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320 Lees Avenue (2 Robinson Avenue)

Transportation Impact Assessment

320 Lees Avenue (2 Robinson Avenue)

Transportation Impact Assessment

Prepared By:

NOVATECH
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
K2M 1P6

Dated: November 16, 2021
Revised: March 22, 2022
Revised: October 6, 2022
Revised: November 1, 2023
Revised: January 25, 2024

Novatech File: 119171
Ref: R-2020-126

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Engineers, Planners & Landscape Architects

January 25, 2024

City of Ottawa
Planning, Real Estate, and Economic Development
110 Laurier Ave. W., 4th Floor,
Ottawa, Ontario K1P 1J1

Ministry of Transportation
Corridor Management Section
1355 John Counter Blvd.
Kingston, ON K7L 5A3

Attention: **Mr. Mike Giampa**
Senior Transportation Engineer
Infrastructure Applications

Attention: **Mr. Tarique Kamal**
Senior Project Manager
East Operations

Dear Sirs:

Reference: **320 Lees Avenue (2 Robinson Avenue)**
Revised Transportation Impact Assessment Report
Novatech File No. 119171

We are pleased to submit the following revised Transportation Impact Assessment report in support of a Site Plan Control application for Phase 1 of the development at the above address. The structure and format of this report is in accordance with the Ministry of Transportation of Ontario (MTO) Traffic Impact Study Guidelines (February 2021) and the City of Ottawa Transportation Impact Assessment Guidelines (June 2017).

A TIA report was submitted in November 2021 and revised in March 2022, October 2022, and November 2023 in support of a Site Plan Control application for Phase 1 of the development. This report has been revised to address changes to the Site Plan and proposed roadway modifications.

A TIA report was submitted in December 2020 and revised in June 2021 in support of Zoning By-law Amendment and Official Plan Amendment applications for the above address. This report will reference the previous TIA report and include a review of the on-site provisions and review any transportation related impacts from the previous submission.

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

Yours truly,

NOVATECH

Joshua Audia, P.Eng.
Project Engineer | Transportation

Suite 200, 240 Michael Cowpland Drive, Ottawa ON K2M 1P6 Tel: 613.254.9643 Fax: 613.254.5867 www.novatech-eng.com

Certification Form for Transportation Impact Assessment (TIA) Study Program Manager

TIA Plan Reports

On April 14, 2022, the Province's Bill 109 received Royal Assent providing legislative direction to implement the More Homes for Everyone Act, 2022 aiming to increase the supply of a range of housing options to make housing more affordable. Revisions have been made to the TIA guidelines to comply with Bill 109 and streamline the process for applicants and staff.

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

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

Certification

- ☑ I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines (Update Effective July 2023);
- ☑ I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
- ☑ I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and

City of Ottawa
Transportation Engineering Services
Planning, Real Estate and Economic Development
110 Laurier Avenue West, 4th fl.
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Fax: 613-560-6006

☑ I am either a licensed or registered[1] professional in good standing, whose field of expertise [check ✓ appropriate field(s)]:

- ☑ is either transportation engineering
- ☐ or transportation planning.

Dated at Ottawa (City) this 25th day of January, 20 24.

Name: Jennifer Luong, P.Eng.

Professional Title: Senior Project Manager

Jennifer Luong

Signature of Individual certifier that they meet the above four criteria

Office Contact Information (Please Print)	
Address:	240 Michael Cowpland Drive, Suite 200
City / Postal Code:	Ottawa, ON K2M 1P6
Telephone / Extension:	613-254-9643 x 254
E-Mail Address:	j.luong@novatech-eng.com

Stamp

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

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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) report has been prepared in support of a Site Plan Control application for Phase 1 of the development at 320 Lees Avenue (2 Robinson Avenue). A TIA report was submitted in December 2020 and revised in June 2021 in support of Zoning By-law Amendment and Official Plan Amendment applications for the above address.

The site was previously occupied by an industrial building and parking lot. The building was last used as the Iranian culture centre, which has since been demolished. Two existing accesses to the site are found on Lees Avenue. The site's easterly access is approximately 85m west of Chapel Crescent and 20m east of Robinson Avenue, while the site's westerly access is approximately 70m west of Robinson Avenue and 80m east of the Highway 417 Westbound Off-Ramp, measured from nearest edge to nearest edge. An eastbound left turn lane was previously provided at the site's westerly access.

Based on the property parcels shown on GeoOttawa, the subject site consists of four parcels addressed as 320 Lees Avenue (2 Robinson Avenue). Prior to the approval of the Official Plan Amendment 265 and Zoning By-law 2021-234, the majority of the site was zoned Transit Oriented Development Zoned (TD), with the southern portion (fronting Lees Avenue) zoned at TD2 and the northern portion zoned TD1. The northern extent of the site was zoned as I1A (Minor Institutional Zone). The Zoning By-law Amendment, approved by City Council on October 13, 2021, facilitated the rezoning of the site to TD2, with site-specific exemptions, and Parks and Open Spaces, Subzone A (O1A) to accommodate the parkland space at the corner of Lees Avenue and Chapel Crescent. The proposed development is compliant with the approved TD2 and O1A zoning of the subject site.

The northern portion of the site is proposed to contain a 28-storey building on a six-storey podium while the southern portion of the site (fronting Lees Avenue) is proposed to contain one 28-storey building on a six-storey podium and two 32-storey buildings on a six-storey podium. A total of 1,534 apartment units are proposed, with 450 units in Buildings A, 738 units in Buildings B and C, and 346 units in Building D. Building A will also include 13,305 square feet of commercial space while Buildings B and C will include 13,915 square feet of commercial space.

Access to the site is proposed via two connections to Lees Avenue, with the main access tying in to form the north leg of the Lees Avenue/Robinson Avenue intersection, and the secondary access at the west of the site. The main access is proposed to restrict left turns out at Phase 1, and may be a signalized full-movement access at ultimate buildout. The west access is proposed to restrict left turns in and right turns out. A total of 934 vehicular parking spaces and 1,834 bicycle parking spaces are proposed. The first phase, which includes Building A as well as both accesses to Lees Avenue, was anticipated to be constructed by 2023. Full buildout of the site is anticipated by 2027.

The current concept for the site includes a total of 1,534 apartment units and 27,220 square feet of ground floor commercial. The previous concept from the June 2021 TIA included a total of 1,463 units (377 units in Building A, 735 units in Buildings B and C, and 351 units in Building D) and 29,000 square feet of ground floor commercial space. The revised concept represents a decrease of 1,780 square feet of commercial space and an increase of 71 apartment units compared to the June 2021 TIA.

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

Development Design

- Pedestrian connections will be provided between the main podium entrances and the sidewalk along Lees Avenue. A sidewalk will be provided along the vehicular accesses, linking to an internal pathway system within the site and connecting to the main entrance for residential tower D.
- An east-west pathway is proposed along the north end of the site connecting to Chapel Crescent and the western property limit. This pathway effectively reinstates the existing pathway in this location that is currently fenced off.
- A total of 1,782 bicycle parking spaces will be provided indoors and 52 bicycle parking spaces will be provided outdoors.
- One bicycle repair station and bicycle wash station will be included in each building's main bike room, for a total of four bicycle repair and wash stations.
- Cyclist access to the site will be accommodated through shared use lanes at the two vehicular accesses. The proposed bicycle parking is anticipated to exceed the minimum requirements of the City's Zoning By-law.
- All required Transportation Demand Management (TDM)-supportive design and infrastructure measures in the TDM checklist are met.

Parking

- Approximately 198 vehicle parking spaces and 347 bicycle parking spaces will be provided for Phase 1 of the development.
- Approximately 934 vehicle parking spaces and 1,834 bicycle parking spaces are anticipated to be provided for the overall development.
- The vehicular and bicycle parking will conform to the requirements of the Zoning By-law.

Boundary Streets

- There is a clear pedestrian desire line between the walkway provided on the north edge of the site and the pathway on the east side of Chapel Crescent. A Roadway Modification Approval (RMA) report has been submitted under separate cover and includes a PXO (Type D) at this location.

Access Intersections

- The required eastbound left turn storage length and taper at the west access is unachievable. Therefore, it is recommended that left turns into the west access be prohibited.
- Due to the curvilinear alignment of Lees Avenue between the two accesses, the podium for building A limits the ISD. A maximum ISD of 90m looking left to turn right from the west access is available, and a maximum ISD of 104m looking right to turn left is available at the east access.
- It is recommended that right turns out of the west access be prohibited, due to insufficient sight lines looking left. To restrict the left turns in and right turns out of the west access, a traffic island and signage will be provided.
- It is also recommended that left turns out of the east access be prohibited, due to insufficient sight lines looking right, as part of Phase 1. To restrict the left turns out of the east access, a traffic island and signage will be provided.
- At ultimate buildout, if signalization of the east access/Robinson Avenue is required from a delay perspective, the left-out restriction will be removed, allowing for a signalized, full-movement access. This will be confirmed in a subsequent TIA in support of future phases.

- The existing bike lanes along Lees Avenue transition to shared use lanes in advance of the Chapel Crescent and Robinson Avenue back-to-back left turn lanes. As an eastbound left turn lane is required at the site's east access, a cycle track is proposed in the westbound direction along the site's frontage. In the eastbound direction, it is proposed that the shared use lane be extended further west along the extents of the proposed left turn lane.
- The west and east accesses will have widths of approximately 10.5m and 15m, respectively (as measured at the property line). This does not conform to the requirements of the Private Approach By-law. The widths of these accesses are required to accommodate an HSU design vehicle, and to develop traffic islands to restrict left turns in and right turns out at the west access, and left turns out at the east access. A waiver to the Private Approach By-law is requested to allow for the wider accesses.
- A distance of 2.4m is provided between the west access and the adjacent property line. As a baseball diamond is currently provided on the adjacent property west of the site, a new access to the adjacent property in close proximity to the proposed access is not anticipated in the future. As such, a waiver to the Private Approach By-law is requested for the proximity of the west access to the property line.
- The proposed 30m clear throat length at the west access can accommodate four vehicles prior to spilling over onto the roadway. As the traffic entering this access only equates to less than one vehicle every six minutes during the AM and PM peak hours, spillover of queued vehicles onto Lees Avenue is not anticipated.
- The distance between the west access and the northbound right turn movement at the Lees Avenue/Highway 417 Westbound Off-ramp intersection is approximately 60m and does not meet the TAC corner clearance spacing requirement of 70m.

Transportation Demand Management

- The proposed development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle and transit systems.
- The following measures will be implemented within the proposed development:
    - Designate an internal coordinator, or contract with an external coordinator;
    - Display local area maps with walking/cycling access routes and key destinations at major entrances;
    - Display relevant transit schedules and route maps at entrances;
    - Unbundle parking from monthly rent; and
    - Provide multimodal travel option information package to new residents.

Transit

- The proposed development is not anticipated to have a significant impact on the existing operations of OC Transpo Route 16 and 56.
- The additional trips generated by the development are not anticipated to result in increased service for Route 55 at stop #6803 and #6806.
- No capacity deficiencies are anticipated for Line 1 at Lees Station.

The proposed development is recommended from a transportation perspective.

1.0 INTRODUCTION

A Transportation Impact Assessment (TIA) report was submitted in December 2020 and revised in June 2021 in support of Zoning By-law Amendment and Official Plan Amendment applications at 320 Lees Avenue (2 Robinson Avenue). This TIA report has been prepared in support of a Site Plan Control application for Phase 1 of the development at 320 Lees Avenue (2 Robinson Avenue).

The location and surrounding context are shown in **Figure 1**. The subject site is surrounded by the following:

- Residential dwellings to the north;
- Chapel Crescent to the east;
- Lees Avenue to the south; and
- An arena and sports field to the west.

Figure 1: View of the Subject Site

The site was previously occupied by an industrial building and parking lot. The building was last used as the Iranian culture centre, which has since been demolished. Two existing accesses to the site are found on Lees Avenue. The site's easterly access is approximately 85m west of Chapel Crescent and 20m east of Robinson Avenue, while the site's westerly access is approximately 70m west of Robinson Avenue and 80m east of the Highway 417 Westbound Off-Ramp, measured from nearest edge to nearest edge. An eastbound left turn lane was previously provided at the site's westerly access.

2.0 PROPOSED DEVELOPMENT

Based on the property parcels shown on GeoOttawa, the subject site consists of four parcels addressed as 320 Lees Avenue (2 Robinson Avenue).

Prior to the approval of the Official Plan Amendment 265 and Zoning By-law 2021-234, the majority of the site was zoned Transit Oriented Development Zoned (TD), with the southern portion (fronting Lees Avenue) zoned at TD2 and the northern portion zoned TD1. The northern extent of the site was zoned as I1A (Minor Institutional Zone). The Zoning By-law Amendment, approved by City Council on October 13, 2021, facilitated the rezoning of the site to TD2, with site-specific exemptions, and Parks and Open Spaces, Subzone A (O1A) to accommodate the parkland space at the corner of Lees Avenue and Chapel Crescent. The proposed development is compliant with the approved TD2 and O1A zoning of the subject site.

The northern portion of the site is proposed to contain a 28-storey building on a six-storey podium while the southern portion of the site (fronting Lees Avenue) is proposed to contain one 28-storey building on a six-storey podium and two 32-storey buildings on a six-storey podium. A total of 1,534 apartment units are proposed, with 450 units in Buildings A, 738 units in Buildings B and C, and 346 units in Building D. Building A will also include 13,305 square feet of commercial space while Buildings B and C will include 13,915 square feet of commercial space.

Access to the site is proposed via two connections to Lees Avenue, with the main access tying in to form the north leg of the Lees Avenue/Robinson Avenue intersection, and the secondary access at the west of the site. The main access is proposed to restrict left turns out at Phase 1, and may be a signalized full-movement access at ultimate buildout. The west access is proposed to restrict left turns in and right turns out. A total of 934 vehicular parking spaces and 1,834 bicycle parking spaces are proposed.

The first phase, which includes Building A as well as both accesses to Lees Avenue, was anticipated to be constructed by 2023. Full buildout of the site is anticipated by 2027.

A copy of the site plan is included in **Appendix A**.

3.0 SCREENING

3.1 Screening Form

The City's 2017 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. 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 Trigger – The development is located in a Protected Major Transit Station Area (Lees Station; further assessment is **required** based on this trigger.
- Safety Trigger – The proposed driveways will have limited sightlines and are located within the area of influence of an adjacent traffic signal; further assessment is **required** based on this trigger.

The proposed development satisfies all three triggers for completing a TIA. A copy of the TIA screening form is included in **Appendix B**.

4.0 SCOPING

4.1 Existing Conditions

This section provides a review of existing conditions in the vicinity of the subject site including: roadways, intersections, driveways, pedestrian and cycling facilities, transit, area traffic management measures, traffic volumes, and collision records.

4.1.1 Roadways

The roadway network of the greater area surrounding the subject site is illustrated in **Figure 2**.

Highway 417 falls under the jurisdiction of the Ministry of Transportation of Ontario (MTO). All other study area roadways fall under the jurisdiction of the City of Ottawa.

Highway 417 is an east-west divided freeway with a posted speed limit of 100km/h. Within the vicinity of the subject site, three lanes are provided in each direction.

Lees Avenue is an arterial roadway with a two-lane undivided cross-section, and is classified as a truck route, allowing full loads. The roadway has a posted speed limit of 50km/h in the vicinity of the subject site, and generally runs on an east-west alignment between Main Street and King Edward Avenue, looping over Highway 417. The City of Ottawa's Official Plan identifies a right-of-way (ROW) protection on Lees Avenue of 23m between Main Street and Robinson Avenue, and 26m between Robinson Avenue and Mann Avenue. It is anticipated that no widening will be required as part of this development. For the purpose of this report, Lees Avenue will be identified as east-west from Mann Avenue to Chapel Crescent, and north-south at the intersection with UOttawa/Lees Campus.

Robinson Avenue is a local roadway with a two-lane undivided cross-section and is not classified as a truck route. The roadway has an unposted speed limit of 50km/h under the Highway Traffic Act, and generally runs on an east-west alignment between Lees Avenue and Hurdman Road.

Chapel Crescent is a north-south roadway that is classified as a local road from Lees Avenue to Mann Avenue and continues as Chapel Street north of Mann Avenue, where it is classified as a collector roadway. Between the two intersections with Wiggins Private, Chapel Crescent is open to transit and non-auto modes only. The roadway has a posted speed limit of 40km/h and an undivided two-lane urban cross section.

Figure 2: Roadway Network

Mann Avenue is a collector roadway with a two-lane undivided cross-section and a posted speed limit of 40km/h. Bulb-outs and speed humps are provided along Mann Avenue. Street parking is permitted on both sides of the roadway. Mann Avenue is not classified as a truck route.

King Edward Avenue is a north-south arterial roadway that runs from the MacDonald-Cartier Bridge to Mann Avenue. Within the vicinity of the subject site, it has an undivided two-lane cross-section, with a posted speed limit of 40km/h and street parking on the east side of the roadway. King Edward Avenue is not classified as a truck route within the vicinity of the subject site.

Greenfield Avenue is a two-lane arterial roadway with a regulatory speed of 50km/h. The road has a divided cross-section with no parking permitted north of Concord Street and is undivided with parking permitted on both sides south of Concord Street. Greenfield Avenue is classified as a truck route, allowing full loads.

The access roadway to the UOttawa Lees Campus has a posted speed limit of 30km/h and a two-lane undivided urban cross section.

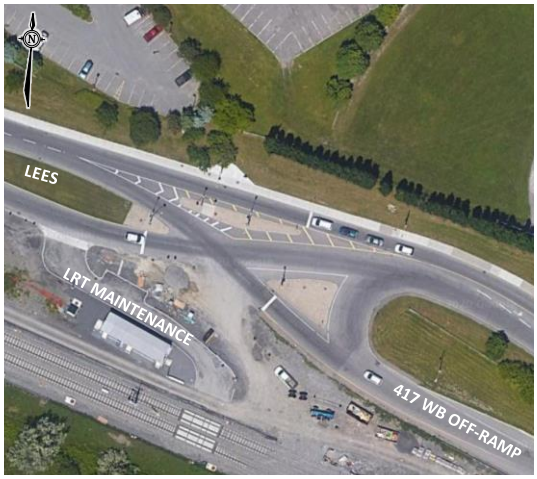
4.1.2 Intersections

Lees Avenue/King Edward Avenue/ Mann Avenue/Greenfield Avenue

- Signalized intersection
- Eastbound/Westbound: one left turn lane and one shared through/right turn lane
- Southbound: one left turn lane, one through lane, and one stop controlled right turn channel
- Northbound: one left turn lane, one through lane, and one yield right turn channel
- Standard crosswalks on all approaches

Lees Avenue/417 Westbound Off-Ramp

- Signalized intersection
- Eastbound/Westbound: one through lane
- Northbound: one left turn lane and one channelized right turn lane
- No pedestrian crossing
- Previously, this intersection had a fourth southerly leg as the transitway was tied in. With the conversion of the transitway to LRT tracks, this driveway has since been closed and an LRT maintenance access is included along Lees Avenue west of the 417 Westbound Off-Ramp intersection (pictured here under construction).



Lees Avenue/Robinson Avenue

- Unsignalized intersection, with stop control on Robinson Avenue and free flow on Lees Avenue
- Northbound: one shared left/right turn lane
- Eastbound: one shared through/right turn lane
- Westbound: one left turn lane, one through lane
- No pedestrian crossing

Lees Avenue/Chapel Crescent

- Unsignalized intersection, with stop control on Chapel Crescent and free flow on Lees Avenue
- Southbound: one shared left/right turn lane
- Eastbound: one left turn lane, one through lane
- Westbound: one shared though/right turn lane
- Standard pedestrian crossing on the north approach

Lees Avenue/UOttawa Lees Campus

- Signalized intersection
- Eastbound/Westbound: one left turn lane, one shared through/right turn lane
- Northbound/Southbound: one shared all movement lane
- Bike lanes are provided on the east, west, and south legs
- Standard pedestrian crossing on all approaches

4.1.3 Driveways

In accordance with the City's 2017 TIA guidelines, a review of adjacent driveways along the boundary roads (within 200m of the subject site) is provided as follows:

- A maintenance access to the light rail track is provided just west of the Lees Avenue/Highway 417 Westbound Off-Ramp intersection. Previously this was an access to/from the Transitway and formed an extra leg at the intersection, however it has since been relocated to the west of the intersection.
- A lay-by is provided to the building at 721 Chapel Crescent (north of the Chapel Crescent/Wiggins Private intersection).

No other driveways are located within 200m of the subject site.

4.1.4 Pedestrian and Cycling Facilities

The existing pedestrian and cycling infrastructure provided in the greater area surrounding the subject site is illustrated in **Figure 3**. The City's Ultimate Cycling Network within the vicinity of the subject site is shown in **Figure 4**.

The City of Ottawa's 2013 Cycling Plan identifies Chapel Crescent, Robinson Avenue east of Hurdman Road and Lees Avenue between Robinson Avenue and the UOttawa Lees Campus as Local Routes in the Ultimate Cycling Network. Lees Avenue south of the UOttawa Lees Campus is identified as a Spine Cycling Route, and Robinson Avenue between Hurdman Road and Lees Avenue is identified as a Major Pathway.

The City of Ottawa recently installed cycling improvements along Lees Avenue from Mann Avenue to the UOttawa Lees Campus. The design for City cycling improvements is included in **Appendix C**. The cycling design includes a 1.5m bike lane with a 0.4m painted buffer from the Highway 417 Off-Ramp to Robinson Avenue, transitioning to shared use lanes between Robinson Avenue and Chapel Crescent, and bike lanes continuing from Chapel Crescent to approximately 80m east of Chapel Crescent, tying into the existing on-street bike lanes to the east.

A multi-use pathway (MUP) is provided along the north side of Lees Avenue from Hurdman Road to Chapel Crescent, and is planned to continue north of the subject site, linking Chapel Crescent with the arena to the west and Mann Avenue. A MUP is also provided along the east side of the LRT tracks, north of Lees Avenue and along both sides south of Lees Avenue. A MUP is provided along the west side of the Rideau River, which crosses below Highway 417 and connects Robinson Avenue with the UOttawa Lees Campus, with a crossing for the Rideau River at the campus.

A pedestrian crossover is provided on Lees Avenue, approximately 70m east of Chapel Crescent.

Sidewalks are provided along both sides of King Edward Avenue, Mann Avenue, Greenfield Avenue, Chapel Crescent, and the access to the UOttawa Lees Campus. A sidewalk is provided on Robinson Avenue, east of Hurdman Avenue. A sidewalk is provided along the east/south side of Lees Avenue for its extent, and a sidewalk is provided on the west side, north of the 417 Westbound Off-Ramp and south of the Highway 417 underpass. A sidewalk is provided on the north side of Lees Avenue between Main Street and the Lees Avenue/Highway 417 underpass.

Figure 3: Existing Pedestrian and Cycling Infrastructure

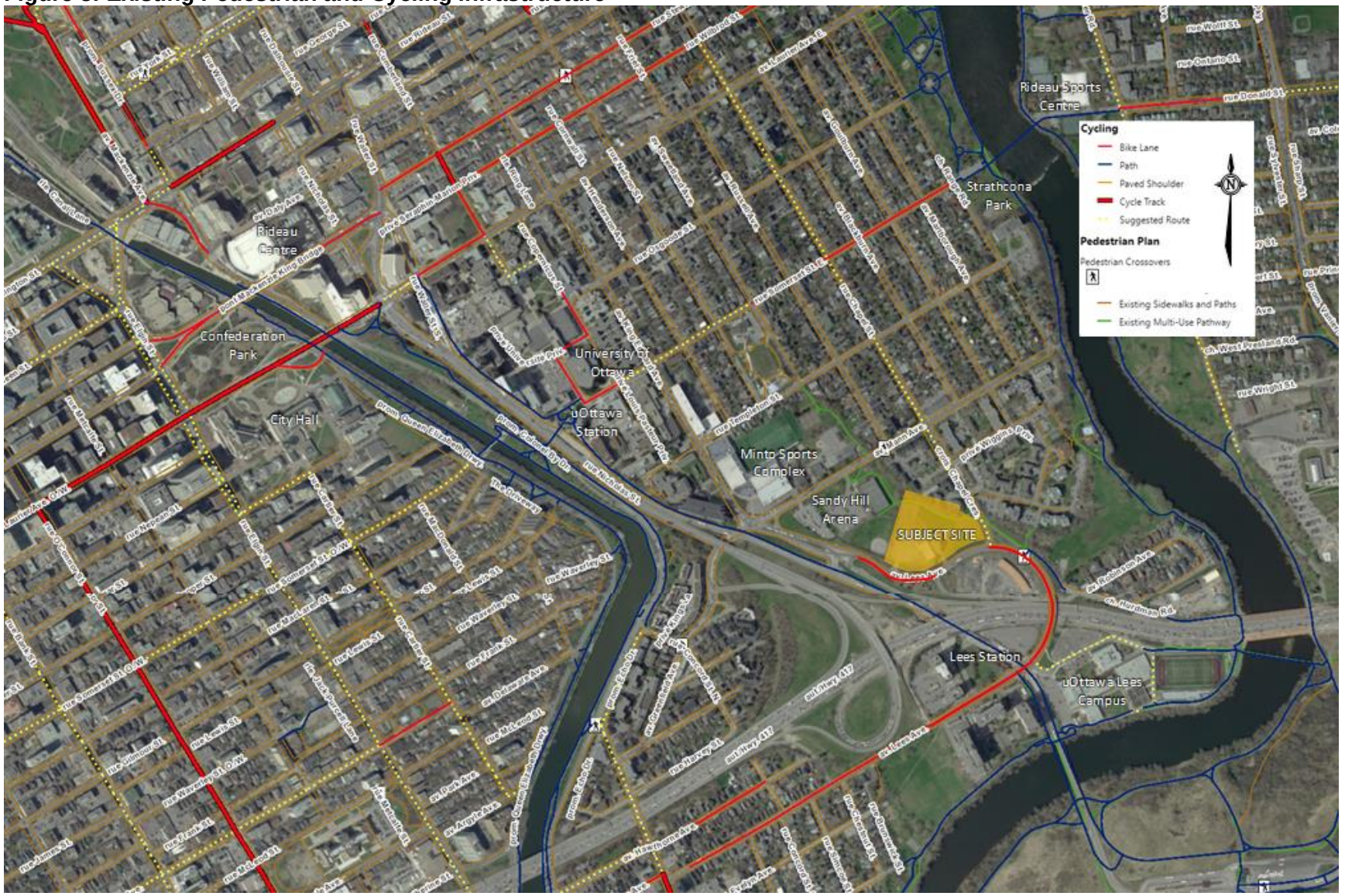
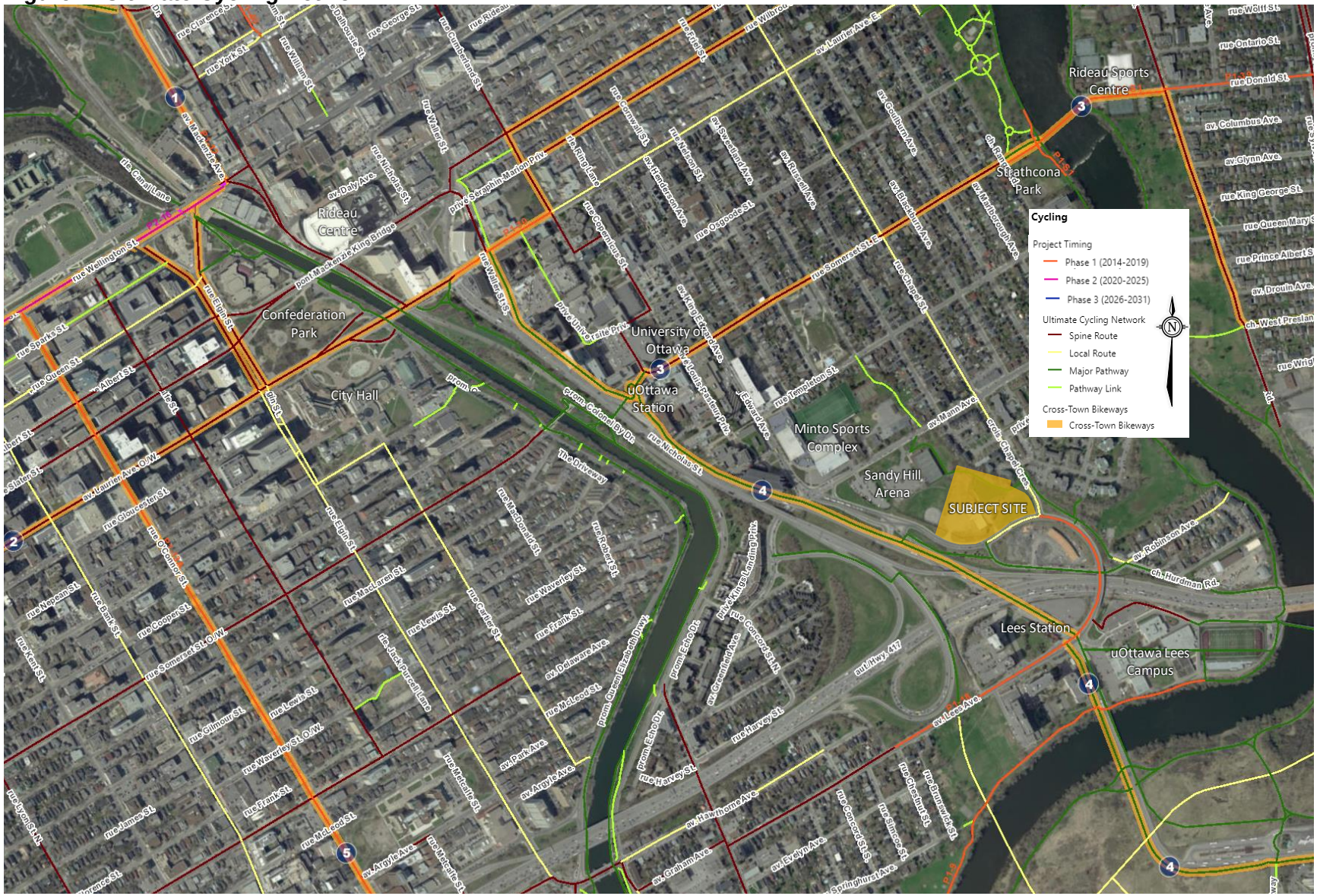


Figure 4: Ultimate Cycling Network



4.1.5 Transit

The nearest transit stops to the subject site are located at the PXO crossing on Lees Avenue (approximately 70m east of Chapel Crescent). Additionally, Lees LRT station is located at approximately 450m walking distance from the proposed site. An aerial depicting the nearest transit stops can be found in **Figure 5**. The location of the nearest OC Transpo transit stops, and the route(s) serviced at each stop is summarized in **Table 1**. OC Transpo Route information is included in **Appendix D**.

Figure 5: OC Transpo Transit Stops

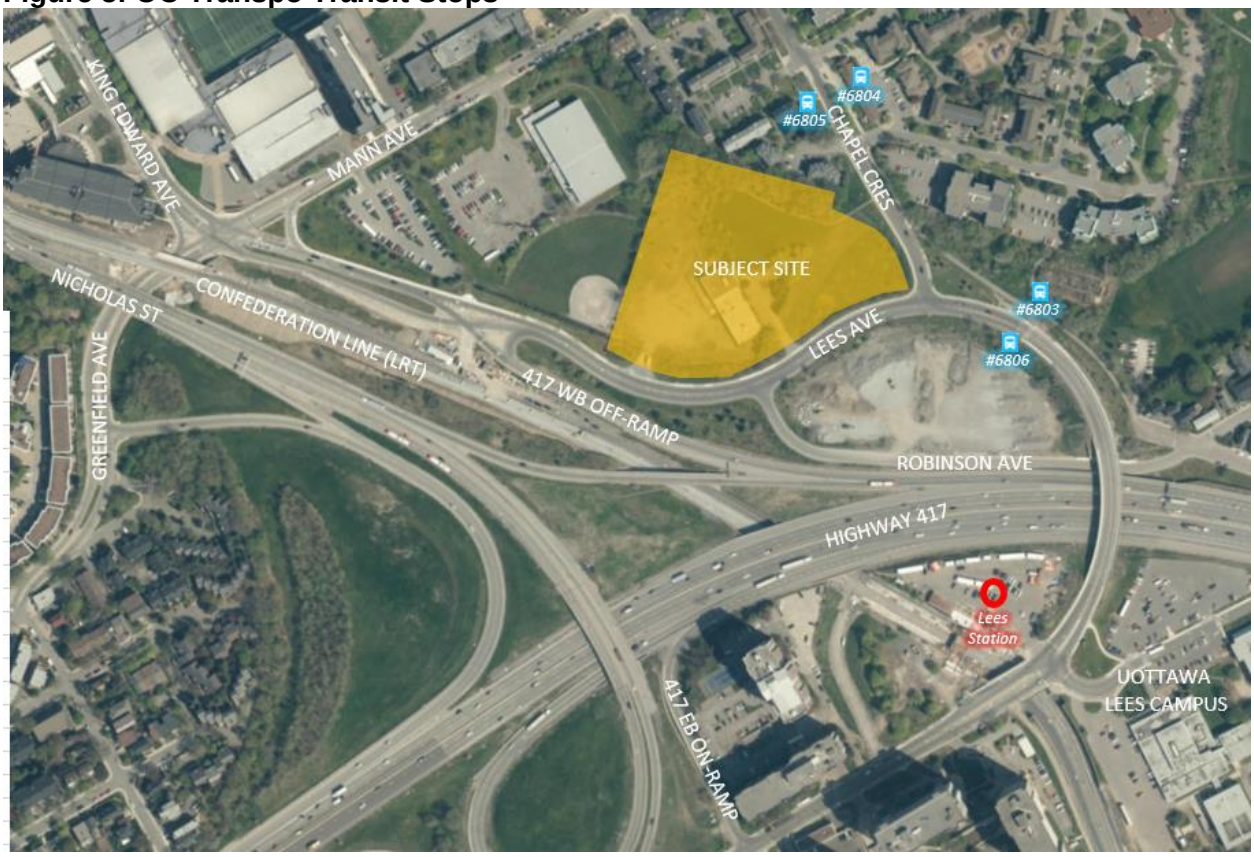


Table 1: OC Transpo Transit Stops

OC Transpo Stop	Location	Route(s) Serviced
#6803	North side of Lees Avenue, approximately 70m east of Chapel Crescent	16, 55, 56
#6804	East side of Chapel Crescent, between Wiggins Private and Wiggins Private	16, 55, 56
#6805	West side of Chapel Crescent, between Wiggins Private and Wiggins Private	16, 55, 56
#6806	South side of Lees Avenue, approximately 70m east of Chapel Crescent	16, N39, N45, 55, 56, N97
Lees Station	West side of Lees Avenue, across from the UOttawa Lees Campus	1, 16, N39, N45, 55, 56, N97

OC Transpo Route 16 travels from Main Street to Tunney's Pasture Transit Station, with select routes extending to Westboro Transit Station. It operates seven days a week, with all day service. Route 16 operates on 30-minute headways on weekdays and Saturdays and 30-minute to one-hour headways on Sundays.

OC Transpo Route 55 travels from Elmvale Transit Station to the Westgate Shopping Centre. It operates seven days a week, with all day service. Route 55 operates on 15- to 30- minute headways on weekdays and 30-minute headways on weekends.

OC Transpo Route 56 travels from King Edward to Tunney's Pasture Transit Station on weekdays. On weekends, it travels only from the Civic Hospital to Tunney's Pasture Transit Station. Route 56 operates on 30-minute headways.

OC Transpo Line 1 (Confederation Line) travels from Blair Station to Tunney's Pasture Station. It operates seven days a week, with all day service. The Confederation Line typically operates on headways of 5 minutes of less during peak periods, with a maximum headway of 15 minutes after midnight and during off-peak times on weekends. When the Confederation Line (LRT) is not running overnight, several routes are extended downtown, with extended service to Rideau Transit Station. These include Route 39 (for service from Blair Station to Millennium Station), Route 45 (for service from Hurdman Station to the Ottawa General Hospital), and Route 97 (for service from Hurdman Station to the Airport).

4.1.6 Existing Area Traffic Management Measures

Chapel Avenue is restricted to bus only travel between the two intersections with Wiggins Private. Bulb-outs and speed humps are provided along Mann Avenue. Currently, there are no other existing Area Traffic Management (ATM) measures within the study area.

4.1.7 Existing Traffic Volumes

As part of LRT construction, the Highway 417 eastbound on-ramp at Lees Avenue was restricted to bus-only travel in June 2013. This on-ramp has been re-opened to vehicular traffic (as of October 2019). New traffic counts have not been obtained for the study area intersections since the re-opening of the on-ramp. At the time of the previous submission of this TIA, collecting new turning movement counts would not have been reflective of typical traffic conditions due to COVID-19 restrictions. Updated counts since the pandemic are not available from the City. However, new counts will be conducted as part of the next Site Plan application, in support of subsequent phases of the proposed development.

Weekday traffic counts were obtained from the City of Ottawa at available intersections. A weekday traffic count was obtained from the 36 Robinson Avenue TIA (by CGH Transportation) for the Lees Avenue/Robinson Avenue intersection. The available weekday traffic counts were completed on the following dates:

- Lees Avenue/King Edward Avenue/ Mann Avenue/Greenfield Avenue — July 9, 2012 (Monday) and February 2, 2017 (Thursday)
- Lees Avenue/417 Westbound Off-Ramp — July 30, 2015 (Thursday)
- Lees Avenue/Robinson Avenue — January 9, 2019 (Wednesday)
- Chapel Crescent/Wiggins Private S — July 4, 2018 (Wednesday)
- Lees Avenue/UOttawa Lees Campus — May 20, 2011 (Friday)

- Lees Avenue/UOttawa Lees Campus February 22, 2018 (Thursday)

A comparison of the traffic counts at the Lees Avenue/King Edward Avenue/Mann Avenue/ Greenfield Avenue and Lees Avenue/UOttawa Lees Campus intersections from pre-2013 and post-2018 show that the eastbound/southbound volume on Lees Avenue substantially decreased following the closure of the Highway 417 eastbound on-ramp. As new traffic counts are not available since this ramp has re-opened, the eastbound/southbound traffic on Lees Avenue has been estimated using the pre-2013 traffic counts.

The northbound/westbound traffic on Lees Avenue and turning movements were estimated using the latest available traffic counts.

Turning movements at the Lees Avenue/Chapel Crescent intersection were derived from the weekday count at the Chapel Crescent/Wiggins Private S intersection, while through movements were estimated from the Lees Avenue/UOttawa Lees Campus traffic counts.

As there are no driveways along Lees Avenue between the study area intersections, through volumes along Lees Avenue have been balanced to within 10% of the higher adjacent intersection.

Existing traffic volumes along the study area roadways are shown in **Figure 6**. Peak hour summary sheets of the above traffic counts are included in **Appendix E**.

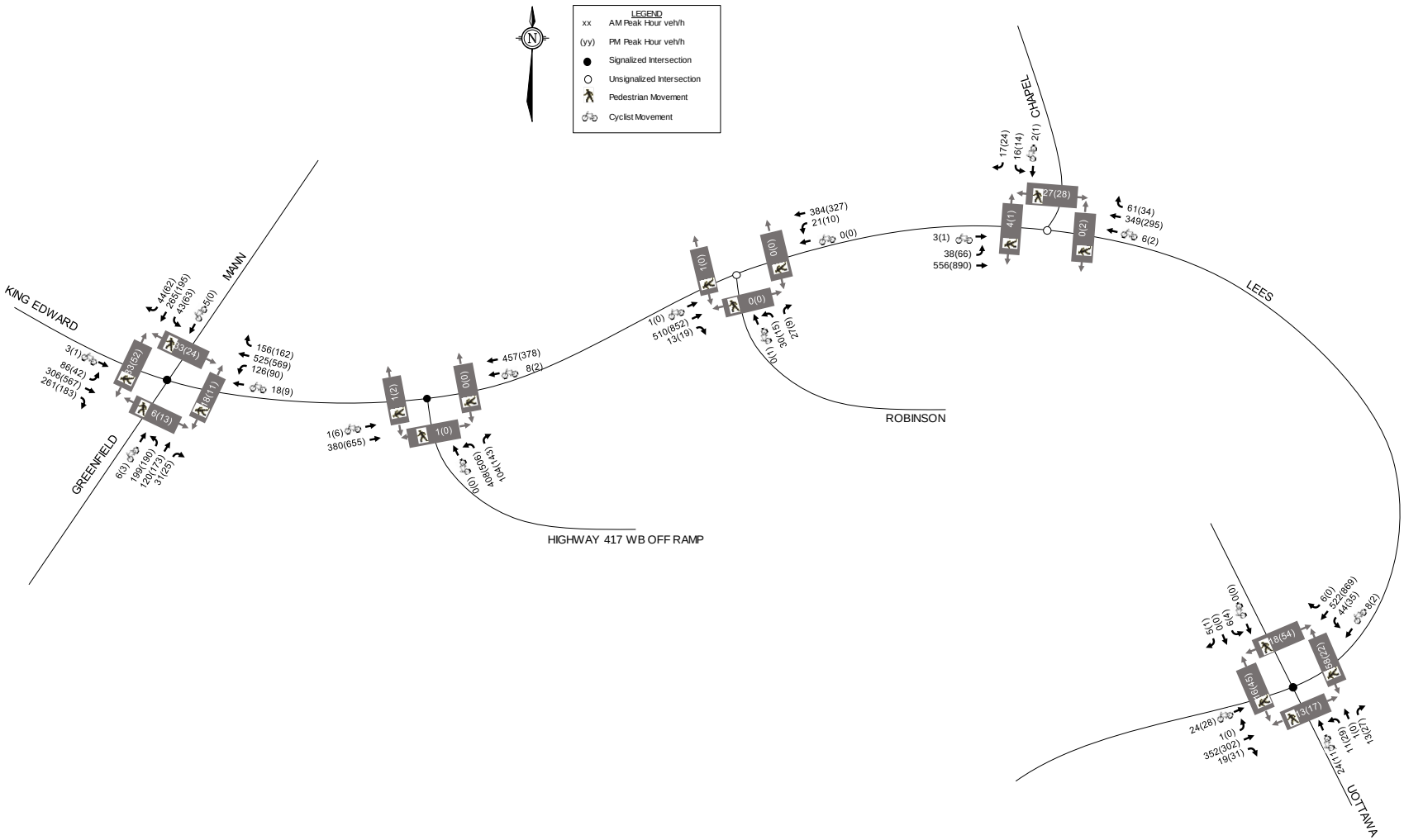
4.1.8 Collision Records

Historical collision data from the last five years was obtained from the City's Public Works and Service Department for the study area intersection. Copies of the collision summary report are included in **Appendix F**. The collision data has been evaluated to determine if there are any identifiable collision patterns. The following summarizes the number of collisions at each intersection from January 1, 2016 to December 31, 2020.

Table 2: Reported Collisions

Intersection	Impact Types					Total Number of Collisions
	Angle	Sideswipe	Rear End	Turning Movement	SMV/ Other	
Lees Avenue/ Robinson Avenue	-	-	1	-	-	**1**
Lees Avenue/ UOttawa Lees Campus	-	-	2	-	-	**2**
Lees Avenue/ Chapel Crescent	-	-	2	-	1	**3**
Lees Avenue/417 Westbound Off-Ramp	-	-	4	2	1	**7**
Lees Avenue/King Edward Avenue/Mann Avenue/ Greenfield Avenue	1	4	33	-	6	**44**

Figure 6: Existing Traffic Volumes



Lees Avenue/Robinson Avenue
One rear end collision was reported at the Lees Avenue/Robinson Avenue intersection over the course of the last five years. The collision occurred on the northbound approach and resulted in property damage only.

Lees Avenue/UOttawa Lees Campus
Two rear end collisions were reported at the Lees Avenue/UOttawa Lees Campus intersection over the course of the last five years. Both collisions occurred on the westbound approach and resulted in property damage only. One of the collisions occurred under snowy conditions while the other occurred under clear conditions.

Lees Avenue/Chapel Crescent
Three collisions were reported at the Lees Avenue/Chapel Crescent intersection over the course of the last five years. Two of the collisions were rear end collisions (one on the westbound approach and one on the northbound approach) while the other collision was a single vehicle collision.

Lees Avenue/417 Westbound Off-Ramp
Seven collisions were reported at the Lees Avenue/417 Westbound Off-Ramp intersection over the course of the last five years. Of these, there were four rear end collisions, two turning movement collisions and one single vehicle collision. One collision caused injury, but none caused fatalities.

Of the four rear end collisions, three occurred on the westbound approach and one on the northbound approach. All rear end collisions were classified as causing property damage only (no injuries).

Lees Avenue/King Edward Avenue/Mann Avenue/Greenfield Avenue
Forty-four (44) collisions were reported at the Lees Avenue/King Edward Avenue/Mann Avenue/Greenfield Avenue intersection over the course of the last five years. Of these, there were thirty-three (33) rear end collisions, six single vehicle or 'other' collisions, four sideswipes, and one angle impact. A total of ten collisions caused injuries, but none caused fatalities.

Of the thirty-three (33) rear end collisions, seventeen (17) occurred on the northbound approach, ten on the southbound approach, four on the eastbound approach, and two on the westbound approach. A total of eight rear end collisions caused injuries, but none caused fatalities.

Of the sixteen rear end collisions on the northbound approach, one occurred between right turning vehicles, and the rest between northbound through vehicles. The high frequency of collisions on the northbound through approach could be explained by the high volume of vehicles (over 500 vph during peak hours) in a single through lane, and the proximity to the Lees Avenue/417 Westbound Off-Ramp intersection (180m measured from stop bar to stop bar).

Of the ten rear end collisions on the southbound approach, six occurred between right turning vehicles, and four between southbound through vehicles. The southbound right turn channel is stop-controlled which may play a factor in the high frequency of southbound right rear ends, as people are more accustomed to a yield channel. Additionally, while the Highway 417 eastbound Lees Avenue on-ramp was closed (2013-2019), many vehicles performed this southbound right turn manoeuvre as an alternate travel route, as demonstrated by comparing traffic counts before and after the ramp closure.

Of the six single vehicle or 'other' collisions, three collisions were caused by vehicles reversing, two involved unattended vehicles, and one was a collision between a vehicle turning southbound right and a pedestrian.

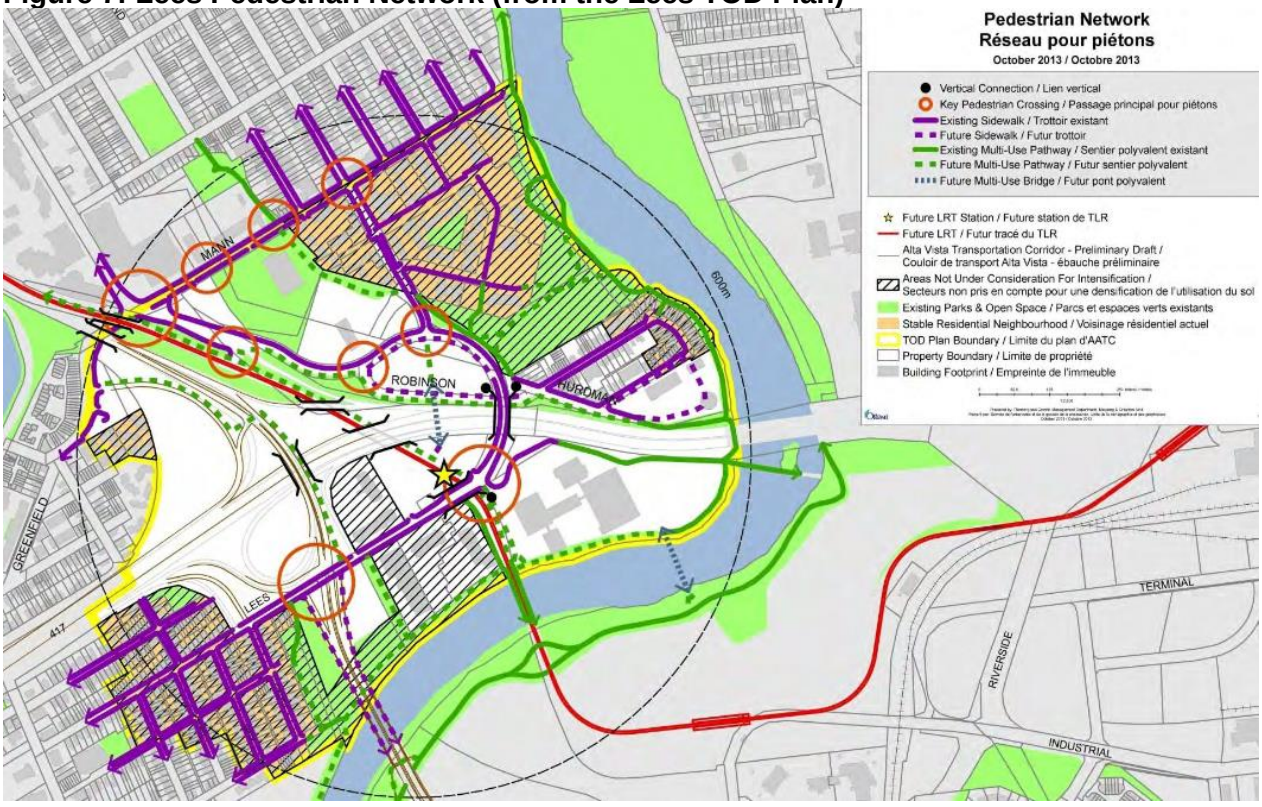
4.2 Planned Conditions

4.2.1 Planned Infrastructure Projects

The design of the Greenfield Avenue/Main Street/Hawthorne Avenue Reconstruction Project is complete. The construction of some advanced works commenced in late summer 2021. The majority of the work was tendered for construction in early 2022. The design includes cycle tracks along Greenfield Avenue, terminating at the intersection of Lees Avenue/King Edward Avenue/Mann Avenue/Greenfield Avenue and a MUP along the west side of Lees Avenue, south of Greenfield Avenue/Mann Avenue to the LRT maintenance driveway.

The Lees Transit Oriented Development (TOD) Plan identifies a future multi-use bridge over Highway 417, to provide a more direct link between the Sandy Hill community via Chapel Crescent and Lees Station. No timing is identified; it is noted as a long-term project. The Lees Pedestrian Network from the TOD plan is included as **Figure 7**.

Figure 7: Lees Pedestrian Network (from the Lees TOD Plan)



Stage 1 of the Confederation Line LRT has been completed and runs between Tunney's Pasture Station and Blair Station. The former transitway which ran in between the roadways of Nicholas Street and King Edward Avenue/Lees Avenue has been converted to LRT track. The closest station to the subject site, the Lees LRT station, is operational as part of Stage 1. Stage 2 of the Confederation Line will expand the line to the west and east of the current terminal stations.

The Lees Avenue/Highway 417 underpass was replaced in 2014, while the Nicholas Avenue/Highway 417 underpass was replaced in 2020. It is our understanding that all other MTO bridge structures in this area will be replaced prior to 2030. The replacement of all other bridge structures will be rapid replacements, where traffic impacts will be minimal until the replacement of the structures.

4.2.2 Other Development

A review of the City's Development Application Search Tool has been conducted to identify any developments in the vicinity of the subject site that are being constructed, are approved, or are in the approval process. Other developments in the area are described as follows:

17-23, 27-31, 36, and 130-138 Robinson Avenue
Four mid-rise apartments are planned on Robinson Avenue east of Hurdman Road. Site Plan Agreements are registered for 17-23, 27-31, and 130-138 Robinson Avenue; the application for 36 Robinson Avenue has been approved. TIAs were written in support of these developments in December 2018 and March 2019. The Development Application Search Tool identifies that a three-storey apartment with 47 dwellings are approved at 17-23 Robinson Avenue, three-storey apartments with 51 dwellings each are approved at both 27-31 and 130-138 Robinson Avenue, and a nine-storey apartment with 153 dwellings is approved at 36 Robinson Avenue. Vehicular access to these developments will be limited to Robinson Avenue, meaning that all vehicular traffic generated by these sites will be entering and exiting via the Lees Avenue/Robinson Avenue intersection.

