

April 4, 2023

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**RE: Proposed Limen Head Office – 15123 Woodbine Avenue, Whitchurch-Stouffville
Transportation Mobility Plan**

Dear Randy:

Please find enclosed BA Group's updated Transportation Mobility Plan for the proposed office development at 15123 Woodbine Avenue in the Town of Whitchurch-Stouffville.

Sincerely,
BA Consulting Group Ltd.



Luke Richardson, P.Eng.
Associate

15123 WOODBINE AVENUE LIMEN HEAD OFFICE

Transportation Mobility Plan

Prepared For: Scal Properties Ltd.

April 4, 2023



**MOVEMENT
IN URBAN
ENVIRONMENTS**

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1.0 INTRODUCTION

1.1 OVERVIEW

BA Group is retained by Scal Properties Ltd. to provide transportation consulting services in relation to the proposed office and contractors yard development located on the western portion of the property at 15123 Woodbine Avenue in the Town of Whitchurch-Stouffville (the "Site").

Transportation Studies have previously been prepared by BA Group for the Phase 1 development on the site (Limen Yard Facility), with the most recent analysis for Phase 1 undertaken in a report dated August 2, 2022 (herein referred to as the 2022 Phase 1 Report). This current report refers to Phase 2 of the proposed development (Limen Head Office).

1.2 THE SITE

The property at 15123 Woodbine Avenue is located approximately 200 metres south of Aurora Road on the east side of Woodbine Avenue, extending from Fortecon Drive in the east to Woodbine Avenue in the west. The Site refers to the western portion of the property, fronting Woodbine Avenue. The Site is included within the Vandorf-Preston Lake Secondary Plan Area and is currently occupied by vegetation.

The Site location is shown in **Figure 1**.

1.3 THE APPLICATION

1.3.1 Proposal

The application is for a Zoning By-law Amendment (ZBA) to subdivide the land into two properties, with the following proposed on each property:

- **North Property**
 - 2,906 square metres office (Building 2A)
- **South Property**
 - 1,876 square metres office (Building 2B)
 - Contractor's yard and 2,548 square metres storage building

A Site Plan Application (SPA) is also being submitted for the north property (Building 2A) only.

BA Group are advised that the proposed Building 2A is purpose-built as the new Limen head office. Each of the buildings are being designed for the following staffing numbers:

- **Building 2A:** 101 staff
- **Building 2B:** 80 staff
- **Storage Building:** 15 staff

Vehicle access to the Site is proposed via a centrally located driveway connecting to Woodbine Avenue. A left turn lane is proposed to be constructed on Woodbine Avenue to provide left turn access into the site. The

driveway will subsequently provide access to both office buildings, as well as the contractors yard and storage building.

A total of 249 car parking spaces are proposed across the Site, including 12 barrier free spaces, including:

- **North Property – 135 spaces, comprising:**
 - 135 spaces (including 6 accessible spaces) adjacent Building 2A.
- **South Property – 114 spaces, comprising:**
 - 98 spaces (including 5 accessible spaces) adjacent Building 2B
 - 16 spaces (including 1 accessible spaces) adjacent the storage building

In addition, bicycle end of trip facilities are proposed as follows:

- **Building 2A:** 11 spaces and a bicycle repair station adjacent the front of the building
- **Building 2B:** 9 spaces adjacent the front of the building
- **Storage Building:** 6 spaces adjacent the car parking

A loading bay is proposed adjacent to the east side of Building 2A, and 4 loading bays are proposed within the storage building.

BA Group are advised that in the order of 10-15 trucks up to 45 feet in length are intended to potentially access the contractors yard, generally occurring between 6:00am-8:00am (inbound) and 2:00pm-4:00pm (outbound).

The proposed Site plan is shown in **Figure 2** and a reduced copy (not to scale) of the proposed development plan is provided in **Appendix A**. A concept functional plan for the proposed site driveways is attached in **Appendix B**. A signage and pavement marking plan is attached in **Appendix C**.

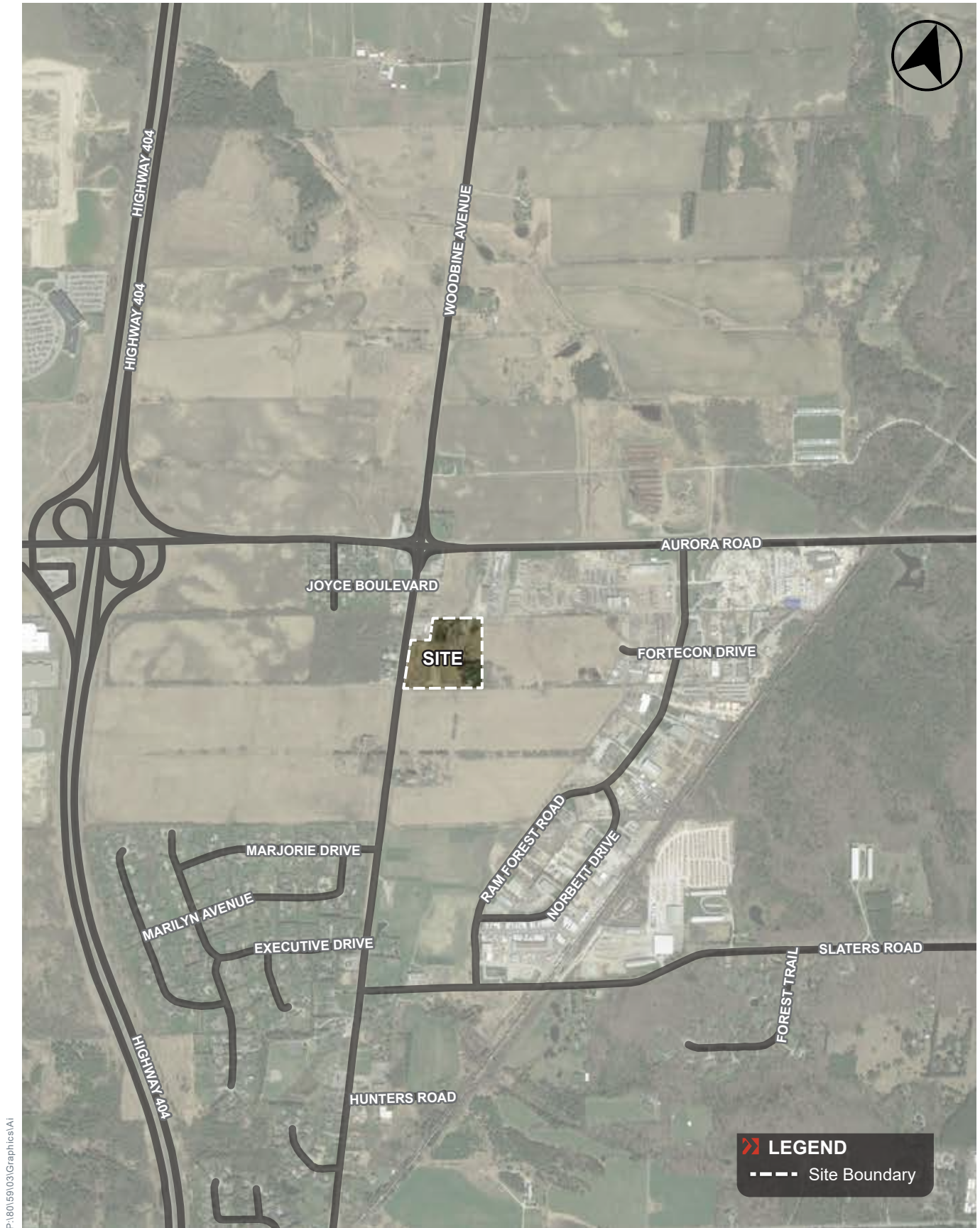


FIGURE 1 SITE LOCATION

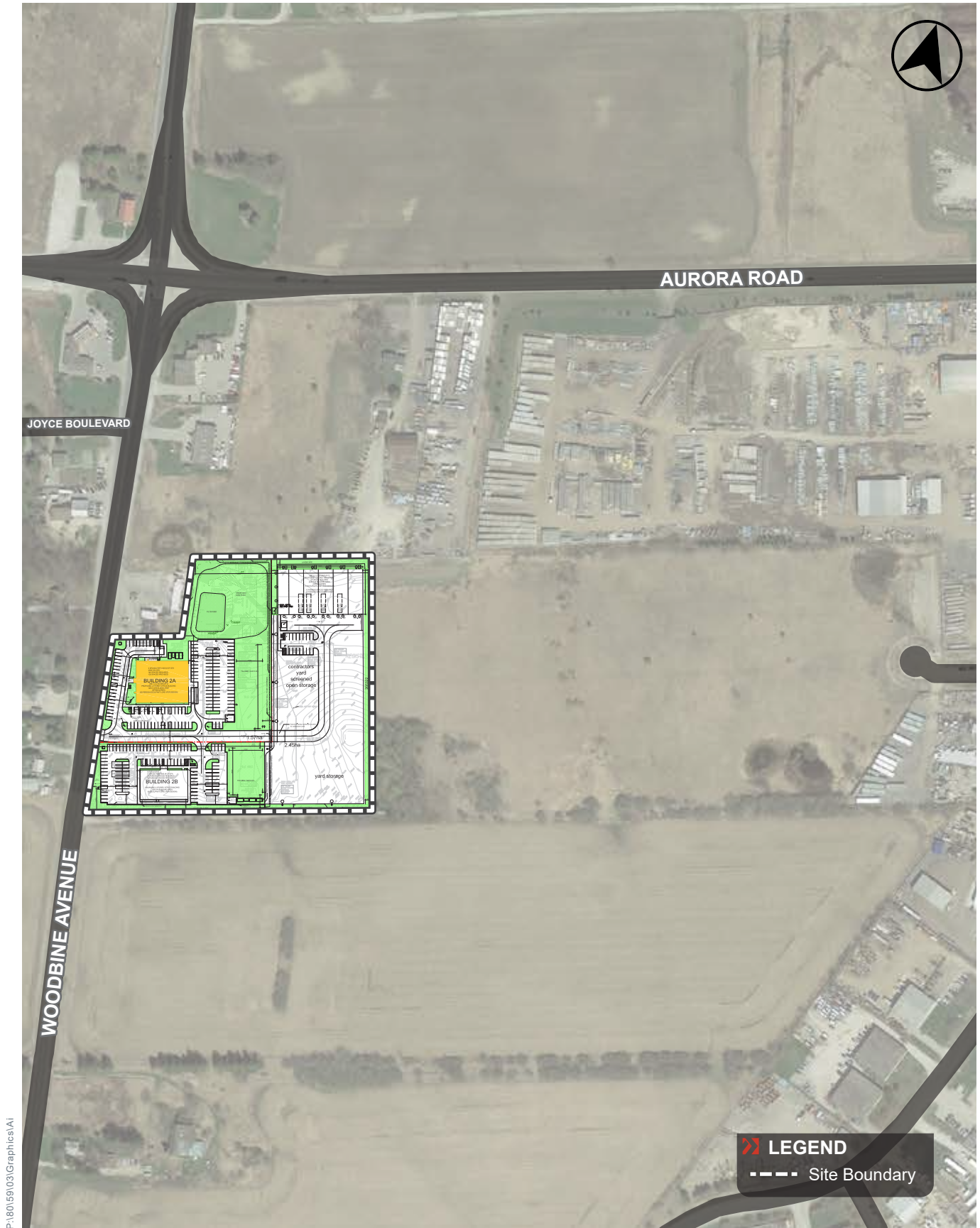


FIGURE 2 SITE PLAN

2.0 BACKGROUND

2.1 TRANSPORTATION PLANNING POLICIES

2.1.1 Whitchurch-Stouffville Transportation Master Plan

On May 15, 2018, the Town of Whitchurch-Stouffville Council approved a Transportation Master Plan prepared by HDR and amended March 2018 (herein referred to as the “TMP”). The TMP is intended to serve as a blueprint for the Town of Whitchurch-Stouffville to strategically advance the development of the Town’s long-term transportation network to ensure community prosperity and sustainability.

Relevant points and excerpts from the TMP are outlined within this report as appropriate.

2.1.2 Vandorf-Preston Lake Secondary Plan

As part of the Town of Whitchurch-Stouffville Official Plan, December 2020 Consolidation, the Vandorf-Preston Lake Secondary Plan was prepared (herein referred to as the “Secondary Plan”). The Secondary Plan “establishes the principles, objectives and general policies, as well as specific strategies with respect to community structure, community improvement, servicing, land use and transportation” for planning lands in and around the Site.

Relevant points and excerpts from the Secondary Plan are outlined within this report as appropriate.

2.2 PROPOSED STUDY SCOPE

2.2.1 Study Periods

Given the employment nature of the development, analysis was undertaken for the AM and PM peak hours.

2.2.2 Study Horizons

Analysis has been undertaken for a 5 year development horizon (2028), reflecting the opening date of the development, and a 10 year development horizon (2033), reflecting five years beyond the opening date of the development.

2.2.3 Study Scenarios

In consideration of the adopted study horizons, the study scenarios are summarized as follows:

- Existing Conditions (2023);
- Future Background Conditions (5 year horizon – 2028);
- Future Background Conditions (10 year horizon – 2033);
- Future Total Conditions (5 year horizon – 2028); and
- Future Total Conditions (10 year horizon – 2033).

2.2.4 Study Area

The adopted study area comprises the following intersections:

- Aurora Road / Woodbine Avenue (Signalized);
- Slaters Road / Woodbine Avenue; and
- Woodbine Avenue / Site Driveway.

3.0 TRANSPORTATION CONTEXT

3.1 EXISTING TRANSPORTATION SYSTEM

3.1.1 Existing Road Network

The existing road network in the vicinity of the Site is described in **Table 1** and is illustrated in **Figure 3**.

TABLE 1 EXISTING AREA ROAD CONTEXT

Road Type	Road Name	Road Limits	Description
Major Arterial (Regional) Road	Aurora Road (RR 15)	East: York-Durham Line West: Highway 404, continues west as Wellington Street East	Aurora Road is an east-west major arterial road. In the vicinity of the Site, it has a two-lane cross section consisting of one eastbound and one westbound lane. Auxiliary lanes are provided for left and right turns at some intersections. The posted speed limit is 80 km/h.
	Woodbine Avenue (RR 8)	North: Lake Drive, Town of Georgina South: Steeles Avenue East, City of Toronto	Woodbine Avenue is a north-south major arterial road. In the vicinity of the Site, it has a typical two-lane cross section consisting of one to two northbound and one to two southbound lanes. Auxiliary lanes are provided for left and right turns at intersections. The posted speed limit is 80 km/h in the vicinity of Aurora Road and 50 km/h in the vicinity of Slaters Road.
Collector Road	Slaters Road	East: Woodbine Avenue West: Warden Avenue	Slaters Road is an east-west minor collector road. In the vicinity of the Site, it has a two-lane cross section consisting of one eastbound and one westbound lane. The posted speed limit is 60 km/h.

3.1.2 Existing Transit Network

There are no transit services in the immediate vicinity of the Site.

