)	0	0	0	356	24	168	12	883	660	173	342	68
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						168			660			113
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
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
Heavy Vehicles (%)	2%	2%	2%	4%	2%	5%	8%	2%	4%	5%	3%	3%
Adj. Flow (vph)	0	0	0	356	24	168	12	883	660	173	342	68
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	356	24	168	12	883	660	173	342	68
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	

Richmond Rd/Robertson Rd/Baseline Rd
2030 BG AM Peak

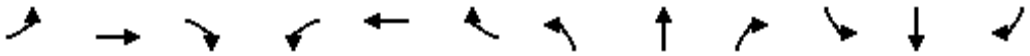
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	19.0	44.0	44.0	19.0	44.0	44.0
Total Split (%)				37.0%	37.0%	37.0%	19.0%	44.0%	44.0%	19.0%	44.0%	44.0%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				17.1	17.1	17.1	6.4	52.2	52.2	10.7	66.7	66.7
Actuated g/C Ratio				0.17	0.17	0.17	0.06	0.52	0.52	0.11	0.67	0.67
v/c Ratio				0.65	0.08	0.43	0.12	0.50	0.60	0.51	0.15	0.07
Control Delay				43.9	33.3	9.0	46.2	17.8	4.1	51.8	7.0	0.3
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				43.9	33.3	9.0	46.2	17.8	4.1	51.8	7.0	0.3
LOS				D	C	A	D	B	A	D	A	A
Approach Delay					32.7			12.2			19.5	
Approach LOS					C			B			B	
Queue Length 50th (m)				30.7	3.6	0.0	2.1	51.3	0.0	16.4	9.3	0.0
Queue Length 95th (m)				41.1	9.4	14.6	7.1	79.2	18.6	25.8	18.0	0.8
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				973	538	562	198	1770	1092	405	2237	1038
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.37	0.04	0.30	0.06	0.50	0.60	0.43	0.15	0.07

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 93 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 59.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



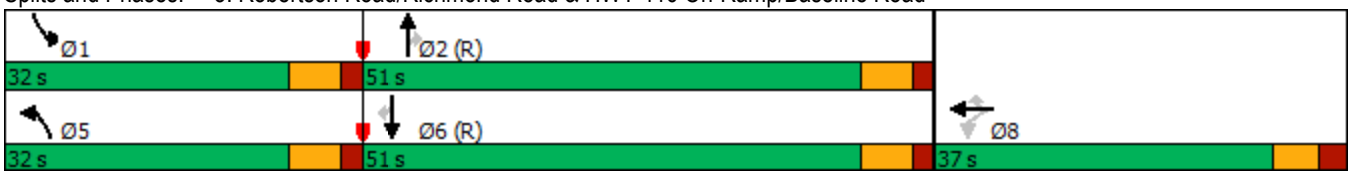
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	653	112	180	56	630	521	208	656	240
Future Volume (vph)	0	0	0	653	112	180	56	630	521	208	656	240
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00		0.99	1.00		0.98
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3288	1767	1517	1647	3390	1517	3288	3390	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3288	1767	1517	1643	3390	1495	3286	3390	1465
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						180			521			240
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
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
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	5%	2%	2%	2%	2%	3%
Adj. Flow (vph)	0	0	0	653	112	180	56	630	521	208	656	240
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	653	112	180	56	630	521	208	656	240
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	32.0	51.0	51.0	32.0	51.0	51.0
Total Split (%)				30.8%	30.8%	30.8%	26.7%	42.5%	42.5%	26.7%	42.5%	42.5%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				28.4	28.4	28.4	9.5	58.7	58.7	12.9	64.6	64.6
Actuated g/C Ratio				0.24	0.24	0.24	0.08	0.49	0.49	0.11	0.54	0.54
v/c Ratio				0.84	0.27	0.36	0.43	0.38	0.52	0.59	0.36	0.27
Control Delay				54.2	38.6	7.3	62.1	20.9	3.8	72.9	11.1	0.8
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				54.2	38.6	7.3	62.1	20.9	3.8	72.9	11.1	0.8
LOS				D	D	A	E	C	A	E	B	A
Approach Delay					43.5			15.4			20.5	
Approach LOS					D			B			C	
Queue Length 50th (m)				68.4	19.5	0.0	11.8	45.2	0.0	24.1	22.4	0.0
Queue Length 95th (m)				88.0	33.9	15.8	23.3	62.0	17.2	m34.1	m27.4	m1.9
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				827	444	516	348	1658	997	695	1825	899
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.79	0.25	0.35	0.16	0.38	0.52	0.30	0.36	0.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 25.3		Intersection LOS: C	
Intersection Capacity Utilization 62.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	756	91	98	466	121	367	
Future Volume (vph)	756	91	98	466	121	367	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.98			1.00		
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3390	1517	1695	3325	1695	1517	
Flt Permitted			0.236		0.950		
Satd. Flow (perm)	3390	1482	421	3325	1693	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		89				367	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		1	1		1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	2%	2%	2%	4%	2%	2%	
Adj. Flow (vph)	756	91	98	466	121	367	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	756	91	98	466	121	367	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

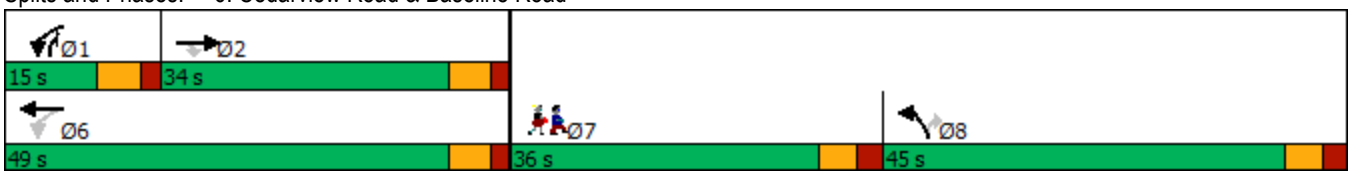


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	36.2	11.1	34.2
Total Split (s)	34.0	34.0	15.0	49.0	45.0	15.0	36.0
Total Split (%)	26.2%	26.2%	11.5%	37.7%	34.6%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	None	None	None
Act Effct Green (s)	31.1	31.1	44.7	44.7	10.7	24.4	
Actuated g/C Ratio	0.43	0.43	0.61	0.61	0.15	0.33	
v/c Ratio	0.52	0.13	0.25	0.23	0.49	0.49	
Control Delay	20.8	6.6	12.0	9.8	38.0	5.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.8	6.6	12.0	9.8	38.0	5.2	
LOS	C	A	B	A	D	A	
Approach Delay	19.3			10.2	13.3		
Approach LOS	B			B	B		
Queue Length 50th (m)	29.2	0.1	3.3	9.0	12.5	0.0	
Queue Length 95th (m)	#99.8	11.2	21.9	43.8	37.4	18.9	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	1444	682	420	2040	940	783	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.52	0.13	0.23	0.23	0.13	0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 72.9			
Natural Cycle: 110			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 15.1		Intersection LOS: B	
Intersection Capacity Utilization 56.2%		ICU Level of Service B	
Analysis Period (min) 15			

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

Splits and Phases: 6: Cedarview Road & Baseline Road



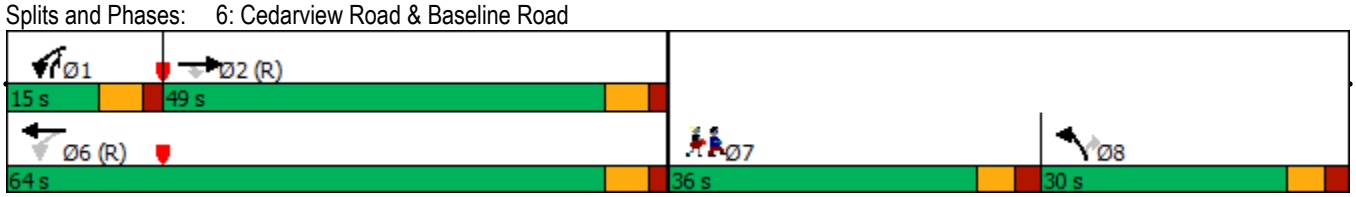
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	572	163	245	836	130	140	
Future Volume (vph)	572	163	245	836	130	140	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.96	0.99				
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3357	1517	1662	3390	1601	1517	
Flt Permitted			0.392		0.950		
Satd. Flow (perm)	3357	1454	682	3390	1601	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		163				140	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		7	7				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	4%	2%	8%	2%	
Adj. Flow (vph)	572	163	245	836	130	140	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	572	163	245	836	130	140	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

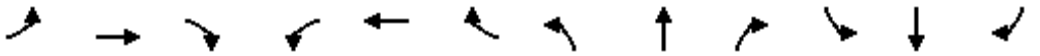
Baseline Rd/Cedarview Rd
2030 BG PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	11.2	11.1	34.2
Total Split (s)	49.0	49.0	15.0	64.0	30.0	15.0	36.0
Total Split (%)	37.7%	37.7%	11.5%	49.2%	23.1%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	84.1	84.1	101.9	101.9	15.8	33.7	
Actuated g/C Ratio	0.65	0.65	0.78	0.78	0.12	0.26	
v/c Ratio	0.26	0.16	0.39	0.31	0.67	0.28	
Control Delay	11.0	2.1	5.9	4.7	70.5	6.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	11.0	2.1	5.9	4.7	70.5	6.5	
LOS	B	A	A	A	E	A	
Approach Delay	9.0			5.0	37.3		
Approach LOS	A			A	D		
Queue Length 50th (m)	28.1	0.0	12.4	25.1	29.8	0.0	
Queue Length 95th (m)	44.5	8.5	23.7	39.6	46.9	13.0	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	2171	997	623	2656	293	497	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.26	0.16	0.39	0.31	0.44	0.28	

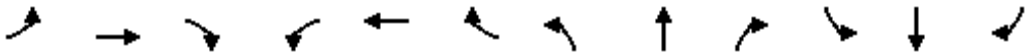
Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 15 (12%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 10.6		Intersection LOS: B	
Intersection Capacity Utilization 54.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Cedarview Road & Baseline Road





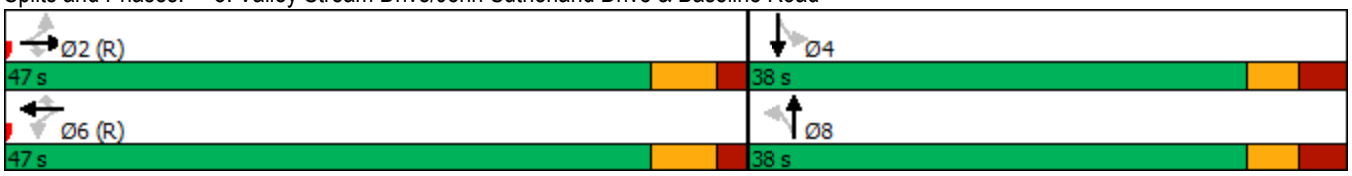
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	1173	19	8	533	118	30	2	14	72	6	67
Future Volume (vph)	138	1173	19	8	533	118	30	2	14	72	6	67
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		0.99			0.99	
Frt			0.850			0.850		0.959			0.938	
Flt Protected	0.950			0.950				0.968			0.976	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1642	0	0	1579	0
Flt Permitted	0.454			0.206				0.767			0.819	
Satd. Flow (perm)	786	3357	1461	357	3357	1446	0	1300	0	0	1322	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			118		14			58	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			172.9	
Travel Time (s)		19.2			19.4			29.3			12.4	
Confl. Peds. (#/hr)	2		4	4		2	2		6	6		2
Confl. Bikes (#/hr)			1			6			2			
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	138	1173	19	8	533	118	30	2	14	72	6	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	1173	19	8	533	118	0	46	0	0	145	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	38.0	38.0		38.0	38.0	
Total Split (%)	55.3%	55.3%	55.3%	55.3%	55.3%	55.3%	44.7%	44.7%		44.7%	44.7%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	57.1	57.1	57.1	57.1	57.1	57.1		15.2			15.2	
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67		0.18			0.18	
v/c Ratio	0.26	0.52	0.02	0.03	0.24	0.12		0.19			0.51	
Control Delay	9.6	9.7	1.1	16.4	10.7	6.7		21.2			23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	9.6	9.7	1.1	16.4	10.7	6.7		21.2			23.8	
LOS	A	A	A	B	B	A		C			C	
Approach Delay		9.6			10.1			21.2			23.8	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	5.8	32.8	0.0	0.2	10.3	0.0		4.3			12.3	
Queue Length 95th (m)	25.0	91.1	1.0	m3.9	47.5	17.0		9.4			20.8	
Internal Link Dist (m)		349.9			354.0			301.9			148.9	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	528	2256	996	239	2256	1010		490			526	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.26	0.52	0.02	0.03	0.24	0.12		0.09			0.28	

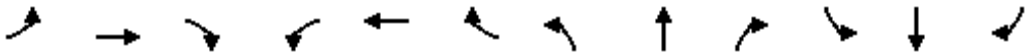
Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 37 (44%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 10.9		Intersection LOS: B	
Intersection Capacity Utilization 69.8%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road



Baseline Rd/John Sutherland Dr/Valley Stream Dr
2030 BG PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	715	57	14	1175	56	38	4	12	94	5	92
Future Volume (vph)	34	715	57	14	1175	56	38	4	12	94	5	92
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		1.00			0.99	
Frt			0.850			0.850		0.970			0.935	
Flt Protected	0.950			0.950				0.966			0.976	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1661	0	0	1572	0
Flt Permitted	0.206			0.369				0.677			0.816	
Satd. Flow (perm)	357	3357	1456	638	3357	1446	0	1164	0	0	1309	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57			38		12			49	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			172.9	
Travel Time (s)		19.2			19.4			29.3			12.4	
Confl. Peds. (#/hr)	3		4	4		3			9	9		
Confl. Bikes (#/hr)			5			3						3
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	34	715	57	14	1175	56	38	4	12	94	5	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	715	57	14	1175	56	0	54	0	0	191	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	62.0	62.0	62.0	62.0	62.0	62.0	38.0	38.0		38.0	38.0	
Total Split (%)	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	38.0%	38.0%		38.0%	38.0%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	69.1	69.1	69.1	69.1	69.1	69.1		18.2			18.2	
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69		0.18			0.18	
v/c Ratio	0.14	0.31	0.06	0.03	0.51	0.06		0.24			0.69	
Control Delay	9.5	7.6	2.6	3.0	4.6	0.4		28.3			39.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	9.5	7.6	2.6	3.0	4.6	0.4		28.3			39.7	
LOS	A	A	A	A	A	A		C			D	
Approach Delay		7.3			4.4			28.3			39.7	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	1.7	21.6	0.0	0.3	32.8	0.3		6.6			24.4	
Queue Length 95th (m)	7.9	46.1	4.8	m0.6	13.8	0.0		13.7			38.0	
Internal Link Dist (m)		349.9			354.0			301.9			148.9	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	246	2320	1024	441	2320	1011		374			445	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.14	0.31	0.06	0.03	0.51	0.06		0.14			0.43	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 77 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 58.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road



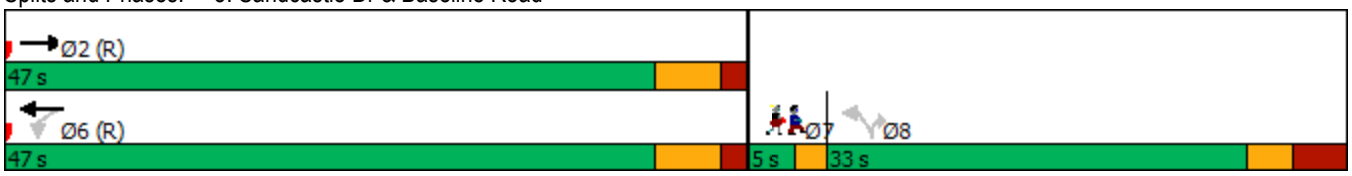
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	1236	25	94	602	60	129	
Future Volume (vph)	1236	25	94	602	60	129	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	1.00				1.00		
Frt	0.997					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3346	0	1695	3357	1695	1488	
Flt Permitted			0.185		0.950		
Satd. Flow (perm)	3346	0	330	3357	1693	1488	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	3					106	
Link Speed (k/h)	70			70	50		
Link Distance (m)	378.0			246.3	226.0		
Travel Time (s)	19.4			12.7	16.3		
Confl. Peds. (#/hr)		5	5		1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	1236	25	94	602	60	129	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1261	0	94	602	60	129	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Perm	Perm	
Protected Phases	2			6			7
Permitted Phases			6		8	8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	47.0		47.0	47.0	33.0	33.0	5.0
Total Split (%)	55.3%		55.3%	55.3%	38.8%	38.8%	6%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	60.3		60.3	60.3	11.3	11.3	
Actuated g/C Ratio	0.71		0.71	0.71	0.13	0.13	
v/c Ratio	0.53		0.40	0.25	0.27	0.44	
Control Delay	2.2		16.7	6.3	32.9	13.6	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	2.2		16.7	6.3	32.9	13.6	
LOS	A		B	A	C	B	
Approach Delay	2.2			7.7	19.7		
Approach LOS	A			A	B		
Queue Length 50th (m)	6.3		3.8	11.1	8.6	3.2	
Queue Length 95th (m)	9.2		#30.7	38.8	14.4	13.5	
Internal Link Dist (m)	354.0			222.3	202.0		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2373		234	2379	527	536	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.53		0.40	0.25	0.11	0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 55 (65%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 5.5		Intersection LOS: A	
Intersection Capacity Utilization 64.7%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Sandcastle Dr & Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	775	43	193	1178	68	107	
Future Volume (vph)	775	43	193	1178	68	107	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor					0.99	0.98	
Frt	0.992					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3332	0	1695	3357	1695	1488	
Flt Permitted			0.331		0.950		
Satd. Flow (perm)	3332	0	591	3357	1674	1461	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	9					107	
Link Speed (k/h)	70			70	50		
Link Distance (m)	378.0			246.3	226.0		
Travel Time (s)	19.4			12.7	16.3		
Confl. Peds. (#/hr)					11	5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	775	43	193	1178	68	107	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	818	0	193	1178	68	107	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		97	97		97	97	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

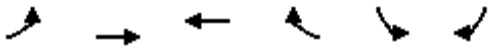
Baseline Rd/Sandcastle Dr
2030 BG PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Perm	Perm	
Protected Phases	2			6			7
Permitted Phases			6		8	8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	62.0		62.0	62.0	33.0	33.0	5.0
Total Split (%)	62.0%		62.0%	62.0%	33.0%	33.0%	5%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	74.6		74.6	74.6	12.0	12.0	
Actuated g/C Ratio	0.75		0.75	0.75	0.12	0.12	
v/c Ratio	0.33		0.44	0.47	0.34	0.40	
Control Delay	4.8		11.5	7.3	42.1	11.2	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.8		11.5	7.3	42.1	11.2	
LOS	A		B	A	D	B	
Approach Delay	4.8			7.9	23.2		
Approach LOS	A			A	C		
Queue Length 50th (m)	15.1		8.8	29.3	11.7	0.0	
Queue Length 95th (m)	35.3		43.5	88.2	19.3	11.3	
Internal Link Dist (m)	354.0			222.3	202.0		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2487		441	2504	443	465	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.33		0.44	0.47	0.15	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 62 (62%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 7.9		Intersection LOS: A	
Intersection Capacity Utilization 57.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Sandcastle Dr & Baseline Road

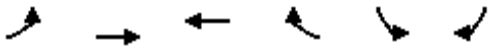




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	86	151	143	39	63
Future Volume (Veh/h)	26	86	151	143	39	63
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	86	151	143	39	63
Pedestrians					9	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			173			
pX, platoon unblocked						
vC, conflicting volume	160				370	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160				370	232
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	98				93	92
cM capacity (veh/h)	1406				595	800

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	112	294	102
Volume Left	26	0	39
Volume Right	0	143	63
cSH	1406	1700	707
Volume to Capacity	0.02	0.17	0.14
Queue Length 95th (m)	0.4	0.0	3.5
Control Delay (s)	1.9	0.0	11.0
Lane LOS	A		B
Approach Delay (s)	1.9	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	129	68	57	97	52
Future Volume (Veh/h)	70	129	68	57	97	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	129	68	57	97	52
Pedestrians					17	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			173			
pX, platoon unblocked						
vC, conflicting volume	85				382	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	85				382	114
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	95				83	94
cM capacity (veh/h)	1485				563	923

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	199	125	149
Volume Left	70	0	97
Volume Right	0	57	52
cSH	1485	1700	651
Volume to Capacity	0.05	0.07	0.23
Queue Length 95th (m)	1.0	0.0	6.1
Control Delay (s)	2.9	0.0	12.2
Lane LOS	A		B
Approach Delay (s)	2.9	0.0	12.2
Approach LOS			B

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	124	41	15	121	13	2
Future Volume (vph)	124	41	15	121	13	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	124	41	15	121	13	2

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	165	136	15
Volume Left (vph)	0	15	13
Volume Right (vph)	41	0	2
Hadj (s)	-0.04	0.16	0.13
Departure Headway (s)	4.0	4.3	4.7
Degree Utilization, x	0.18	0.16	0.02
Capacity (veh/h)	879	835	717
Control Delay (s)	7.9	8.1	7.8
Approach Delay (s)	7.9	8.1	7.8
Approach LOS	A	A	A

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	129	18	18	94	47	26
Future Volume (vph)	129	18	18	94	47	26
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	129	18	18	94	47	26

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	147	112	73
Volume Left (vph)	0	18	47
Volume Right (vph)	18	0	26
Hadj (s)	0.05	0.17	-0.05
Departure Headway (s)	4.2	4.4	4.4
Degree Utilization, x	0.17	0.14	0.09
Capacity (veh/h)	828	800	764
Control Delay (s)	8.1	8.1	7.9
Approach Delay (s)	8.1	8.1	7.9
Approach LOS	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	124	190	61	85	77	25
Future Volume (vph)	124	190	61	85	77	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	124	190	61	85	77	25

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	314	146	102
Volume Left (vph)	0	61	77
Volume Right (vph)	190	0	25
Hadj (s)	-0.30	0.20	0.05
Departure Headway (s)	4.0	4.7	4.9
Degree Utilization, x	0.35	0.19	0.14
Capacity (veh/h)	866	735	669
Control Delay (s)	9.2	8.8	8.8
Approach Delay (s)	9.2	8.8	8.8
Approach LOS	A	A	A

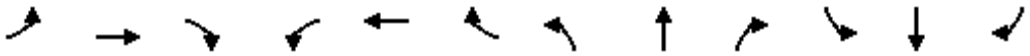
Intersection Summary			
Delay	9.0		
Level of Service	A		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	87	35	8	133	191	48
Future Volume (vph)	87	35	8	133	191	48
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	87	35	8	133	191	48

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	122	141	239
Volume Left (vph)	0	8	191
Volume Right (vph)	35	0	48
Hadj (s)	-0.08	0.14	0.09
Departure Headway (s)	4.6	4.8	4.6
Degree Utilization, x	0.16	0.19	0.31
Capacity (veh/h)	731	706	743
Control Delay (s)	8.4	8.9	9.7
Approach Delay (s)	8.4	8.9	9.7
Approach LOS	A	A	A

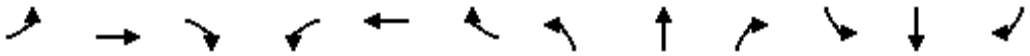
Intersection Summary			
Delay	9.2		
Level of Service	A		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	300	1	1	117	45	0	0	1	4	0	11
Future Volume (Veh/h)	83	300	1	1	117	45	0	0	1	4	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	83	300	1	1	117	45	0	0	1	4	0	11
Pedestrians		5			7			2			4	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		121										
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	166			303			626	636	310	620	614	148
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	166			274			605	616	281	599	593	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	100	100	99	100	99
cM capacity (veh/h)	1406			1256			373	371	733	379	382	890

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	384	163	1	15
Volume Left	83	1	0	4
Volume Right	1	45	1	11
cSH	1406	1256	733	654
Volume to Capacity	0.06	0.00	0.00	0.02
Queue Length 95th (m)	1.3	0.0	0.0	0.5
Control Delay (s)	2.1	0.1	9.9	10.6
Lane LOS	A	A	A	B
Approach Delay (s)	2.1	0.1	9.9	10.6
Approach LOS			A	B

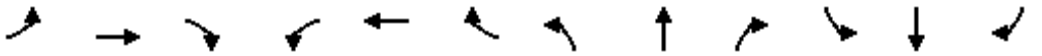
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	48.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	119	0	3	307	2	0	0	1	14	0	73
Future Volume (Veh/h)	1	119	0	3	307	2	0	0	1	14	0	73
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	119	0	3	307	2	0	0	1	14	0	73
Pedestrians		3			6			9			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		121										
pX, platoon unblocked												
vC, conflicting volume	314			128			520	450	134	447	449	316
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	314			128			520	450	134	447	449	316
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	97	100	90
cM capacity (veh/h)	1240			1444			409	496	901	509	496	719

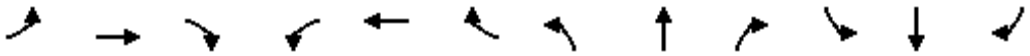
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	120	312	1	87
Volume Left	1	3	0	14
Volume Right	0	2	1	73
cSH	1240	1444	901	674
Volume to Capacity	0.00	0.00	0.00	0.13
Queue Length 95th (m)	0.0	0.0	0.0	3.1
Control Delay (s)	0.1	0.1	9.0	11.1
Lane LOS	A	A	A	B
Approach Delay (s)	0.1	0.1	9.0	11.1
Approach LOS			A	B

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	38.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	541	8	393	21	37	91	154	936	22	26	437	18
Future Volume (vph)	541	8	393	21	37	91	154	936	22	26	437	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.97		0.99	0.98	1.00	1.00				0.98
Frt			0.850			0.850		0.997				0.850
Flt Protected	0.950				0.982		0.950			0.950		
Satd. Flow (prot)	3195	1784	1473	0	1734	1517	1572	3378	0	1544	3357	943
Flt Permitted	0.950				0.982		0.389			0.209		
Satd. Flow (perm)	3195	1784	1431	0	1723	1487	643	3378	0	340	3357	929
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			393			158		2				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		88.7			195.5			655.9			232.4	
Travel Time (s)		5.3			17.6			39.4			13.9	
Confl. Peds. (#/hr)			11	11			2		1	1		2
Confl. Bikes (#/hr)			1			4						1
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
Heavy Vehicles (%)	5%	2%	5%	5%	2%	2%	10%	2%	2%	12%	3%	64%
Adj. Flow (vph)	541	8	393	21	37	91	154	936	22	26	437	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	541	8	393	0	58	91	154	958	0	26	437	18
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	97		97	97		97	97		97	97		97
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

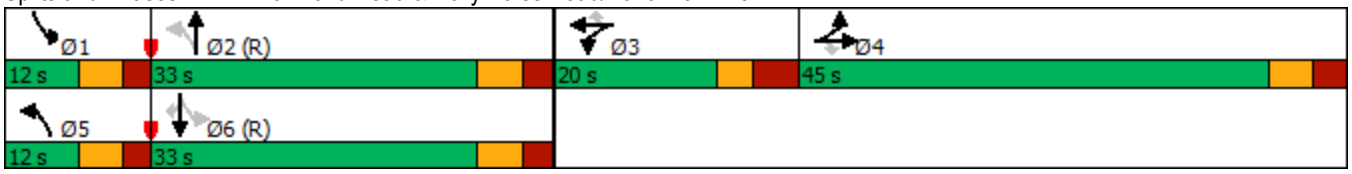
Holly Acres Rd/Richmond Rd/Nanaimo Dr
2035 BG AM Peak