150 Louis Pasteur Private
A Site Plan Control agreement has been registered for a new six-storey academic building toward the southern extent of the University of Ottawa campus (northwest of the King Edward Avenue/Lees Avenue/Mann Avenue intersection). As most traffic generated by the proposed academic building is anticipated to utilize non-auto modes, no transportation impact study was prepared in support of this application.

Future Robinson-Lees UOttawa Developments

The 1 Robinson Avenue lands are identified in the Lees TOD Plan which states that ownership of the property was being transferred from the City to the University of Ottawa. No finalized concept has been prepared for this location, however it is zoned TD3 (Transit Oriented Development), which permits a maximum building height of 30 storeys. This parcel is noted in the UOttawa Campus Master Plan as being a potential development site, with the land use noted as general mixed-use (which could be a mix of apartments, office, administrative uses, teaching/research facilities, student residences, ancillary services and retail). The estimated number of units identified in the UOttawa Campus Master Plan at the Robinson site is approximately 1,040 units in towers, and another 140 units in podiums for high-rise, for a total of 1,180 units. A signal is proposed at the Lees Avenue/Chapel Crescent intersection, and a new access road to the site would tie into this signal.

Additionally, future mixed-use development at 191 Lees Avenue is identified in the UOttawa Campus Master Plan. This land is also zoned TD3 and the estimated number of units was 880 units in high-rise towers and another 300 units in podiums, for a total of 1,180 units.

The Lees Avenue Campus (200 Lees Avenue) has also been identified in the UOttawa Campus Master Plan as buildings that are slated for demolition, with new construction focusing on Academic Mixed-Use (teaching and research facilities, athletic and recreation facilities, administrative uses, student residences, ancillary services). The UOttawa Campus Master Plan estimated 655 units at this site, located in towers above academic uses. A Site Plan Control application was submitted in June 2021 in support of the UOttawa Lees Campus redevelopment at 200 Lees Avenue. The proposed redevelopment of the campus will involve the demolition of three existing buildings and replacement with a single 6-storey building. The new building will result in a net increase of 9,900 m^2 of GFA and is expected to be fully occupied by 2023.

4.3 Study Area and Time Periods

A boundary street review has been conducted for Lees Avenue and Chapel Crescent. The study area intersections include the proposed accesses and the signalized intersections at Lees Avenue/King Edward Avenue/Mann Avenue/Greenfield Avenue, Lees Avenue/417 Westbound Off-Ramp, and Lees Avenue/UOttawa Lees Campus, as well as the unsignalized Lees Avenue/ Robinson Avenue and Lees Avenue/Chapel Crescent intersections.

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. Parking requirements will also be reviewed for the subject site. Analysis was completed for the 2023 year (anticipated buildout of phase 1), the 2027 full build-out year, and the 2032 five-year horizon.

4.4 Exemptions Review

This module reviews possible exemptions from the final TIA, as outlined in the City's TIA Guidelines. The applicable exemptions for this site are shown in **Table 3**.

Table 3: TIA Exemptions

Module	Element	Exemption Criteria	Status
Design Review Component			
4.1 Development Design	*4.1.2* Circulation and Access	• Required for site plans	Not Exempt
	4.1.3 New Street Networks	• Required for plans of subdivision	Exempt
4.2 Parking	*4.2.1* Parking Supply	• Required for site plans	Not Exempt
Network Impact Component			
4.5 Transportation Demand Management	*All elements*	• Required for any development generating more than 60 person trips	Not Exempt
4.6 Neighbourhood Traffic Calming	*4.6.1* Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access	Exempt
4.8 Network Concept	*All elements*	• Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Exempt

The proposed development is compliant with the approved TD2 and O1A zoning for the subject site. A review of the network concept is not required in the TIA. As the trip generation trigger is met, a TIA report reviewing the Design Review component and the Network Impact component is required. The following modules will be included in the TIA report:

Design Review Component
- Module 4.1: Development Design
- Module 4.2: Parking
- Module 4.3: Boundary Streets
- Module 4.4: Access Design

Network Impact Component
- Module 4.5: Transportation Demand Management
- Module 4.7: Transit
- Module 4.9: Intersection Design

The current concept for the site includes a total of 1,534 apartment units and 27,220 square feet of ground floor commercial. The previous concept from the June 2021 TIA included a total of 1,463 units (377 units in Building A, 735 units in Buildings B and C, and 351 units in Building D) and 29,000 square feet of ground floor commercial space. The revised concept represents a decrease of 1,780 square feet of commercial space and an increase of 71 apartment units compared to the June 2021 TIA. As the new concept for the site is anticipated to generate approximately the same number of trips as the June 2021 TIA concept, the intersection analysis conducted in the June 2021 TIA is considered valid, and no new analysis is required.

The TIA will provide an on-site design review including provisions for non-auto modes, circulation, access and review parking provisions with respect to the Zoning By-Law requirements. The report will reference the intersection analysis provided in the June 2021 TIA, except for an update to the access operations in the Phase 1 buildout year, due to proposed restrictions and control at the east access.

5.0 FORECASTING

5.1 Development-Generated Traffic

5.1.1 Trip Generation

The northern portion of the site is proposed to contain a 28-storey building on a six-storey podium while the southern portion of the site (fronting Lees Avenue) is proposed to contain one 28-storey building on a six-storey podium and two 32-storey buildings on a six-storey podium. A total of 1,534 apartment units are proposed, with 450 units in Buildings A, 738 units in Buildings B and C, and 346 units in Building D. Building A will also include 13,305 square feet of commercial space while Buildings B and C will include 13,915 square feet of commercial space.

The previous concept from the June 2021 TIA included a total of 1,463 units (377 units in Building A, 735 units in Buildings B and C, and 351 units in Building D) and 29,000 square feet of ground floor commercial space. The revised concept represents a decrease of 1,780 square feet of commercial space and an increase of 71 apartment units compared to the June 2021 TIA. The projections and analysis in this TIA are based on the previous concept from the June 2021 TIA. However, no significant change in results is expected due to the minor revisions.

The *TRANS Trip Generation Manual Summary Report*, prepared in October 2020 by WSP, includes data to estimate the mode shares for commercial trip generators (in Table 13 of the manual) and high-rise multifamily housing (in Table 8 of the manual) for the AM and PM peak periods, based on district. The *TRANS Trip Generation Manual* identifies the subject site as being located within the Ottawa Inner Area district and outlines the following mode shares for commercial and residential developments in the Ottawa Inner Area.

Commercial Mode Shares

- Auto Driver: 39% AM, 22% PM
- Auto Passenger: 2% AM, 4% PM
- Transit: 16% AM, 12% PM
- Cyclist: 3% AM, 4% PM
- Pedestrian: 40% AM, 58% PM

Residential Mode Shares

- Auto Driver: 26% AM, 25% PM
- Auto Passenger: 6% AM, 8% PM
- Transit: 28% AM, 21% PM
- Cyclist: 5% AM, 6% PM
- Pedestrian: 34% AM, 39% PM

As the subject site is also located within 600m of the Lees LRT Station, the site is also located within a Transit-Oriented Development (TOD) Zone. In TOD Zones, the transit share is assumed to increase significantly compared to the TRANS O-D district. The City has outlined sustainable mode share targets for transit-oriented developments, which can be summarized as follows:

- Auto Driver: 15% during peak periods;
- Auto Passenger: 5% during peak periods;
- Transit: 65% during peak periods;
- Non-Auto (Active): 15% during peak periods.

As the Ottawa Inner Area has a higher non-auto modal share compared to the TOD zone, the TOD modal shares have been adjusted to reflect a lower transit modal share and higher non-auto modal share. The mode shares carried forward in the trip generation estimates for each land use are included in **Table 4**.

Table 4: Mode Shares for Commercial and Residential Uses

Mode	Mode Share	
	Proposed Commercial	Proposed Residential
Auto Driver	15%	15%
Auto Passenger	5%	5%
Transit	25%	40%
Cyclist	5%	5%
Pedestrian	50%	35%

The trips generated by the 1,463 proposed residential dwellings have been estimated using the *TRANS Trip Generation Manual* (October 2020), which presents peak period trip generation rates for different types of housing for the AM and PM peak periods. For the High-Rise Multifamily Housing land use, the process of converting the trip generation estimates from peak period to peak hour is shown in the following tables.

Table 5: Proposed Residential – Peak Period Trip Generation

Land Use	TRANS Rate	Units	AM Peak Period (ppp[1])			PM Peak Period (ppp)		
			IN	OUT	TOT	IN	OUT	TOT
Phase 1 (Building A)								
High-Rise Multifamily Housing	AM: 0.80 PM: 0.90	377	94	208	*302*	197	142	*339*
Phase 2 (Buildings B, C, and D)								
High-Rise Multifamily Housing	AM: 0.80 PM: 0.90	1,086	269	600	*869*	567	410	*977*

1. ppp: Person Trips per Peak Period

Table 4 of the *TRANS Trip Generation Manual* includes adjustment factors to convert the estimated number of person trips generated from peak period to peak hour. A breakdown of the peak hour person trips is shown in **Table 6**.

Table 6: Proposed Residential – Peak Hour Person Trip Generation

Land Use	Adj. Factor	Units	AM Peak Period (pph[1])			PM Peak Period (pph)		
			IN	OUT	TOT	IN	OUT	TOT
Phase 1 (Building A)								
High-Rise Multifamily Housing	AM: 0.50 PM: 0.44	377	47	104	*151*	87	62	*149*
Phase 2 (Buildings B, C, and D)								
High-Rise Multifamily Housing	AM: 0.50 PM: 0.44	1,086	135	300	*435*	250	180	*430*

1. pph: Person Trips per Peak Hour

As the commercial uses are not known at this time, the trips generated by the commercial component have been estimated using land code 820 for Shopping Center in the ITE *Trip Generation Manual*, 10th Edition. Person trips were calculated using an ITE Trip to Person Trip factor of 1.28, consistent with the TIA guidelines.

Table 7: Proposed Commercial – Person Trip Generation

Land Use	ITE Code	GFA	AM Peak Hour (pph)			PM Peak Hour (pph)		
			IN	OUT	TOT	IN	OUT	TOT
Phase 1 (Building A)								
Shopping Centre	820	15,000 ft^2	12	6	*18*	35	38	*73*
Phase 2 (Buildings B, C, and D)								
Shopping Centre	820	14,000 ft^2	10	6	*16*	32	36	*68*

A full breakdown of the projected peak hour person trips by modal share generated by the proposed development is included in **Table 8**.

The commercial land use is expected to generate two types of external peak hour trips; primary and pass-by trips. Primary trips are made for the specific purpose of visiting the site, and pass-by trips are made as intermediate stops on the way to another destination. However, as the retail development is only anticipated to generate six vehicle trips during the AM peak hour and 21 vehicle trips during the PM peak hour, pass-by trips are anticipated to be minimal. The analysis presented in this study assumes that all trips generated by the retail development are primary trips.

Due to the nature of the proposed land uses of the development, it is possible that some of the total volume of site-generated trips will be internally captured within the site (i.e., tenants from the apartments that frequent the commercial component). However, in the interest of making a conservative estimate of the likely traffic impact associated with the development, the possibility of traffic being internally captured has been ignored. The analysis presented in this study assumes that all trips generated by the proposed development are 'external' trips.

Table 8: Person Trips by Modal Share

Travel Mode	Modal Share	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
Phase 1 (Building A)							
Residential Person Trips		*47*	*104*	*151*	*87*	*62*	*149*
Auto Driver	15%	**7**	**16**	**23**	**13**	**9**	**22**
Auto Passenger	5%	2	5	7	4	3	7
Transit	40%	19	42	61	35	25	60
Cyclist	5%	2	5	7	4	3	7
Pedestrian	35%	17	36	53	31	22	53
Commercial Person Trips		*12*	*6*	*18*	*35*	*38*	*73*
Auto Driver	15%	**2**	**1**	**3**	**5**	**6**	**11**
Auto Passenger	5%	1	0	1	2	2	4
Transit	25%	3	2	5	9	10	19
Cyclist	5%	0	0	0	1	1	2
Pedestrian	50%	6	3	9	18	19	37

Travel Mode	Modal Share	AM Peak			PM Peak		
		IN	OUT	TOT	IN	OUT	TOT
Phase 2 (Buildings B, C, and D)							
Residential Person Trips		*135*	*300*	*435*	*250*	*180*	*430*
Auto Driver	15%	**20**	**45**	**65**	**38**	**27**	**65**
Auto Passenger	5%	7	15	22	13	9	22
Transit	40%	54	120	174	100	72	172
Cyclist	5%	7	15	22	13	9	22
Pedestrian	35%	47	105	152	86	63	149
Commercial Person Trips		*10*	*6*	*16*	*32*	*36*	*68*
Auto Driver	15%	**2**	**1**	**3**	**5**	**5**	**10**
Auto Passenger	5%	0	0	0	1	2	3
Transit	25%	3	2	5	9	9	18
Cyclist	5%	0	0	0	1	2	3
Pedestrian	50%	5	3	8	16	18	34
Total Person Trips – Full Build-out							
Auto Driver		**31**	**63**	**94**	**61**	**47**	**108**
Auto Passenger		10	20	30	20	16	36
Transit		79	166	245	153	116	269
Cyclist		9	20	29	19	15	34
Pedestrian		78	147	222	151	122	273

5.1.2 Trip Distribution

The distribution of traffic generated by the proposed development has been estimated based on origin-destination data in the TRANS O-D Survey Report for the Ottawa Inner Area and the principles of logical trip routing. The destinations of trips from the Ottawa Inner Area to all TRANS O-D districts during the AM peak period were used to develop the following cardinal distribution:

- 35% to/from the north;
- 15% to/from the south;
- 15% to/from the east; and
- 35% to/from the west.

Of the traffic to/from the north, 25% are anticipated to use King Edward Avenue and 10% are anticipated to use Greenfield Avenue/Colonel By Drive. All traffic to/from the south is anticipated to use Lees Avenue/Main Street. All traffic to/from the east is anticipated to use the Highway 417 eastbound on-ramp and westbound off-ramp along Lees Avenue. All traffic to/from the west is anticipated to use the Highway 417 westbound on-ramp along Greenfield Avenue and the eastbound off-ramp along Lees Avenue.

Both the east and west accesses will be constructed as part of Phase 1. The west access is proposed to have a right-in/left-out configuration. The east access is proposed to have a left-in/right-in/right-out configuration when Phase 1 is constructed. It may become a signalized, full-movement access as subsequent phases are completed. This will be confirmed in a future TIA in support of future phases.

At Phase 1, traffic arriving from/departing to the east via Lees Avenue have been assigned to the west access, and traffic arriving from/departing to the west via Lees Avenue have been assigned to the east access.

At ultimate buildout, traffic arriving from/departing to Phase 1 from the east via Lees Avenue is assumed to be split 10%/90% between the east and west accesses, and all traffic generated by future phases is anticipated to use the east access to the development. Traffic generated by future phases is anticipated to use the east access to the development for the following reasons:

- The west access is intended to provide localized access to Phase 1, while the east access is intended to be the main access to the development;
- High traffic volumes along Lees Avenue increase delays associated with the eastbound left turn at the west access;
- It is anticipated that traffic signalization may be required at the east access opposite Robinson Avenue, as discussed further in Section 6.4;
    - Traffic to/from the future phases will be attracted to the east access due to improved intersection operations associated with traffic signalization.

Traffic generated by Phase 1 of the proposed development during the AM and PM peak hours is shown in **Figure 8**. Traffic generated by the ultimate development is shown in **Figure 9**.

5.2 Background Traffic

5.2.1 General Background Growth Rate

A review of the City of Ottawa's Long-Range Transportation Model has been conducted to determine an appropriate background growth rate for the area roadways. A summary of the City's 2011 and 2031 Long-Range Transportation Model snapshots is provided in the following table.

Table 9: Long-Range Transportation Model Summary

Roadway Segment	2011 Volumes	2031 Volumes	Growth per Annum
King Edward Avenue – North of Mann Avenue	1,520	1,667	0.5%
Lees Avenue – Between Mann Avenue and Highway 417 Westbound Off-Ramp	757	1,031	1.8%
	862	1,209	2.0%
Lees Avenue – Between Highway 417 Westbound Off-Ramp and Chapel Crescent	348	449	1.5%
Mann Avenue – East of Lees Avenue	399	523	1.6%
	470	580	1.2%
Greenfield Avenue – West of Lees Avenue	1,246	1,229	-0.1%
Highway 417 Westbound Off-Ramp	650	942	2.2%

For the purposes of this analysis, a 1% per annum growth rate will be applied to traffic along King Edward Avenue, Lees Avenue, Mann Avenue, and Highway 417 Westbound Off-Ramp. No growth rate will be applied to traffic along Greenfield Avenue, Robinson Avenue, and Chapel Crescent.

5.2.2 Other Area Development

Traffic generated by the developments at 17-23, 27-31, 36, and 130-138 Robinson Avenue were added to the background traffic volumes in the 2023 Phase 1 build-out year. As no traffic report was required in support of the development at 150 Louis Pasteur Private, traffic generated by this development is anticipated to be negligible.

A Site Plan Control application was submitted in June 2021 for the UOttawa Lees Avenue redevelopment at 200 Lees Avenue. The proposed redevelopment of the campus will involve the demolition of three existing buildings and replacement with a single 6-storey building. The new building will result in a net increase of 9,900 m^2 of GFA and is expected to be fully occupied by 2023. Based on the TIA, it is anticipated that the net increase in GFA will result in an increase of 25-28 two-way vehicular trips during the AM and PM peak hours.

Previously an estimate of one-third of 665 residential units (or 222 units) was carried forward in this analysis for the 200 Lees Avenue redevelopment in the 2032 horizon year. These 222 units would generate approximately 21-24 vehicle trips in the AM and PM peak hours. The difference in vehicle trips between the assumed concept and the proposed concept is anticipated to be negligible and the background growth rate assumed along Lees Avenue will account for the difference in trips. Based on the above, the methodology for estimating background traffic as presented in the June 2021 TIA is still valid and will be carried forward.

The UOttawa developments at 1 Robinson Avenue (1180 residential units), 191 Lees Avenue (1180 residential units), and 200 Lees Avenue (665 units) are part of the universities long-term plan. For the purposes of this analysis, it is assumed that none of the UOttawa developments will be occupied by the 2027 build-out year and one third will be occupied by the 2032 horizon year. Traffic generated by the UOttawa developments has been estimated and distributed to the adjacent road network for the 2032 horizon year using similar methodology to Section 5.1.

Based on the UOttawa concept plan included in **Appendix G**, the main access for 1 Robinson Avenue will be located along Lees Avenue opposite Chapel Crescent with secondary access on Robinson Avenue. However, as the proposed development proceeds, it is anticipated that UOttawa may refine the 1 Robinson Avenue development to provide main access along Robinson Avenue opposite the development. For the purposes of this analysis, traffic generated by the 1 Robinson Avenue development has been assigned to/from Robinson Avenue. Traffic generated by the UOttawa developments in 2032 are shown in **Figure 10**.

Relevant excerpts from other area developments are included in **Appendix G**.

Background traffic volumes for the 2023 Phase 1 build-out, 2027 ultimate build-out, and 2032 horizon years are shown in **Figures 11** to **13**. Total traffic volumes for the 2023 Phase 1 build-out, 2027 ultimate build-out, and 2032 horizon years are shown in **Figures 14** to **16**.

Figure 8: Site Generated Traffic – Phase 1

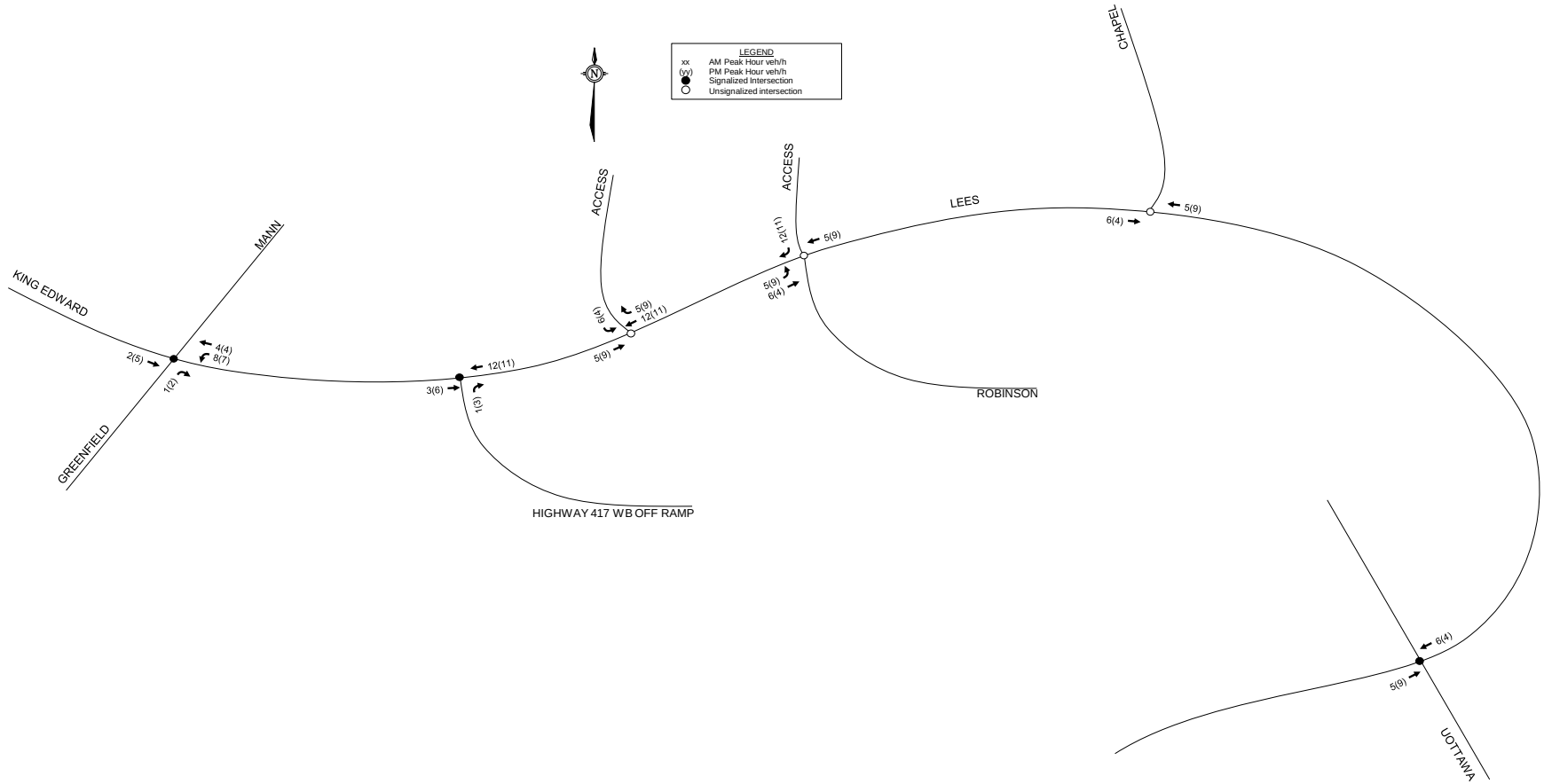


Figure 9: Site Generated Traffic – Ultimate Development

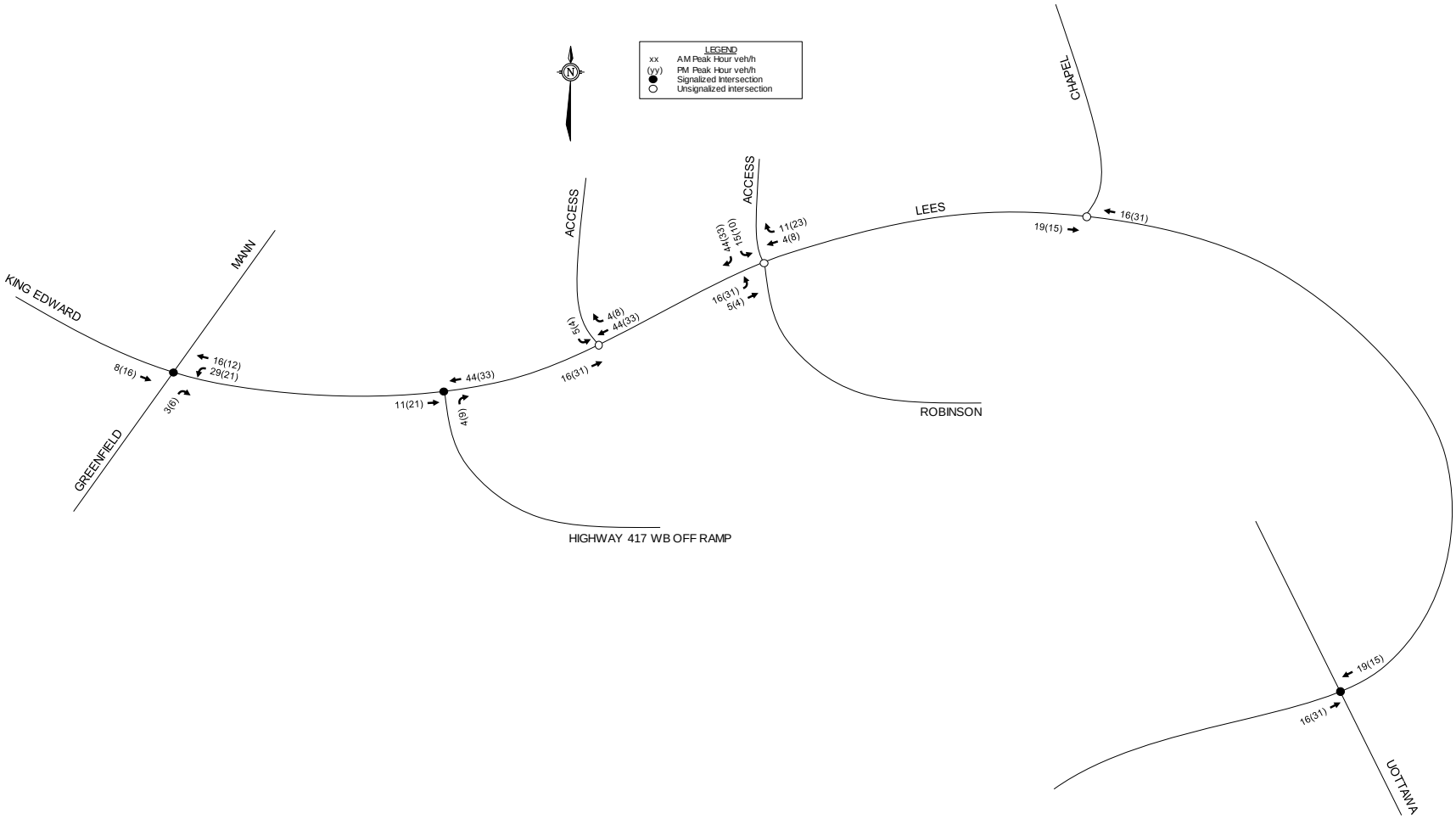


Figure 10: 2032 UOttawa Development Traffic

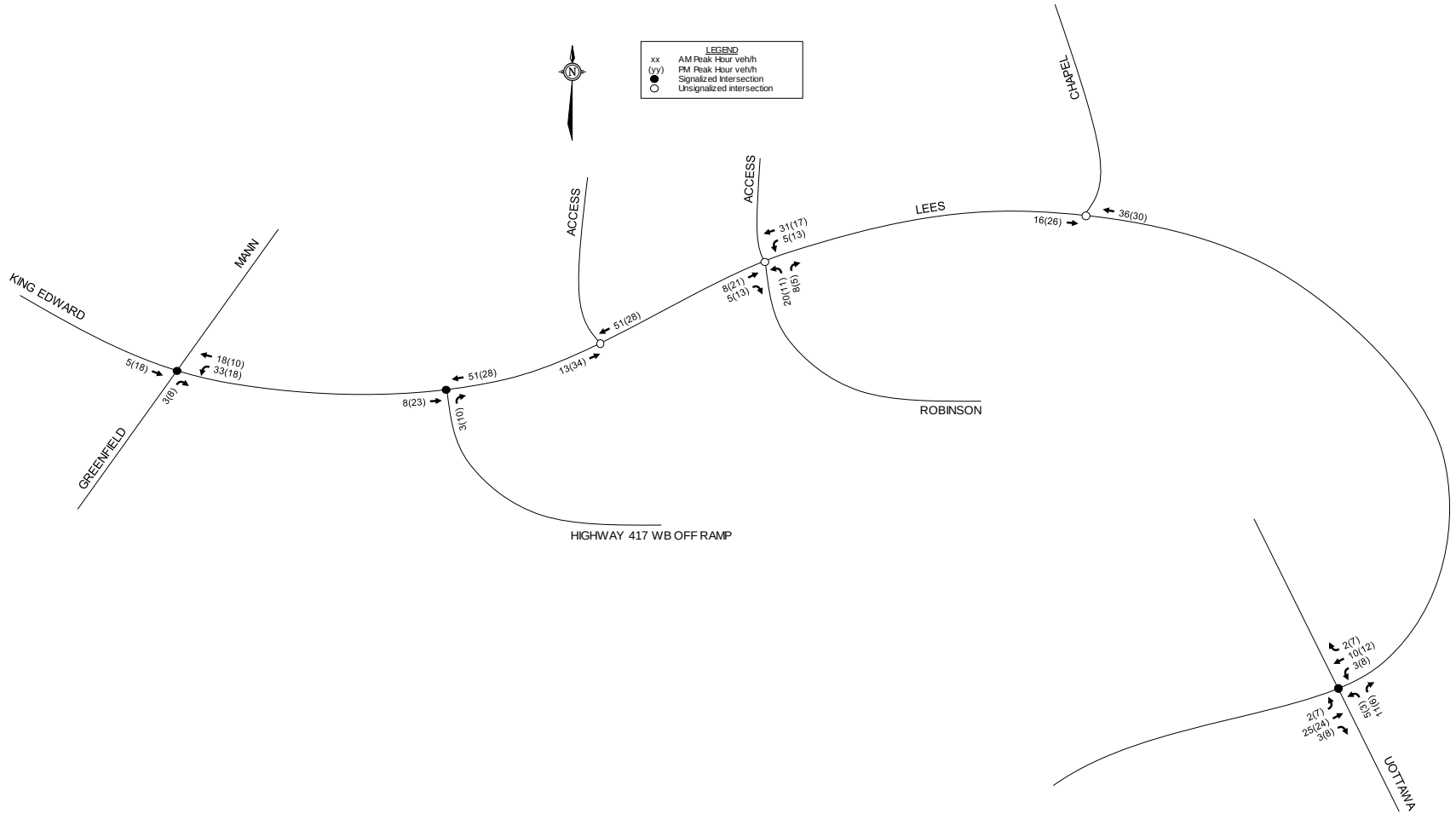


Figure 11: 2023 Background Traffic

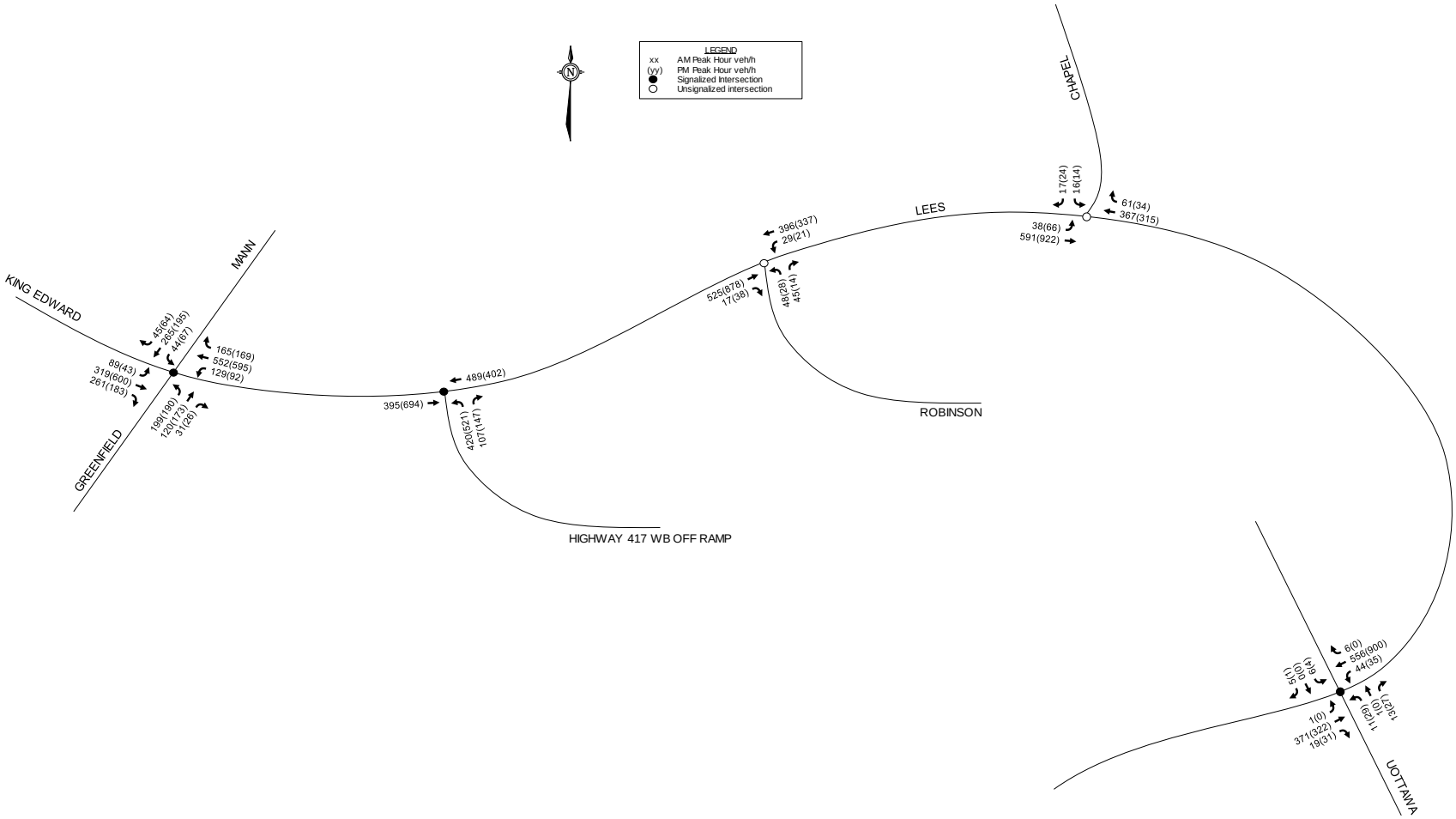


Figure 12: 2027 Background Traffic

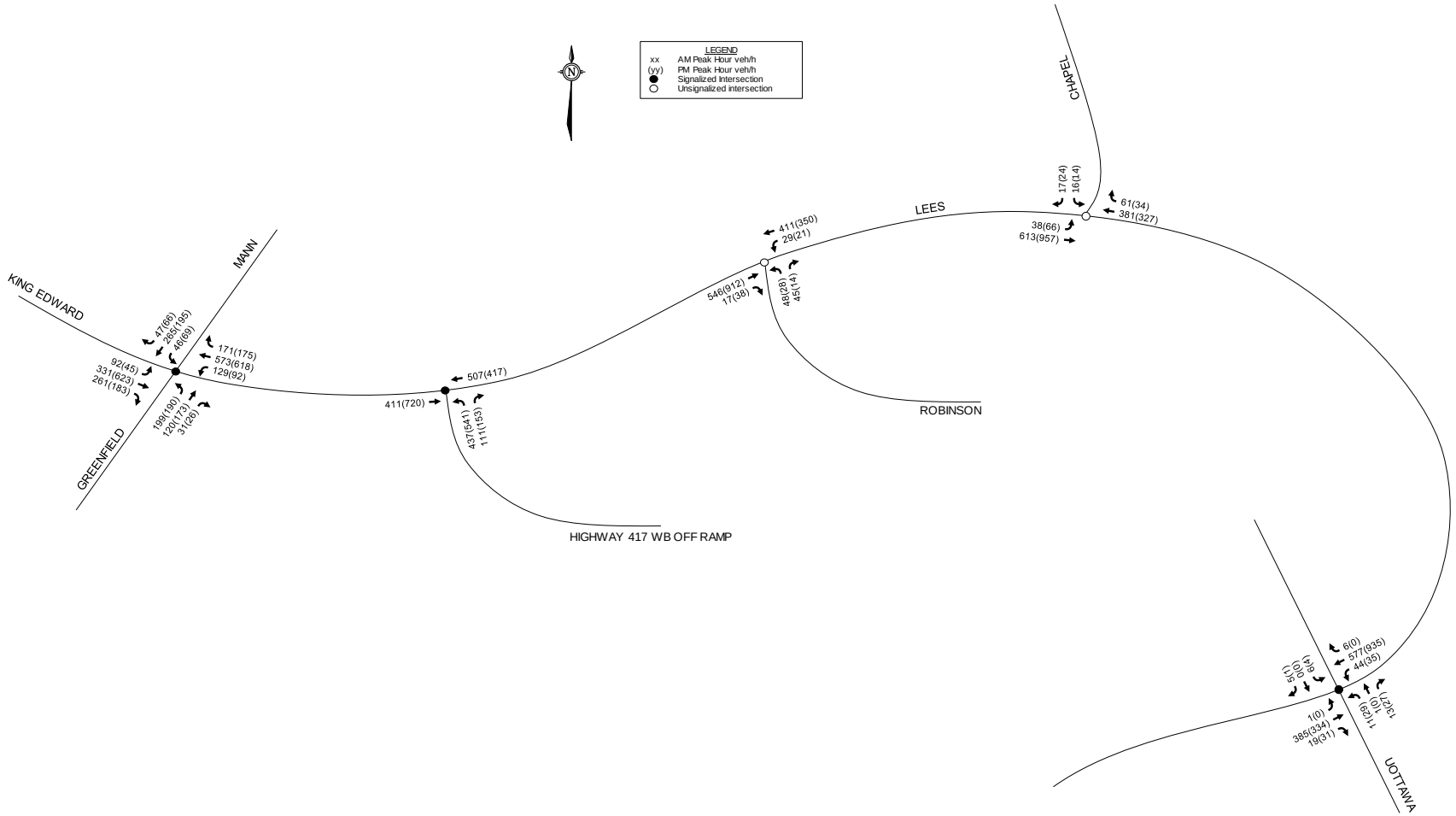


Figure 13: 2032 Background Traffic

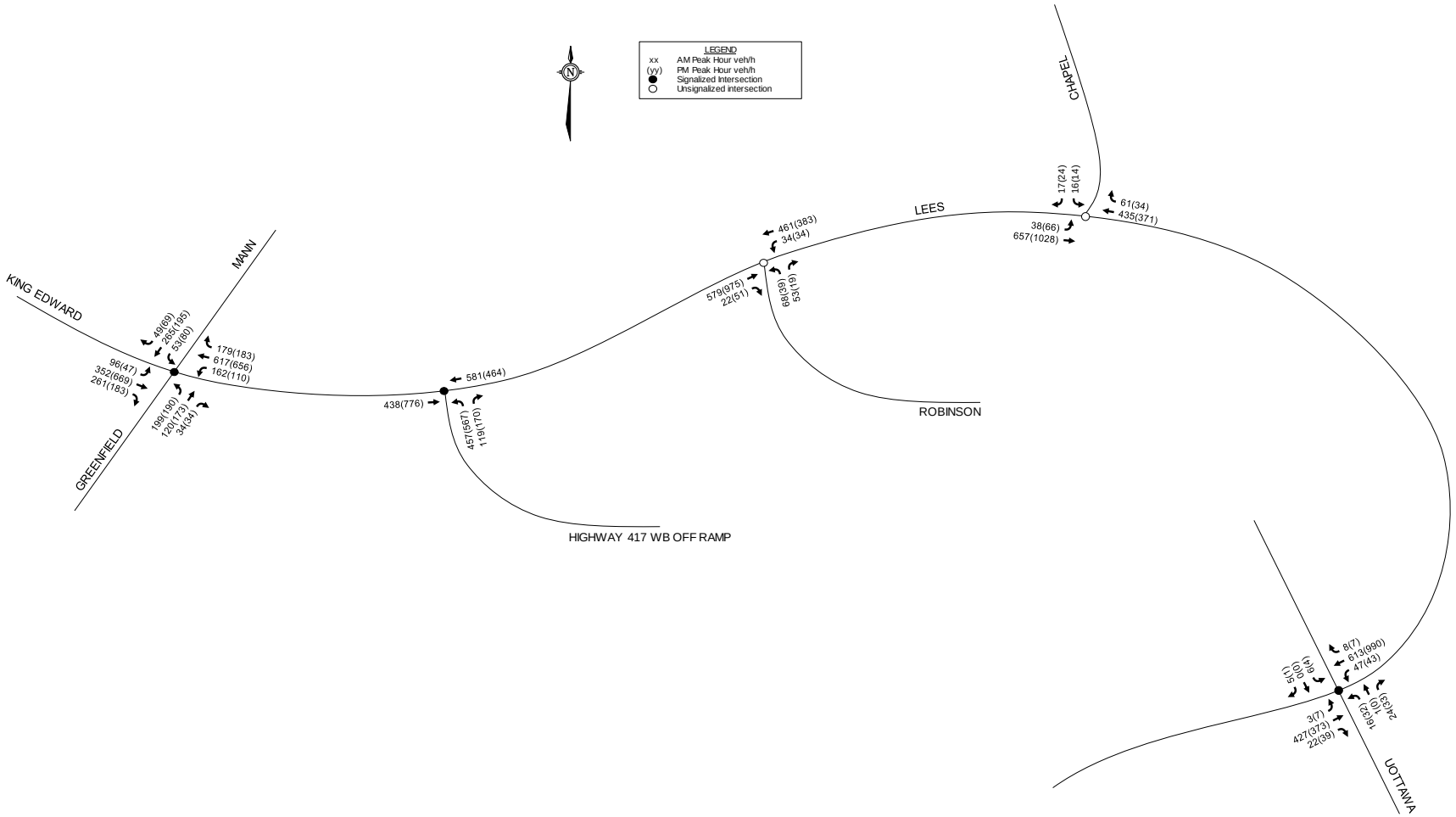


Figure 14: 2023 Total Traffic

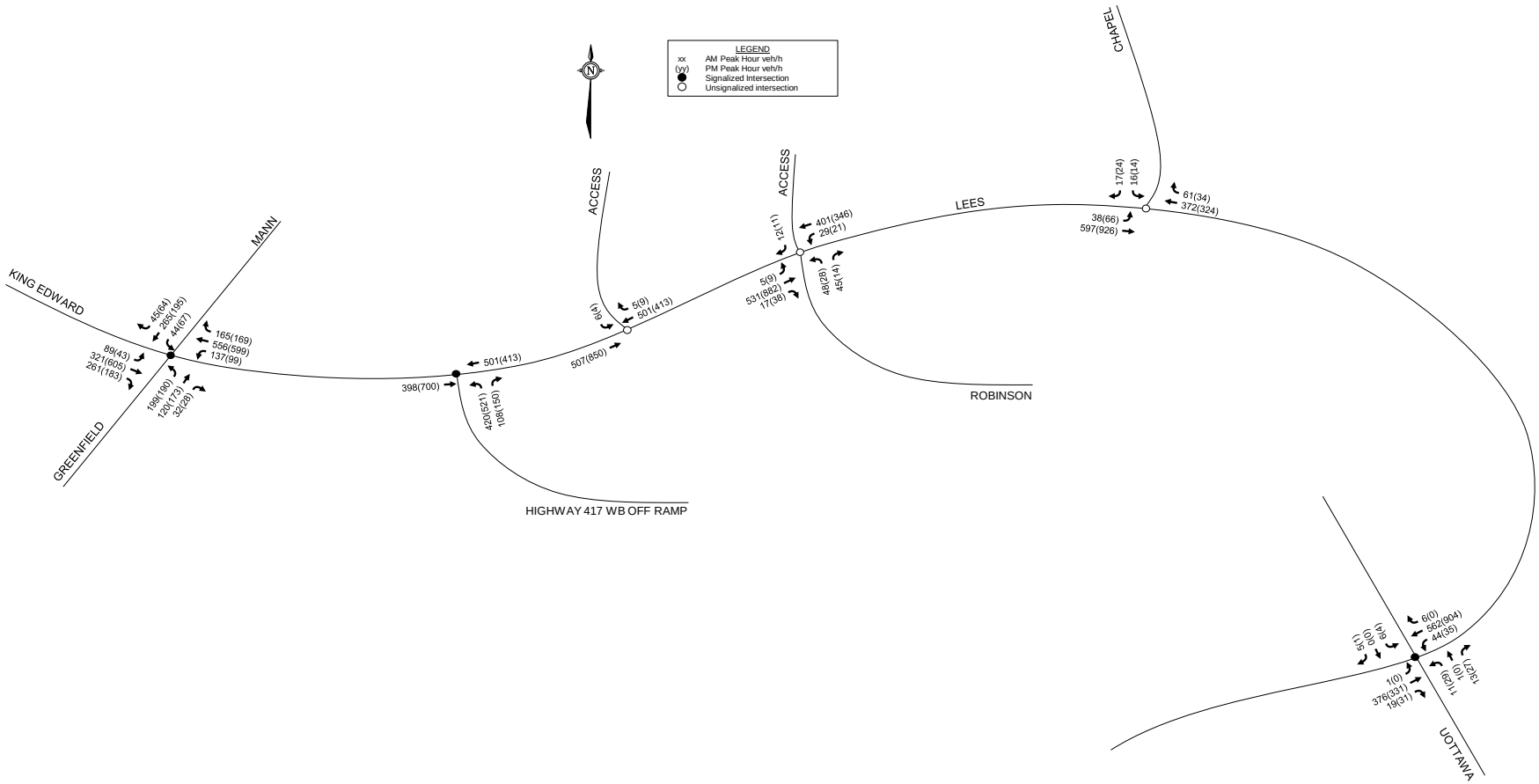


Figure 15: 2027 Total Traffic

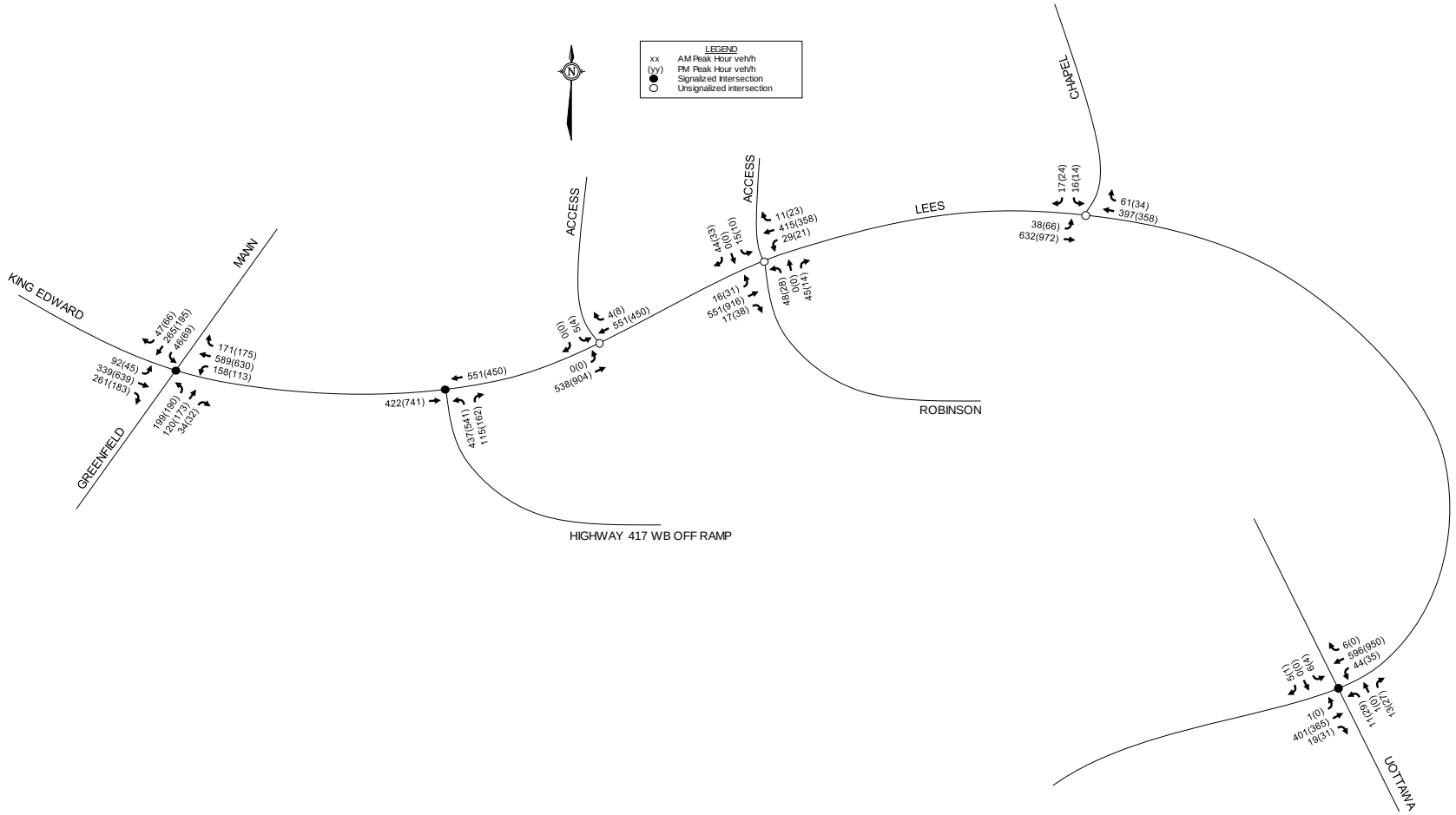
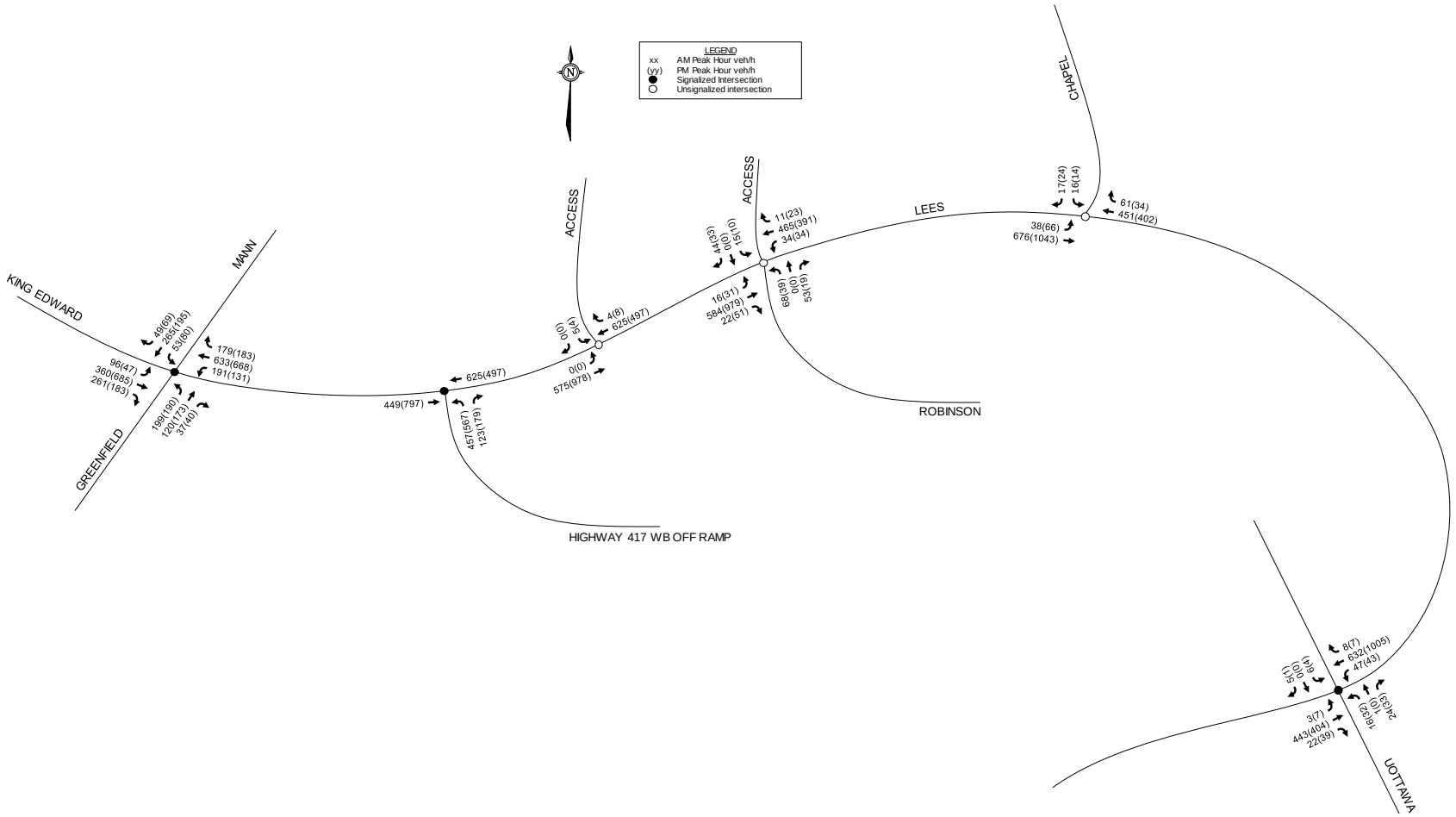


Figure 16: 2032 Total Traffic



5.3 Demand Rationalization

A review of the existing and background intersection operations was conducted as part of the June 2021 TIA.