Services on the Richmond Hill GO Rail corridor are accessible via Bloomington Station, located approximately 4 kilometres to the southwest of the Site. Bloomington Station is an approximate 10 minute drive from the site, with car parking available. Service provided on the Richmond Hill GO Rail corridor provide access to other areas of the Greater Toronto and Hamilton Area (GTHA), including Downtown Toronto, and access to other municipal transit systems, such as York Region Transit (YRT) and the Toronto Transit Commission (TTC). GO Bus services are also provided at Bloomington Station.

The Wellington Street East at Highway 404 Park and Ride facility, located approximately 1.4 kilometres west of the Site (a 5 minute drive), includes a GO Bus facility serving two routes. These are route 65 (Barrie), providing service between Union Station in Downtown Toronto and East Gwillimbury GO Station in East Gwillimbury, and route 67 (Keswick/North York), providing service between the Finch Station Bus Terminal in North York and the Woodbine Avenue at Highway 404 Park and Ride in Georgina.

York Region Transit bus services are available from the Wellington Street East / First Commerce Drive intersection, located approximately 1.6 kilometres west of the Site (a 6 minute drive). One bus route, 33

Wellington, serves this area and provides connections to the Aurora GO Station and other York Region Transit bus routes along Wellington Street East and West.

3.1.3 Existing Cycling and Pedestrian Network

Existing cycling and pedestrian infrastructure in the vicinity of the Site is currently limited.

Sidewalks are not currently provided in the vicinity of the Site. Narrow paved shoulders are provided along both sides of Aurora Road in the vicinity of the Site as identified in the TMP and shown in **Figure 4**. These improvements are shown on the map as “proposed,” but have been completed since the original publication.

3.2 FUTURE TRANSPORTATION SYSTEM

3.2.1 Future Road Network

The planned future road improvements as outlined in the Secondary Plan are shown graphically in **Figure 3**.

A grade separation is proposed along Aurora Road at the CN Bala Subdivision rail corridor crossing, located approximately 600 metres east of the Aurora Road / Ram Forest Road intersection, as outlined in the TMP. No other Regional road improvements are proposed in the vicinity of the Site.

The Secondary Plan also identifies two “potential local roads” in the vicinity of the Site; one east-west road extending from the western end of Fortecon Drive to Woodbine Avenue, and one north-south road extending from the southern Ram Forest Road / Norbett Drive intersection to the new east-west road. It is noted however, that these roads are not shown or considered in the TMP. The potential east-west local road is discussed further in **Section 3.2.4**.

3.2.2 Future Transit Network

The planned future transit network as outlined in the Secondary Plan is shown graphically in **Figure 3**.

In the vicinity of the Site, a rural transit link is proposed along Aurora Road between the Wellington Street East at Highway 404 Park and Ride facility and the community of Ballantrae (at Highway 48), as outlined in the TMP. This link would connect to a transit node, proposed at the Aurora Road / Woodbine Avenue intersection as shown in the Secondary Plan, which would serve the community of Wesley Corners and surrounding area.

Additionally, a potential new GO station is shown as an extension of the Richmond Hill GO Rail line, located at Aurora Road approximately 600 metres east of the Aurora Road / Ram Forest Road intersection.

3.2.3 Future Cycling and Pedestrian Network

The planned future active transportation (cycling and pedestrian) network as outlined in the Secondary Plan is shown graphically in **Figure 4**.

Proposed and potential improvements in the vicinity of the Site include:

- An on-street trail on Aurora Road between Woodbine Avenue and Warden Avenue;
- A “potential on-street trail” on the potential east-west road between Fortecon Drive and Woodbine Avenue; and
- A Greenbelt Route (Oak Ridges Trail) on Slaters Road between Warden Avenue and Woodbine Avenue.

The potential east-west road is discussed further in **Section 3.2.4**.

3.2.4 Discussion on “Potential Local Roads”

As noted in **Section 3.2.1**, the Secondary Plan identifies two “potential local roads” in the vicinity of the Site; one east-west road extending from the western end of Fortecon Drive to Woodbine Avenue, and one north-south road extending from the southern Ram Forest Road / Norbett Drive intersection to the new east-west road. It is noted however, that these roads are not shown or considered in the TMP. The potential east-west road as shown in the Secondary Plan is located within the Site. The Secondary Plan describes “local roads”, such as the above, as being “designed to provide access to individual properties and to discourage through traffic.”

A plan of subdivision with individual lots and street is not proposed for the Site. Given this, the potential east-west local road as shown in the Secondary Plan is not required for providing access and connections by the landowner. It is noted that an Official Plan Amendment application (OPA) was submitted with the Phase 1 development application which proposes to remove this road, and is currently under consideration by the Town.

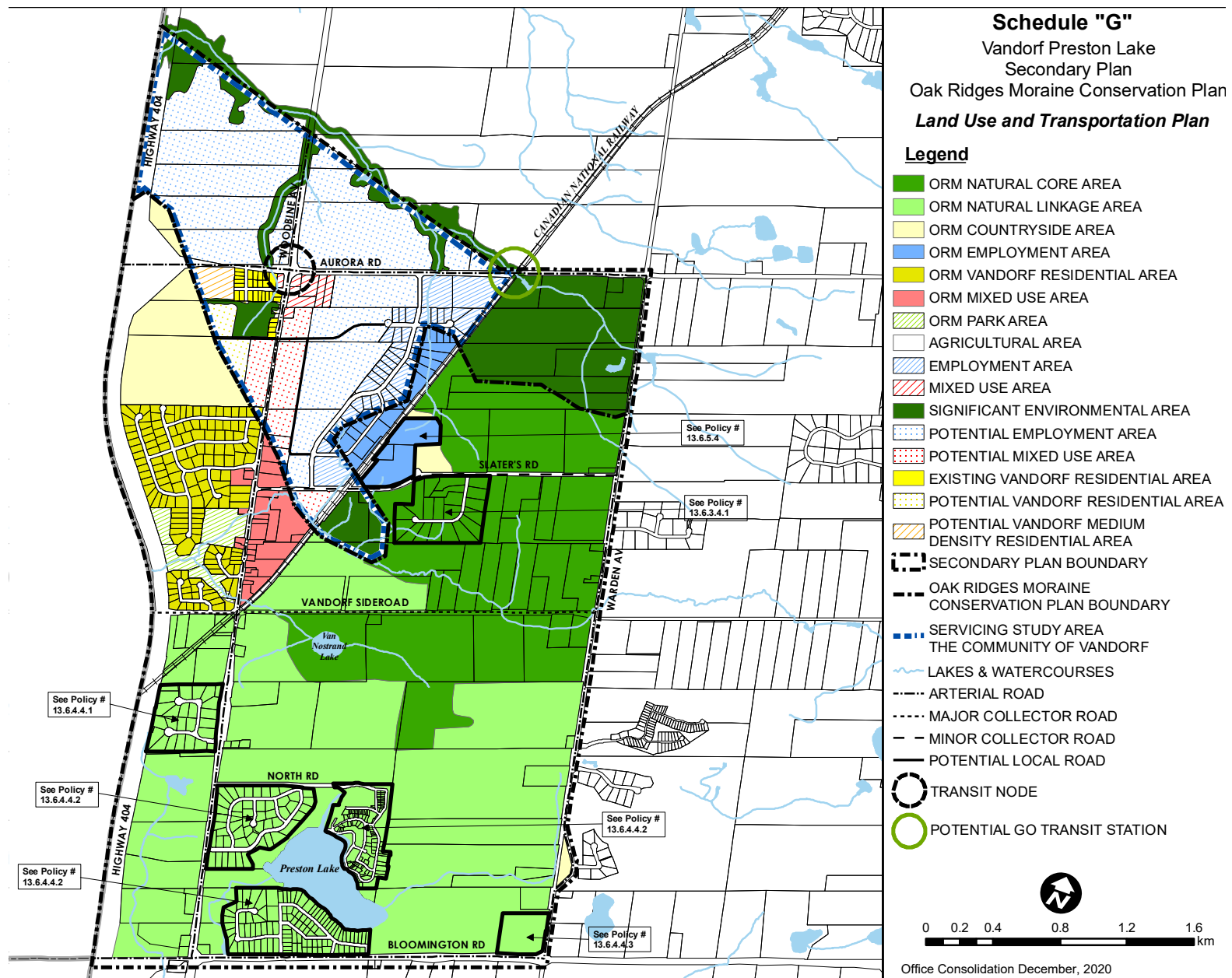


FIGURE 3 EXISTING AND PLANNED ROAD AND TRANSIT NETWORK

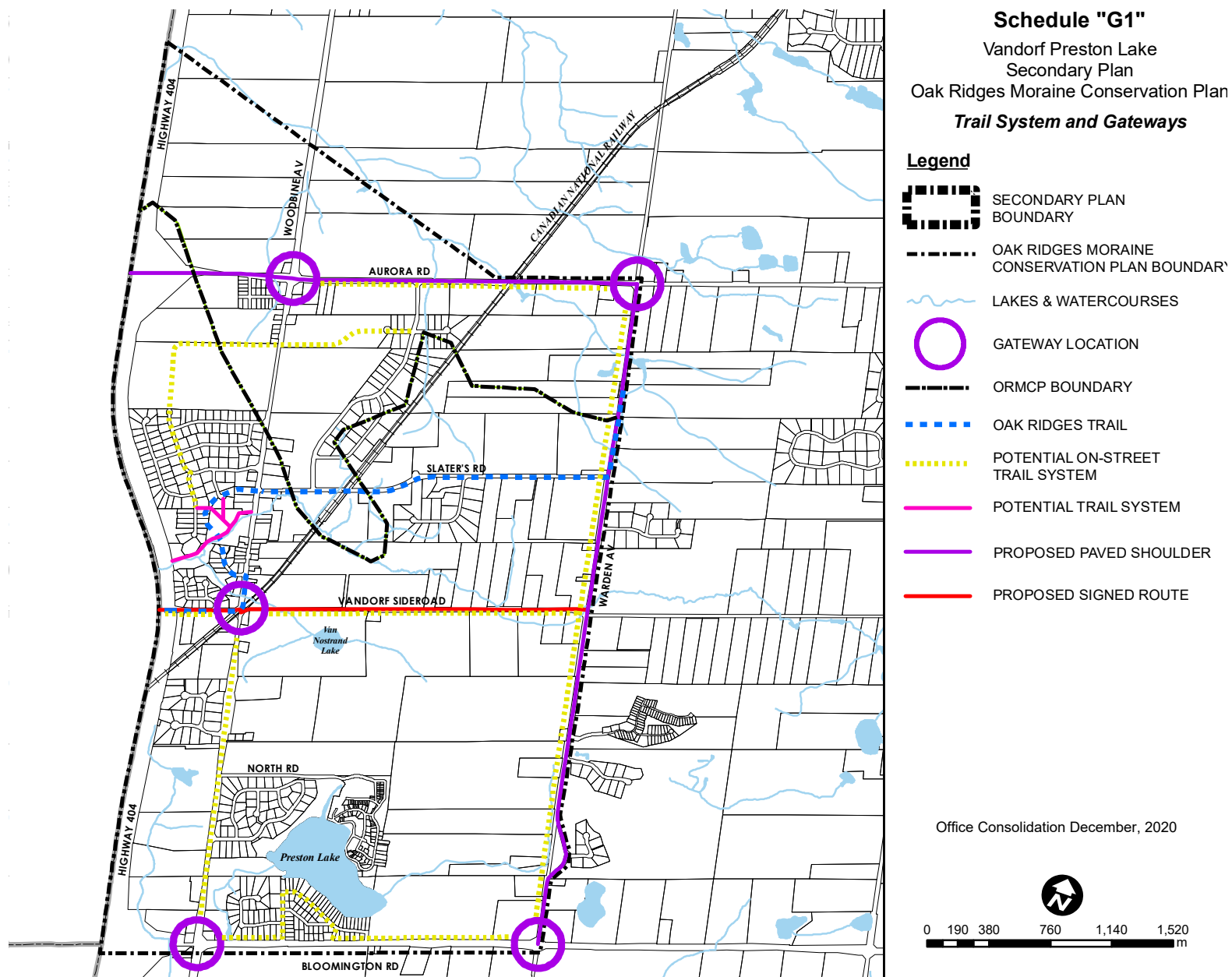


FIGURE 4 EXISTING AND PLANNED ACTIVE TRANSPORTATION NETWORK

4.0 VEHICLE PARKING CONSIDERATIONS

4.1 ZONING BY-LAW REQUIREMENT

4.1.1 Car Parking Requirements

The car parking requirements for the proposal are outlined in the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO. The requirements are applied to the proposed development in **Table 2**.

TABLE 2 CAR PARKING REQUIREMENTS – WHITCHURCH-STOUFFVILLE COMPREHENSIVE ZONING BY-LAW 2010-001-ZO

Property	Use	GFA	Rate	Requirement ¹
North Property	Building 2A Office	2,906 m ²	5 spaces per 100 m ² GFA	146 spaces
	Subtotal			146 spaces
South Property	Building 2B Office	1,876 m ²	5 spaces per 100 m ² GFA	94 spaces
	Storage Building (Warehouse)	2,548 m ²	0.6 spaces per 100 m ² GFA (where GFA > 2,000 m ²)	16 spaces
	Subtotal			110 spaces

Notes:

1. Rounded up to the nearest whole number, in accordance with Clause 3.24.1 of the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO.

Based on the foregoing, the applicable parking requirement is 146 spaces for Building 2A, 94 spaces for Building 2B and 16 spaces for the storage building (110 spaces total for the south property).

4.1.2 Barrier Free Parking Requirements

The requirements for barrier free parking for the proposal are outlined in the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO. It is noted that the Whitchurch-Stouffville Comprehensive Zoning By-law states that half of the required barrier free spaces must be Type A (large) barrier free parking spaces and the other half must be Type B (small) barrier free parking spaces.

The requirements are applied to the proposed development in **Table 3**.

**TABLE 3 BARRIER FREE PARKING REQUIREMENTS – WHITCHURCH-STOUFFVILLE
COMPREHENSIVE ZONING BY-LAW 2010-001-ZO**

Property	Use	Total Parking Spaces	Rate	Barrier Free Requirement ¹
North Property	Building 2A Office	146 spaces	1 space + 3% of total required parking	6 spaces
	Subtotal			6 spaces, incl. 3 Type A spaces 3 Type B spaces
South Property	Building 2B Office	94 spaces	4% of total required parking	4 spaces
	Storage Building	16 spaces	1 Type A space	1 Type A space
	Subtotal			5 spaces, incl. 3 Type A spaces 2 Type B spaces

Notes:

1. Rounded up to the nearest whole number, in accordance with Clause 3.24.1 of the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO.

Based on the foregoing, the applicable accessible parking requirement is 6 spaces (3 Type A and 3 Type B) for Building 2A, 4 spaces (2 Type A and 2 Type B) for Building 2B and 1 space (1 Type A) for the storage building (5 spaces total for the south property).

4.2 PROPOSED PARKING SUPPLY

4.2.1 North Property

The proposed north property plans include a total of 135 parking spaces, which results in an effective car parking provision of 4.65 spaces per 100 square metres, and represents a slight shortfall from the requirement of the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO of 146 spaces.

Notwithstanding, as discussed in **Section 1.3.1**, the proposed building is purpose-built as the new Limen head office, and is designed to accommodate up to 101 staff. The proposed provision of 135 spaces would be sufficient to accommodate all 101 staff with a surplus of 34 spaces which could be utilized by visitors, conservatively assuming that every staff member drives every day (not allowing for possible car pooling, for example).