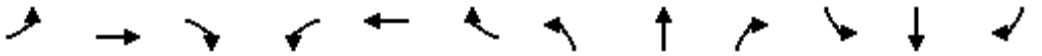


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	45.0	45.0	45.0	20.0	20.0	20.0	12.0	33.0		12.0	33.0	33.0
Total Split (%)	40.9%	40.9%	40.9%	18.2%	18.2%	18.2%	10.9%	30.0%		10.9%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	25.2	25.2	25.2		10.6	10.6	57.8	50.0		47.9	41.0	41.0
Actuated g/C Ratio	0.23	0.23	0.23		0.10	0.10	0.53	0.45		0.44	0.37	0.37
v/c Ratio	0.74	0.02	0.62		0.35	0.32	0.36	0.62		0.12	0.35	0.04
Control Delay	45.3	29.6	7.9		52.3	3.2	19.0	29.4		18.5	29.2	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	45.3	29.6	7.9		52.3	3.2	19.0	29.4		18.5	29.2	0.2
LOS	D	C	A		D	A	B	C		B	C	A
Approach Delay		29.6			22.3			27.9			27.5	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	51.5	1.2	0.0		11.0	0.0	16.1	83.3		2.5	33.9	0.0
Queue Length 95th (m)	62.6	4.6	21.2		22.3	0.9	32.6	#139.3		7.9	54.4	0.0
Internal Link Dist (m)		64.7			171.5			631.9			208.4	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	1115	622	755		209	318	429	1536		222	1252	448
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.49	0.01	0.52		0.28	0.29	0.36	0.62		0.12	0.35	0.04

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 71.5 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 28.1		Intersection LOS: C	
Intersection Capacity Utilization 71.5%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

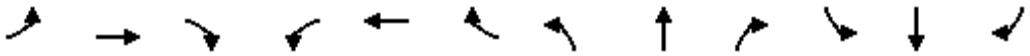
Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	509	50	341	37	71	52	256	879	33	27	816	23
Future Volume (vph)	509	50	341	37	71	52	256	879	33	27	816	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.96		0.99	0.98	1.00	1.00				0.97
Frt			0.850			0.850		0.995				0.850
Flt Protected	0.950				0.983		0.950			0.950		
Satd. Flow (prot)	3257	1784	1473	0	1748	1517	1631	3369	0	1662	3357	1097
Flt Permitted	0.950				0.983		0.198			0.249		
Satd. Flow (perm)	3257	1784	1415	0	1736	1484	339	3369	0	436	3357	1063
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			337			158		4				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		88.7			195.5			655.9			232.4	
Travel Time (s)		5.3			17.6			39.4			13.9	
Confl. Peds. (#/hr)			15	15			13					13
Confl. Bikes (#/hr)			5			4			4			2
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
Heavy Vehicles (%)	3%	2%	5%	3%	2%	2%	6%	2%	3%	4%	3%	41%
Adj. Flow (vph)	509	50	341	37	71	52	256	879	33	27	816	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	509	50	341	0	108	52	256	912	0	27	816	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	97		97	97		97	97		97	97		97
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Holly Acres Rd/Richmond Rd/Nanaimo Dr
2035 BG PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	29.0	29.0	29.0	17.0	17.0	17.0	17.0	47.0		17.0	47.0	47.0
Total Split (%)	26.4%	26.4%	26.4%	15.5%	15.5%	15.5%	15.5%	42.7%		15.5%	42.7%	42.7%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Act Effct Green (s)	20.8	20.8	20.8		10.2	10.2	56.9	50.1		47.4	40.7	40.7
Actuated g/C Ratio	0.19	0.19	0.19		0.09	0.09	0.52	0.46		0.44	0.38	0.38
v/c Ratio	0.82	0.15	0.63		0.65	0.18	0.83	0.58		0.10	0.65	0.05
Control Delay	53.4	37.4	10.0		67.4	1.4	39.5	24.8		13.9	31.1	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	53.4	37.4	10.0		67.4	1.4	39.5	24.8		13.9	31.1	0.2
LOS	D	D	B		E	A	D	C		B	C	A
Approach Delay		36.1			46.0			28.1			29.7	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	49.3	8.2	0.6		21.0	0.0	27.2	74.6		2.5	69.8	0.0
Queue Length 95th (m)	66.2	17.7	24.1		#42.6	0.0	#60.3	96.5		6.3	89.3	0.0
Internal Link Dist (m)		64.7			171.5			631.9			208.4	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	673	369	559		166	284	309	1559		333	1261	500
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.76	0.14	0.61		0.65	0.18	0.83	0.58		0.08	0.65	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 108.4			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 31.8		Intersection LOS: C	
Intersection Capacity Utilization 76.5%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive



Richmond Rd/John Sutherland Dr
2035 BG AM Peak

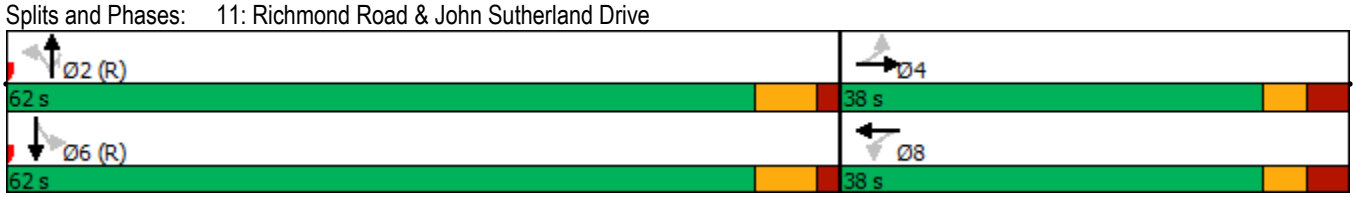
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	51	0	80	0	970	88	242	576	0
Future Volume (vph)	0	0	0	51	0	80	0	970	88	242	576	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt					0.918				0.850			
Flt Protected					0.981					0.950		
Satd. Flow (prot)	0	1784	0	0	1579	0	1784	3390	1517	1679	3390	0
Flt Permitted					0.872					0.282		
Satd. Flow (perm)	0	1784	0	0	1403	0	1784	3390	1517	498	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					80				84			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	0	0	0	51	0	80	0	970	88	242	576	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	131	0	0	970	88	242	576	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	

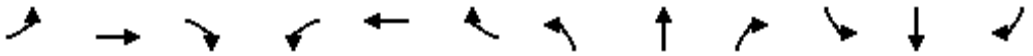
Richmond Rd/John Sutherland Dr
2035 BG AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		62.0	62.0	62.0	62.0	62.0	
Total Split (%)	38.0%	38.0%		38.0%	38.0%		62.0%	62.0%	62.0%	62.0%	62.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					11.5			75.5	75.5	75.5	75.5	
Actuated g/C Ratio					0.12			0.76	0.76	0.76	0.76	
v/c Ratio					0.56			0.38	0.08	0.64	0.23	
Control Delay					27.8			1.2	0.2	16.7	4.0	
Queue Delay					0.0			0.0	0.0	0.0	0.0	
Total Delay					27.8			1.2	0.2	16.7	4.0	
LOS					C			A	A	B	A	
Approach Delay					27.8			1.1			7.8	
Approach LOS					C			A			A	
Queue Length 50th (m)					8.7			2.8	0.0	15.6	12.1	
Queue Length 95th (m)					24.2			9.7	0.1	#55.8	21.7	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)									35.0	40.0		
Base Capacity (vph)					495			2559	1165	376	2559	
Starvation Cap Reductn					0			0	0	0	0	
Spillback Cap Reductn					0			0	0	0	0	
Storage Cap Reductn					0			0	0	0	0	
Reduced v/c Ratio					0.26			0.38	0.08	0.64	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 92 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 5.6		Intersection LOS: A	
Intersection Capacity Utilization 67.0%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

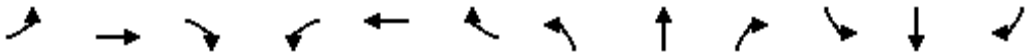
Splits and Phases: 11: Richmond Road & John Sutherland Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	137	0	224	4	802	27	79	958	0
Future Volume (vph)	0	0	0	137	0	224	4	802	27	79	958	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00		0.98	1.00		
Frt					0.916				0.850			
Flt Protected					0.981		0.950			0.950		
Satd. Flow (prot)	0	1784	0	0	1594	0	1695	3390	1517	1647	3390	0
Flt Permitted					0.875		0.261			0.320		
Satd. Flow (perm)	0	1784	0	0	1421	0	465	3390	1482	554	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					66				33			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
Confl. Peds. (#/hr)							2		1	1		2
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	0	0	0	137	0	224	4	802	27	79	958	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	361	0	4	802	27	79	958	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Richmond Rd/John Sutherland Dr
2035 BG PM Peak

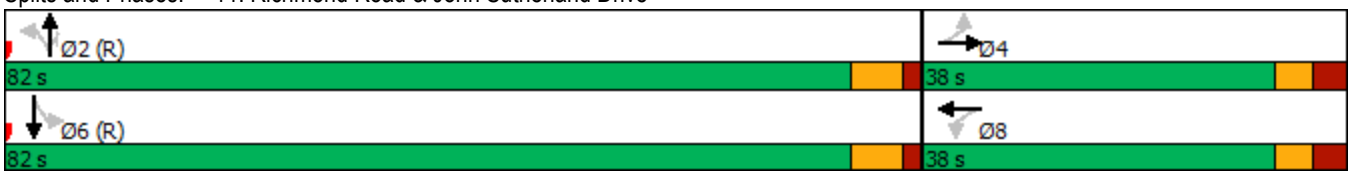


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		82.0	82.0	82.0	82.0	82.0	
Total Split (%)	31.7%	31.7%		31.7%	31.7%		68.3%	68.3%	68.3%	68.3%	68.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					28.9		78.1	78.1	78.1	78.1	78.1	
Actuated g/C Ratio					0.24		0.65	0.65	0.65	0.65	0.65	
v/c Ratio					0.92		0.01	0.36	0.03	0.22	0.43	
Control Delay					65.8		5.5	5.6	0.6	11.2	11.3	
Queue Delay					0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay					65.8		5.5	5.6	0.6	11.2	11.3	
LOS					E		A	A	A	B	B	
Approach Delay					65.8			5.5			11.3	
Approach LOS					E			A			B	
Queue Length 50th (m)					62.5		0.1	14.9	0.0	6.9	52.5	
Queue Length 95th (m)					#110.4		m0.4	23.6	0.3	14.4	65.2	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)							40.0		35.0	40.0		
Base Capacity (vph)					420		302	2207	976	360	2207	
Starvation Cap Reductn					0		0	0	0	0	0	
Spillback Cap Reductn					0		0	0	0	0	0	
Storage Cap Reductn					0		0	0	0	0	0	
Reduced v/c Ratio					0.86		0.01	0.36	0.03	0.22	0.43	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 82 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 75.0% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Richmond Road & John Sutherland Drive



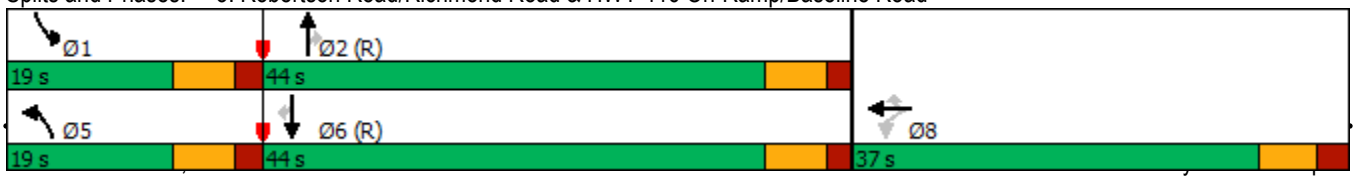
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	364	24	172	13	903	675	177	349	69
Future Volume (vph)	0	0	0	364	24	172	13	903	675	177	349	69
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						172			675			113
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
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
Heavy Vehicles (%)	2%	2%	2%	4%	2%	5%	8%	2%	4%	5%	3%	3%
Adj. Flow (vph)	0	0	0	364	24	172	13	903	675	177	349	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	364	24	172	13	903	675	177	349	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	

Richmond Rd/Robertson Rd/Baseline Rd
2035 BG AM Peak

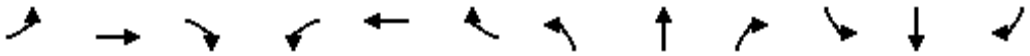
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	19.0	44.0	44.0	19.0	44.0	44.0
Total Split (%)				37.0%	37.0%	37.0%	19.0%	44.0%	44.0%	19.0%	44.0%	44.0%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				17.3	17.3	17.3	6.4	51.9	51.9	10.8	66.4	66.4
Actuated g/C Ratio				0.17	0.17	0.17	0.06	0.52	0.52	0.11	0.66	0.66
v/c Ratio				0.65	0.08	0.43	0.13	0.51	0.62	0.51	0.16	0.07
Control Delay				43.8	33.1	8.8	46.4	18.2	4.2	52.0	7.1	0.4
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				43.8	33.1	8.8	46.4	18.2	4.2	52.0	7.1	0.4
LOS				D	C	A	D	B	A	D	A	A
Approach Delay					32.6			12.5			19.7	
Approach LOS					C			B			B	
Queue Length 50th (m)				31.4	3.6	0.0	2.3	53.2	0.0	16.9	9.5	0.0
Queue Length 95th (m)				41.9	9.4	14.7	7.6	82.2	18.9	26.3	18.2	0.9
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				973	538	564	198	1758	1097	406	2229	1035
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.37	0.04	0.30	0.07	0.51	0.62	0.44	0.16	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 93 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 18.2		Intersection LOS: B	
Intersection Capacity Utilization 60.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



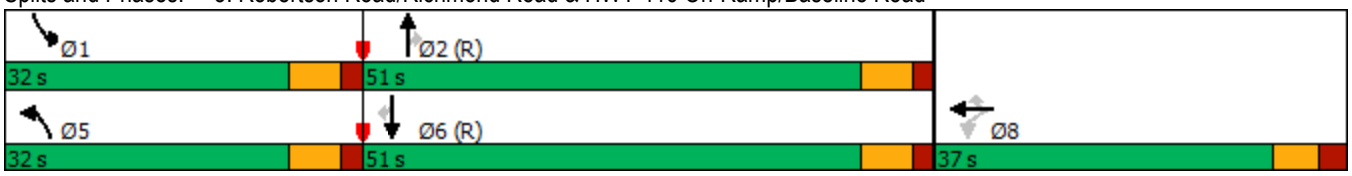
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	668	114	185	58	644	533	213	671	246
Future Volume (vph)	0	0	0	668	114	185	58	644	533	213	671	246
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00		0.99	1.00		0.98
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3288	1767	1517	1647	3390	1517	3288	3390	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3288	1767	1517	1643	3390	1495	3286	3390	1465
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						185			533			246
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
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
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	5%	2%	2%	2%	2%	3%
Adj. Flow (vph)	0	0	0	668	114	185	58	644	533	213	671	246
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	668	114	185	58	644	533	213	671	246
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	32.0	51.0	51.0	32.0	51.0	51.0
Total Split (%)				30.8%	30.8%	30.8%	26.7%	42.5%	42.5%	26.7%	42.5%	42.5%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				28.6	28.6	28.6	9.6	58.3	58.3	13.1	64.3	64.3
Actuated g/C Ratio				0.24	0.24	0.24	0.08	0.49	0.49	0.11	0.54	0.54
v/c Ratio				0.85	0.27	0.37	0.44	0.39	0.53	0.59	0.37	0.27
Control Delay				55.0	38.6	7.3	62.3	21.3	3.9	73.1	11.2	0.9
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				55.0	38.6	7.3	62.3	21.3	3.9	73.1	11.2	0.9
LOS				E	D	A	E	C	A	E	B	A
Approach Delay					44.0			15.7			20.6	
Approach LOS					D			B			C	
Queue Length 50th (m)				70.4	19.9	0.0	12.2	46.6	0.0	24.7	22.8	0.0
Queue Length 95th (m)				90.5	34.5	16.0	24.0	63.8	17.5	m34.9	m27.9	m1.9
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				827	444	520	348	1646	1000	695	1815	898
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.81	0.26	0.36	0.17	0.39	0.53	0.31	0.37	0.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 25.6		Intersection LOS: C	
Intersection Capacity Utilization 63.2%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	774	100	106	477	132	401	
Future Volume (vph)	774	100	106	477	132	401	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.98			1.00		
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3390	1517	1695	3325	1695	1517	
Flt Permitted			0.226		0.950		
Satd. Flow (perm)	3390	1482	403	3325	1693	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		95				401	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		1	1		1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	2%	2%	2%	4%	2%	2%	
Adj. Flow (vph)	774	100	106	477	132	401	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	774	100	106	477	132	401	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

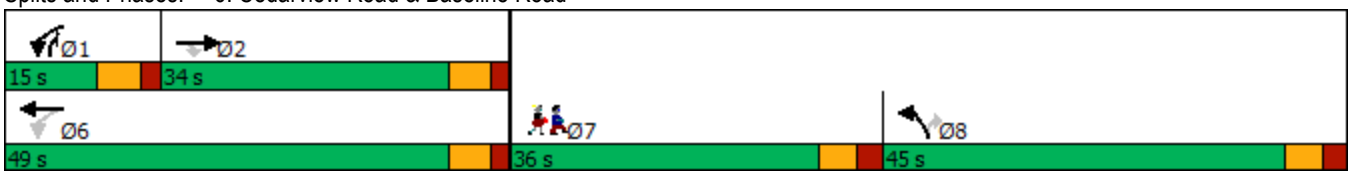


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	36.2	11.1	34.2
Total Split (s)	34.0	34.0	15.0	49.0	45.0	15.0	36.0
Total Split (%)	26.2%	26.2%	11.5%	37.7%	34.6%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	None	None	None
Act Effct Green (s)	30.9	30.9	44.8	44.8	11.2	25.1	
Actuated g/C Ratio	0.42	0.42	0.61	0.61	0.15	0.34	
v/c Ratio	0.54	0.15	0.28	0.24	0.51	0.51	
Control Delay	21.5	6.8	12.5	10.1	38.3	5.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.5	6.8	12.5	10.1	38.3	5.2	
LOS	C	A	B	B	D	A	
Approach Delay	19.8			10.5	13.4		
Approach LOS	B			B	B		
Queue Length 50th (m)	30.6	0.3	3.7	9.4	13.7	0.0	
Queue Length 95th (m)	#105.2	12.3	23.7	45.6	40.4	19.6	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	1426	678	409	2027	934	810	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.54	0.15	0.26	0.24	0.14	0.50	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 73.4			
Natural Cycle: 110			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 15.4		Intersection LOS: B	
Intersection Capacity Utilization 59.0%		ICU Level of Service B	
Analysis Period (min) 15			

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

Splits and Phases: 6: Cedarview Road & Baseline Road



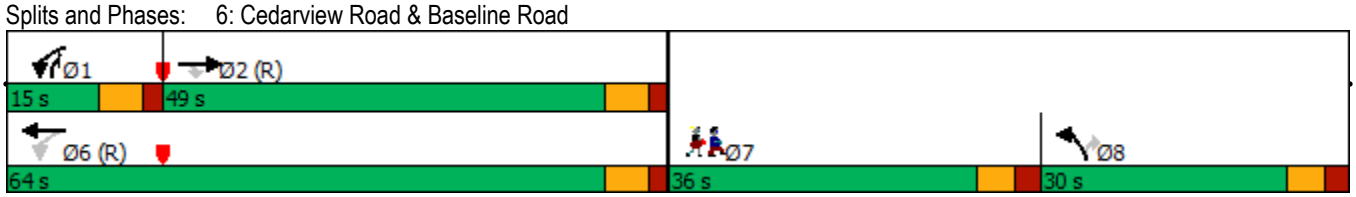
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	585	178	267	856	142	152	
Future Volume (vph)	585	178	267	856	142	152	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.96	0.99				
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3357	1517	1662	3390	1601	1517	
Flt Permitted			0.381		0.950		
Satd. Flow (perm)	3357	1454	663	3390	1601	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		178				152	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		7	7				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	4%	2%	8%	2%	
Adj. Flow (vph)	585	178	267	856	142	152	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	585	178	267	856	142	152	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

Baseline Rd/Cedarview Rd
2035 BG PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	11.2	11.1	34.2
Total Split (s)	49.0	49.0	15.0	64.0	30.0	15.0	36.0
Total Split (%)	37.7%	37.7%	11.5%	49.2%	23.1%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	80.7	80.7	100.9	100.9	16.8	37.1	
Actuated g/C Ratio	0.62	0.62	0.78	0.78	0.13	0.29	
v/c Ratio	0.28	0.18	0.43	0.33	0.69	0.28	
Control Delay	12.6	2.3	6.6	5.1	70.5	5.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	12.6	2.3	6.6	5.1	70.5	5.8	
LOS	B	A	A	A	E	A	
Approach Delay	10.2			5.4	37.1		
Approach LOS	B			A	D		
Queue Length 50th (m)	31.5	0.0	14.3	27.1	32.5	0.0	
Queue Length 95th (m)	48.8	9.4	27.0	42.5	50.3	12.9	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	2084	970	623	2631	293	541	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.28	0.18	0.43	0.33	0.48	0.28	

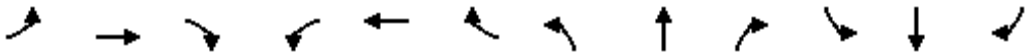
Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 15 (12%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 11.4		Intersection LOS: B	
Intersection Capacity Utilization 56.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Cedarview Road & Baseline Road



Baseline Rd/John Sutherland Dr/Valley Stream Dr
2035 BG AM Peak

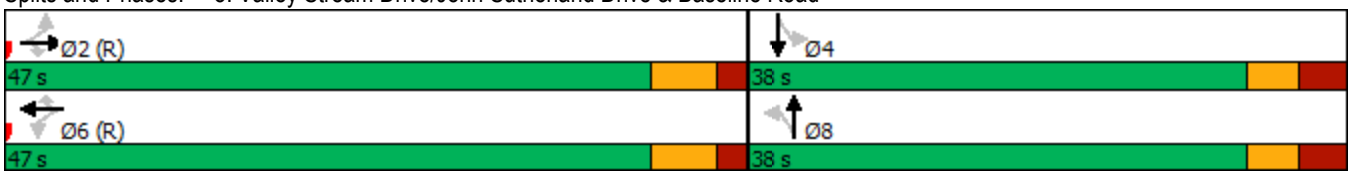
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	1201	19	8	545	118	30	2	14	72	6	67
Future Volume (vph)	138	1201	19	8	545	118	30	2	14	72	6	67
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		0.99			0.99	
Frt			0.850			0.850		0.959			0.938	
Flt Protected	0.950			0.950				0.968			0.976	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1642	0	0	1579	0
Flt Permitted	0.449			0.198				0.767			0.819	
Satd. Flow (perm)	777	3357	1461	343	3357	1446	0	1300	0	0	1322	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			118		14			58	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			172.9	
Travel Time (s)		19.2			19.4			29.3			12.4	
Confl. Peds. (#/hr)	2		4	4		2	2		6	6		2
Confl. Bikes (#/hr)			1			6			2			
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	138	1201	19	8	545	118	30	2	14	72	6	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	138	1201	19	8	545	118	0	46	0	0	145	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

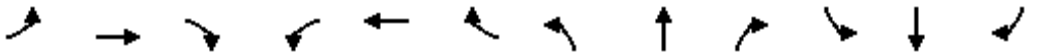


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	38.0	38.0		38.0	38.0	
Total Split (%)	55.3%	55.3%	55.3%	55.3%	55.3%	55.3%	44.7%	44.7%		44.7%	44.7%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	57.1	57.1	57.1	57.1	57.1	57.1		15.2			15.2	
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67		0.18			0.18	
v/c Ratio	0.26	0.53	0.02	0.03	0.24	0.12		0.19			0.51	
Control Delay	9.6	9.9	1.1	16.5	10.8	6.8		21.2			23.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	9.6	9.9	1.1	16.5	10.8	6.8		21.2			23.8	
LOS	A	A	A	B	B	A		C			C	
Approach Delay		9.7			10.1			21.2			23.8	
Approach LOS		A			B			C			C	
Queue Length 50th (m)	5.8	34.1	0.0	0.2	10.6	0.0		4.3			12.3	
Queue Length 95th (m)	25.2	94.4	1.0	m3.8	49.2	17.2		9.4			20.8	
Internal Link Dist (m)		349.9			354.0			301.9			148.9	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	522	2256	996	230	2256	1010		490			526	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.26	0.53	0.02	0.03	0.24	0.12		0.09			0.28	

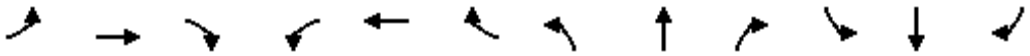
Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 37 (44%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 70.6%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	731	57	14	1203	56	38	4	12	94	5	92
Future Volume (vph)	34	731	57	14	1203	56	38	4	12	94	5	92
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		1.00			0.99	
Frt			0.850			0.850		0.970			0.935	
Flt Protected	0.950			0.950				0.966			0.976	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1661	0	0	1572	0
Flt Permitted	0.198			0.362				0.677			0.816	
Satd. Flow (perm)	343	3357	1456	626	3357	1446	0	1164	0	0	1309	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57			38		12			49	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			172.9	
Travel Time (s)		19.2			19.4			29.3			12.4	
Confl. Peds. (#/hr)	3		4	4		3			9	9		
Confl. Bikes (#/hr)			5			3						3
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	34	731	57	14	1203	56	38	4	12	94	5	92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	731	57	14	1203	56	0	54	0	0	191	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	62.0	62.0	62.0	62.0	62.0	62.0	38.0	38.0		38.0	38.0	
Total Split (%)	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	38.0%	38.0%		38.0%	38.0%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	69.1	69.1	69.1	69.1	69.1	69.1		18.2			18.2	
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.69	0.69		0.18			0.18	
v/c Ratio	0.14	0.32	0.06	0.03	0.52	0.06		0.24			0.69	
Control Delay	9.7	7.6	2.6	3.0	4.7	0.4		28.3			39.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	9.7	7.6	2.6	3.0	4.7	0.4		28.3			39.7	
LOS	A	A	A	A	A	A		C			D	
Approach Delay		7.3			4.5			28.3			39.7	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	1.7	22.3	0.0	0.3	34.6	0.3		6.6			24.4	
Queue Length 95th (m)	8.0	47.3	4.8	m0.6	14.0	m0.0		13.7			38.0	
Internal Link Dist (m)		349.9			354.0			301.9			148.9	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	237	2320	1024	432	2320	1011		374			445	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.14	0.32	0.06	0.03	0.52	0.06		0.14			0.43	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 77 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 58.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road