6.0 ANALYSIS

6.1 Development Design

6.1.1 Design for Sustainable Modes

The main entrance to the podium for towers A, B and C will be located along Lees Avenue. Pedestrian connections will be provided between the main podium entrances and the sidewalk along Lees Avenue. A sidewalk will be provided along both sides of the proposed accesses, linking to an internal pathway system within the site and connecting to the main entrance for residential tower D. An east-west pathway is proposed along the north end of the site connecting to Chapel Crescent and the western property limit. This pathway effectively reinstates the existing pathway in this location that is currently fenced off.

Cyclist access to the site will be accommodated through shared use lanes at the two vehicular accesses. The proposed bicycle parking is anticipated to exceed the minimum requirements of the City's Zoning By-law. A total of 1,782 bicycle parking spaces will be provided indoors and 52 bicycle parking spaces will be provided outdoors.

One bicycle repair station and bicycle wash station will be included in each building's main bike room, for a total of four bicycle repair and wash stations.

OC Transpo's service design guideline for peak period service is to provide service within a five minute (400m) walk of the home, school and work location of 95% of urban residents. OC Transpo bus stops are located along Chapel Crescent and Lees Avenue, within a 400m walk of the development. The Lees LRT station is also located within a 600m walk of the development.

A review of the Transportation Demand Management (TDM) – Supportive Development Design and Infrastructure checklist has been conducted, and is included in **Appendix H**. All required TDM-supportive design and infrastructure measures in the TDM checklist are met.

6.1.2 Circulation and Access

On-site move-in/move-out loading areas will be provided on the west side of Tower A, the west side of Tower B, the north side of Tower C, and the west side of Tower D.

Garbage collection will occur on the west side of Tower A, the west side of Tower B, and the west side of Tower D.

The fire route is shown on the site plan and includes both accesses and the east-west drive aisle.

On-site turning movements are included in **Appendix I**. A Medium Single Unit (MSU) truck was selected as the design vehicle to represent a garbage truck, while a Light Single Unit (LSU) truck was selected as the design vehicle to represent a moving truck or UPS/delivery truck. A Heavy Single Unit (HSU) truck has been selected as the design vehicle to represent a fire truck along the fire route. The HSU truck has been selected as the design vehicle for turning movements to and from Robinson Avenue per City comments, due to Hurdman Yard.

6.2 Parking

The subject site is located in Area B on Schedule 1 and Area Z on Schedule 1A of the City's Zoning By-law. Minimum vehicular and bicycle parking rates for the proposed development are identified in the Zoning By-law and summarized in the following table.

Table 10: Parking Requirements

Phase	Land Use	Rate	Units/GFA	Required
Vehicle Parking (Minimum)				
Phase 1	Residential	Resident: No parking requirement	450	0
		Visitor: 0.1 spaces per dwelling unit after the first 12 units; no more than 30 total per building		30
	Commercial	No parking requirement	13,305 ft^2 (1,236m^2)	0
Total Site	Residential	Resident: No parking requirement	1,534	0
		Visitor: 0.1 spaces per dwelling unit after the first 12 units; no more than 30 total per building		120
	Commercial	No parking requirement	27,220 ft^2 (2,530m^2)	0
Vehicle Parking (Maximum)				
Phase 1	Residential	1.75 spaces per unit	450	788
	Commercial	3.6 spaces per 100m^2 of GFA	13,305 ft^2 (1,236m^2)	44
Total Site	Residential	1.75 spaces per unit	1,534	2,685
	Commercial	3.6 spaces per 100m^2 of GFA	27,220 ft^2 (2,530m^2)	91
Bicycle Parking				
Phase 1	Residential	0.5 spaces per dwelling unit	450	225
	Commercial	1 per 250m^2 of GFA	13,305 ft^2 (1,236m^2)	5
Total Site	Residential	0.5 spaces per dwelling unit	1,534	767
	Commercial	1 per 250m^2 of GFA	27,220 ft^2 (2,530m^2)	10

Approximately 198 vehicle parking spaces and 347 bicycle parking spaces will be provided for Phase 1 of the development. Approximately 934 vehicle parking spaces and 1,834 bicycle parking spaces (1,782 indoors and 52 outdoors) are anticipated to be provided for the overall development, conforming to the requirements of the Zoning By-law.

6.3 Boundary Streets

The boundary streets MMLOS was reviewed for Lees Avenue and Chapel Crescent as part of the June 2021 TIA.

6.3.1 Pedestrian Crossover

The *Ontario Traffic Manual (OTM) – Book 15 identifies* the following criteria for the consideration of a pedestrian crossover (PXO):

- If the total eight-hour pedestrian volume crossing the main road is greater than 100 pedestrians, and the total eight-hour vehicular volume is greater than 750 vehicles; or
- If the crossing location provides system connectivity, or is on a pedestrian desire line.

There is a clear pedestrian desire line between the walkway provided on the north edge of the site and the pathway on the east side of Chapel Crescent.

The projected 2032 total traffic volumes and appropriate City expansion factors were used to estimate the four-hour and eight-hour volumes along Chapel Crescent. These volumes are estimated to be approximately 500 vehicles in the four-hour time period and 860 vehicles in the eight-hour time period. Chapel Crescent has a posted speed limit of 40km/h. A road narrowing from 9m to 7.5m would result in a crossing distance equivalent to two lanes crossed. Based on these criteria, the Pedestrian Crossover Selection Matrix included in OTM Book 15 identifies a Type D PXO as the appropriate treatment for a crossing.

Implementation of pavement markings, signage, and curb extensions are required to accommodate a Type D PXO. A Type D PXO has been included in the Functional Design of the roadway modifications. The Functional Design is included in **Appendix J**. A Roadway Modification Approval (RMA) report has been submitted under separate cover.

6.4 Access Intersections Design

Two new accesses are proposed along Lees Avenue and will be constructed as part of Phase 1. The east access to the overall development will be located opposite Robinson Avenue, while the west access will be located west of Building A.

A distance of approximately 55m is available between the west access and the signalized intersection of Lees Avenue/Highway 417 Westbound Off-ramp. This spacing is insufficient to accommodate the required 30m eastbound left turn lane and taper length. As the required turn lane is unachievable, it is recommended that the eastbound left turn movement at the west access be prohibited.

A review of sight distance requirements has been conducted at the proposed accesses. Transportation Association of Canada (TAC) Geometric Design Guidelines for Canadian Roads identify the following sight distance criteria based on a design speed of 60km/hr for Lees Avenue.

- 85m Stopping Sight Distance;
- 130m Intersection Sight Distance looking right to turn left;
- 110m Intersection Sight Distance looking left to turn right.

The minimum 85m Stopping Sight Distance (SSD) is available along Lees Avenue at both accesses and is shown in **Figure 17**.

At the east access, the minimum Intersection Sight Distance (ISD) of 130m for drivers looking right to turn left is not met, due to the curvilinear alignment of Lees Avenue between the two accesses and the podium of Building A. Approximately 104m of ISD is provided. These sight distances are shown in **Figure 18**. The minimum ISD of 110m for drivers looking left to turn right is met, and this is shown in **Figure 19**. Drivers departing the east access will also have adequate sightlines to approaching westbound cyclists travelling in the proposed cycle tracks, as shown in **Figure 20**. An ISD of 40m has been considered, as that ISD is the minimum requirement for a design speed of 20 km/h.

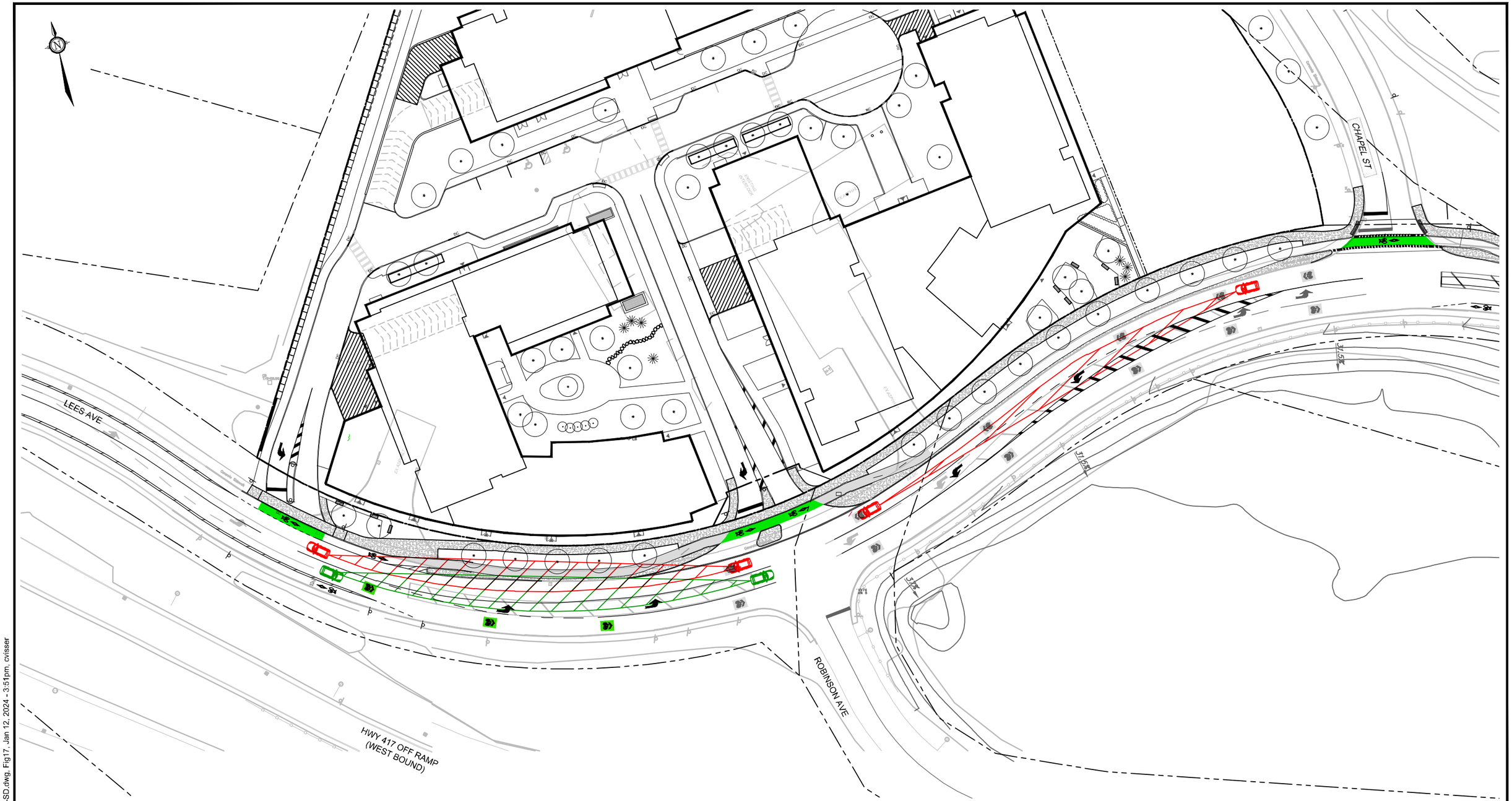
At the west access, the minimum ISD of 110m for drivers looking left to turn right is not met, due to the curvilinear alignment of Lees Avenue between the two accesses and the podium of Building A. Approximately 90m of ISD is provided. These sight distances are shown in **Figure 21**. The minimum ISD of 130m for drivers looking right to turn left is met, and this is shown in **Figure 22**.

It is recommended that right turns out of the west access be prohibited due to insufficient sight lines looking left. To restrict right turns out of and left turns into the west access, traffic islands and signage will be provided. The previously existing left turn lane at the existing site access was removed as the City implemented bike lanes along Lees Avenue. It is proposed that 'no left turn' signage be implemented on the south side of Lees Avenue in advance of the west access.

It is also recommended that left turns out of the east access be prohibited due to insufficient sight lines looking right, as part of Phase 1 development. To restrict left turns out of the east access, a traffic island and signage will be provided. The traffic island will be a raised concrete island, with a depression to accommodate a continuous concrete sidewalk and asphalt cycle track. Motorists are anticipated to stop twice at the east access, once behind the sidewalk and cycle track (to check for oncoming pedestrians and cyclists), and once at the road edge (to check for oncoming vehicles). At ultimate buildout, if signalization of the east access/Robinson Avenue is required from a delay perspective, the left-out restriction will be removed, allowing for a signalized, full-movement access. Traffic signal control may be used to safely and efficiently alternate the right-of-way when visibility is inadequate, can alleviate sight distance concerns at the east access, and mitigate future delays at the intersection.

The existing bike lanes along Lees Avenue transition to shared use lanes in advance of the Chapel Crescent and Robinson Avenue back-to-back left turn lanes. As an eastbound left turn lane is required at the site's east access, a cycle track is proposed in the westbound direction along the site's frontage. In the eastbound direction, it is proposed that the shared use lane be extended further west along the extents of the proposed left turn lane. A functional design of the proposed access design and line painting along Lees Avenue is included in **Appendix J**. A Roadway Modification Approval (RMA) report has been submitted under separate cover.

Bus turning movements at the modified Lees Avenue/Chapel Crescent intersection have been prepared, validating that an articulated bus (ABUS design vehicle) and standard single-unit bus (B12 design vehicle) can make all turns at the intersection once the proposed cycle track is constructed. These movements are included in **Appendix I**.



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2 ROBINSON AVENUE

REQUIRED STOPPING SIGHT DISTANCE(85m)

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

DATE DEC 2023 | JOB 119171 | FIGURE FIGURE 17

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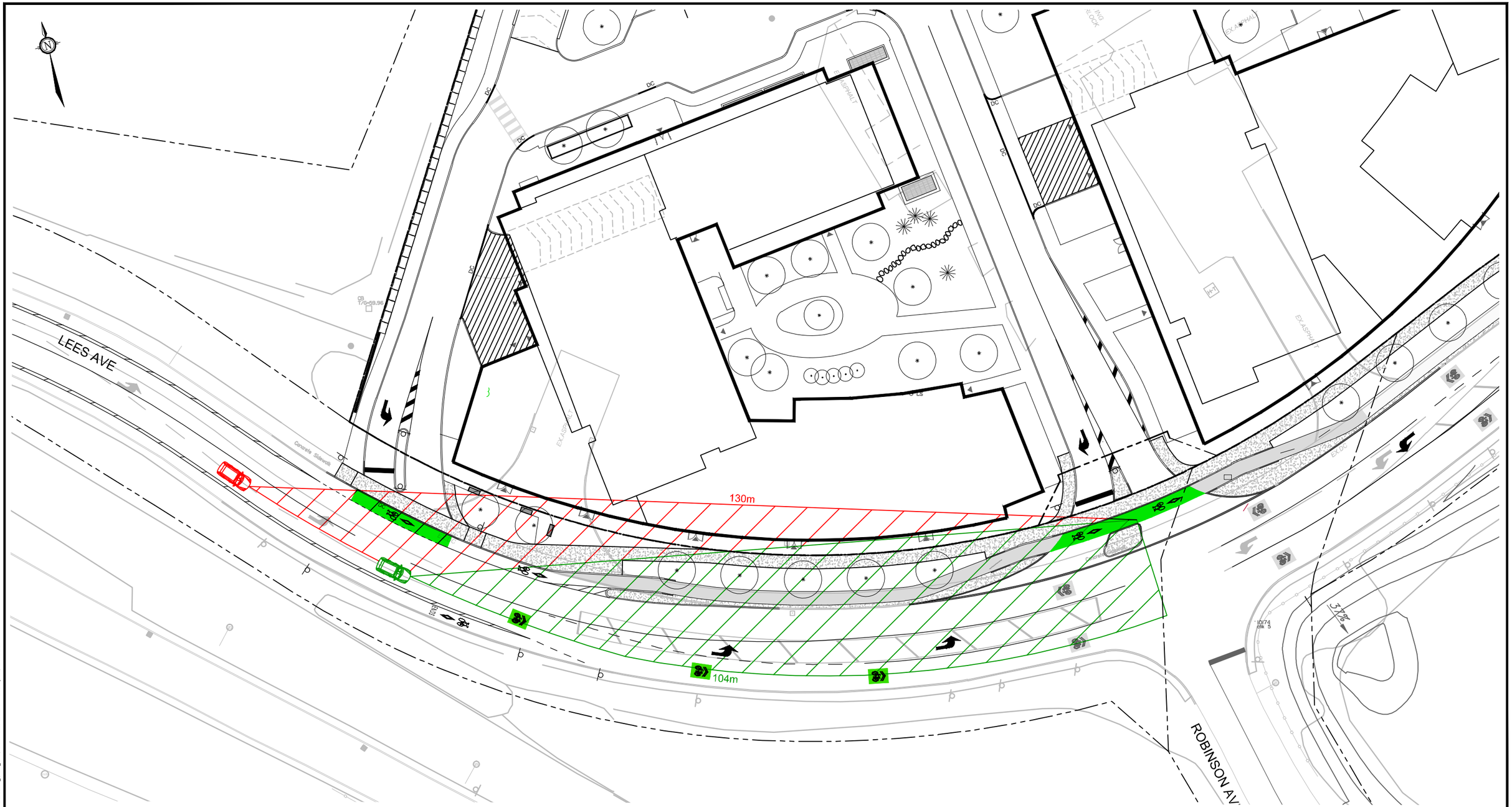

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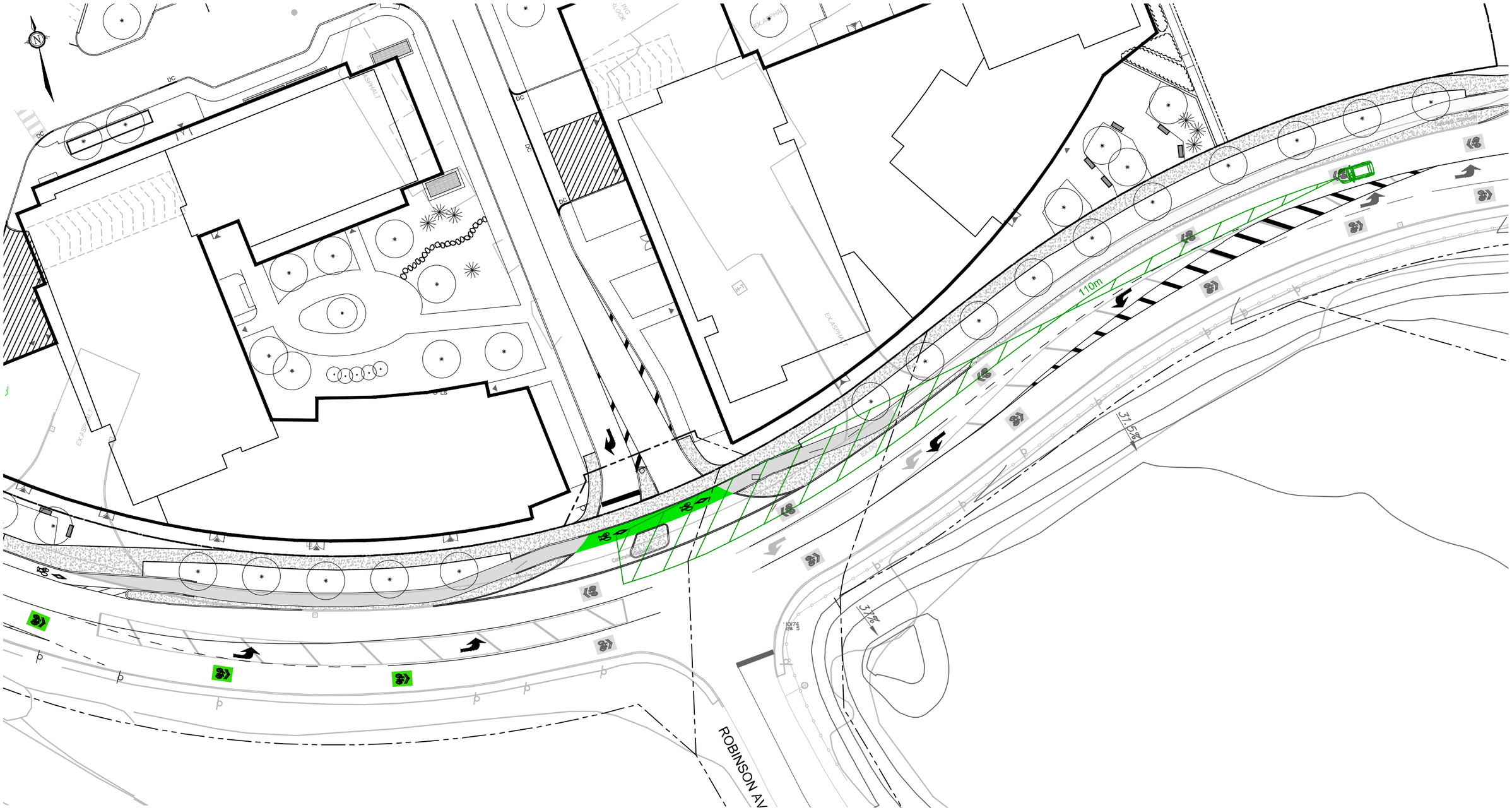
2 ROBINSON AVENUE

INTERSECTION SIGHT DISTANCE LEFT TURN AT EAST ACCESS

SCALE 1 : 500 (0, 5, 10, 15, 20)

DATE DEC 2023 | JOB 119171 | FIGURE FIGURE 18



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2 ROBINSON AVENUE

INTERSECTION SIGHT DISTANCE RIGHT TURN AT EAST ACCESS

SCALE 1 : 500 (0 5 10 15 20)
DATE DEC 2023
JOB 119171
FIGURE FIGURE 19

SHT11X17.DWG - 279mmX432mm

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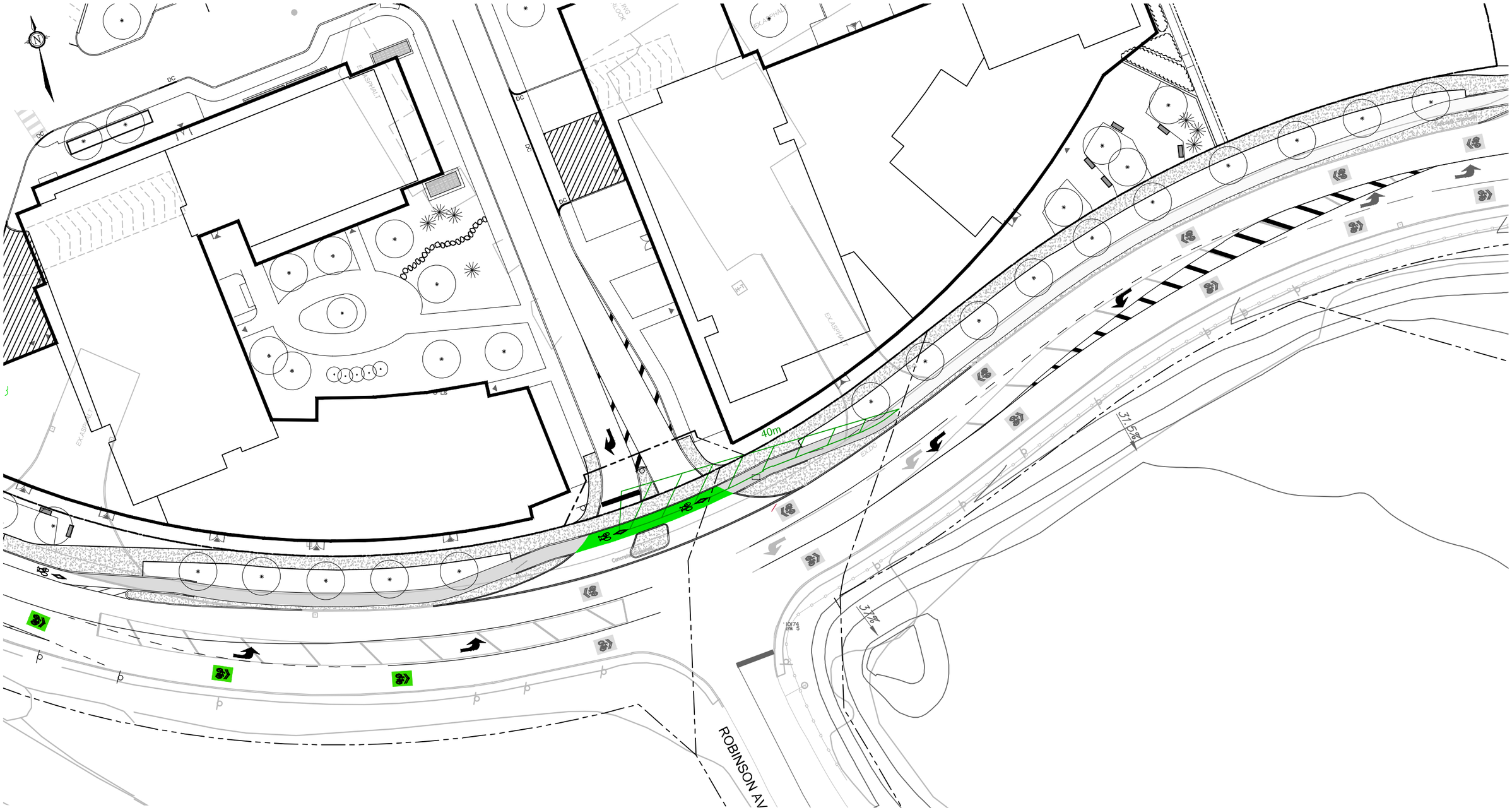

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2 ROBINSON AVENUE

INTERSECTION SIGHT DISTANCE TO CYCLISTS AT EAST ACCESS

SCALE 1 : 500 (0 5 10 15 20)
DATE DEC 2023
JOB 119171
FIGURE FIGURE 20

SHT11X17.DWG - 279mmX432mm

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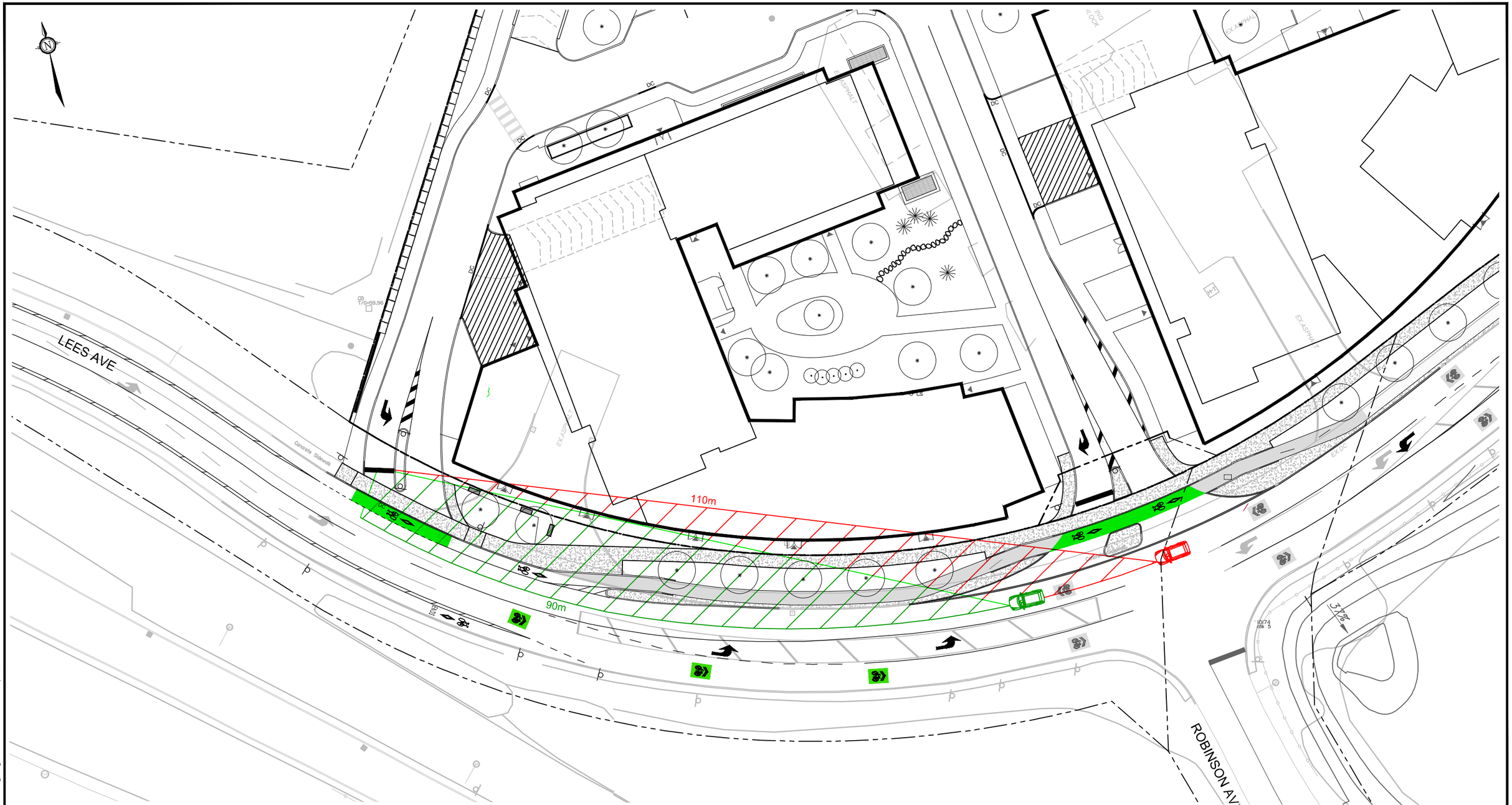

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2 ROBINSON AVENUE

INTERSECTION SIGHT DISTANCE RIGHT TURN AT WEST ACCESS

SCALE 1 : 500 (0, 5, 10, 15, 20)

DATE	JOB	FIGURE
DEC 2023	119171	FIGURE 21

SHT11X17.DWG - 279mmX432mm

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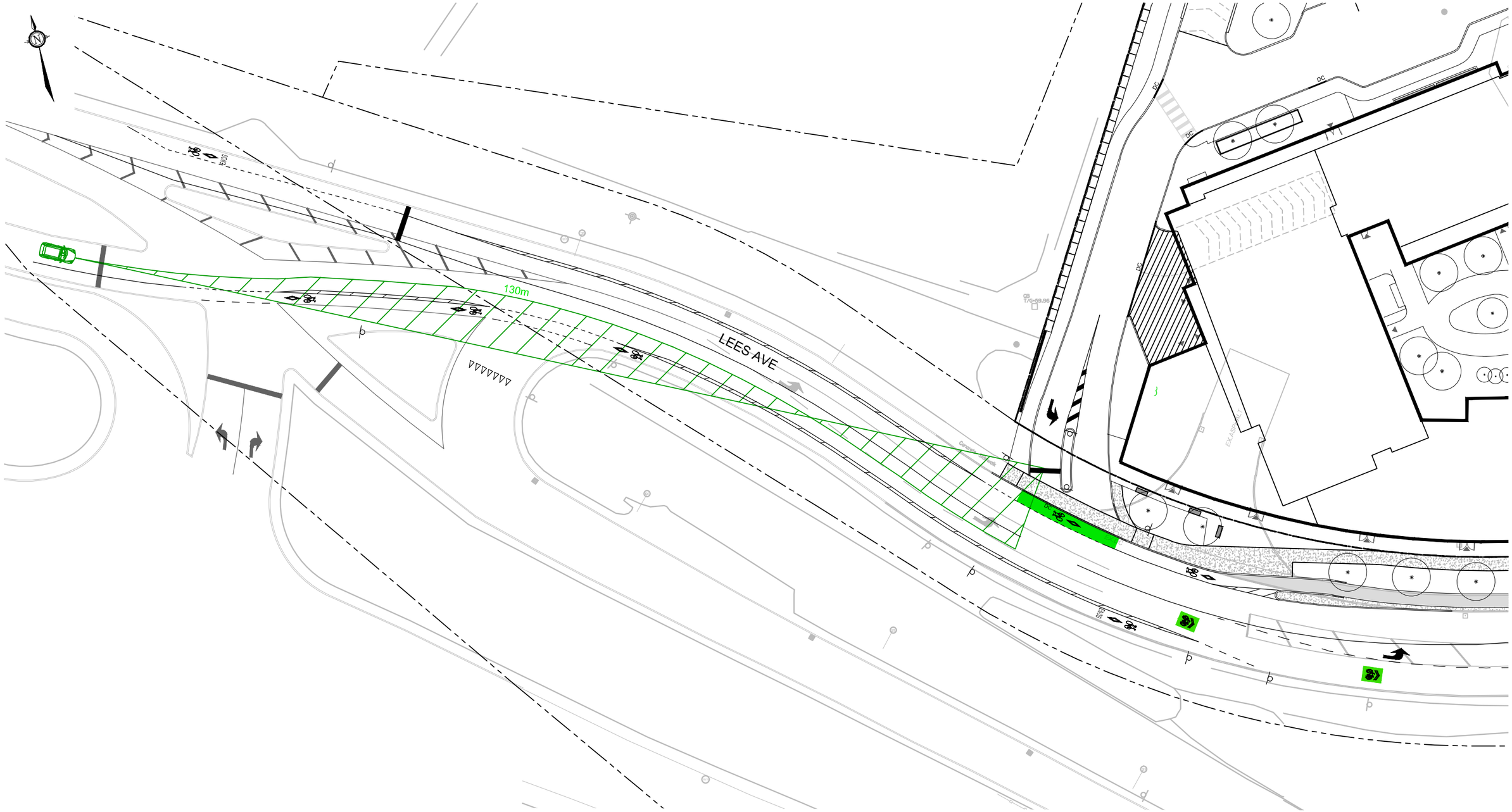

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2 ROBINSON AVENUE

INTERSECTION SIGHT DISTANCE LEFT TURN AT WEST ACCESS

SCALE 1 : 500 (0, 5, 10, 15, 20)

DATE DEC 2023 | JOB 119171 | FIGURE FIGURE 22

SHT11X17.DWG - 279mmX432mm

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A review of the access intersection operations was conducted as part of the June 2021 TIA. Full-movement unsignalized operation was previously analyzed for the east access, and showed that Robinson Avenue operated at a failing vehicular level of service (Auto LOS) during the PM peak hour in all years of analysis, with delays on Robinson Avenue exceeding 90 seconds by 2027. Signalization of the east access was recommended by the Phase 1 buildout year to mitigate future delays and alleviate sight distance concerns. Analysis of total traffic conditions in 2023 and 2027 at the proposed accesses has been redone to reflect the updated proposed conditions (i.e. restricting left turns out of the east access, and reassigning all previous outbound left turns to the west access).

A comparison of the previous results and new results at the proposed accesses in 2023 and 2027 is included in **Table 11**. Updated detailed Synchro reports are included in **Appendix K**.

Table 11: Access Intersection Operations – 2023 and 2027

Access	AM Peak			PM Peak		
	Delay	LOS	Movement	Delay	LOS	Movement
2023 Phase 1 Buildout						
Previous Analysis						
East Access	25 sec	D	NB	**54 sec**	**F**	**NB**
West Access	21 sec	C	SB	36 sec	E	SB
Updated Analysis						
East Access	25 sec	D	NB	**54 sec**	**F**	**NB**
West Access	21 sec	D	SB	36 sec	E	SB
2027 Ultimate Buildout						
Previous Analysis						
East Access	33 sec	D	NB	**95 sec**	**F**	**NB**
West Access	27 sec	D	SB	**53 sec**	**F**	**SB**
Updated Analysis						
East Access	36 sec	E	NB	**106 sec**	**F**	**NB**
West Access	29 sec	D	SB	**60 sec**	**F**	**SB**

The east access is anticipated to operate with an LOS F during the PM peak hour by the 2023 year, consistent with the findings of the June 2021 analysis. The delays at this access only marginally exceed the 50-second threshold for an LOS F, and are attributable to high vehicle traffic volumes along Lees Avenue and high pedestrian volumes from the development travelling towards the Lees Avenue transit station. Traffic signals are not warranted and not recommended as part of Phase 1, since a raised traffic island is proposed to restrict the outbound left turn and address the deficiency in turning sight distance.

Unsignalized operations at both proposed accesses are anticipated to marginally worsen compared to the previous analysis, as a result of additional southbound left turns at the west access, which become additional eastbound through vehicles on Lees Avenue at the east access/Robinson Avenue. Signalization of the east access by the ultimate buildout year 2027 may be required, and this will be confirmed with new analysis as part of future studies in support of subsequent phases.

A review of the proposed access location and design with respect to the City's Private Approach By-law, Zoning By-law, and Transportation Association of Canada Geometric Design Guidelines for Canadian Roadways has been conducted.

Section 25 (c) of the City's Private Approach By-law identifies a maximum width of 9m for two-way driveways. The City's Zoning By-law identifies a minimum driveway width of 6.7m leading to a surface parking lot. The west and east accesses will have widths of approximately 10.5m and 15m, respectively (as measured at the property line). This does not conform to the requirements of the Private Approach By-law. The widths of these accesses are required to accommodate an HSU design vehicle, and to develop traffic islands to restrict left turns in and right turns out at the west access, and left turns out at the east access. A waiver to the Private Approach By-law is requested to allow for the wider accesses.

Section 25 (m) of the Private Approach By-law identifies a minimum requirement of 75m between two private approaches to the same property for a development along an arterial roadway containing 300 or more parking spaces. The distance between the two proposed accesses is approximately 95m, measured curb-to-curb, and conforms to the requirements of the Private Approach By-law.

Section 25 (p) of the Private Approach By-law also identifies a minimum distance of 3m between a private approach and the adjacent property line. A distance of approximately 2.4m is provided between the west access and the adjacent property line. As a baseball diamond is currently provided on the adjacent property west of the site, a new access to the adjacent property in close proximity to the proposed access is not anticipated in the future. As such, a waiver to the Private Approach By-law is requested for the proximity of the west access to the property line.

The Transportation Association of Canada (TAC)'s *Geometric Design Guidelines* identify a clear throat length requirement of 45m for driveways along arterial roadways that serve apartment developments containing greater than 200 units. The east access has a clear throat length of 45m, while the west access has a clear throat length of 30m, measured from the edge of the curb radius to the first on-site conflict point. As the west access will be restricted to right-in left-out operation, less than ten vehicles during the AM and PM peak hours are anticipated to enter the access. The proposed 30m clear throat length can accommodate four vehicles prior to spilling over onto the roadway. As the traffic entering this access only equates to less than one vehicle every six minutes during the AM and PM peak hours, spillover of queued vehicles onto Lees Avenue is not anticipated.

TAC's *Geometric Design Guidelines* identify a minimum corner clearance of 70m for an access on the departing side of a signalized intersection and 70m for an access on the arriving side of a signalized intersection where a median isn't provided. The curb-to-curb distance between the east access and the west access is approximately 95m, meeting the minimum requirements of TAC. The distance between the west access and the northbound right turn movement at the Lees Avenue/Highway 417 Westbound Off-ramp intersection is approximately 60m and does not meet the TAC corner clearance spacing requirement of 70m.

6.5 Transportation Demand Management

6.5.1 Context for TDM

Phase 1 of the development will consist of 450 residential units and approximately 13,305 square feet of commercial space. The tenant for the commercial development is not known at this time. The future phases of the development will include an additional 1,084 residential units and 13,915 square feet of commercial space.

6.5.2 Need and Opportunity

The proposed development is located within a TOD Zone as it is within a 600m walking distance of the Lees LRT station. As described in Section 5.1, the target modal shares for the proposed development are based on the City's TOD zone modal shares and have been adjusted to reflect a higher non-auto modal share associated with the Ottawa Inner Area.

Using the 2011 TRANS O-D Survey Report, the typical residential commuter pattern in the Ottawa Inner Area is represented by all observed trips from/within the district during the AM peak hour and all observed trips to/within the district in the PM peak hour. Based on TRANS O-D Survey Report data, typical residential modal shares in the Ottawa Inner Area equate to approximately 35% auto driver, 10% passenger, 20% transit, 35% non-auto.

The TOD modal shares represent an increased transit modal share and a reduced auto/passenger modal share compared to the Ottawa Inner Area. Should the development only meet the Ottawa Inner Area modal shares, the ultimate development is anticipated to generate an additional 125-150 vehicle trips two-way during the peak hours.

6.5.3 TDM Program

The proposed development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle, and transit systems as outlined in **Section 6.1**. A review of the TDM Measures Checklist has been conducted for the residential component of the development and is included in **Appendix H.** The following measures will be implemented within the development:

- Designate an internal coordinator, or contract with an external coordinator;
- Display local area maps with walking/cycling access routes and key destinations at major entrances;
- Display relevant transit schedules and route maps at entrances;
- Unbundle parking from monthly rent; and
- Provide multimodal travel option information package to new residents.

6.6 Neighbourhood Traffic Management

As identified in Section 4.4, this section is exempt from the analysis.

6.7 Transit

Based on the trip generation presented in Section 5.1, the proposed development is anticipated to generate 245 transit trips (79 in, 166 out) during the AM peak hour, and 269 transit trips (153 in, 116 out) during the PM peak hour.

A review of the projected transit utilization was completed as part of the June 2021 TIA. The proposed development is not anticipated to have a significant impact on the existing operations of OC Transpo Route 16 and 56 and no capacity deficiencies are anticipated for Line 1 at Lees Station.

6.8 Network Concept

As identified in Section 4.4, this section is exempt from the analysis. A review of the lane capacity along Lees Avenue/King Edward Avenue was conducted as part of the June 2021 TIA.

6.9 Intersection Design

6.9.1 Existing Intersection MMLOS Analysis

The intersection MMLOS was reviewed as part of the June 2021 TIA.

6.9.2 Total Intersection Operations

Intersection capacity analysis was completed as part of the June 2021 TIA.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing, the conclusions and recommendations of this TIA can be summarized as follows:

Development Design

- Pedestrian connections will be provided between the main podium entrances and the sidewalk along Lees Avenue. A sidewalk will be provided along the vehicular accesses, linking to an internal pathway system within the site and connecting to the main entrance for residential tower D.
- An east-west pathway is proposed along the north end of the site connecting to Chapel Crescent and the western property limit. This pathway effectively reinstates the existing pathway in this location that is currently fenced off.
- A total of 1,782 bicycle parking spaces will be provided indoors and 52 bicycle parking spaces will be provided outdoors.
- One bicycle repair station and bicycle wash station will be included in each building's main bike room, for a total of four bicycle repair and wash stations.
- Cyclist access to the site will be accommodated through shared use lanes at the two vehicular accesses. The proposed bicycle parking is anticipated to exceed the minimum requirements of the City's Zoning By-law.
- All required Transportation Demand Management (TDM)-supportive design and infrastructure measures in the TDM checklist are met.

Parking

- Approximately 198 vehicle parking spaces and 347 bicycle parking spaces will be provided for Phase 1 of the development.
- Approximately 934 vehicle parking spaces and 1,834 bicycle parking spaces are anticipated to be provided for the overall development.
- The vehicular and bicycle parking will conform to the requirements of the Zoning By-law.

Boundary Streets

- There is a clear pedestrian desire line between the walkway provided on the north edge of the site and the pathway on the east side of Chapel Crescent. A Roadway Modification Approval (RMA) report has been submitted under separate cover and includes a PXO (Type D) at this location.

Access Intersections

- The required eastbound left turn storage length and taper at the west access is unachievable. Therefore, it is recommended that left turns into the west access be prohibited.
- Due to the curvilinear alignment of Lees Avenue between the two accesses, the podium for building A limits the ISD. A maximum ISD of 90m looking left to turn right from the west access is available, and a maximum ISD of 104m looking right to turn left is available at the east access.
- It is recommended that right turns out of the west access be prohibited, due to insufficient sight lines looking left. To restrict the left turns in and right turns out of the west access, a traffic island and signage will be provided.
- It is also recommended that left turns out of the east access be prohibited, due to insufficient sight lines looking right, as part of Phase 1. To restrict the left turns out of the east access, a traffic island and signage will be provided.
- At ultimate buildout, if signalization of the east access/Robinson Avenue is required from a delay perspective, the left-out restriction will be removed, allowing for a signalized, full-movement access. This will be confirmed in a subsequent TIA in support of future phases.
- The existing bike lanes along Lees Avenue transition to shared use lanes in advance of the Chapel Crescent and Robinson Avenue back-to-back left turn lanes. As an eastbound left turn lane is required at the site's east access, a cycle track is proposed in the westbound direction along the site's frontage. In the eastbound direction, it is proposed that the shared use lane be extended further west along the extents of the proposed left turn lane.
- The west and east accesses will have widths of approximately 10.5m and 15m, respectively (as measured at the property line). This does not conform to the requirements of the Private Approach By-law. The widths of these accesses are required to accommodate an HSU design vehicle, and to develop traffic islands to restrict left turns in and right turns out at the west access, and left turns out at the east access. A waiver to the Private Approach By-law is requested to allow for the wider accesses.
- A distance of 2.4m is provided between the west access and the adjacent property line. As a baseball diamond is currently provided on the adjacent property west of the site, a new access to the adjacent property in close proximity to the proposed access is not anticipated in the future. As such, a waiver to the Private Approach By-law is requested for the proximity of the west access to the property line.
- The proposed 30m clear throat length at the west access can accommodate four vehicles prior to spilling over onto the roadway. As the traffic entering this access only equates to less than one vehicle every six minutes during the AM and PM peak hours, spillover of queued vehicles onto Lees Avenue is not anticipated.
- The distance between the west access and the northbound right turn movement at the Lees Avenue/Highway 417 Westbound Off-ramp intersection is approximately 60m and does not meet the TAC corner clearance spacing requirement of 70m.

Transportation Demand Management

- The proposed development conforms to the City's TDM initiatives by providing easy access to the local pedestrian, bicycle and transit systems.
- The following measures will be implemented within the proposed development:
  - Designate an internal coordinator, or contract with an external coordinator;
  - Display local area maps with walking/cycling access routes and key destinations at major entrances;
  - Display relevant transit schedules and route maps at entrances;
  - Unbundle parking from monthly rent; and
  - Provide multimodal travel option information package to new residents.

Transit

- The proposed development is not anticipated to have a significant impact on the existing operations of OC Transpo Route 16 and 56.
- The additional trips generated by the development are not anticipated to result in increased service for Route 55 at stop #6803 and #6806.
- No capacity deficiencies are anticipated for Line 1 at Lees Station.

Based on the foregoing, the proposed development is recommended from a transportation perspective.

NOVATECH

Prepared by:

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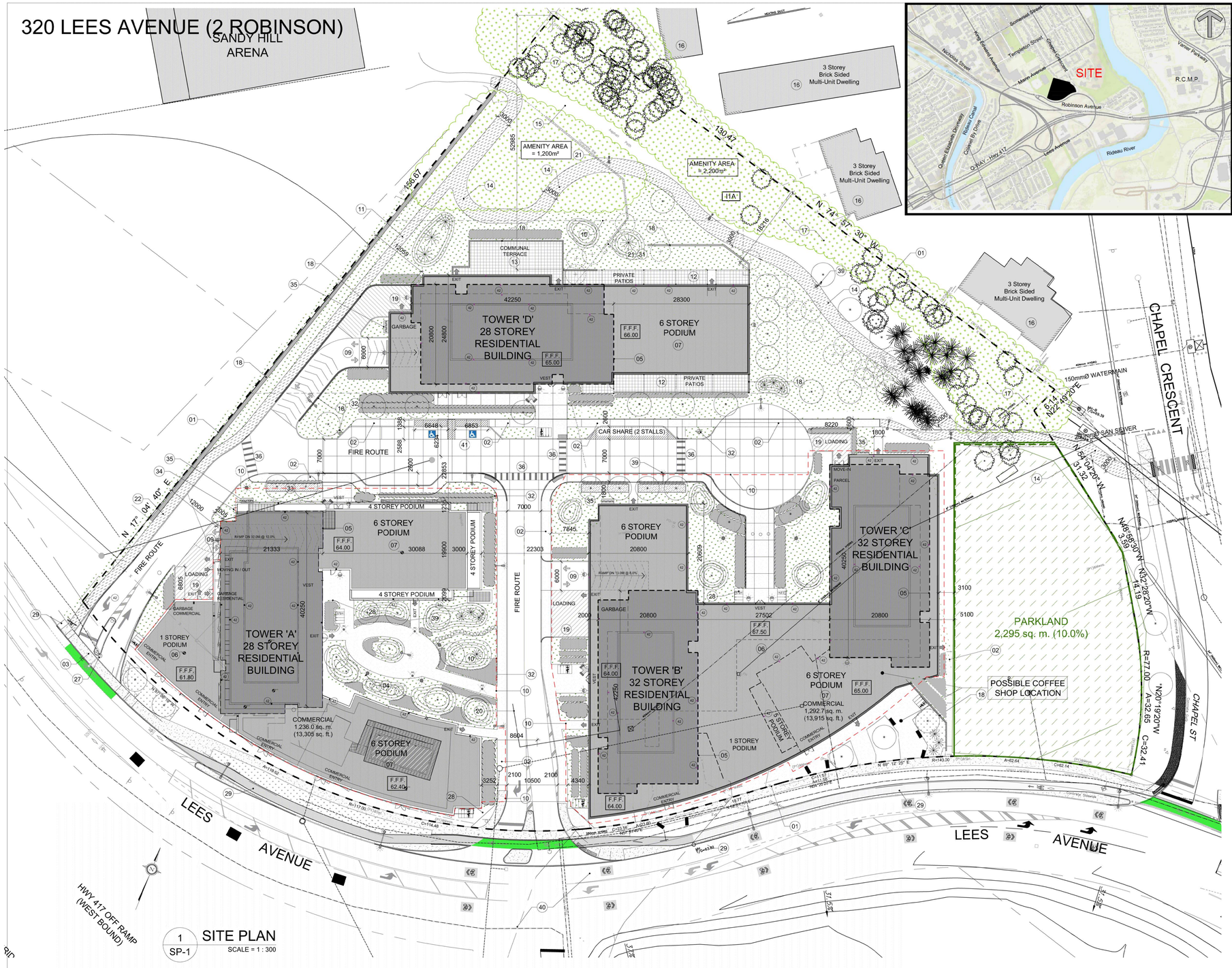
Reviewed by:

Jennifer Luong, P.Eng.
Senior Project Manager | Transportation

APPENDIX A

Site Plan

320 LEES AVENUE (2 ROBINSON)



1 SP-1 **SITE PLAN**
SCALE = 1 : 300

PROJECT INFORMATION

ZONING		TD2 [2745] S449
SITE AREA	22,951.0 sq. m. (247,043 sq. ft.)	22,948.5 sq. m. (247,016 sq. ft.)