The provision of 6 barrier free spaces (3 Type A and 3 Type B) satisfies the barrier free car parking requirement. Overall, the provision is considered sufficient to accommodate the expected building operations.

4.2.2 South Property

The proposed south property plans include a total of 114 parking spaces, including 98 spaces adjacent Building 2B and 16 spaces adjacent the storage building, both of which satisfy the zoning by-law requirements.

The provision of 4 barrier free spaces (2 Type A and 2 Type B) for Building 2 B and 1 barrier free space (1 Type A) also satisfies the barrier free car parking requirement.

5.0 BICYCLE PARKING CONSIDERATIONS

There are no bicycle parking rates listed in the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO, however it is understood that Whitchurch-Stouffville typically applies rates as listed within the City of Markham Draft Comprehensive Zoning By-law. The alternative bicycle parking standards (i.e. the more conservative rates) listed in the City of Markham Draft Comprehensive Zoning By-law for office are applied in **Table 4**.

TABLE 4 BICYCLE PARKING RATES

Use	GFA	Type	Rate	Requirement ¹
Building 2A Office	2,906 m ²	Long-term	1 space / 670 m ²	5 spaces
		Short-term	Greater of 1 space / 670 m ² or 6 spaces	6 spaces
Building 2B Office	1,876 m ²	Long-term	1 space / 670 m ²	3 spaces
		Short-term	Greater of 1 space / 670 m ² or 6 spaces	6 spaces
Storage Building (Industrial)	2,548 m ²	Long-term	1 space / 2,000 m ²	2 spaces
		Short-term	1 space / 670 m ²	4 spaces

Notes:

1. Alternative bicycle parking standards as outlined in the City of Markham Draft Comprehensive Zoning By-law

Application of the above rates results in the following bicycle parking provisions:

- **Building 2A:** 11 bicycle spaces, including 5 long-term spaces and 6 short-term spaces.
- **Building 2B:** 9 bicycle spaces, including 3 long-term spaces and 6 short-term spaces
- **Storage Building:** 6 bicycle spaces, including 2 long-term spaces and 4 short-term spaces

The proposed provisions for each building satisfies these rates.

6.0 LOADING

6.1 LOADING REQUIREMENTS AND PROVISION

6.1.1 North Property

The Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO does not include a requirement for any loading spaces for office land use.

Notwithstanding, a loading space is proposed for Building 2A, measuring 13 metres in length and 5.3 metres in width, which exceeds the dimensions of a “small loading space” as outlined in Zoning By-law 2010-001-ZO. Vehicle manoeuvring diagrams for a TAC HSU truck are attached in **Appendix B**.

6.1.2 South Property

As noted above, the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO does not include a requirement for any loading spaces for office land use. There is therefore no requirement to provide a loading space for Building 2B.

For an industrial building between 2,400-7,500 square metres, the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO requires the provision of 4 loading spaces measuring 15 metres in length, 3.6 metres in width, and with 4.25 metres clear height.

The proposed contractors yard and storage building comprises storage occurring within the contractors yard itself and within the storage building, accessed by overhead doors. Four loading spaces in accordance with the above requirements have been provided within the building, adjacent to overhead doors. Vehicle manoeuvring diagrams for a TAC HSU truck are attached in **Appendix B**. Further detail can be provided at the Site Plan stage.

6.2 WASTE COLLECTION

6.2.1 North Property

The waste refuse areas are located to the east the proposed building 2A and access has been tested using a Turtle Island Garbage front loader truck, measuring 9.33 metres in length and 2.44 metres in width, and a Turtle Island Garbage rear sled truck, measuring 9.88 metres in length and 2.55 metres in width.

Vehicle manoeuvring diagrams are attached in **Appendix D**.

6.2.2 North Property

Molok containers are located to the east of the proposed building 2B and access has been tested using a Molok collection truck, measuring 11.7 metres in length and 2.47 metres in width.

Waste refuse areas for the contractors yard are located to the south of the storage building and access has been tested using a Turtle Island Garbage front loader truck, measuring 9.33 metres in length and 2.44

metres in width, and a Turtle Island Garbage rear sled truck, measuring 9.88 metres in length and 2.55 metres in width.

Vehicle manoeuvring diagrams are attached in **Appendix D**.

6.3 TRUCK ACCESS

As noted in **Section 1.3.1**, BA Group are advised that in the order of 10-15 trucks up to 45 feet in length are intended to potentially use this driveway for access into the contractors yard per day, generally occurring between 6:00am-8:00am (inbound) and 2:00pm-4:00pm (outbound).

Vehicle manoeuvring diagrams for a TAC HSU truck and WB-20.5 accessing and circulating are attached in **Appendix D**. It is noted that the WB-20.5 vehicles are larger than 45 feet in length and are therefore conservative.

7.0 TRAFFIC VOLUME PROJECTIONS

7.1 SCOPE

As discussed in **Section 2.2**, analysis has been completed for the following scenarios during the AM and PM peak hours:

- Existing Conditions (2023);
- Future Background Conditions (5 year horizon – 2028);
- Future Background Conditions (10 year horizon – 2033);
- Future Total Conditions (5 year horizon – 2028); and
- Future Total Condition (10 year horizon – 2033).

Intersections included within the analysis study area are listed below:

- Aurora Road / Woodbine Avenue (Signalized);
- Slaters Road / Woodbine Avenue; and
- Woodbine Avenue / Site Driveway

Existing lane configurations are shown in **Figure 5**.

7.2 EXISTING TRAFFIC VOLUMES

7.2.1 Traffic Counts

Existing peak hour traffic volumes have been established based on traffic counts undertaken by Spectrum Traffic Data on behalf of BA Group and based on historical traffic counts sourced from York Region. The intersections which were counted are summarized in **Table 5**. The raw traffic count data is provided in **Appendix E**.

TABLE 5 EXISTING TRAFFIC DATA SOURCES

Intersection	Count Date	Count Times	Source
Aurora Road / Woodbine Avenue	October 20, 2021	7:00 AM – 9:00 AM 4:00 PM – 6:00 PM	Spectrum Traffic Data
Slaters Road / Woodbine Avenue	October 17, 2013	7:00 AM – 9:00 AM 3:00 PM – 6:00 PM	York Region

7.2.2 COVID-19 Adjustments

It is noted that the Aurora Road / Woodbine Avenue traffic count was undertaken during the COVID-19 pandemic, during which time, travel patterns were altered to varying degrees, primarily as a result of various mitigation measures implemented to halt the spread of the virus.

As such, traffic counts undertaken pre-pandemic have been compared against counts undertaken during the pandemic.

Volumes at the intersection of Woodbine Avenue / Slaters Road, where pre-pandemic counts were available for comparison are reviewed and summarized in **Table 6**. The historical count at the Woodbine Avenue / Slaters Road intersection was dated 2013, and as such, growth was applied to these counts to reflect existing conditions (2023), in accordance with the growth assumptions outlined in **Section 7.3.2**. For any intersections not listed below, pre-pandemic traffic counts were not able to be sourced.

The review has been undertaken by direction, noting that the change in traffic volumes as a result of the COVID-19 pandemic is highly variable and dependent on the ultimate origin and destination. The peak direction on Woodbine Avenue (southbound towards Toronto in the AM peak hour and northbound away from Toronto in the PM peak hour) is notably affected by the COVID-19 pandemic. East-west traffic on Aurora Road and traffic into/out of the sideroads is largely unaffected, and in some cases, the pre-pandemic volume is actually lower than the volume observed during the pandemic.

The raw traffic count data is provided in **Appendix E**.

TABLE 6 COVID-19 TRAFFIC VOLUME COMPARISON

Intersection	Direction	AM Peak			PM Peak		
		Volume Pre-Pandemic	Volume During Pandemic	Adjustment Factor	Volume Pre-Pandemic	Volume During Pandemic	Adjustment Factor
Woodbine Ave / Slaters Rd	To/From Slaters	87	123	0.7	240	148	1.6
	NBT	67	82	0.8	407	293	1.4
	SBT	615	265	2.3	108	128	0.8
	Intersection	769	470	1.6	755	569	1.3

Notes:

1. Woodbine Ave / Slaters Rd Pre-pandemic counts undertaken on October 17, 2013. Growth was applied to these counts to the year in which data was most recently collected (2021), in accordance with the growth assumptions outlined in **Section 7.3.2**.
2. Traffic counts undertaken during the pandemic were undertaken on October 20, 2021.

7.2.3 Base 2023 Existing Traffic Volumes

On the basis of the above, the following assumptions were made in development of base existing traffic volumes adopted for the purpose of analysis:

- 2023 traffic at the Woodbine Avenue / Slaters Road intersection was adopted based on the traffic counts undertaken on October 17, 2013 (i.e. pre-pandemic traffic counts), with growth to 2023, in accordance with the growth assumptions outlined in **Section 7.3.2**;
- 2023 traffic volumes at the Aurora Road / Woodbine Avenue intersection were based on the October 20, 2021 traffic counts (i.e. counts undertaken during the pandemic). North-south traffic was subsequently balanced to the Woodbine Avenue / Slaters Road intersection, on a pro-rata basis between the left, through and right turn movements. East-west traffic was balanced to base traffic volumes assumed in the Phase 1 Report at Aurora Road / Ram Forest Road, also on a pro-rata basis between the left, through and right turn movements;

The resulting existing 2023 baseline area traffic volumes for the AM and PM peak hours are provided in **Figure 6**.

7.3 FUTURE BACKGROUND TRAFFIC VOLUMES

7.3.1 Background Development Growth

A series of background development traffic allowances were made for specific proposed developments in the area. Developments within approximately 2 kilometres of the Site were identified using the Town of Whitchurch-Stouffville Development Activity Map¹ and are outlined in **Table 7**.

TABLE 7 AREA BACKGROUND DEVELOPMENTS

Site	Development Proposal	Development Statistics	Trip Generation Source
2159 Aurora Road	Electric Vehicle Manufacturing/ Assembly & Sales	8,243.9 m ² industrial	Report prepared by CGH Transportation, dated June 30, 2021
5532 Slaters Road	Assembly Plant	2,210 m ² industrial	No traffic study – Manually estimated and assigned ¹
14609 Woodbine Avenue	Residential Subdivision	11 single detached residential dwellings	No traffic study – Manually estimated and assigned ²
Limen Yard Phase I	Contractor's Yard (1 building)	8,926 m ² industrial	Report prepared by BA Group, dated August 2, 2022
Total (rounded)	-	11 residential dwellings 10,450 m² non-residential	-

Notes:

1. Trip generation based on ITE 11th Edition Land Use Code 140 (Manufacturing). Trip distribution based on TTS for work-based trips.
2. Trip generation based on ITE 11th Edition Land Use Code 210 (Single-Family Detached Housing). Trip distribution based on TTS for home-based trips.

For the 5532 Slaters Road and 14609 Woodbine Avenue developments, traffic studies were not available. As such, trip generation was assumed in accordance with rates outlined in the ITE 11th Edition as follows:

- **5532 Slaters Road:** Land Use Code 140 (Manufacturing)
- **14609 Woodbine Avenue:** Land Use Code 210 (Single-Family Detached Housing)

Trip distributions for the above developments were undertaken based on TTS data, as outlined in **Table 8**.

¹ The Corporation of the Town of Whitchurch-Stouffville. "Town of Whitchurch-Stouffville Development Activity Map." Town of Whitchurch-Stouffville. <https://townofws.maps.arcgis.com/apps/MapJournal/index.html?appid=9c3e72e46cc842c1a0731dad537c1d3d> (accessed October 22, 2021).

TABLE 8 BACKGROUND DEVELOPMENT VEHICLE TRIP DISTRIBUTION

Direction	5532 Slaters Rd ¹		14609 Woodbine Ave ²	
	Inbound	Outbound	Inbound	Outbound
North – Woodbine Avenue	10%	5%	15%	10%
South – Woodbine Avenue	5%	5%	5%	5%
East – Aurora Road	5%	5%	0%	5%
West – Aurora Road	80%	85%	80%	80%
Total	100%	100%	100%	100%

Notes:

1. Based on work trips for TTS Planning District 28 (Aurora)
2. Based on home trips for TTS Planning District 28 (Aurora).

Background development traffic volumes are shown in **Figure 7** and individual traffic layers for these developments are attached in **Appendix F**.

7.3.2 Corridor Growth

According to the TMP, the annual growth rate along arterial roads across the Town of Whitchurch-Stouffville is, on average, 2%. As such, for the purpose of this assessment, a growth rate of 2% per annum has been adopted on the Aurora Road and Woodbine Avenue corridors. This is consistent with the corridor growth rates adopted in other BA Group transportation studies for developments in the Town of Whitchurch-Stouffville.

Corridor growth traffic volumes for the 5 year and 10 year horizons are shown in **Figure 8** and **Figure 9**, respectively.

7.3.3 Future Background Traffic Volumes

The future background traffic volumes are determined by adding existing traffic volumes, background development traffic volumes, and corridor growth traffic volumes.

Future background traffic volumes for the 5 year and 10 year horizons are shown in **Figure 10** and **Figure 11**, respectively.

7.4 SITE TRAFFIC FORECASTS

7.4.1 Site Vehicle Trip Generation

7.4.1.1 Office

Vehicle trips associated with the proposed office buildings are forecasted based on ITE 11th Edition trip generation rates. The prevailing and selected rates, as well as the resulting trips are summarized in **Table 9**.

TABLE 9 SITE OFFICE TRAFFIC GENERATION

	AM Peak Hour			PM Peak Hour		
	In	Out	2-way	In	Out	2-way
ITE 710 – General Office Building (trips per 100m ²)	1.44	0.20	1.64	0.26	1.29	1.55
Building 2A Trips (2,906m ²)	40	10	50	10	35	45
Building 2B Trips (1,876 m ²)	25	5	30	5	25	30
Total Office	65	15	80	15	60	75

Notes:

1. Trips are rounded to the nearest 5

7.4.1.2 Contractors Yard

BA Group are advised that the contractors yard and storage building will be staffed by in the order of 15 people. For the purpose of this assessment, it is conservatively assumed that all employees arrive by car during the weekday AM peak hour and depart during the weekday PM peak hour.

BA Group are also advised that in the order of 10-15 trucks are intended to potentially use this driveway for access into the yard facility per day, generally occurring between 6:00am-8:00am (inbound) and 2:00pm-4:00pm (outbound). It is noted that these periods are prior to the typical commuter peak period, however for the purpose of analysis, it is conservatively assumed that there will be 5 inbound trucks during the AM peak hour and 5 outbound trucks during the PM peak hour associated with the potential yard facility.

The resulting contractors yard vehicle trips are summarized in **Table 10**.

TABLE 10: SITE CONTRACTORS YARD TRAFFIC GENERATION

	AM Peak Hour			PM Peak Hour		
	In	Out	2-way	In	Out	2-way
Staff Trips	15	0	15	0	15	15
Truck Trips	5	0	5	0	5	5
Total Contractors Yard	45	5	50	5	45	50

7.4.1.3 Total

Overall, it is projected that the proposed development will generate in the order of 130 and 125 two-way vehicle trips during the weekday morning and afternoon peak hours, respectively.