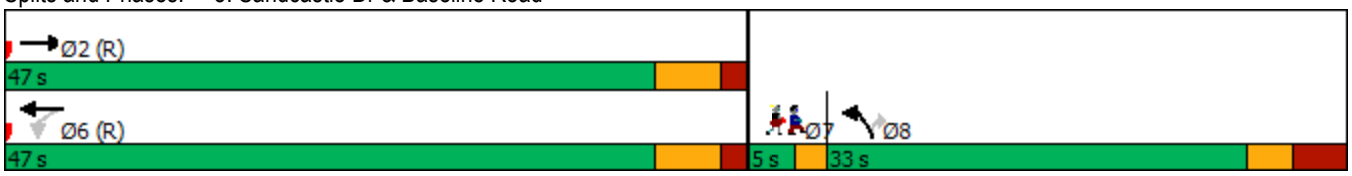
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	1266	25	94	616	60	129	
Future Volume (vph)	1266	25	94	616	60	129	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	1.00				1.00		
Frt	0.997					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3346	0	1695	3357	1695	1488	
Flt Permitted			0.178		0.950		
Satd. Flow (perm)	3346	0	318	3357	1693	1488	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	3					103	
Link Speed (k/h)	70			70	50		
Link Distance (m)	378.0			246.3	226.0		
Travel Time (s)	19.4			12.7	16.3		
Confl. Peds. (#/hr)		5	5		1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	1266	25	94	616	60	129	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1291	0	94	616	60	129	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		97	97		97	97	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Prot	Perm	
Protected Phases	2			6	8		7
Permitted Phases			6			8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	47.0		47.0	47.0	33.0	33.0	5.0
Total Split (%)	55.3%		55.3%	55.3%	38.8%	38.8%	6%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	60.3		60.3	60.3	11.3	11.3	
Actuated g/C Ratio	0.71		0.71	0.71	0.13	0.13	
v/c Ratio	0.54		0.42	0.26	0.27	0.45	
Control Delay	2.3		17.7	6.4	32.9	14.2	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	2.3		17.7	6.4	32.9	14.2	
LOS	A		B	A	C	B	
Approach Delay	2.3			7.9	20.1		
Approach LOS	A			A	C		
Queue Length 50th (m)	6.4		3.9	11.4	8.6	3.6	
Queue Length 95th (m)	9.3		#31.6	39.8	14.4	13.8	
Internal Link Dist (m)	354.0			222.3	202.0		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2373		225	2379	528	534	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.54		0.42	0.26	0.11	0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 55 (65%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 5.6		Intersection LOS: A	
Intersection Capacity Utilization 65.5%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Sandcastle Dr & Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	794	43	193	1206	68	107	
Future Volume (vph)	794	43	193	1206	68	107	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor					0.99	0.98	
Frt	0.992					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3332	0	1695	3357	1695	1488	
Flt Permitted			0.324		0.950		
Satd. Flow (perm)	3332	0	578	3357	1674	1461	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	9					107	
Link Speed (k/h)	70			70	50		
Link Distance (m)	378.0			246.3	226.0		
Travel Time (s)	19.4			12.7	16.3		
Confl. Peds. (#/hr)					11	5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	794	43	193	1206	68	107	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	837	0	193	1206	68	107	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		97	97		97	97	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

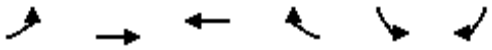
Baseline Rd/Sandcastle Dr
2035 BG PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Perm	Perm	
Protected Phases	2			6			7
Permitted Phases			6		8	8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	62.0		62.0	62.0	33.0	33.0	5.0
Total Split (%)	62.0%		62.0%	62.0%	33.0%	33.0%	5%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	74.6		74.6	74.6	12.0	12.0	
Actuated g/C Ratio	0.75		0.75	0.75	0.12	0.12	
v/c Ratio	0.34		0.45	0.48	0.34	0.40	
Control Delay	4.9		11.9	7.4	42.1	11.2	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.9		11.9	7.4	42.1	11.2	
LOS	A		B	A	D	B	
Approach Delay	4.9			8.0	23.2		
Approach LOS	A			A	C		
Queue Length 50th (m)	15.7		8.9	30.5	11.7	0.0	
Queue Length 95th (m)	36.3		44.5	91.3	19.3	11.3	
Internal Link Dist (m)	354.0			222.3	202.0		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2487		431	2504	443	465	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.34		0.45	0.48	0.15	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 62 (62%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 8.0		Intersection LOS: A	
Intersection Capacity Utilization 58.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Sandcastle Dr & Baseline Road

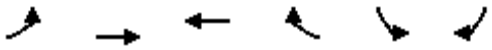




Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	86	151	143	39	63
Future Volume (Veh/h)	26	86	151	143	39	63
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	86	151	143	39	63
Pedestrians					9	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			173			
pX, platoon unblocked						
vC, conflicting volume	160				370	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	160				370	232
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	98				93	92
cM capacity (veh/h)	1406				595	800

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	112	294	102
Volume Left	26	0	39
Volume Right	0	143	63
cSH	1406	1700	707
Volume to Capacity	0.02	0.17	0.14
Queue Length 95th (m)	0.4	0.0	3.5
Control Delay (s)	1.9	0.0	11.0
Lane LOS	A		B
Approach Delay (s)	1.9	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	129	68	57	97	52
Future Volume (Veh/h)	70	129	68	57	97	52
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	129	68	57	97	52
Pedestrians					17	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			173			
pX, platoon unblocked						
vC, conflicting volume	85				382	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	85				382	114
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	95				83	94
cM capacity (veh/h)	1485				563	923

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	199	125	149
Volume Left	70	0	97
Volume Right	0	57	52
cSH	1485	1700	651
Volume to Capacity	0.05	0.07	0.23
Queue Length 95th (m)	1.0	0.0	6.1
Control Delay (s)	2.9	0.0	12.2
Lane LOS	A		B
Approach Delay (s)	2.9	0.0	12.2
Approach LOS			B

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	124	41	15	121	13	2
Future Volume (vph)	124	41	15	121	13	2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	124	41	15	121	13	2

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	165	136	15
Volume Left (vph)	0	15	13
Volume Right (vph)	41	0	2
Hadj (s)	-0.04	0.16	0.13
Departure Headway (s)	4.0	4.3	4.7
Degree Utilization, x	0.18	0.16	0.02
Capacity (veh/h)	879	835	717
Control Delay (s)	7.9	8.1	7.8
Approach Delay (s)	7.9	8.1	7.8
Approach LOS	A	A	A

Intersection Summary			
Delay	8.0		
Level of Service	A		
Intersection Capacity Utilization	30.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	129	18	18	94	47	26
Future Volume (vph)	129	18	18	94	47	26
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	129	18	18	94	47	26

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	147	112	73
Volume Left (vph)	0	18	47
Volume Right (vph)	18	0	26
Hadj (s)	0.05	0.17	-0.05
Departure Headway (s)	4.2	4.4	4.4
Degree Utilization, x	0.17	0.14	0.09
Capacity (veh/h)	828	800	764
Control Delay (s)	8.1	8.1	7.9
Approach Delay (s)	8.1	8.1	7.9
Approach LOS	A	A	A

Intersection Summary			
Delay	8.1		
Level of Service	A		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	124	190	61	85	77	25
Future Volume (vph)	124	190	61	85	77	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	124	190	61	85	77	25

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	314	146	102
Volume Left (vph)	0	61	77
Volume Right (vph)	190	0	25
Hadj (s)	-0.30	0.20	0.05
Departure Headway (s)	4.0	4.7	4.9
Degree Utilization, x	0.35	0.19	0.14
Capacity (veh/h)	866	735	669
Control Delay (s)	9.2	8.8	8.8
Approach Delay (s)	9.2	8.8	8.8
Approach LOS	A	A	A

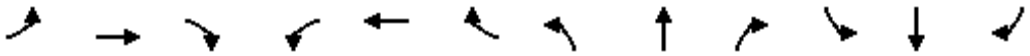
Intersection Summary			
Delay	9.0		
Level of Service	A		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	87	35	8	133	191	48
Future Volume (vph)	87	35	8	133	191	48
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	87	35	8	133	191	48

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total (vph)	122	141	239
Volume Left (vph)	0	8	191
Volume Right (vph)	35	0	48
Hadj (s)	-0.08	0.14	0.09
Departure Headway (s)	4.6	4.8	4.6
Degree Utilization, x	0.16	0.19	0.31
Capacity (veh/h)	731	706	743
Control Delay (s)	8.4	8.9	9.7
Approach Delay (s)	8.4	8.9	9.7
Approach LOS	A	A	A

Intersection Summary			
Delay	9.2		
Level of Service	A		
Intersection Capacity Utilization	35.9%	ICU Level of Service	A
Analysis Period (min)	15		

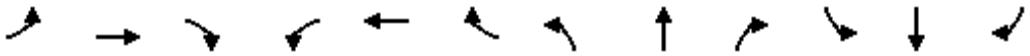


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	300	1	1	117	45	0	0	1	4	0	11
Future Volume (Veh/h)	83	300	1	1	117	45	0	0	1	4	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	83	300	1	1	117	45	0	0	1	4	0	11
Pedestrians		5			7			2			4	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		1			1			0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		121										
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	166			303			626	636	310	620	614	148
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	166			274			605	616	281	599	593	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	100	100	99	100	99
cM capacity (veh/h)	1406			1256			373	371	733	379	382	890

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	384	163	1	15
Volume Left	83	1	0	4
Volume Right	1	45	1	11
cSH	1406	1256	733	654
Volume to Capacity	0.06	0.00	0.00	0.02
Queue Length 95th (m)	1.3	0.0	0.0	0.5
Control Delay (s)	2.1	0.1	9.9	10.6
Lane LOS	A	A	A	B
Approach Delay (s)	2.1	0.1	9.9	10.6
Approach LOS			A	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	48.1%	ICU Level of Service	A	
Analysis Period (min)	15			

John Sutherland Dr/QCH Lot TL2
2035 BG PM Peak



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	119	0	3	307	2	0	0	1	14	0	73
Future Volume (Veh/h)	1	119	0	3	307	2	0	0	1	14	0	73
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	1	119	0	3	307	2	0	0	1	14	0	73
Pedestrians		3			6			9			5	
Lane Width (m)		3.7			3.7			3.7			3.7	
Walking Speed (m/s)		1.0			1.0			1.0			1.0	
Percent Blockage		0			1			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		121										
pX, platoon unblocked												
vC, conflicting volume	314			128			520	450	134	447	449	316
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	314			128			520	450	134	447	449	316
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	97	100	90
cM capacity (veh/h)	1240			1444			409	496	901	509	496	719

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	120	312	1	87
Volume Left	1	3	0	14
Volume Right	0	2	1	73
cSH	1240	1444	901	674
Volume to Capacity	0.00	0.00	0.00	0.13
Queue Length 95th (m)	0.0	0.0	0.0	3.1
Control Delay (s)	0.1	0.1	9.0	11.1
Lane LOS	A	A	A	B
Approach Delay (s)	0.1	0.1	9.0	11.1
Approach LOS			A	B

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	38.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Appendix L: TDM Checklists

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
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

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☐
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

TDM-supportive design & infrastructure measures: *Non-residential developments*			Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☑ Benches are provided along the new trail proposed along eastern property line. Lighting is provided along walking and cycling routes.
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☑

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☑ Based on assumed modal shares, approximately 110 cyclists are anticipated during the AM peak hour. Combined long-term and short-term, approximately a total of 268 bicycle parking spaces are provided.
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☑ Based on assumed modal shares, approximately 110 cyclists are anticipated during the AM peak hour. Combined long-term and short-term, approximately a total of 268 bicycle parking spaces are provided. Assuming 150 cyclists, 25% buffer requires approximately 190 spaces.
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☑
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☑ Based on assumed modal shares, approximately 110 cyclists are anticipated during the AM peak hour. A total of 120 long-term bicycle parking spaces are proposed.
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☑
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☑
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☑
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☑ Staff and visitor parking spaces are generally separated across the entire campus. Visitors primarily park in the visitors parking lot (West Surface Parking Lot and Visitors Parking Lot 6. All major parking lots are controlled by physical barriers/access permits.
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☑ QCH has cafeteria providing breakfast and lunch service. It also has Tim Hortons & Vending machines. In addition to these, it has: - Wellness center with workout area. - Staff lounges - Yoga Space

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

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: *Non-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	☑ QCH will appoint a staff member who will be dedicated to collecting data, managing incentives, and evaluating impacts of TDM measures. This staff will also liaise with various leadership groups to develop a TDM strategy.
	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	☐ Although not physically displayed at main entrances, online link to Cycling Maps is provided at QCH website: https://www.qch.on.ca/LifeatQCH
	2.2	**Bicycle skills training**	
		Commuter travel	
BETTER ★	2.2.1	Offer on-site cycling courses for commuters, or subsidize off-site courses	☐
	2.3	**Valet bike parking**	
		Visitor travel	
BETTER	2.3.1	Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-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	☐
BASIC		3.1.2	Provide online links to OC Transpo and STO information	☑ Online link to OC Transpo is provided at: https://www.qch.on.ca/LifeatQCH
BETTER		3.1.3	Provide real-time arrival information display at entrances	☑
		3.2	**Transit fare incentives**	
			Commuter travel	
BETTER		3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	☐
BETTER	★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	☐
			Visitor travel	
BETTER		3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	☐
		3.3	**Enhanced public transit service**	
			Commuter travel	
BETTER		3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	☐
		3.4	**Private transit service**	
			Commuter travel	
BETTER		3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	☐
			Visitor travel	
BETTER		3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	☐

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	☐
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	☑
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	☐
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	☑
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	☐
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	☐
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	☐
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	☑
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	☐
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	☑

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7. TDM MARKETING & COMMUNICATIONS	
		7.1 Multimodal travel information	
		Commuter travel	
BASIC	★	7.1.1 Provide a multimodal travel option information package to new/relocating employees and students	☑
		Visitor travel	
BETTER	★	7.1.2 Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	☑
		7.2 Personalized trip planning	
		Commuter travel	
BETTER	★	7.2.1 Offer personalized trip planning to new/relocating employees	☐
		7.3 Promotions	
		Commuter travel	
BETTER		7.3.1 Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	☑
		8. OTHER INCENTIVES & AMENITIES	
		8.1 Emergency ride home	
		Commuter travel	
BETTER	★	8.1.1 Provide emergency ride home service to non-driving commuters	☐
		8.2 Alternative work arrangements	
		Commuter travel	
BASIC	★	8.2.1 Encourage flexible work hours	☑
BETTER		8.2.2 Encourage compressed workweeks	☐
BETTER	★	8.2.3 Encourage telework	☑
		8.3 Local business travel options	
		Commuter travel	
BASIC	★	8.3.1 Provide local business travel options that minimize the need for employees to bring a personal car to work	☐
		8.4 Commuter incentives	
		Commuter travel	
BETTER		8.4.1 Offer employees a taxable, mode-neutral commuting allowance	☐
		8.5 On-site amenities	
		Commuter travel	
BETTER		8.5.1 Provide on-site amenities/services to minimize mid-day or mid-commute errands	☑ QCH has cafeteria providing breakfast and lunch service. It also has Tim Hortons & Vending machines. In addition to these, it has: - Wellness center with workout area. - Staff lounges - Yoga Space

Appendix M: Detailed Parking Calculations

Part 4 Expansion Parking Calculations - If Existing Modal Shares Persist

Existing Modal Shares		
Employees	**Planned**	**Emerg**
80%	80%	95%

Part 4 Modal Shares		
Employees	**Planned**	**Emerg**
80%	80%	95%

Hospital Stats			Notes	
	Existing	**Part 4**		
GFA ft^2	637,444	1,023,388		
No of Beds	287	444		
Full Time Employees	1337	2066		
Total Visitors - Annual	331,331	450,934		
Planned	250,264	354,856		
Emerg	81,067	96,078		
%growth from existing	-	136		
Total Visitors - Daily	1044	1421	1.15	Daily = (Annual/365) + 15% for daily variation
Planned	789	1118		
Emerg	255	303		
Approx. Total Parking	1292	1703		
Approx. Emp Parking	891	1268		
Approx. Visitor Parking	401	435		

Estimated Auto Drivers				
	Employees	**Planned**	**Emerg**	**Total**
Existing	1070	631	242	1943
Part 4	1653	894	288	2835

Parking/Driver Ratio
0.66
0.6

If existing ratio is maintained, how much is the demand
1282.38
1871.1

Part 4 Expansion Parking Calculations - If Target Modal Shares are Met

Existing Modal Shares		
Employees	**Planned**	**Emerg**
80%	80%	95%

Part 4 Modal Shares		
Employees	**Planned**	**Emerg**
65%	65%	95%

Hospital Stats			Notes	
	Existing	**Part 4**		
GFA ft^2	637,444	1,023,388		
No of Beds	287	444		
Full Time Employees	1337	2066		
Total Visitors - Annual	331,331	450,934		
Planned	250,264	354,856		
Emerg	81,067	96,078		
%growth from existing	-	136		
Total Visitors - Daily	1044	1421	1.15	Daily = (Annual/365) + 15% for daily variation
Planned	789	1118		
Emerg	255	303		
Approx. Total Parking	1292	1703		
Approx. Emp Parking	891	1268		
Approx. Visitor Parking	401	435		

Estimated Auto Drivers				
	Employees	**Planned**	**Emerg**	**Total**
Existing	1070	631	242	1943
Part 4	1343	727	288	2358

Parking/Driver Ratio
0.66
0.72

If existing ratio is maintained, how much is the demand
1282.38
1556.28

Appendix N: Detailed MMLOS Analysis

Multi-Modal Level of Service - Segments Form

Project: 3045 Baseline Road, QCH Part 4 (123089)
Consultant: Novatech Engineering Consultants Ltd.
Date: Mar 17, 2026
Scenario: Existing Conditions

	Segment Name	**Richmond Road b/w John Sutherland Drive and Holly Acres Road**				**Baseline Road b/w Cedarview Road and John Sutherland Drive**			
	OP Transect / Policy Area	**Greenbelt or Rural**				**Greenbelt or Rural**			
	Segment Component	**Majority (>50%)**		**Critical**		**Majority (>50%)**		**Critical**	
	Side of Street	**West Side**	**East Side**	**West Side**	**East Side**	**North Side**	**South Side**	**North Side**	**South Side**
Pedestrian	**PLOS Inputs**								
	Posted Speed (km/h)	80 km/h		80 km/h		70 km/h		70 km/h	
	Two-Way ADT	24,796		24,796		20,433		20,433	
	Pedestrian Facility	None	None	None	None	Multi-Use Pathway	Sidewalk	Multi-Use Pathway	Sidewalk
	Does the facility meet the TMP Sidewalk or MUP Policy? If not, for MUPs, does the location have a low volume of peak daily users AND are pedestrian volumes likely less than 20% of total users?	No	No	No	No	Yes	Yes	Yes	Yes
	Facility Width (m)	-	-	-	-	3.00m	2.00m	3.00m	2.00m
	Offset from Motor Vehicle Travel Lanes (m)	-	-	-	-	≥ 3.0m	1.5-2.99m	≥ 3.0m	< 0.5m
	Presence of Adjacent Parking?	-	-	-	-	No	-	No	-
	General Purpose Curb Lane ADT	-	-	-	-	-	> 3000	-	≤ 3000
	Max. Distance between Controlled Crossings (m)	-	-	-	-	≤ 200m	≤ 200m	≤ 200m	≤ 200m
	Score	**0.00**	**0.00**	**0.00**	**0.00**	**4.25**	**3.50**	**4.25**	**2.75**
	PLOS	**F**	**F**	**F**	**F**	**B**	**B**	**B**	**C**
	Target PLOS	**D**				**D**			
Bicycle	**BLOS Inputs**								
	Cycling Route Classification	**Cross-Town Bikeway**				**Elsewhere**			
	Cycling Facility	Painted or Physically Separated Bike Lanes	Painted or Physically Separated Bike Lanes	Painted or Physically Separated Bike Lanes	Painted or Physically Separated Bike Lanes	Multi-Use Pathway	Painted or Physically Separated Bike Lanes	Multi-Use Pathway	Painted or Physically Separated Bike Lanes
	Is the minimum level of separation provided according to OTM Book 18 Pre-Selection Nomograph - Rural Context (Figure 5.6)? (for paved shoulders)	-	-	-	-	-	-	-	-
	Facility Operation	Unidirectional	Unidirectional	Unidirectional	Unidirectional	-	Unidirectional	-	Unidirectional
	Pedestrian/Cyclist Volume	-	-	-	-	Low to Moderate Volume MUP (≤ 100 users per hour)	-	Low to Moderate Volume MUP (≤ 100 users per hour)	-
	Facility Width	1.5-1.79m or 1.8m contraflow bike lane	1.8-1.99m	< 1.5m over more than 15m or > 2.5m	1.8-1.99m	3.0-3.49m	1.5-1.79m or 1.8m contraflow bike lane	3.0-3.49m	1.5-1.79m or 1.8m contraflow bike lane
	Boulevard/Buffer Width (excluding curb)	-	-	-	-	≥ 1.5m or any boulevard width with continuous traffic barrier	-	≥ 1.5m or any boulevard width with continuous traffic barrier	-
	Unsignalized Roadway Crossing Type (where cyclists are required to yield)	None	None	None	None	None	None	None	None
	Number of Travel Lanes at Crossing	-	-	-	-	-	-	-	-
	Crossing includes Median Refuge (≥ 2.7m)	-	-	-	-	-	-	-	-
	Cross-street Posted Speed (km/h)	-	-	-	-	-	-	-	-
	Cycling Path Blockages (e.g. bus stops and/or loading zones)	Rare	Rare	Rare	Rare	-	Rare	-	Rare
	Score	**2.03**	**2.45**	**1.18**	**2.45**	**4.00**	**2.03**	**4.00**	**2.03**
	BLOS	**D**	**D**	**E**	**D**	**B**	**D**	**B**	**D**
	Target BLOS	**C**				**D**			
Transit	**TLOS Inputs**								
	Transit Facility	**Mixed Traffic**				**Mixed Traffic**			
	Facility Type	Mixed Traffic	Mixed Traffic			Mixed Traffic	Mixed Traffic		
	Expected Transit Running Time	Slightly Impeded	Slightly Impeded			Slightly Impeded	Slightly Impeded		
	Transit Travel Speed (if available)	Enter Speed (if available)	Enter Speed (if available)			Enter Speed (if available)	Enter Speed (if available)		
	TLOS	**C**	**C**			**C**	**C**		
	Target TLOS	**E (D for frequent transit routes)**				**E (D for frequent transit routes)**			
Public Realm	**PRLOS Inputs**								
	Context	Other Streets	Other Streets			Other Streets	Other Streets		
	Inner Boulevard Width	≤ 0.6m	≤ 0.6m			≥ 4.0m	≤ 0.6m		
	Middle Boulevard Width	≤ 0.5m	≤ 0.5m			≤ 0.5m	≤ 0.5m		
	Outer Boulevard (Frontage) Width	≥ 3.0m	≥ 3.0m			≤ 0.5m	≥ 3.0m		
	Transit Route on Segment?	Yes	Yes			Yes	Yes		
	Bus Stop Elements	Curbside landing zone with no shelter	No platform, landing zone or shelter			Curbside platform with shelter (island style)	Curbside platform with shelter (island style)		
	Number of Midblock Traffic Lanes (both travel directions)	≤ 2				4			
	Score	**-**	**11.10**			**-**	**22.20**		
	PRLOS	**-**	**D**			**-**	**B**		
		D				**B**			

Multi-Modal Level of Service - Intersections Form
Project: 3045 Baseline Road, QCH Part 4 (123089)
Consultant: Novatech Engineering Consultants Ltd.
Date: Mar 18, 2026
Scenario: Existing Conditions AM Peak

	Intersection Name	Richmond Road/Holly Acres Road/Nanaimo Drive				Richmond Road/John Sutherland Drive				Richmond Road/Robertson Road/Baseline Road/HWY417 On-Ramp				
	OP Transect / Policy Area	Outer Urban or Suburban				Greenbelt or Rural				Greenbelt or Rural				
Pedestrian	PLOS Inputs													
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg
	Number of Travel Lanes Crossed	No Crosswalk	6	1-3	6	5	6	1-3	1-3	7	No Crosswalk	7	1-3	No Crosswalk
	Median Refuge (≥2.7m)	-	No	No	No	No	No	No	No	No	-	No	No	-
	Crosswalk Treatment	-	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	-	Std Transverse Markings	Std Transverse Markings	-
	Signal Cycle Length (sec)	110.0				100.0				100.0				
	Effective Walk Time (sec)	-	23.4	9.7	9.7	7.4	7.4	39.6	39.6	11.2	-	20.4	20.4	-
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR	WBR
	Right-Turn Geometry	Right-Turn With No Channel	Conventional Right-Turn Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Conventional Right-Turn Channel	No Right-Turn / Prohib.	Conventional Right-Turn Channel	Conventional Right-Turn Channel	No Right-Turn / Prohib.
	Right-Turn Signal Phasing	Permissive	-	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	-	-	-	-	-
	Right-Turn Volume	≤ 150 veh/h	> 300 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	> 150 to 300 veh/h	-	> 300 veh/h	≤ 150 veh/h	-
	Right-Turn Effective Corner Radius	> 8m	-	> 8m	> 8m	> 8m	> 8m	> 8m	≤ 8m	-	-	-	-	-
	Cross-street Posted Speed (km/h)	80 km/h		60 km/h		80 km/h		50 km/h		80 km/h		70 km/h		60 k
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL	EBL
	Left-Turn Signal Phasing	Fully Protected	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	No Left-Turn / Prohib.	Fully Protected	Fully Protected	Fully Protected	No Left-Turn / Prohib.
	Left-Turn Volume	-	-	≤ 50 veh/h	> 100 veh/h	≤ 50 veh/h	> 50 to 100 veh/h	> 100 veh/h	≤ 50 veh/h	-	-	-	-	-
	Left-Turn Opposing Lanes	-	-	-	-	-	≤ 1	-	-	-	-	-	-	-
	Score	-	1.90	4.00	2.00	2.80	2.20	4.40	4.60	1.45	-	1.30	3.85	-
	PLOS	-	D	B	D	C	D	B	A	E	-	E	B	-
		C				B				D				
	Target PLOS	C				D				D				
Bicycle	BLOS Inputs													
	Cycling Route Classification	Cross-Town Bikeway				Cross-Town Bikeway				Cross-Town Bikeway				
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg
	Type of Cycling Facility Across Leg	Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection		Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection
	Two-Way ADT (in Cyclist Travel Direction)	11,459		19,058		2,386		22,048		8,764		24,984		18,5
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	Yes	No	Yes	No	No	Yes	No	Yes		No	Yes	No
	Crossride Operation	-	-	-	-	-	-	-	-	-	-	-	-	-
	Target Crossride Setback Met?	-	-	-	-	-	-	-	-	-	-	-	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL	WBL
	Cyclist Left-Turn Treatment Type	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Dual Left-Turn Lanes	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	One-Stage Bike Box		No Left-Turn	General Purpose Dual Left-Turn Lanes	General Purpose Through-Left or Single Left-Turn Lane
	Vehicle Lanes Crossed by Cyclists	One Lane Crossed	-	Two or More Lanes Crossed	Two or More Lanes Crossed	No Lane Crossed	No Lane Crossed	Two or More Lanes Crossed	Two or More Lanes Crossed	-	-	-	-	Two or More Lanes Crossed
	Score	40	25	55	-15	50	50	-15	65	55	-	50	25	75
	BLOS	D	E	D	F	D	D	F	C	D	-	D	E	C
		E				D				D				
	Target BLOS	B				C				C				
Transit	TLOS Inputs													
	Transit Facility	Mixed Traffic				Mixed Traffic				Mixed Traffic				
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound
	Average Transit Delay (if available)	≤ 10 sec	21-35 sec		36-55 sec	21-35 sec	≤ 10 sec	21-35 sec		≤ 10 sec	11-20 sec	36-55 sec		
	Example Transit Priority Treatment	-	-		-	-	-	-		-	-	-		
	TLOS	A	C	-	D	C	A	C	-	A	B	D	-	-
		C				B				B				
	Target TLOS	E (D for frequent transit routes)				E (D for frequent transit routes)				E (D for frequent transit routes)				
Auto	AutoLOS Inputs													
	Overall Intersection Volume to Capacity Ratio	0.61 to 0.70				0 to 0.60				0 to 0.60				
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table				See Separate Traffic Operations Table				See Separate Traffic Operations Table				
	AutoLOS	B				A				A				
	Target AutoLOS	E				D				D				

Multi-Modal Level of Service - Intersections Form

Project: 3045 Baseline Road, QCH Part 4 (123085
Consultant: Novatech Engineering Consultants Ltd.
Date: Mar 18, 2026
Scenario: Existing Conditions AM Peak