REQUIRED

BUILDING HEIGHT (AS PER SCHEDULE S449)	103.0m
FRONT YARD SETBACK - LEES AVENUE	0.0m
FRONT YARD SETBACK - I1A ZONE	3.0m
INTERIOR YARD SETBACK - EAST	2.0m
INTERIOR YARD SETBACK - WEST	12.0m
REAR YARD SETBACK	17.0m
AMENITY SPACE - PER UNIT	6.0 sq. m.
EXTERIOR AMENITY SPACE - 2% LOT AREA	459.0 sq. m.
VEHICLE PARKING - VISITOR ONLY	0.1 PER UNIT
BICYCLE PARKING - RESIDENTIAL	0.5 PER UNIT
BICYCLE PARKING - COMMERCIAL	1 PER 250m² GFA

PROVIDED

BUILDING HEIGHT - BUILDING A	28 STOREY'S - 89.0m
BUILDING HEIGHT - BUILDING B	32 STOREY'S - 103.0m
BUILDING HEIGHT - BUILDING C	32 STOREY'S - 103.0m
BUILDING HEIGHT - BUILDING D	28 STOREY'S - 89.0m
GRADE - BUILDING A (GROUND = 64.0m)	63.0m geo. elev.
GRADE - BUILDING B-C (GROUND = 67.5m)	65.5m geo. elev.
GRADE - BUILDING D (GROUND = 65.0m)	64.0m geo. elev.
DENSITY - TD3 LOT (1,440 UNITS)	627 units/ha
UNIT COUNT	1,539 units
FRONT YARD SETBACK - TD3 ZONE	1.9m
CORNER YARD SETBACK - TD3 ZONE	23.3m
INTERIOR YARD SETBACK - TD3 ZONE	12.0m
INTERIOR YARD SETBACK ABOVE 6 STOREY'S	12.0m
REAR YARD SETBACK - TD3 ZONE	18.5m
VEHICLE PARKING - TOTAL	934
VEHICLE PARKING - RESIDENTIAL UNIT	814
VEHICLE PARKING - VISITOR	120
BICYCLE PARKING - RESIDENTIAL	1782
BICYCLE PARKING - COMMERCIAL	52
LOT COVERAGE	36.9%
EXTERIOR AMENITY SPACE	3,900.0 sq. m.
GROUND FLOOR TRANSPARENT GLAZING	60.0%
TOTAL PROJECT G.F.A.	92,364.5 sq. m. 994,203 sq. ft.

CAR PARKING

REQUIRED

RESIDENCE	- Area "Z" NOT REQUIRED	0
VISITOR	- 0.1 PER UNIT (MAXIMUM 30 PER BUILDING)	120
COMMERCIAL	- Area "Z" NOT REQUIRED	0
TOTAL		120

PROVIDED

RESIDENCE	- 0.53 PER UNIT (1,517 UNITS)	804
VISITOR - INTERIOR	- 0.072 PER UNIT	109
VISITOR - SURFACE	- 0.011 PER UNIT	17
CAR SHARE		4
	- 0.62 PER UNIT	934

BICYCLE PARKING

REQUIRED

RESIDENCE	- 0.5 PER UNIT (1,517 UNITS)	759
COMMERCIAL	- 1 PER 250m² GFA (2,518.7m²)	10
		769

PROVIDED

INTERIOR	1,782
EXTERIOR	52
	1,834

AMENITY SPACE

EXISTING BUSH ALONG NORTH =	2,200.0 sq. m.
COURTYARD OF BUILDING A =	500.0 sq. m.
NORTH SIDE OF BUILDING D =	1,200.0 sq. m.
COMMUNAL INTERNAL AMENITY - 1st LEVEL =	1,600.0 sq. m.
COMMUNAL INTERNAL AMENITY - 7th LEVEL =	800.0 sq. m.
COMMUNAL EXTERIOR PATIO - 7th LEVEL =	1,200.0 sq. m.
PRIVATE BALCONIES =	3,800.0 sq. m.
TOTAL =	11,300 sq. m.
TOTAL COMMUNAL =	7,300 sq. m.
REQUIRED - 6.0M² PER UNIT (1,517) =	9,102 sq. m.
REQUIRED COMMUNAL @ 50% =	4,551 sq. m.

LAND PHASE AREA

BUILDING "A" =	6,070.6 sq. m.	26.45%
BUILDING "B-C" =	7,011.4 sq. m.	30.55%
BUILDING "D" =	7,569.8 sq. m.	32.99%
PARKLAND =	2,296.2 sq. m.	10.01%
TOTAL =	2,2948 sq. m.	100.00%

LOT COVERAGE

BUILDING FOOTPRINT - "A" =	2,732.4 sq. m.	11.91%
BUILDING FOOTPRINT - "B-C" =	3,762.5 sq. m.	16.40%
BUILDING FOOTPRINT - "D" =	1,970.8 sq. m.	8.59%
DRIVING SURFACE =	3,292.2 sq. m.	14.35%
LANDSCAPE SURFACE =	8,895.6 sq. m.	38.75%
PARKLAND =	2,295.0 sq. m.	10.00%
TOTAL =	22,948.5 sq. m.	100.00%

SOLID WASTE

BUILDING 'A' - 450 UNITS

GARBAGE	0.110 Y³ PER UNIT	50 Y³
RECYCLING - GMP	0.018 Y³ PER UNIT	8 Y³
RECYCLING - FIBRE	0.038 Y³ PER UNIT	17 Y³
ORGANICS	1 - 240 L BIN PER PER 50 UNITS	9

BUILDING 'B' - 369 UNITS

GARBAGE	0.110 Y³ PER UNIT	40 Y³
RECYCLING - GMP	0.018 Y³ PER UNIT	7 Y³
RECYCLING - FIBRE	0.038 Y³ PER UNIT	14 Y³
ORGANICS	1 - 240 L BIN PER PER 50 UNITS	8

BUILDING 'C' - 369 UNITS

GARBAGE	0.110 Y³ PER UNIT	42 Y³
RECYCLING - GMP	0.018 Y³ PER UNIT	7 Y³
RECYCLING - FIBRE	0.038 Y³ PER UNIT	14 Y³
ORGANICS	1 - 240 L BIN PER PER 50 UNITS	8

BUILDING 'D' - 346 UNITS

GARBAGE	0.110 Y³ PER UNIT	37 Y³
RECYCLING - GMP	0.018 Y³ PER UNIT	6 Y³
RECYCLING - FIBRE	0.038 Y³ PER UNIT	13 Y³
ORGANICS	1 - 240 L BIN PER PER 50 UNITS	7

GROSS BUILDING - AREAS

(CITY OF OTTAWA ZONING AREA)

BUILDING 'A' STAGE 1 CONSTRUCTION

PARKING LEVEL		0.0 sq. m. 000 sq. ft.
GROUND FLOOR		2,630 sq. m. 28,309 sq. ft.
2nd FLOOR		2,339 sq. m. 25,174 sq. ft.
3rd - 6th FLOOR	4 x 2,353 sq. m. 4 x 25,329 sq. ft.	9,412 sq. m. 101,316 sq. ft.
7th FLOOR		877 sq. m. 9,444 sq. ft.
8th - 26th FLOOR TOWER	19 x 877 sq. m. 19 x 9,438 sq. ft.	16,663 sq. m. 179,322 sq. ft.
27st - 28th FLOOR	2 x 752 sq. m. 2 x 8,096 sq. ft.	1,504 sq. m. 16,192 sq. ft.
MECHANICAL LEVEL		320 sq. m. 3,444 sq. ft.
TOTAL AREA		33,745 sq. m. 363,201 sq. ft.
TOWER FOOTPRINT		831.8 sq. m. 8,953 sq. ft.
UNIT COUNT		450
VEHICLE PARKING		198
BICYCLE PARKING		347
COMMERCIAL AREA		1,236 sq. m. 13,305 sq. ft.

BUILDING 'B' & 'C' STAGE 3 CONSTRUCTION

PARKING LEVEL		0.0 sq. m. 000 sq. ft.
STREET LEVEL		1,261.7 sq. m. 13,581 sq. ft.
GROUND FLOOR		218.6 sq. m. 2,353 sq. ft.
2nd FLOOR - TOWER B		1,211.4 sq. m. 13,039 sq. ft.
2nd FLOOR - TOWER C		1,176.2 sq. m. 12,660 sq. ft.
3rd - 5th PODIUM - TOWER B	3 x 1,211.4 sq. m. 3 x 13,039 sq. ft.	3,634.1 sq. m. 39,117 sq. ft.
3rd - 5th PODIUM - TOWER C	3 x 1,176.2 sq. m. 3 x 12,660 sq. ft.	3,528.5 sq. m. 37,980 sq. ft.
6th FLOOR PODIUM - TOWER B		1,211.4 sq. m. 13,039 sq. ft.
6th FLOOR PODIUM - TOWER C		1,176.2 sq. m. 12,660 sq. ft.
7th FLOOR - TOWER B		588.9 sq. m. 6,339 sq. ft.
7th FLOOR - TOWER C		579.9 sq. m. 6,242 sq. ft.
8th - 30th FLOOR TOWER B	23 x 662.58 sq. m. 23 x 7,132 sq. ft.	15,248.0 sq. m. 164,128 sq. ft.
8th - 30th FLOOR TOWER C	23 x 662.58 sq. m. 23 x 7,132 sq. ft.	15,248.0 sq. m. 164,128 sq. ft.
31st - 32nd FLOOR TOWER B	2 x 551.9 sq. m. 2 x 5,931 sq. ft.	1,108.7 sq. m. 11,934 sq. ft.
31st - 32nd FLOOR TOWER C	2 x 551.9 sq. m. 2 x 5,931 sq. ft.	1,108.7 sq. m. 11,934 sq. ft.
MECHANICAL LEVEL TOWER B		0.0 sq. m. 000 sq. ft.
MECHANICAL LEVEL TOWER C		0.0 sq. m. 000 sq. ft.
TOTAL AREA		46,007.9 sq. m. 495,225 sq. ft.
TOWER FOOTPRINT		831.8 sq. m. 8,953 sq. ft.
UNIT COUNT - BUILDING B		369
UNIT COUNT - BUILDING C		369
VEHICLE PARKING		450
BICYCLE PARKING		1,157
COMMERCIAL AREA		1,292.7 sq. m. 13,915 sq. ft.

BUILDING 'D' STAGE 2 CONSTRUCTION

PARKING LEVEL		0.0 sq. m. 000 sq. ft.
GROUND FLOOR		846.5 sq. m. 9,112 sq. ft.
2nd FLOOR		1,374.0 sq. m. 14,790 sq. ft.
3rd - 5th PODIUM	3 x 1,336.1 sq. m. 3 x 14,382 sq. ft.	4,008.4 sq. m. 43,146 sq. ft.
6th FLOOR PODIUM		1,336.1 sq. m. 14,382 sq. ft.
7th FLOOR TOWER		585.9 sq. m. 6,307 sq. ft.
8th - 26th FLOOR TOWER	19 x 662.58 sq. m. 19 x 7,132 sq. ft.	12,589.1 sq. m. 135,508 sq. ft.
27st - 28th FLOOR	2 x 551.0 sq. m. 2 x 5,931 sq. ft.	1,102.0 sq. m. 11,862 sq. ft.
MECHANICAL LEVEL		0.0 sq. m. 000 sq. ft.
TOTAL AREA		21,842.2 sq. m. 235,107 sq. ft.
TOWER FOOTPRINT		831.8 sq. m. 8,953 sq. ft.
UNIT COUNT		329
VEHICLE PARKING		286
BICYCLE PARKING		330

UNIT MIX - 1,539 UNITS

STUDIO UNIT	120
ONE BEDROOM UNIT	686
ONE BEDROOM + DEN UNIT	436
TWO BEDROOM UNIT	536
TWO BEDROOM + DEN UNIT	76
THREE BEDROOM UNIT	295
TOTAL UNITS	1539

SITE PLAN SYMBOLS

- SOFT LANDSCAPE
- CONCRETE WALKING SURFACE
- ASPHALT PATH
- EXISTING WOODED AREA
- PROPOSED PARKLAND
- PROPERTY LINE
- GUARD RAILING / FENCE
- BIKE RACK
- ENTRANCE / EXIT DOOR
- COMMERCIAL / EXIT DOOR
- FIRE HYDRANT
- VEHICULAR DIRECTION
- EXISTING TREE TO REMAIN
- SIAMESE CONNECTION
- CITY STREET LIGHTING
- SITE LIGHTING

DRAWING NOTES

1. PROPERTY LINE
2. HARD SURFACE PAVING, WIDTH AS NOTED
3. CONCRETE SIDEWALK WITH DEPRESSED CURB
4. SOFT LANDSCAPING, SEE LANDSCAPE PLAN
5. OUTLINE OF TOWER ABOVE
6. 1 STOREY PODIUM LEVEL
7. 6 STOREY PODIUM LEVEL
8. OUTLINE OF PRIVATE TERRACE ABOVE
9. PARKING GARAGE RAMP WITH DRENCH DRAIN IF REQUIRED
10. OUTLINE OF BELOW GRADE PARKING GARAGE
11. 1.8m WIDE ASPHALT PEDESTRIAN PATH
12. AT GRADE PRIVATE PATIO WITH LOW FENCE
13. AT GRADE COMMUNAL TERRACE
14. 3m WIDE ASPHALT PATH
15. EXISTING 1.8m WIDE ASPHALT PEDESTRIAN PATH
16. EXISTING BUILDINGS ON ADJACENT PROPERTY
17. EXISTING WOODED AREA TO REMAIN
18. RETAINING WALL WITH GUARD RAIL AS REQUIRED
19. LOADING / SERVICE BAY / GARBAGE PICK-UP
20. OUTLINE OF EXISTING BUILDING TO BE REMOVED
21. EXISTING CHAIN LINK FENCE TO BE REMOVED
22. EXISTING TREE TO BE REMOVED
23. CAR SHARE SPACE
24. EXISTING TREE TO BE PRESERVED
25. PROPOSED SERVICES
26. EXISTING RETAINING WALL TO REMAIN
27. EXISTING STREET LIGHT POLE, RELOCATE AS REQUIRED
28. BICYCLE RACK, SEE LANDSCAPE FOR DETAILS
29. EXISTING 2.1m WIDE CITY SIDEWALK
30. CATCH BASIN
31. EXISTING RETAINING WALL TO BE REMOVED
32. FIRE HYDRANT
33. SIAMESE CONNECTION
34. PARKING GARAGE INTAKE / EXHAUST GRILL
35. NATURAL GAS EQUIPMENT WITH BOLLARDS
36. PEDESTRIAN CROSS WALK WITH DEPRESS CURBS
37. SITE FURNITURE - SEE LANDSCAPE FOR DETAILS
38. MOUNTABLE CURB
39. SITE LIGHTING
40. NEW SIGNALIZED INTERSECTION
41. ACCESSIBLE PARKING SPACES
42. WALL MOUNT LIGHT FIXTURE

LANDSCAPE ARCHITECT
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E-Mail: abbasi@fotenn.com

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Novatech Eng. Consultants Ltd.
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Ottawa, Ontario, K2M 1P6
Tel: 613 254-9643
Fax: 613 254-5867
Email: f.thauvette@novatech-eng.com

LEGAL DESCRIPTION
TOPOGRAPHICAL PLAN OF SURVEY OF
PART OF LOT F
CONCESSION D (RIDEAU FRONT)
GEOGRAPHIC TOWNSHIP OF NEPEAN
CITY OF OTTAWA
Prepared by Annis, O'Sullivan, Vollebekk Ltd.

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SURVEYOR
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Ontario Land Surveyors
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Nepean, Ontario K2E 7S6
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Fax: (613) 727-1079
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GeigerHuot
architectes
424, rue Guy, bureau 104, Montréal, QC, H3J 1S6
tél. 514 - 935 - 3338 télec. 514 - 935 - 3375
info@geigerhuot.com

NOTES GENRALES:

Ne pas mesurer directement des dessins.

Toutes les dimensions et conditions générales doivent être vérifiées avant le début des travaux.

En aucun cas ne procéder dans l'incertitude.

Ce dessin doit être lu conjointement avec le devis architectural et les notes générales.

Ordre des architectes du Québec — 3151 ERIC HUOT ARCHITECTES

Sceau

Client

NORD DE PROJET | NORD GEOGRAPHIQUE

DATE	ISSUE/RÉVISION	PAR
25 JAN 2024	CITY COMMENTS	GM
12 OCT 2023	UPDATED LANDSCAPE	GM
7 OCT 2022	ISSUED FOR SITE PLAN APPROVAL	CA
5 OCT 2022	ISSUED FOR COORDINATION	CA
12 SEPT 2022	ISSUED FOR COORDINATION	CA

Revision

CLELAND JARDINE ENGINEERING LTD
200-580 Terry Fox Drive
Kanata, Ontario
K2L 4B9
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F 613-591-1705

Structure

Smith + Andersen
Smith + Andersen (Ottawa)
1500 Carling Avenue, Suite 330
Ottawa, Ontario, K1Z 1G3
T 613.230.1185
F 613.230.2039

MECANIQUE- ELECTRICITÉ

FOTENN Planning + Design
223 McLeod Street, Ottawa ON K2P 0Z5
613.730.5709

MÉCANIQUE PROTECTION INCENDIE

ROBINSON
NEW CONSTRUCTION

Projet

Titre du dessin :

SITE PLAN
BUILDING A

échelle :	1: 300	dessiné par :	CA
date :	2024-01-17	approuvé par :	EH
dossier :	22-027	dessin :	A000

DWG 22-027-A000

#18357

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines TIA Screening

1. Description of Proposed Development

Municipal Address	2 Robinson Avenue
Description of Location	North of Lees Avenue and Robinson Avenue, west of Chapel Crescent
Land Use Classification	Mixed-Use Residential and Commercial
Development Size (units)	1,539 residential dwellings
Development Size square metre (m^2)	2,529 sq.m. commercial GFA
Number of Accesses and Locations	Two proposed accesses to Lees Ave
Phase of Development	Multi-phased
Buildout Year	2027

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

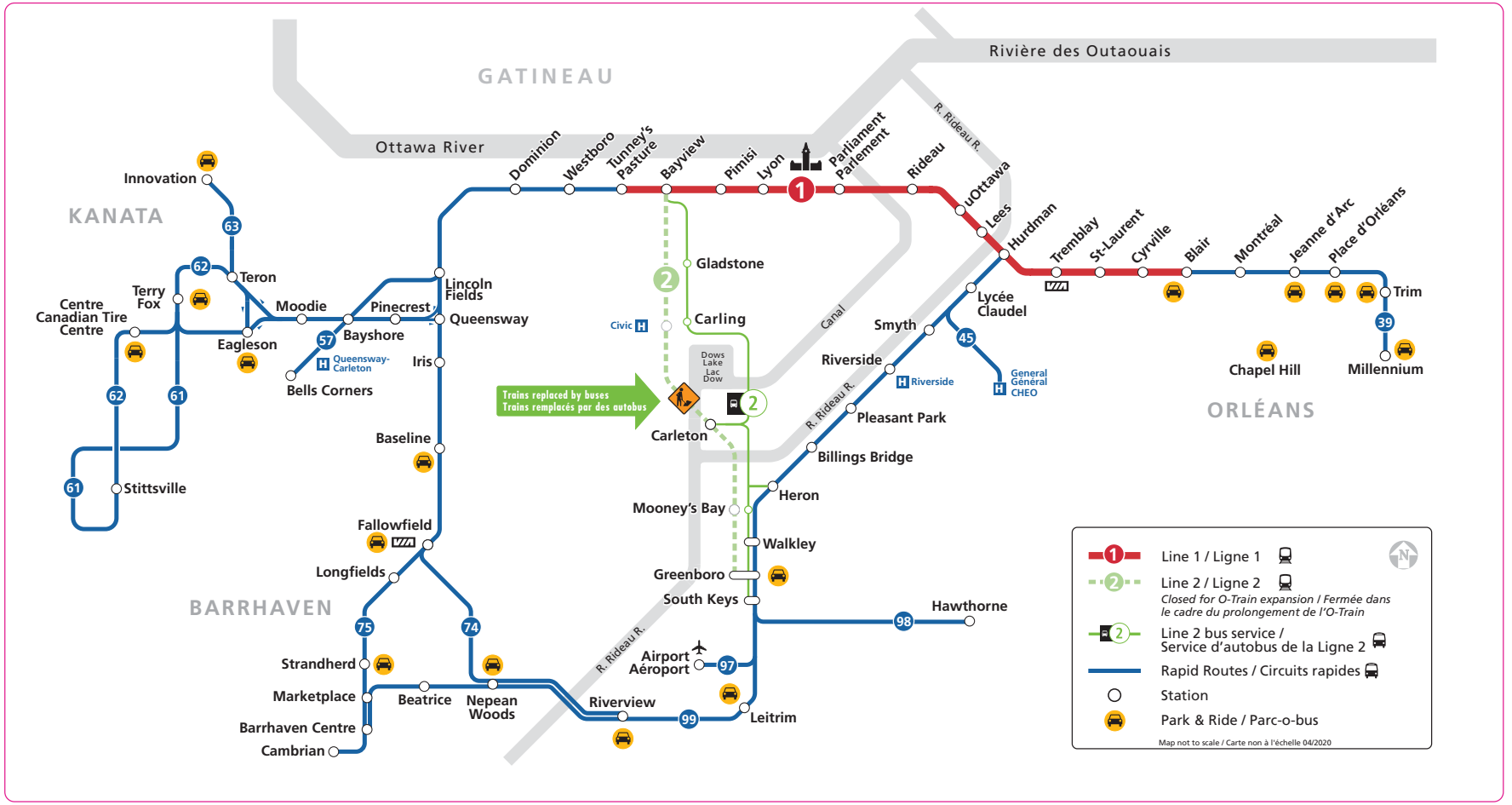
Lees Avenue Cycling Improvements

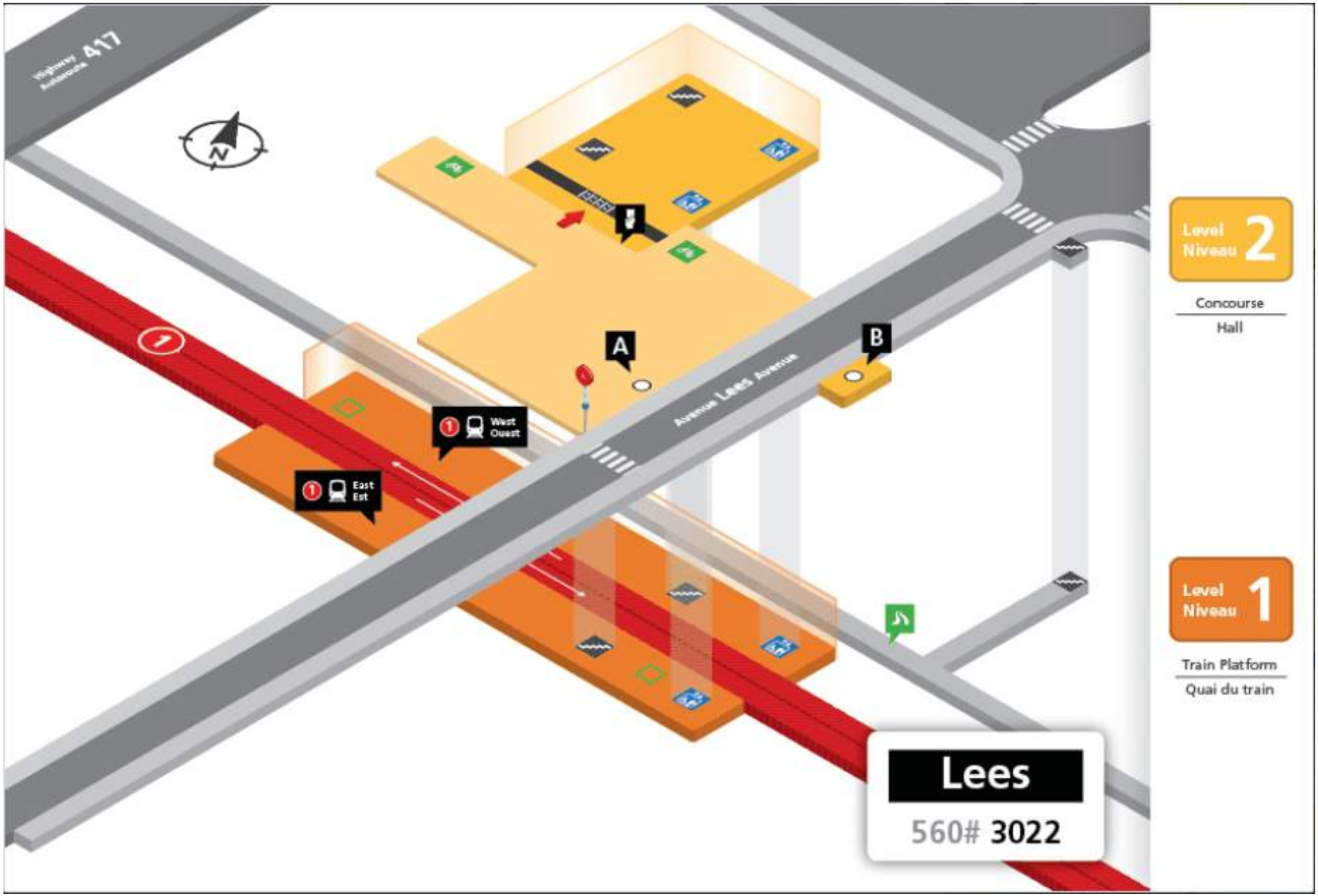
Lees Ave from Mann Ave to UOttawa Southern Campus
Proposed Redesign to include Bike Lanes with Shared Lane Segments


HURDMAN RD
LEES AVE
ROBINSON AVE
HIGHWAY 417
HIGHWAY 417
RB-37 (TAC)
RB-37 (TAC)
THIS LANE
THIS LANE
Existing markings, shown in blue, installed after airphoto shown here. (typ)
Ottawa

APPENDIX D

OC Transpo System Information


GATINEAU
Rivière des Outaouais
Ottawa River
R. Rideau R.
KANATA
BARRHAVEN
ORLÉANS
Canal
R. Rideau R.
Innovation
Teron
Terry Fox
Centre Canadian Tire Centre
Eagleson
Moodie
Pinecrest
Bayshore
Queensway-Carleton
Bells Corners
Lincoln Fields
Queensway
Iris
Baseline
Fallowfield
Longfields
Stittsville
Strandherd
Marketplace
Barrhaven Centre
Cambrian
Beatrice
Nepean Woods
Dominion
Westboro
Tunney's Pasture
Bayview
Pimisi
Lyon
Parliament
Parlement
Rideau
uOttawa
Lees
Hurdman
Tremblay
St-Laurent
Cyrville
Blair
Montréal
Jeanne d'Arc
Place d'Orléans
Trim
Millennium
Chapel Hill
Gladstone
Civic
Carling
Dows Lake
Lac Dow
Trains replaced by buses
Trains remplacés par des autobus
Carleton
Mooney's Bay
Greenboro
South Keys
Airport
Aéroport
Riverview
Leitrim
Lycée Claudel
Smyth
Riverside
General
Général
CHEO
Pleasant Park
Billings Bridge
Heron
Walkley
Hawthorne
Line 1 / Ligne 1
Line 2 / Ligne 2
Closed for O-Train expansion / Fermée dans le cadre du prolongement de l'O-Train
Line 2 bus service / Service d'autobus de la Ligne 2
Rapid Routes / Circuits rapides
Station
Park & Ride / Parc-o-bus
Map not to scale / Carte non à l'échelle 04/2020


Highway 417
Autoroute
N
Avenue Lees Avenue
A
B
1 West Ouest
1 East Est
Level 2
Niveau
Concourse
Hall
Level 1
Niveau
Train Platform
Quai du train
Lees
560# 3022


Sandy Hill Arena
Aréna Côte-de-Sable
WIGGINS
Dutchie's Hole Park
Parc Dutchie's Hole
Robinson Field
Terrain Robinson
417
5 min.
Av. LEES Ave.
Av. ROBINSON Ave.
The Citadel
Riverview Place
Rideau East
River Club
uOttawa
200 Lees
Gee-Gees Field
Terrain des Gee-Gees
Rideau River Trail
Sentier de la rivière Rideau
Springhurst Park
Parc Springhurst
Rivière Rideau River

Pimisi
Lyon
Parliament
Parlement
Rideau
uOttawa
Lees
Hurdman
Tremblay
St-Laurent
Cyrville
Lycée Claudel
Smyth
Riverside
QUEENSWAY
417
Plaines LeBreton Flats
Library and Archives
Bibliothèque et Archives
Wellington
Sparks
Queen
Albert
Slater
Laurier W.
Somerset W.
Gladstone
Catherine
Raymond
Chamberlain
Isabella
Pretoria
Strathcona
Glebe
First
Queen Elizabeth
Canal Rideau
Sunnyside
Grove
Hawthorne
Besserer
Daly
Laurier E.
Somerset E.
Mann
Lees
Montréal
McArthur
Donald
Queen Mary
Coventry
Terminal
Belfast
Industrial
Coronation
Kenaston
Algoma
Newmarket
Innes
Brittany
Deschamps
Montfort
Tormey
Pères-Blancs
Richelieu
Centre d'accueil Champlain
Cimetière Notre Dame Cemetery
NAC
CNA
Shaw Centre
Centre Shaw
CF Rideau Centre
Confederation
Confédération
City Hall
Hôtel de ville
Lisgar
University of Ottawa
Université d'Ottawa
Canadian Museum of Nature
Musée canadien de la nature
Central Station
Station centrale
Saint-Vincent
Adult
Immaculata
Saint-Paul University
Université Saint-Paul
Glebe
TD Place
Place TD
Lansdowne Park
Parc Lansdowne
Lansdowne
Dows Lake
Lac Dow
Arboretum du Dominion
Dominion Arboretum
Heartwood House
Au Coeur De La Vie
Parc RCGT Park
C.C. St. Laurent S.C.
VIA Rail
Ottawa Train Yards
Lycée Claudel
Springhurst
Strathcona
Gil O Julien
Ken Steele
Montfort
La Cité
TOH Rehabilitation Centre
CHEO
STO
Rideau Canal
Booth
Bronson
Bay
Lyon
Kent
Bank
O'Connor
Metcalfe
Elgin
Preston
Nicholas
Colonel By
Queen Elizabeth
Main
Greenfield
King Edward
Chapel
Cobourg
Charlotte
North River
Vanier
Range
Olmstead
Lafontaine
St-Laurent
Cummings
Granville
Alfred
Cantin
Marier
Lola
Frances
Riverside
Transitway
Alta Vista
Sandford Fleming
Trainyards
Triole
Michael
Labrie
Star Top
Den Haag
Reine-Elizabeth
Riverdale
Windsor
Oblats
Hazel
Seneca
Campus
Mackenzie King
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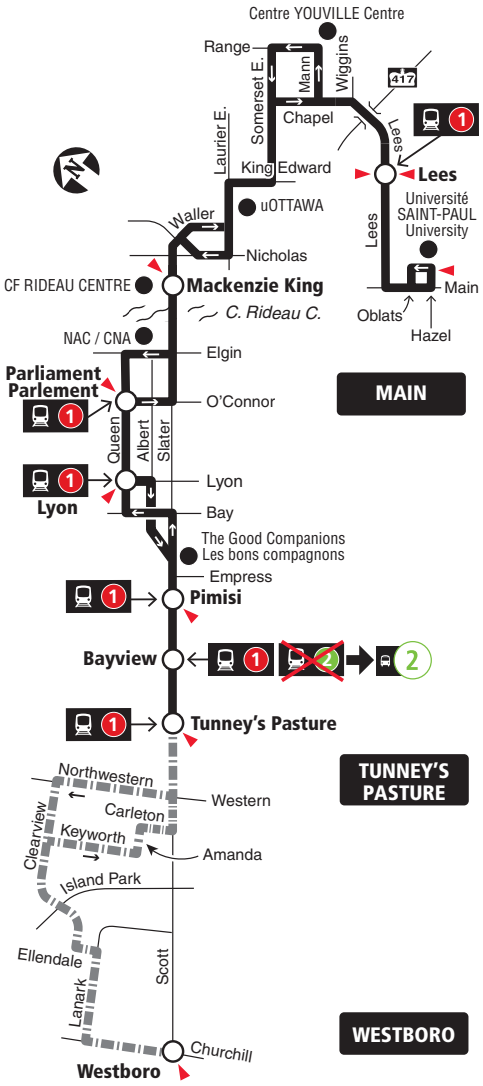
85
88
111
114
302

16 MAIN

TUNNEY'S PASTURE
WESTBORO

7 days a week / 7 jours par semaine
All day service
Service toute la journée



Station
No Sunday service / Aucun service le dimanche
Timepoint / Heures de passage

2020.04

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

Customer Service
Service à la clientèle **613-741-4390**
Lost and Found / Objets perdus..... **613-563-4011**
Security / Sécurité **613-741-2478**

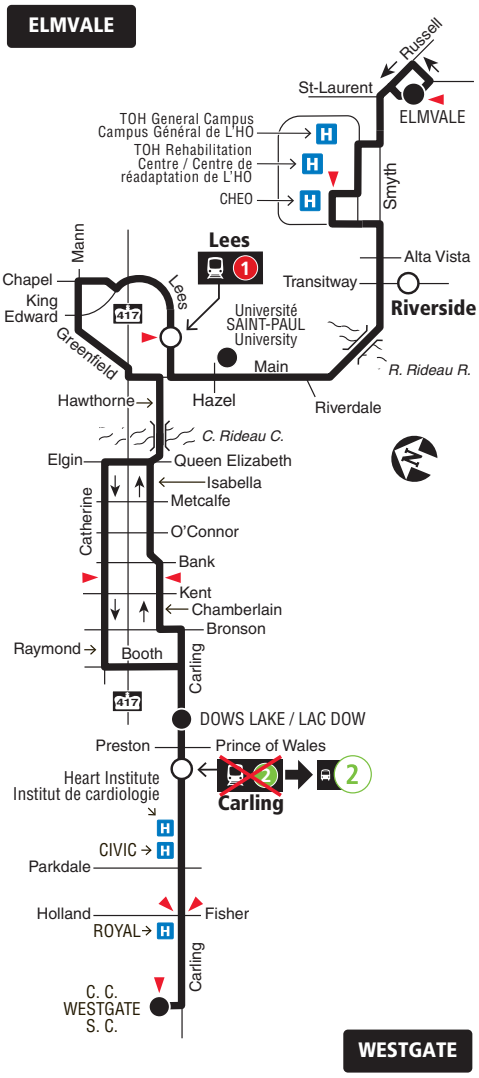
Effective May 3, 2020
En vigueur 3 mai 2020

OC Transpo
INFO 613-741-4390
octranspo.com

55 ELMVALE / WESTGATE

Local

7 days a week / 7 jours par semaine



Stations

Timepoint / Heures de passage

2021.06

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 **613-741-4390**

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

Security / Sécurité **613-741-2478**

Effective June 20, 2021
En vigueur 20 juin 2021

OC Transpo

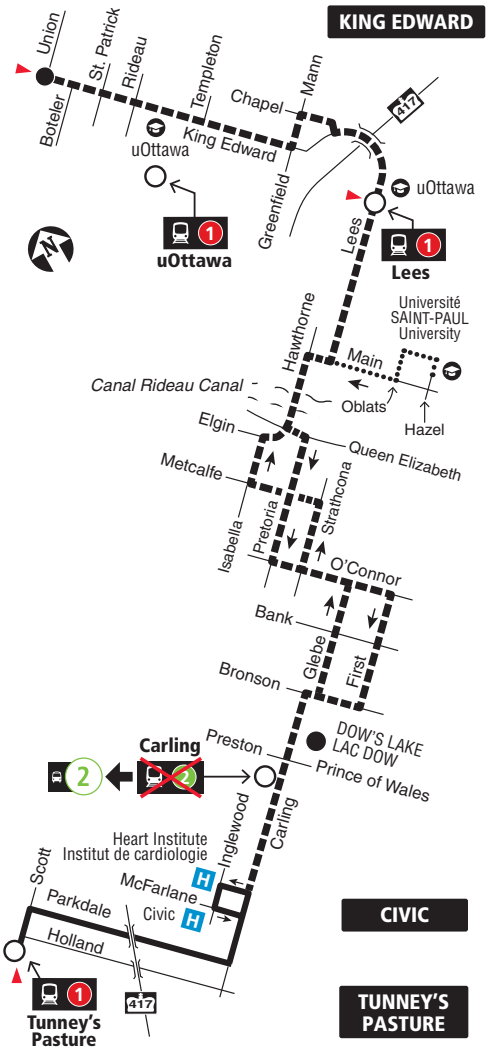
INFO 613-741-4390
octranspo.com

56

CIVIC
KING EDWARD
TUNNEY'S PASTURE

Local

7 days a week / 7 jours par semaine



Station

7 days a week / 7 jours par semaine

Monday to Friday only (Peak periods)
Lundi au vendredi seulement (Périodes de pointe)

Some trips / Quelques trajets

Timepoint / Heures de passage

2021.06

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 **613-741-4390**

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

Security / Sécurité **613-741-2478**

Effective June 20, 2021
En vigueur 20 juin 2021

OC Transpo
INFO 613-741-4390
octranspo.com

APPENDIX E

Traffic Count and Signal Timing Data

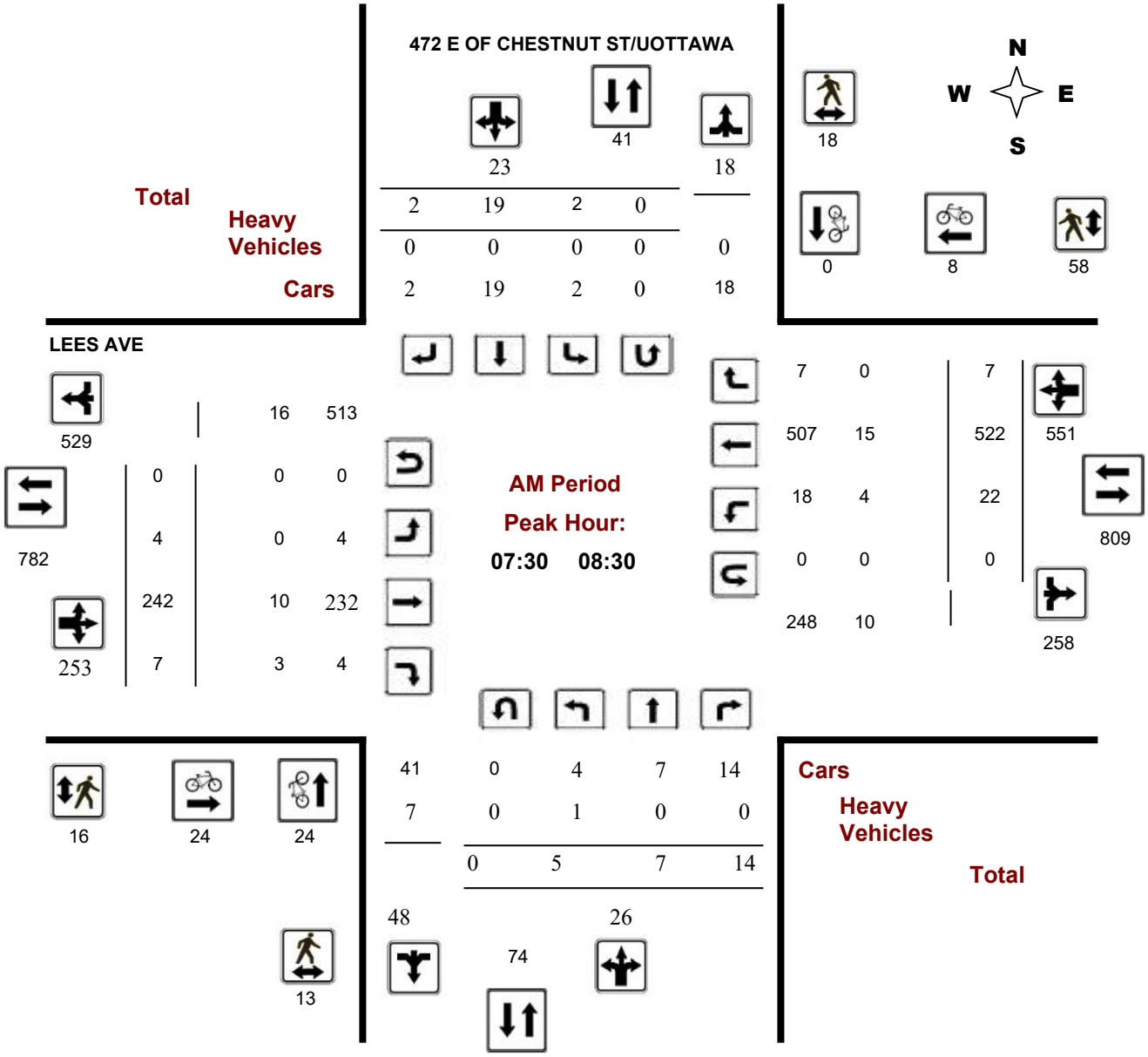
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

472 E OF CHESTNUT ST/UOTTAWA @ LEES AVE

Survey Date: Friday, May 20, 2011 **WO No:** 29736

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



Comments

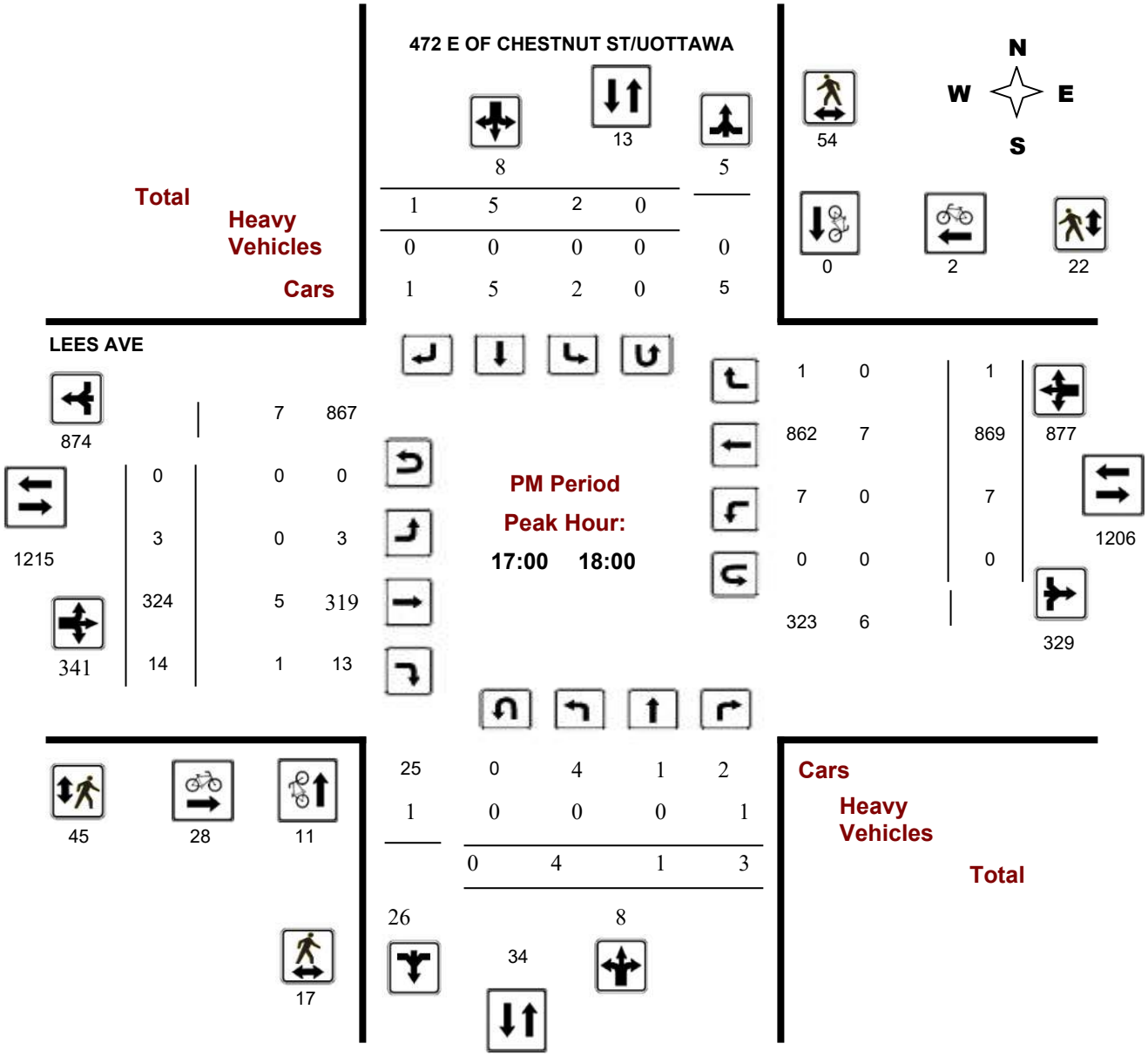
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

472 E OF CHESTNUT ST/UOTTAWA @ LEES AVE

Survey Date: Friday, May 20, 2011 **WO No:** 29736

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



Comments

Transportation Services - Traffic Services

Work Order
29736

Turning Movement Count - Full Study Summary Report

472 E OF CHESTNUT ST/UOTTAWA @ LEES AVE

Survey Date: Friday, May 20, 2011

Total Observed U-Turns

Northbound: 0 Southbound: 0

Eastbound: 2 Westbound: 0

AADT Factor
1.11

Full Study

	472 E OF CHESTNUT ST/UOTTAWA									LEES AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	3	6	10	**19**	0	18	2	**20**	**39**	3	168	4	**175**	23	484	4	**511**	**686**	**725**
08:00 09:00	7	1	11	**19**	2	1	5	**8**	**27**	5	283	6	**294**	22	494	6	**522**	**816**	**843**
09:00 10:00	2	7	7	**16**	0	12	3	**15**	**31**	5	163	2	**170**	9	414	3	**426**	**596**	**627**
11:30 12:30	7	7	6	**20**	0	10	1	**11**	**31**	2	196	8	**206**	12	542	3	**557**	**763**	**794**
12:30 13:30	1	0	13	**14**	1	0	1	**2**	**16**	6	220	7	**233**	15	553	1	**569**	**802**	**818**
15:00 16:00	8	5	19	**32**	0	6	1	**7**	**39**	2	309	7	**318**	9	688	1	**698**	**1016**	**1055**
16:00 17:00	12	0	9	**21**	1	3	4	**8**	**29**	5	331	6	**342**	4	739	0	**743**	**1085**	**1114**
17:00 18:00	4	1	3	**8**	2	5	1	**8**	**16**	3	324	14	**341**	7	869	1	**877**	**1218**	**1234**
Sub Total	44	27	78	**149**	6	55	18	**79**	**228**	31	1994	54	**2079**	101	4783	19	**4903**	**6982**	**7210**
U Turns				**0**				**0**	**0**				**2**				**0**	**2**	**2**
Total	44	27	78	**149**	6	55	18	**79**	**228**	31	1994	54	**2081**	101	4783	19	**4903**	**6984**	**7212**
AVG 12Hr	49	30	87	**166**	7	61	20	**88**	**254**	34	2217	60	**2314**	112	5319	21	**5452**	**7766**	**8020**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**1.11**						
AVG 24Hr	64	39	114	**217**	9	80	26	**115**	**332**	45	2905	79	**3031**	147	6967	28	**7142**	**10173**	**10505**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

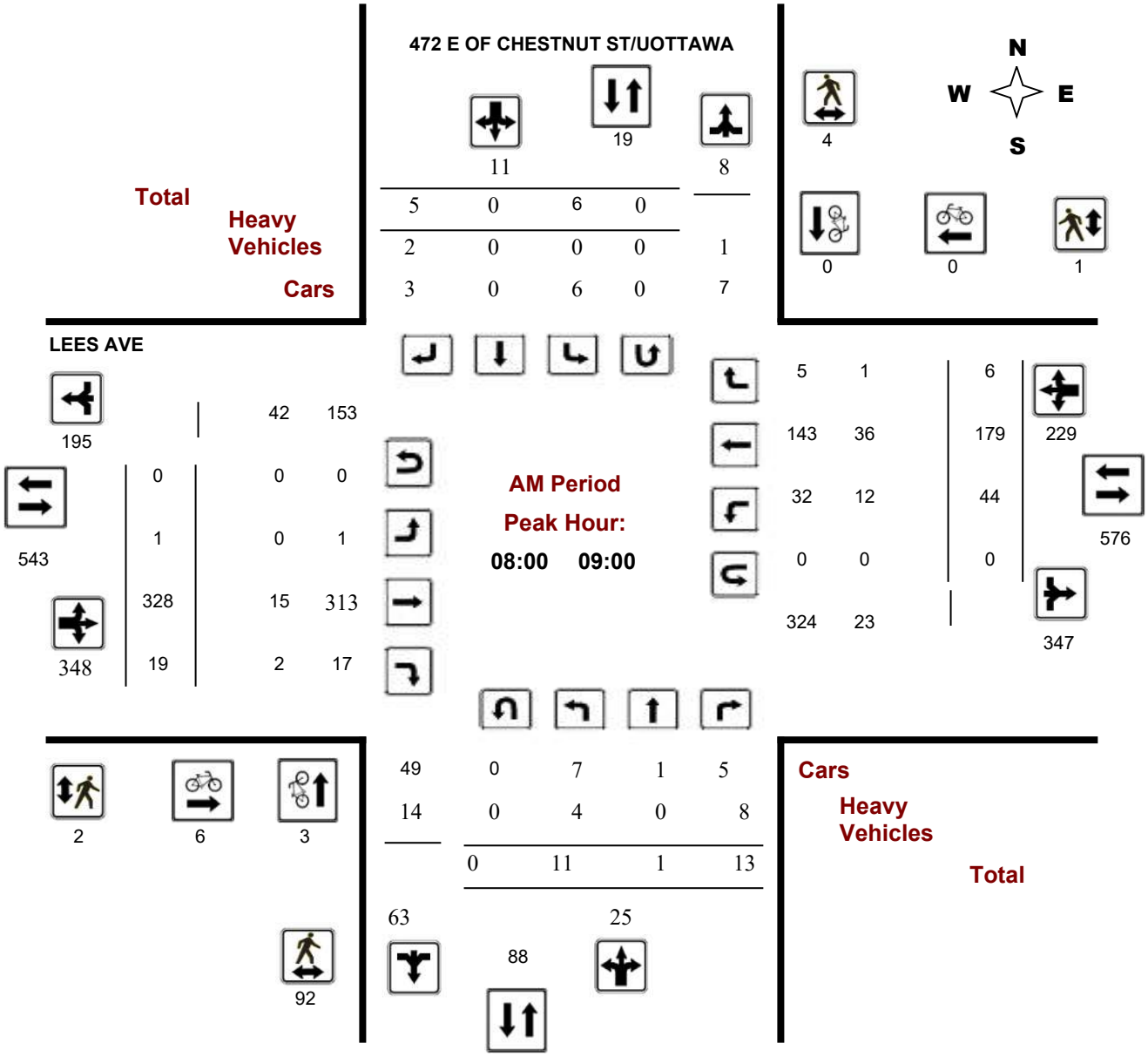
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