7.4.2 Vehicle Trip Distribution

Site traffic was assigned onto the area road network based on the results of the 2016 Transportation Tomorrow Survey (TTS), prevailing traffic patterns, and area turn restrictions. General direction of approach percentages for work/employment traffic was based on the results of the TTS and is summarized in **Table 11**.

TABLE 11 SITE TRAFFIC DISTRIBUTION

Direction	Inbound	Outbound
North – Woodbine Avenue	10%	5%
South – Woodbine Avenue	5%	5%
East – Aurora Road	5%	5%
West – Aurora Road	80%	85%
Total	100%	100%

Notes:

1. Based on work trips for TTS Planning District 28 (Aurora).

The site traffic volumes are shown in **Figure 12**.

7.4.3 Future Total Traffic Volumes

Future total traffic volumes are determined by adding the future background traffic volumes and site traffic volumes. The future total traffic volumes for the 5 year and 10 year horizons are shown in **Figure 13** and **Figure 14**, respectively.

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig05-03-ExLC.dwg

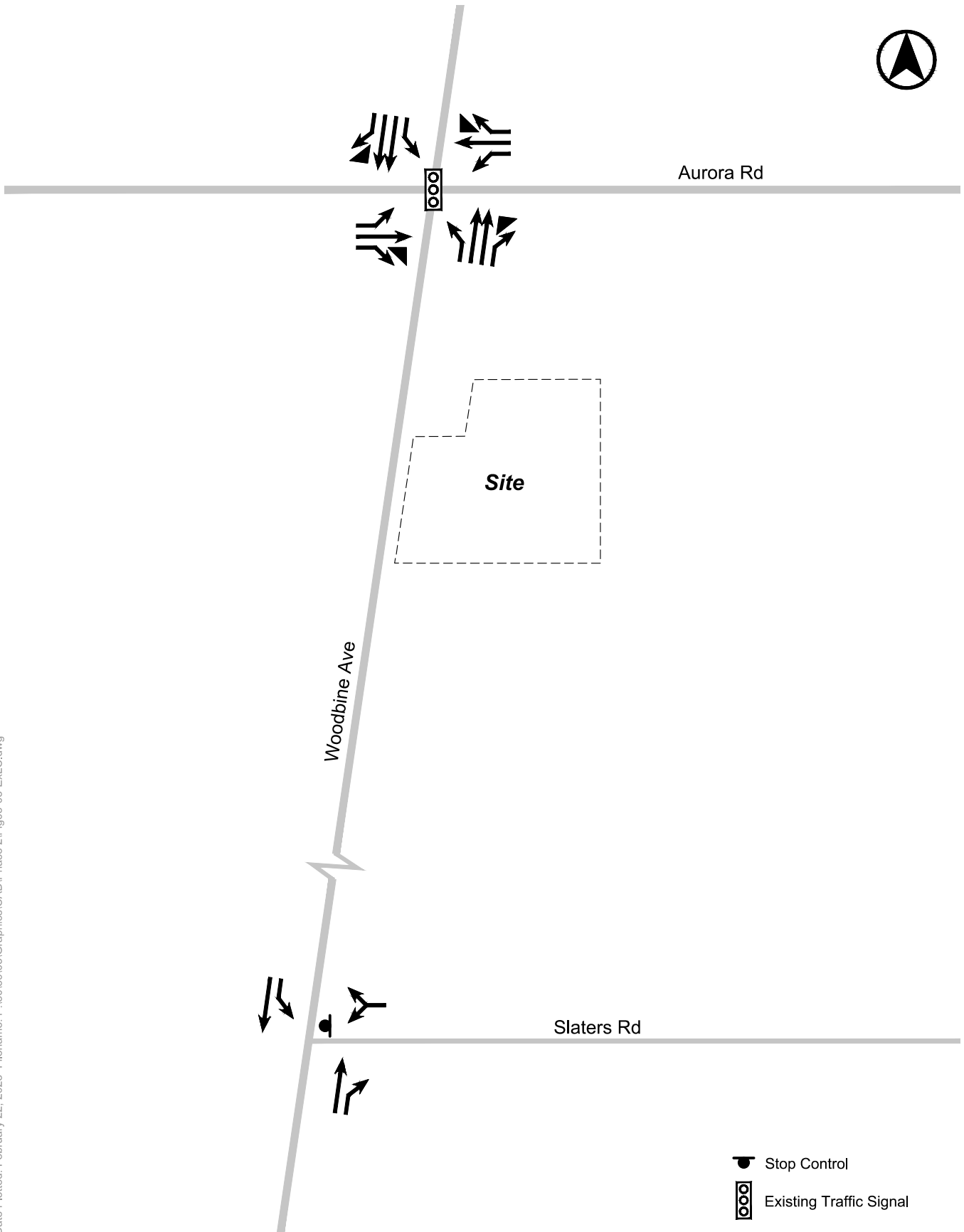


FIGURE 5 EXISTING LANE CONFIGURATION & TRAFFIC CONTROL

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig06-03-EX.dwg

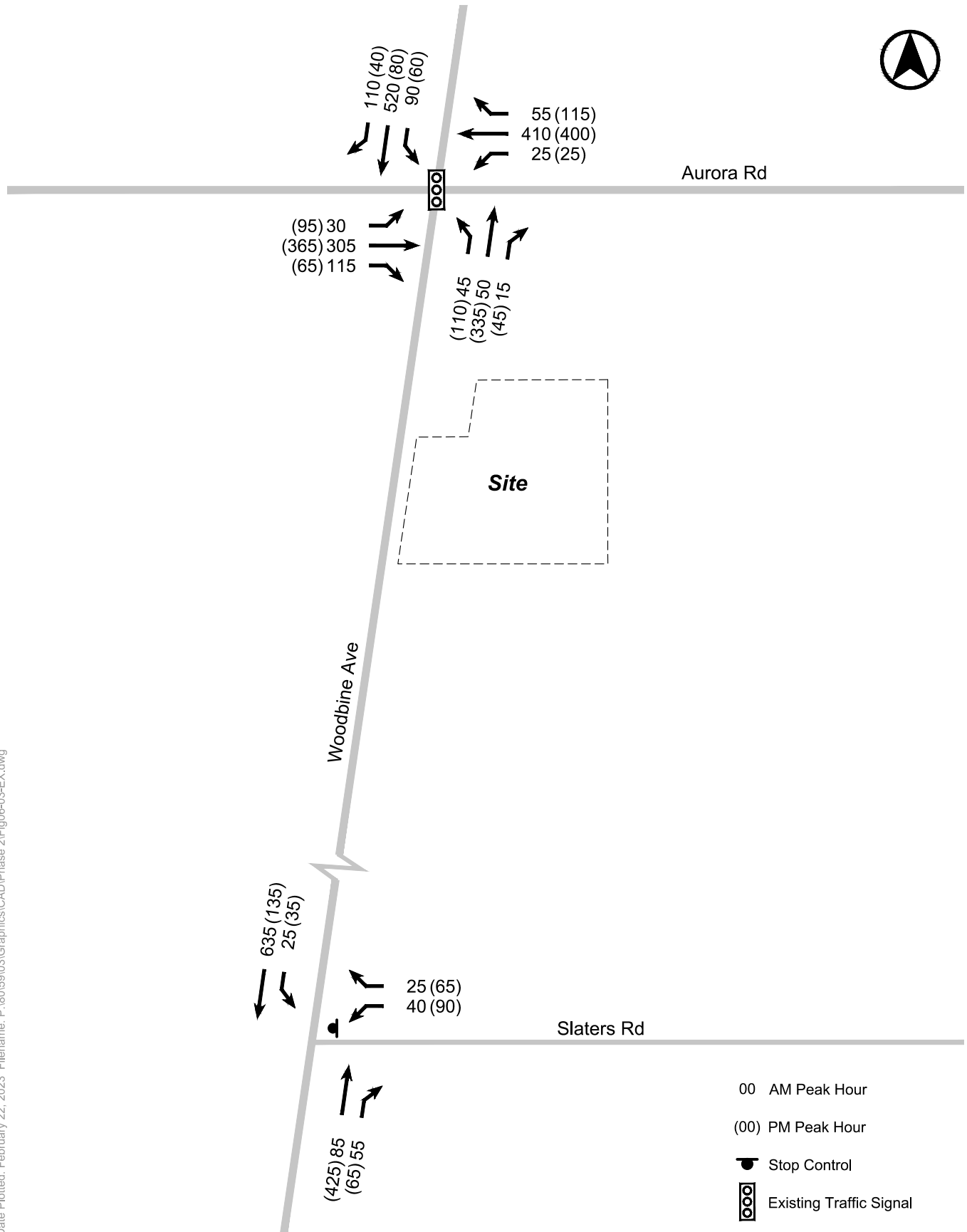


FIGURE 6 EXISTING TRAFFIC VOLUMES

Date Plotted: February 22, 2023 Filename: P:\80159\03\Graphics\CAD\Phase 2\Fig07-03-BD.dwg

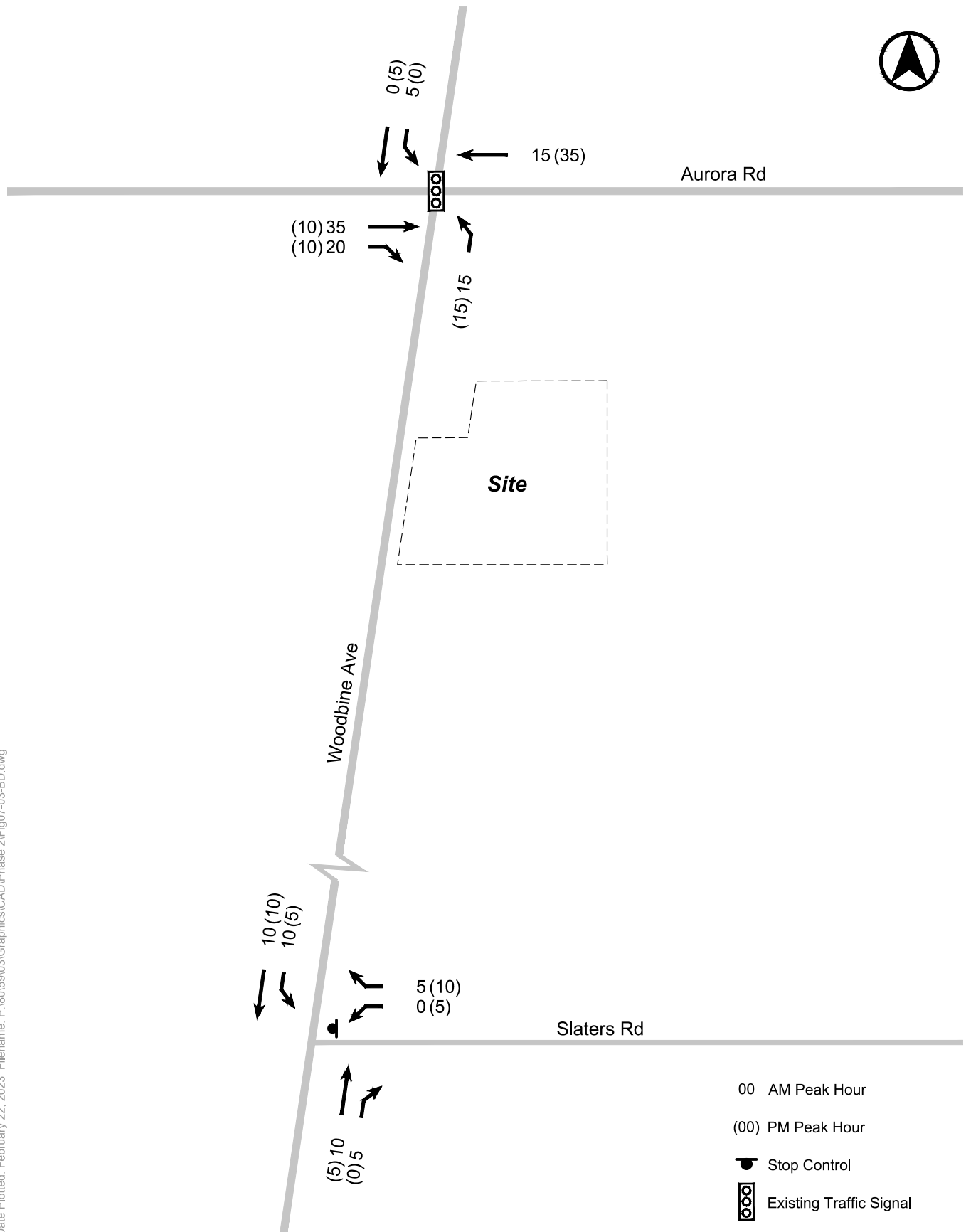


FIGURE 7 BACKGROUND DEVELOPMENT TRAFFIC VOLUMES

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig08-03-CG2028.dwg

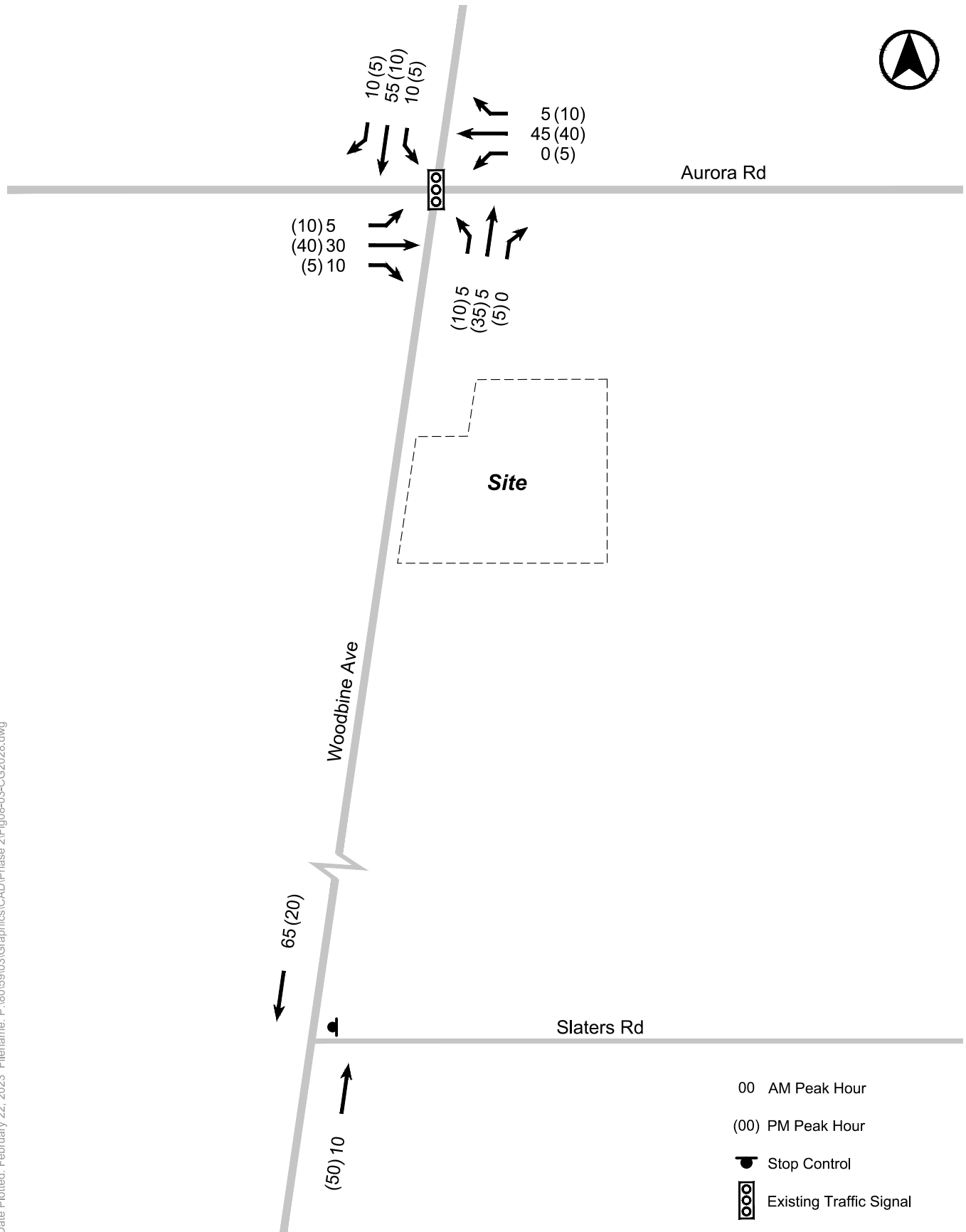


FIGURE 8 CORRIDOR GROWTH TRAFFIC VOLUMES - 5 YEAR (2028)