	Intersection Name	Baseline Road/Cedarview Road			Baseline Road/John Sutherland Drive/Valley Stream Drive				Baseline Road/Sandcastle Drive			
	OP Transect / Policy Area	**Greenbelt or Rural**			**Greenbelt or Rural**				**Mainstreet Corridor (outside a Hub)**			
Pedestrian	**PLOS Inputs**											
	Pedestrians Crossing the	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**
	Number of Travel Lanes Crossed	4	5	5	4	1-3	6	7	No Crosswalk	1-3	6	4
	Median Refuge (≥2.7m)	No	No	No	No	No	No	No	-	No	No	No
	Crosswalk Treatment	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	-	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings
	Signal Cycle Length (sec)	130.0			85.0				85.0			
	Effective Walk Time (sec)	13.9	6.8	6.8	21.8	21.8	7.5	7.5	-	30.1	7.5	7.5
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	**EBR**	**NBR**	**SBR**	**WBR**	**EBR**	**NBR**	**SBR**	**WBR**	**EBR**	**NBR**	**SBR**
	Right-Turn Geometry	Conventional Right-Turn Channel	Right-Turn With No Channel	No Right-Turn / Prohib.	Conventional Right-Turn Channel	Right-Turn With No Channel	Right-Turn With No Channel	Conventional Right-Turn Channel	No Right-Turn / Prohib.	Right-Turn With No Channel	Right-Turn With No Channel	No Right-Turn / Prohib.
	Right-Turn Signal Phasing	-	Fully Protected	-	-	Permissive	Permissive	-	-	Permissive	Permissive (with LPI/LBI)	-
	Right-Turn Volume	≤ 150 veh/h	-	-	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	-	≤ 150 veh/h	≤ 150 veh/h	-
	Right-Turn Effective Corner Radius	-	-	-	-	> 8m	> 8m	-	-	> 8m	≤ 8m	-
	Cross-street Posted Speed (km/h)	m/h	70 km/h		50 km/h		70 km/h		50 km/h		70 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	**WBL**	**SBL**	**NBL**	**EBL**	**WBL**	**SBL**	**NBL**	**EBL**	**WBL**	**SBL**	**NBL**
	Left-Turn Signal Phasing	Perm or Prot+Perm	No Left-Turn / Prohib.	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	No Left-Turn / Prohib.	Perm or Prot+Perm	No Left-Turn / Prohib.	Perm or Prot+Perm (with LPI)
	Left-Turn Volume	> 50 to 100 veh/h	-	-	> 100 veh/h	≤ 50 veh/h	> 50 to 100 veh/h	≤ 50 veh/h	-	≤ 50 veh/h	-	≤ 50 veh/h
	Left-Turn Opposing Lanes	≥ 2	-	-	-	-	≤ 1	-	-	-	-	-
	Score	**2.95**	**3.15**	**3.15**	**3.20**	**4.45**	**2.35**	**1.45**	**-**	**4.60**	**2.65**	**3.85**
	PLOS	**C**	**C**	**C**	**C**	**B**	**D**	**E**	**-**	**A**	**C**	**B**
		C			**C**				**B**			
	Target PLOS	**D**			**D**				**B**			
Bicycle	**BLOS Inputs**											
	Cycling Route Classification	**Elsewhere**			**Elsewhere**				**Elsewhere**			
	Cyclists Crossing the	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**	**North Leg**	**South Leg**	**East Leg**	**West Leg**
	Type of Cycling Facility Across Leg	Bike Lane Through Intersection	Crossride		Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	
	Two-Way ADT (in Cyclist Travel Direction)	530	3,913		20,241		2,509		21,525		1,617	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	Yes	No		Yes	Yes	No	Yes	No	No	No	
	Crossride Operation	-	Bidirectional	-	-	-	-	-	-	-	-	-
	Target Crossride Setback Met?	-	-	-	-	-	-	-	-	-	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-	-	-	-	-	-	-	-
	Cyclist Left-Turn Operation	**EBL**	**NBL**	**SBL**	**WBL**	**EBL**	**NBL**	**SBL**	**WBL**	**EBL**	**NBL**	**SBL**
	Cyclist Left-Turn Treatment Type	Two-Stage Queue Box	Protected Corner		General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	No Left-Turn	General Purpose Through-Left or Single Left-Turn Lane	
	Vehicle Lanes Crossed by Cyclists	-	-	-	Two or More Lanes Crossed	Two or More Lanes Crossed	One Lane Crossed	No Lane Crossed	Two or More Lanes Crossed	-	One Lane Crossed	-
	Score	**15**	**150**	**-**	**-15**	**25**	**40**	**20**	**75**	**115**	**55**	**-**
	BLOS	**E**	**A**	**-**	**F**	**E**	**D**	**E**	**C**	**B**	**D**	**-**
		C			**E**				**C**			
	Target BLOS	**D**			**D**				**C**			
Transit	**TLOS Inputs**											
	Transit Facility	**Mixed Traffic**			**Mixed Traffic**				**Mixed Traffic**			
	Vehicles Travelling	**Northbound**	**Westbound**	**Eastbound**	**Southbound**	**Northbound**	**Westbound**	**Eastbound**	**Southbound**	**Northbound**	**Westbound**	**Eastbound**
	Average Transit Delay (if available)		≤ 10 sec	21-35 sec	21-35 sec		≤ 10 sec	≤ 10 sec			≤ 10 sec	≤ 10 sec
	Example Transit Priority Treatment		-	-	-		-	-			-	-
	TLOS	**-**	**A**	**C**	**C**	**-**	**A**	**A**	**-**	**-**	**A**	**A**
		B			**B**				**A**			
	Target TLOS	**E (D for frequent transit routes)**			**E (D for frequent transit routes)**				**E (D for frequent transit routes)**			
Auto	**AutoLOS Inputs**											
	Overall Intersection Volume to Capacity Ratio	0 to 0.60			0 to 0.60				0 to 0.60			
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table			See Separate Traffic Operations Table				See Separate Traffic Operations Table			
	AutoLOS	**A**			**A**				**A**			
	Target AutoLOS	**D**			**D**				**E**			

Multi-Modal Level of Service - Intersections Form
Project: 3045 Baseline Road, QCH Part 4 (123089)
Consultant: Novatech Engineering Consultants Ltd.
Date: Mar 18, 2026
Scenario: Existing Conditions PM Peak

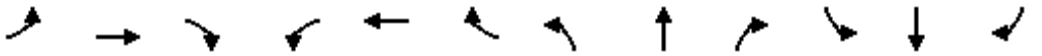
	Intersection Name	Richmond Road/Holly Acres Road/Nanaimo Drive				Richmond Road/John Sutherland Drive				Richmond Road/Robertson Road/Baseline Road/HWY417 On-Ramp				
	OP Transect / Policy Area	Outer Urban or Suburban				Greenbelt or Rural				Greenbelt or Rural				
Pedestrian	PLOS Inputs													
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg
	Number of Travel Lanes Crossed	No Crosswalk	6	1-3	6	5	6	1-3	1-3	7	No Crosswalk	7	1-3	No Crosswalk
	Median Refuge (≥2.7m)	-	No	No	No	No	No	No	No	No	-	No	No	-
	Crosswalk Treatment	-	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	-	Std Transverse Markings	Std Transverse Markings	-
	Signal Cycle Length (sec)	110.0				120.0				120.0				
	Effective Walk Time (sec)	-	7.4	8.7	8.7	7.4	7.4	59.6	59.6	11.2	-	27.4	27.4	-
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR	WBR
	Right-Turn Geometry	Right-Turn With No Channel	Conventional Right-Turn Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Conventional Right-Turn Channel	No Right-Turn / Prohib.	Conventional Right-Turn Channel	Conventional Right-Turn Channel	No Right-Turn / Prohib.
	Right-Turn Signal Phasing	Permissive	-	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive	-	-	-	-	-
	Right-Turn Volume	≤ 150 veh/h	> 300 veh/h	≤ 150 veh/h	≤ 150 veh/h	> 150 to 300 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	> 150 to 300 veh/h	-	> 300 veh/h	> 150 to 300 veh/h	-
	Right-Turn Effective Corner Radius	> 8m	-	> 8m	> 8m	> 8m	> 8m	> 8m	≤ 8m	-	-	-	-	-
	Cross-street Posted Speed (km/h)	80 km/h		60 km/h		80 km/h		50 km/h		80 km/h		70 km/h		60 k
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL	EBL
	Left-Turn Signal Phasing	Fully Protected	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	No Left-Turn / Prohib.	Fully Protected	Fully Protected	Fully Protected	No Left-Turn / Prohib.
	Left-Turn Volume	-	-	≤ 50 veh/h	> 100 veh/h	≤ 50 veh/h	> 100 veh/h	> 50 to 100 veh/h	≤ 50 veh/h	-	-	-	-	-
	Left-Turn Opposing Lanes	-	-	-	-	-	-	≥ 2	-	-	-	-	-	-
	Score	-	1.75	4.00	2.00	2.50	2.00	4.40	4.60	1.30	-	1.30	3.85	-
	PLOS	-	D	B	D	C	D	B	A	E	-	E	B	-
		C				C				D				
	Target PLOS	C				D				D				
Bicycle	BLOS Inputs													
	Cycling Route Classification	Cross-Town Bikeway				Cross-Town Bikeway				Cross-Town Bikeway				
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg
	Type of Cycling Facility Across Leg	Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection	Bike Lane Through Intersection		Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection
	Two-Way ADT (in Cyclist Travel Direction)	11,459		19,058		2,386		22,048		8,764		24,984		18,5
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	Yes	No	Yes	No	No	Yes	No	Yes		No	Yes	No
	Crossride Operation	-	-	-	-	-	-	-	-	-	-	-	-	-
	Target Crossride Setback Met?	-	-	-	-	-	-	-	-	-	-	-	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-	-	-	-	-	-	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL	WBL
	Cyclist Left-Turn Treatment Type	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Dual Left-Turn Lanes	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	One-Stage Bike Box		No Left-Turn	General Purpose Dual Left-Turn Lanes	General Purpose Through-Left or Single Left-Turn Lane
	Vehicle Lanes Crossed by Cyclists	One Lane Crossed	-	Two or More Lanes Crossed	Two or More Lanes Crossed	No Lane Crossed	No Lane Crossed	Two or More Lanes Crossed	Two or More Lanes Crossed	-	-	-	-	Two or More Lanes Crossed
	Score	40	25	55	-15	30	10	-15	65	55	-	50	25	75
	BLOS	D	E	D	F	E	F	F	C	D	-	D	E	C
		E				E				D				
	Target BLOS	B				C				C				
Transit	TLOS Inputs													
	Transit Facility	Mixed Traffic				Mixed Traffic				Mixed Traffic				
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound
	Average Transit Delay (if available)	≤ 10 sec	36-55 sec		56-80 sec	11-20 sec	≤ 10 sec	56-80 sec		11-20 sec	21-35 sec	56-80 sec		
	Example Transit Priority Treatment	-	-		-	-	-	-		-	-	-		
	TLOS	A	D	-	E	B	A	E	-	B	C	E	-	-
		C				C				C				
	Target TLOS	E (D for frequent transit routes)				E (D for frequent transit routes)				E (D for frequent transit routes)				
Auto	AutoLOS Inputs													
	Overall Intersection Volume to Capacity Ratio	0.71 to 0.80				0 to 0.60				0.61 to 0.70				
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table				See Separate Traffic Operations Table				See Separate Traffic Operations Table				
	AutoLOS	C				A				B				
	Target AutoLOS	E				D				D				

Multi-Modal Level of Service - Intersections Form

Project: 3045 Baseline Road, QCH Part 4 (123085
Consultant: Novatech Engineering Consultants Ltd.
Date: Mar 18, 2026
Scenario: Existing Conditions PM Peak

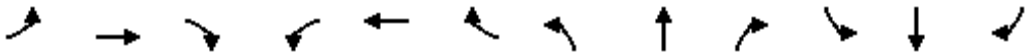
	Intersection Name	Baseline Road/Cedarview Road			Baseline Road/John Sutherland Drive/Valley Stream Drive				Baseline Road/Sandcastle Drive			
	OP Transect / Policy Area	Greenbelt or Rural			Greenbelt or Rural				Mainstreet Corridor (outside a Hub)			
Pedestrian	PLOS Inputs											
	Pedestrians Crossing the	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg
	Number of Travel Lanes Crossed	4	5	5	4	1-3	6	7	No Crosswalk	1-3	6	4
	Median Refuge (≥2.7m)	No	No	No	No	No	No	No	-	No	No	No
	Crosswalk Treatment	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Zebra Stripe Hi-Vis Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	-	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings
	Signal Cycle Length (sec)	130.0			100.0				100.0			
	Effective Walk Time (sec)	28.9	6.8	6.8	36.8	36.8	7.5	7.5	-	45.1	7.5	7.5
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	EBR	NBR	SBR	WBR	EBR	NBR	SBR	WBR	EBR	NBR	SBR
	Right-Turn Geometry	Conventional Right-Turn Channel	Right-Turn With No Channel	No Right-Turn / Prohib.	Conventional Right-Turn Channel	Right-Turn With No Channel	Right-Turn With No Channel	Conventional Right-Turn Channel	No Right-Turn / Prohib.	Right-Turn With No Channel	Right-Turn With No Channel	No Right-Turn / Prohib.
	Right-Turn Signal Phasing	-	Fully Protected	-	-	Permissive	Permissive	-	-	Permissive	Permissive (with LPI/LBI)	-
	Right-Turn Volume	≤ 150 veh/h	-	-	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	-	≤ 150 veh/h	≤ 150 veh/h	-
	Right-Turn Effective Corner Radius	-	-	-	-	> 8m	> 8m	-	-	> 8m	≤ 8m	-
	Cross-street Posted Speed (km/h)	m/h	70 km/h		50 km/h		70 km/h		50 km/h		70 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	WBL	SBL	NBL	EBL	WBL	SBL	NBL	EBL	WBL	SBL	NBL
	Left-Turn Signal Phasing	Perm or Prot+Perm	No Left-Turn / Prohib.	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	Perm or Prot+Perm	No Left-Turn / Prohib.	Perm or Prot+Perm	No Left-Turn / Prohib.	Perm or Prot+Perm (with LPI)
	Left-Turn Volume	> 100 veh/h	-	-	≤ 50 veh/h	≤ 50 veh/h	> 50 to 100 veh/h	≤ 50 veh/h	-	> 100 veh/h	-	≤ 50 veh/h
	Left-Turn Opposing Lanes	-	-	-	-	-	≤ 1	-	-	-	-	-
	Score	3.10	3.15	3.15	3.55	4.60	2.20	1.30	-	4.40	2.50	3.70
	PLOS	C	C	C	B	A	D	E	-	B	C	B
		C			C				B			
	Target PLOS	D			D				B			
Bicycle	BLOS Inputs											
	Cycling Route Classification	Elsewhere			Elsewhere				Elsewhere			
	Cyclists Crossing the	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg	North Leg	South Leg	East Leg	West Leg
	Type of Cycling Facility Across Leg	Bike Lane Through Intersection	Crossride		Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	Mixed Traffic	Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	
	Two-Way ADT (in Cyclist Travel Direction)	530	3,913		20,241		2,509		21,525		1,617	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	Yes	No		Yes	Yes	No	Yes	No	No	No	
	Crossride Operation	-	Bidirectional	-	-	-	-	-	-	-	-	-
	Target Crossride Setback Met?	-	-	-	-	-	-	-	-	-	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-	-	-	-	-	-	-	-
	Cyclist Left-Turn Operation	EBL	NBL	SBL	WBL	EBL	NBL	SBL	WBL	EBL	NBL	SBL
	Cyclist Left-Turn Treatment Type	Two-Stage Queue Box	Protected Corner		General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	No Left-Turn	General Purpose Through-Left or Single Left-Turn Lane	
	Vehicle Lanes Crossed by Cyclists	-	-	-	Two or More Lanes Crossed	Two or More Lanes Crossed	One Lane Crossed	No Lane Crossed	Two or More Lanes Crossed	-	One Lane Crossed	-
	Score	15	150	-	25	25	40	20	75	75	55	-
	BLOS	E	A	-	E	E	D	E	C	C	D	-
		C			E				C			
	Target BLOS	D			D				C			
Transit	TLOS Inputs											
	Transit Facility	Mixed Traffic			Mixed Traffic				Mixed Traffic			
	Vehicles Travelling	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound
	Average Transit Delay (if available)		≤ 10 sec	11-20 sec	36-55 sec		≤ 10 sec	11-20 sec			≤ 10 sec	≤ 10 sec
	Example Transit Priority Treatment		-	-	-		-	-			-	-
	TLOS	-	A	B	D	-	A	B	-	-	A	A
		A			B				A			
	Target TLOS	E (D for frequent transit routes)			E (D for frequent transit routes)				E (D for frequent transit routes)			
Auto	AutoLOS Inputs											
	Overall Intersection Volume to Capacity Ratio	0 to 0.60			0 to 0.60				0 to 0.60			
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table			See Separate Traffic Operations Table				See Separate Traffic Operations Table			
	AutoLOS	A			A				A			
	Target AutoLOS	D			D				E			

Appendix O: Synchro Analysis Reports for Total Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	528	8	391	21	37	91	155	938	22	26	474	17
Future Volume (vph)	528	8	391	21	37	91	155	938	22	26	474	17
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.97		0.99	0.98	1.00	1.00				0.98
Frt			0.850			0.850		0.997				0.850
Flt Protected	0.950				0.982		0.950			0.950		
Satd. Flow (prot)	3195	1784	1473	0	1734	1517	1572	3378	0	1544	3357	943
Flt Permitted	0.950				0.982		0.365			0.212		
Satd. Flow (perm)	3195	1784	1431	0	1723	1487	603	3378	0	345	3357	929
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			391			158		2				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		88.7			195.5			655.9			232.4	
Travel Time (s)		5.3			17.6			39.4			13.9	
Confl. Peds. (#/hr)			11	11			2		1	1		2
Confl. Bikes (#/hr)			1			4						1
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
Heavy Vehicles (%)	5%	2%	5%	5%	2%	2%	10%	2%	2%	12%	3%	64%
Adj. Flow (vph)	528	8	391	21	37	91	155	938	22	26	474	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	528	8	391	0	58	91	155	960	0	26	474	17
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

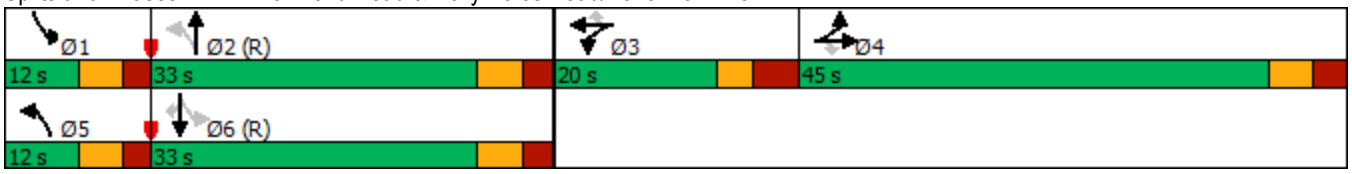
Holly Acres Rd/Richmond Rd/Nanaimo Dr
Total2030 AM Peak

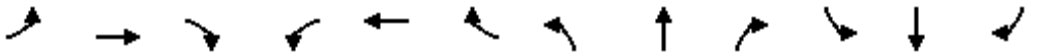


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	45.0	45.0	45.0	20.0	20.0	20.0	12.0	33.0		12.0	33.0	33.0
Total Split (%)	40.9%	40.9%	40.9%	18.2%	18.2%	18.2%	10.9%	30.0%		10.9%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	24.8	24.8	24.8		10.6	10.6	58.4	50.4		48.0	41.1	41.1
Actuated g/C Ratio	0.23	0.23	0.23		0.10	0.10	0.53	0.46		0.44	0.37	0.37
v/c Ratio	0.73	0.02	0.63		0.35	0.32	0.37	0.62		0.12	0.38	0.04
Control Delay	45.5	30.0	8.1		52.3	3.2	18.9	29.0		18.2	29.5	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	45.5	30.0	8.1		52.3	3.2	18.9	29.0		18.2	29.5	0.2
LOS	D	C	A		D	A	B	C		B	C	A
Approach Delay		29.6			22.3			27.6			28.0	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	50.4	1.3	0.0		11.0	0.0	16.0	82.8		2.5	37.2	0.0
Queue Length 95th (m)	61.4	4.6	21.1		22.3	0.9	32.5	#138.2		7.8	59.1	0.0
Internal Link Dist (m)		64.7			171.5			631.9			208.4	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	1115	622	754		209	318	418	1550		224	1255	448
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.47	0.01	0.52		0.28	0.29	0.37	0.62		0.12	0.38	0.04

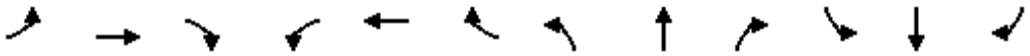
Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 49 (45%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 28.1		Intersection LOS: C	
Intersection Capacity Utilization 71.4%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	497	50	336	37	71	52	257	902	33	27	814	23
Future Volume (vph)	497	50	336	37	71	52	257	902	33	27	814	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.96		0.99	0.98	1.00	1.00				0.97
Frt			0.850			0.850		0.995				0.850
Flt Protected	0.950				0.983		0.950			0.950		
Satd. Flow (prot)	3257	1784	1473	0	1748	1517	1631	3369	0	1662	3357	1097
Flt Permitted	0.950				0.983		0.199			0.238		
Satd. Flow (perm)	3257	1784	1415	0	1736	1484	340	3369	0	416	3357	1063
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			336			158		4				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		88.7			195.5			655.9			232.4	
Travel Time (s)		5.3			17.6			39.4			13.9	
Confl. Peds. (#/hr)			15	15			13					13
Confl. Bikes (#/hr)			5			4			4			2
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
Heavy Vehicles (%)	3%	2%	5%	3%	2%	2%	6%	2%	3%	4%	3%	41%
Adj. Flow (vph)	497	50	336	37	71	52	257	902	33	27	814	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	497	50	336	0	108	52	257	935	0	27	814	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	97		97	97		97	97		97	97		97
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

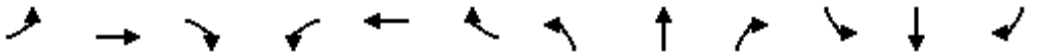


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	29.0	29.0	29.0	17.0	17.0	17.0	17.0	47.0		17.0	47.0	47.0
Total Split (%)	26.4%	26.4%	26.4%	15.5%	15.5%	15.5%	15.5%	42.7%		15.5%	42.7%	42.7%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Act Effct Green (s)	20.6	20.6	20.6		10.2	10.2	56.9	50.1		47.4	40.7	40.7
Actuated g/C Ratio	0.19	0.19	0.19		0.09	0.09	0.53	0.46		0.44	0.38	0.38
v/c Ratio	0.80	0.15	0.62		0.65	0.18	0.83	0.60		0.11	0.64	0.05
Control Delay	52.6	37.4	9.7		67.2	1.4	39.5	25.1		13.9	31.0	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	52.6	37.4	9.7		67.2	1.4	39.5	25.1		13.9	31.0	0.2
LOS	D	D	A		E	A	D	C		B	C	A
Approach Delay		35.4			45.9			28.2			29.6	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	47.9	8.2	0.0		21.0	0.0	27.3	77.3		2.5	69.6	0.0
Queue Length 95th (m)	64.6	17.7	22.8		#42.6	0.0	#60.6	99.8		6.3	88.9	0.0
Internal Link Dist (m)		64.7			171.5			631.9			208.4	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	675	369	559		166	284	310	1563		327	1264	501
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.74	0.14	0.60		0.65	0.18	0.83	0.60		0.08	0.64	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 108.2			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 31.6		Intersection LOS: C	
Intersection Capacity Utilization 76.2%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	77	0	106	0	949	134	296	563	0
Future Volume (vph)	0	0	0	77	0	106	0	949	134	296	563	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt					0.922				0.850			
Flt Protected					0.979					0.950		
Satd. Flow (prot)	0	1784	0	0	1584	0	1784	3390	1517	1679	3390	0
Flt Permitted					0.863					0.284		
Satd. Flow (perm)	0	1784	0	0	1396	0	1784	3390	1517	502	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					72				131			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	0	0	0	77	0	106	0	949	134	296	563	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	183	0	0	949	134	296	563	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	

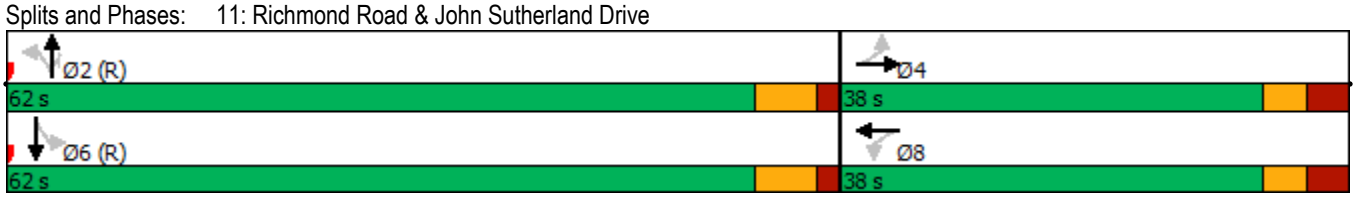
Richmond Rd/John Sutherland Dr
Total2030 AM Peak

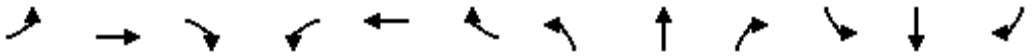
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		62.0	62.0	62.0	62.0	62.0	
Total Split (%)	38.0%	38.0%		38.0%	38.0%		62.0%	62.0%	62.0%	62.0%	62.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					14.5			72.5	72.5	72.5	72.5	
Actuated g/C Ratio					0.14			0.72	0.72	0.72	0.72	
v/c Ratio					0.70			0.39	0.12	0.82	0.23	
Control Delay					37.7			1.5	0.2	32.3	5.3	
Queue Delay					0.0			0.0	0.0	0.0	0.0	
Total Delay					37.7			1.5	0.2	32.3	5.3	
LOS					D			A	A	C	A	
Approach Delay					37.7			1.3			14.6	
Approach LOS					D			A			B	
Queue Length 50th (m)					19.0			3.2	0.0	29.0	14.3	
Queue Length 95th (m)					36.7			10.1	0.1	#95.1	26.5	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)									35.0	40.0		
Base Capacity (vph)					487			2457	1135	363	2457	
Starvation Cap Reductn					0			0	0	0	0	
Spillback Cap Reductn					0			0	0	0	0	
Storage Cap Reductn					0			0	0	0	0	
Reduced v/c Ratio					0.38			0.39	0.12	0.82	0.23	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 92 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 9.8 Intersection LOS: A
Intersection Capacity Utilization 72.5% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

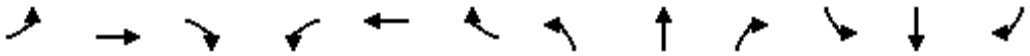
Splits and Phases: 11: Richmond Road & John Sutherland Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	187	0	274	4	785	43	98	937	0
Future Volume (vph)	0	0	0	187	0	274	4	785	43	98	937	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00		0.98	1.00		
Frt					0.920				0.850			
Flt Protected					0.980		0.950			0.950		
Satd. Flow (prot)	0	1784	0	0	1599	0	1695	3390	1517	1647	3390	0
Flt Permitted					0.868		0.263			0.323		
Satd. Flow (perm)	0	1784	0	0	1417	0	469	3390	1482	559	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					60				43			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
Confl. Peds. (#/hr)							2		1	1		2
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	0	0	0	187	0	274	4	785	43	98	937	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	461	0	4	785	43	98	937	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Richmond Rd/John Sutherland Dr
Total2030 PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		82.0	82.0	82.0	82.0	82.0	
Total Split (%)	31.7%	31.7%		31.7%	31.7%		68.3%	68.3%	68.3%	68.3%	68.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					31.4		75.6	75.6	75.6	75.6	75.6	
Actuated g/C Ratio					0.26		0.63	0.63	0.63	0.63	0.63	
v/c Ratio					1.11		0.01	0.37	0.05	0.28	0.44	
Control Delay					114.1		5.5	5.9	0.8	12.5	12.1	
Queue Delay					0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay					114.1		5.5	5.9	0.8	12.5	12.1	
LOS					F		A	A	A	B	B	
Approach Delay					114.1			5.6			12.2	
Approach LOS					F			A			B	
Queue Length 50th (m)					~104.4		0.1	14.5	0.0	8.9	50.8	
Queue Length 95th (m)					#163.2		m0.4	22.8	0.4	18.0	63.3	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)							40.0		35.0	40.0		
Base Capacity (vph)					415		295	2135	949	352	2135	
Starvation Cap Reductn					0		0	0	0	0	0	
Spillback Cap Reductn					0		0	0	0	0	0	
Storage Cap Reductn					0		0	0	0	0	0	
Reduced v/c Ratio					1.11		0.01	0.37	0.05	0.28	0.44	