472 E OF CHESTNUT ST/UOTTAWA @ LEES AVE

Survey Date: Thursday, February 22, 2018 **WO No:** 37572

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



Comments

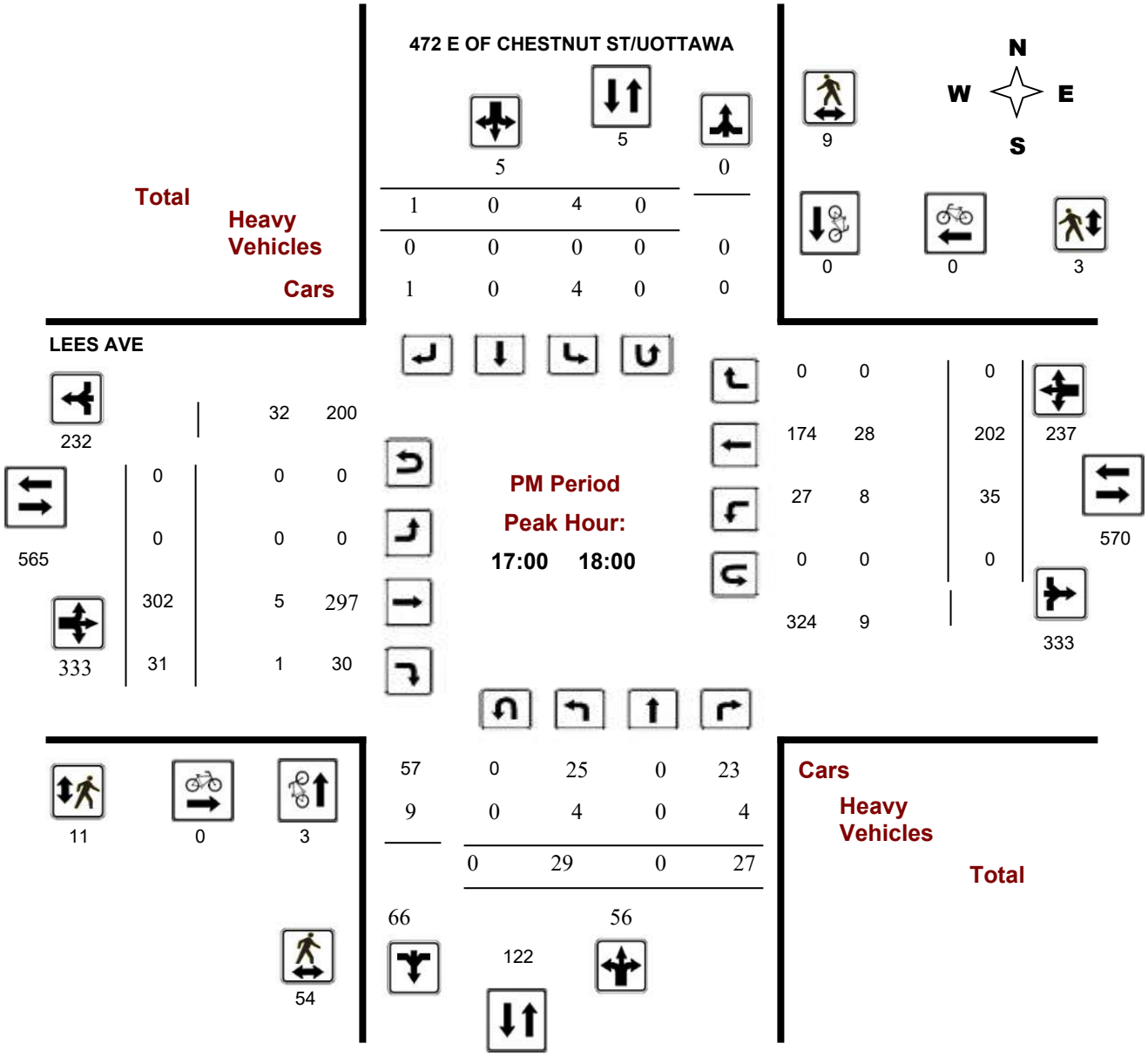
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

472 E OF CHESTNUT ST/UOTTAWA @ LEES AVE

Survey Date: Thursday, February 22, 2018 **WO No:** 37572

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



Comments

5199107- Lees and Hwy 417 Wb Off Ramp/Transi... - TMC

Thu Jul 30, 2015

Full Length (3 PM-6 PM, 11:30 AM-1:30 PM, 7 AM-10 AM)

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)

All Movements

ID: 249727, Location: 45.418452, -75.675078, Site Code: 39643103

Provided by: City of Ottawa

100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						South Northbound						Southwest Northeastbound						West Eastbound						
Time	R	BR	T	U	App	Ped*	T	L	HL	U	App	Ped*	HR	BL	HL	U	App	Ped*	HR	R	L	U	App	Ped*	Int
2015-07-30 7:00AM	0	0	12	0	**12**	0	82	0	0	0	**82**	0	11	82	0	0	**93**	0	0	0	0	0	**0**	0	**187**
7:15AM	0	0	22	0	**22**	0	61	1	0	0	**62**	0	16	65	0	0	**81**	0	0	0	0	0	**0**	0	**165**
7:30AM	0	0	10	0	**10**	0	78	0	0	0	**78**	0	9	92	0	0	**101**	1	0	0	0	0	**0**	0	**189**
7:45AM	0	0	21	0	**21**	0	79	1	0	0	**80**	0	12	93	0	0	**105**	0	0	0	0	0	**0**	0	**206**
Hourly Total	0	0	65	0	**65**	0	300	2	0	0	**302**	0	48	332	0	0	**380**	1	0	0	0	0	**0**	0	**747**
8:00AM	0	0	14	0	**14**	0	107	0	0	0	**107**	0	10	97	0	0	**107**	0	0	0	0	0	**0**	0	**228**
8:15AM	0	0	28	0	**28**	0	98	0	0	0	**98**	0	23	88	0	0	**111**	0	0	0	0	0	**0**	0	**237**
8:30AM	0	0	21	0	**21**	0	109	0	0	0	**109**	0	26	102	0	0	**128**	0	0	0	0	0	**0**	0	**258**
8:45AM	1	0	31	0	**32**	0	125	0	0	0	**125**	0	37	101	0	0	**138**	0	0	0	0	0	**0**	0	**295**
Hourly Total	1	0	94	0	**95**	0	439	0	0	0	**439**	0	96	388	0	0	**484**	0	0	0	0	0	**0**	0	**1018**
9:00AM	0	0	24	0	**24**	2	125	0	0	0	**125**	0	18	117	0	0	**135**	0	0	0	0	0	**0**	1	**284**
9:15AM	0	0	19	1	**20**	2	103	0	0	0	**103**	0	15	95	1	0	**111**	0	0	0	0	0	**0**	2	**234**
9:30AM	0	0	22	0	**22**	0	104	0	0	0	**104**	0	15	89	0	0	**104**	0	0	0	0	0	**0**	0	**230**
9:45AM	0	0	26	0	**26**	0	86	0	0	0	**86**	0	19	86	0	0	**105**	0	0	0	1	0	**1**	1	**218**
Hourly Total	0	0	91	1	**92**	4	418	0	0	0	**418**	0	67	387	1	0	**455**	0	0	0	1	0	**1**	4	**966**
11:30AM	0	0	38	0	**38**	0	70	0	0	0	**70**	0	20	106	0	0	**126**	0	0	0	0	0	**0**	0	**234**
11:45AM	1	0	27	0	**28**	0	72	0	0	0	**72**	0	26	87	0	0	**113**	0	0	0	0	0	**0**	0	**213**
Hourly Total	1	0	65	0	**66**	0	142	0	0	0	**142**	0	46	193	0	0	**239**	0	0	0	0	0	**0**	0	**447**
12:00PM	0	0	28	0	**28**	0	67	0	0	0	**67**	0	22	78	0	0	**100**	0	0	0	1	0	**1**	0	**196**
12:15PM	0	0	29	1	**30**	0	67	0	0	0	**67**	0	8	92	0	0	**100**	0	0	0	0	0	**0**	0	**197**
12:30PM	0	0	23	0	**23**	0	86	0	0	0	**86**	0	16	92	0	0	**108**	0	0	0	0	0	**0**	0	**217**
12:45PM	0	0	24	0	**24**	0	84	0	0	0	**84**	0	19	93	0	0	**112**	0	0	0	0	0	**0**	0	**220**
Hourly Total	0	0	104	1	**105**	0	304	0	0	0	**304**	0	65	355	0	0	**420**	0	0	0	1	0	**1**	0	**830**
1:00PM	0	0	32	0	**32**	1	81	0	0	0	**81**	0	17	99	0	0	**116**	0	0	0	0	0	**0**	0	**229**
1:15PM	0	0	22	0	**22**	0	76	0	0	0	**76**	0	28	104	0	0	**132**	0	0	0	0	0	**0**	0	**230**
Hourly Total	0	0	54	0	**54**	1	157	0	0	0	**157**	0	45	203	0	0	**248**	0	0	0	0	0	**0**	0	**459**
3:00PM	0	0	24	0	**24**	0	101	0	0	0	**101**	0	28	106	0	0	**134**	0	0	0	0	0	**0**	0	**259**
3:15PM	0	0	35	0	**35**	0	116	0	0	0	**116**	0	24	133	0	0	**157**	0	0	1	0	0	**1**	0	**309**
3:30PM	0	0	37	0	**37**	1	105	0	0	0	**105**	0	27	126	0	0	**153**	0	0	0	1	0	**1**	0	**296**
3:45PM	0	0	48	1	**49**	4	93	0	0	0	**93**	0	26	123	0	0	**149**	0	0	0	6	0	**6**	0	**297**
Hourly Total	0	0	144	1	**145**	5	415	0	0	0	**415**	0	105	488	0	0	**593**	0	0	1	7	0	**8**	0	**1161**
4:00PM	3	0	34	0	**37**	1	105	0	0	0	**105**	0	22	106	0	0	**128**	0	0	0	0	0	**0**	1	**270**
4:15PM	4	0	42	0	**46**	0	76	0	0	0	**76**	0	36	126	0	0	**162**	0	0	0	0	0	**0**	0	**284**
4:30PM	0	0	52	0	**52**	0	90	0	0	0	**90**	0	32	135	0	0	**167**	0	0	0	0	0	**0**	0	**309**
4:45PM	1	0	44	0	**45**	0	82	0	0	0	**82**	0	34	125	0	0	**159**	0	0	0	0	0	**0**	0	**286**
Hourly Total	8	0	172	0	**180**	1	353	0	0	0	**353**	0	124	492	0	0	**616**	0	0	0	0	0	**0**	1	**1149**
5:00PM	0	0	37	0	**37**	2	103	0	0	0	**103**	0	31	117	0	0	**148**	0	0	1	0	0	**1**	0	**289**
5:15PM	0	0	34	0	**34**	0	103	0	0	0	**103**	0	46	129	0	0	**175**	0	0	0	0	0	**0**	0	**312**
5:30PM	0	0	33	0	**33**	0	77	0	0	0	**77**	0	36	116	0	0	**152**	0	0	0	0	0	**0**	0	**262**
5:45PM	0	0	30	0	**30**	0	93	0	0	0	**93**	0	30	132	0	0	**162**	0	0	0	0	0	**0**	0	**285**
Hourly Total	0	0	134	0	**134**	2	376	0	0	0	**376**	0	143	494	0	0	**637**	0	0	1	0	0	**1**	0	**1148**
Total	10	0	923	3	**936**	13	2904	2	0	0	**2906**	0	739	3332	1	0	**4072**	1	0	2	9	0	**11**	5	**7925**
% Approach	1.1%	0%	98.6%	0.3%	**-**	-	99.9%	0.1%	0%	0%	**-**	-	18.1%	81.8%	0%	0%	**-**	-	0%	18.2%	81.8%	0%	**-**	-	-
% Total	0.1%	0%	11.6%	0%	**11.8%**	-	36.6%	0%	0%	0%	**36.7%**	-	9.3%	42.0%	0%	0%	**51.4%**	-	0%	0%	0.1%	0%	**0.1%**	-	-
Lights and Motorcycles	0	0	836	3	**839**	-	2679	0	0	0	**2679**	-	686	3214	1	0	**3901**	-	0	0	2	0	**2**	-	7421
% Lights and Motorcycles	0%	0%	90.6%	100%	**89.6%**	-	92.3%	0%	0%	0%	**92.2%**	-	92.8%	96.5%	100%	0%	**95.8%**	-	0%	0%	22.2%	0%	**18.2%**	-	93.6%
Heavy	0	0	52	0	**52**	-	180	0	0	0	**180**	-	53	118	0	0	**171**	-	0	0	0	0	**0**	-	403
% Heavy	0%	0%	5.6%	0%	**5.6%**	-	6.2%	0%	0%	0%	**6.2%**	-	7.2%	3.5%	0%	0%	**4.2%**	-	0%	0%	0%	0%	**0%**	-	5.1%
Bicycles on Road	10	0	35	0	**45**	-	45	2	0	0	**47**	-	0	0	0	0	**0**	-	0	2	7	0	**9**	-	101
% Bicycles on Road	100%	0%	3.8%	0%	**4.8%**	-	1.5%	100%	0%	0%	**1.6%**	-	0%	0%	0%	0%	**0%**	-	0%	100%	77.8%	0%	**81.8%**	-	1.3%
Pedestrians	-	-	-	-	-	13	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	5	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

5199107- Lees and Hwy 417 Wb Off Ramp/Transi... - TMC

Thu Jul 30, 2015

Full Length (3 PM-6 PM, 11:30 AM-1:30 PM, 7 AM-10 AM)

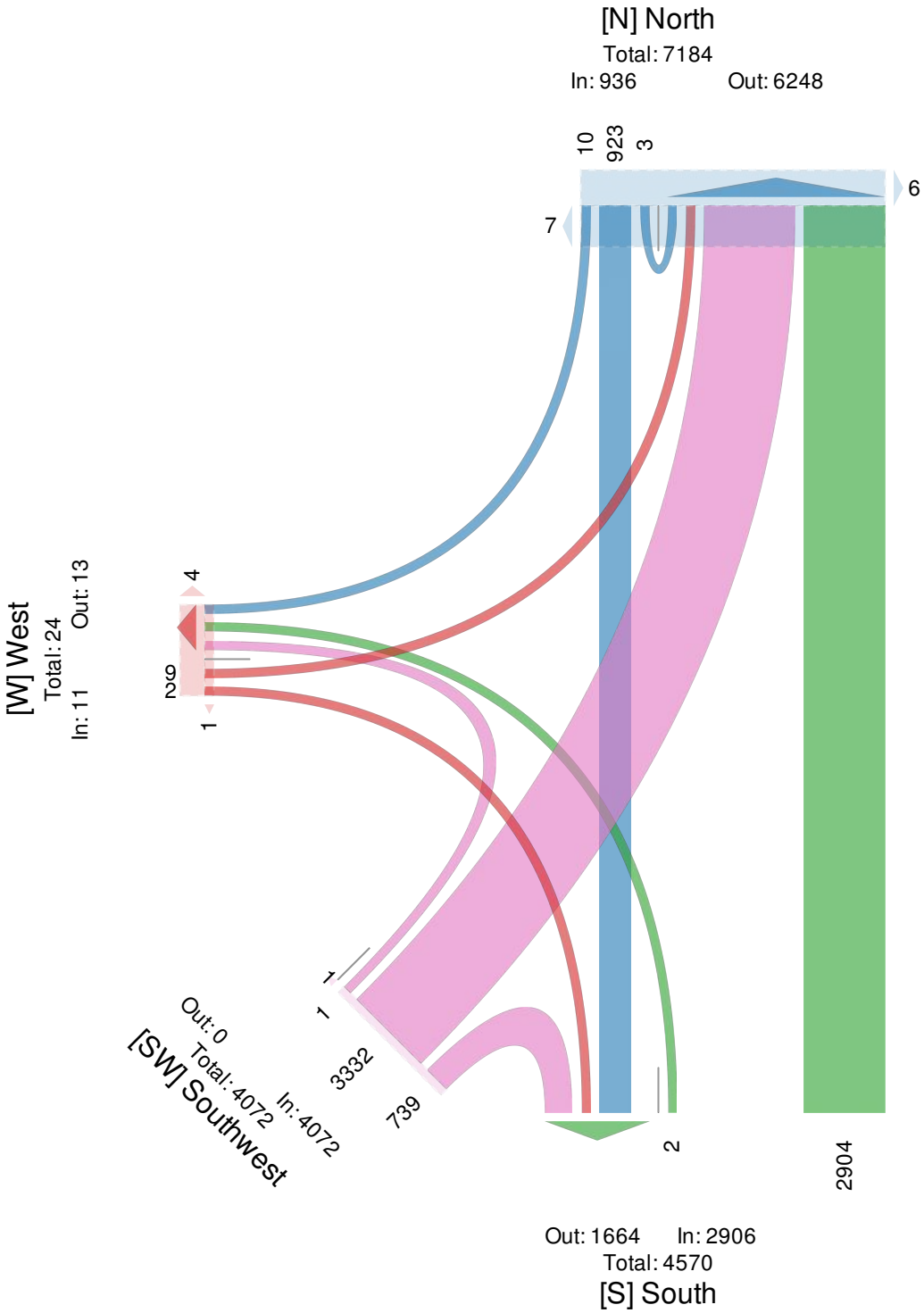
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)

All Movements

ID: 249727, Location: 45.418452, -75.675078, Site Code: 39643103

Provided by: City of Ottawa

100 Constellation Dr, Nepean, ON, K2G 5J9, CA



5199107- Lees and Hwy 417 Wb Off Ramp/Transi... - TMC

Thu Jul 30, 2015
AM Peak (8:15 AM - 9:15 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)
All Movements
ID: 249727, Location: 45.418452, -75.675078, Site Code: 39643103

Provided by: City of Ottawa
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg	North						South						Southwest						West						
Direction	Southbound						Northbound						Northeastbound						Eastbound						
Time	R	BR	T	U	**App**	Ped*	T	L	HL	U	**App**	Ped*	HR	BL	HL	U	**App**	Ped*	HR	R	L	U	**App**	Ped*	**Int**
2015-07-30 8:15AM	0	0	28	0	**28**	0	98	0	0	0	**98**	0	23	88	0	0	**111**	0	0	0	0	0	**0**	0	**237**
8:30AM	0	0	21	0	**21**	0	109	0	0	0	**109**	0	26	102	0	0	**128**	0	0	0	0	0	**0**	0	**258**
8:45AM	1	0	31	0	**32**	0	125	0	0	0	**125**	0	37	101	0	0	**138**	0	0	0	0	0	**0**	0	**295**
9:00AM	0	0	24	0	**24**	2	125	0	0	0	**125**	0	18	117	0	0	**135**	0	0	0	0	0	**0**	1	**284**
Total	1	0	104	0	**105**	2	457	0	0	0	**457**	0	104	408	0	0	**512**	0	0	0	0	0	**0**	1	**1074**
% Approach	1.0%	0%	99.0%	0%	**-**	-	100%	0%	0%	0%	**-**	-	20.3%	79.7%	0%	0%	**-**	-	0%	0%	0%	0%	**-**	-	-
% Total	0.1%	0%	9.7%	0%	**9.8%**	-	42.6%	0%	0%	0%	**42.6%**	-	9.7%	38.0%	0%	0%	**47.7%**	-	0%	0%	0%	0%	**0%**	-	-
PHF	-	-	0.831	-	**0.831**	-	0.905	-	-	-	**0.905**	-	0.703	0.872	-	-	**0.928**	-	-	-	-	-	**-**	-	0.911
Lights and Motorcycles	0	0	99	0	**99**	-	428	0	0	0	**428**	-	97	386	0	0	**483**	-	0	0	0	0	**0**	-	1010
% Lights and Motorcycles	0%	0%	95.2%	0%	**94.3%**	-	93.7%	0%	0%	0%	**93.7%**	-	93.3%	94.6%	0%	0%	**94.3%**	-	0%	0%	0%	0%	**-**	-	94.0%
Heavy	0	0	4	0	**4**	-	21	0	0	0	**21**	-	7	22	0	0	**29**	-	0	0	0	0	**0**	-	54
% Heavy	0%	0%	3.8%	0%	**3.8%**	-	4.6%	0%	0%	0%	**4.6%**	-	6.7%	5.4%	0%	0%	**5.7%**	-	0%	0%	0%	0%	**-**	-	5.0%
Bicycles on Road	1	0	1	0	**2**	-	8	0	0	0	**8**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	10
% Bicycles on Road	100%	0%	1.0%	0%	**1.9%**	-	1.8%	0%	0%	0%	**1.8%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0.9%
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

5199107- Lees and Hwy 417 Wb Off Ramp/Transi... - TMC

Thu Jul 30, 2015

AM Peak (8:15 AM - 9:15 AM)

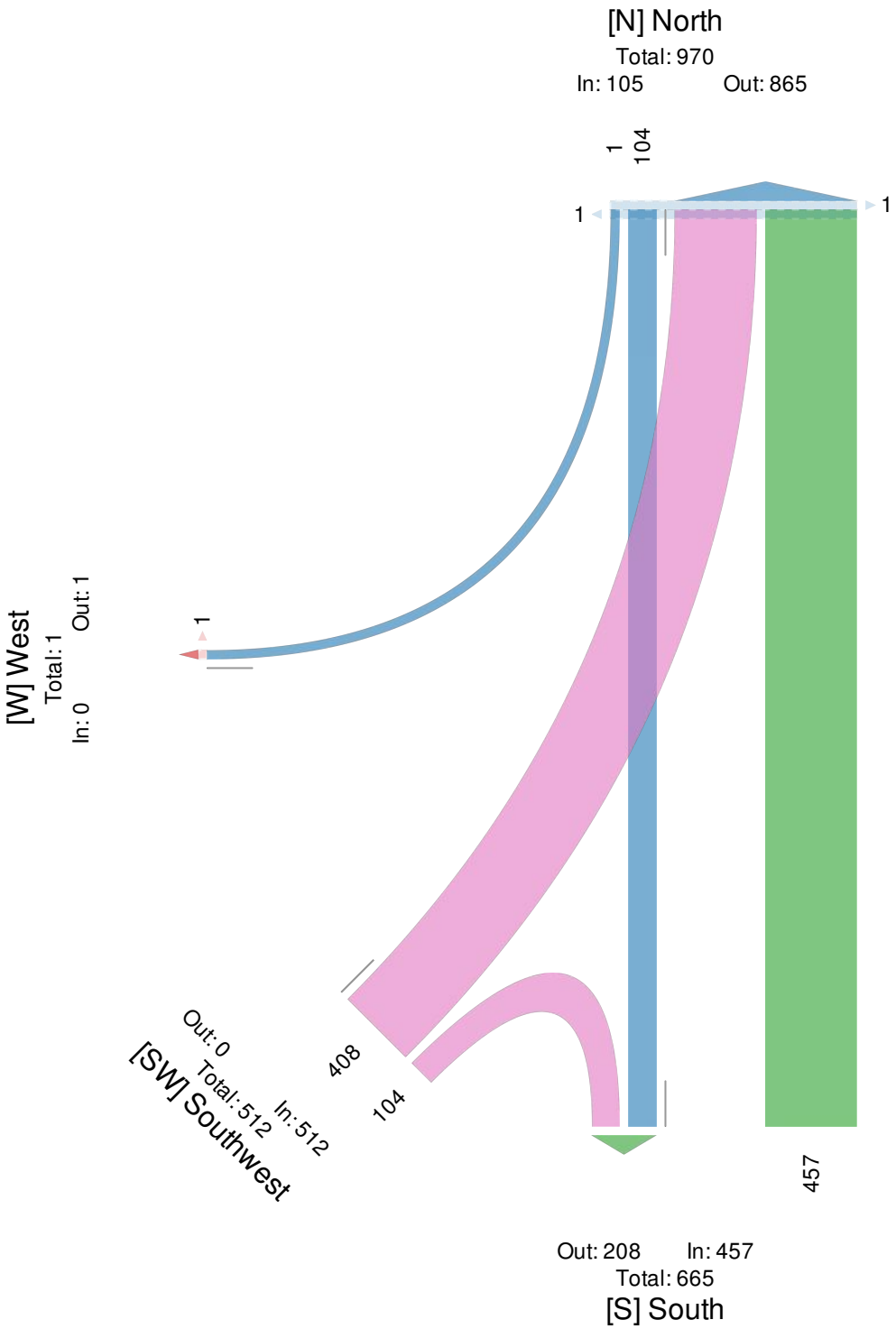
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)

All Movements

ID: 249727, Location: 45.418452, -75.675078, Site Code: 39643103

Provided by: City of Ottawa

100 Constellation Dr, Nepean, ON, K2G 5J9, CA



5199107- Lees and Hwy 417 Wb Off Ramp/Transi... - TMC

Thu Jul 30, 2015
Midday Peak (11:30 AM - 12:30 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)
All Movements
ID: 249727, Location: 45.418452, -75.675078, Site Code: 39643103

Provided by: City of Ottawa
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						South Northbound						Southwest Northeastbound						West Eastbound						
Time	R	BR	T	U	**App**	Ped*	T	L	HL	U	**App**	Ped*	HR	BL	HL	U	**App**	Ped*	HR	R	L	U	**App**	Ped*	**Int**
2015-07-30 11:30AM	0	0	38	0	**38**	0	70	0	0	0	**70**	0	20	106	0	0	**126**	0	0	0	0	0	**0**	0	**234**
11:45AM	1	0	27	0	**28**	0	72	0	0	0	**72**	0	26	87	0	0	**113**	0	0	0	0	0	**0**	0	**213**
12:00PM	0	0	28	0	**28**	0	67	0	0	0	**67**	0	22	78	0	0	**100**	0	0	0	1	0	**1**	0	**196**
12:15PM	0	0	29	1	**30**	0	67	0	0	0	**67**	0	8	92	0	0	**100**	0	0	0	0	0	**0**	0	**197**
Total	1	0	122	1	**124**	0	276	0	0	0	**276**	0	76	363	0	0	**439**	0	0	0	1	0	**1**	0	**840**
% Approach	0.8%	0%	98.4%	0.8%	**-**	-	100%	0%	0%	0%	**-**	-	17.3%	82.7%	0%	0%	**-**	-	0%	0%	100%	0%	**-**	-	**-**
% Total	0.1%	0%	14.5%	0.1%	**14.8%**	-	32.9%	0%	0%	0%	**32.9%**	-	9.0%	43.2%	0%	0%	**52.3%**	-	0%	0%	0.1%	0%	**0.1%**	-	**-**
PHF	-	-	0.791	0.250	**0.797**	-	0.951	-	-	-	**0.951**	-	0.731	0.856	-	-	**0.871**	-	-	-	0.250	-	**0.250**	-	0.893
Lights and Motorcycles	0	0	109	1	**110**	-	255	0	0	0	**255**	-	62	347	0	0	**409**	-	0	0	1	0	**1**	-	775
% Lights and Motorcycles	0%	0%	89.3%	100%	**88.7%**	-	92.4%	0%	0%	0%	**92.4%**	-	81.6%	95.6%	0%	0%	**93.2%**	-	0%	0%	100%	0%	**100%**	-	92.3%
Heavy	0	0	8	0	**8**	-	19	0	0	0	**19**	-	14	16	0	0	**30**	-	0	0	0	0	**0**	-	57
% Heavy	0%	0%	6.6%	0%	**6.5%**	-	6.9%	0%	0%	0%	**6.9%**	-	18.4%	4.4%	0%	0%	**6.8%**	-	0%	0%	0%	0%	**0%**	-	6.8%
Bicycles on Road	1	0	5	0	**6**	-	2	0	0	0	**2**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	8
% Bicycles on Road	100%	0%	4.1%	0%	**4.8%**	-	0.7%	0%	0%	0%	**0.7%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	1.0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

5199107- Lees and Hwy 417 Wb Off Ramp/Transi... - TMC

Thu Jul 30, 2015

Midday Peak (11:30 AM - 12:30 PM)

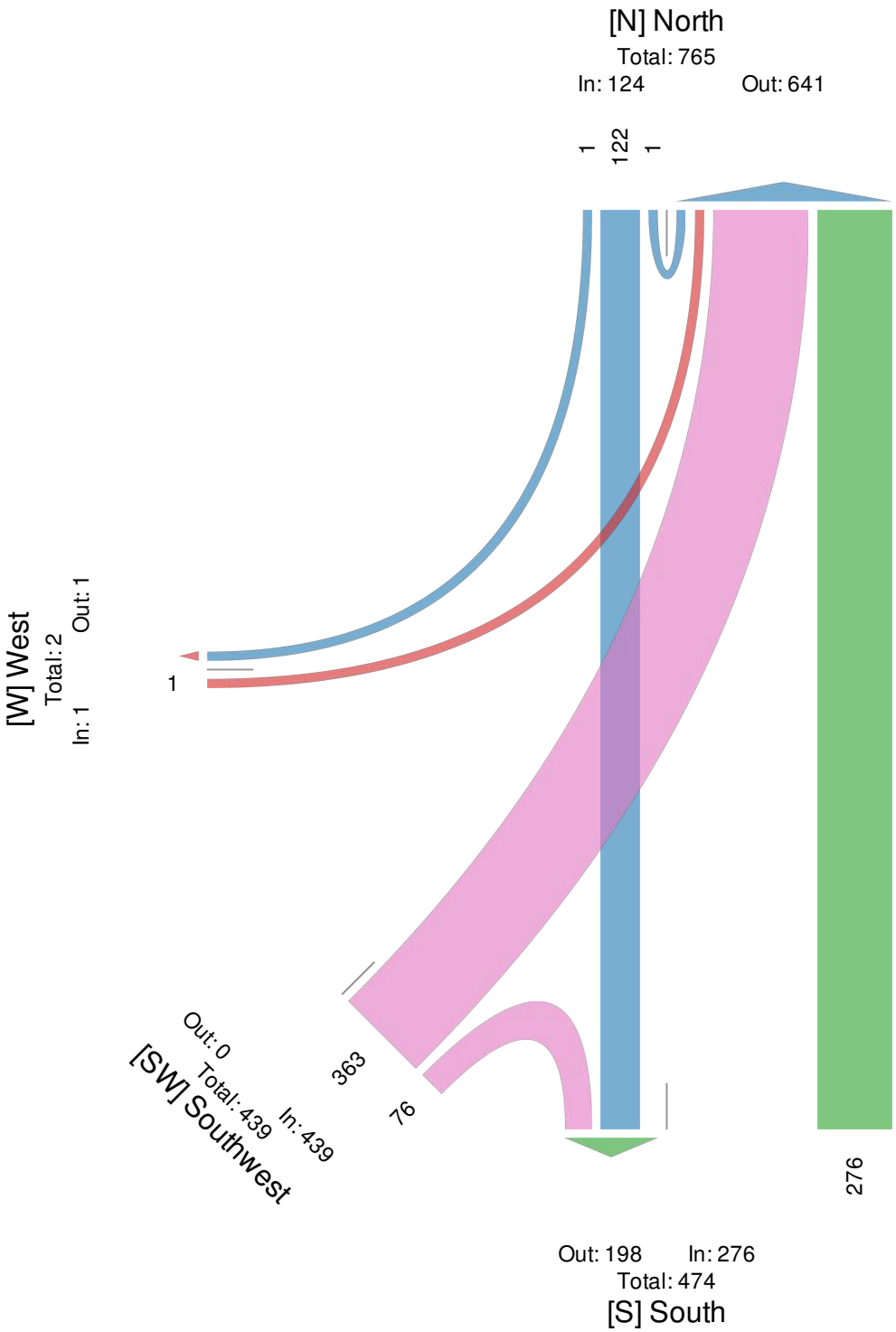
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)

All Movements

ID: 249727, Location: 45.418452, -75.675078, Site Code: 39643103

Provided by: City of Ottawa

100 Constellation Dr, Nepean, ON, K2G 5J9, CA



5199107- Lees and Hwy 417 Wb Off Ramp/Transi... - TMC

Thu Jul 30, 2015
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)
All Movements
ID: 249727, Location: 45.418452, -75.675078, Site Code: 39643103

Provided by: City of Ottawa
100 Constellation Dr, Nepean, ON, K2G 5J9, CA

Leg Direction	North Southbound						South Northbound						Southwest Northeastbound						West Eastbound						
Time	R	BR	T	U	**App**	Ped*	T	L	HL	U	**App**	Ped*	HR	BL	HL	U	**App**	Ped*	HR	R	L	U	**App**	Ped*	**Int**
2015-07-30 4:30PM	0	0	52	0	**52**	0	90	0	0	0	**90**	0	32	135	0	0	**167**	0	0	0	0	0	**0**	0	**309**
4:45PM	1	0	44	0	**45**	0	82	0	0	0	**82**	0	34	125	0	0	**159**	0	0	0	0	0	**0**	0	**286**
5:00PM	0	0	37	0	**37**	2	103	0	0	0	**103**	0	31	117	0	0	**148**	0	0	1	0	0	**1**	0	**289**
5:15PM	0	0	34	0	**34**	0	103	0	0	0	**103**	0	46	129	0	0	**175**	0	0	0	0	0	**0**	0	**312**
Total	1	0	167	0	**168**	2	378	0	0	0	**378**	0	143	506	0	0	**649**	0	0	1	0	0	**1**	0	**1196**
% Approach	0.6%	0%	99.4%	0%	**-**	-	100%	0%	0%	0%	**-**	-	22.0%	78.0%	0%	0%	**-**	-	0%	100%	0%	0%	**-**	-	-
% Total	0.1%	0%	14.0%	0%	**14.0%**	-	31.6%	0%	0%	0%	**31.6%**	-	12.0%	42.3%	0%	0%	**54.3%**	-	0%	0.1%	0%	0%	**0.1%**	-	-
PHF	-	-	0.819	-	**0.819**	-	0.914	-	-	-	**0.914**	-	0.777	0.937	-	-	**0.927**	-	-	-	-	-	**-**	-	0.948
Lights and Motorcycles	0	0	146	0	**146**	-	353	0	0	0	**353**	-	142	500	0	0	**642**	-	0	0	0	0	**0**	-	1141
% Lights and Motorcycles	0%	0%	87.4%	0%	**86.9%**	-	93.4%	0%	0%	0%	**93.4%**	-	99.3%	98.8%	0%	0%	**98.9%**	-	0%	0%	0%	0%	**0%**	-	95.4%
Heavy	0	0	8	0	**8**	-	20	0	0	0	**20**	-	1	6	0	0	**7**	-	0	0	0	0	**0**	-	35
% Heavy	0%	0%	4.8%	0%	**4.8%**	-	5.3%	0%	0%	0%	**5.3%**	-	0.7%	1.2%	0%	0%	**1.1%**	-	0%	0%	0%	0%	**0%**	-	2.9%
Bicycles on Road	1	0	13	0	**14**	-	5	0	0	0	**5**	-	0	0	0	0	**0**	-	0	1	0	0	**1**	-	20
% Bicycles on Road	100%	0%	7.8%	0%	**8.3%**	-	1.3%	0%	0%	0%	**1.3%**	-	0%	0%	0%	0%	**0%**	-	0%	100%	0%	0%	**100%**	-	1.7%
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. BL: Bear left, BR: Bear right, HL: Hard left, HR: Hard right, L: Left, R: Right, T: Thru, U: U-Turn

5199107- Lees and Hwy 417 Wb Off Ramp/Transi... - TMC

Thu Jul 30, 2015

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

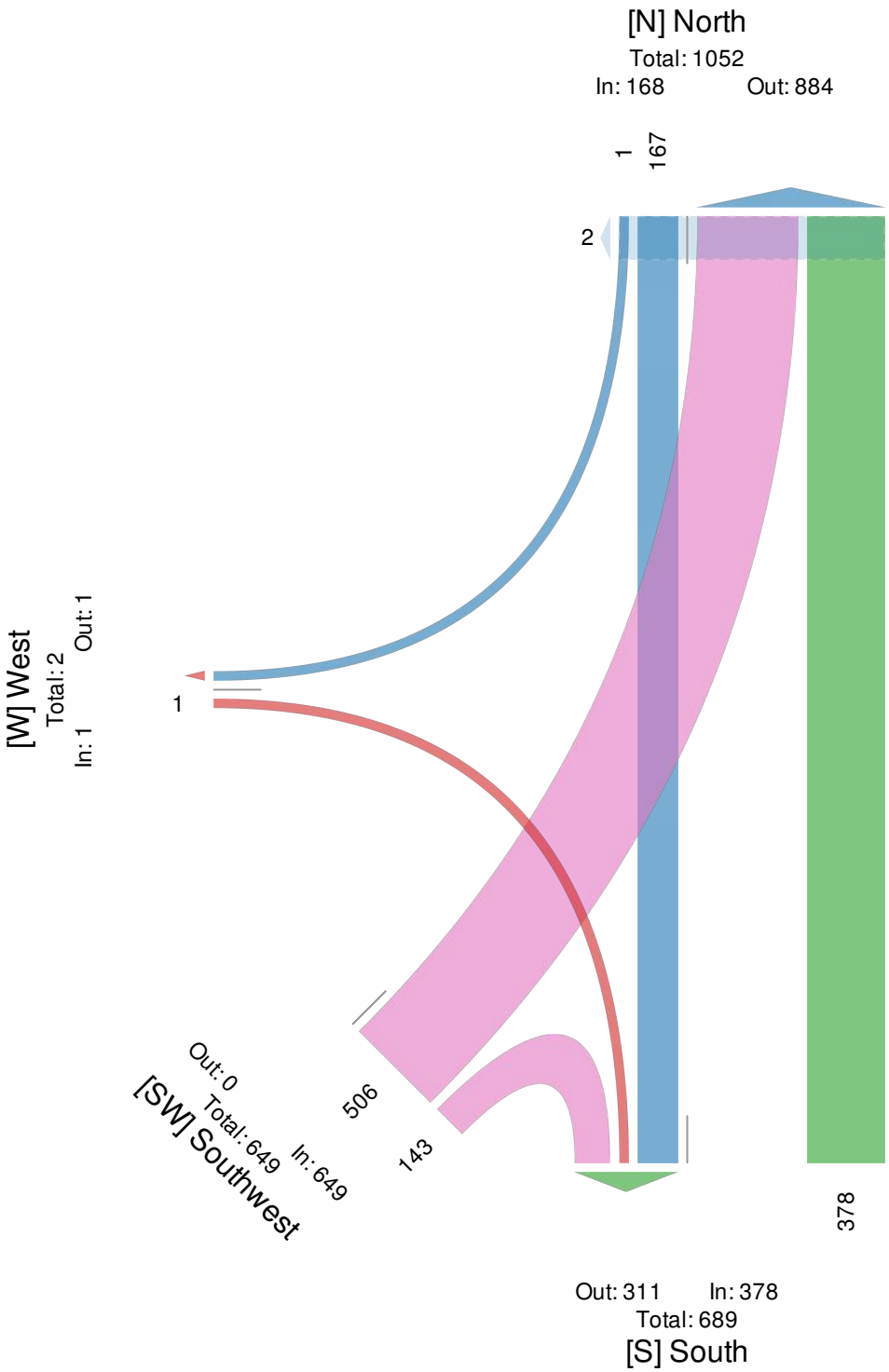
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road)

All Movements

ID: 249727, Location: 45.418452, -75.675078, Site Code: 39643103

Provided by: City of Ottawa

100 Constellation Dr, Nepean, ON, K2G 5J9, CA



5372685 - Chapel and Wiggins S - July 4th - TMC

Wed Jul 4, 2018
Full Length (7 AM-10 AM, 11:30 AM-1:30 PM, 3 PM-6 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 544570, Location: 45.419596, -75.671491, Site Code: 37921103

Provided by: City of Ottawa
100 Constellation Dr,
Nepean, ON, K2G 5J9, CA

Leg / Direction	North Southbound					East Westbound					South Northbound					
Time	T	L	U	**App**	Ped*	R	L	U	**App**	Ped*	R	T	U	**App**	Ped*	**Int**
2018-07-04 7:00AM	1	0	0	**1**	0	0	6	0	**6**	4	7	2	0	**9**	0	**16**
7:15AM	2	2	0	**4**	0	0	2	0	**2**	6	5	2	0	**7**	0	**13**
7:30AM	0	2	0	**2**	2	0	4	0	**4**	7	8	7	0	**15**	0	**21**
7:45AM	3	1	0	**4**	1	0	7	0	**7**	8	12	4	0	**16**	0	**27**
Hourly Total	6	5	0	**11**	3	0	19	0	**19**	25	32	15	0	**47**	0	**77**
8:00AM	3	0	0	**3**	1	1	6	0	**7**	6	15	5	0	**20**	0	**30**
8:15AM	4	0	0	**4**	0	2	3	1	**6**	6	22	3	1	**26**	0	**36**
8:30AM	1	0	0	**1**	2	1	6	0	**7**	7	24	3	0	**27**	0	**35**
8:45AM	4	1	0	**5**	1	0	5	0	**5**	8	22	4	0	**26**	0	**36**
Hourly Total	12	1	0	**13**	4	4	20	1	**25**	27	83	15	1	**99**	0	**137**
9:00AM	1	0	0	**1**	0	0	9	0	**9**	2	12	2	0	**14**	0	**24**
9:15AM	5	1	0	**6**	0	0	6	0	**6**	6	16	5	0	**21**	0	**33**
9:30AM	3	0	0	**3**	0	0	6	0	**6**	5	12	4	0	**16**	0	**25**
9:45AM	5	0	0	**5**	3	0	2	0	**2**	11	10	3	0	**13**	0	**20**
Hourly Total	14	1	0	**15**	3	0	23	0	**23**	24	50	14	0	**64**	0	**102**
11:30AM	1	0	0	**1**	0	1	7	0	**8**	2	16	6	0	**22**	0	**31**
11:45AM	7	2	0	**9**	1	2	6	1	**9**	6	16	1	0	**17**	0	**35**
Hourly Total	8	2	0	**10**	1	3	13	1	**17**	8	32	7	0	**39**	0	**66**
12:00PM	2	2	0	**4**	0	1	13	0	**14**	1	15	6	0	**21**	4	**39**
12:15PM	6	0	0	**6**	1	3	6	0	**9**	10	18	6	0	**24**	1	**39**
12:30PM	1	0	0	**1**	0	1	7	0	**8**	7	20	3	0	**23**	0	**32**
12:45PM	3	0	0	**3**	2	0	6	0	**6**	7	16	5	0	**21**	0	**30**
Hourly Total	12	2	0	**14**	3	5	32	0	**37**	25	69	20	0	**89**	5	**140**
1:00PM	3	0	0	**3**	0	1	5	0	**6**	3	12	6	0	**18**	0	**27**
1:15PM	3	2	0	**5**	0	0	4	0	**4**	0	18	9	0	**27**	0	**36**
Hourly Total	6	2	0	**8**	0	1	9	0	**10**	3	30	15	0	**45**	0	**63**
3:00PM	1	1	0	**2**	2	1	5	0	**6**	6	13	5	0	**18**	0	**26**
3:15PM	4	0	0	**4**	0	0	10	0	**10**	2	13	5	0	**18**	0	**32**
3:30PM	1	1	0	**2**	3	1	7	0	**8**	4	13	4	0	**17**	0	**27**
3:45PM	3	0	0	**3**	1	0	8	0	**8**	6	19	6	0	**25**	0	**36**
Hourly Total	9	2	0	**11**	6	2	30	0	**32**	18	58	20	0	**78**	0	**121**
4:00PM	3	0	0	**3**	0	0	10	0	**10**	6	23	4	0	**27**	0	**40**
4:15PM	3	0	0	**3**	3	0	8	0	**8**	11	17	3	0	**20**	0	**31**
4:30PM	1	2	0	**3**	1	0	7	0	**7**	13	18	4	0	**22**	0	**32**
4:45PM	1	2	0	**3**	0	1	10	0	**11**	6	17	3	0	**20**	2	**34**
Hourly Total	8	4	0	**12**	4	1	35	0	**36**	36	75	14	0	**89**	2	**137**
5:00PM	0	0	0	**0**	0	2	11	0	**13**	4	22	5	0	**27**	0	**40**
5:15PM	3	1	0	**4**	0	0	5	0	**5**	5	26	5	0	**31**	0	**40**
5:30PM	5	0	0	**5**	0	1	4	0	**5**	9	12	5	0	**17**	0	**27**
5:45PM	3	0	0	**3**	0	1	8	0	**9**	4	13	4	0	**17**	0	**29**
Hourly Total	11	1	0	**12**	0	4	28	0	**32**	22	73	19	0	**92**	0	**136**
Total	86	20	0	**106**	24	20	209	2	**231**	188	502	139	1	**642**	7	**979**
% Approach	81.1%	18.9%	0%	-	-	8.7%	90.5%	0.9%	-	-	78.2%	21.7%	0.2%	-	-	-
% Total	8.8%	2.0%	0%	**10.8%**	-	2.0%	21.3%	0.2%	**23.6%**	-	51.3%	14.2%	0.1%	**65.6%**	-	-
Lights and Motorcycles	18	15	0	**33**	-	14	205	2	**221**	-	495	56	1	**552**	-	806
% Lights and Motorcycles	20.9%	75.0%	0%	**31.1%**	-	70.0%	98.1%	100%	**95.7%**	-	98.6%	40.3%	100%	**86.0%**	-	82.3%
Heavy	56	0	0	**56**	-	1	4	0	**5**	-	6	62	0	**68**	-	129
% Heavy	65.1%	0%	0%	**52.8%**	-	5.0%	1.9%	0%	**2.2%**	-	1.2%	44.6%	0%	**10.6%**	-	13.2%
Bicycles on Road	12	5	0	**17**	-	5	0	0	**5**	-	1	21	0	**22**	-	44
% Bicycles on Road	14.0%	25.0%	0%	**16.0%**	-	25.0%	0%	0%	**2.2%**	-	0.2%	15.1%	0%	**3.4%**	-	4.5%
Pedestrians	-	-	-	-	22	-	-	-	-	168	-	-	-	-	7	
% Pedestrians	-	-	-	-	91.7%	-	-	-	-	89.4%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	2	-	-	-	-	20	-	-	-	-	0	

Leg Direction	North Southbound					East Westbound					South Northbound					
Time	T	L	U	**App**	Ped*	R	L	U	**App**	Ped*	R	T	U	**App**	Ped*	**Int**
% Bicycles on Crosswalk	-	-	-	-	8.3%	-	-	-	-	10.6%	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

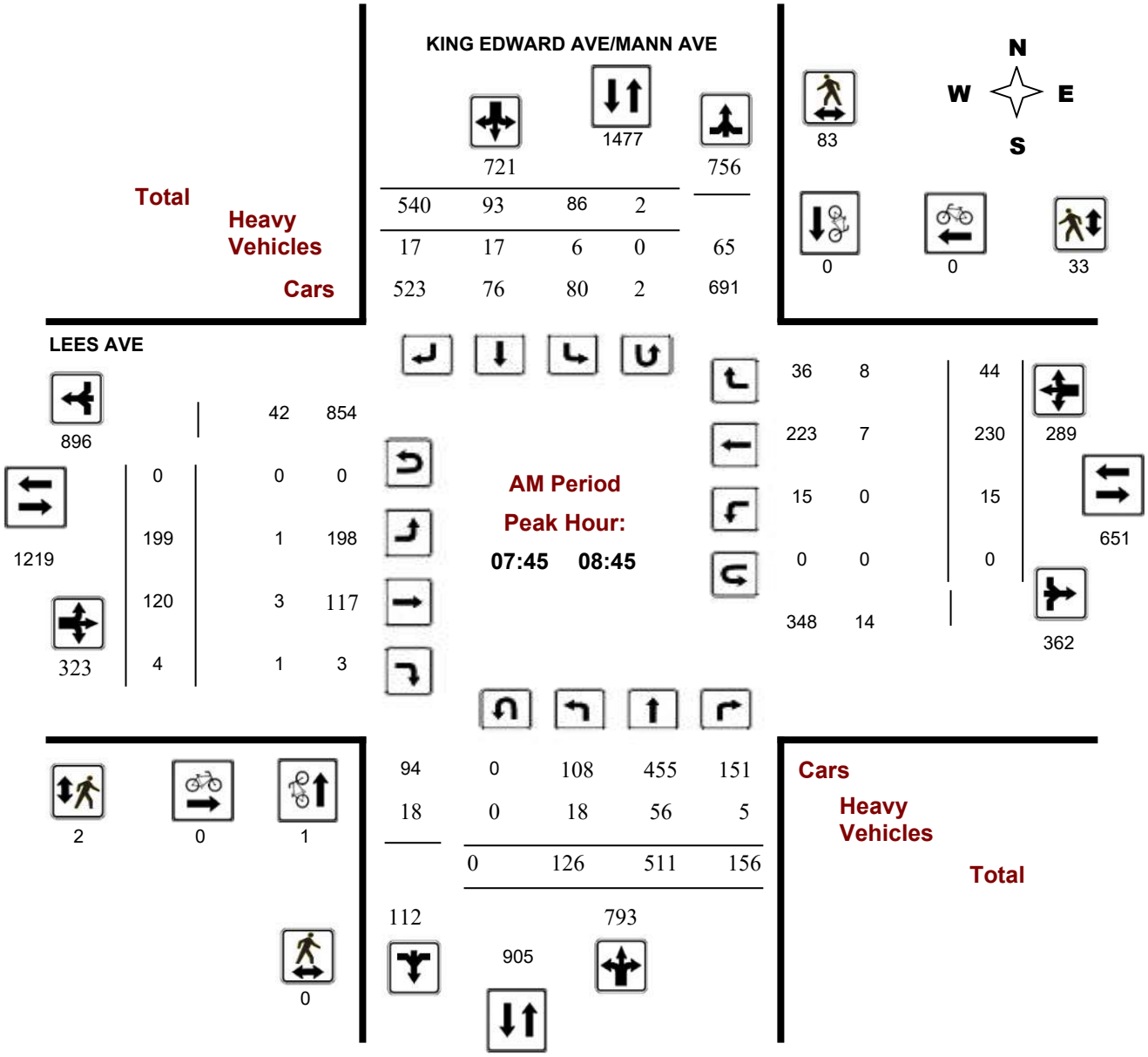
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

LEES AVE @ KING EDWARD AVE/MANN AVE

Survey Date: Thursday, February 02, 2017 **WO No:** 36670

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



Comments

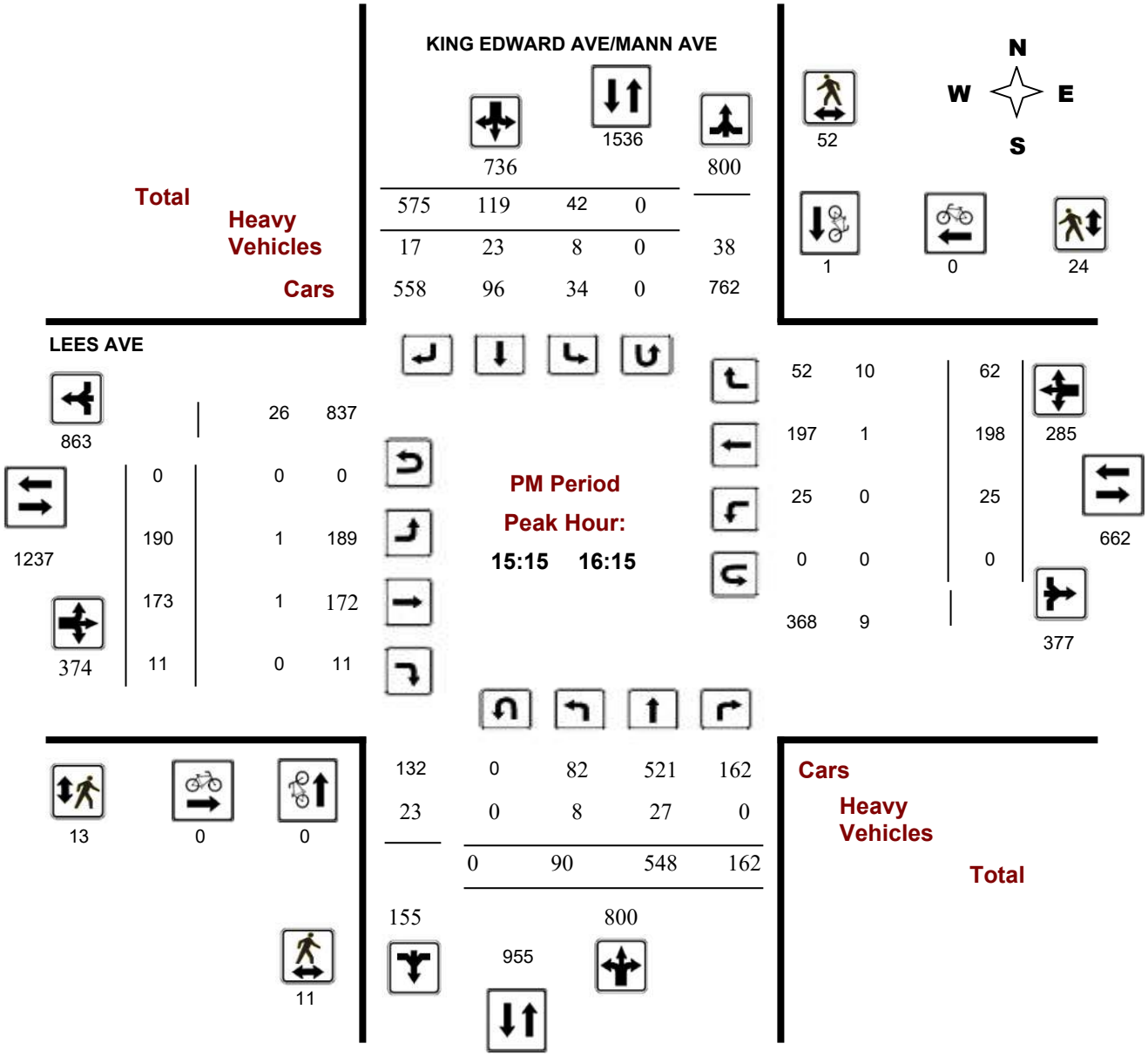
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