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig09-03-CG2033.dwg

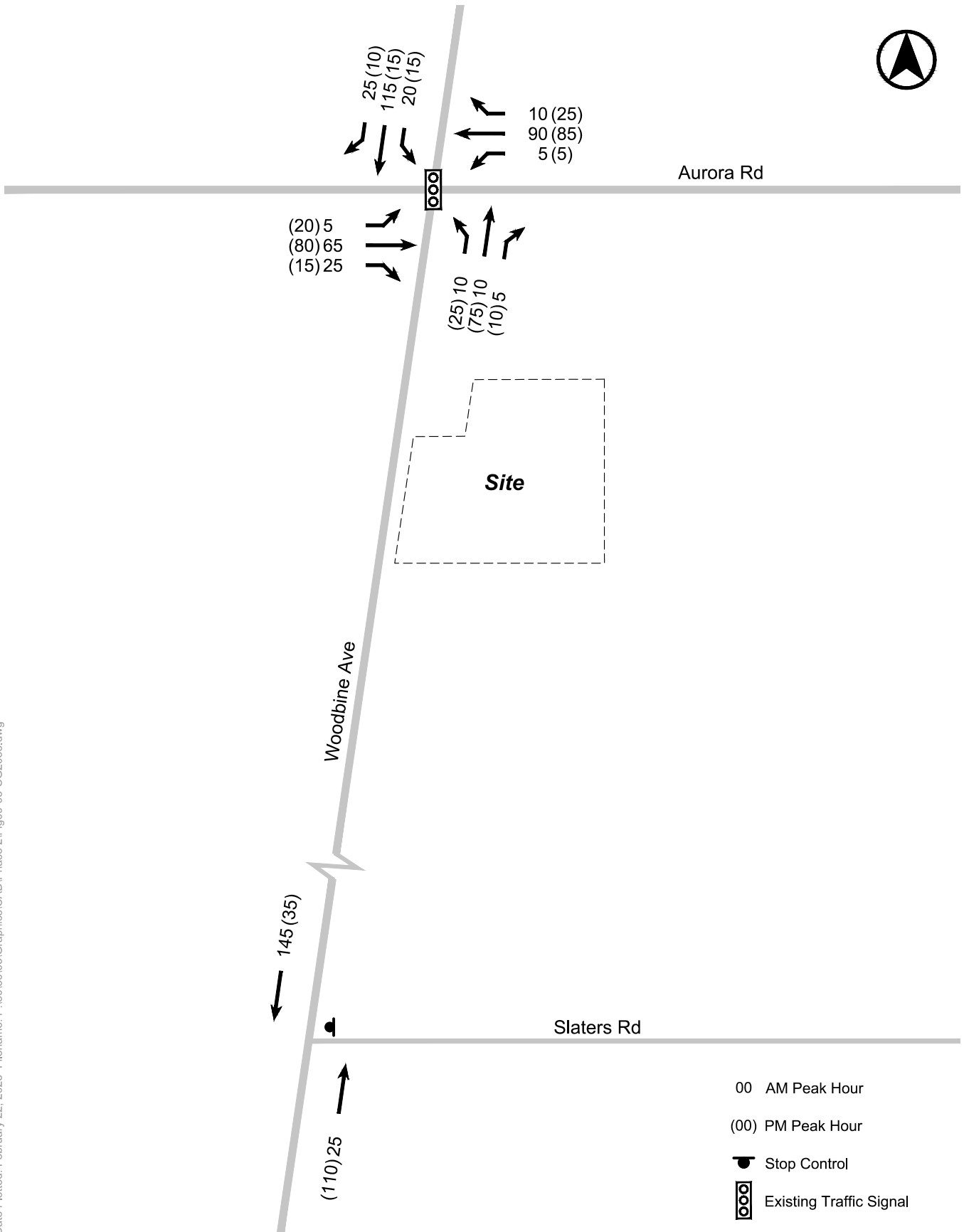


FIGURE 9 CORRIDOR GROWTH TRAFFIC VOLUMES - 10 YEAR (2033)

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig10-03-FB2028.dwg

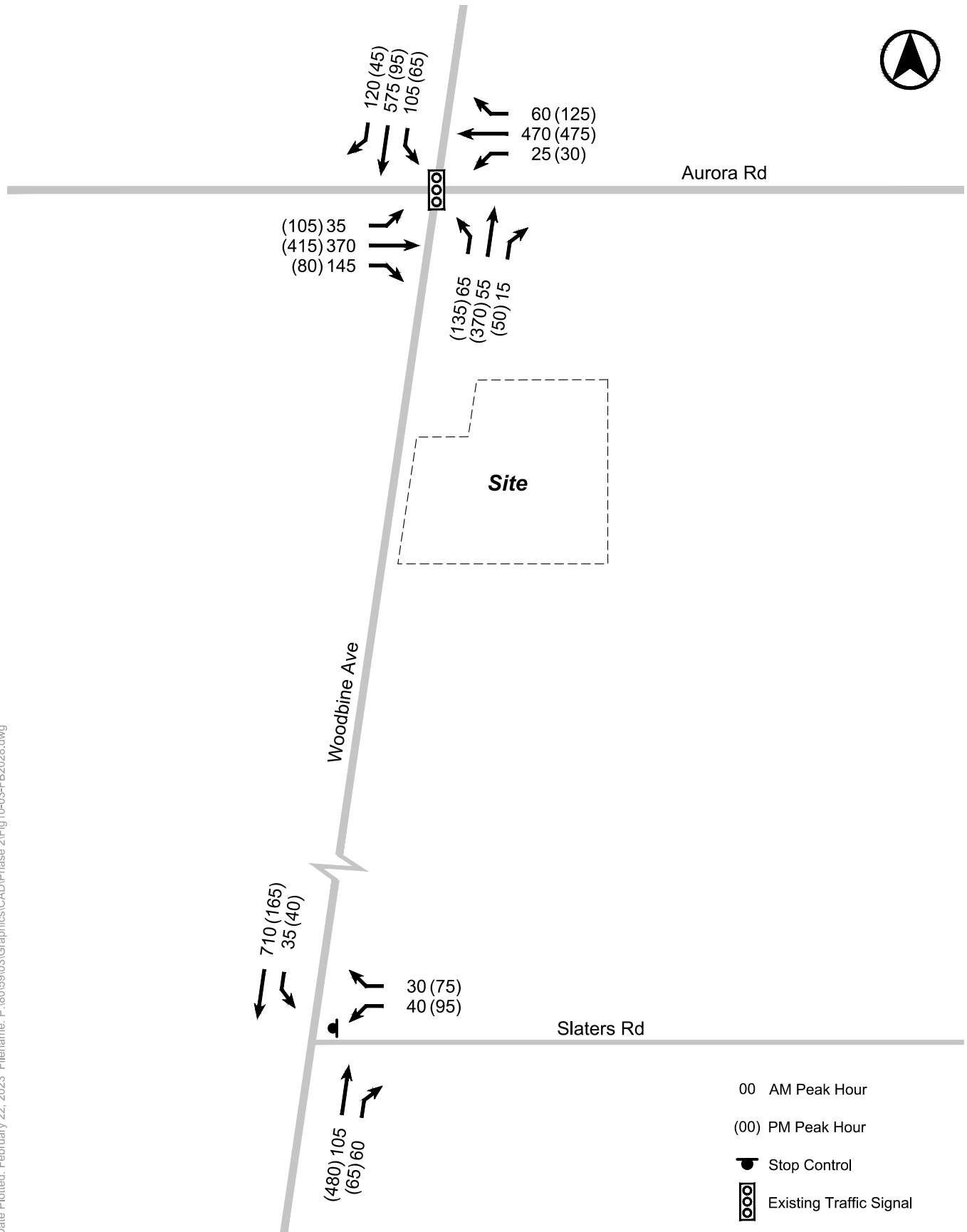


FIGURE 10 FUTURE BACKGROUND TRAFFIC VOLUMES - 5 YEAR (2028)

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig11-03-FB2033.dwg

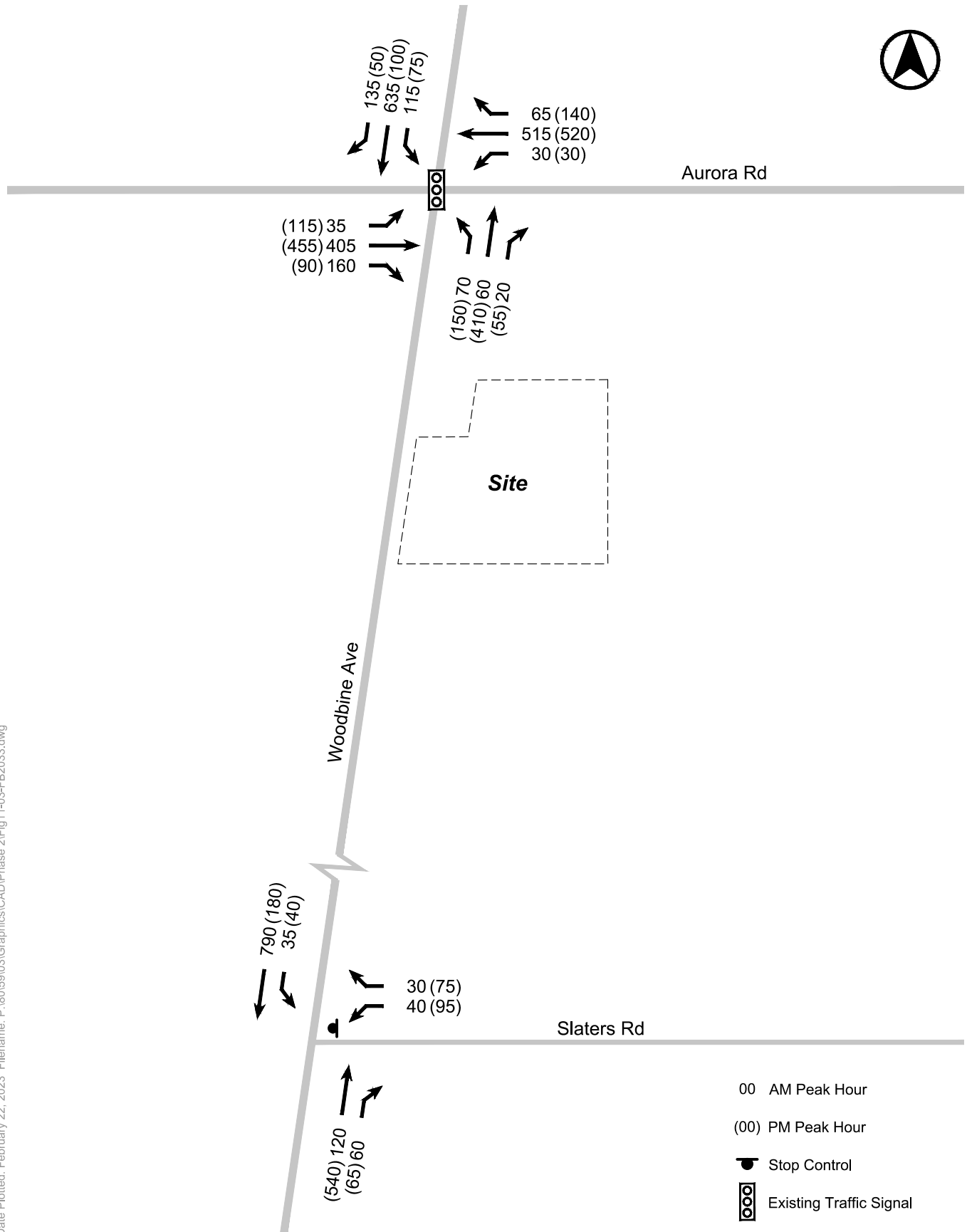


FIGURE 11 FUTURE BACKGROUND TRAFFIC VOLUMES - 10 YEAR (2033)