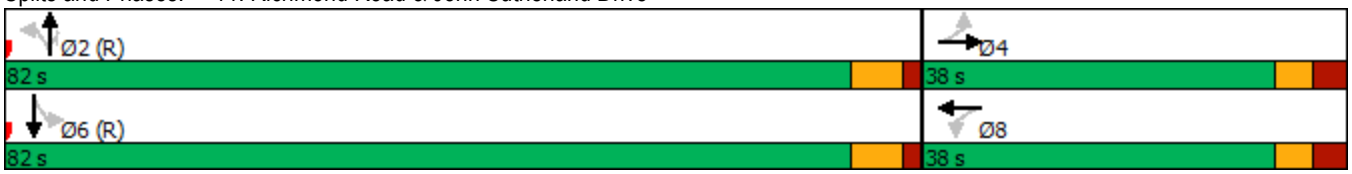
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 30.0		Intersection LOS: C	
Intersection Capacity Utilization 80.5%		ICU Level of Service D	
Analysis Period (min) 15			

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

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Richmond Road & John Sutherland Drive



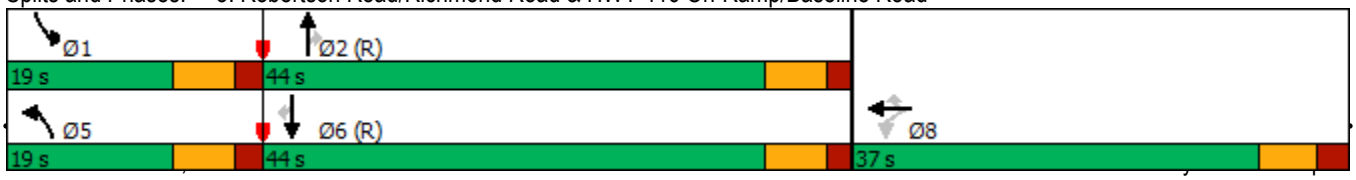
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	356	24	168	12	929	660	173	364	72
Future Volume (vph)	0	0	0	356	24	168	12	929	660	173	364	72
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						168			660			113
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
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
Heavy Vehicles (%)	2%	2%	2%	4%	2%	5%	8%	2%	4%	5%	3%	3%
Adj. Flow (vph)	0	0	0	356	24	168	12	929	660	173	364	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	356	24	168	12	929	660	173	364	72
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	

Richmond Rd/Robertson Rd/Baseline Rd
Total2030 AM Peak

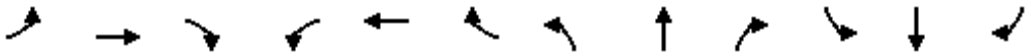
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	19.0	44.0	44.0	19.0	44.0	44.0
Total Split (%)				37.0%	37.0%	37.0%	19.0%	44.0%	44.0%	19.0%	44.0%	44.0%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				17.1	17.1	17.1	6.4	52.2	52.2	10.7	66.7	66.7
Actuated g/C Ratio				0.17	0.17	0.17	0.06	0.52	0.52	0.11	0.67	0.67
v/c Ratio				0.65	0.08	0.43	0.12	0.52	0.60	0.51	0.16	0.07
Control Delay				43.9	33.3	9.0	46.2	18.2	4.1	51.8	6.8	0.3
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				43.9	33.3	9.0	46.2	18.2	4.1	51.8	6.8	0.3
LOS				D	C	A	D	B	A	D	A	A
Approach Delay					32.7			12.6			18.8	
Approach LOS					C			B			B	
Queue Length 50th (m)				30.7	3.6	0.0	2.1	55.1	0.0	16.4	9.4	0.0
Queue Length 95th (m)				41.1	9.4	14.6	7.1	84.5	18.6	25.7	18.5	0.8
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				973	538	562	198	1770	1092	405	2237	1038
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.37	0.04	0.30	0.06	0.52	0.60	0.43	0.16	0.07

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 93 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 18.0		Intersection LOS: B	
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



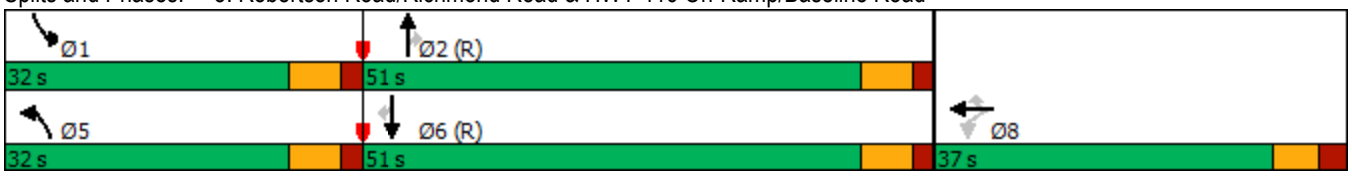
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	653	112	180	56	646	521	208	699	247
Future Volume (vph)	0	0	0	653	112	180	56	646	521	208	699	247
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00		0.99	1.00		0.98
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3288	1767	1517	1647	3390	1517	3288	3390	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3288	1767	1517	1644	3390	1495	3286	3390	1465
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						180			521			247
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
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
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	5%	2%	2%	2%	2%	3%
Adj. Flow (vph)	0	0	0	653	112	180	56	646	521	208	699	247
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	653	112	180	56	646	521	208	699	247
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	32.0	51.0	51.0	32.0	51.0	51.0
Total Split (%)				30.8%	30.8%	30.8%	26.7%	42.5%	42.5%	26.7%	42.5%	42.5%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				28.4	28.4	28.4	9.5	58.7	58.7	12.9	64.6	64.6
Actuated g/C Ratio				0.24	0.24	0.24	0.08	0.49	0.49	0.11	0.54	0.54
v/c Ratio				0.84	0.27	0.36	0.43	0.39	0.52	0.59	0.38	0.27
Control Delay				54.2	38.6	7.3	62.1	21.0	3.8	70.4	11.6	0.8
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				54.2	38.6	7.3	62.1	21.0	3.8	70.4	11.6	0.8
LOS				D	D	A	E	C	A	E	B	A
Approach Delay					43.5			15.6			19.9	
Approach LOS					D			B			B	
Queue Length 50th (m)				68.4	19.5	0.0	11.8	46.6	0.0	23.5	26.5	0.0
Queue Length 95th (m)				88.0	33.9	15.8	23.3	63.7	17.2	m32.3	m34.0	m1.2
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				827	444	516	348	1658	997	695	1825	902
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.79	0.25	0.35	0.16	0.39	0.52	0.30	0.38	0.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 25.0		Intersection LOS: C	
Intersection Capacity Utilization 62.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	756	91	105	466	121	390	
Future Volume (vph)	756	91	105	466	121	390	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.98			1.00		
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3390	1517	1695	3325	1695	1517	
Flt Permitted			0.235		0.950		
Satd. Flow (perm)	3390	1482	419	3325	1693	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		89				390	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		1	1		1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	2%	2%	2%	4%	2%	2%	
Adj. Flow (vph)	756	91	105	466	121	390	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	756	91	105	466	121	390	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

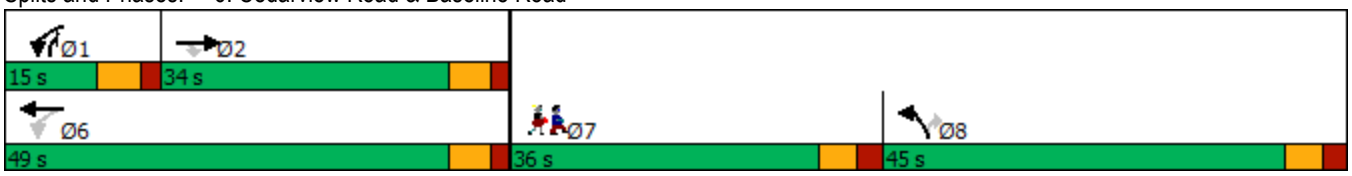


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	36.2	11.1	34.2
Total Split (s)	34.0	34.0	15.0	49.0	45.0	15.0	36.0
Total Split (%)	26.2%	26.2%	11.5%	37.7%	34.6%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	None	None	None
Act Effct Green (s)	30.9	30.9	44.7	44.7	10.7	24.6	
Actuated g/C Ratio	0.42	0.42	0.61	0.61	0.15	0.34	
v/c Ratio	0.53	0.13	0.27	0.23	0.49	0.51	
Control Delay	20.9	6.6	12.1	9.8	38.0	5.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	20.9	6.6	12.1	9.8	38.0	5.2	
LOS	C	A	B	A	D	A	
Approach Delay	19.4			10.3	13.0		
Approach LOS	B			B	B		
Queue Length 50th (m)	29.3	0.1	3.5	9.0	12.5	0.0	
Queue Length 95th (m)	#99.8	11.2	23.1	43.8	37.4	19.6	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	1437	679	419	2040	940	798	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.53	0.13	0.25	0.23	0.13	0.49	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 72.9			
Natural Cycle: 110			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 15.0		Intersection LOS: B	
Intersection Capacity Utilization 57.7%		ICU Level of Service B	
Analysis Period (min) 15			

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

Splits and Phases: 6: Cedarview Road & Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	572	163	259	836	130	148	
Future Volume (vph)	572	163	259	836	130	148	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.96	0.99				
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3357	1517	1662	3390	1601	1517	
Flt Permitted			0.391		0.950		
Satd. Flow (perm)	3357	1454	680	3390	1601	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		163				148	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		7	7				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	4%	2%	8%	2%	
Adj. Flow (vph)	572	163	259	836	130	148	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	572	163	259	836	130	148	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

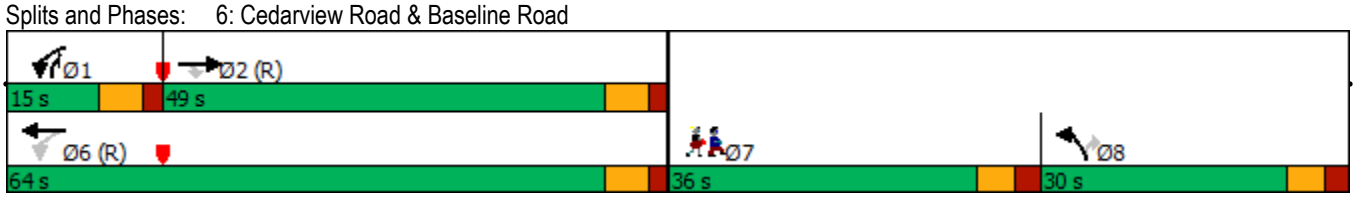
Baseline Rd/Cedarview Rd
Total2030 PM Peak

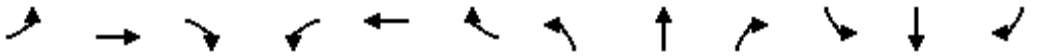
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	11.2	11.1	34.2
Total Split (s)	49.0	49.0	15.0	64.0	30.0	15.0	36.0
Total Split (%)	37.7%	37.7%	11.5%	49.2%	23.1%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	83.0	83.0	101.9	101.9	15.8	34.8	
Actuated g/C Ratio	0.64	0.64	0.78	0.78	0.12	0.27	
v/c Ratio	0.27	0.17	0.41	0.31	0.67	0.29	
Control Delay	11.5	2.2	6.1	4.7	70.5	6.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	11.5	2.2	6.1	4.7	70.5	6.3	
LOS	B	A	A	A	E	A	
Approach Delay	9.4			5.1	36.3		
Approach LOS	A			A	D		
Queue Length 50th (m)	29.0	0.0	13.2	25.1	29.8	0.0	
Queue Length 95th (m)	45.5	8.7	25.0	39.6	46.9	13.1	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	2142	986	629	2656	293	514	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.27	0.17	0.41	0.31	0.44	0.29	

Intersection Summary

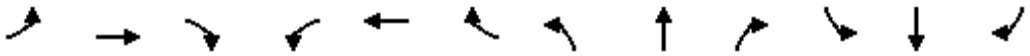
Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 15 (12%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 85
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 10.7 Intersection LOS: B
Intersection Capacity Utilization 55.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 6: Cedarview Road & Baseline Road





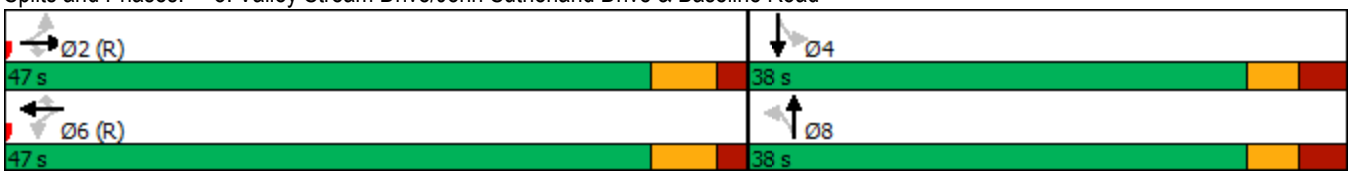
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	1173	19	8	533	149	30	2	14	87	6	74
Future Volume (vph)	161	1173	19	8	533	149	30	2	14	87	6	74
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		0.99			0.99	
Frt			0.850			0.850		0.959			0.940	
Flt Protected	0.950			0.950				0.968			0.975	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1642	0	0	1581	0
Flt Permitted	0.454			0.204				0.756			0.812	
Satd. Flow (perm)	786	3357	1461	353	3357	1446	0	1282	0	0	1313	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			149		14			54	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			150.3	
Travel Time (s)		19.2			19.4			29.3			10.8	
Confl. Peds. (#/hr)	2		4	4		2	2		6	6		2
Confl. Bikes (#/hr)			1			6			2			
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	161	1173	19	8	533	149	30	2	14	87	6	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	1173	19	8	533	149	0	46	0	0	167	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

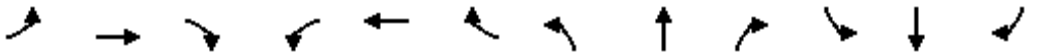


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	38.0	38.0		38.0	38.0	
Total Split (%)	55.3%	55.3%	55.3%	55.3%	55.3%	55.3%	44.7%	44.7%		44.7%	44.7%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	56.3	56.3	56.3	56.3	56.3	56.3		16.0			16.0	
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66		0.19			0.19	
v/c Ratio	0.31	0.53	0.02	0.03	0.24	0.15		0.18			0.58	
Control Delay	10.5	10.2	1.1	16.6	11.1	6.5		20.5			27.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	10.5	10.2	1.1	16.6	11.1	6.5		20.5			27.2	
LOS	B	B	A	B	B	A		C			C	
Approach Delay		10.1			10.2			20.5			27.2	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	7.7	36.2	0.0	0.3	11.4	0.0		4.2			15.9	
Queue Length 95th (m)	29.7	91.1	1.0	m3.7	48.2	20.2		9.4			25.3	
Internal Link Dist (m)		349.9			354.0			301.9			126.3	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	521	2225	983	233	2225	1008		483			520	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.31	0.53	0.02	0.03	0.24	0.15		0.10			0.32	

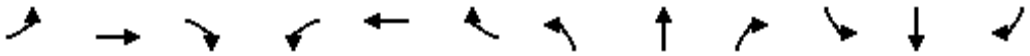
Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 37 (44%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 11.6		Intersection LOS: B	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	715	57	14	1175	67	38	4	12	122	5	106
Future Volume (vph)	42	715	57	14	1175	67	38	4	12	122	5	106
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		1.00			0.99	
Frt			0.850			0.850		0.970			0.939	
Flt Protected	0.950			0.950				0.966			0.974	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1661	0	0	1576	0
Flt Permitted	0.200			0.365				0.682			0.807	
Satd. Flow (perm)	346	3357	1456	631	3357	1446	0	1172	0	0	1300	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57			40		12			44	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			150.3	
Travel Time (s)		19.2			19.4			29.3			10.8	
Confl. Peds. (#/hr)	3		4	4		3			9	9		
Confl. Bikes (#/hr)			5			3						3
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	42	715	57	14	1175	67	38	4	12	122	5	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	715	57	14	1175	67	0	54	0	0	233	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	62.0	62.0	62.0	62.0	62.0	62.0	38.0	38.0		38.0	38.0	
Total Split (%)	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	38.0%	38.0%		38.0%	38.0%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	66.6	66.6	66.6	66.6	66.6	66.6		20.7			20.7	
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67		0.21			0.21	
v/c Ratio	0.18	0.32	0.06	0.03	0.53	0.07		0.22			0.77	
Control Delay	11.2	8.6	2.7	3.5	6.0	0.8		26.1			45.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	11.2	8.6	2.7	3.5	6.0	0.8		26.1			45.8	
LOS	B	A	A	A	A	A		C			D	
Approach Delay		8.3			5.7			26.1			45.8	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	2.5	25.2	0.0	0.3	55.9	0.2		6.2			32.3	
Queue Length 95th (m)	9.6	46.1	4.8	m0.6	13.7	0.0		13.7			49.7	
Internal Link Dist (m)		349.9			354.0			301.9			126.3	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	230	2237	989	420	2237	977		377			439	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.18	0.32	0.06	0.03	0.53	0.07		0.14			0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 77 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 62.5%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road



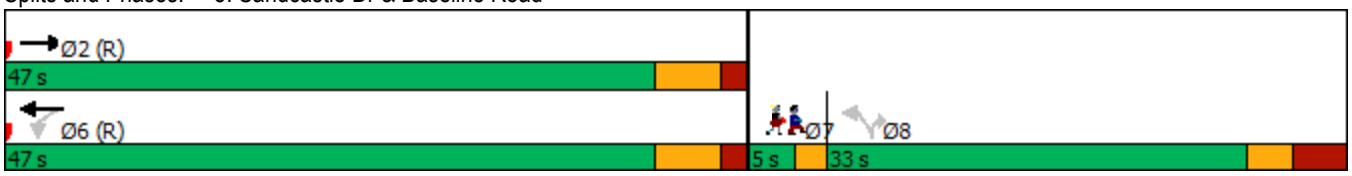
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	1251	25	94	633	60	129	
Future Volume (vph)	1251	25	94	633	60	129	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	1.00				1.00		
Frt	0.997					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3346	0	1695	3357	1695	1488	
Flt Permitted			0.181		0.950		
Satd. Flow (perm)	3346	0	323	3357	1693	1488	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	3					104	
Link Speed (k/h)	70			70	50		
Link Distance (m)	378.0			246.3	226.0		
Travel Time (s)	19.4			12.7	16.3		
Confl. Peds. (#/hr)		5	5		1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	1251	25	94	633	60	129	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1276	0	94	633	60	129	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Perm	Perm	
Protected Phases	2			6			7
Permitted Phases			6		8	8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	47.0		47.0	47.0	33.0	33.0	5.0
Total Split (%)	55.3%		55.3%	55.3%	38.8%	38.8%	6%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	60.3		60.3	60.3	11.3	11.3	
Actuated g/C Ratio	0.71		0.71	0.71	0.13	0.13	
v/c Ratio	0.54		0.41	0.27	0.27	0.45	
Control Delay	2.5		17.3	6.4	32.9	14.0	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	2.5		17.3	6.4	32.9	14.0	
LOS	A		B	A	C	B	
Approach Delay	2.5			7.8	20.0		
Approach LOS	A			A	B		
Queue Length 50th (m)	7.6		3.8	11.8	8.6	3.5	
Queue Length 95th (m)	10.7		#31.2	41.0	14.4	13.7	
Internal Link Dist (m)	354.0			222.3	202.0		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2373		228	2379	527	535	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.54		0.41	0.27	0.11	0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 55 (65%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 5.8		Intersection LOS: A	
Intersection Capacity Utilization 65.1%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Sandcastle Dr & Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	803	43	193	1189	68	107	
Future Volume (vph)	803	43	193	1189	68	107	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor					0.99	0.98	
Frt	0.992					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3332	0	1695	3357	1695	1488	
Flt Permitted			0.320		0.950		
Satd. Flow (perm)	3332	0	571	3357	1674	1461	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	9					107	
Link Speed (k/h)	70			70	50		
Link Distance (m)	378.0			246.3	226.0		
Travel Time (s)	19.4			12.7	16.3		
Confl. Peds. (#/hr)					11	5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	803	43	193	1189	68	107	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	846	0	193	1189	68	107	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		97	97		97	97	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

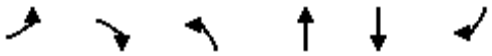
Baseline Rd/Sandcastle Dr
Total2030 PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Perm	Perm	
Protected Phases	2			6			7
Permitted Phases			6		8	8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	62.0		62.0	62.0	33.0	33.0	5.0
Total Split (%)	62.0%		62.0%	62.0%	33.0%	33.0%	5%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	74.6		74.6	74.6	12.0	12.0	
Actuated g/C Ratio	0.75		0.75	0.75	0.12	0.12	
v/c Ratio	0.34		0.45	0.47	0.34	0.40	
Control Delay	4.7		12.1	7.3	42.1	11.2	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.7		12.1	7.3	42.1	11.2	
LOS	A		B	A	D	B	
Approach Delay	4.7			8.0	23.2		
Approach LOS	A			A	C		
Queue Length 50th (m)	15.1		9.0	29.8	11.7	0.0	
Queue Length 95th (m)	35.6		45.1	89.3	19.3	11.3	
Internal Link Dist (m)	354.0			222.3	202.0		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2487		426	2504	443	465	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.34		0.45	0.47	0.15	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 62 (62%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 7.9		Intersection LOS: A	
Intersection Capacity Utilization 58.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Sandcastle Dr & Baseline Road

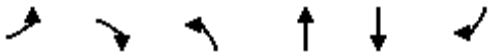




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	99	196	152	48	63
Future Volume (Veh/h)	26	99	196	152	48	63
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	99	196	152	48	63
Pedestrians					9	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				150		
pX, platoon unblocked						
vC, conflicting volume	632	80	111			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	632	80	111			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	90	87			
cM capacity (veh/h)	382	981	1479			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	125	348	111
Volume Left	26	196	0
Volume Right	99	0	63
cSH	739	1479	1700
Volume to Capacity	0.17	0.13	0.07
Queue Length 95th (m)	4.2	3.2	0.0
Control Delay (s)	10.9	4.9	0.0
Lane LOS	B	A	
Approach Delay (s)	10.9	4.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	155	79	65	113	52
Future Volume (Veh/h)	70	155	79	65	113	52
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	155	79	65	113	52
Pedestrians					17	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				150		
pX, platoon unblocked						
vC, conflicting volume	379	139	165			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	379	139	165			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	83	94			
cM capacity (veh/h)	578	909	1413			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	225	144	165
Volume Left	70	79	0
Volume Right	155	0	52
cSH	772	1413	1700
Volume to Capacity	0.29	0.06	0.10
Queue Length 95th (m)	8.5	1.2	0.0
Control Delay (s)	11.6	4.4	0.0
Lane LOS	B	A	
Approach Delay (s)	11.6	4.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	130	38	14	120	12	2
Future Volume (Veh/h)	130	38	14	120	12	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	130	38	14	120	12	2
Pedestrians	38			1	4	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.0			1.0	1.0	
Percent Blockage	4			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	262					
pX, platoon unblocked						
vC, conflicting volume			172		339	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		339	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	100
cM capacity (veh/h)			1399		622	887

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	168	134	14
Volume Left	0	14	12
Volume Right	38	0	2
cSH	1700	1399	650
Volume to Capacity	0.10	0.01	0.02
Queue Length 95th (m)	0.0	0.2	0.5
Control Delay (s)	0.0	0.9	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.9	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	142	17	17	103	44	24
Future Volume (Veh/h)	142	17	17	103	44	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	142	17	17	103	44	24
Pedestrians	32			4	8	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.0			1.0	1.0	
Percent Blockage	3			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	262					
pX, platoon unblocked						
vC, conflicting volume			167		328	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			167		328	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	97
cM capacity (veh/h)			1399		632	871

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	159	120	68
Volume Left	0	17	44
Volume Right	17	0	24
cSH	1700	1399	700
Volume to Capacity	0.09	0.01	0.10
Queue Length 95th (m)	0.0	0.3	2.3
Control Delay (s)	0.0	1.2	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	10.7
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	129	355	106	43	137	39
Future Volume (Veh/h)	129	355	106	43	137	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	129	355	106	43	137	39
Pedestrians	5			7	2	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.0			1.0	1.0	
Percent Blockage	1			1	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	121					
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			486		568	316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			436		523	258
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		69	95
cM capacity (veh/h)			1069		439	738

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	484	149	176
Volume Left	0	106	137
Volume Right	355	0	39
cSH	1700	1069	482
Volume to Capacity	0.28	0.10	0.37
Queue Length 95th (m)	0.0	2.3	11.6
Control Delay (s)	0.0	6.5	16.7
Lane LOS		A	C
Approach Delay (s)	0.0	6.5	16.7
Approach LOS			C

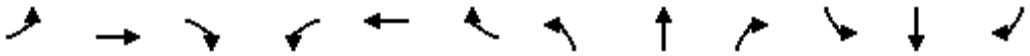
Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	83	71	22	133	347	77
Future Volume (Veh/h)	83	71	22	133	347	77
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	83	71	22	133	347	77
Pedestrians	3			6	9	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.0			1.0	1.0	
Percent Blockage	0			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	121					
pX, platoon unblocked			1.00		1.00	1.00
vC, conflicting volume			163		308	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			162		307	133
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		48	91
cM capacity (veh/h)			1403		666	902

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	154	155	424
Volume Left	0	22	347
Volume Right	71	0	77
cSH	1700	1403	699
Volume to Capacity	0.09	0.02	0.61
Queue Length 95th (m)	0.0	0.3	28.9
Control Delay (s)	0.0	1.2	17.8
Lane LOS		A	C
Approach Delay (s)	0.0	1.2	17.8
Approach LOS			C

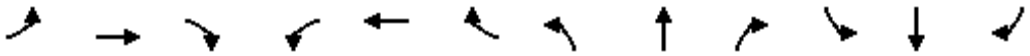
Intersection Summary			
Average Delay	10.5		
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	155	0	0	144	0	0	0	0	0	0	3
Future Volume (Veh/h)	22	155	0	0	144	0	0	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	22	155	0	0	144	0	0	0	0	0	0	3
Pedestrians		3			89			18				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.0			1.0			1.0				
Percent Blockage		0			9			2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		169										
pX, platoon unblocked												
vC, conflicting volume	144			173			367	361	262	432	361	147
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	144			173			367	361	262	432	361	147
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	100	100	100
cM capacity (veh/h)	1438			1360			558	547	693	473	547	897

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	177	144	0	3
Volume Left	22	0	0	0
Volume Right	0	0	0	3
cSH	1438	1360	1700	897
Volume to Capacity	0.02	0.00	0.00	0.00
Queue Length 95th (m)	0.3	0.0	0.0	0.1
Control Delay (s)	1.0	0.0	0.0	9.0
Lane LOS	A		A	A
Approach Delay (s)	1.0	0.0	0.0	9.0
Approach LOS			A	A

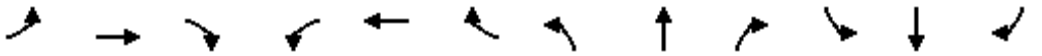
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	42.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	148	0	0	147	0	0	0	0	0	0	19
Future Volume (Veh/h)	0	148	0	0	147	0	0	0	0	0	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	148	0	0	147	0	0	0	0	0	0	19
Pedestrians		2			41			22				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.0			1.0			1.0				
Percent Blockage		0			4			2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		169										
pX, platoon unblocked												
vC, conflicting volume	147			170			338	317	211	336	317	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	147			170			338	317	211	336	317	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	98
cM capacity (veh/h)	1435			1358			576	586	776	581	586	896