LEES AVE @ KING EDWARD AVE/MANN AVE

Survey Date: Thursday, February 02, 2017 **WO No:** 36670

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



Comments

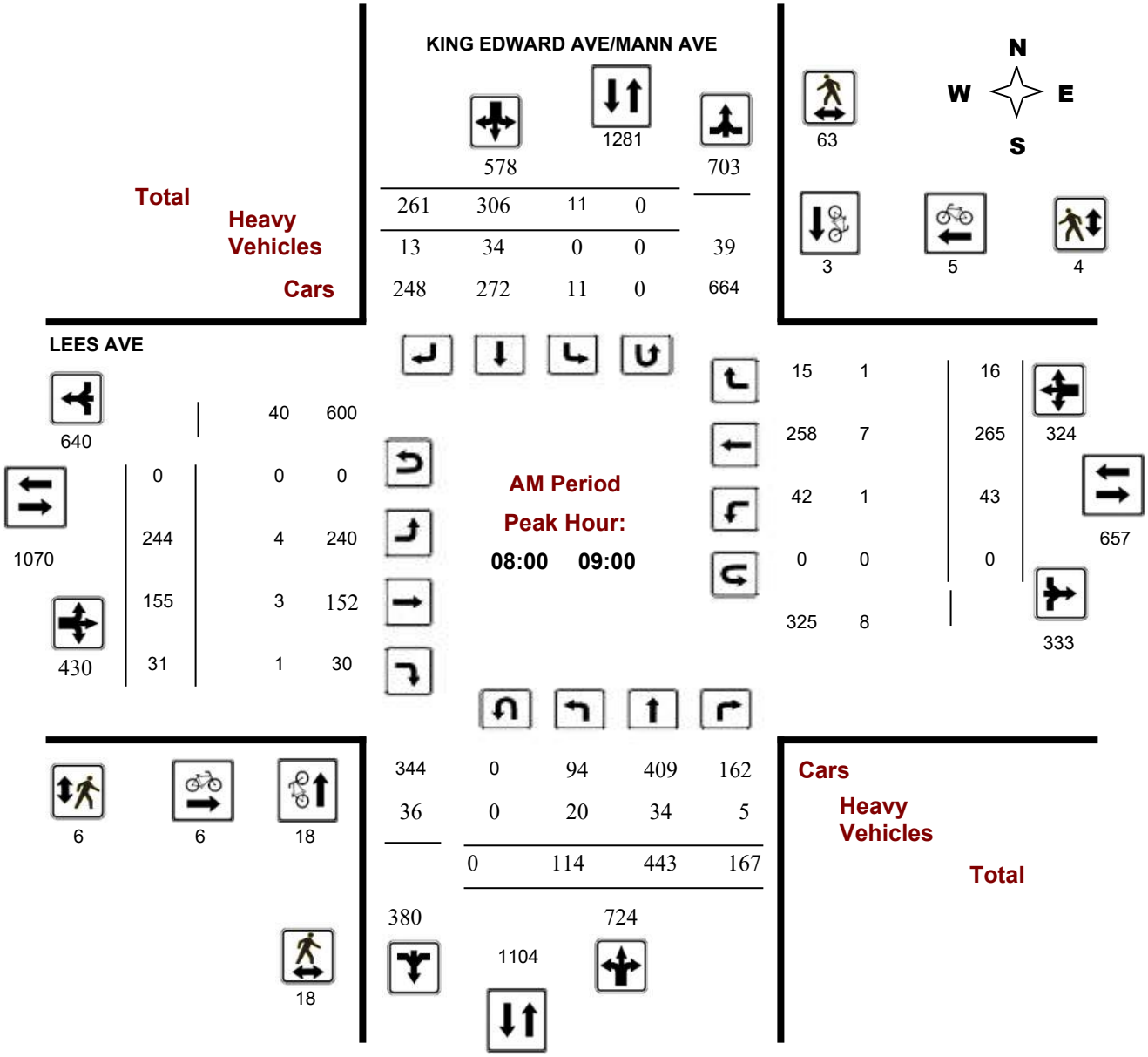
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

LEES AVE @ KING EDWARD AVE/MANN AVE

Survey Date: Monday, July 09, 2012 **WO No:** 30845

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



Comments

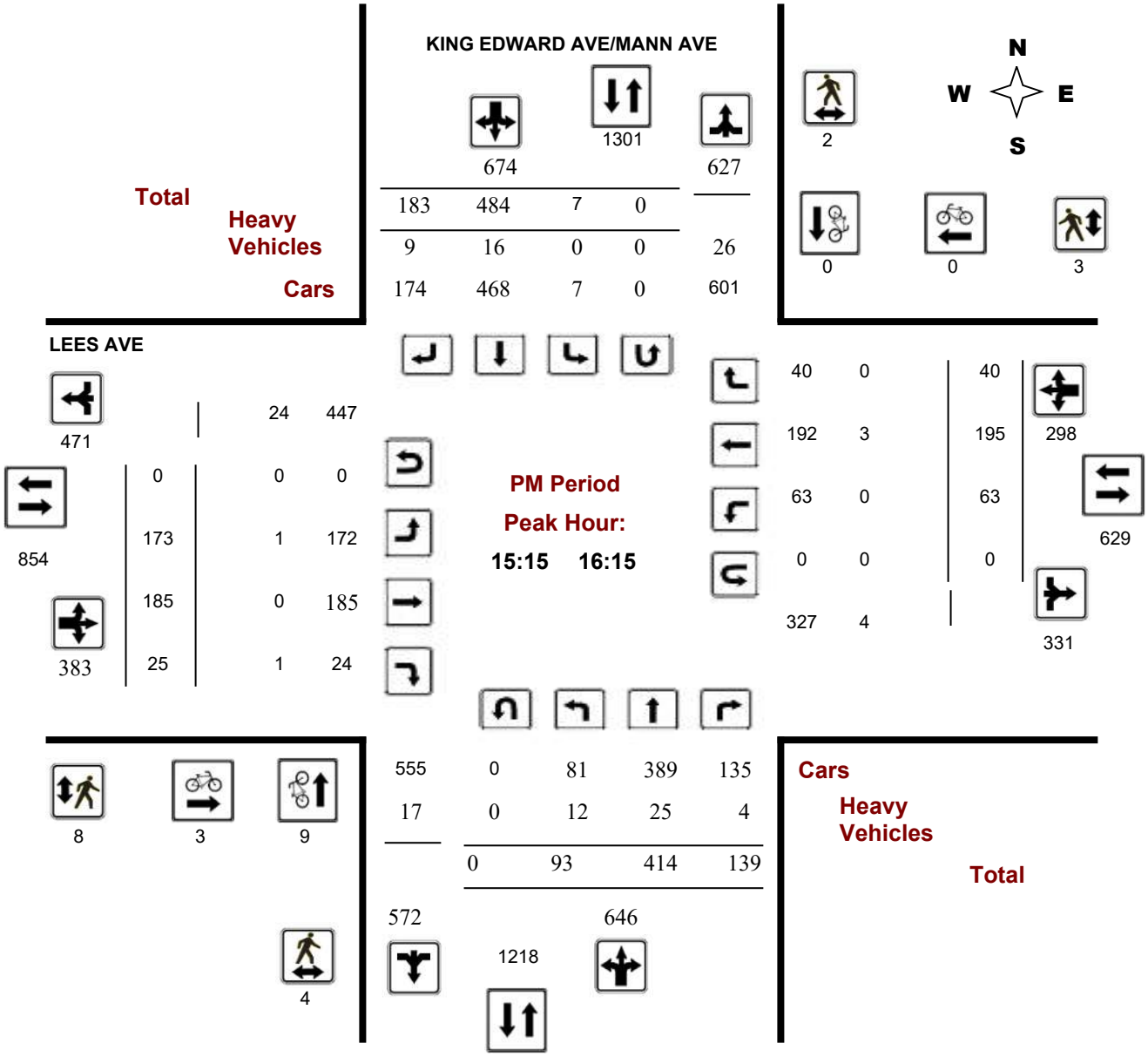
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

LEES AVE @ KING EDWARD AVE/MANN AVE

Survey Date: Monday, July 09, 2012 **WO No:** 30845

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



Comments

Transportation Services - Traffic Services

Work Order 30845

Turning Movement Count - Full Study Summary Report

LEES AVE @ KING EDWARD AVE/MANN AVE

Survey Date: Monday, July 09, 2012

Total Observed U-Turns

Northbound: 1 Southbound: 0

Eastbound: 1 Westbound: 0

AADT Factor 1.00

Full Study

	KING EDWARD AVE/MANN AVE									LEES AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	79	374	123	**576**	18	370	206	**594**	**1170**	131	68	10	**209**	35	187	2	**224**	**433**	**1603**
08:00 09:00	114	443	167	**724**	11	306	261	**578**	**1302**	244	155	31	**430**	43	265	16	**324**	**754**	**2056**
09:00 10:00	79	325	139	**543**	19	243	175	**437**	**980**	140	135	19	**294**	36	153	9	**198**	**492**	**1472**
11:30 12:30	65	344	94	**503**	12	372	268	**652**	**1155**	106	82	18	**206**	51	124	44	**219**	**425**	**1580**
12:30 13:30	70	370	80	**520**	6	297	294	**597**	**1117**	111	88	28	**227**	33	170	10	**213**	**440**	**1557**
15:00 16:00	89	409	140	**638**	7	505	181	**693**	**1331**	175	149	25	**349**	55	172	15	**242**	**591**	**1922**
16:00 17:00	67	368	165	**600**	14	275	140	**429**	**1029**	172	248	23	**443**	110	276	49	**435**	**878**	**1907**
17:00 18:00	73	390	191	**654**	10	300	149	**459**	**1113**	186	167	31	**384**	96	160	14	**270**	**654**	**1767**
Sub Total	636	3023	1099	**4758**	97	2668	1674	**4439**	**9197**	1265	1092	185	**2542**	459	1507	159	**2125**	**4667**	**13864**
U Turns				**1**				**0**	**1**				**1**				**0**	**1**	**2**
Total	636	3023	1099	**4759**	97	2668	1674	**4439**	**9198**	1265	1092	185	**2543**	459	1507	159	**2125**	**4668**	**13866**
EQ 12Hr	884	4202	1528	**6615**	135	3709	2327	**6170**	**12785**	1758	1518	257	**3535**	638	2095	221	**2954**	**6489**	**19274**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	884	4202	1528	**6615**	135	3709	2327	**6170**	**12785**	1758	1518	257	**3535**	638	2095	221	**2954**	**6489**	**19274**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**1.00**						
AVG 24Hr	1158	5505	2001	**8666**	177	4858	3048	**8083**	**16749**	2303	1988	337	**4631**	836	2744	290	**3869**	**8500**	**25249**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Transportation Services - Traffic Services

Work Order
36670

Turning Movement Count - Full Study Summary Report

LEES AVE @ KING EDWARD AVE/MANN AVE

Survey Date: Thursday, February 02, 2017

Total Observed U-Turns

Northbound: 2 Southbound: 7
Eastbound: 0 Westbound: 0

AADT Factor
.90

Full Study

	KING EDWARD AVE/MANN AVE									LEES AVE									
	Northbound				Southbound					Eastbound				Westbound					
Period	LT	ST	RT	**NB TOT**	LT	ST	RT	**SB TOT**	**STR TOT**	LT	ST	RT	**EB TOT**	LT	ST	RT	**WB TOT**	**STR TOT**	**Grand Total**
07:00 08:00	89	470	127	**686**	61	74	491	**626**	**1312**	107	61	6	**174**	18	156	35	**209**	**383**	**1695**
08:00 09:00	124	487	137	**748**	72	89	559	**720**	**1468**	214	146	3	**363**	7	226	37	**270**	**633**	**2101**
09:00 10:00	96	499	148	**743**	68	102	513	**683**	**1426**	157	97	5	**259**	16	211	32	**259**	**518**	**1944**
11:30 12:30	94	460	160	**714**	46	87	425	**558**	**1272**	128	102	3	**233**	16	172	46	**234**	**467**	**1739**
12:30 13:30	97	471	135	**703**	47	76	495	**618**	**1321**	126	101	14	**241**	16	192	55	**263**	**504**	**1825**
15:00 16:00	90	588	153	**831**	37	111	556	**704**	**1535**	198	165	11	**374**	22	196	51	**269**	**643**	**2178**
16:00 17:00	75	489	172	**736**	51	125	536	**712**	**1448**	157	181	2	**340**	18	226	55	**299**	**639**	**2087**
17:00 18:00	65	578	182	**825**	41	123	524	**688**	**1513**	201	156	9	**366**	19	243	49	**311**	**677**	**2190**
Sub Total	730	4042	1214	**5986**	423	787	4099	**5309**	**11295**	1288	1009	53	**2350**	132	1622	360	**2114**	**4464**	**15759**
U Turns				**2**				**7**	**9**				**0**				**0**	**0**	**9**
Total	730	4042	1214	**5988**	423	787	4099	**5316**	**11304**	1288	1009	53	**2350**	132	1622	360	**2114**	**4464**	**15768**
EQ 12Hr	1015	5618	1687	**8323**	588	1094	5698	**7389**	**15712**	1790	1403	74	**3266**	183	2255	500	**2938**	**6204**	**21916**
Note: These values are calculated by multiplying the totals by the appropriate expansion factor.													**1.39**						
AVG 12Hr	913	5057	1519	**7491**	529	985	5128	**6650**	**14141**	1611	1262	66	**2940**	165	2029	450	**2645**	**5585**	**19726**
Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor.													**.90**						
AVG 24Hr	1196	6624	1990	**9813**	693	1290	6717	**8712**	**18525**	2111	1654	87	**3851**	216	2658	590	**3464**	**7315**	**25840**
Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor.													**1.31**						

Comments:

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

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

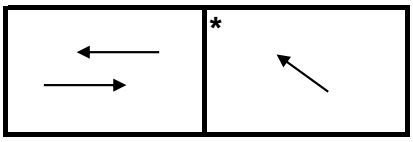
Intersection:	***Main:*** Lees	***Side:***	Hwy 417 WB Off Ramp
Controller:	**MS 3200**	**TSD:**	**5954**
Author:	Ahmed Abdullah	**Date:**	May 14, 2020

Existing Timing Plans†

	Plan						**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	**Evening** 12	***Walk***	***DW***	***A+R***
Cycle	100	95	115	70	95	95			
Offset	60	X	115	X	X	X			
EB Thru	37	34	41	22	34	32	5	5	3.3+2.4
WB Thru	37	34	41	22	34	32	5	5	3.3+2.4
Ramp	63	61	74	48	61	63	-	-	3.3+2.6

Phasing Sequence‡

Plan: All



Notes: 1) For all plans; the Ramp phase has min recall of 20 seconds green

Schedule

Weekday

Time	Plan
0:15	4
6:15	1
9:30	2
15:00	3
18:30	2
20:30	12
23:30	4

Saturday

Time	Plan
0:15	4
8:00	12
9:00	5
21:00	12
23:30	4

Sunday

Time	Plan
0:15	4
8:00	12
9:00	5
19:00	12
23:30	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 $58.78 ($52.02 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

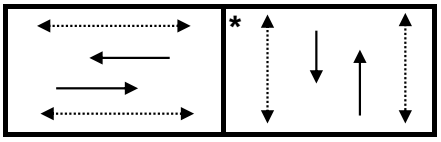
Intersection:	***Main:*** Lees	***Side:***	Lees Campus / 990m E of Main
Controller:	**MS 3200**	**TSD:**	**5713**
Author:	Matthew Anderson	**Date:**	14-May-2020

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	Free	Free	Free	Free	Free			
Offset	X	X	X	X	X			
EB Thru	max=30.6	max=25.6	max=32.6	max=22.6	max=27.6	7	10	3.3+2.3
WB Thru	max=30.6	max=25.6	max=32.6	max=22.6	max=27.6	7	10	3.3+2.3
NB Thru	max=25.8	max=20.8	max=25.8	max=20.8	max=23.8	7	14	3.3+2.5
SB Thru	max=25.8	max=20.8	max=25.8	max=20.8	max=23.8	7	14	3.3+2.5

Phasing Sequence‡

Plan: All



Schedule

Weekday

Time	Plan
0:15	4
6:30	1
9:30	2
15:00	3
18:30	2
22:00	4

Weekend

Time	Plan
0:15	4
8:00	5
22:00	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 $58.78 ($52.02 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

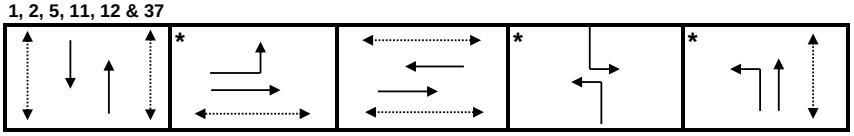
Intersection:	***Main:*** King Edward / Lees	***Side:***	Mann / Greenfield
Controller:	**MS 3200**	**TSD:**	**5667**
Author:	Ahmed Abdullah	**Date:**	May 14, 2020

Existing Timing Plans†

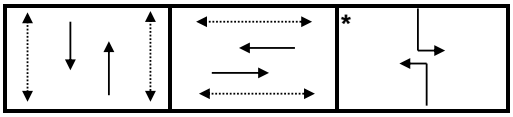
	Plan							**Ped Minimum Time**		
	AM Peak	**Off Peak**	**Night**	**Weekend**	**AM Heavy**	**Evening**	**PM Peak**	***Walk***	***DW***	***A+R***
	1	2	4	5	11	12	37			
Cycle	100	100	80	100	100	85	100			
Offset	0	51	41	X	0	31	X			
NB Thru	37	34	30	40	32	31	44	7	13	3.0+3.6
SB Thru	35	32	30	38	30	29	42	7	13	3.0+3.6
EB Left	16	19	-	14	19	10	12	-	-	3.3+2.1
EB Thru	48	51	38	46	51	42	44	7	24	3.3+3.4
WB Thru	32	32	38	32	32	32	32	7	18	3.3+3.4
NB Left (fp)	17	17	12	16	19	14	14	-	-	3.0+4.4
SB Left (fp)	15	15	12	14	17	12	12	-	-	3.0+4.4

Phasing Sequence‡

Plan: 1, 2, 5, 11, 12 & 37



Plan: 4



Notes: 1) In plan 4, if the EB pedestrian phase is not actuated, the EB movement will be forced off 24 seconds early
2) In plan 4, if the WB pedestrian phase is not actuated, the WB movement will be forced off 18 seconds early

Schedule

Weekday

Time	Plan
0:15	4
6:15	1
8:05	11
9:00	1
9:30	2
14:30	37
18:30	2
20:30	12
23:30	4

Saturday

Time	Plan
0:15	4
8:00	12
9:00	5
21:00	12
23:30	4

Sunday

Time	Plan
0:15	4
8:00	12
9:00	5
19:00	12
23:30	4

Notes

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

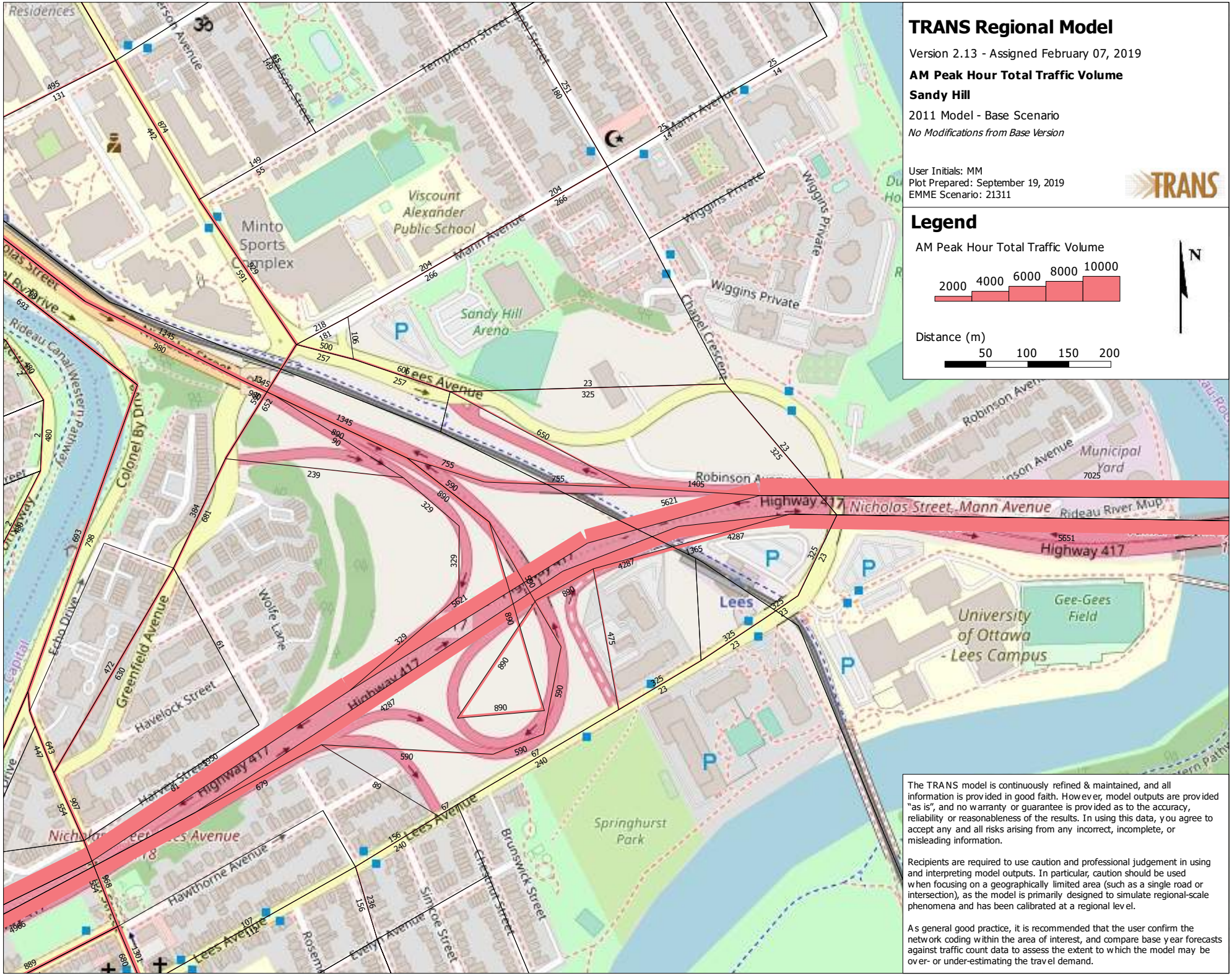
‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $58.78 ($52.02 + HST)



TRANS Regional Model

Version 2.13 - Assigned February 07, 2019

AM Peak Hour Total Traffic Volume

Sandy Hill

2011 Model - Base Scenario

No Modifications from Base Version

User Initials: MM
Plot Prepared: September 19, 2019
EMME Scenario: 21311

TRANS

Legend

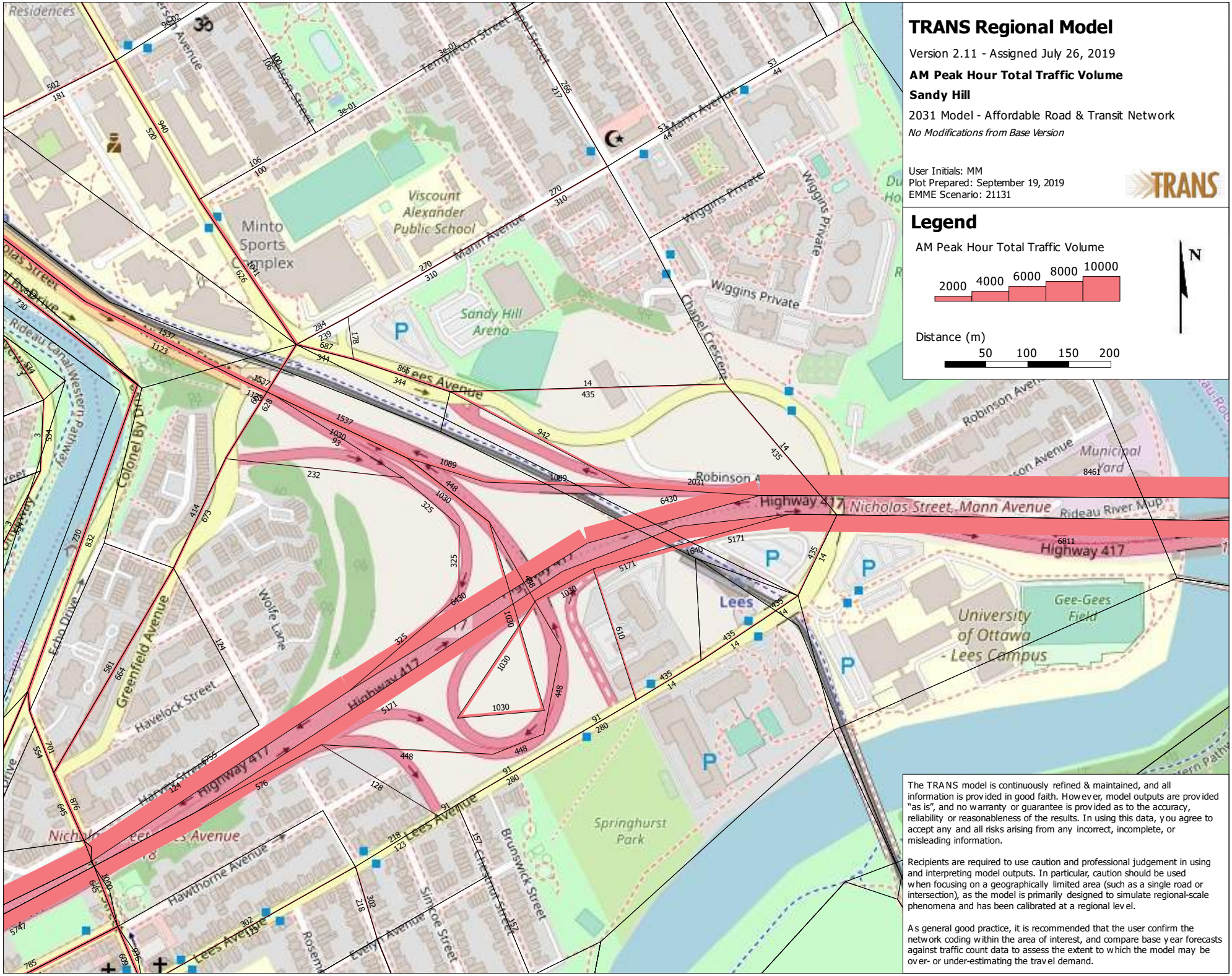
AM Peak Hour Total Traffic Volume

2000 4000 6000 8000 10000

Distance (m)

50 100 150 200

N



TRANS Regional Model

Version 2.11 - Assigned July 26, 2019

AM Peak Hour Total Traffic Volume

Sandy Hill

2031 Model - Affordable Road & Transit Network

No Modifications from Base Version

User Initials: MM
Plot Prepared: September 19, 2019
EMME Scenario: 21131

TRANS

Legend

AM Peak Hour Total Traffic Volume

2000 4000 6000 8000 10000

N

Distance (m)

50 100 150 200

APPENDIX F

Collision Records

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: 472 E OF CHESTNUT ST/UOTTAWA @ LEES AVE

Traffic Control: Traffic signal **Total Collisions:** 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Jan-18, Sat,19:42	Snow	Rear end	P.D. only	Loose snow	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2020-Oct-02, Fri,12:10	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	

Location: CHAPEL CRES @ LEES AVE

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
2017-Feb-24, Fri,23:11	Rain	SMV other	Non-fatal injury	Wet	East	Going ahead	Automobile, station wagon	Pole (utility, power)	0
2019-Jan-12, Sat,15:44	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Feb-27, Thu,07:46	Snow	Rear end	P.D. only	Loose snow	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Bus (other)	Other motor vehicle	

Location: LEES AVE @ TRANSITWAY/HWY 417 NICHOLAS IC118R

Traffic Control: Traffic signal **Total Collisions:** 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jun-16, Thu,15:20	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Jan-07, Sat,10:05	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-May-31, Wed,09:50	Clear	Turning movement	P.D. only	Dry	South	Making "U" turn	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: LEES AVE @ TRANSITWAY/HWY 417 NICHOLAS IC118R

Traffic Control: Traffic signal **Total Collisions:** 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Sep-21, Thu,18:25	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-Oct-27, Sat,18:45	Snow	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-29, Sun,21:13	Rain	Turning movement	P.D. only	Wet	East	Stopped	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2020-Dec-13, Sun,15:26	Clear	SMV other	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Curb	0

Location: LEES AVE @ KING EDWARD AVE/MANN AVE

Traffic Control: Traffic signal **Total Collisions:** 44

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Jan-11, Mon,14:35	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2016-Jan-22, Fri,21:00	Clear	Rear end	P.D. only	Packed snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Feb-09, Tue,08:17	Snow	Rear end	P.D. only	Slush	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Slowing or stopping	Truck-other	Other motor vehicle	
2016-Apr-02, Sat,03:31	Clear	Sideswipe	Non-fatal injury	Dry	North	Going ahead	Passenger van	Other motor vehicle	0
					North	Stopped	Police vehicle	Other motor vehicle	
2016-May-15, Sun,13:05	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	
2016-Jul-26, Tue,09:30	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Tow truck	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: LEES AVE @ KING EDWARD AVE/MANN AVE

Traffic Control: Traffic signal **Total Collisions:** 44

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Sep-25, Sun,13:34	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Nov-09, Wed,10:29	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	
2016-Dec-12, Mon,15:16	Snow	Rear end	P.D. only	Loose snow	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Turning right	Truck - tractor	Other motor vehicle	
2016-Dec-17, Sat,16:35	Snow	Rear end	P.D. only	Slush	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Mar-07, Tue,16:00	Clear	Other	P.D. only	Dry	South	Reversing	Truck and trailer	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2017-Mar-10, Fri,09:30	Clear	Rear end	P.D. only	Dry	North	Unknown	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2017-Apr-04, Tue,06:56	Rain	Sideswipe	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2017-May-12, Fri,14:49	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Aug-09, Wed,00:00	Clear	SMV unattended vehicle	P.D. only	Dry	Unknown	Unknown	Unknown	Unattended vehicle	0
2017-Sep-02, Sat,13:12	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Unknown	Other motor vehicle	0
					North	Stopped	Passenger van	Other motor vehicle	
2017-Sep-06, Wed,19:35	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: LEES AVE @ KING EDWARD AVE/MANN AVE

Traffic Control: Traffic signal **Total Collisions:** 44

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2017-Nov-01, Wed,23:20	Rain	Rear end	P.D. only	Wet	North	Stopped	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2017-Dec-15, Fri,13:27	Clear	Sideswipe	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Overtaking	Automobile, station wagon	Other motor vehicle	
2018-Jan-28, Sun,13:37	Clear	SMV unattended vehicle	P.D. only	Wet	North	Unknown	Unknown	Unattended vehicle	0
2018-Jun-14, Thu,16:15	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-25, Mon,16:30	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	
2018-Jun-30, Sat,18:00	Clear	Rear end	P.D. only	Dry	North	Unknown	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-23, Mon,13:39	Clear	Other	P.D. only	Dry	North	Reversing	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Aug-22, Wed,15:24	Clear	Sideswipe	P.D. only	Dry	North	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Municipal transit bus	Other motor vehicle	
2018-Nov-16, Fri,16:08	Snow	Rear end	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Nov-20, Tue,20:30	Clear	Rear end	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-15, Sat,15:30	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: LEES AVE @ KING EDWARD AVE/MANN AVE

Traffic Control: Traffic signal **Total Collisions:** 44

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Jan-18, Fri,12:58	Snow	Other	P.D. only	Loose snow	East	Reversing	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Jan-26, Sat,21:45	Clear	Rear end	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Feb-01, Fri,12:15	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	
2019-Feb-02, Sat,10:00	Snow	Rear end	Non-fatal injury	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Mar-01, Fri,07:45	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Apr-13, Sat,02:08	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Slowing or stopping	Construction equipment	Other motor vehicle	
2019-Aug-11, Sun,13:40	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	
2019-Sep-03, Tue,20:45	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Sep-08, Sun,18:00	Clear	Rear end	P.D. only	Dry	North	Going ahead	Unknown	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Oct-21, Mon,12:48	Clear	SMV other	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Pedestrian	1
2019-Nov-11, Mon,20:00	Snow	Rear end	P.D. only	Loose snow	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Passenger van	Other motor vehicle	
2019-Dec-12, Thu,17:42	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	

Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2016 **To:** December 31, 2020

Location: LEES AVE @ KING EDWARD AVE/MANN AVE

Traffic Control: Traffic signal **Total Collisions:** 44

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Feb-01, Sat,12:20	Snow	Rear end	Non-fatal injury	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2020-Feb-29, Sat,18:00	Snow	Rear end	P.D. only	Slush	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2020-Aug-03, Mon,10:29	Clear	Rear end	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Pick-up truck	Other motor vehicle	
2020-Oct-05, Mon,13:00	Clear	Rear end	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	

Location: LEES AVE @ ROBINSON AVE W

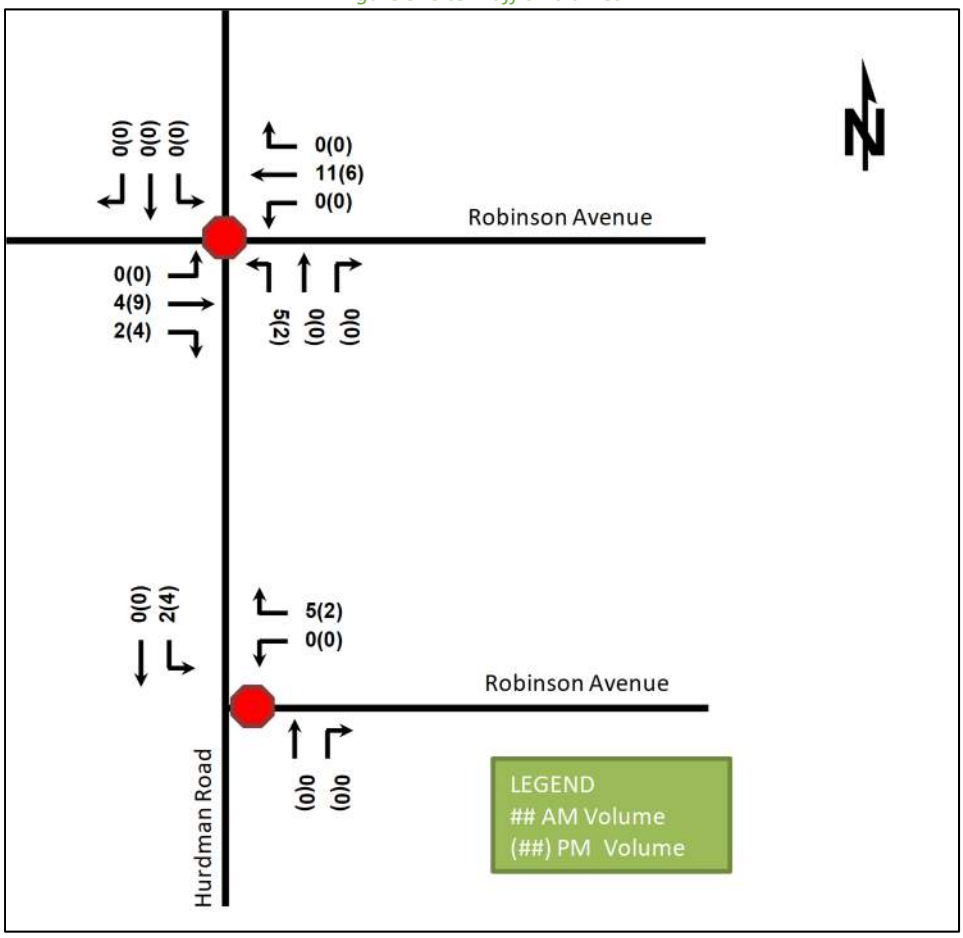
Traffic Control: Stop sign **Total Collisions:** 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2016-Dec-18, Sun,02:41	Snow	Rear end	P.D. only	Slush	North	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Pick-up truck	Other motor vehicle	

APPENDIX G

Relevant Excerpts from Other Area Development Reports

Figure 9: Site Traffic Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

There are no planned changes to the Study Area Transportation Network that would influence the Study Area.

6.2 Background Growth

No additional background growth has been accounted for along Robinson Avenue or Hurdman Road.

6.3 Other Developments

At the time of this report, no other development applications are noted in the area.

7 Demand Rationalization

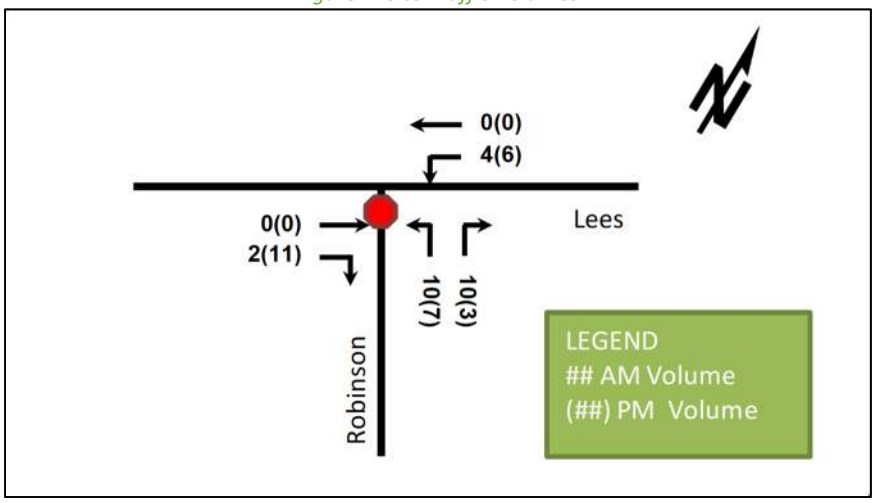
The new vehicle volumes forecasted to be generated by the new sites is minimal and no demand rationalization is required for the proposed sites or study area.

8 Development Design

8.1 Design for Sustainable Modes

The proposed development is a residential site plan with perpendicular visitor parking at the side of the buildings and external bicycle parking at the rear of the buildings. Sidewalks are provided along the frontage of each building on Robinson Avenue.

Figure 7: Site Traffic Volumes



6 Background Network Travel Demands

6.1 Transportation Network Plans

There are no planned changes to the Study Area Transportation Network that would influence the Study Area.

6.2 Background Growth

A 2% background growth has been assumed along Lees Avenue.

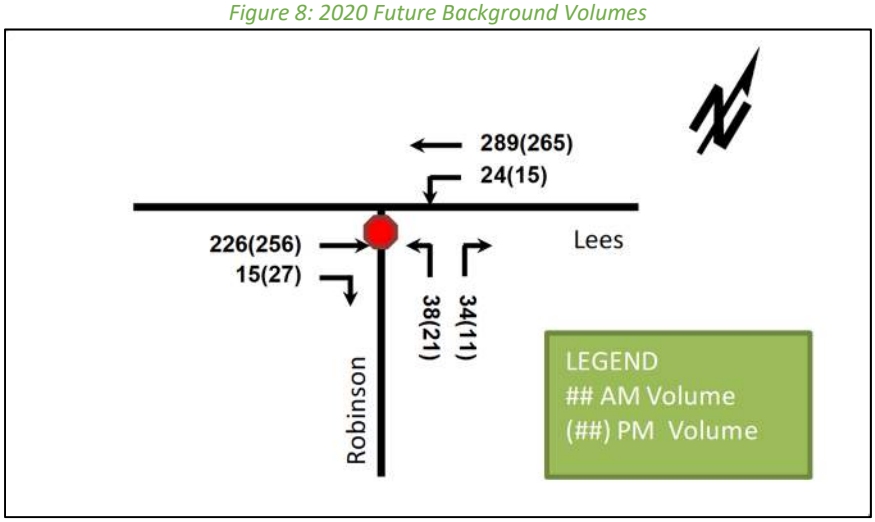
6.3 Other Developments

As detailed in Section 2.3.2, the following developments have been included in the background traffic forecasts.

7 Demand Rationalization

Figure 8 illustrates the 2020 future background traffic volumes and Figure 9 illustrates the 2025 future background traffic volumes. Table 10 summarizes the 2020 future background intersection operations and Table 11 summarizes the 2025 future background intersection operations. The level of service is based on the HCM criteria for average delay at unsignalized intersections. The Synchro works sheets have been provided in Appendix E and Appendix F.

Figure 8: 2020 Future Background Volumes



Housing Development Opportunities

The map and table at right identify specific sites where the University may consider new student residences or other forms of housing for students and visiting faculty, either as a stand-alone project or as a component of a new academic building or other mixed-use project, and the estimated housing capacity of these sites.

New first-year undergraduate student residences may be accommodated west of King Edward and in the Mann, River and Station Precincts, where larger residences with a range of amenities, services, and programming may be provided. Properties east of King Edward may accommodate student apartments as part of new mixed-use buildings, with units in such projects generally geared toward upper-division students, international students, and potentially families.

In total, the sites identified in yellow could accommodate approximately 6,700 beds. If the student-oriented housing was also developed on the sites identified in orange, another 6,700 beds could be realized. Note, the illustrated building footprints are conceptual and do not represent the only potential housing sites. For example, residential towers above academic buildings can also be considered in the Core Precinct.

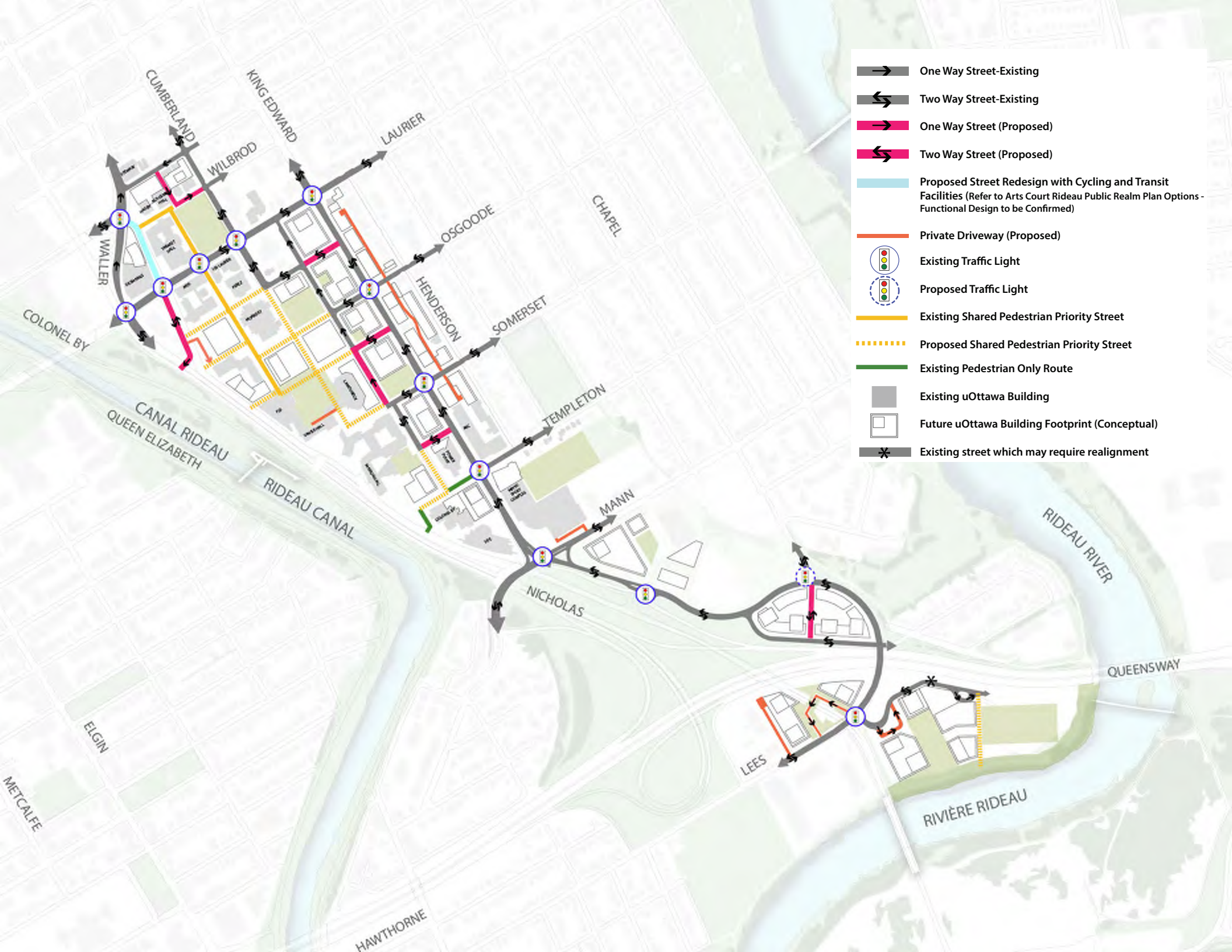
	Residence Type	GFA	Unit	Number of Beds
King Edward				
Site A	Tower	19,500	175	610
Site B	Mid-Profile	17,900	300	600
Site C	Tower	9,000	80	280
Site D	Mid-Profile	15,700	260	520
Site E	Tower	6,000	55	190
Site F	Mid-Profile	11,200	190	380
TOTAL		79,300	1,060	2,580
Mann				
Site G	Tower	9,000	85	300
Robinson				
Site H	Podium for High-rise	15,600	140	490
Station				
Site I	Podium for High-rise	31,800	300	1,050
River				
Site J	Tower	72,000	655	2,290
TOTAL		207,700	2,240	6,710
Robinson				
Site K	Podium-Tower	114,400	1,040	3,640
Station				
Site L	Podium-Tower	96,350	880	3,080
TOTAL		210,750	1,920	6,720
TOTAL		**418,450**	**4,160**	**13,430**

Estimated Capacity of Potential Housing Sites

Average 3.5 Beds/Unit (Based on 110 Sq.m per Unit)

Average 2 Beds/Unit (Based on 60 Sq.m per Unit)

Figure 4-5
Potential Housing Sites


CUMBERLAND
KING EDWARD
LAURIER
WILBROD
WALLER
OSGOODE
CHAPEL
HENDERSON
SOMERSET
COLONEL BY
TEMPLETON
CANAL RIDEAU
QUEEN ELIZABETH
RIDEAU CANAL
MANN
RIDEAU RIVER
NICHOLAS
QUEENSWAY
ELGIN
LEES
METCALFE
RIVIÈRE RIDEAU
HAWTHORNE
One Way Street-Existing
Two Way Street-Existing
One Way Street (Proposed)
Two Way Street (Proposed)
Proposed Street Redesign with Cycling and Transit Facilities (Refer to Arts Court Rideau Public Realm Plan Options - Functional Design to be Confirmed)
Private Driveway (Proposed)
Existing Traffic Light
Proposed Traffic Light
Existing Shared Pedestrian Priority Street
Proposed Shared Pedestrian Priority Street
Existing Pedestrian Only Route
Existing uOttawa Building
Future uOttawa Building Footprint (Conceptual)
Existing street which may require realignment

4 Forecasting

4.1 Development Generated Traffic

4.1.1 Trip Generation Methodology

Site-generated traffic volumes were developed using the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) for the weekday peak hours of the adjacent transportation network. These represent the periods where the combination of background and site-generated travel demands have the greatest impact on the available network capacity. The TIA Guidelines indicate that vehicle-trip generation rates from the ITE Trip Generation Manual should be converted to person-trips through the application of a 1.28 vehicle-to-person-trip conversion factor. It is important to note that the person-trip generation estimates prepared in this study are not specific to the University of Ottawa but rather typical of urban post-secondary institutions in North America.

Following the application of the above conversion factor, the person-trips were then subdivided based on representative mode share percentages applicable to the study area to determine the number of vehicle, passenger, transit, pedestrian, cycling and 'other' trip types.

The mode share targets for the proposed development were developed based on the University of Ottawa 2019 Campus Mode Share Survey. The survey is broadly representative of student, staff and faculty mode choices for the University of Ottawa, however, primarily captures the mode share characteristics of the Main Campus. Given the unique geographical barriers surrounding the Lees Campus, these mode share were adjusted to reflect the local context.

4.1.2 Trip Generation Results

4.1.2.1 Vehicle Trip Generation

Weekday peak hour vehicular traffic volumes associated with the subject development were determined using appropriate peak hour trip generation rates from the ITE Trip Generation Manual. The **net increase** in GFA (Gross Floor Area) was used to estimate future site-generated trips. It is expected that trips generated by the existing buildings have been captured in the existing traffic data at the site access intersection. **Table 5** below summarizes the existing and proposed GFA for each building within the Lees Campus. As discussed in Section 3.1.2, Building B, C and D will be replaced with the proposed building.

Table 5 - Existing and Proposed Gross Floor Area

BUILDING	GROSS FLOOR AREA (m^2)	
	EXISTING	PROPOSED
A	5,631	5,631
B	2,503	-
C	3,099	-
D	1,877	-
E	5,883	5,883
Proposed Building	-	17,379
Net Change	**-**	**9,900**

The vehicular trip generation results for the proposed development have been summarized in **Table 6**.

Table 6 - Base Vehicular Trip Generation Results – Net Change

LAND USE	SIZE (NET CHANGE)	WEEKDAY PEAK HOUR	GENERATED TRIPS (VPH)		
			IN	OUT	TOTAL
Post-Secondary Institution	9,900 m^2	AM	89	27	116
		PM	40	85	125

Note: vph = Vehicles Per Hour *Source: ITE Trip Generation Manual*

4.1.2.2 Person Trip Generation

The TIA Guidelines indicate that a 1.28 vehicle-to-person-trip conversion rate should be utilized to convert the base vehicular trip generation results into person trips.

The resulting number of person-trips have been summarized in **Table 7**.

Table 7 - Person-Trip Generation – Net Change

LAND USE	WEEKDAY PEAK HOUR	PERSON TRIPS (PPH)		
		IN	OUT	TOTAL
Post-Secondary Institution	AM	114	34	149
	PM	51	109	160

Notes: pph = persons per hour

4.1.2.3 Mode Share Proportions

The University of Ottawa 2019 Campus Mode Share Survey serves as a foundation for the development of mode share targets for the subject site. The survey is broadly representative of student, staff and faculty mode choices for the University of Ottawa, however, approximately 91% of respondents considered the Main Campus as their primary destination while only 2% for the Lees Campus. As such, mode share adjustments were required to reflect the unique context of the subject site. Compared with the Main Campus, which is well integrated into the urban fabric, the Lees Campus is relatively isolated with physical barriers such as the Rideau River and Highway 417. The proportion of walking trips to/from the site has therefore been reduced and redistributed to transit and auto mode share for the purposes of this study.