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig12-03-ST.dwg

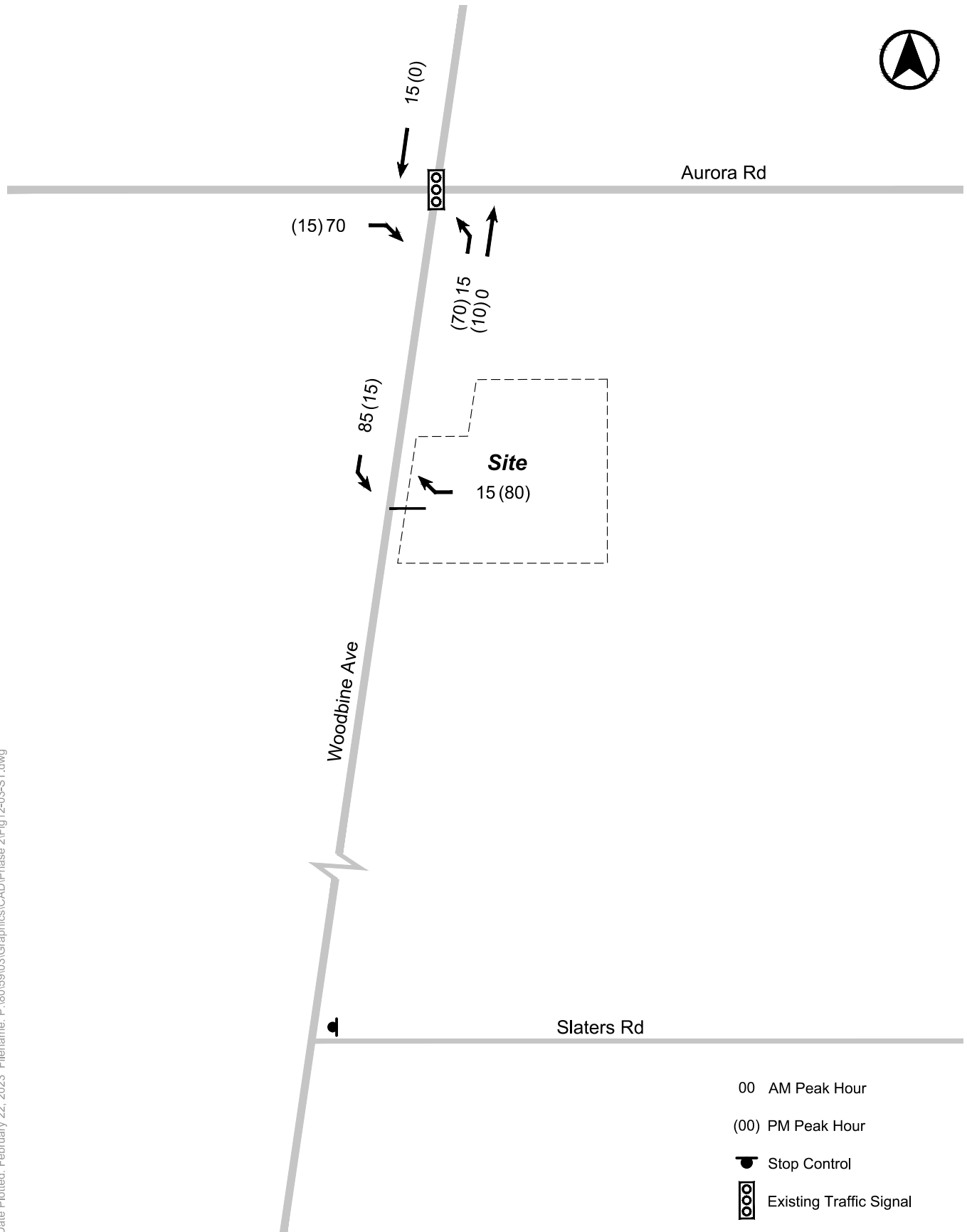


FIGURE 12 SITE TRAFFIC VOLUMES

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig13-03-FT2028.dwg

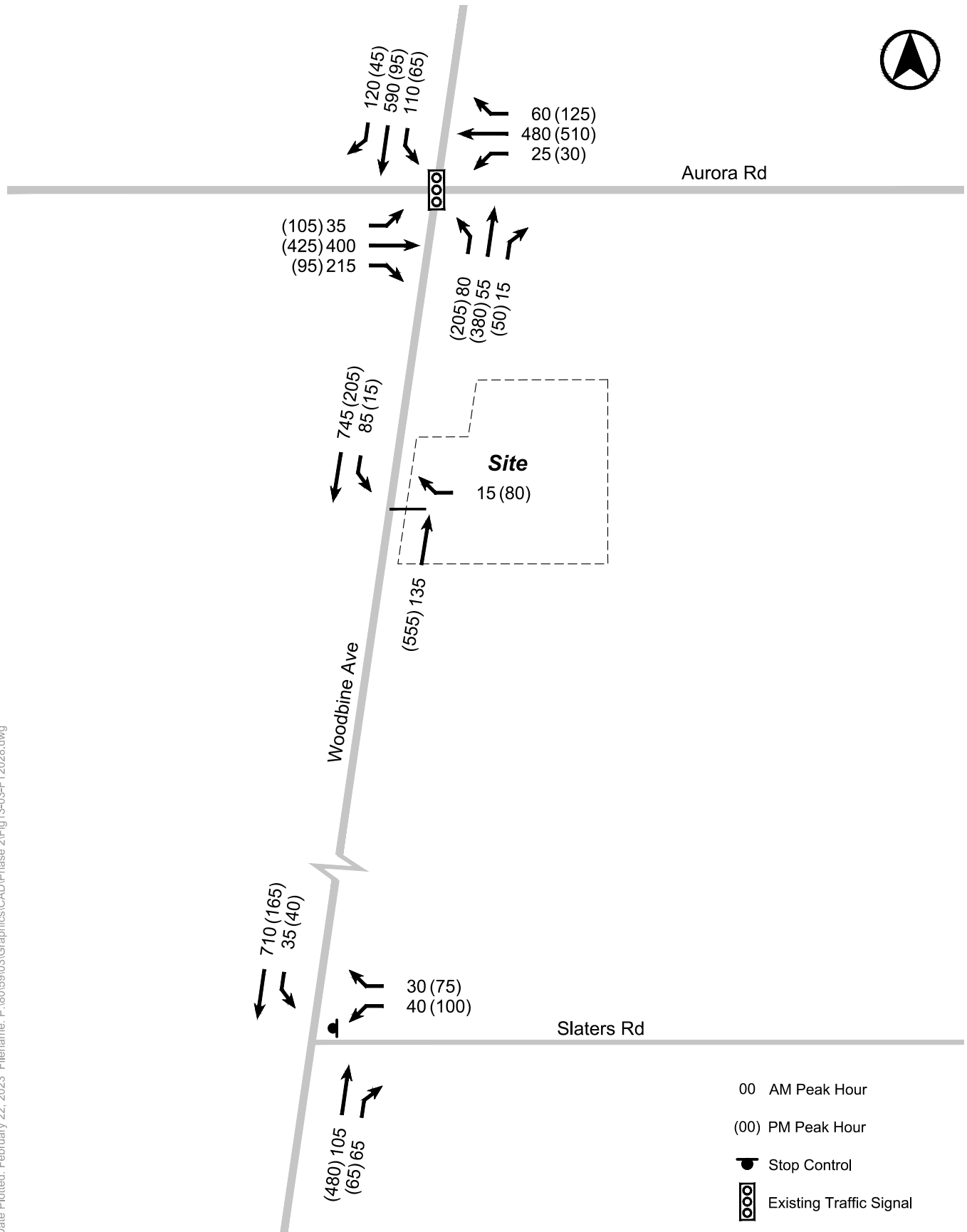


FIGURE 13 FUTURE TOTAL TRAFFIC VOLUMES - 5 YEAR (2028)

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\Fig14-03-FT2033.dwg

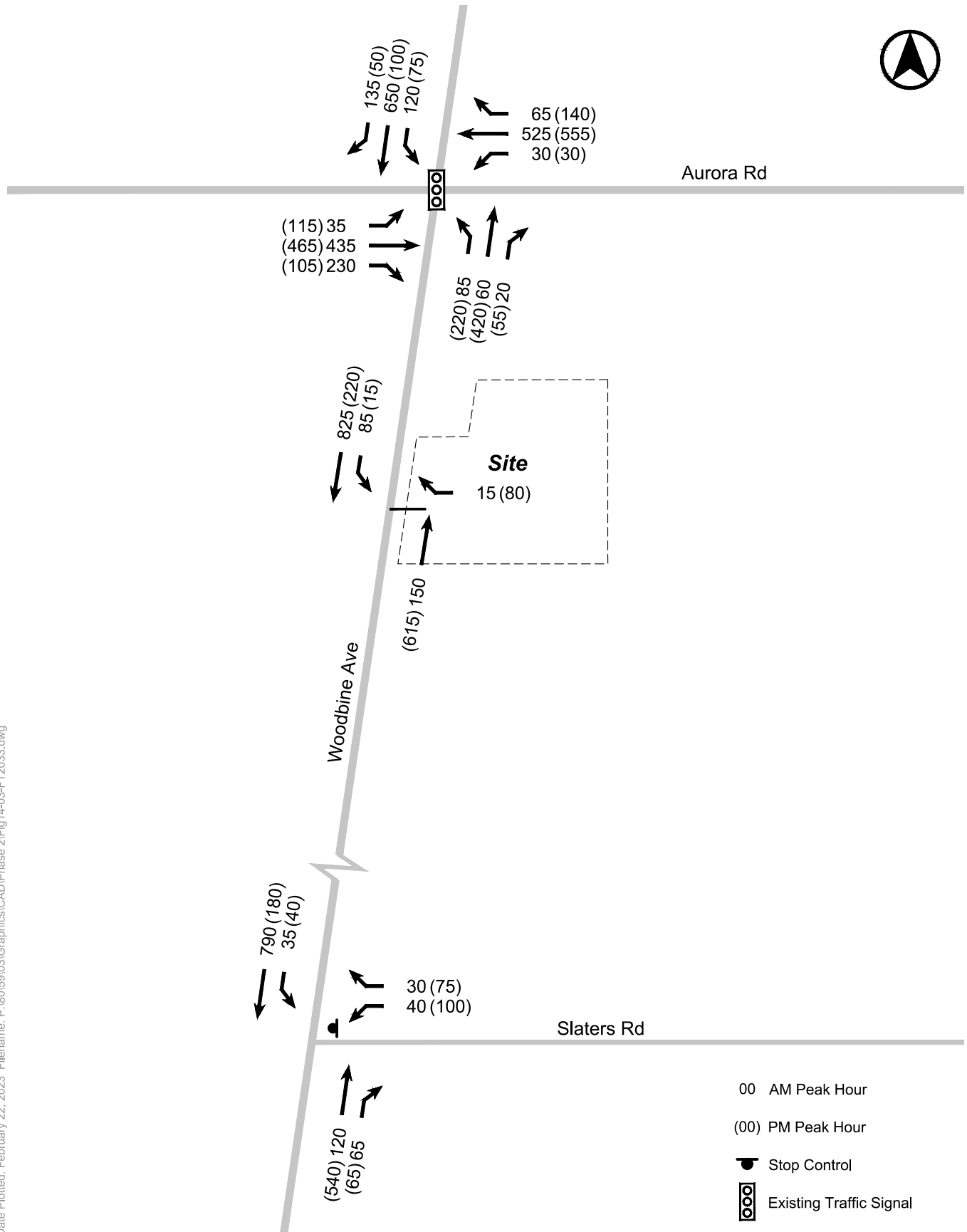


FIGURE 14 FUTURE TOTAL TRAFFIC VOLUMES - 10 YEAR (2033)

8.0 OPERATIONAL ANALYSIS

8.1 ANALYSIS METHODOLOGY

Synchro version 11.1 and the Highway Capacity Manual (HCM) methodology were used to analyze the study area intersections and site access points.

For signalized intersections, the volume-to-capacity ratio (v/c) is an indicator of the capacity utilization for the key movements in the intersection. A v/c of 1.00 indicates that a traffic movement through an intersection is operating at or near maximum capacity.

Further to the above, it is noted that York Region's Transportation Mobility Plan Guidelines specify that at rural intersections, a v/c ratio of 0.7 or higher is deemed to be "critical" in terms of operations, and that movements which experience a v/c ratio of 0.7 or higher may be considered for possible remedial measures.

For unsignalized intersections, level of service (LOS) characterizes operational conditions for key movements in terms of average delay experienced by vehicles attempting to complete a manoeuvre through the intersection. LOS 'A' represents a good level of service with short delays, while LOS 'F' represents a poor level of service with extended delays.

Detailed analysis worksheets for each intersection in the Site vicinity are provided in **Appendix G**.

8.2 ANALYSIS ASSUMPTIONS AND PARAMETERS

A base saturation flow of 2,000 vehicles per hour per lane was assumed for Regional roads and a lost time adjustment of 0 seconds was utilized, in accordance with York Region's Transportation Mobility Plan Guidelines. A base saturation flow of 1,900 vehicles per hour per lane was assumed for municipal roads. Peak hour factors and heavy vehicle percentages were calculated based on existing traffic volume data extracted from the traffic counts utilized in this study.

Existing traffic signal timing plans for the signalized intersections within the study area were obtained from York Region and are provided in **Appendix H**. Analyses were undertaken using these signal timing plans.

8.3 AURORA ROAD / WOODBINE AVENUE

The intersection of Aurora Road / Woodbine Avenue is signalized and operates with a callable north-south phase at all times of day. When called, the signal has a maximum cycle length of 65 seconds in both the AM and PM peak hours.

Under existing conditions (2023), the intersection operates at overall v/c ratios of 0.56 and 0.42 during the AM and PM peak hours, respectively.

Under future background conditions, the intersection is expected to operate at:

- Overall v/c ratios of 0.63 and 0.50 in the AM and PM peak hours, respectively, for the 5 year horizon (2028); and
- Overall v/c ratios of 0.69 and 0.55 in the AM and PM peak hours, respectively, for the 10 year horizon (2033).

Under future total conditions, the intersection is expected to operate at:

- Overall v/c ratios of 0.64 and 0.57 in the AM and PM peak hours, respectively, for the 5 year horizon (2028); and
- Overall v/c ratios of 0.70 and 0.62 in the AM and PM peak hours, respectively, for the 10 year horizon (2033).

Overall, it is estimated that the proposed development will have minimal impact on the operation of this intersection and can be adequately accommodated. A summary of the traffic capacity analysis results for this intersection is provided in **Table 12** and for existing conditions and the 5 year horizon (2028) and in **Table 13** for the 10 year horizon (2033).

TABLE 12 PEAK HOUR ANALYSIS: AURORA ROAD / WOODBINE AVENUE (SIGNALIZED) – EXISTING AND 5 YEAR HORIZON (2028)

Lane Group	Existing			Future Background (2028)			Future Total (2028)		
	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
EBL	0.08 (0.20)	8.5 (8.4)	A (A)	0.12 (0.27)	9.3 (9.7)	A (A)	0.12 (0.28)	9.4 (10.8)	A (B)
EBT	0.37 (0.39)	10.7 (9.6)	B (A)	0.46 (0.45)	12.3 (10.7)	B (B)	0.46 (0.47)	12.3 (11.9)	B (B)
EBR	0.11 (0.04)	8.5 (7.0)	A (A)	0.16 (0.05)	9.2 (7.3)	A (A)	0.26 (0.06)	10.2 (8.1)	B (A)
WBL	0.05 (0.05)	8.1 (7.1)	A (A)	0.06 (0.07)	8.6 (7.6)	A (A)	0.06 (0.08)	8.7 (8.4)	A (A)
WBT	0.52 (0.42)	12.7 (9.9)	B (A)	0.61 (0.51)	14.8 (11.4)	B (B)	0.61 (0.53)	14.9 (12.7)	B (B)
WBR	0.04 (0.10)	8.0 (7.3)	A (A)	0.05 (0.11)	8.4 (7.7)	A (A)	0.05 (0.11)	8.5 (8.5)	A (A)
NBL	0.30 (0.40)	20.4 (22.4)	C (C)	0.47 (0.47)	22.1 (22.6)	C (C)	0.60 (0.65)	27.3 (26.0)	C (C)
NBT	0.06 (0.44)	18.3 (22.1)	B (C)	0.07 (0.46)	17.7 (21.8)	B (C)	0.07 (0.43)	17.6 (20.5)	B (C)
NBR	0.01 (0.03)	18.0 (19.8)	B (B)	0.01 (0.03)	17.4 (19.3)	B (B)	0.01 (0.03)	17.4 (18.1)	B (B)
SBL	0.30 (0.33)	19.9 (22.1)	B (C)	0.33 (0.35)	19.6 (21.8)	B (C)	0.33 (0.32)	19.5 (20.4)	B (C)
SBT	0.64 (0.11)	22.9 (20.1)	C (C)	0.67 (0.12)	23.0 (19.7)	C (B)	0.68 (0.11)	23.2 (18.5)	C (B)
SBR	0.17 (0.03)	18.9 (19.8)	B (B)	0.19 (0.03)	18.5 (19.2)	B (B)	0.19 (0.03)	18.4 (18.1)	B (B)
Overall	0.56 (0.42)	15.9 (14.0)	B (B)	0.63 (0.50)	16.7 (14.5)	B (B)	0.64 (0.57)	16.9 (15.4)	B (B)