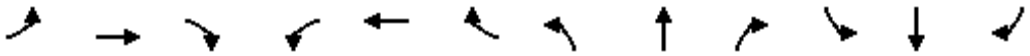
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	148	147	0	19
Volume Left	0	0	0	0
Volume Right	0	0	0	19
cSH	1435	1358	1700	896
Volume to Capacity	0.00	0.00	0.00	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.5
Control Delay (s)	0.0	0.0	0.0	9.1
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	9.1
Approach LOS			A	A

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	28.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	541	8	401	21	37	91	158	958	22	26	483	18
Future Volume (vph)	541	8	401	21	37	91	158	958	22	26	483	18
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.97		0.99	0.98	1.00	1.00				0.98
Frt			0.850			0.850		0.997				0.850
Flt Protected	0.950				0.982		0.950			0.950		
Satd. Flow (prot)	3195	1784	1473	0	1734	1517	1572	3378	0	1544	3357	943
Flt Permitted	0.950				0.982		0.357			0.201		
Satd. Flow (perm)	3195	1784	1431	0	1723	1487	590	3378	0	327	3357	929
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			401			158		2				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		88.7			195.5			655.9			232.4	
Travel Time (s)		5.3			17.6			39.4			13.9	
Confl. Peds. (#/hr)			11	11			2		1	1		2
Confl. Bikes (#/hr)			1			4						1
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
Heavy Vehicles (%)	5%	2%	5%	5%	2%	2%	10%	2%	2%	12%	3%	64%
Adj. Flow (vph)	541	8	401	21	37	91	158	958	22	26	483	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	541	8	401	0	58	91	158	980	0	26	483	18
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	97		97	97		97	97		97	97		97
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

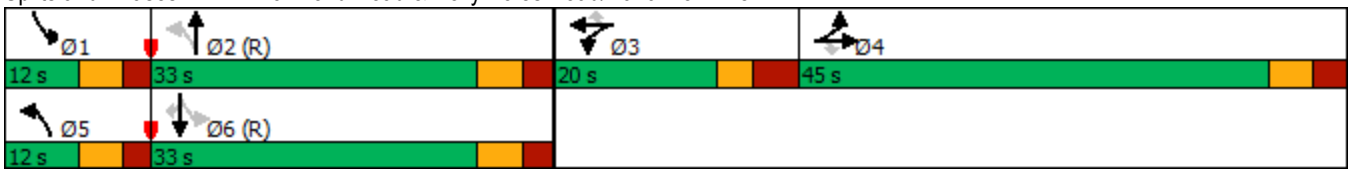
Holly Acres Rd/Richmond Rd/Nanaimo Dr
Total2035 AM Peak

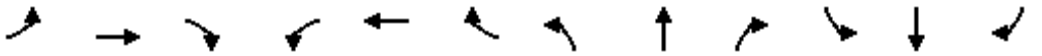


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	45.0	45.0	45.0	20.0	20.0	20.0	12.0	33.0		12.0	33.0	33.0
Total Split (%)	40.9%	40.9%	40.9%	18.2%	18.2%	18.2%	10.9%	30.0%		10.9%	30.0%	30.0%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max		None	C-Max	C-Max
Act Effct Green (s)	25.2	25.2	25.2		10.6	10.6	57.9	50.0		47.5	40.6	40.6
Actuated g/C Ratio	0.23	0.23	0.23		0.10	0.10	0.53	0.45		0.43	0.37	0.37
v/c Ratio	0.74	0.02	0.63		0.35	0.32	0.38	0.64		0.12	0.39	0.04
Control Delay	45.3	29.6	8.0		52.3	3.2	19.4	29.7		18.6	30.0	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	45.3	29.6	8.0		52.3	3.2	19.4	29.7		18.6	30.0	0.2
LOS	D	C	A		D	A	B	C		B	C	A
Approach Delay		29.4			22.3			28.3			28.4	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	51.5	1.2	0.0		11.0	0.0	16.5	86.0		2.5	38.4	0.0
Queue Length 95th (m)	62.6	4.6	21.2		22.3	0.9	33.2	#144.6		7.9	60.2	0.0
Internal Link Dist (m)		64.7			171.5			631.9			208.4	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	1115	622	760		209	318	411	1536		215	1238	445
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.49	0.01	0.53		0.28	0.29	0.38	0.64		0.12	0.39	0.04

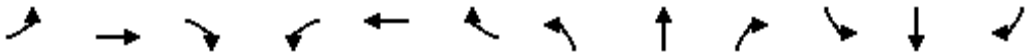
Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 71.5 (65%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 28.4		Intersection LOS: C	
Intersection Capacity Utilization 72.0%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	509	50	344	37	71	52	263	922	33	27	832	23
Future Volume (vph)	509	50	344	37	71	52	263	922	33	27	832	23
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		34.0	17.0		0.0	25.0		0.0	143.0		100.0
Storage Lanes	2		1	1		1	1		0	1		1
Taper Length (m)	2.5			24.0			100.0			40.0		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.96		0.99	0.98	1.00	1.00				0.97
Frt			0.850			0.850		0.995				0.850
Flt Protected	0.950				0.983		0.950			0.950		
Satd. Flow (prot)	3257	1784	1473	0	1748	1517	1631	3369	0	1662	3357	1097
Flt Permitted	0.950				0.983		0.191			0.228		
Satd. Flow (perm)	3257	1784	1415	0	1736	1484	327	3369	0	399	3357	1063
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			335			158		4				162
Link Speed (k/h)		60			40			60			60	
Link Distance (m)		88.7			195.5			655.9			232.4	
Travel Time (s)		5.3			17.6			39.4			13.9	
Confl. Peds. (#/hr)			15	15			13					13
Confl. Bikes (#/hr)			5			4			4			2
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
Heavy Vehicles (%)	3%	2%	5%	3%	2%	2%	6%	2%	3%	4%	3%	41%
Adj. Flow (vph)	509	50	344	37	71	52	263	922	33	27	832	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	509	50	344	0	108	52	263	955	0	27	832	23
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			3.7			3.7	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			1.6			1.6			1.6	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	97		97	97		97	97		97	97		97
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (m)	2.0	10.0	2.0	2.0	10.0	2.0	2.0	10.0		2.0	10.0	2.0
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Size(m)	2.0	0.6	2.0	2.0	0.6	2.0	2.0	0.6		2.0	0.6	2.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(m)		9.4			9.4			9.4			9.4	
Detector 2 Size(m)		0.6			0.6			0.6			0.6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA	Perm	Split	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4			3	2			6		6
Detector Phase	4	4	4	3	3	3	5	2		1	6	6
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	28.6	28.6	28.6	16.7	16.7	16.7	11.0	30.3		11.0	30.3	30.3
Total Split (s)	29.0	29.0	29.0	17.0	17.0	17.0	17.0	47.0		17.0	47.0	47.0
Total Split (%)	26.4%	26.4%	26.4%	15.5%	15.5%	15.5%	15.5%	42.7%		15.5%	42.7%	42.7%
Yellow Time (s)	3.7	3.7	3.7	3.0	3.0	3.0	3.7	3.7		3.7	3.7	3.7
All-Red Time (s)	2.9	2.9	2.9	3.7	3.7	3.7	2.3	2.6		2.3	2.6	2.6
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.6	6.6	6.6		6.7	6.7	6.0	6.3		6.0	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	Max		None	Max	Max
Act Effct Green (s)	20.8	20.8	20.8		10.2	10.2	56.9	50.1		47.4	40.7	40.7
Actuated g/C Ratio	0.19	0.19	0.19		0.09	0.09	0.52	0.46		0.44	0.38	0.38
v/c Ratio	0.82	0.15	0.64		0.65	0.18	0.87	0.61		0.11	0.66	0.05
Control Delay	53.4	37.4	10.6		67.4	1.4	44.8	25.5		14.0	31.4	0.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	53.4	37.4	10.6		67.4	1.4	44.8	25.5		14.0	31.4	0.2
LOS	D	D	B		E	A	D	C		B	C	A
Approach Delay		36.2			46.0			29.6			30.1	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	49.3	8.2	1.5		21.0	0.0	28.1	79.6		2.5	71.6	0.0
Queue Length 95th (m)	66.2	17.7	25.4		#42.6	0.0	#65.8	102.5		6.3	91.4	0.0
Internal Link Dist (m)		64.7			171.5			631.9			208.4	
Turn Bay Length (m)			34.0				25.0			143.0		100.0
Base Capacity (vph)	673	369	558		166	284	304	1559		319	1261	500
Starvation Cap Reductn	0	0	0		0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0		0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0		0	0	0	0		0	0	0
Reduced v/c Ratio	0.76	0.14	0.62		0.65	0.18	0.87	0.61		0.08	0.66	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 108.4			
Natural Cycle: 90			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 32.5		Intersection LOS: C	
Intersection Capacity Utilization 77.4%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 22: Richmond Road & Holly Acres Road/Nanaimo Drive



Richmond Rd/John Sutherland Dr
Total2035 AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Future Volume (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt					0.922				0.850			
Flt Protected					0.979					0.950		
Satd. Flow (prot)	0	1784	0	0	1584	0	1784	3390	1517	1679	3390	0
Flt Permitted					0.863					0.277		
Satd. Flow (perm)	0	1784	0	0	1396	0	1784	3390	1517	489	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					72				128			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	183	0	0	970	134	296	576	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	

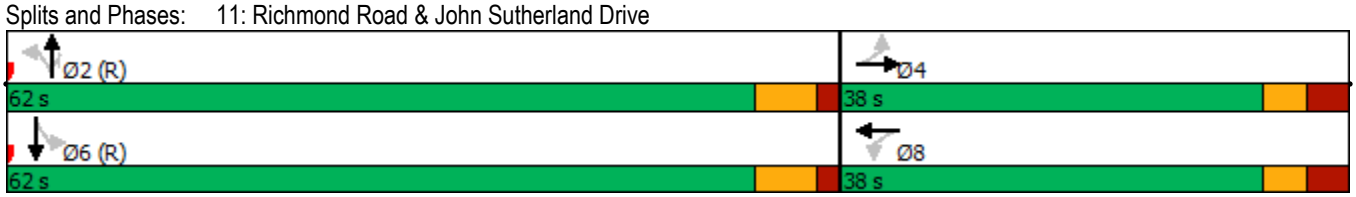
Richmond Rd/John Sutherland Dr
Total2035 AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		62.0	62.0	62.0	62.0	62.0	
Total Split (%)	38.0%	38.0%		38.0%	38.0%		62.0%	62.0%	62.0%	62.0%	62.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					14.5			72.5	72.5	72.5	72.5	
Actuated g/C Ratio					0.14			0.72	0.72	0.72	0.72	
v/c Ratio					0.70			0.39	0.12	0.84	0.23	
Control Delay					37.7			1.5	0.2	35.3	5.3	
Queue Delay					0.0			0.0	0.0	0.0	0.0	
Total Delay					37.7			1.5	0.2	35.3	5.3	
LOS					D			A	A	D	A	
Approach Delay					37.7			1.3			15.5	
Approach LOS					D			A			B	
Queue Length 50th (m)					19.0			3.3	0.0	30.3	14.7	
Queue Length 95th (m)					36.7			10.2	0.1	#96.7	27.3	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)									35.0	40.0		
Base Capacity (vph)					487			2457	1134	354	2457	
Starvation Cap Reductn					0			0	0	0	0	
Spillback Cap Reductn					0			0	0	0	0	
Storage Cap Reductn					0			0	0	0	0	
Reduced v/c Ratio					0.38			0.39	0.12	0.84	0.23	

Intersection Summary

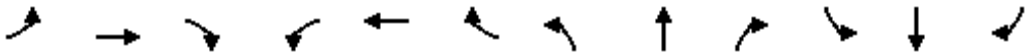
Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 92 (92%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 10.1 Intersection LOS: B
Intersection Capacity Utilization 73.2% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 11: Richmond Road & John Sutherland Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Future Volume (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00		0.98	1.00		
Frt					0.920				0.850			
Flt Protected					0.980		0.950			0.950		
Satd. Flow (prot)	0	1784	0	0	1599	0	1695	3390	1517	1647	3390	0
Flt Permitted					0.868		0.256			0.315		
Satd. Flow (perm)	0	1784	0	0	1417	0	456	3390	1482	546	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					60				43			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
Confl. Peds. (#/hr)							2		1	1		2
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	461	0	4	802	43	98	958	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Richmond Rd/John Sutherland Dr
Total2035 PM Peak



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	29.4	29.4	
Total Split (s)	38.0	38.0		38.0	38.0		82.0	82.0	82.0	82.0	82.0	
Total Split (%)	31.7%	31.7%		31.7%	31.7%		68.3%	68.3%	68.3%	68.3%	68.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6			6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)					31.4		75.6	75.6	75.6	75.6	75.6	
Actuated g/C Ratio					0.26		0.63	0.63	0.63	0.63	0.63	
v/c Ratio					1.11		0.01	0.38	0.05	0.29	0.45	
Control Delay					114.1		5.5	5.9	0.8	12.7	12.3	
Queue Delay					0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay					114.1		5.5	5.9	0.8	12.7	12.3	
LOS					F		A	A	A	B	B	
Approach Delay					114.1			5.6			12.3	
Approach LOS					F			A			B	
Queue Length 50th (m)					~104.4		0.1	14.8	0.0	8.9	52.5	
Queue Length 95th (m)					#163.2		m0.4	23.3	0.4	18.1	65.2	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)							40.0		35.0	40.0		
Base Capacity (vph)					415		287	2135	949	343	2135	
Starvation Cap Reductn					0		0	0	0	0	0	
Spillback Cap Reductn					0		0	0	0	0	0	
Storage Cap Reductn					0		0	0	0	0	0	
Reduced v/c Ratio					1.11		0.01	0.38	0.05	0.29	0.45	

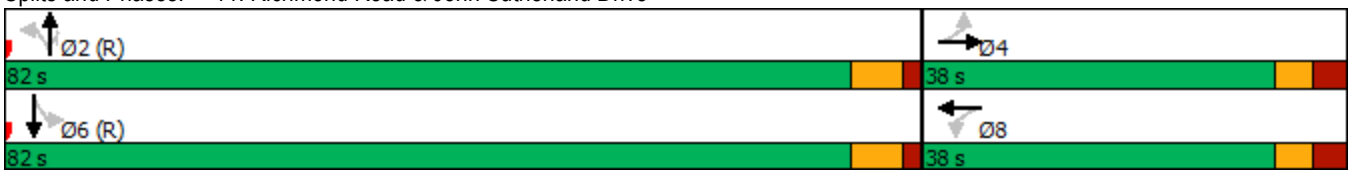
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82 (68%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.11			
Intersection Signal Delay: 29.7		Intersection LOS: C	
Intersection Capacity Utilization 81.2%		ICU Level of Service D	
Analysis Period (min) 15			

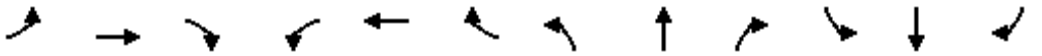
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Richmond Road & John Sutherland Drive





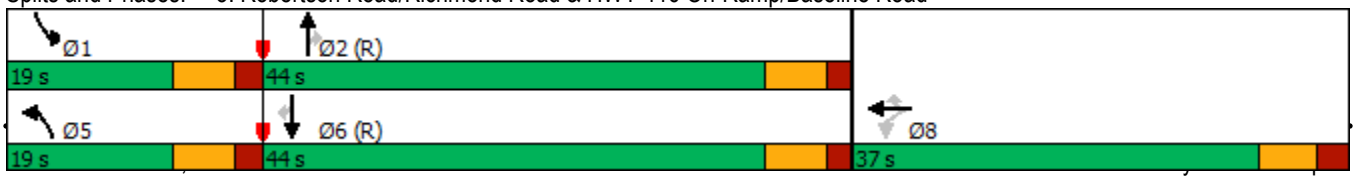
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	364	24	172	13	949	675	177	371	73
Future Volume (vph)	0	0	0	364	24	172	13	949	675	177	371	73
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3225	1784	1473	1601	3390	1488	3195	3357	1502
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						172			675			113
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
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
Heavy Vehicles (%)	2%	2%	2%	4%	2%	5%	8%	2%	4%	5%	3%	3%
Adj. Flow (vph)	0	0	0	364	24	172	13	949	675	177	371	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	364	24	172	13	949	675	177	371	73
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	

Richmond Rd/Robertson Rd/Baseline Rd
Total2035 AM Peak

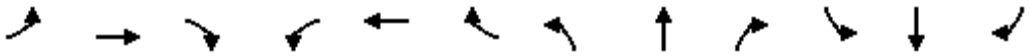
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	19.0	44.0	44.0	19.0	44.0	44.0
Total Split (%)				37.0%	37.0%	37.0%	19.0%	44.0%	44.0%	19.0%	44.0%	44.0%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				17.3	17.3	17.3	6.4	51.9	51.9	10.8	66.4	66.4
Actuated g/C Ratio				0.17	0.17	0.17	0.06	0.52	0.52	0.11	0.66	0.66
v/c Ratio				0.65	0.08	0.43	0.13	0.54	0.62	0.51	0.17	0.07
Control Delay				43.8	33.1	8.8	46.4	18.7	4.2	51.9	6.9	0.4
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				43.8	33.1	8.8	46.4	18.7	4.2	51.9	6.9	0.4
LOS				D	C	A	D	B	A	D	A	A
Approach Delay					32.6			12.9			18.9	
Approach LOS					C			B			B	
Queue Length 50th (m)				31.4	3.6	0.0	2.3	57.0	0.0	16.8	9.7	0.0
Queue Length 95th (m)				41.9	9.4	14.7	7.6	87.7	18.9	26.1	19.0	0.9
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				973	538	564	198	1758	1097	406	2229	1035
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.37	0.04	0.30	0.07	0.54	0.62	0.44	0.17	0.07

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 93 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 18.2	Intersection LOS: B
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



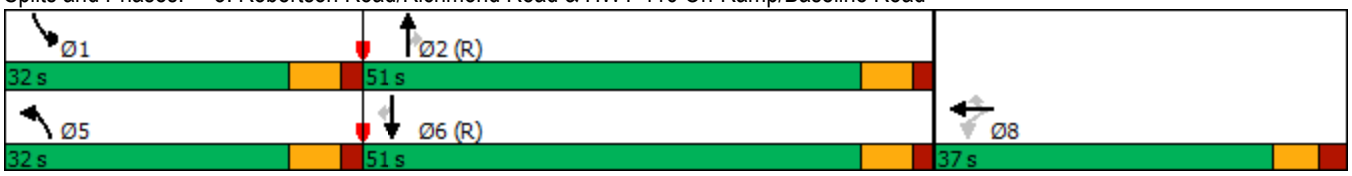
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	668	114	185	58	660	533	213	714	253
Future Volume (vph)	0	0	0	668	114	185	58	660	533	213	714	253
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	250.0		60.0	45.0		100.0	80.0		125.0
Storage Lanes	0		0	1		1	1		1	2		1
Taper Length (m)	7.6			50.0			75.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Ped Bike Factor							1.00		0.99	1.00		0.98
Frt						0.850			0.850			0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	0	0	3288	1767	1517	1647	3390	1517	3288	3390	1502
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	0	0	0	3288	1767	1517	1644	3390	1495	3287	3390	1465
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						185			533			253
Link Speed (k/h)		70			70			80			80	
Link Distance (m)		130.4			357.2			405.5			359.3	
Travel Time (s)		6.7			18.4			18.2			16.2	
Confl. Peds. (#/hr)							2		1	1		2
Confl. Bikes (#/hr)									1			
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
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	5%	2%	2%	2%	2%	3%
Adj. Flow (vph)	0	0	0	668	114	185	58	660	533	213	714	253
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	668	114	185	58	660	533	213	714	253
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		7.4			7.4			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors				1	2	1	1	2	1	1	2	1
Detector Template				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (m)				6.1	30.5	6.1	6.1	30.5	6.1	6.1	30.5	6.1
Trailing Detector (m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Position(m)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Size(m)				6.1	1.8	6.1	6.1	1.8	6.1	6.1	1.8	6.1
Detector 1 Type				Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(m)					28.7			28.7			28.7	
Detector 2 Size(m)					1.8			1.8			1.8	
Detector 2 Type					Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)					0.0			0.0			0.0	
Turn Type				Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases					8		5	2		1	6	
Permitted Phases				8		8			2			6
Detector Phase				8	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)				10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)				36.8	36.8	36.8	11.6	30.6	30.6	11.6	30.6	30.6
Total Split (s)				37.0	37.0	37.0	32.0	51.0	51.0	32.0	51.0	51.0
Total Split (%)				30.8%	30.8%	30.8%	26.7%	42.5%	42.5%	26.7%	42.5%	42.5%
Yellow Time (s)				4.2	4.2	4.2	4.6	4.6	4.6	4.6	4.6	4.6
All-Red Time (s)				2.6	2.6	2.6	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)				6.8	6.8	6.8	6.6	6.6	6.6	6.6	6.6	6.6
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode				None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)				28.6	28.6	28.6	9.6	58.3	58.3	13.1	64.3	64.3
Actuated g/C Ratio				0.24	0.24	0.24	0.08	0.49	0.49	0.11	0.54	0.54
v/c Ratio				0.85	0.27	0.37	0.44	0.40	0.53	0.59	0.39	0.28
Control Delay				55.0	38.6	7.3	62.3	21.4	3.9	70.5	11.8	0.8
Queue Delay				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay				55.0	38.6	7.3	62.3	21.4	3.9	70.5	11.8	0.8
LOS				E	D	A	E	C	A	E	B	A
Approach Delay					44.0			15.8			20.0	
Approach LOS					D			B			C	
Queue Length 50th (m)				70.4	19.9	0.0	12.2	48.1	0.0	24.1	26.9	0.0
Queue Length 95th (m)				90.5	34.5	16.0	24.0	65.6	17.5	m33.0	m35.5	m1.2
Internal Link Dist (m)		106.4			333.2			381.5			335.3	
Turn Bay Length (m)				250.0		60.0	45.0		100.0	80.0		125.0
Base Capacity (vph)				827	444	520	348	1646	1000	695	1815	902
Starvation Cap Reductn				0	0	0	0	0	0	0	0	0
Spillback Cap Reductn				0	0	0	0	0	0	0	0	0
Storage Cap Reductn				0	0	0	0	0	0	0	0	0
Reduced v/c Ratio				0.81	0.26	0.36	0.17	0.40	0.53	0.31	0.39	0.28

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 108 (90%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 25.3		Intersection LOS: C	
Intersection Capacity Utilization 63.2%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 3: Robertson Road/Richmond Road & HWY 416 On-Ramp/Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	774	100	113	477	132	424	
Future Volume (vph)	774	100	113	477	132	424	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.98			1.00		
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3390	1517	1695	3325	1695	1517	
Flt Permitted			0.224		0.950		
Satd. Flow (perm)	3390	1482	400	3325	1693	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		95				424	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		1	1		1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	2%	2%	2%	4%	2%	2%	
Adj. Flow (vph)	774	100	113	477	132	424	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	774	100	113	477	132	424	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

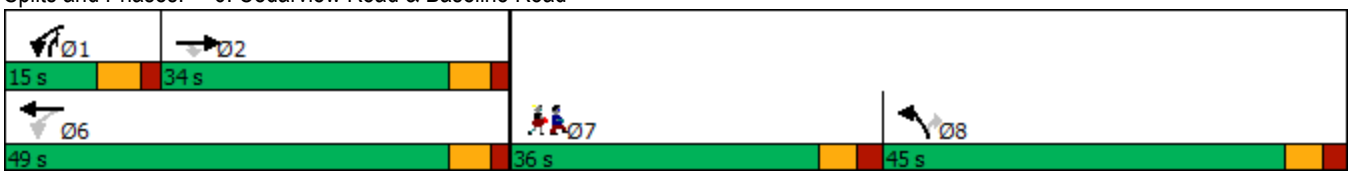


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	36.2	11.1	34.2
Total Split (s)	34.0	34.0	15.0	49.0	45.0	15.0	36.0
Total Split (%)	26.2%	26.2%	11.5%	37.7%	34.6%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	Max	Max	None	Max	None	None	None
Act Effct Green (s)	30.6	30.6	44.8	44.8	11.2	25.4	
Actuated g/C Ratio	0.42	0.42	0.61	0.61	0.15	0.35	
v/c Ratio	0.55	0.15	0.30	0.24	0.51	0.53	
Control Delay	21.7	6.8	12.6	10.1	38.3	5.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.7	6.8	12.6	10.1	38.3	5.2	
LOS	C	A	B	B	D	A	
Approach Delay	20.0			10.6	13.1		
Approach LOS	C			B	B		
Queue Length 50th (m)	31.1	0.3	3.9	9.4	13.7	0.0	
Queue Length 95th (m)	#105.2	12.3	24.9	45.6	40.4	20.4	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	1413	673	407	2027	934	824	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.55	0.15	0.28	0.24	0.14	0.51	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 73.4			
Natural Cycle: 110			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 60.5%		ICU Level of Service B	
Analysis Period (min) 15			

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

Splits and Phases: 6: Cedarview Road & Baseline Road



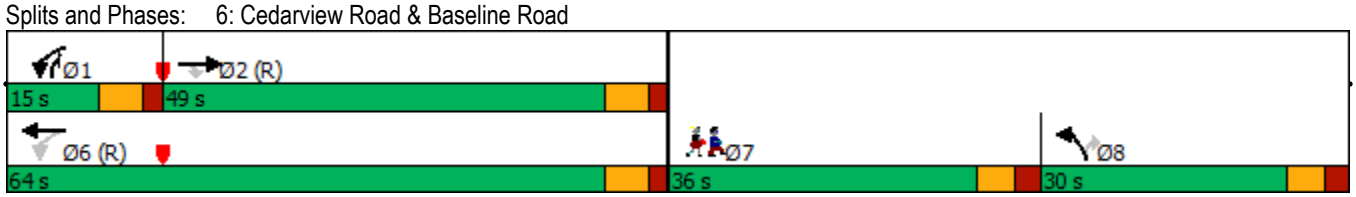
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	585	178	281	856	142	160	
Future Volume (vph)	585	178	281	856	142	160	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	45.0		20.0	0.0	
Storage Lanes		1	1		1	1	
Taper Length (m)			80.0		35.0		
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00	
Ped Bike Factor		0.96	0.99				
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3357	1517	1662	3390	1601	1517	
Flt Permitted			0.378		0.950		
Satd. Flow (perm)	3357	1454	658	3390	1601	1517	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		178				160	
Link Speed (k/h)	70			70	50		
Link Distance (m)	357.2			373.9	442.3		
Travel Time (s)	18.4			19.2	31.8		
Confl. Peds. (#/hr)		7	7				
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	4%	2%	8%	2%	
Adj. Flow (vph)	585	178	281	856	142	160	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	585	178	281	856	142	160	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	4.9			4.9	4.9		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		14	24		24	14	
Number of Detectors	2	1	1	2	1	1	
Detector Template	Thru	Right	Left	Thru	Left	Right	
Leading Detector (m)	30.5	6.1	6.1	30.5	6.1	6.1	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	1.8	6.1	6.1	1.8	6.1	6.1	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)	28.7			28.7			
Detector 2 Size(m)	1.8			1.8			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