For sites adjacent to Light Rail Transit (LRT) stations, the City of Ottawa expects new developments to target a transit mode share of at least 65% and a non-auto mode share of at least 15%. Based on the 2019 Campus Mode Share Survey, the University of Ottawa presently exceeds the overall target for non-auto modes. Nonetheless, Transportation Demand Management (TDM) measures aimed at encouraging non-auto modes will be incorporated in the proposed development, as discussed in latter sections of this report.

Table 8 summarizes the mode share derived from University of Ottawa 2019 Campus Mode Share Survey as well as the mode share targets for subject site.

Relevant extracts from the University of Ottawa 2019 Campus Mode Share Survey are provided in **Appendix F**.

Table 8 - University of Ottawa 2019 Campus Mode Share Survey Results and Proposed Mode Share Targets

TRAVEL MODE	2019 CAMPUS MODE SHARE SURVEY[1]	MODE SHARE TARGETS
Auto Driver	14%	17%
Auto Passenger	2%	3%
Transit	59%	65%
Cycling	3%	3%
Walking	20%	10%
Other	2%	2%

[1] - *Carpool trips were evenly distributed between auto driver and auto passenger. It is assumed that most carpool trips have an auto occupancy rate of two people: one driver and one passenger.*

4.1.2.4 Trip Reduction Factors

Deduction of Existing Development Trips

As discussed previously, Buildings B, C and D will be replaced with a new structure for the University's Faculty of Heath Sciences. The new building will result in a net increase of approximately 9,900 m^2 of GFA to the Lees Campus. Trips generated by the existing buildings are assumed to have been adequately captured in the City's traffic count data at the site access intersection.

Pass-by Traffic

Not Applicable: The proposed development is institutional and will not generate pass-by traffic.

Synergy/ Internalization

Not Applicable: The proposed development will include only institutional land uses; therefore, internalization reduction factors are not required for this study.

4.1.2.5 Trip Generation by Mode

The mode share targets presented above were applied to the number of development-generated person-trips to establish the number of trips per travel mode, as summarized in **Table 9**.

Table 9 – Peak Hour Person-Trips by Mode – Net Change

MODE	AM		PM	
	IN	OUT	IN	OUT
Auto Driver	19	6	9	19
Auto Passenger	4	1	2	3
Transit	74	22	33	71
Walking	4	1	1	3
Cycling	11	3	5	11
Other	2	1	1	2
Total	**149**		**159**	

Based on the above, the proposed development is expected to result in a net increase of up to 28 two-way vehicular trips and 104 two-way transit trips during the weekday peak hours. It is important to note that these trips represent a net increase over the existing demand generated by the site.

4.1.3 Trip Distribution and Assignment

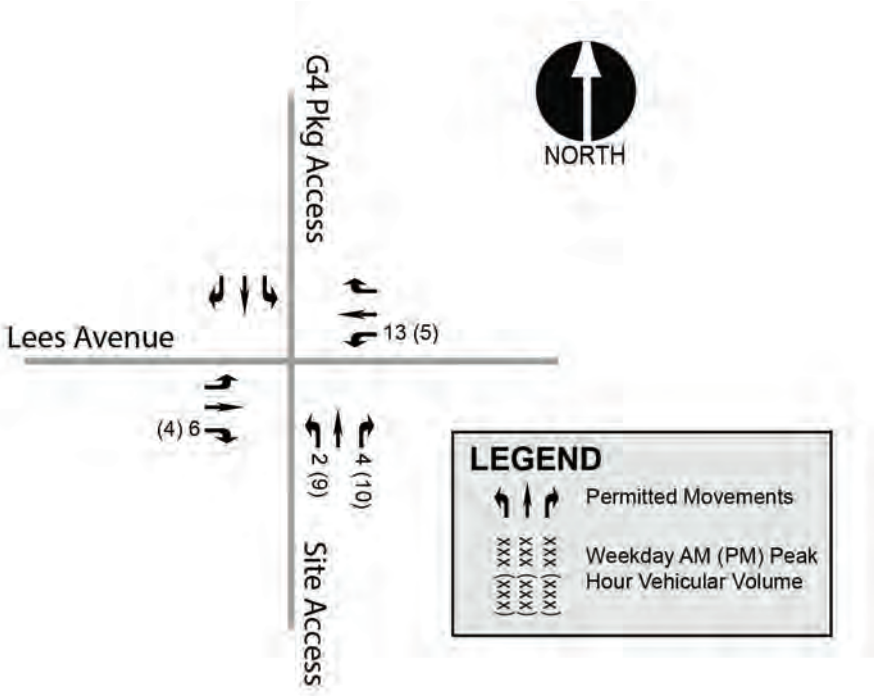
Based on existing travel patterns at the site access intersection, vehicular trips generated by the proposed development were distributed to the adjacent road network as shown in **Table 10**.

Table 10 - Distribution of Vehicular Trips

AM Peak Hour	PM Peak Hour
➢ 66% to/from the East	➢ 50% to/from the East
➢ 34% to/from the West	➢ 50% to/from the West

Utilizing the estimated number of new auto trips and applying the above distributions, future site-generated traffic volumes at the site access intersection are illustrated in **Figure 8**.

Figure 8 - Site-Generated Traffic



4.2 Background Network Traffic

4.2.1 Changes to the Background Transportation Network

To properly assess future traffic conditions, planned modifications to the transportation network that may impact travel patterns or demand within the study area have been considered. The Scoping section of this report reviewed the anticipated changes to the study area transportation network based on the Transportation Master Plan (TMP) and determined that there are currently no planned transportation network projects in the study area prior to the 2028 horizon year.

4.2.2 General Background Growth Rates

The background growth rate is intended to represent regional growth from outside the study area that will travel along the adjacent road network. Lees Avenue is well connected to Highway 417 via on- and off-ramps both upstream and downstream of the subject site. Therefore, the majority of traffic growth experienced along this corridor is expected to be a result of trips to/from Highway 417. Based on a review of traffic data collected by the Ministry of Transportation (MTO) of Highway 417 near Nicholas Street, it is estimated that Lees Avenue experiences a background traffic growth rate of approximately 2% per year. This growth rate is further supported by historical turning movement counts conducted by the City of Ottawa at the nearby Lees Avenue / King Edward Avenue & Mann Avenue intersection. As such, a linear 2% growth rate has been applied to through movements on Lees Avenue for the calculation of future background traffic volumes.

4.2.3 Other Area Development

The Scoping section of this report determined that there were active development applications for four proposed apartment buildings on Robinson Avenue. Based on the supporting transportation studies, these sites are expected to be low traffic generators, with only 18 to 25 vehicle trips on

APPENDIX H

TDM Checklists

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

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: *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: *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	☐
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: *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 resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential 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 at least the number of units at condominiums or multi-family residential developments	☑
	2.3	**Bicycle repair station**	
BETTER	2.3.1	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)	☑
	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	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	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	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(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	☐
	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	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐

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

Legend

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

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

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

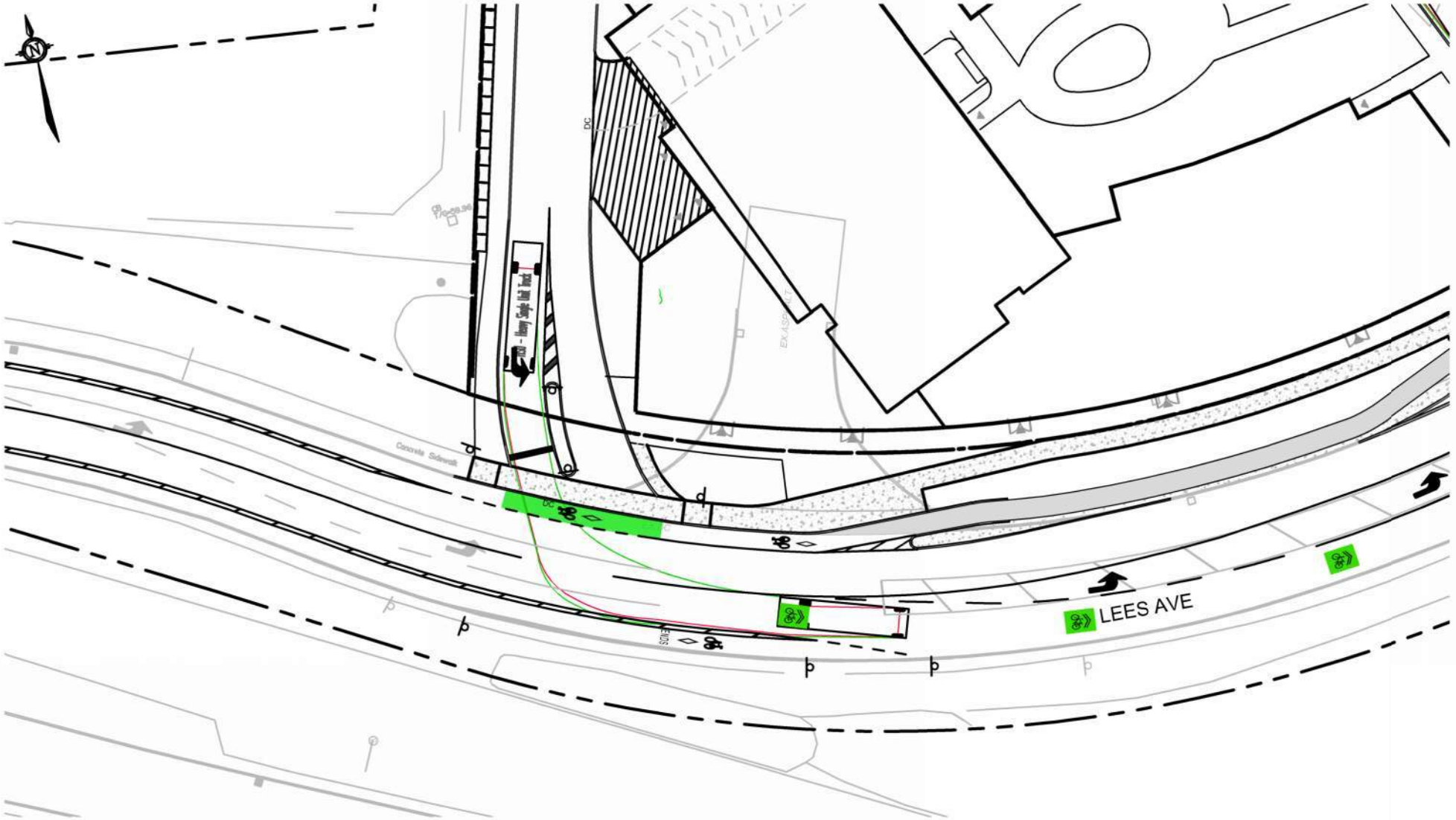
		TDM measures: *Residential developments*	Check if proposed & add descriptions
	1.	**TDM PROGRAM MANAGEMENT**	
	1.1	**Program coordinator**	
BASIC ★	1.1.1	Designate an internal coordinator, or contract with an external coordinator	☑
	1.2	**Travel surveys**	
BETTER	1.2.1	Conduct periodic surveys to identify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

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

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

APPENDIX I

Turning Movements



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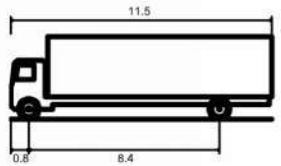

HSU - Heavy Single Unit Truck

Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (HSU)

SCALE 1 : 500 (0, 5, 10, 15, 20)

DATE	JOB	FIGURE
DEC 2023	119171	TM-1

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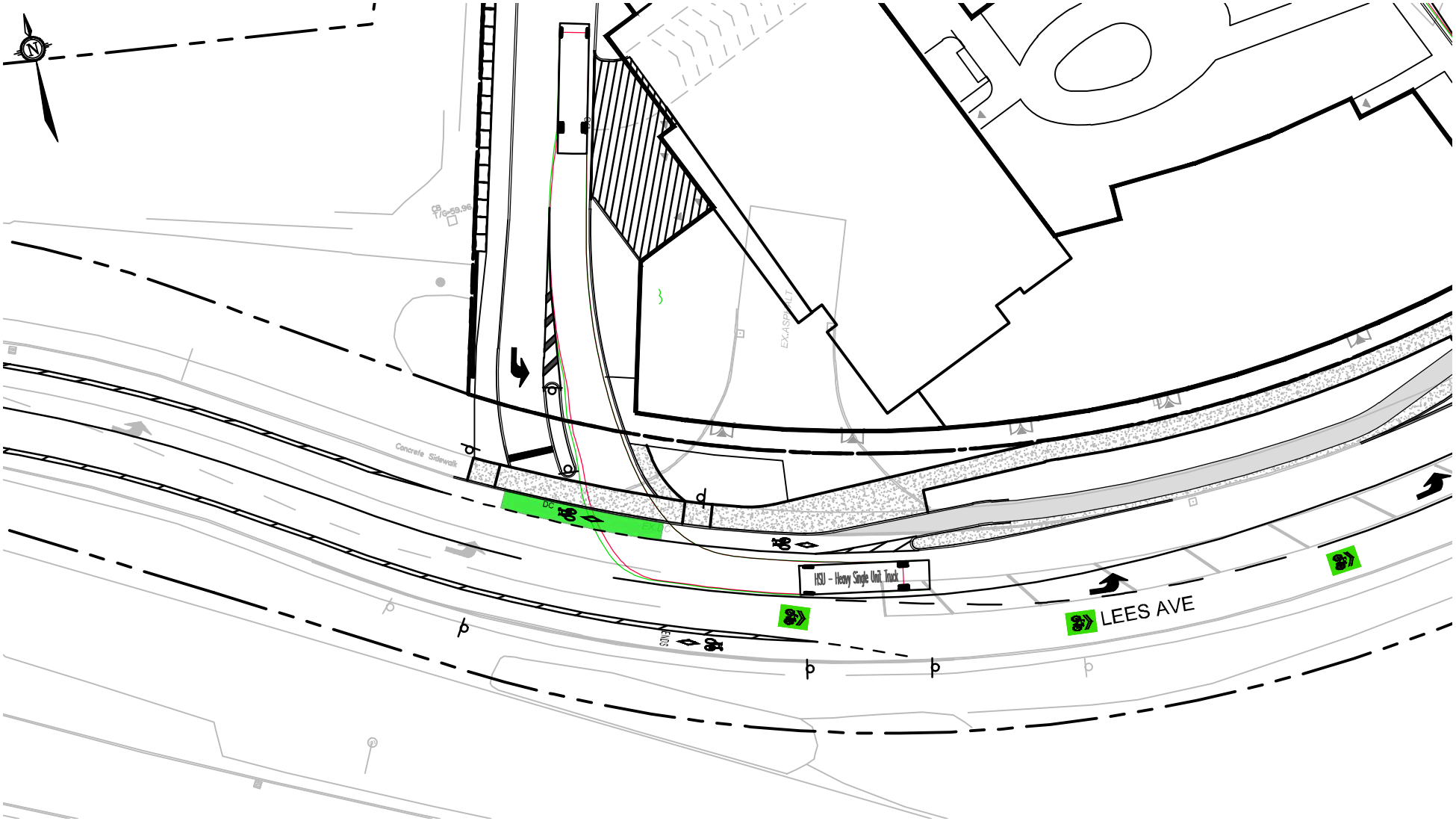

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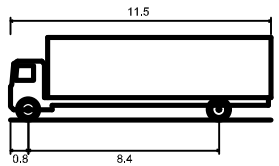

HSU - Heavy Single Unit Truck

Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (HSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-2

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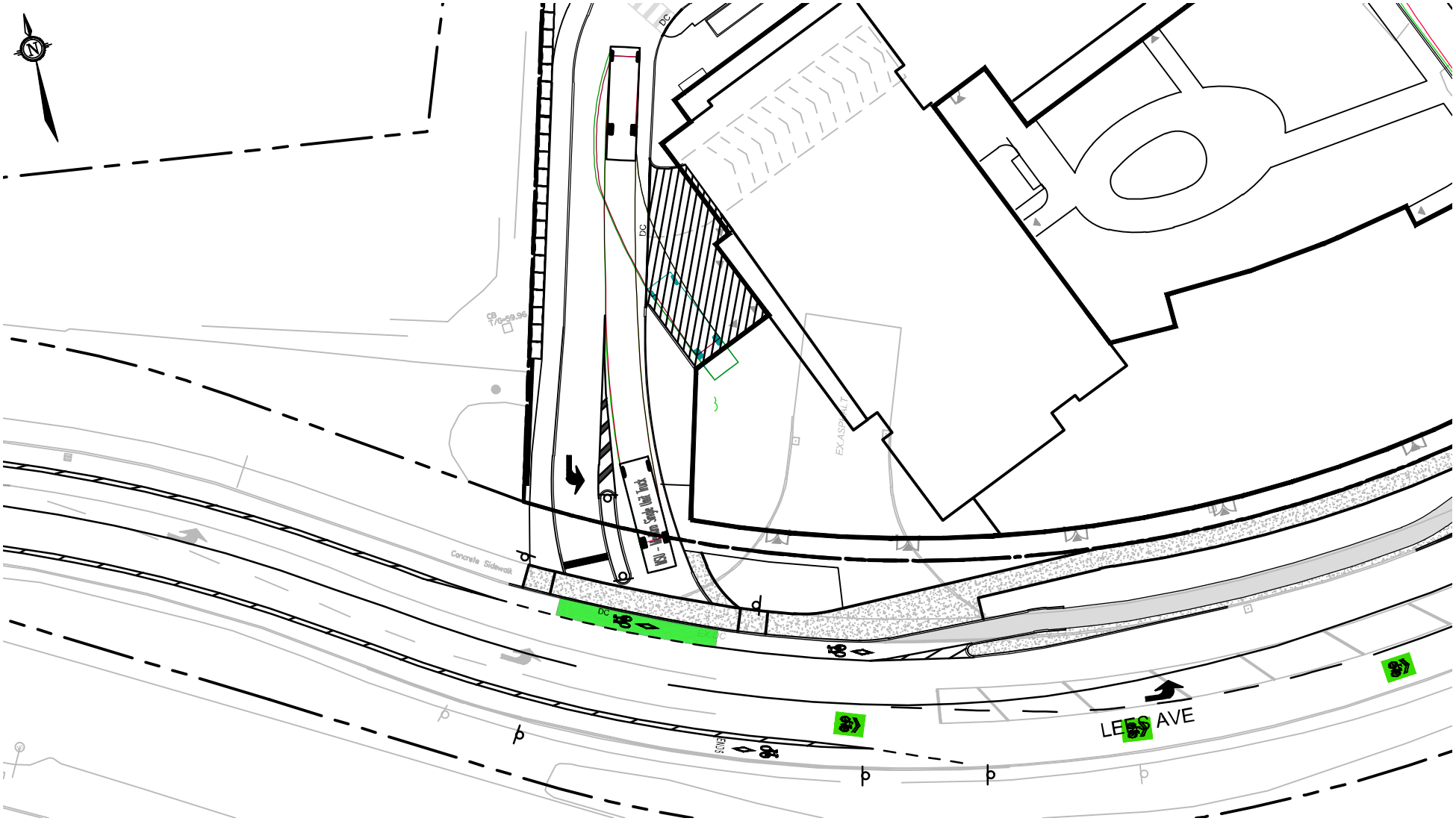

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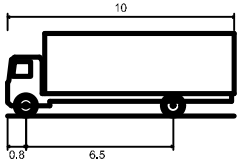

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

LOADING MOVEMENTS TOWER 'A' - IN (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-3

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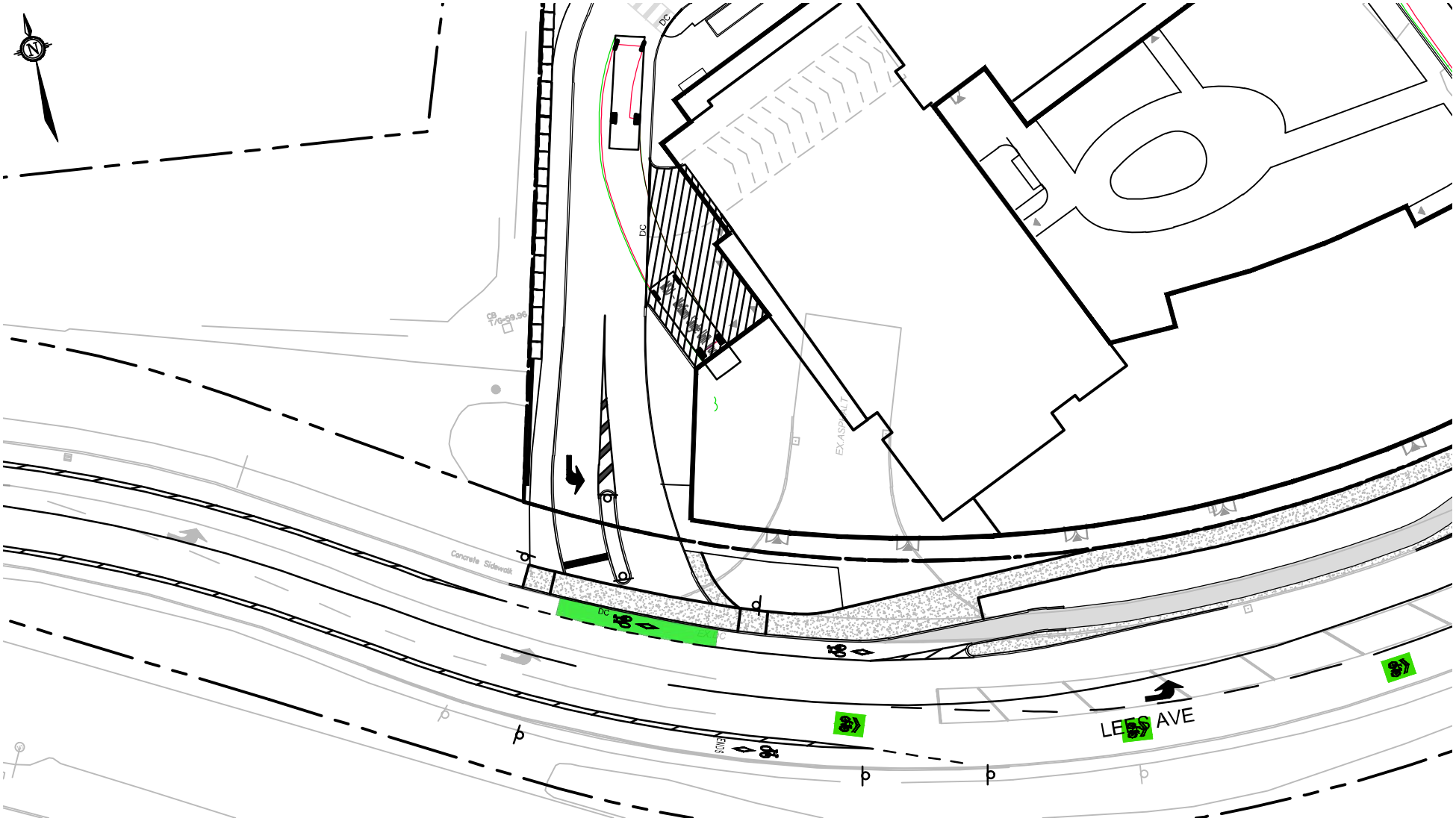

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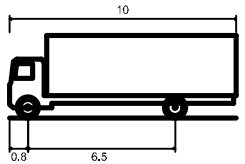

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

LOADING MOVEMENTS TOWER 'A' - OUT (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-4

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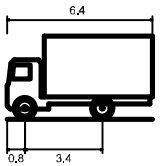

LSU - Light Single Unit Truck

Overall Length	6.400m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

2 ROBINSON AVENUE

LOADING MOVEMENTS TOWER 'D' - IN (LSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE	JOB	FIGURE
DEC 2023	119171	TM-5

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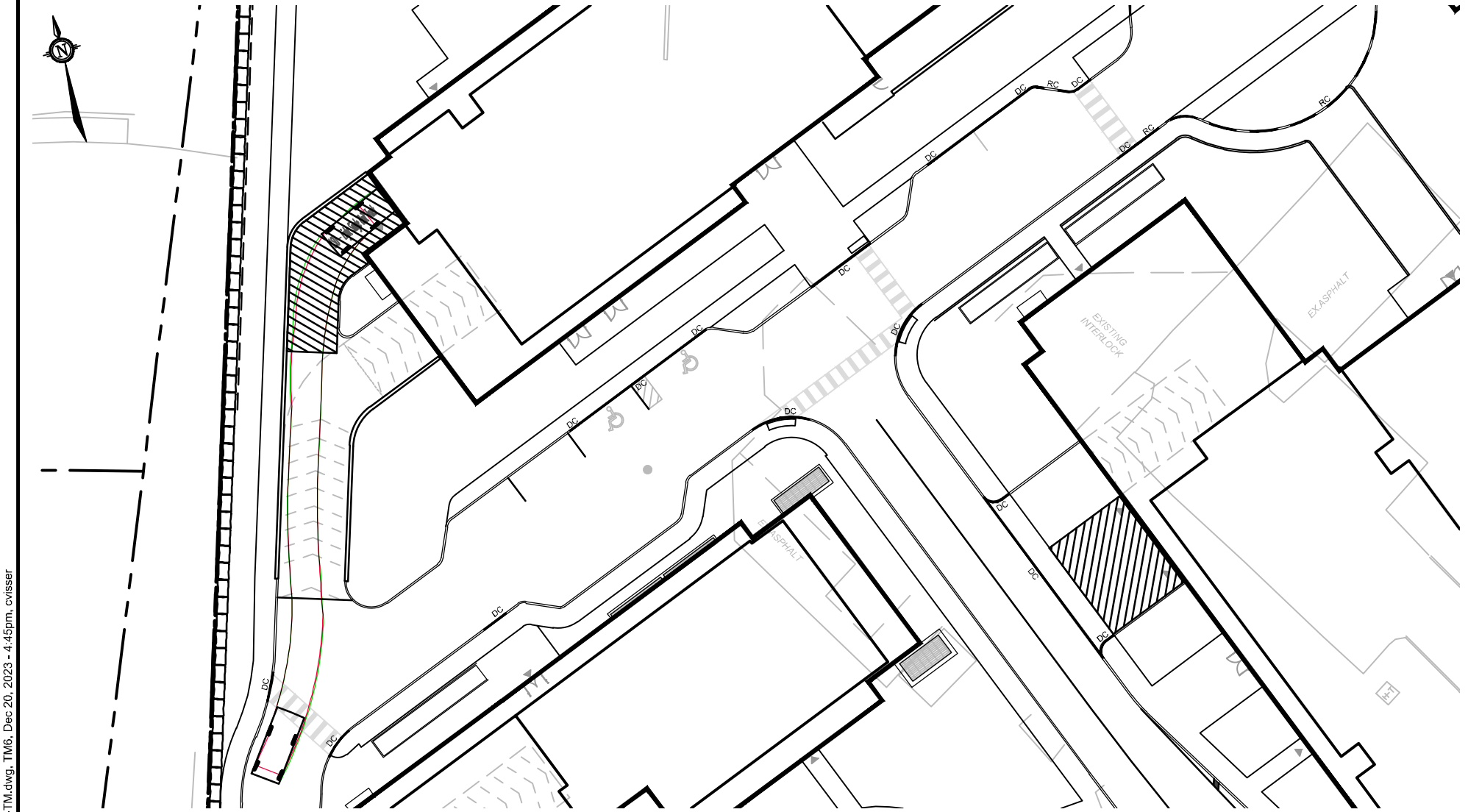

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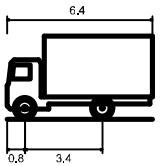

LSU - Light Single Unit Truck

Overall Length	6.400m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

2 ROBINSON AVENUE

LOADING MOVEMENTS TOWER 'D' - OUT (LSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-6

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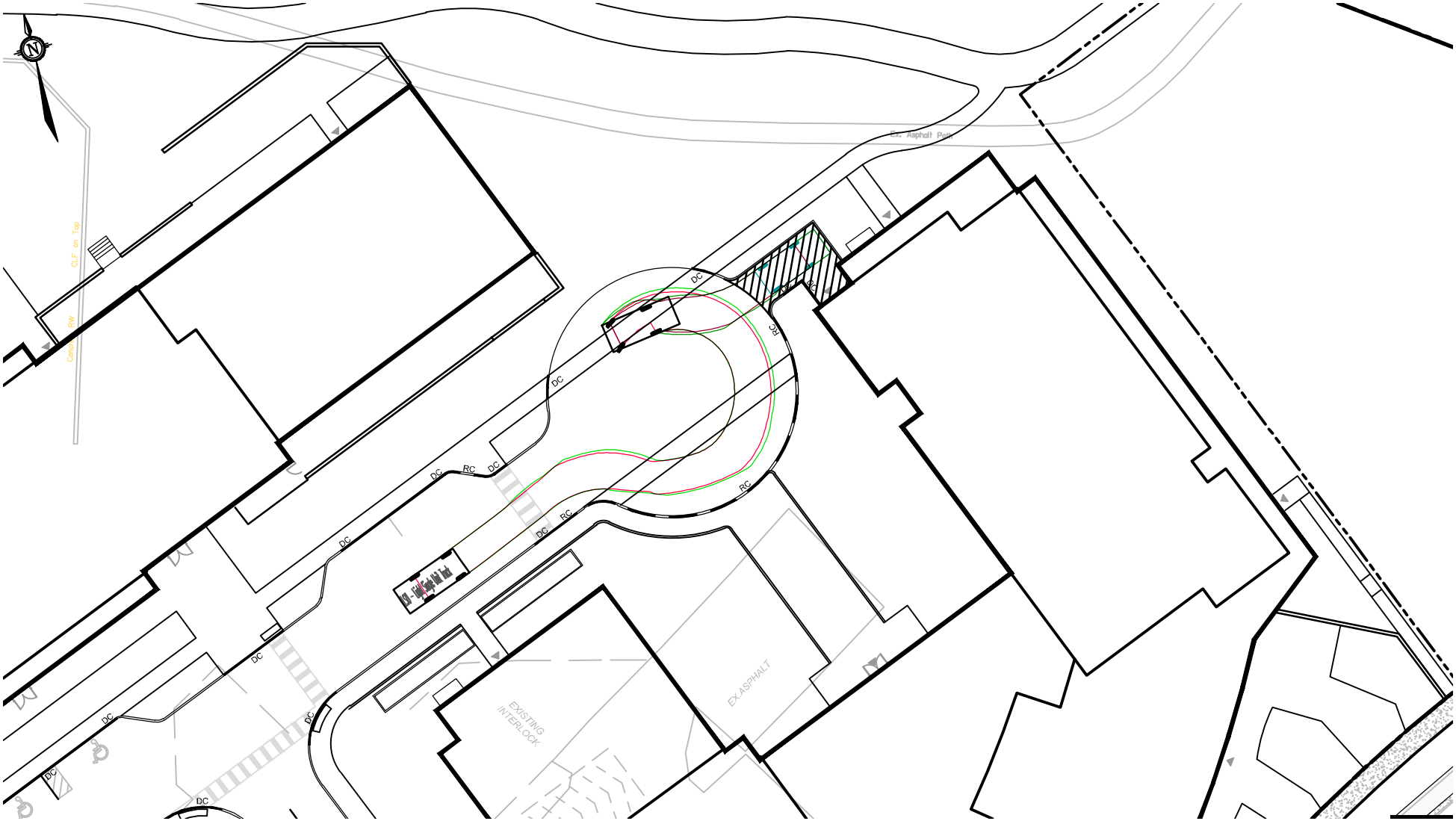

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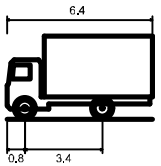

LSU - Light Single Unit Truck

Overall Length	6.400m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

2 ROBINSON AVENUE

LOADING MOVEMENTS TOWER 'C' - IN (LSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-7

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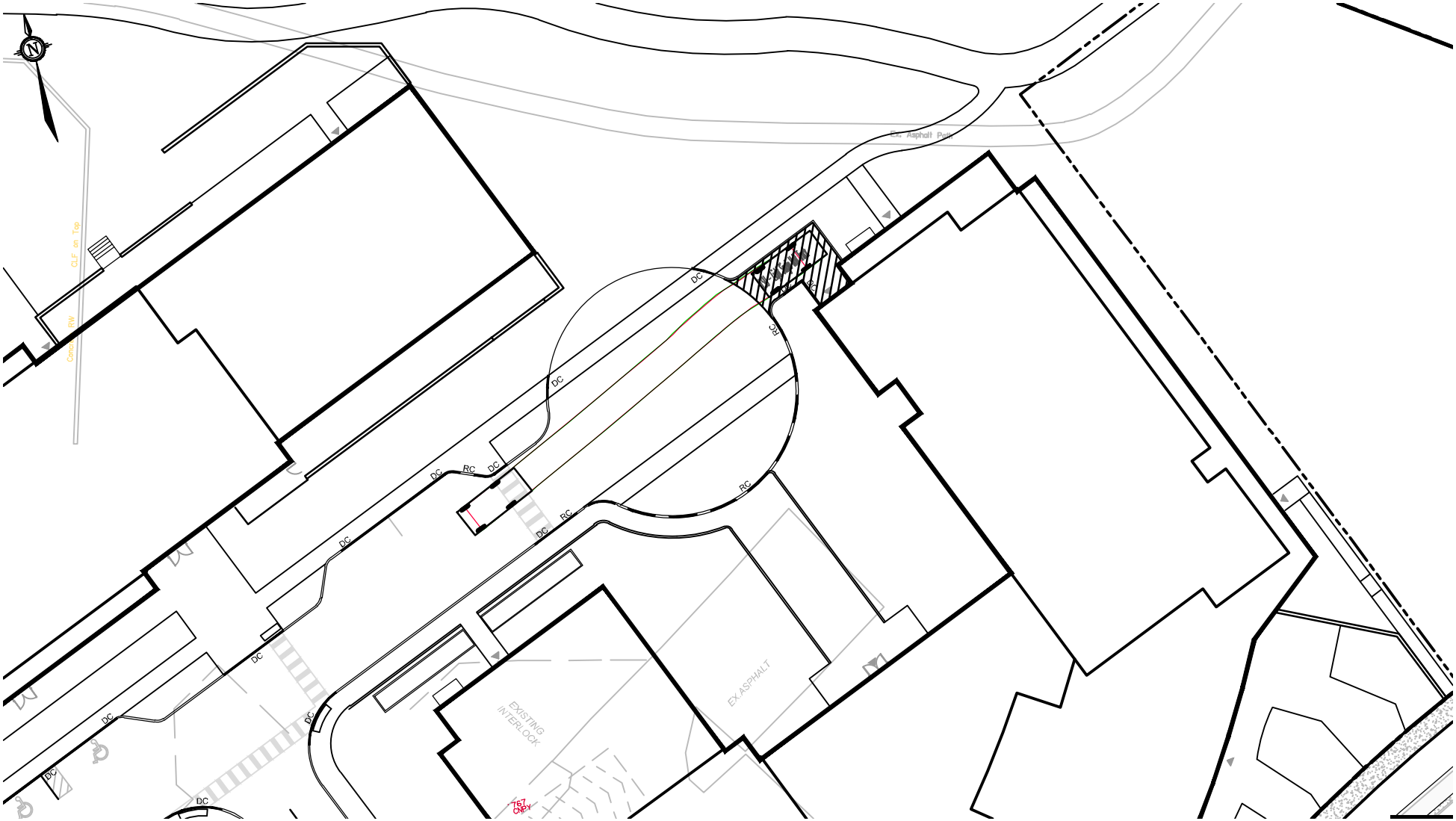

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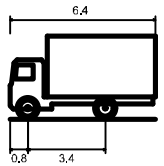

LSU - Light Single Unit Truck

Overall Length	6.400m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

2 ROBINSON AVENUE

LOADING MOVEMENTS TOWER 'C' - OUT (LSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-8

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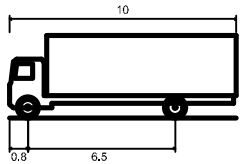

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

LOADING MOVEMENTS TOWER 'B' - IN (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-9

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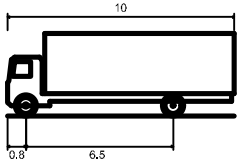

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

LOADING MOVEMENTS TOWER 'B' - OUT (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-10

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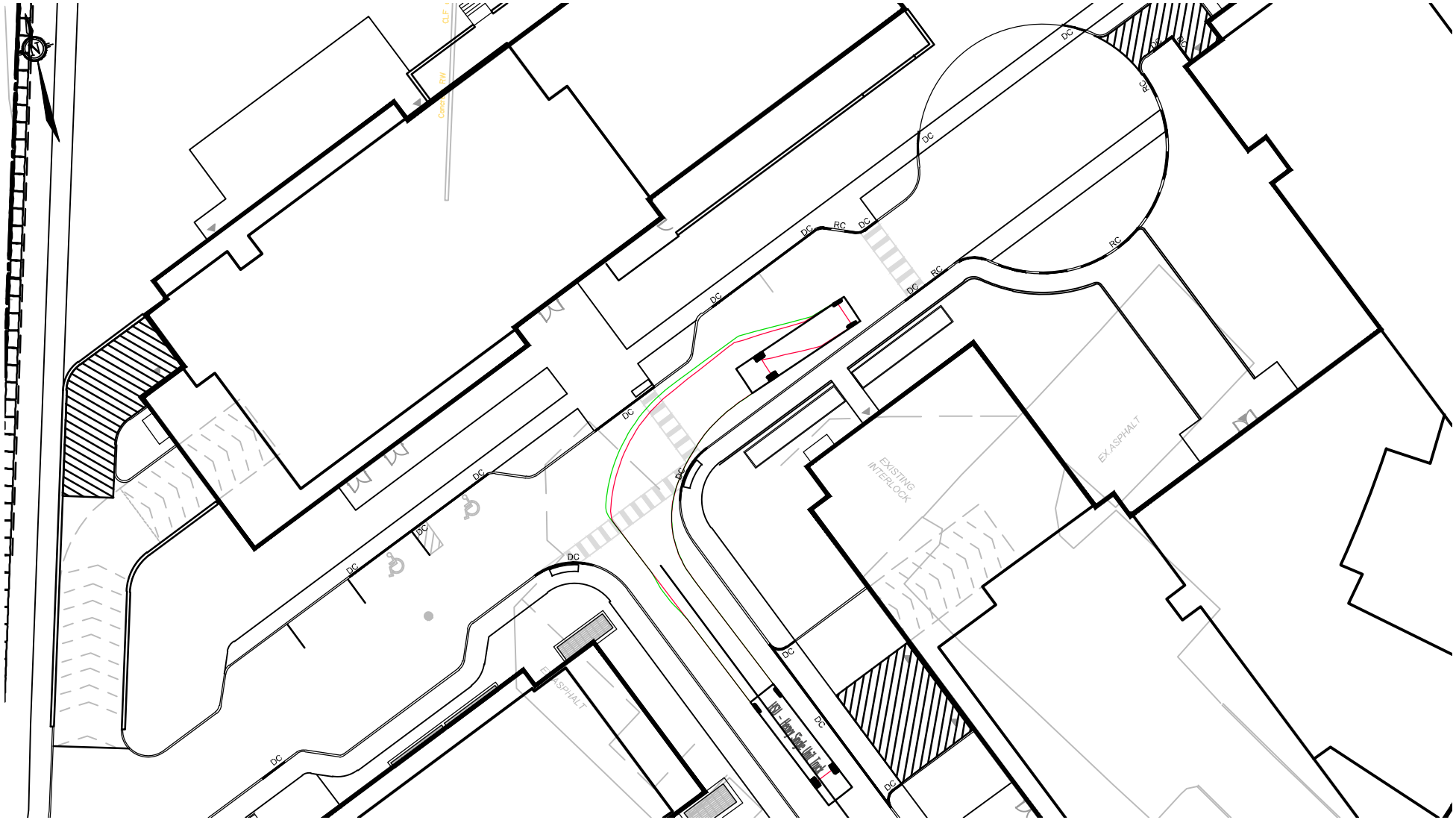

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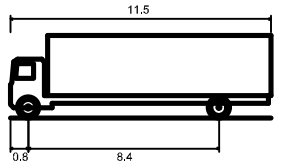

HSU - Heavy Single Unit Truck

Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

2 ROBINSON AVENUE

TURNING MOVEMENT 3-POINT TURN - "IN" (HSU)

SCALE 1 : 500 (0, 5, 10, 15, 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-11

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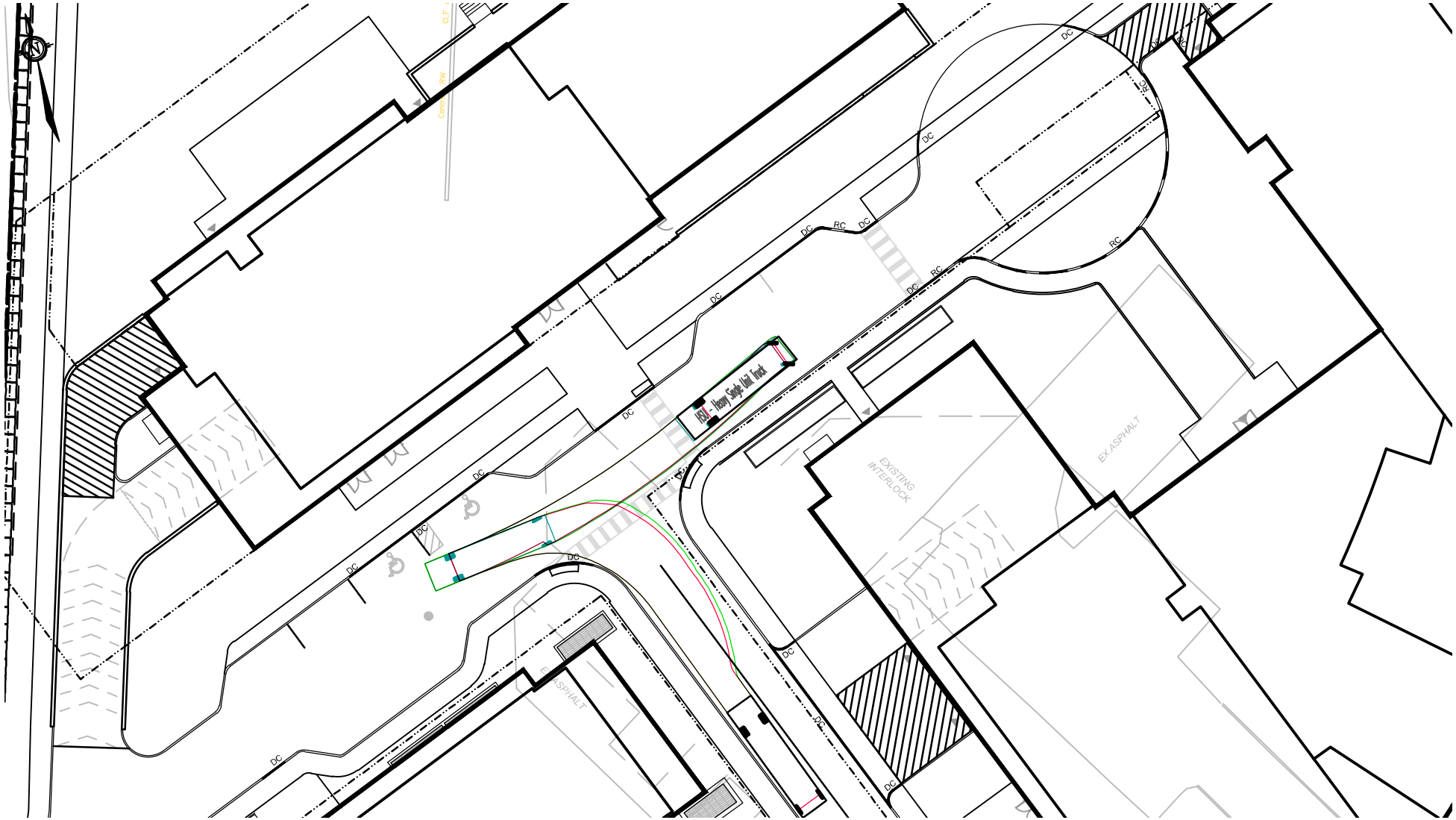

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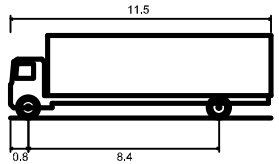

HSU - Heavy Single Unit Truck

Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

2 ROBINSON AVENUE

TURNING MOVEMENT 3-POINT TURN-"OUT"(HSU)

SCALE 1 : 500 (0, 5, 10, 15, 20)

DATE	JOB	FIGURE
DEC 2023	119171	TM-12

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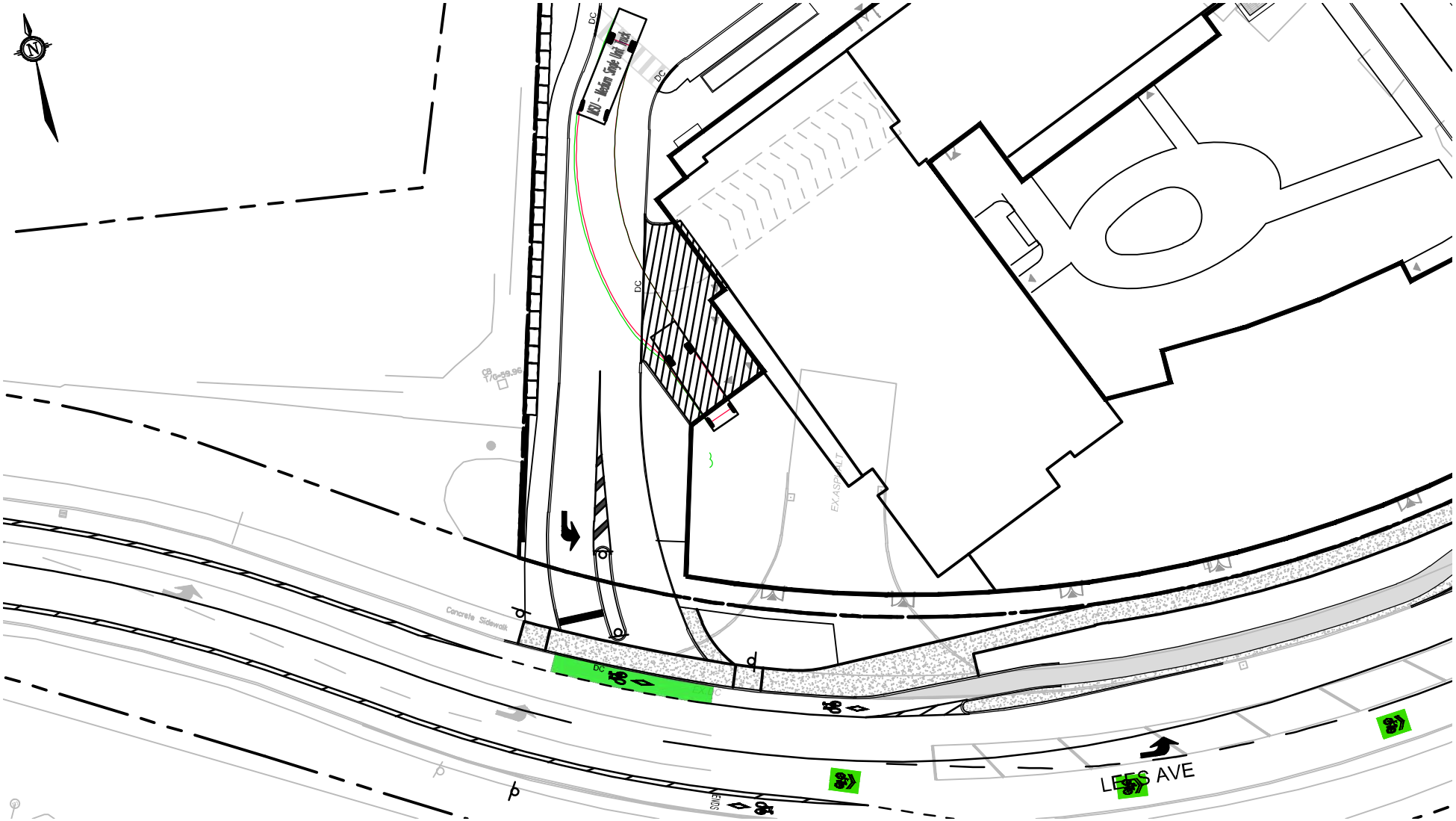

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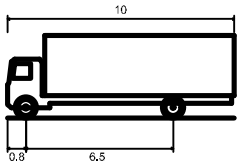

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

GARBAGE MOVEMENTS TOWER 'A' - IN (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-13

SHT8X11.DWG - 216mmx279mm

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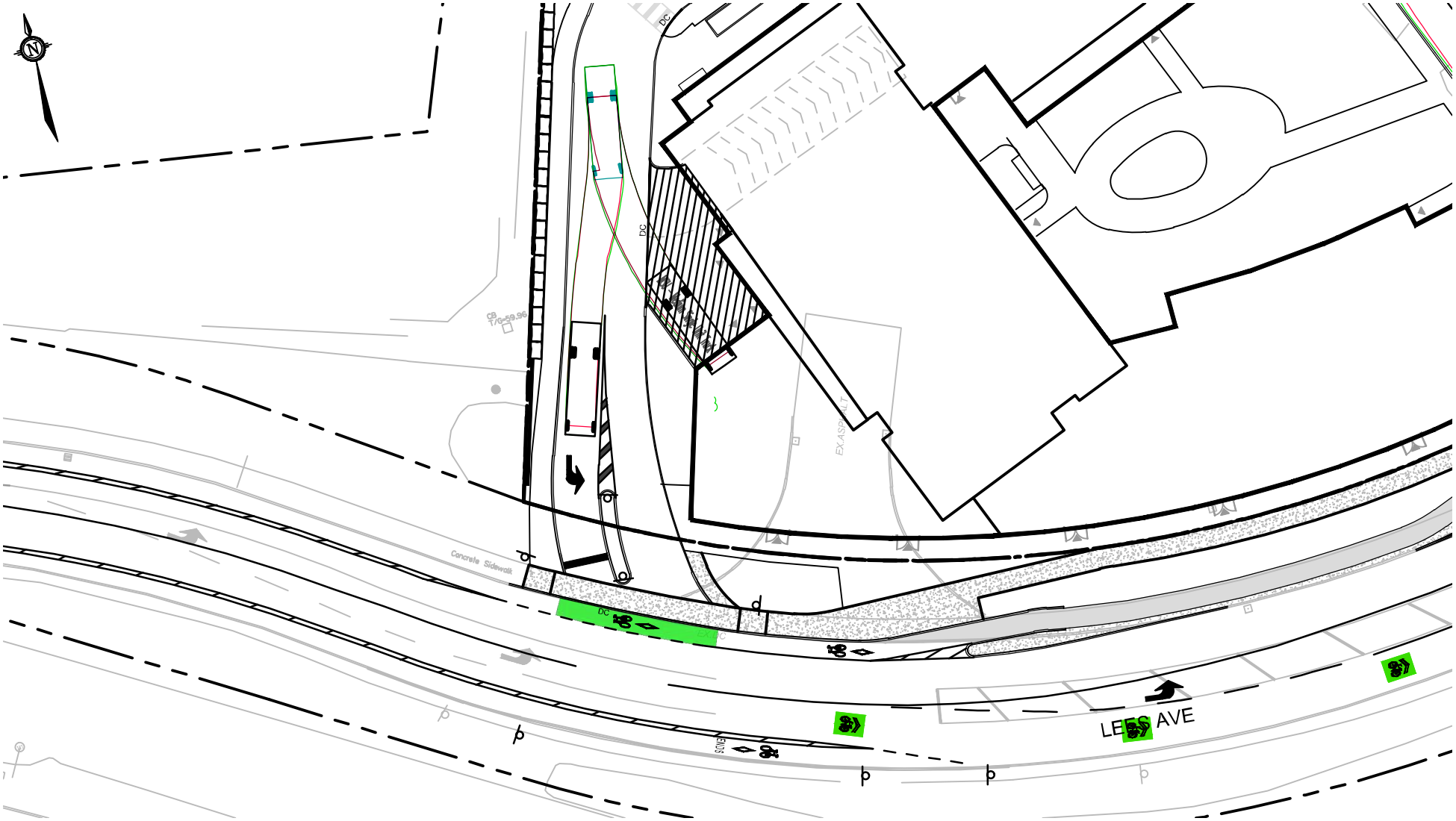