Notes:

1. xx (xx) – AM Peak (PM Peak)

TABLE 13 PEAK HOUR ANALYSIS: AURORA ROAD / WOODBINE AVENUE (SIGNALIZED) – 10 YEAR HORIZON (2033)

Lane Group	Future Background (2033)			Future Total (2033)		
	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
EBL	0.14 (0.33)	10.0 (11.1)	B (B)	0.14 (0.36)	10.1 (12.5)	B (B)
EBT	0.52 (0.50)	13.4 (11.7)	B (B)	0.52 (0.52)	13.5 (12.9)	B (B)
EBR	0.18 (0.06)	9.8 (7.6)	A (A)	0.28 (0.07)	10.7 (8.4)	B (A)
WBL	0.08 (0.08)	9.2 (8.0)	A (A)	0.08 (0.09)	9.2 (8.8)	A (A)
WBT	0.68 (0.56)	17.0 (12.6)	B (B)	0.68 (0.59)	17.1 (13.9)	B (B)
WBR	0.05 (0.13)	8.8 (8.1)	A (A)	0.05 (0.13)	8.8 (8.8)	A (A)
NBL	0.58 (0.51)	26.0 (22.6)	C (C)	0.72 (0.69)	38.7 (27.1)	D (C)
NBT	0.07 (0.50)	17.3 (21.7)	B (C)	0.07 (0.47)	17.2 (20.5)	B (C)
NBR	0.02 (0.04)	17.0 (18.9)	B (B)	0.02 (0.04)	16.9 (17.8)	B (B)
SBL	0.36 (0.41)	19.4 (22.1)	B (C)	0.35 (0.38)	19.3 (20.7)	B (C)
SBT	0.72 (0.12)	23.6 (19.3)	C (B)	0.73 (0.11)	23.8 (18.2)	C (B)
SBR	0.22 (0.03)	18.3 (18.9)	B (B)	0.22 (0.03)	18.2 (17.8)	B (B)
Overall	0.69 (0.55)	17.7 (15.1)	B (B)	0.70 (0.62)	18.2 (16.1)	B (B)

Notes:

1. xx (xx) – AM Peak (PM Peak)

Queueing behaviour at the intersection of Aurora Road / Woodbine Avenue for existing conditions as well as the 5 and 10 year horizons (2028 and 2033) is summarized in **Table 14**. Overall, it is anticipated that future traffic queues can be acceptably accommodated at this intersection.

TABLE 14 QUEUEING ANALYSIS: AURORA ROAD / WOODBINE AVENUE (SIGNALIZED) – EXISTING, 5 YEAR HORIZON (2028), AND 10 YEAR HORIZON (2033)

Lane Group	Available Storage Length (m)	Existing		Future Background (2028)		Future Total (2028)		Future Background (2033)		Future Total (2033)	
		50 th %ile Queue (m)	95 th %ile Queue (m)	50 th %ile Queue (m)	95 th %ile Queue (m)	50 th %ile Queue (m)	95 th %ile Queue (m)	50 th %ile Queue (m)	95 th %ile Queue (m)	50 th %ile Queue (m)	95 th %ile Queue (m)
EBL	200	2.0 (5.9)	6.7 (14.9)	2.5 (6.8)	7.8 (18.7)	2.5 (7.4)	7.8 (19.9)	2.7 (7.7)	8.0 (22.7)	2.7 (9.0)	8.1 (23.1)
EBT	745	24.4 (25.8)	45.2 (47.8)	32.3 (30.4)	56.3 (59.7)	32.6 (33.0)	56.3 (62.8)	39.0 (34.5)	63.1 (70.5)	39.3 (39.9)	63.1 (70.5)
EBR	75	2.7 (0.0)	10.9 (4.9)	5.6 (0.0)	15.3 (6.1)	11.2 (0.0)	24.7 (7.0)	7.2 (0.0)	17.2 (6.8)	13.3 (0.0)	26.9 (7.4)
WBL	80	1.6 (1.4)	5.7 (5.2)	1.7 (1.8)	5.8 (6.5)	1.7 (1.9)	5.8 (6.8)	2.3 (1.8)	6.7 (6.9)	2.3 (2.1)	6.7 (6.9)
WBT	740	36.2 (28.9)	65.4 (52.7)	45.4 (36.2)	78.7 (70.2)	46.0 (39.4)	78.7 (73.8)	55.6 (41.1)	89.6 (83.4)	56.0 (47.5)	89.6 (83.4)
WBR	45	0.0 (2.6)	4.4 (10.1)	0.0 (3.2)	5.0 (12.0)	0.0 (3.5)	5.0 (12.6)	0.0 (4.1)	5.6 (14.4)	0.0 (4.7)	5.6 (14.4)
NBL	100	5.2 (13.2)	12.9 (25.9)	7.8 (16.6)	18.8 (29.8)	9.9 (25.6)	26.2 (43.6)	8.4 (18.6)	24.2 (31.8)	10.6 (26.9)	32.1 (47.1)
NBT	>1km	2.8 (21.2)	6.2 (31.1)	3.1 (23.7)	6.7 (32.5)	3.1 (23.4)	6.7 (32.3)	3.2 (26.6)	7.1 (34.9)	3.2 (25.2)	7.1 (35.7)
NBR	45	0.0 (0.0)	0.0 (4.5)	0.0 (0.0)	0.0 (5.0)	0.0 (0.0)	0.0 (4.8)	0.0 (0.0)	0.0 (5.8)	0.0 (0.0)	0.0 (5.8)
SBL	65	10.4 (7.0)	20.3 (16.7)	12.0 (7.8)	23.2 (17.2)	12.0 (7.4)	23.2 (16.7)	12.8 (9.1)	25.2 (19.1)	12.7 (8.4)	25.2 (19.1)
SBT	>1km	35.0 (4.6)	45.5 (9.4)	38.6 (5.5)	50.7 (10.2)	39.5 (5.3)	52.2 (9.8)	41.6 (5.8)	56.7 (10.3)	42.7 (5.4)	58.1 (10.3)
SBR	40	4.8 (0.0)	14.9 (3.4)	5.8 (0.0)	16.5 (4.3)	5.7 (0.0)	16.5 (4.1)	7.1 (0.0)	18.9 (4.9)	7.1 (0.0)	18.9 (4.9)

Notes:

1. xx (xx) – AM Peak (PM Peak)

8.4 UNSIGNALIZED INTERSECTIONS

Capacity analysis for the existing unsignalized intersections within the study area, including the intersection of Slaters Road / Woodbine Avenue and the proposed site access on Woodbine Avenue, are summarized in **Table 15** for the existing and 5 year horizon (2028) and in **Table 16** for the 10 year horizon (2033).

Results indicate that existing unsignalized intersections within the study area are generally expected to operate with an LOS E or better under future total conditions. Overall, it is estimated that the proposed development will have minimal impact on the operation of these intersections and can be adequately accommodated.

TABLE 15 PEAK HOUR ANALYSIS: UNSIGNALIZED INTERSECTIONS – EXISTING AND 5 YEAR HORIZON (2028)

Lane Group	Existing			Future Background (2028)			Future Total (2028)		
	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Slaters Road / Woodbine Avenue									
WBLR	0.19 (0.46)	16.9 (21.0)	C (C)	0.24 (0.58)	19.1 (27.7)	C (D)	0.24 (0.58)	19.1 (27.7)	C (D)
NBT	0.06 (0.30)	0.0 (0.0)	A (A)	0.07 (0.34)	0.0 (0.0)	A (A)	0.07 (0.34)	0.0 (0.0)	A (A)
NBR	0.04 (0.05)	0.0 (0.0)	A (A)	0.04 (0.05)	0.0 (0.0)	A (A)	0.04 (0.05)	0.0 (0.0)	A (A)
SBL	0.02 (0.05)	7.6 (9.4)	A (A)	0.03 (0.06)	7.7 (9.7)	A (A)	0.03 (0.06)	7.7 (9.7)	A (A)
SBT	0.42 (0.10)	0.0 (0.0)	A (A)	0.47 (0.12)	0.0 (0.0)	A (A)	0.47 (0.12)	0.0 (0.0)	A (A)
Proposed Site Access / Woodbine Avenue									
WBLR	Does not exist.						0.02 (0.17)	9.1 (13.7)	A (B)
NBTR							0.09 (0.35)	0.0 (0.0)	A (A)
SBL							0.06 (0.02)	7.7 (8.8)	A (A)
SBT							0.48 (0.13)	0.0 (0.0)	A (A)

Notes:

1. xx (xx) – AM Peak (PM Peak)

TABLE 16 PEAK HOUR ANALYSIS: UNSIGNALIZED INTERSECTIONS – 10 YEAR HORIZON (2033)

Lane Group	Future Background (2033)			Future Total (2033)		
	v/c	Delay (s)	LOS	v/c	Delay (s)	LOS
Slaters Road / Woodbine Avenue						
WBLR	0.27 (0.65)	21.9 (35.1)	C (E)	0.27 (0.65)	21.9 (35.1)	C (E)
NBT	0.08 (0.39)	0.0 (0.0)	A (A)	0.08 (0.39)	0.0 (0.0)	A (A)
NBR	0.04 (0.05)	0.0 (0.0)	A (A)	0.04 (0.05)	0.0 (0.0)	A (A)
SBL	0.03 (0.06)	7.7 (10.1)	A (B)	0.03 (0.06)	7.7 (10.1)	A (B)
SBT	0.53 (0.13)	0.0 (0.0)	A (A)	0.53 (0.13)	0.0 (0.0)	A (A)
Proposed Site Access / Woodbine Avenue						
WBLR	Does not exist.			0.02 (0.19)	9.2 (14.7)	A (B)
NBTR				0.10 (0.39)	0.0 (0.0)	A (A)
SBL				0.06 (0.02)	7.7 (9.0)	A (A)
SBT				0.53 (0.14)	0.0 (0.0)	A (A)

Notes:

1. xx (xx) – AM Peak (PM Peak)

Queueing behaviour at unsignalized intersections for existing conditions as well as the 5 and 10 year horizons (2028 and 2033) is summarized in **Table 17**. Overall, it is anticipated that future traffic queues can be acceptably accommodated at these intersections.

TABLE 17 QUEUEING ANALYSIS: UNSIGNALIZED INTERSECTIONS – EXISTING, 5 YEAR HORIZON (2028), AND 10 YEAR HORIZON (2033)

Lane Group	Available Storage Length (m)	Existing	Future Background (2028)	Future Total (2028)	Future Background (2033)	Future Total (2033)
		95 th %ile Queue (m)	95 th %ile Queue (m)	95 th %ile Queue (m)	95 th %ile Queue (m)	95 th %ile Queue (m)
Slaters Road / Woodbine Avenue						
WBLR	320	5.7 (18.9)	7.3 (27.6)	7.3 (27.6)	8.6 (34.1)	8.6 (34.1)
SBL	40	0.5 (1.3)	0.7 (1.5)	0.7 (1.5)	0.7 (1.7)	0.7 (1.7)
Proposed Site Access / Woodbine Avenue						
WBLR	20	Does not exist.		0.4 (5.0)	Does not exist.	0.4 (5.5)
SBL	75			1.6 (0.4)		1.7 (0.4)

Notes:

1. xx (xx) – AM Peak (PM Peak)

9.0 MULTIMODAL VOLUME PROJECTIONS

9.1 MODE SPLIT

The existing mode split of work/employment trips was determined based on the 2016 TTS for the area and is summarized in **Table 18**.

TABLE 18 EXISTING WORK/EMPLOYMENT MODE SPLIT

Mode	AM Peak	PM Peak
Driver	92%	91%
Passenger	5%	4%
Transit	2%	3%
Walk	1%	2%
Cycle	0%	0%
Total	100%	100%

Notes:

1. Based on work trips for TTS Planning District 28 (Aurora).

It is noted that while some transit trips could be expected from the Site, any transit trips would largely start or end as a driver trip from the Site as there is no transit in the immediate vicinity of the Site.

As such, for the purpose of this assessment, transit mode split has been incorporated into the driver mode split as outlined in **Table 19**.

TABLE 19 ADOPTED WORK/EMPLOYMENT MODE SPLIT

Mode	AM Peak	PM Peak
Driver	94%	94%
<i>Driver Only</i>	<i>92%</i>	<i>91%</i>
<i>Driver to Transit</i>	<i>2%</i>	<i>3%</i>
Passenger	5%	4%
Walk	1%	2%
Cycle	0%	0%
Total	100%	100%

9.2 MULTIMODAL SITE TRIP GENERATION

Based on the existing mode splits and the projected driver trips associated with the proposal, the projected multimodal trip generation for the development is provided in **Table 20**.

TABLE 20 SITE MULTIMODAL TRIP GENERATION

Mode	AM Peak Hour			PM Peak Hour		
	In	Out	2-way	In	Out	2-way
Driver	110	20	130	20	105	125
<i>Driver Only</i>	105	20	125	20	100	120
<i>Driver to Transit</i>	5	0	5	0	5	5
Passenger	10	0	10	0	5	5
Walk	0	0	0	0	5	5
Cycle	0	0	0	0	0	0
Total Person Trips	120	20	140	20	115	135

9.3 MULTIMODAL PERFORMANCE ANALYSIS

9.3.1 Overview

A multimodal performance assessment has been undertaken in accordance with the requirements of York Region's Transportation Mobility Plan Guidelines (TMPG) as provided in the following sections.

9.3.2 Transit Mode Performance

9.3.2.1 Criteria

The TMPG outlines LOS criteria for the assessment of transit performance. The criteria have been reproduced in **Table 21**.

TABLE 21 TRANSIT LEVEL OF SERVICE CRITERIA

Level of Service	Access to Transit Stops	Transit Headways	Intersection Approach (transit or curb lanes)	
			Delay (seconds/veh)	V/C
A	90% within ≤ 200 m	≤ 5 minutes	≤ 10	0 – 0.60
B	90% within ≤ 500 m and 70% within ≤ 200 m	$\leq 5 - 10$ minutes	$> 10 - 20$	0.61 – 0.70
C	90% within ≤ 500 m and 50% within ≤ 200 m	$> 10 - 15$ minutes	$> 20 - 35$	0.71 – 0.80
D	100% within ≤ 600 m	$> 15 - 20$ minutes	$> 35 - 55$	0.81 – 0.90
E	100% within ≤ 800 m	$> 20 - 30$ minutes	$> 55 - 80$	0.91 – 1.00
F	100% ≥ 800 m	> 30 minutes	> 80	> 1.00

9.3.2.2 Performance Assessment – Existing Conditions

There are no transit services operating within the immediate study area. However, an assessment has been undertaken for GO Bus routes 65 and 67 with respect to the Site and is provided in **Table 22**.