Baseline Rd/Cedarview Rd
Total2035 PM Peak

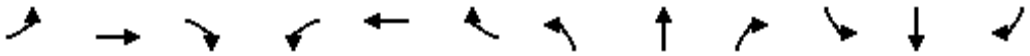
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA	Perm	pm+pt	NA	Prot	pm+ov	
Protected Phases	2		1	6	8	1	7
Permitted Phases		2	6			8	
Detector Phase	2	2	1	6	8	1	
Switch Phase							
Minimum Initial (s)	10.0	10.0	5.0	10.0	5.0	5.0	5.0
Minimum Split (s)	27.1	27.1	11.1	27.1	11.2	11.1	34.2
Total Split (s)	49.0	49.0	15.0	64.0	30.0	15.0	36.0
Total Split (%)	37.7%	37.7%	11.5%	49.2%	23.1%	11.5%	28%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.7	4.2	3.7
All-Red Time (s)	1.9	1.9	1.9	1.9	2.5	1.9	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.1	6.1	6.1	6.1	6.2	6.1	
Lead/Lag	Lag	Lag	Lead		Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	79.0	79.0	100.9	100.9	16.8	38.8	
Actuated g/C Ratio	0.61	0.61	0.78	0.78	0.13	0.30	
v/c Ratio	0.29	0.19	0.44	0.33	0.69	0.28	
Control Delay	13.3	2.4	6.7	5.1	70.5	5.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	13.3	2.4	6.7	5.1	70.5	5.6	
LOS	B	A	A	A	E	A	
Approach Delay	10.8			5.5	36.1		
Approach LOS	B			A	D		
Queue Length 50th (m)	32.5	0.0	15.2	27.1	32.5	0.0	
Queue Length 95th (m)	49.7	9.5	28.5	42.5	50.3	13.0	
Internal Link Dist (m)	333.2			349.9	418.3		
Turn Bay Length (m)			45.0		20.0		
Base Capacity (vph)	2040	953	632	2631	293	564	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.29	0.19	0.44	0.33	0.48	0.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 15 (12%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 57.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Cedarview Road & Baseline Road



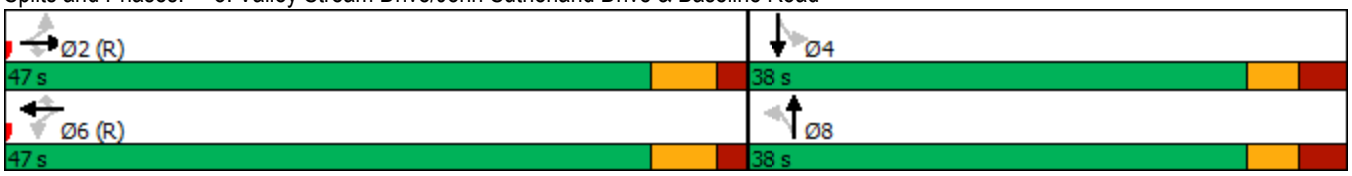
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	1201	19	8	545	149	30	2	14	87	6	74
Future Volume (vph)	161	1201	19	8	545	149	30	2	14	87	6	74
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		0.99			0.99	
Frt			0.850			0.850		0.959			0.940	
Flt Protected	0.950			0.950				0.968			0.975	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1642	0	0	1581	0
Flt Permitted	0.449			0.196				0.756			0.812	
Satd. Flow (perm)	777	3357	1461	339	3357	1446	0	1282	0	0	1313	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			45			149		14			54	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			150.3	
Travel Time (s)		19.2			19.4			29.3			10.8	
Confl. Peds. (#/hr)	2		4	4		2	2		6	6		2
Confl. Bikes (#/hr)			1			6			2			
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	161	1201	19	8	545	149	30	2	14	87	6	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	1201	19	8	545	149	0	46	0	0	167	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

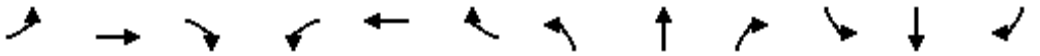


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	47.0	47.0	47.0	47.0	47.0	47.0	38.0	38.0		38.0	38.0	
Total Split (%)	55.3%	55.3%	55.3%	55.3%	55.3%	55.3%	44.7%	44.7%		44.7%	44.7%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	56.3	56.3	56.3	56.3	56.3	56.3		16.0			16.0	
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.66	0.66		0.19			0.19	
v/c Ratio	0.31	0.54	0.02	0.04	0.24	0.15		0.18			0.58	
Control Delay	10.6	10.3	1.1	16.6	11.2	6.6		20.5			27.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	10.6	10.3	1.1	16.6	11.2	6.6		20.5			27.2	
LOS	B	B	A	B	B	A		C			C	
Approach Delay		10.2			10.3			20.5			27.2	
Approach LOS		B			B			C			C	
Queue Length 50th (m)	7.8	37.5	0.0	0.3	11.8	0.0		4.2			15.9	
Queue Length 95th (m)	29.8	94.4	1.0	m3.7	49.8	20.4		9.4			25.3	
Internal Link Dist (m)		349.9			354.0			301.9			126.3	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	514	2225	983	224	2225	1008		483			520	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.31	0.54	0.02	0.04	0.24	0.15		0.10			0.32	

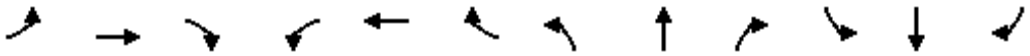
Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 37 (44%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 11.7		Intersection LOS: B	
Intersection Capacity Utilization 71.4%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	731	57	14	1203	67	38	4	12	122	5	106
Future Volume (vph)	42	731	57	14	1203	67	38	4	12	122	5	106
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		1.00			0.99	
Frt			0.850			0.850		0.970			0.939	
Flt Protected	0.950			0.950				0.966			0.974	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1661	0	0	1576	0
Flt Permitted	0.192			0.358				0.682			0.807	
Satd. Flow (perm)	333	3357	1456	619	3357	1446	0	1172	0	0	1300	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			57			39		12			44	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			150.3	
Travel Time (s)		19.2			19.4			29.3			10.8	
Confl. Peds. (#/hr)	3		4	4		3			9	9		
Confl. Bikes (#/hr)			5			3						3
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	42	731	57	14	1203	67	38	4	12	122	5	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	731	57	14	1203	67	0	54	0	0	233	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2		2	6		6	8			4		
Detector Phase	2	2	2	6	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	32.2	32.2	32.2	32.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	62.0	62.0	62.0	62.0	62.0	62.0	38.0	38.0		38.0	38.0	
Total Split (%)	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	38.0%	38.0%		38.0%	38.0%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	66.6	66.6	66.6	66.6	66.6	66.6		20.7			20.7	
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.67	0.67		0.21			0.21	
v/c Ratio	0.19	0.33	0.06	0.03	0.54	0.07		0.22			0.77	
Control Delay	11.5	8.6	2.7	3.5	6.0	0.8		26.1			45.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	11.5	8.6	2.7	3.5	6.0	0.8		26.1			45.8	
LOS	B	A	A	A	A	A		C			D	
Approach Delay		8.4			5.7			26.1			45.8	
Approach LOS		A			A			C			D	
Queue Length 50th (m)	2.5	25.9	0.0	0.3	57.7	0.2		6.2			32.3	
Queue Length 95th (m)	9.7	47.3	4.8	m0.6	13.8	0.0		13.7			49.7	
Internal Link Dist (m)		349.9			354.0			301.9			126.3	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	221	2237	989	412	2237	976		377			439	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.19	0.33	0.06	0.03	0.54	0.07		0.14			0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 77 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 11.0		Intersection LOS: B	
Intersection Capacity Utilization 62.5%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road



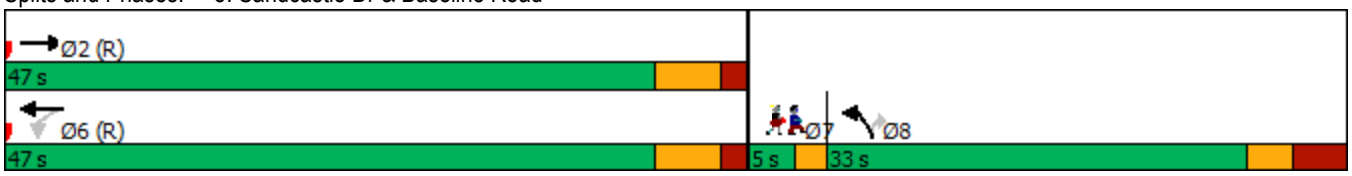
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	1281	25	94	647	60	129	
Future Volume (vph)	1281	25	94	647	60	129	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	1.00				1.00		
Frt	0.997					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3346	0	1695	3357	1695	1488	
Flt Permitted			0.174		0.950		
Satd. Flow (perm)	3346	0	310	3357	1693	1488	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	3					102	
Link Speed (k/h)	70			70	50		
Link Distance (m)	378.0			246.3	226.0		
Travel Time (s)	19.4			12.7	16.3		
Confl. Peds. (#/hr)		5	5		1		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	1281	25	94	647	60	129	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	1306	0	94	647	60	129	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		97	97		97	97	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Prot	Perm	
Protected Phases	2			6	8		7
Permitted Phases			6			8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	47.0		47.0	47.0	33.0	33.0	5.0
Total Split (%)	55.3%		55.3%	55.3%	38.8%	38.8%	6%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	60.3		60.3	60.3	11.3	11.3	
Actuated g/C Ratio	0.71		0.71	0.71	0.13	0.13	
v/c Ratio	0.55		0.43	0.27	0.27	0.45	
Control Delay	2.5		18.5	6.4	32.9	14.3	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	2.5		18.5	6.4	32.9	14.3	
LOS	A		B	A	C	B	
Approach Delay	2.5			8.0	20.2		
Approach LOS	A			A	C		
Queue Length 50th (m)	7.6		3.9	12.1	8.6	3.8	
Queue Length 95th (m)	10.9		#32.2	42.0	14.4	13.9	
Internal Link Dist (m)	354.0			222.3	202.0		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2373		219	2379	528	534	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.55		0.43	0.27	0.11	0.24	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 55 (65%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 5.8		Intersection LOS: A	
Intersection Capacity Utilization 66.0%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Sandcastle Dr & Baseline Road



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Lane Configurations							
Traffic Volume (vph)	822	43	193	1217	68	107	
Future Volume (vph)	822	43	193	1217	68	107	
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	
Storage Length (m)		0.0	146.0		37.0	0.0	
Storage Lanes		0	1		1	1	
Taper Length (m)			26.0		75.0		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor					0.99	0.98	
Frt	0.993					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3335	0	1695	3357	1695	1488	
Flt Permitted			0.313		0.950		
Satd. Flow (perm)	3335	0	558	3357	1674	1461	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	9					107	
Link Speed (k/h)	70			70	50		
Link Distance (m)	378.0			246.3	226.0		
Travel Time (s)	19.4			12.7	16.3		
Confl. Peds. (#/hr)					11	5	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Heavy Vehicles (%)	3%	2%	2%	3%	2%	4%	
Adj. Flow (vph)	822	43	193	1217	68	107	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	865	0	193	1217	68	107	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(m)	3.7			3.7	3.7		
Link Offset(m)	0.0			0.0	0.0		
Crosswalk Width(m)	1.6			1.6	1.6		
Two way Left Turn Lane							
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	
Turning Speed (k/h)		97	97		97	97	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (m)	10.0		2.0	10.0	2.0	2.0	
Trailing Detector (m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Size(m)	0.6		2.0	0.6	2.0	2.0	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(m)	9.4			9.4			
Detector 2 Size(m)	0.6			0.6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

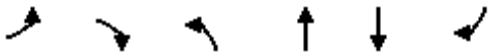
Baseline Rd/Sandcastle Dr
Total2035 PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø7
Turn Type	NA		Perm	NA	Perm	Perm	
Protected Phases	2			6			7
Permitted Phases			6		8	8	
Detector Phase	2		6	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		10.0	10.0	5.0	5.0	1.0
Minimum Split (s)	23.9		15.9	15.9	32.5	32.5	5.0
Total Split (s)	62.0		62.0	62.0	33.0	33.0	5.0
Total Split (%)	62.0%		62.0%	62.0%	33.0%	33.0%	5%
Yellow Time (s)	4.2		4.2	4.2	3.0	3.0	2.0
All-Red Time (s)	1.7		1.7	1.7	3.5	3.5	0.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.9		5.9	5.9	6.5	6.5	
Lead/Lag					Lag	Lag	Lead
Lead-Lag Optimize?							
Recall Mode	C-Max		C-Max	C-Max	None	None	None
Act Effct Green (s)	74.6		74.6	74.6	12.0	12.0	
Actuated g/C Ratio	0.75		0.75	0.75	0.12	0.12	
v/c Ratio	0.35		0.46	0.49	0.34	0.40	
Control Delay	4.7		12.5	7.4	42.1	11.2	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.7		12.5	7.4	42.1	11.2	
LOS	A		B	A	D	B	
Approach Delay	4.7			8.1	23.2		
Approach LOS	A			A	C		
Queue Length 50th (m)	15.6		9.1	30.9	11.7	0.0	
Queue Length 95th (m)	36.5		46.2	92.5	19.3	11.3	
Internal Link Dist (m)	354.0			222.3	202.0		
Turn Bay Length (m)			146.0		37.0		
Base Capacity (vph)	2489		416	2504	443	465	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.35		0.46	0.49	0.15	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 62 (62%), Referenced to phase 2:EBT and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 8.0		Intersection LOS: A	
Intersection Capacity Utilization 58.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Sandcastle Dr & Baseline Road

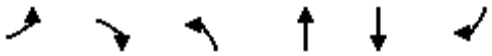




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	26	99	196	152	48	63
Future Volume (Veh/h)	26	99	196	152	48	63
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	26	99	196	152	48	63
Pedestrians					9	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				150		
pX, platoon unblocked						
vC, conflicting volume	632	80	111			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	632	80	111			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	90	87			
cM capacity (veh/h)	382	981	1479			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	125	348	111
Volume Left	26	196	0
Volume Right	99	0	63
cSH	739	1479	1700
Volume to Capacity	0.17	0.13	0.07
Queue Length 95th (m)	4.2	3.2	0.0
Control Delay (s)	10.9	4.9	0.0
Lane LOS	B	A	
Approach Delay (s)	10.9	4.9	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	70	155	79	65	113	52
Future Volume (Veh/h)	70	155	79	65	113	52
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	70	155	79	65	113	52
Pedestrians					17	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				150		
pX, platoon unblocked						
vC, conflicting volume	379	139	165			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	379	139	165			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	83	94			
cM capacity (veh/h)	578	909	1413			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	225	144	165
Volume Left	70	79	0
Volume Right	155	0	52
cSH	772	1413	1700
Volume to Capacity	0.29	0.06	0.10
Queue Length 95th (m)	8.5	1.2	0.0
Control Delay (s)	11.6	4.4	0.0
Lane LOS	B	A	
Approach Delay (s)	11.6	4.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	130	38	14	120	12	2
Future Volume (Veh/h)	130	38	14	120	12	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	130	38	14	120	12	2
Pedestrians	38			1	4	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.0			1.0	1.0	
Percent Blockage	4			0	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	262					
pX, platoon unblocked						
vC, conflicting volume			172		339	154
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			172		339	154
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	100
cM capacity (veh/h)			1399		622	887

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	168	134	14
Volume Left	0	14	12
Volume Right	38	0	2
cSH	1700	1399	650
Volume to Capacity	0.10	0.01	0.02
Queue Length 95th (m)	0.0	0.2	0.5
Control Delay (s)	0.0	0.9	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.9	10.7
Approach LOS			B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	142	17	17	103	44	24
Future Volume (Veh/h)	142	17	17	103	44	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	142	17	17	103	44	24
Pedestrians	32			4	8	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.0			1.0	1.0	
Percent Blockage	3			0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	262					
pX, platoon unblocked						
vC, conflicting volume			167		328	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			167		328	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		93	97
cM capacity (veh/h)			1399		632	871

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	159	120	68
Volume Left	0	17	44
Volume Right	17	0	24
cSH	1700	1399	700
Volume to Capacity	0.09	0.01	0.10
Queue Length 95th (m)	0.0	0.3	2.3
Control Delay (s)	0.0	1.2	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	10.7
Approach LOS			B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	129	355	106	43	137	39
Future Volume (Veh/h)	129	355	106	43	137	39
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	129	355	106	43	137	39
Pedestrians	5			7	2	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.0			1.0	1.0	
Percent Blockage	1			1	0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	121					
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			486		568	316
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			436		523	258
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		69	95
cM capacity (veh/h)			1069		439	738

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	484	149	176
Volume Left	0	106	137
Volume Right	355	0	39
cSH	1700	1069	482
Volume to Capacity	0.28	0.10	0.37
Queue Length 95th (m)	0.0	2.3	11.6
Control Delay (s)	0.0	6.5	16.7
Lane LOS		A	C
Approach Delay (s)	0.0	6.5	16.7
Approach LOS			C

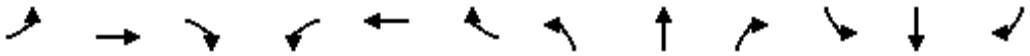
Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	83	71	22	133	347	77
Future Volume (Veh/h)	83	71	22	133	347	77
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	83	71	22	133	347	77
Pedestrians	3			6	9	
Lane Width (m)	3.7			3.7	3.7	
Walking Speed (m/s)	1.0			1.0	1.0	
Percent Blockage	0			1	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	121					
pX, platoon unblocked			1.00		1.00	1.00
vC, conflicting volume			163		308	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			162		307	133
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		48	91
cM capacity (veh/h)			1403		666	902

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	154	155	424
Volume Left	0	22	347
Volume Right	71	0	77
cSH	1700	1403	699
Volume to Capacity	0.09	0.02	0.61
Queue Length 95th (m)	0.0	0.3	28.9
Control Delay (s)	0.0	1.2	17.8
Lane LOS		A	C
Approach Delay (s)	0.0	1.2	17.8
Approach LOS			C

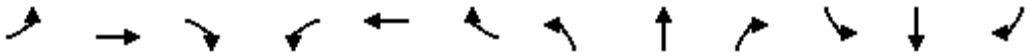
Intersection Summary			
Average Delay	10.5		
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	155	0	0	144	0	0	0	0	0	0	3
Future Volume (Veh/h)	22	155	0	0	144	0	0	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	22	155	0	0	144	0	0	0	0	0	0	3
Pedestrians		3			89			18				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.0			1.0			1.0				
Percent Blockage		0			9			2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		169										
pX, platoon unblocked												
vC, conflicting volume	144			173			367	361	262	432	361	147
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	144			173			367	361	262	432	361	147
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	100	100	100
cM capacity (veh/h)	1438			1360			558	547	693	473	547	897

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	177	144	0	3
Volume Left	22	0	0	0
Volume Right	0	0	0	3
cSH	1438	1360	1700	897
Volume to Capacity	0.02	0.00	0.00	0.00
Queue Length 95th (m)	0.3	0.0	0.0	0.1
Control Delay (s)	1.0	0.0	0.0	9.0
Lane LOS	A		A	A
Approach Delay (s)	1.0	0.0	0.0	9.0
Approach LOS			A	A

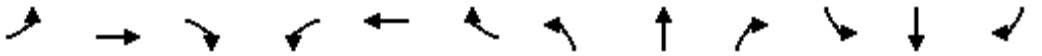
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	42.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	148	0	0	147	0	0	0	0	0	0	19
Future Volume (Veh/h)	0	148	0	0	147	0	0	0	0	0	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	0	148	0	0	147	0	0	0	0	0	0	19
Pedestrians		2			41			22				
Lane Width (m)		3.7			3.7			3.7				
Walking Speed (m/s)		1.0			1.0			1.0				
Percent Blockage		0			4			2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		169										
pX, platoon unblocked												
vC, conflicting volume	147			170			338	317	211	336	317	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	147			170			338	317	211	336	317	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	98
cM capacity (veh/h)	1435			1358			576	586	776	581	586	896

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	148	147	0	19
Volume Left	0	0	0	0
Volume Right	0	0	0	19
cSH	1435	1358	1700	896
Volume to Capacity	0.00	0.00	0.00	0.02
Queue Length 95th (m)	0.0	0.0	0.0	0.5
Control Delay (s)	0.0	0.0	0.0	9.1
Lane LOS			A	A
Approach Delay (s)	0.0	0.0	0.0	9.1
Approach LOS			A	A

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	28.3%	ICU Level of Service	A	
Analysis Period (min)	15			



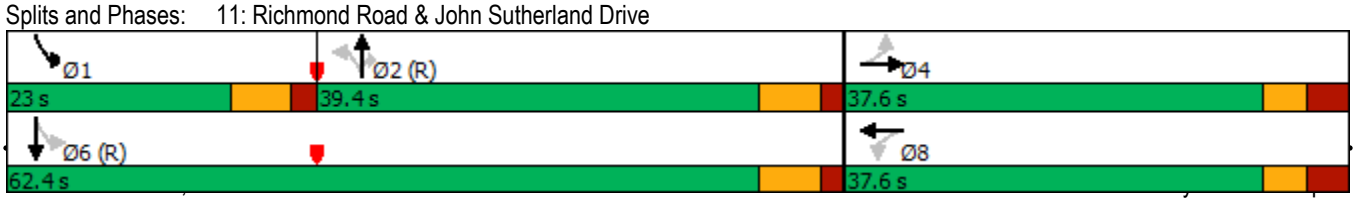
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	77	0	106	0	949	134	296	563	0
Future Volume (vph)	0	0	0	77	0	106	0	949	134	296	563	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt					0.850				0.850			
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1784	0	1695	1473	0	1784	3390	1517	1679	3390	0
Flt Permitted				0.757						0.203		
Satd. Flow (perm)	0	1784	0	1351	1473	0	1784	3390	1517	359	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					380				109			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	0	0	0	77	0	106	0	949	134	296	563	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	77	106	0	0	949	134	296	563	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	

Richmond Rd/John Sutherland Dr
Total2030 AM Peak - Mitigated

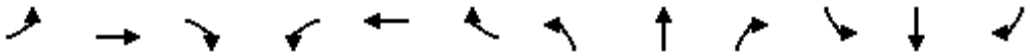
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	11.4	29.4	
Total Split (s)	37.6	37.6		37.6	37.6		39.4	39.4	39.4	23.0	62.4	
Total Split (%)	37.6%	37.6%		37.6%	37.6%		39.4%	39.4%	39.4%	23.0%	62.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)				12.0	12.0			51.0	51.0	75.0	75.0	
Actuated g/C Ratio				0.12	0.12			0.51	0.51	0.75	0.75	
v/c Ratio				0.48	0.21			0.55	0.16	0.59	0.22	
Control Delay				50.4	0.9			5.9	0.5	10.6	4.2	
Queue Delay				0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay				50.4	0.9			5.9	0.5	10.6	4.2	
LOS				D	A			A	A	B	A	
Approach Delay					21.7			5.2			6.4	
Approach LOS					C			A			A	
Queue Length 50th (m)				13.2	0.0			7.9	0.1	12.6	12.4	
Queue Length 95th (m)				25.2	0.0			20.6	0.1	32.2	21.3	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)									35.0	40.0		
Base Capacity (vph)				418	718			1729	827	522	2541	
Starvation Cap Reductn				0	0			0	0	0	0	
Spillback Cap Reductn				0	0			0	0	0	0	
Storage Cap Reductn				0	0			0	0	0	0	
Reduced v/c Ratio				0.18	0.15			0.55	0.16	0.57	0.22	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 12 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 69.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 11: Richmond Road & John Sutherland Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	187	0	274	4	785	43	98	937	0
Future Volume (vph)	0	0	0	187	0	274	4	785	43	98	937	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00		0.98	1.00		
Frt					0.850				0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	1784	0	1695	1502	0	1695	3390	1517	1647	3390	0
Flt Permitted				0.757			0.305			0.286		
Satd. Flow (perm)	0	1784	0	1351	1502	0	543	3390	1482	495	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					291				91			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
Confl. Peds. (#/hr)							2		1	1		2
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	0	0	0	187	0	274	4	785	43	98	937	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	187	274	0	4	785	43	98	937	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	11.4	29.4	
Total Split (s)	44.0	44.0		44.0	44.0		57.0	57.0	57.0	19.0	76.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		47.5%	47.5%	47.5%	15.8%	63.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)				22.5	22.5		70.1	70.1	70.1	84.5	84.5	
Actuated g/C Ratio				0.19	0.19		0.58	0.58	0.58	0.70	0.70	
v/c Ratio				0.74	0.53		0.01	0.40	0.05	0.23	0.39	
Control Delay				62.4	7.2		5.0	4.2	0.1	8.2	8.6	
Queue Delay				0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay				62.4	7.2		5.0	4.2	0.1	8.2	8.6	
LOS				E	A		A	A	A	A	A	
Approach Delay					29.6			4.0			8.6	
Approach LOS					C			A			A	
Queue Length 50th (m)				38.8	0.0		0.1	8.2	0.0	5.9	38.6	
Queue Length 95th (m)				56.1	15.3		m0.3	17.2	0.3	14.2	64.3	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)							40.0		35.0	40.0		
Base Capacity (vph)				421	668		317	1981	904	469	2387	
Starvation Cap Reductn				0	0		0	0	0	0	0	
Spillback Cap Reductn				0	0		0	0	0	0	0	
Storage Cap Reductn				0	0		0	0	0	0	0	
Reduced v/c Ratio				0.44	0.41		0.01	0.40	0.05	0.21	0.39	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 118 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 69.7%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Richmond Road & John Sutherland Drive



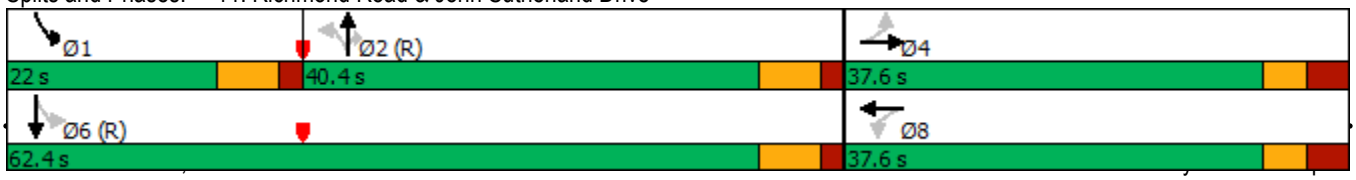
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Future Volume (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt					0.850				0.850			
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1784	0	1695	1473	0	1784	3390	1517	1679	3390	0
Flt Permitted				0.757						0.194		
Satd. Flow (perm)	0	1784	0	1351	1473	0	1784	3390	1517	343	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					359				109			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	77	106	0	0	970	134	296	576	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	

Richmond Rd/John Sutherland Dr
Total2035 AM Peak - Mitigated

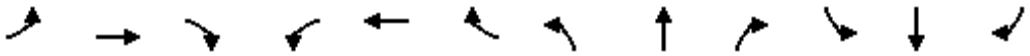
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	11.4	29.4	
Total Split (s)	37.6	37.6		37.6	37.6		40.4	40.4	40.4	22.0	62.4	
Total Split (%)	37.6%	37.6%		37.6%	37.6%		40.4%	40.4%	40.4%	22.0%	62.4%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)				12.0	12.0			50.6	50.6	75.0	75.0	
Actuated g/C Ratio				0.12	0.12			0.51	0.51	0.75	0.75	
v/c Ratio				0.48	0.22			0.57	0.16	0.60	0.23	
Control Delay				50.4	1.0			6.0	0.4	11.2	4.2	
Queue Delay				0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay				50.4	1.0			6.0	0.4	11.2	4.2	
LOS				D	A			A	A	B	A	
Approach Delay					21.8			5.3			6.6	
Approach LOS					C			A			A	
Queue Length 50th (m)				13.2	0.0			8.2	0.1	12.6	12.8	
Queue Length 95th (m)				25.2	0.0			14.9	0.1	34.1	22.0	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)									35.0	40.0		
Base Capacity (vph)				418	704			1714	820	510	2541	
Starvation Cap Reductn				0	0			0	0	0	0	
Spillback Cap Reductn				0	0			0	0	0	0	
Storage Cap Reductn				0	0			0	0	0	0	
Reduced v/c Ratio				0.18	0.15			0.57	0.16	0.58	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 11 (11%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 7.2		Intersection LOS: A	
Intersection Capacity Utilization 70.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 11: Richmond Road & John Sutherland Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Future Volume (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00		0.98	1.00		
Frt					0.850				0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	1784	0	1695	1502	0	1695	3390	1517	1647	3390	0
Flt Permitted				0.757			0.299			0.279		
Satd. Flow (perm)	0	1784	0	1351	1502	0	533	3390	1482	483	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					287				91			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
Confl. Peds. (#/hr)							2		1	1		2
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	187	274	0	4	802	43	98	958	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Perm	NA	Perm	pm+pt	NA	
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		10.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		29.4	29.4	29.4	11.4	29.4	
Total Split (s)	44.0	44.0		44.0	44.0		57.0	57.0	57.0	19.0	76.0	
Total Split (%)	36.7%	36.7%		36.7%	36.7%		47.5%	47.5%	47.5%	15.8%	63.3%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag							Lag	Lag	Lag	Lead		
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	None	C-Max	
Act Effct Green (s)				22.5	22.5		70.1	70.1	70.1	84.5	84.5	
Actuated g/C Ratio				0.19	0.19		0.58	0.58	0.58	0.70	0.70	
v/c Ratio				0.74	0.53		0.01	0.40	0.05	0.24	0.40	
Control Delay				62.4	7.5		5.0	4.2	0.1	8.2	8.7	
Queue Delay				0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay				62.4	7.5		5.0	4.2	0.1	8.2	8.7	
LOS				E	A		A	A	A	A	A	
Approach Delay					29.8			4.0			8.7	
Approach LOS					C			A			A	
Queue Length 50th (m)				38.8	0.0		0.1	8.3	0.0	5.9	39.8	
Queue Length 95th (m)				56.1	16.0		m0.3	17.4	0.2	14.2	66.1	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)							40.0		35.0	40.0		
Base Capacity (vph)				421	665		311	1981	904	462	2387	
Starvation Cap Reductn				0	0		0	0	0	0	0	
Spillback Cap Reductn				0	0		0	0	0	0	0	
Storage Cap Reductn				0	0		0	0	0	0	0	
Reduced v/c Ratio				0.44	0.41		0.01	0.40	0.05	0.21	0.40	