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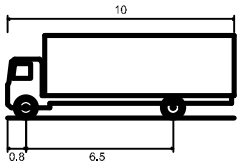

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

GARBAGE MOVEMENTS TOWER 'A' - OUT (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-14

SHT8X11.DWG - 216mmx279mm

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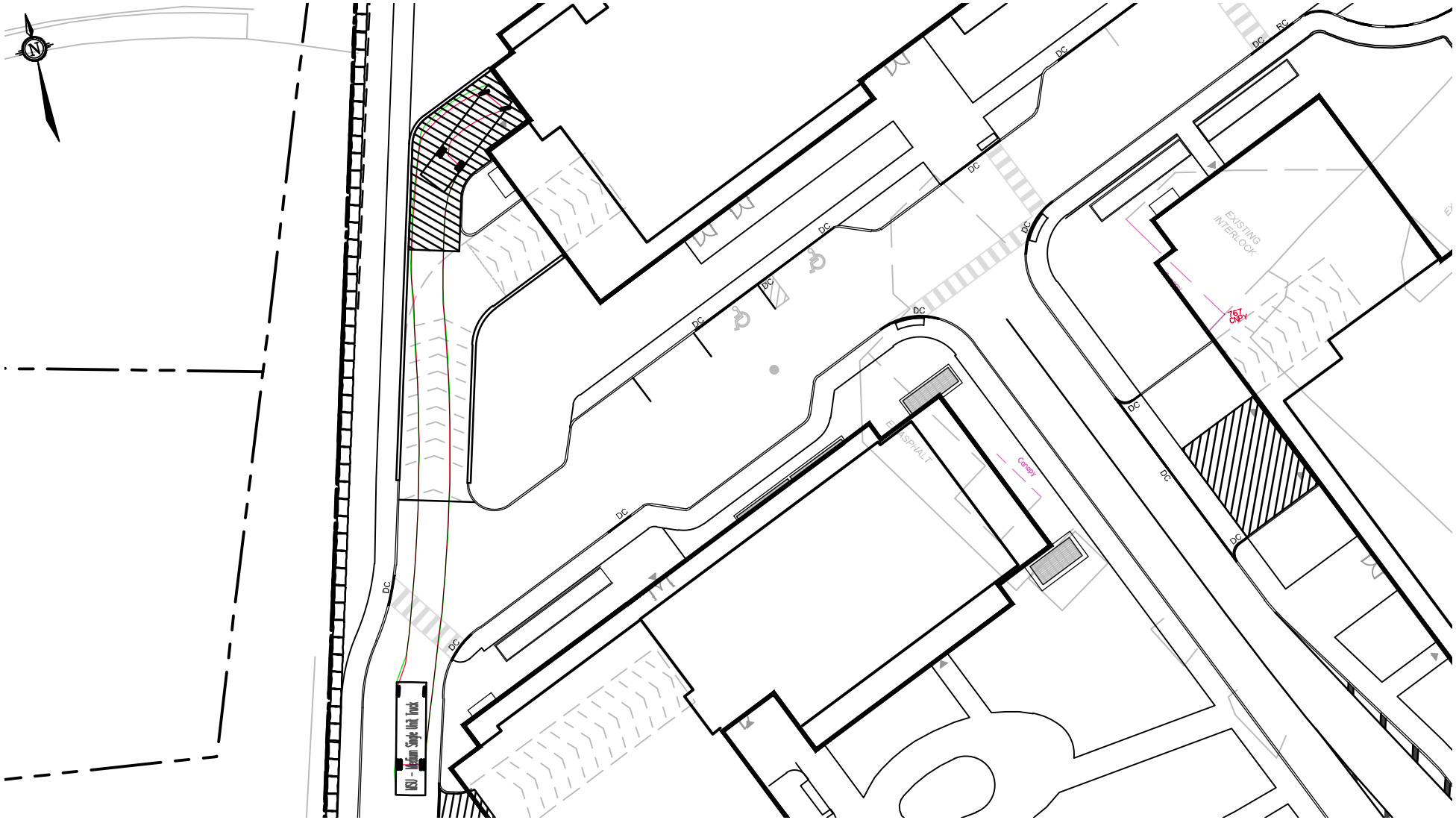

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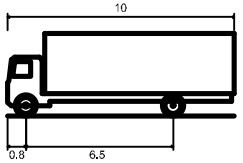

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

GARGAGE MOVEMENTS TOWER 'D' - IN (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-15

SHT8X11.DWG - 216mmx279mm

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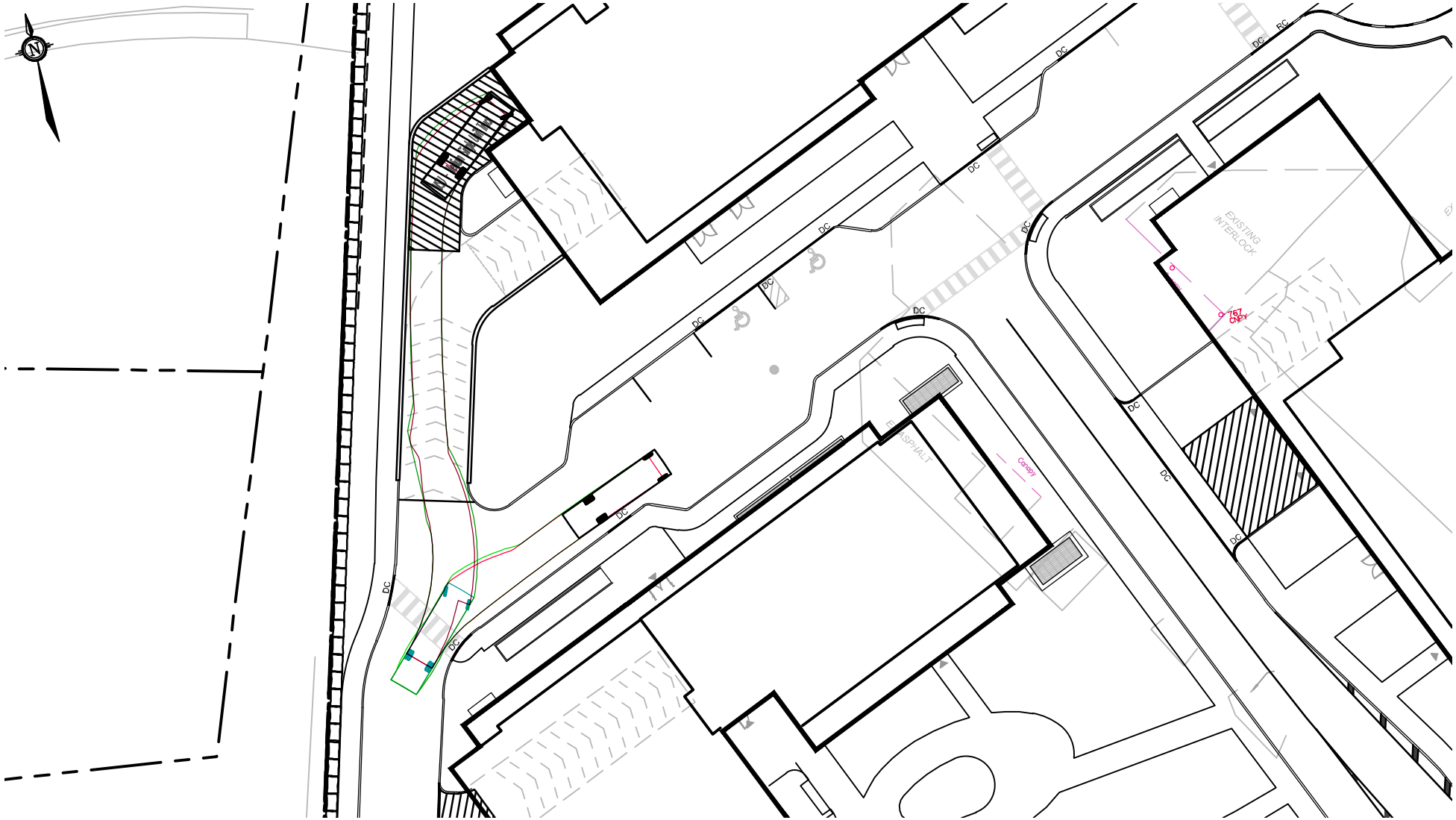

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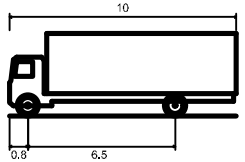

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

GARBAGE MOVEMENTS TOWER 'D' - OUT (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-16

SHT8X11.DWG - 216mmx279mm

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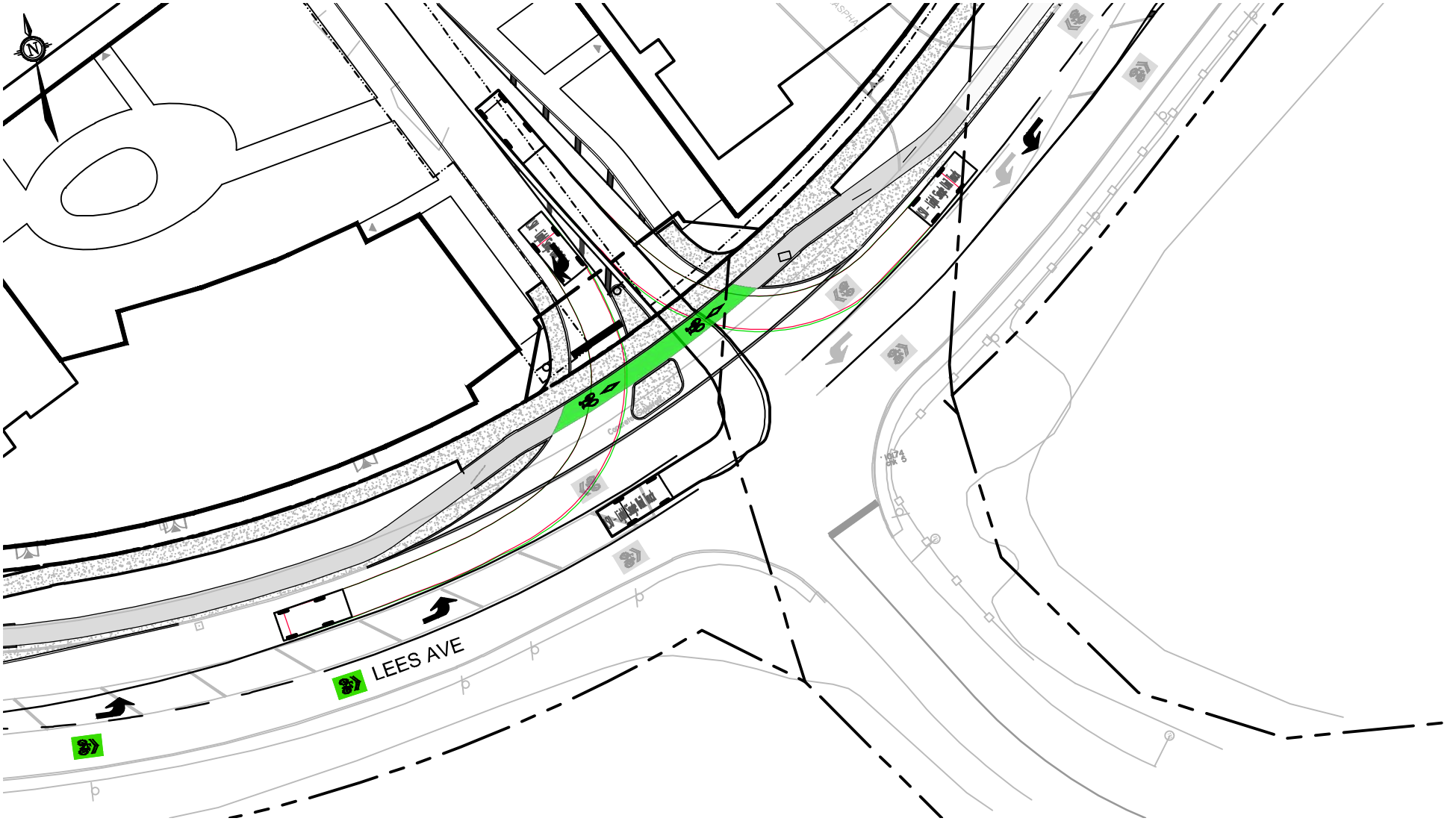

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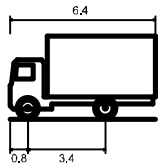

LSU - Light Single Unit Truck

Overall Length	6.400m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (LSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-17

SHT8X11.DWG - 216mmx279mm

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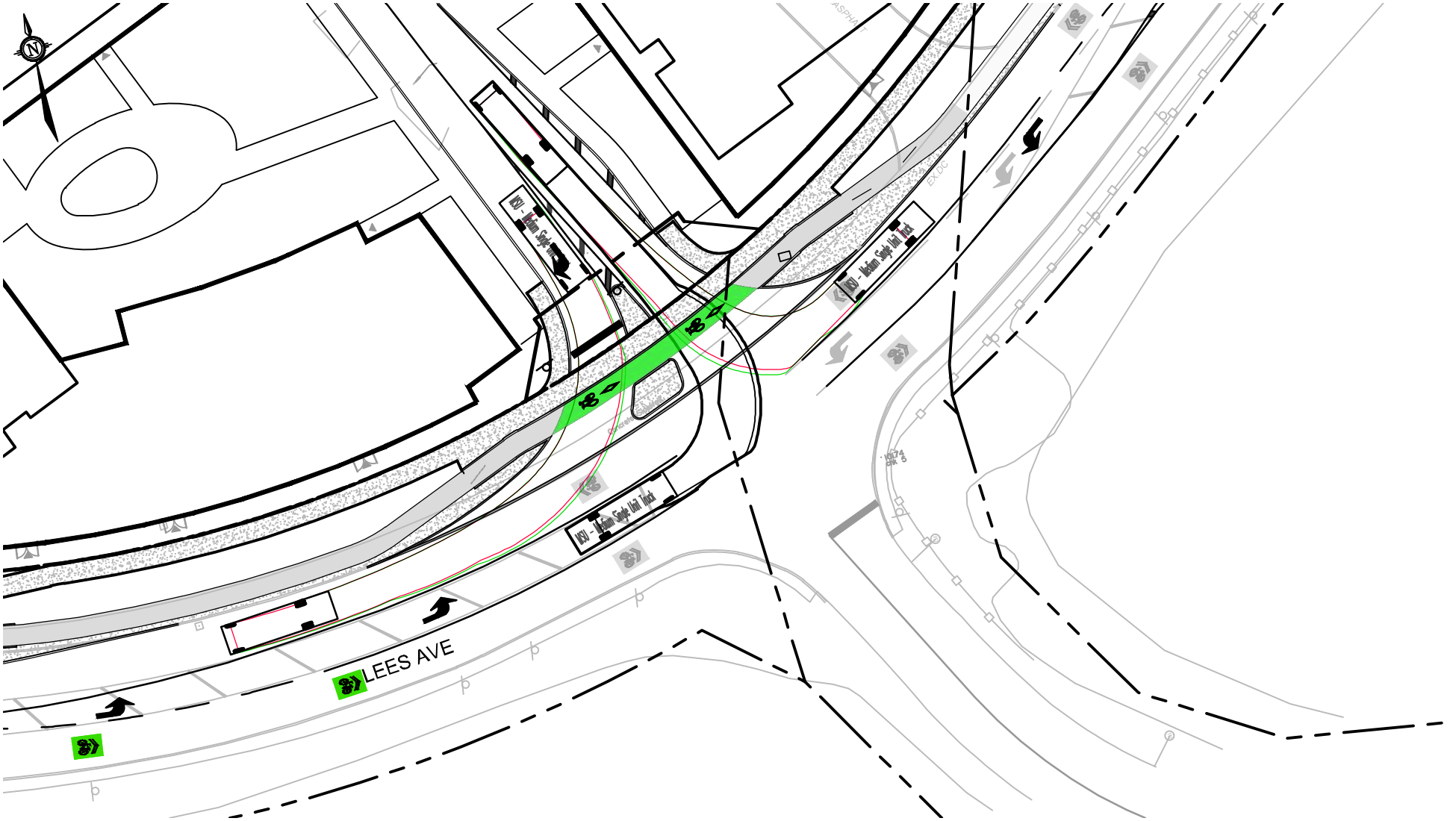

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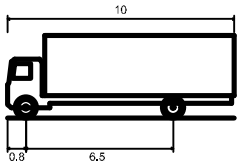

MSU - Medium Single Unit Truck

Overall Length	10.000m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.100m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (MSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-18

SHT8X11.DWG - 216mmx279mm

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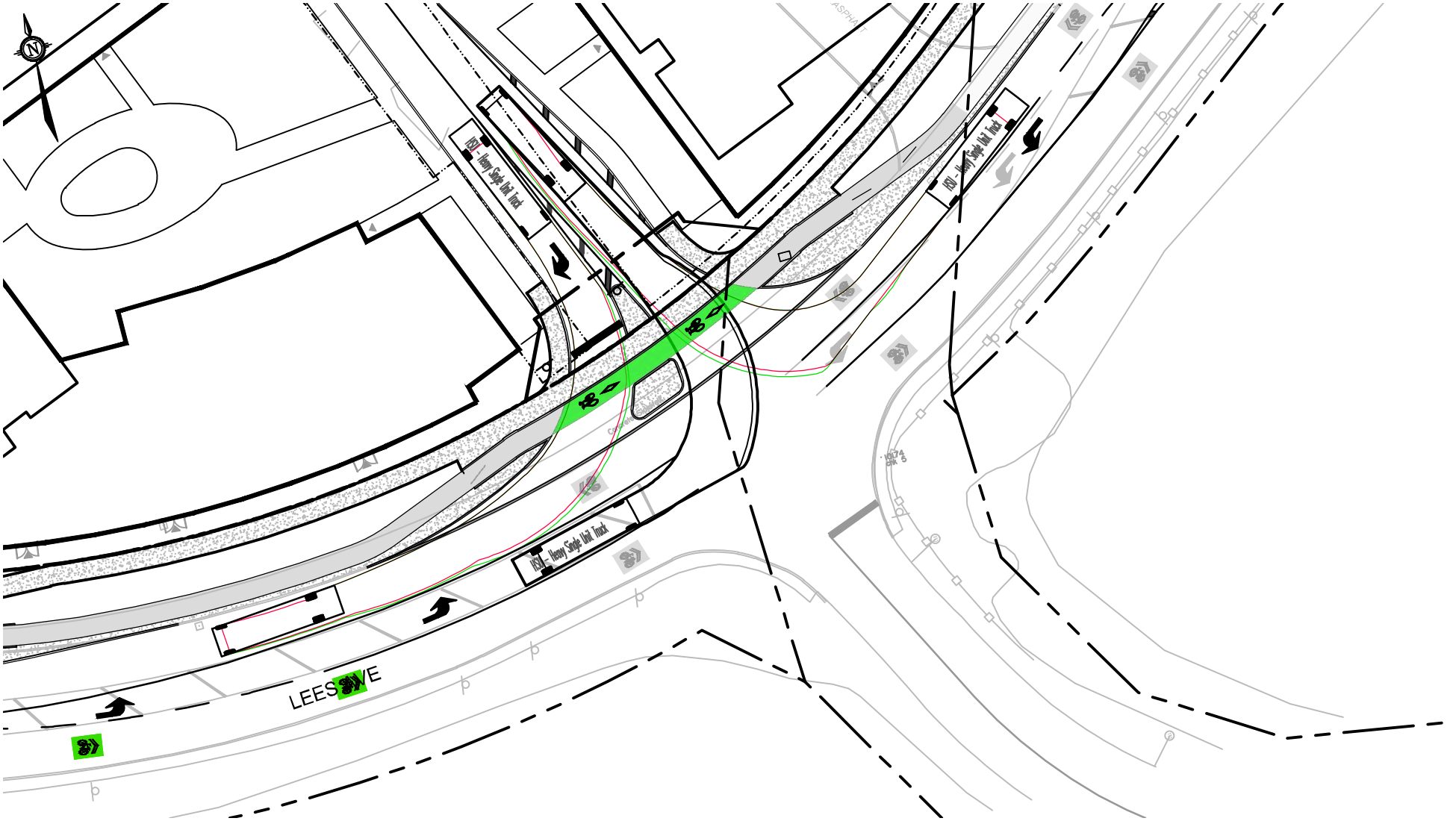

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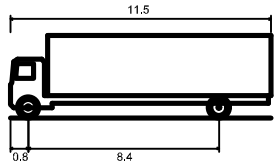

HSU - Heavy Single Unit Truck

Overall Length	11.500m
Overall Width	2.600m
Overall Body Height	3.650m
Min Body Ground Clearance	0.445m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.100m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (HSU)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-19

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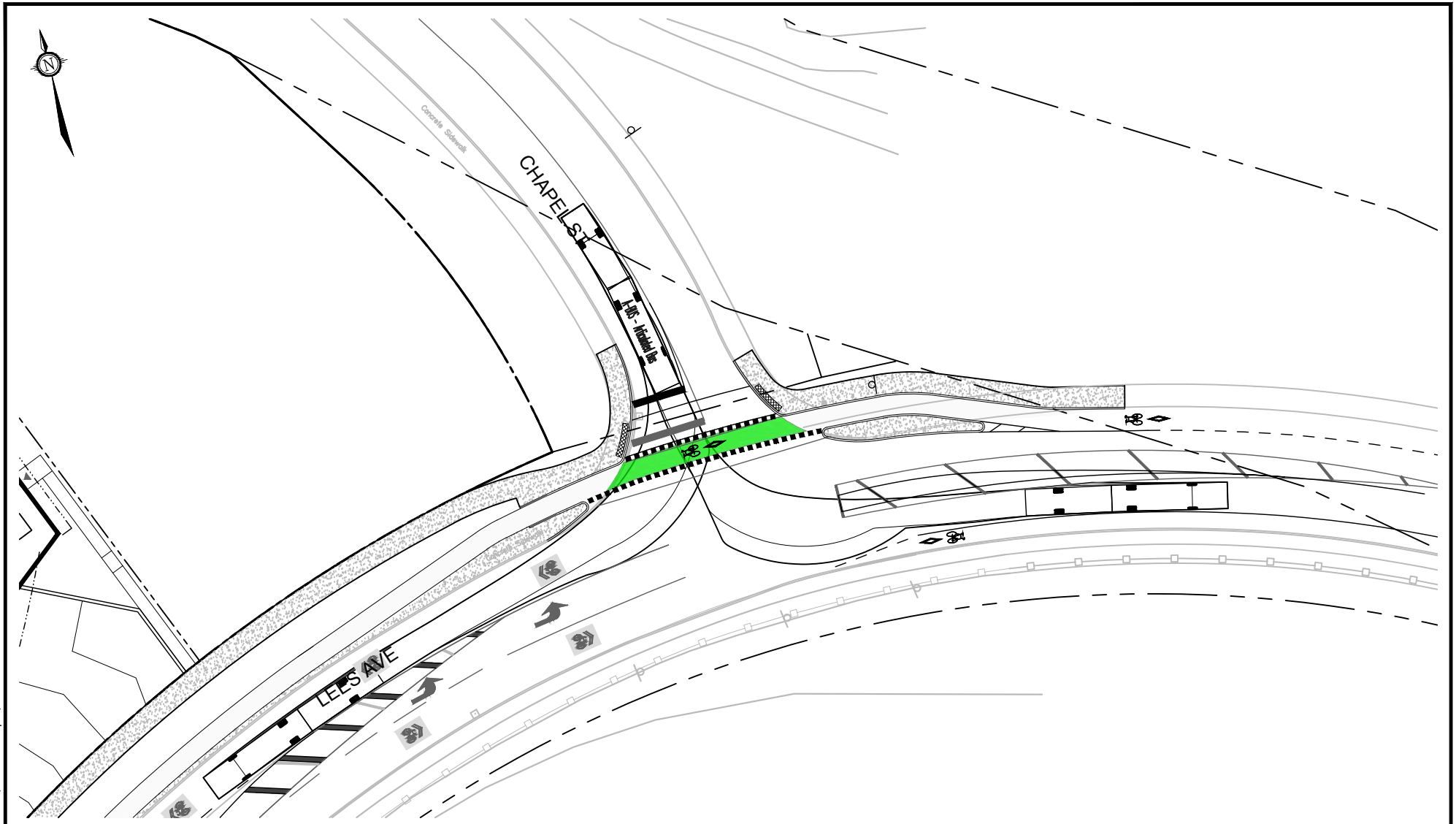

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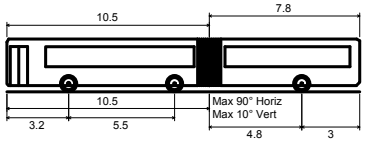

A-BUS - Articulated Bus

Overall Length	18.300m
Overall Width	2.400m
Overall Body Height	2.733m
Min Body Ground Clearance	0.320m
Track Width	2.400m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	13.100m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (A-BUS)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-20

SHT8X11.DWG - 216mmx279mm

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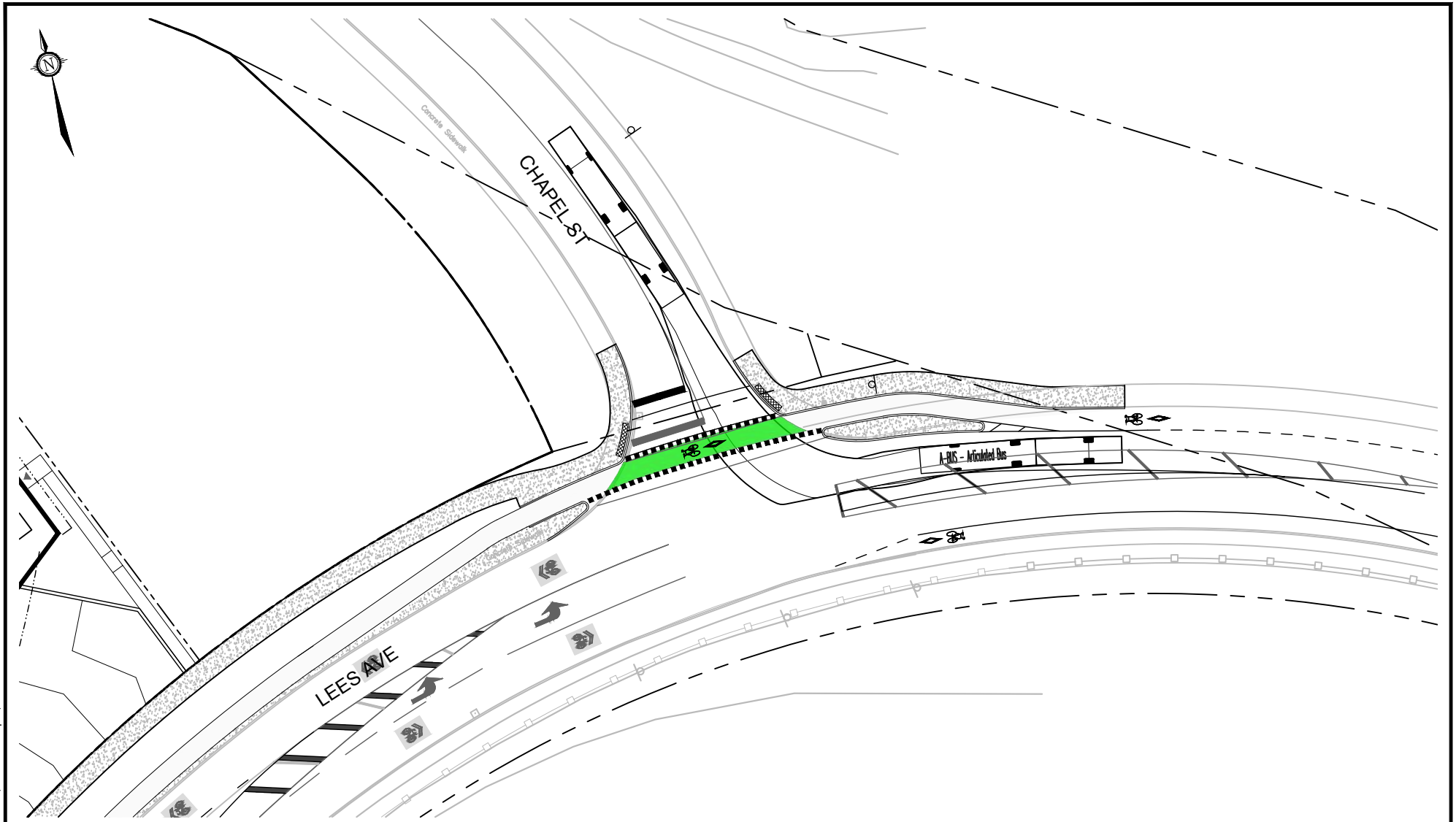

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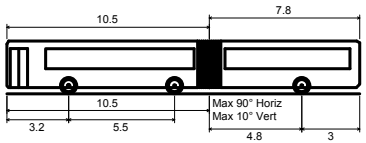

A-BUS - Articulated Bus

Overall Length	18.300m
Overall Width	2.400m
Overall Body Height	2.733m
Min Body Ground Clearance	0.320m
Track Width	2.400m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	13.100m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (A-BUS)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-21

SHT8X11.DWG - 216mmx279mm

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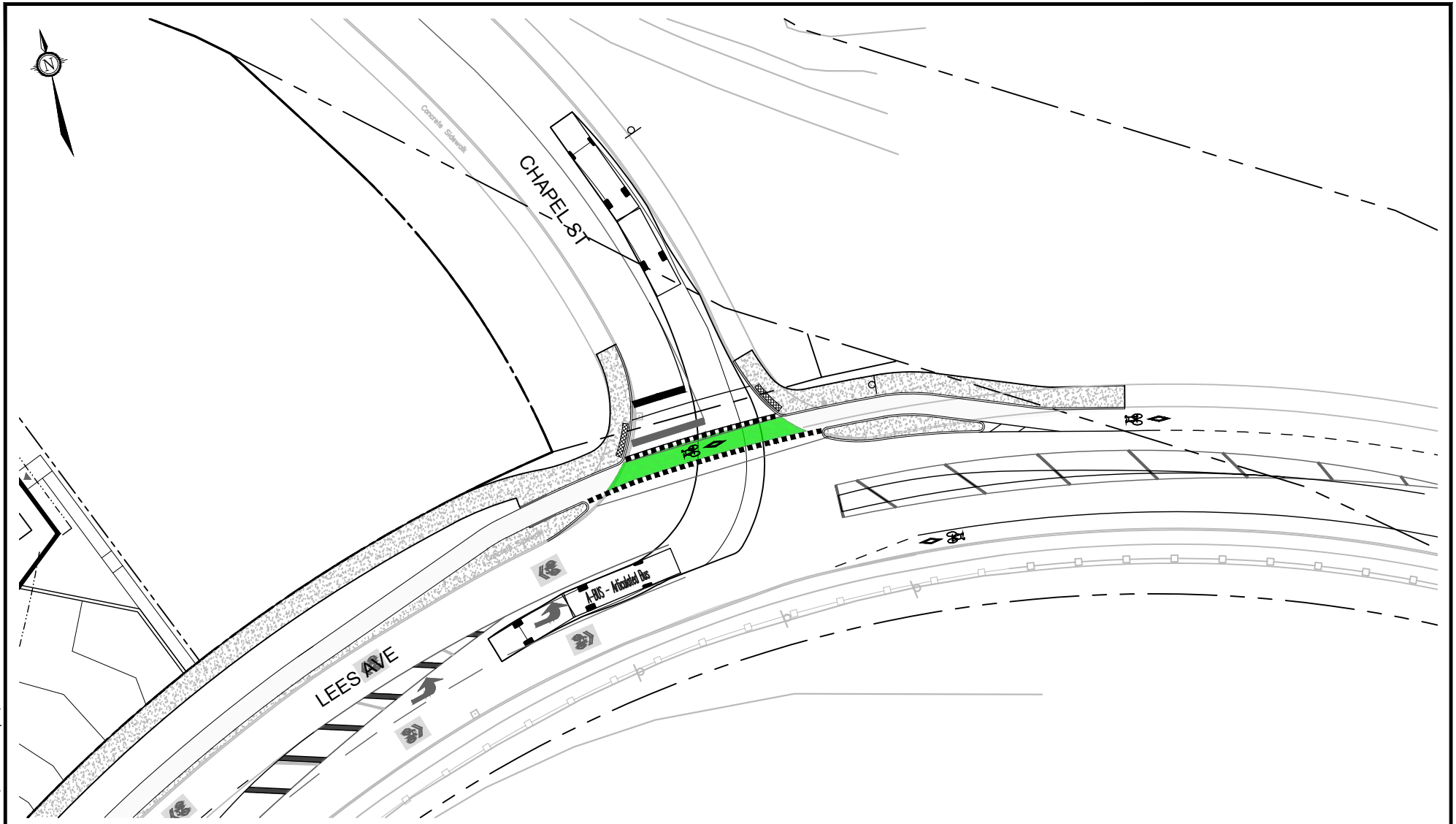

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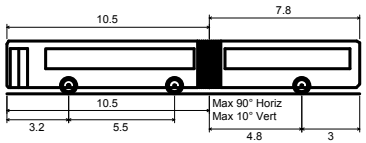

A-BUS - Articulated Bus

Overall Length	18.300m
Overall Width	2.400m
Overall Body Height	2.733m
Min Body Ground Clearance	0.320m
Track Width	2.400m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	13.100m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (A-BUS)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-22

SHT8X11.DWG - 216mmx279mm

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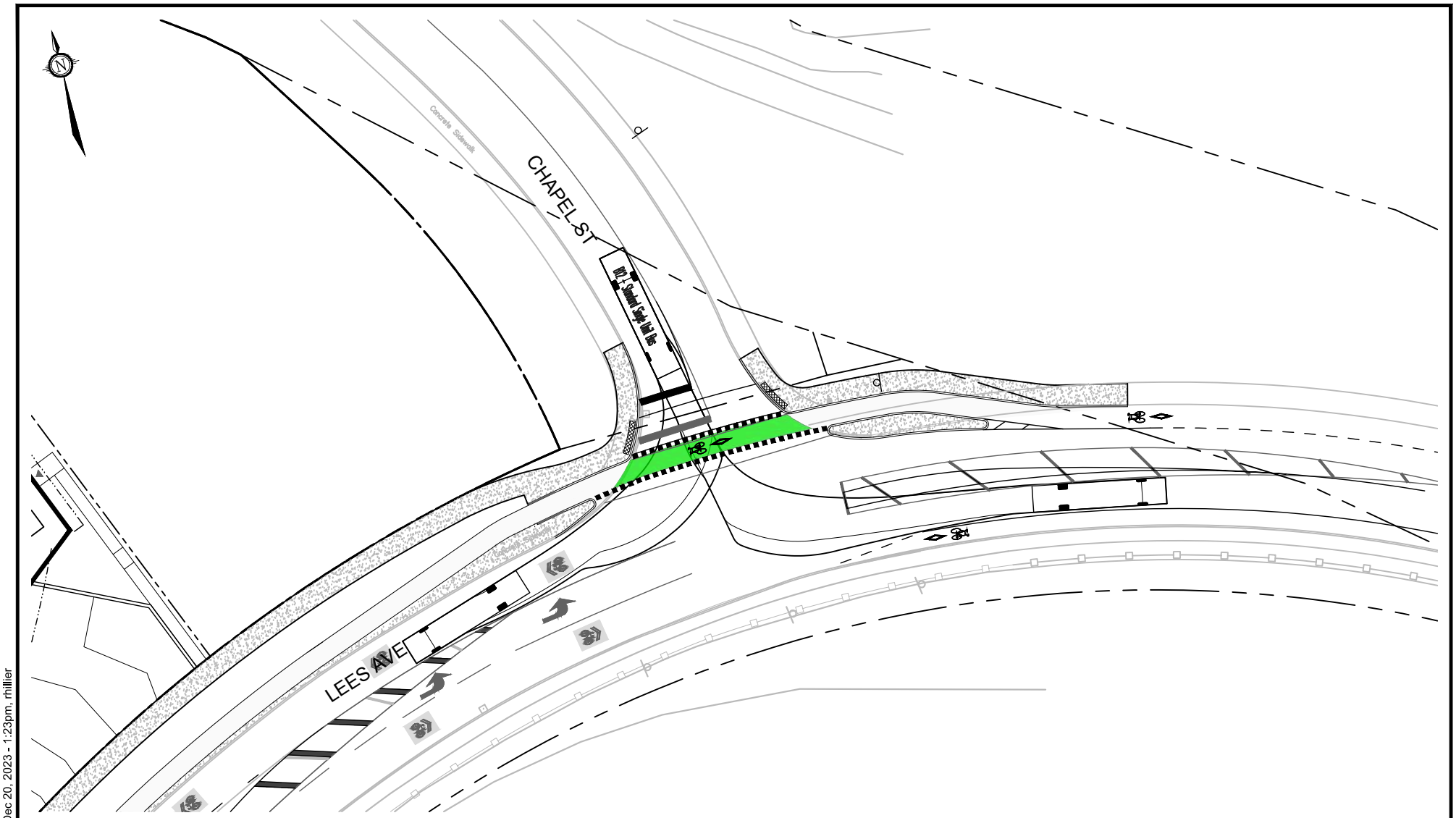

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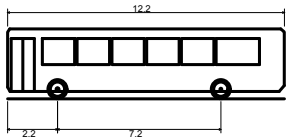

B12 - Standard Single Unit Bus

Overall Length	12.200m
Overall Width	2.400m
Overall Body Height	3.084m
Min Body Ground Clearance	0.319m
Track Width	2.400m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.900m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (B12)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-23

SHT8X11.DWG - 216mmx279mm

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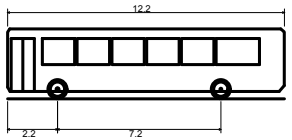

B12 - Standard Single Unit Bus

Overall Length	12.200m
Overall Width	2.400m
Overall Body Height	3.084m
Min Body Ground Clearance	0.319m
Track Width	2.400m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.900m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (B12)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-24

SHT8X11.DWG - 216mmx279mm

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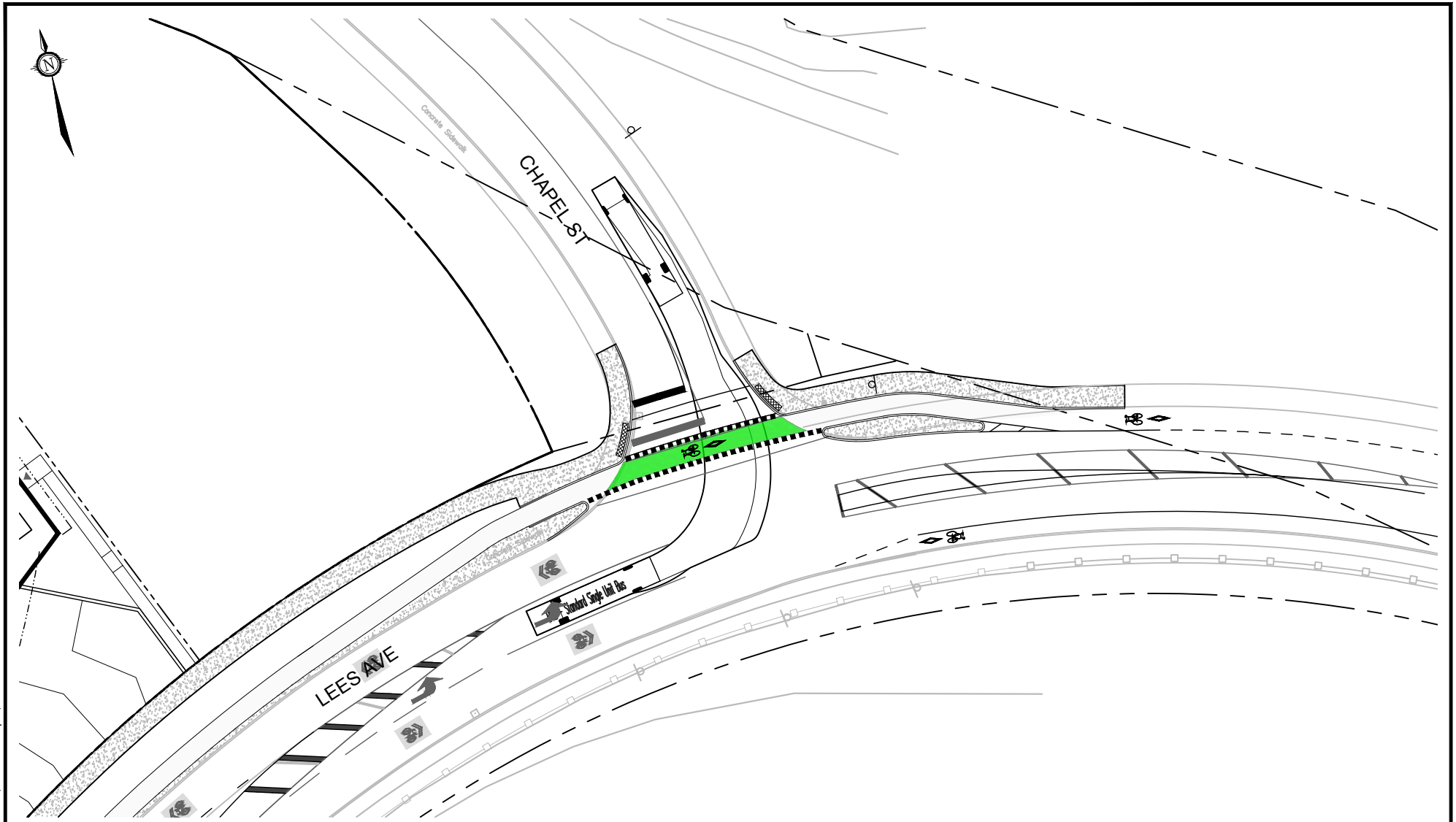

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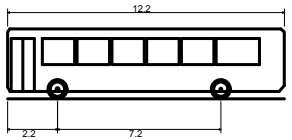

B12 - Standard Single Unit Bus

Overall Length	12.200m
Overall Width	2.400m
Overall Body Height	3.084m
Min Body Ground Clearance	0.319m
Track Width	2.400m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.900m

2 ROBINSON AVENUE

TURNING MOVEMENT LEES AVE. (B12)

SCALE 1 : 500 (0 5 10 15 20)

DATE DEC 2023 | JOB 119171 | FIGURE TM-25

SHT8X11.DWG - 216mmx279mm

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APPENDIX J

Functional Design

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
13	ISSUED FOR REVIEW	JAN 16/24	JLL
12	ISSUED FOR REVIEW	DEC 22/23	JLL
11	ISSUED FOR REVIEW	NOV 01/23	JLL
10	ISSUED FOR REVIEW	OCT 04/23	JLL
9	ISSUED FOR CITY REVIEW	JUL 27/23	BJB
8	ISSUED FOR CITY REVIEW	JUL 14/23	JLL
7	ISSUED FOR CITY REVIEW	JUL 10/23	JLL
6	ISSUED FOR SITEPLAN RESUBMISSION	OCT 6/22	RAF
5.	ISSUED FOR SITEPLAN RESUBMISSION	MAR 08/22	JLL
4.	ISSUED FOR SITEPLAN RESUBMISSION	FEB 25/22	RAF
3.	ISSUED FOR SITEPLAN SUBMISSION	NOV 12/21	DWM
2.	ISSUED FOR ZONING RESUBMISSION	JUN 25/21	RAF
1.	ISSUED FOR CITY REVIEW	DEC 21/20	BJB

SCALE 1:500

DESIGN RCH · CHECKED JRA · DRAWN RCH · CHECKED JRA · APPROVED JLL

FOR REVIEW ONLY

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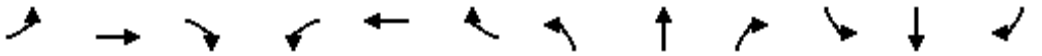
LOCATION
CITY of OTTAWA
2 ROBINSON AVENUE

DRAWING NAME
FUNCTIONAL DESIGN

PROJECT No. 119171-0
REV REV # 10
DRAWING No. 119171-FD

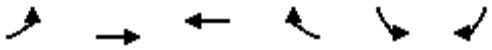
APPENDIX K

Updated Synchro Analysis



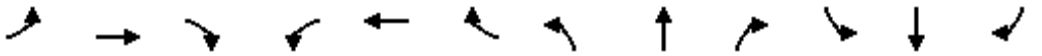
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	530	17	29	401	0	48	0	45	0	0	12
Future Volume (vph)	5	530	17	29	401	0	48	0	45	0	0	12
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0		0.0	20.0		0.0	0.0		0.0	0.0		30.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	50.0			30.0			7.6			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.995						0.935				0.865
Flt Protected	0.950			0.950				0.975				
Satd. Flow (prot)	1695	1775	0	1695	1784	0	0	1627	0	0	0	1543
Flt Permitted	0.950			0.950				0.975				
Satd. Flow (perm)	1695	1775	0	1695	1784	0	0	1627	0	0	0	1543
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		95.7			138.9			151.7			73.4	
Travel Time (s)		6.9			10.0			10.9			5.3	
Confl. Peds. (#/hr)	90		10	10		90						
Confl. Bikes (#/hr)						5						17
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	530	17	29	401	0	48	0	45	0	0	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	547	0	29	401	0	0	93	0	0	0	12
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			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.9%	ICU Level of Service	A
Analysis Period (min)	15		



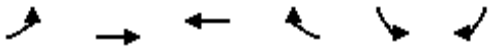
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	507	501	5	6	0
Future Volume (vph)	0	507	501	5	6	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	50.0				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.999			
Flt Protected					0.950	
Satd. Flow (prot)	0	1784	1783	0	1695	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1784	1783	0	1695	0
Link Speed (k/h)		50	50		48	
Link Distance (m)		129.3	95.7		60.1	
Travel Time (s)		9.3	6.9		4.5	
Confl. Peds. (#/hr)	50			50		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	507	501	5	6	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	507	506	0	6	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.2%		ICU Level of Service A	
Analysis Period (min) 15			



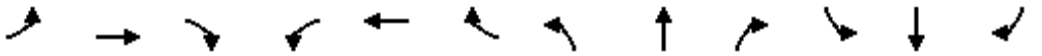
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	882	38	21	345	1	28	0	14	0	0	11
Future Volume (vph)	9	882	38	21	345	1	28	0	14	0	0	11
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0		0.0	20.0		0.0	0.0		0.0	0.0		30.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	50.0			30.0			7.6			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994						0.955				0.865
Flt Protected	0.950			0.950				0.968				
Satd. Flow (prot)	1695	1774	0	1695	1784	0	0	1649	0	0	0	1543
Flt Permitted	0.950			0.950				0.968				
Satd. Flow (perm)	1695	1774	0	1695	1784	0	0	1649	0	0	0	1543
Link Speed (k/h)		50			50			50			48	
Link Distance (m)		95.7			138.9			151.7			71.4	
Travel Time (s)		6.9			10.0			10.9			5.4	
Confl. Peds. (#/hr)	105		10	10		105						
Confl. Bikes (#/hr)						15						9
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
Adj. Flow (vph)	9	882	38	21	345	1	28	0	14	0	0	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	9	920	0	21	346	0	0	42	0	0	0	11
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			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		



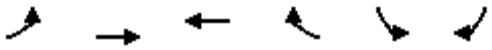
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	850	413	8	4	0
Future Volume (vph)	0	850	413	8	4	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	50.0				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.997			
Flt Protected					0.950	
Satd. Flow (prot)	0	1784	1779	0	1695	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1784	1779	0	1695	0
Link Speed (k/h)		50	50		48	
Link Distance (m)		129.3	95.7		60.1	
Travel Time (s)		9.3	6.9		4.5	
Confl. Peds. (#/hr)	60			60		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	850	413	8	4	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	850	421	0	4	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 57.2%		ICU Level of Service B	
Analysis Period (min) 15			



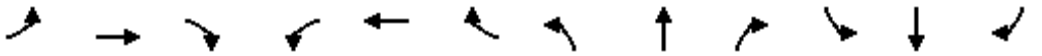
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	566	17	29	415	11	48	0	45	0	0	44
Future Volume (vph)	16	566	17	29	415	11	48	0	45	0	0	44
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0		0.0	20.0		0.0	0.0		0.0	0.0		30.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	50.0			30.0			7.6			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.996			0.996			0.935				0.865
Flt Protected	0.950			0.950				0.975				
Satd. Flow (prot)	1695	1777	0	1695	1777	0	0	1627	0	0	0	1543
Flt Permitted	0.950			0.950				0.975				
Satd. Flow (perm)	1695	1777	0	1695	1777	0	0	1627	0	0	0	1543
Link Speed (k/h)		50			50			50			48	
Link Distance (m)		95.7			138.9			151.7			75.1	
Travel Time (s)		6.9			10.0			10.9			5.6	
Confl. Peds. (#/hr)	140		10	10		140						
Confl. Bikes (#/hr)						13						39
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
Adj. Flow (vph)	16	566	17	29	415	11	48	0	45	0	0	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	583	0	29	426	0	0	93	0	0	0	44
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			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		



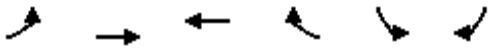
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	538	551	4	20	0
Future Volume (vph)	0	538	551	4	20	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	50.0				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.999			
Flt Protected					0.950	
Satd. Flow (prot)	0	1784	1783	0	1695	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1784	1783	0	1695	0
Link Speed (k/h)		50	50		48	
Link Distance (m)		129.3	95.7		60.1	
Travel Time (s)		9.3	6.9		4.5	
Confl. Peds. (#/hr)	100			100		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	538	551	4	20	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	538	555	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.9%		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)	31	926	38	21	359	23	28	0	14	0	0	33
Future Volume (vph)	31	926	38	21	359	23	28	0	14	0	0	33
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	25.0		0.0	20.0		0.0	0.0		0.0	0.0		30.0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (m)	50.0			30.0			7.6			2.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.991			0.955				0.865
Flt Protected	0.950			0.950				0.968				
Satd. Flow (prot)	1695	1774	0	1695	1768	0	0	1649	0	0	0	1543
Flt Permitted	0.950			0.950				0.968				
Satd. Flow (perm)	1695	1774	0	1695	1768	0	0	1649	0	0	0	1543
Link Speed (k/h)		50			50			50			48	
Link Distance (m)		95.7			138.9			151.7			78.1	
Travel Time (s)		6.9			10.0			10.9			5.9	
Confl. Peds. (#/hr)	160		10	10		160						
Confl. Bikes (#/hr)						36						22
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
Adj. Flow (vph)	31	926	38	21	359	23	28	0	14	0	0	33
Shared Lane Traffic (%)												
Lane Group Flow (vph)	31	964	0	21	382	0	0	42	0	0	0	33
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			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
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.9%		ICU Level of Service B	
Analysis Period (min) 15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	904	450	8	14	0
Future Volume (vph)	0	904	450	8	14	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Storage Length (m)	30.0			0.0	0.0	0.0
Storage Lanes	0			0	1	0
Taper Length (m)	50.0				7.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998			
Flt Protected					0.950	
Satd. Flow (prot)	0	1784	1781	0	1695	0
Flt Permitted					0.950	
Satd. Flow (perm)	0	1784	1781	0	1695	0
Link Speed (k/h)		50	50		48	
Link Distance (m)		129.3	95.7		60.1	
Travel Time (s)		9.3	6.9		4.5	
Confl. Peds. (#/hr)	110			110		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	904	450	8	14	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	904	458	0	14	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	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)	24			14	24	14
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.2%		ICU Level of Service B	
Analysis Period (min) 15			