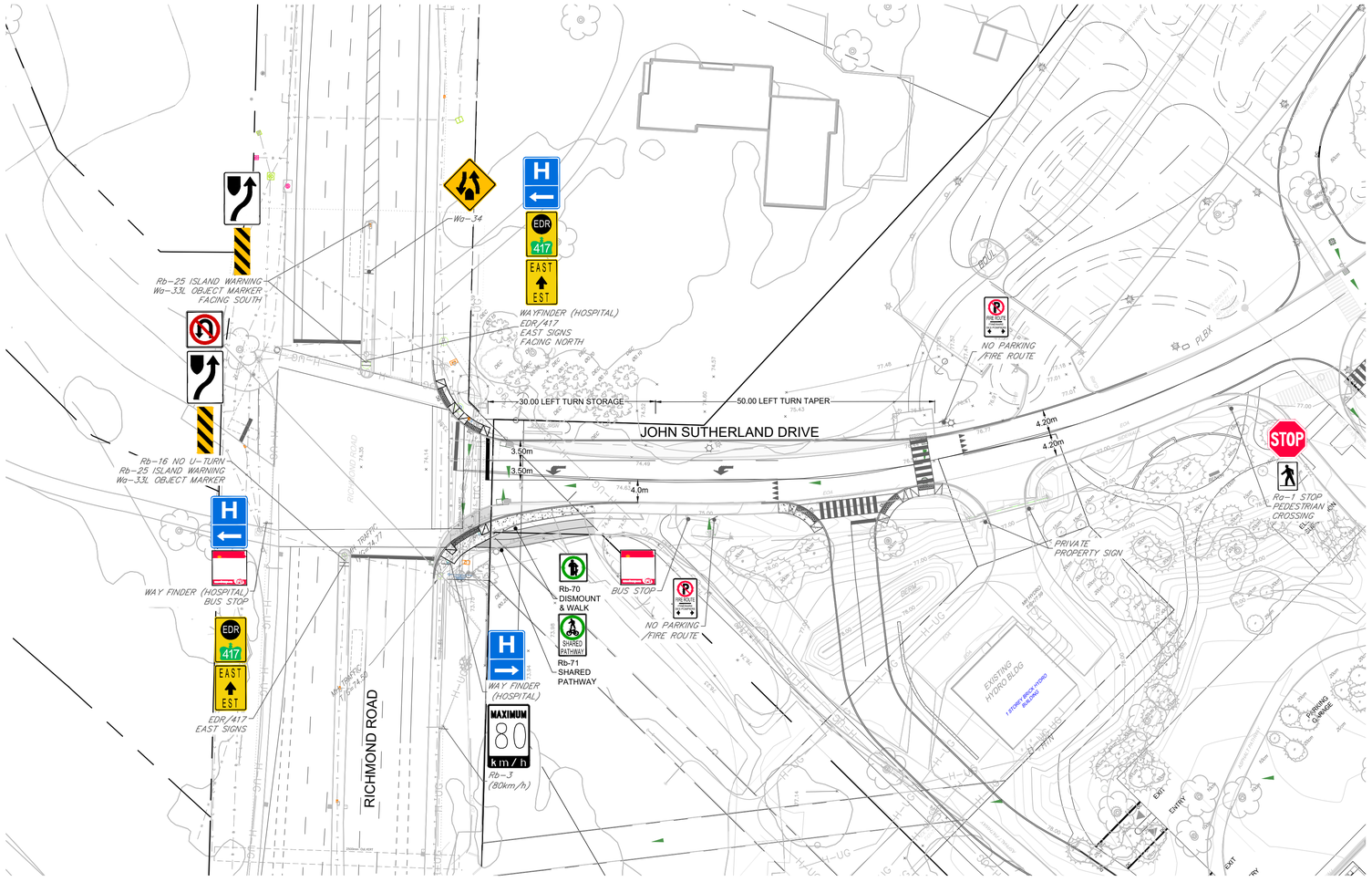
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 118 (98%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 70.4%		ICU Level of Service C	
Analysis Period (min) 15			

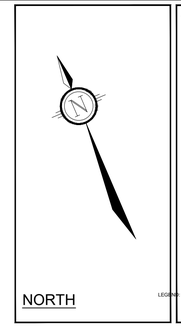
m Volume for 95th percentile queue is metered by upstream signal.

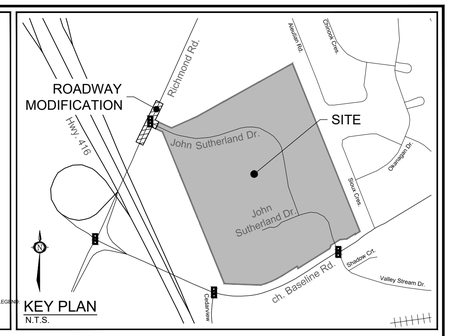
Splits and Phases: 11: Richmond Road & John Sutherland Drive



Appendix P: Functional Design of Proposed Roadway Modifications







LEGEND

- TRAFFIC DUCT
- WATERMAIN
- STORM SEWER
- SANITARY SEWER
- STREET LIGHT DUCT
- HYDRO DUCT
- BELL DUCT
- CABLE DUCT
- GAS MAIN

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
2.	ISSUED FOR CITY REVIEW	SEPT 4/26	BJB
1.	ISSUED FOR CITY REVIEW	JUN 29/26	BJB

SCALE: 1:500 (1:500, 0 5 10 15 20)

DESIGN: RCH
CHECKED: BJB
DRAWN: RCH
CHECKED: MT
APPROVED: BJB

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

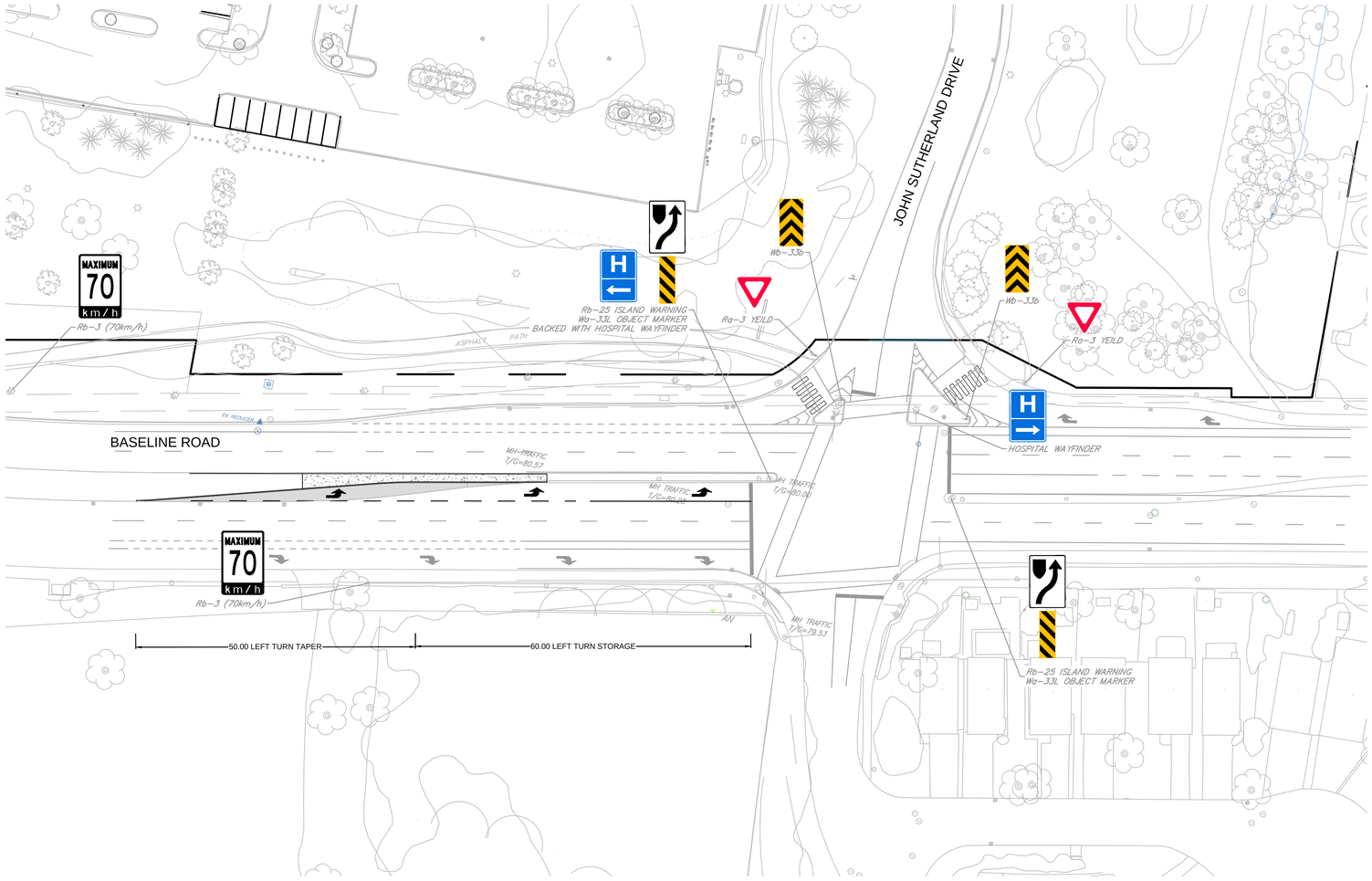
LOCATION
CITY of OTTAWA
QUEENSWAY CARLETON HOSPITAL CAMPUS

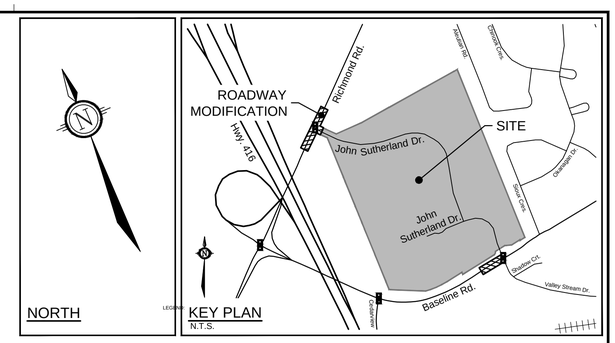
DRAWING NAME
FUNCTIONAL DESIGN
RICHMOND ROAD
& JOHN SUTHERLAND DRIVE

PROJECT No. 123089-00
REV REV # 1
DRAWING No. 123089-FD1

M:\2023\123089\CAD\Civil\Road Mod\Sept 2026 Submission\123089-FD.dwg, Richmond-FD, Sep 02, 2026 - 3:59pm, cvisser

PLANAT.DWG - 841mmx594mm





LEGEND

- TRAFFIC DUCT
- WATERMAIN
- STORM SEWER
- SANITARY SEWER
- STREET LIGHT DUCT
- HYDRO DUCT
- BELL DUCT
- CABLE DUCT
- GAS MAIN

* WAITING ON UCC INFORMATION FROM CITY OF OTTAWA

NOTE:
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No.	REVISION	DATE	BY
1.	ISSUED FOR CITY REVIEW	JUN 29/26	BJB

SCALE 1:500

1:500
0 5 10 15 20

DESIGN RCH
CHECKED BJB
DRAWN RCH
CHECKED MT
APPROVED BJB

FOR REVIEW ONLY

NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6
Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LOCATION
CITY of OTTAWA
QUEENSWAY CARLETON HOSPITAL CAMPUS

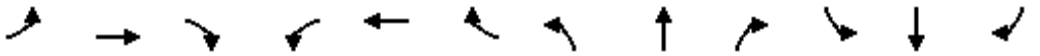
DRAWING NAME
FUNCTIONAL DESIGN
BASELINE ROAD
& JOHN SUTHERLAND DRIVE

PROJECT No. 123089-00
REV REV # 1
DRAWING No. 123089-FD2

C:\Temp\AcPublish_4216\123089-FD.dwg, Baseline-FD, Jun 29, 2026 - 3:41pm, rhillier

PLANAT.DWG - 841mmx594mm

Appendix Q: Synchro Analysis Reports for Protected Left Turn Movements Scenario



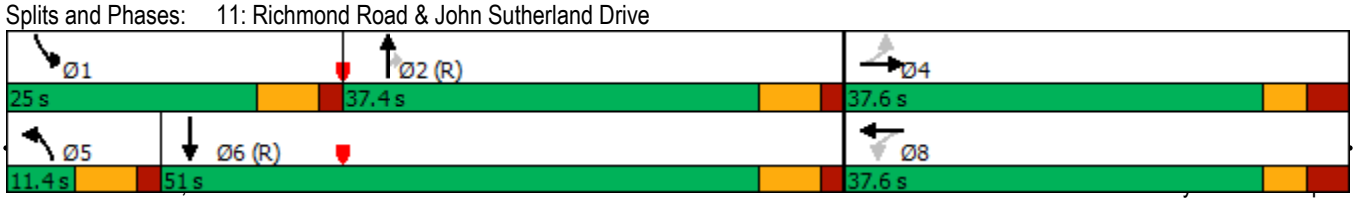
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Future Volume (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Frt					0.850				0.850			
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1784	0	1695	1473	0	1784	3390	1517	1679	3390	0
Flt Permitted				0.757						0.950		
Satd. Flow (perm)	0	1784	0	1351	1473	0	1784	3390	1517	1679	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					319				179			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	5%	2%	2%	2%	3%	2%	2%
Adj. Flow (vph)	0	0	0	77	0	106	0	970	134	296	576	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	77	106	0	0	970	134	296	576	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type				Perm	NA		Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	

Richmond Rd/John Sutherland Dr
Total2035 AM Peak

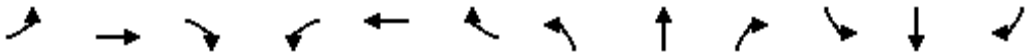
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		11.4	29.4	29.4	11.4	29.4	
Total Split (s)	37.6	37.6		37.6	37.6		11.4	37.4	37.4	25.0	51.0	
Total Split (%)	37.6%	37.6%		37.6%	37.6%		11.4%	37.4%	37.4%	25.0%	51.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)				12.0	12.0			43.9	43.9	24.7	75.0	
Actuated g/C Ratio				0.12	0.12			0.44	0.44	0.25	0.75	
v/c Ratio				0.48	0.23			0.65	0.17	0.72	0.23	
Control Delay				50.4	1.2			11.5	0.7	44.4	4.2	
Queue Delay				0.0	0.0			0.0	0.0	0.0	0.0	
Total Delay				50.4	1.2			11.5	0.7	44.4	4.2	
LOS				D	A			B	A	D	A	
Approach Delay					21.9			10.2			17.9	
Approach LOS					C			B			B	
Queue Length 50th (m)				13.2	0.0			69.1	0.0	48.0	12.8	
Queue Length 95th (m)				25.2	0.0			88.4	0.2	70.8	22.0	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)									35.0	40.0		
Base Capacity (vph)				418	676			1488	766	413	2541	
Starvation Cap Reductn				0	0			0	0	0	0	
Spillback Cap Reductn				0	0			0	0	0	0	
Storage Cap Reductn				0	0			0	0	0	0	
Reduced v/c Ratio				0.18	0.16			0.65	0.17	0.72	0.23	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 13 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 14.3		Intersection LOS: B	
Intersection Capacity Utilization 70.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 11: Richmond Road & John Sutherland Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Future Volume (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	40.0		35.0	40.0		0.0
Storage Lanes	0		0	1		0	1		1	1		0
Taper Length (m)	2.5			7.6			45.0			100.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor							1.00		0.98	1.00		
Frt					0.850				0.850			
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	1784	0	1695	1502	0	1695	3390	1517	1647	3390	0
Flt Permitted				0.757			0.950			0.950		
Satd. Flow (perm)	0	1784	0	1351	1502	0	1693	3390	1482	1645	3390	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					267				149			
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		97.1			121.2			359.3			655.9	
Travel Time (s)		7.0			8.7			16.2			29.5	
Confl. Peds. (#/hr)							2		1	1		2
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
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	2%	2%	2%	5%	2%	2%
Adj. Flow (vph)	0	0	0	187	0	274	4	802	43	98	958	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	187	274	0	4	802	43	98	958	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			7.4			7.4	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		1.6			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2		1	2		1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	
Leading Detector (m)	6.1	30.5		6.1	30.5		6.1	30.5	6.1	6.1	30.5	
Trailing Detector (m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Position(m)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Size(m)	6.1	1.8		6.1	1.8		6.1	1.8	6.1	6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(m)		28.7			28.7			28.7			28.7	
Detector 2 Size(m)		1.8			1.8			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

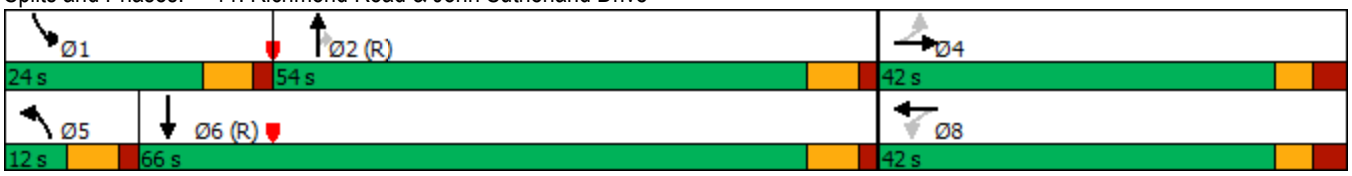


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type				Perm	NA		Prot	NA	Perm	Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			
Detector Phase	4	4		8	8		5	2	2	1	6	
Switch Phase												
Minimum Initial (s)	10.0	10.0		10.0	10.0		5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	37.6	37.6		37.6	37.6		11.4	29.4	29.4	11.4	29.4	
Total Split (s)	42.0	42.0		42.0	42.0		12.0	54.0	54.0	24.0	66.0	
Total Split (%)	35.0%	35.0%		35.0%	35.0%		10.0%	45.0%	45.0%	20.0%	55.0%	
Yellow Time (s)	3.3	3.3		3.3	3.3		4.6	4.6	4.6	4.6	4.6	
All-Red Time (s)	3.3	3.3		3.3	3.3		1.8	1.8	1.8	1.8	1.8	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)		6.6		6.6	6.6		6.4	6.4	6.4	6.4	6.4	
Lead/Lag							Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)				22.4	22.4		5.9	65.8	65.8	12.4	82.0	
Actuated g/C Ratio				0.19	0.19		0.05	0.55	0.55	0.10	0.68	
v/c Ratio				0.74	0.55		0.05	0.43	0.05	0.58	0.41	
Control Delay				62.7	9.3		73.5	6.2	0.1	64.0	10.8	
Queue Delay				0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay				62.7	9.3		73.5	6.2	0.1	64.0	10.8	
LOS				E	A		E	A	A	E	B	
Approach Delay					31.0			6.2			15.8	
Approach LOS					C			A			B	
Queue Length 50th (m)				38.8	1.3		0.9	9.9	0.0	20.6	39.6	
Queue Length 95th (m)				56.2	20.3		m2.2	28.0	0.2	35.1	88.1	
Internal Link Dist (m)		73.1			97.2			335.3			631.9	
Turn Bay Length (m)							40.0		35.0	40.0		
Base Capacity (vph)				398	631		84	1858	879	241	2315	
Starvation Cap Reductn				0	0		0	0	0	0	0	
Spillback Cap Reductn				0	0		0	0	0	0	0	
Storage Cap Reductn				0	0		0	0	0	0	0	
Reduced v/c Ratio				0.47	0.43		0.05	0.43	0.05	0.41	0.41	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 15.3		Intersection LOS: B	
Intersection Capacity Utilization 66.2%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: Richmond Road & John Sutherland Drive



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	1201	19	8	545	149	30	2	14	87	6	74
Future Volume (vph)	161	1201	19	8	545	149	30	2	14	87	6	74
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		0.99			0.99	
Frt			0.850			0.850		0.959			0.940	
Flt Protected	0.950			0.950				0.968			0.975	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1642	0	0	1581	0
Flt Permitted	0.950			0.950				0.756			0.812	
Satd. Flow (perm)	1644	3357	1461	1645	3357	1442	0	1282	0	0	1313	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			145		14			53	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			150.3	
Travel Time (s)		19.2			19.4			29.3			10.8	
Confl. Peds. (#/hr)	2		4	4		2	2		6	6		2
Confl. Bikes (#/hr)			1			6			2			
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	161	1201	19	8	545	149	30	2	14	87	6	74
Shared Lane Traffic (%)												
Lane Group Flow (vph)	161	1201	19	8	545	149	0	46	0	0	167	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Baseline Rd/John Sutherland Dr/Valley Stream Dr
Total2035 AM Peak

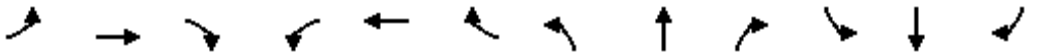
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	32.2	32.2	11.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	15.1	36.3	36.3	11.2	32.4	32.4	37.5	37.5		37.5	37.5	
Total Split (%)	17.8%	42.7%	42.7%	13.2%	38.1%	38.1%	44.1%	44.1%		44.1%	44.1%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	13.4	54.1	54.1	5.6	36.7	36.7		16.0			16.0	
Actuated g/C Ratio	0.16	0.64	0.64	0.07	0.43	0.43		0.19			0.19	
v/c Ratio	0.62	0.56	0.02	0.07	0.38	0.21		0.18			0.58	
Control Delay	47.1	13.9	0.1	33.0	22.6	10.9		20.5			27.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	47.1	13.9	0.1	33.0	22.6	10.9		20.5			27.5	
LOS	D	B	A	C	C	B		C			C	
Approach Delay		17.6			20.2			20.5			27.5	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	22.0	37.7	0.0	1.1	24.7	0.0		4.2			16.0	
Queue Length 95th (m)	#57.0	#136.1	0.0	m4.5	61.4	26.4		9.4			25.4	
Internal Link Dist (m)		349.9			354.0			301.9			126.3	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	259	2135	974	108	1451	705		476			512	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.62	0.56	0.02	0.07	0.38	0.21		0.10			0.33	

Intersection Summary			
Area Type:	Other		
Cycle Length: 85			
Actuated Cycle Length: 85			
Offset: 41 (48%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 19.2		Intersection LOS: B	
Intersection Capacity Utilization 67.2%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	731	57	14	1203	67	38	4	12	122	5	106
Future Volume (vph)	42	731	57	14	1203	67	38	4	12	122	5	106
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	35.0		115.0	35.0		25.0	0.0		0.0	0.0		0.0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (m)	30.0			25.0			7.6			7.6		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		0.97	1.00		0.97		1.00			0.99	
Frt			0.850			0.850		0.970			0.939	
Flt Protected	0.950			0.950				0.966			0.974	
Satd. Flow (prot)	1647	3357	1502	1647	3357	1488	0	1661	0	0	1576	0
Flt Permitted	0.950			0.950				0.681			0.807	
Satd. Flow (perm)	1645	3357	1454	1642	3357	1446	0	1171	0	0	1300	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			106			106		12			44	
Link Speed (k/h)		70			70			40			50	
Link Distance (m)		373.9			378.0			325.9			150.3	
Travel Time (s)		19.2			19.4			29.3			10.8	
Confl. Peds. (#/hr)	3		4	4		3			9	9		
Confl. Bikes (#/hr)			5			3						3
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
Heavy Vehicles (%)	5%	3%	3%	5%	3%	4%	2%	2%	3%	5%	2%	5%
Adj. Flow (vph)	42	731	57	14	1203	67	38	4	12	122	5	106
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	731	57	14	1203	67	0	54	0	0	233	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.7			3.7			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.9			4.9			4.9			4.9	
Two way Left Turn Lane												
Headway Factor	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
Turning Speed (k/h)	24		14	24		14	24		14	24		14
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (m)	2.0	10.0	6.1	6.1	10.0	2.0	6.1	30.5		6.1	30.5	
Trailing Detector (m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Position(m)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Size(m)	2.0	0.6	6.1	6.1	0.6	2.0	6.1	1.8		6.1	1.8	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(m)		9.4			9.4			28.7			28.7	
Detector 2 Size(m)		0.6			0.6			1.8			1.8	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

Baseline Rd/John Sutherland Dr/Valley Stream Dr
Total2035 PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	11.2	32.2	32.2	11.2	32.2	32.2	37.5	37.5		37.5	37.5	
Total Split (s)	12.0	51.3	51.3	11.2	50.5	50.5	37.5	37.5		37.5	37.5	
Total Split (%)	12.0%	51.3%	51.3%	11.2%	50.5%	50.5%	37.5%	37.5%		37.5%	37.5%	
Yellow Time (s)	4.2	4.2	4.2	4.2	4.2	4.2	3.3	3.3		3.3	3.3	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.2	3.2		3.2	3.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Lost Time (s)	6.2	6.2	6.2	6.2	6.2	6.2		6.5			6.5	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?												
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Act Effct Green (s)	7.0	64.4	64.4	5.9	58.4	58.4		20.6			20.6	
Actuated g/C Ratio	0.07	0.64	0.64	0.06	0.58	0.58		0.21			0.21	
v/c Ratio	0.37	0.34	0.06	0.15	0.61	0.08		0.22			0.77	
Control Delay	53.6	10.6	0.6	58.7	12.8	0.4		26.2			45.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	53.6	10.6	0.6	58.7	12.8	0.4		26.2			45.9	
LOS	D	B	A	E	B	A		C			D	
Approach Delay		12.1			12.6			26.2			45.9	
Approach LOS		B			B			C			D	
Queue Length 50th (m)	7.2	25.9	0.0	2.6	82.6	0.0		6.2			32.3	
Queue Length 95th (m)	17.3	61.3	1.2	m5.6	37.5	0.6		13.7			49.7	
Internal Link Dist (m)		349.9			354.0			301.9			126.3	
Turn Bay Length (m)	35.0		115.0	35.0		25.0						
Base Capacity (vph)	116	2162	974	96	1960	888		371			433	
Starvation Cap Reductn	0	0	0	0	0	0		0			0	
Spillback Cap Reductn	0	0	0	0	0	0		0			0	
Storage Cap Reductn	0	0	0	0	0	0		0			0	
Reduced v/c Ratio	0.36	0.34	0.06	0.15	0.61	0.08		0.15			0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 71 (71%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 62.5%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Valley Stream Drive/John Sutherland Drive & Baseline Road