TABLE 22 TRANSIT PERFORMANCE ASSESSMENT – EXISTING CONDITIONS

Nearest Stop	Access to Transit Stops		Transit Headways		Study Area Intersections
	Site Access to Nearest Stop	LOS	Headways	LOS	
GO Bus Route 65 – Barrie					
Wellington Street East at Highway 404 Park and Ride	Approx. 1.4 km	F	40 – 60 minutes	F	N/A
GO Bus Route 67 – Keswick/North York					
Wellington Street East at Highway 404 Park and Ride	Approx. 1.4 km	F	45 – 60 minutes	F	N/A

9.3.2.3 Future Conditions

As outlined in **Section 3.2.2**, rural transit links are proposed along Aurora Road between Woodbine Avenue and Highway 48.

Since bus stop locations and transit headways are unknown at this stage, a LOS cannot be provided for these criteria. Intersection results are provided in detail in **Section 8.0** and generally satisfy the criteria in the range of LOS A to LOS B with respect to the proposed east-west movements through these intersections.

A new GO Station is also contemplated approximately 1.2 kilometres to the northeast of the Site (LOS E). GO Expansion contemplates 15-30 minute service in the peak direction on the Richmond Hill Line, which would equate to LOS D to E with respect to headways.

9.3.3 Bicycle Mode Performance

9.3.3.1 Criteria

The TPMG outlines LOS criteria for the assessment of bicycle performance. These criteria have been reproduced in **Table 23**.

TABLE 23 BICYCLE LEVEL OF SERVICE CRITERIA

Level of Service	Segment	Intersection
A	Separated cycling facilities (e.g. cycle tracks, multi-use path)	Separated cycling facilities Bicycle box or clearly delineated bicycle treatment or bicycle signal head
B	≥ 1.8 m dedicated cycling facilities (e.g. bicycle lanes with and without buffer)	> 1.8 m dedicated cycling facilities (e.g. bicycle lanes with and without buffer), Bicycle box, clearly delineated bicycle treatment or bicycle signal head
C	< 1.8 m dedicated cycling facilities with no buffer	< 1.8 m dedicated cycling facilities with no buffer, Bicycle box, clearly delineated bicycle treatment or bicycle signal head
D	≤ 1.5 m bicycle lane with no buffer	≤ 1.5 m bicycle lane and no buffer Bicycle treatment
E	Shared facilities (e.g. signed routes, sharrows or paved shoulder with minimum 1.2 m in constrained area)	Shared facilities (e.g. signed routes, sharrows or paved shoulder with minimum 1.2 m in constrained area) No clearly delineated bicycle treatment
F	No bicycle provision	No bicycle provision

9.3.3.2 Performance Assessment – Existing Conditions

As discussed in **Section 3.1.3**, bicycle infrastructure within the study area is currently limited. There are narrow paved shoulders along Aurora Road, however the widths are less than 1.2 metres and therefore do not satisfy the requirements for LOS E as outlined in **Table 23**. There is no other bicycle infrastructure within the study area.

As such, LOS F applies to all intersections and segments within the study area.

9.3.3.3 Future Conditions

As outlined in **Section 3.2.3**, improvements to the area bicycle network include:

- An on-street trail on Aurora Road between Woodbine Avenue and Warden Avenue. As the design of this trail is unknown at this stage, an LOS cannot be provided; and
- A Greenbelt Route (Oak Ridges Trail) on Slaters Road between Warden Avenue and Woodbine Avenue. As a separated cycling facility, this would satisfy the requirements for LOS A.

9.3.4 Pedestrian Mode Performance

9.3.4.1 Criteria

The TPMG outlines LOS criteria for the assessment of pedestrian performance. The criteria have been reproduced in **Table 24**.

TABLE 24 PEDESTRIAN LEVEL OF SERVICE CRITERIA

Level of Service	Segment	Intersection
A	≥ 2.0 m sidewalk with minimum 3.5 m buffer including planting and edge zone; or ≥ 3.0 m multi-use path	• ≥ 2.0 m sidewalk with minimum 3.5 m buffer including planting and edge zone; or ≥ 3.0 m multi-use path • Pedestrian signal head with sufficient pedestrian clearance time • Clearly delineated cross-walk
B	≥ 1.5 m sidewalk with minimum 1.0 m buffer including edge zone; or < 3.0 m multi-use path	• ≥ 1.5 m sidewalk with minimum 1.0 m buffer including edge zone; or < 3.0 m multi-use path • Pedestrian signal head with sufficient pedestrian clearance time • Clearly delineated cross-walk
C	≥ 1.5 m curb-faced sidewalk (no buffer)	• ≥ 1.5 m curb-faced sidewalk (no buffer) • Pedestrian signal head with sufficient pedestrian clearance time • Clearly delineated cross-walk
D	< 1.5 m sidewalk	• < 1.5 m sidewalk • Pedestrian signal head with sufficient pedestrian clearance time • No clearly delineated cross-walk
E	Paved shoulder or no sidewalk provision	• Paved shoulder or no sidewalk provision • No pedestrian signal head • No clearly delineated cross-walk
F	No sidewalk provision	• No sidewalk provision • No pedestrian signal head • No clearly delineated cross-walk

9.3.4.2 Performance Assessment – Existing Conditions

As discussed in **Section 3.1.3**, there is currently limited pedestrian infrastructure within the study area. Narrow paved shoulders are provided along Aurora Road in the vicinity of the Site.

Based on the foregoing, LOS E applies to Aurora Road, and LOS F applies to all other road segments within the study area. Further, LOS F applies to all intersections within the study area as none include sidewalk provisions, pedestrian signal heads, or clearly delineated cross-walks.

9.3.4.3 Future Conditions

As outlined in **Section 3.2.3**, improvements to the area pedestrian network include:

- An on-street trail on Aurora Road between Woodbine Avenue and Warden Avenue. As the design of this trail is unknown at this stage, an LOS cannot be provided; and
- A Greenbelt Route (Oak Ridges Trail) on Slaters Road between Warden Avenue and Woodbine Avenue. As the design of this trail is unknown at this stage, an LOS cannot be provided.

10.0 TRANSPORTATION DEMAND MANAGEMENT (TDM)

Consistent with York Region's Transportation Mobility Plan Guidelines, the proposed development will include a Transportation Demand Management (TDM) plan that will attempt to influence the way people travel to and from the Site through a comprehensive suite of TDM strategies.

These measures will include the application of various strategies to reduce congestion and minimize the overall reliance on single-occupant vehicles (SOVs) while promoting the use of more active and sustainable modes of transportation.

10.1 PROPOSED TDM PLAN

Strategies must be adopted to encourage the use of alternate sustainable travel modes, increase vehicle occupancy, and cooperate with the future region-wide trail system. Based upon the Site transportation context and proposed land uses, the following TDM strategies have been selected for the proposed development.

10.1.1 Carpool Incentives

In an effort to increase the viability and attractiveness of carpooling, a number of carpool incentives are recommended as outlined below.

- **Carpool parking:** The inclusion and prioritization of on-site carpool parking can incentivize carpooling by increasing its attractiveness as a mode. In this case, it is recommended that 2 carpool parking spaces be provided for each of Building 2A, 2B and the storage building. The carpool parking spaces are to be provided in desirable locations close to the building entrance.
- **Internal carpool program:** The implementation and promotion of an internal carpool program would increase the visibility of carpooling as an alternative while also facilitating and improving the viability of carpooling by assisting with carpool matching. Management will be encouraged / incentivized to establish an internal carpool program in accordance with the above.
- **Promotional campaign:** The implementation of promotional carpool campaigns, such as carpool to work weeks with reward incentives, will encourage the employees of the development to explore carpooling as an alternative. Management will be encouraged / incentivized to establish promotional carpool campaigns in accordance with the above.

10.1.2 Bicycle Incentives

In an effort to increase the viability and attractiveness of cycling as a travel mode, a number of bicycle incentives are recommended as outlined below.

- **On-site bicycle parking:** The provision of on-site bicycle parking increases the attractiveness and viability of cycling as a mode of travel. On-site bicycle parking is proposed as outlined in **Section 5.0**, notwithstanding that there is no bicycle parking requirement.
- **Shower and change facilities:** The provision of shower and change facilities increases the attractiveness and viability of cycling as a mode of travel. It is recommended to provide one shower and change facility for each of Building 2A, 2B and the storage building.

- **Bicycle repair station:** The provision of a bicycle repair station increases the attractiveness and viability of cycling as a transportation mode. It is recommended to provide a bicycle repair station for each of Building 2A, 2B and the storage building.
- **Bicycle information package:** The provision of a bicycle information package to new employees will help educate them on the available bicycle routes and facilities in the area and increase the visibility of cycling as an alternative mode of travel. Management will provide bicycle information packages to employees upon occupancy.

10.2 TDM CHECKLIST

The preliminary TDM checklist for the site is provided in **Table 25**.

TABLE 25 PROPOSED TDM IMPLEMENTATION PLAN

Measure	Description	Cost Estimate	Implementation Strategy
Carpool Incentives	Management to create and promote an internal carpooling program	N/A	Developer to encourage / incentivize management
	Management to run carpool promotional campaigns	N/A	Developer to encourage / incentivize management
Bicycle Incentives	Provision of 11 bicycle parking spaces for Building 2A, 9 bicycle spaces for Building 2B and 6 bicycle spaces for the storage building	\$2,200 for Building 2A (11 spaces x \$200 per space) \$1,800 for Building 2B (9 spaces x \$200 per space) \$1,200 for the storage building (6 spaces x \$200 per space)	Construct as part of development
	Provision of 1 bicycle repair station for each building	\$1,000 for each building	Construct as part of development
	Management to provide bicycle information package (including information on local routes and bicycle facilities) to each employee	\$250 ¹	Upon occupancy

Notes:

1. York Region responsible for providing promotional materials to the developer. Nominal allowance of \$250 to cover cost of distributing materials provided by the Region

11.0 SUMMARY AND CONCLUSIONS

Proposal Overview

1. The application is for a Zoning By-law Amendment (ZBA) to subdivide the land into two properties, with the following proposed on each property:
 - **North Property**
 - 2,906 square metres office (Building 2A)
 - **South Property**
 - 1,876 square metres office (Building 2B)
 - Contractor's yard and 2,548 square metres storage building
2. A Site Plan Application (SPA) is also being submitted for the north property (Building 2A) only.
3. Vehicle access is proposed via a driveway connecting to Woodbine Avenue at the south end of the site. A left turn lane is proposed to be constructed on Woodbine Avenue to provide left turn access into the site.
4. A total of 249 car parking spaces are proposed across the Site, including 12 barrier free spaces, including:
 - **North Property – 135 spaces, comprising:**
 - 135 spaces (including 6 accessible spaces) adjacent Building 2A.
 - **South Property – 114 spaces, comprising:**
 - 98 spaces (including 5 accessible spaces) adjacent Building 2B
 - 16 spaces (including 1 accessible spaces) adjacent the storage building
5. In addition, bicycle end of trip facilities are proposed as follows:
 - **Building 2A:** 11 spaces and a bicycle repair station adjacent the front of the building
 - **Building 2B:** 9 spaces adjacent the front of the building
 - **Storage Building:** 6 spaces adjacent the front of the building
6. A loading bay is proposed adjacent to the east side of Building 2A, and 4 loading bays are proposed within the storage building.
7. BA Group are advised that in the order of 10-15 trucks up to 45 feet in length are intended to potentially access the contractors yard, generally occurring between 6:00am-8:00am (inbound) and 2:00pm-4:00pm (outbound).

Car Parking Requirements and Provision

8. The applicable parking requirement is 146 spaces for Building 2A, 94 spaces for Building 2B and 16 spaces for the storage building (110 spaces total for the south property).

9. The applicable accessible parking requirement is 6 spaces (3 Type A and 3 Type B) for Building 2A, 4 spaces (2 Type A and 2 Type B) for Building 2B and 1 space (1 Type A) for the storage building (5 spaces total for the south property).
10. The proposed plans for Building 2A include a total of 135 parking spaces, which represents a slight shortfall from the requirement of the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO of 146 spaces. Notwithstanding, the provision is sufficient to accommodate the expected maximum staff numbers of 101 plus a surplus available for visitors, noting that this is a purpose-built office building. The provision of 6 barrier free spaces (3 Type A and 3 Type B) satisfies the barrier free car parking requirement.
11. The proposed south property plans include a total of 114 parking spaces, including 98 spaces adjacent Building 2B and 16 spaces adjacent the storage building, both of which satisfy the zoning by-law requirements. The provision of 4 barrier free spaces (2 Type A and 2 Type B) for Building 2B and 1 barrier free space (1 Type A) also satisfies the barrier free car parking requirement.

Bicycle Parking

12. There are no bicycle parking rates listed in the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO, however it is understood that Whitchurch-Stouffville typically applies rates as listed within the City of Markham Draft Comprehensive Zoning By-law.
13. Application of these rates results in:
 - **Building 2A:** 11 bicycle spaces, including 5 long-term spaces and 6 short-term spaces.
 - **Building 2B:** 9 bicycle spaces, including 3 long-term spaces and 6 short-term spaces
 - **Storage Building:** 6 bicycle spaces, including 2 long-term spaces and 4 short-term spaces
14. The proposed bicycle parking provision satisfies these rates.

Loading

15. The Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO does not include a requirement for any loading spaces for office land use. Notwithstanding, a loading space is proposed adjacent to the proposed Building 2A.
16. For the proposed storage building, the Whitchurch-Stouffville Comprehensive Zoning By-law 2010-001-ZO requires the provision of 4 loading spaces measuring 15 metres in length, 3.6 metres in width, and with 4.25 metres clear height.
17. The proposed contractors yard and storage building comprises storage occurring within the contractors yard itself and within the storage building, accessed by overhead doors. Four loading spaces in

accordance with the above requirements have been provided within the building, adjacent to overhead doors.

18. The waste refuse area for Building 2A is located to the east of the proposed office building. Molok containers are located to the east of the proposed Building 2B and waste refuse areas for the contractors yard are located to the south of the storage building.
19. Vehicle manoeuvring diagrams have been prepared which demonstrate Site access and circulation by the relevant heavy vehicles.

Traffic Analysis Scope

20. Analysis was completed for multiple horizon years, in accordance with York Region requirements.
21. Based on the foregoing, analysis has been completed for the following scenarios during the AM and PM peak hours:
 - Existing Conditions (2023);
 - Future Background Conditions (5 year horizon – 2028);
 - Future Background Conditions (10 year horizon – 2033);
 - Future Total Conditions (5 year horizon – 2028); and
 - Future Total Conditions (10 year horizon – 2033).
22. Capacity analysis was undertaken to determine the site vehicular traffic impacts within the study area listed below:
 - Aurora Road / Woodbine Avenue;
 - Slaters Road / Woodbine Avenue; and
 - Woodbine Avenue / Site driveway

Vehicular Traffic Generation Estimate

23. The proposed development is projected to generate approximately 130 and 125 two-way vehicle trips during the AM and PM peak hours respectively.

Traffic Operations

24. It is expected that traffic associated with the proposed development can be suitably accommodated at all intersections within the study area with minimal capacity impacts.
25. Based on the capacity analysis, the Site traffic impact on the area intersection network is small and can be accommodated without changes to intersection geometry, road geometry, or traffic signal timings.

Multimodal Volumes

26. A total of 140 and 135 two-way person trips are projected for the proposed development in the AM and PM peak hours, respectively.
27. The projected multimodal volumes are largely comprised of driver trips, with some transit, passenger and walk trips.

Transit Mode Performance

28. There are no transit services operating within the immediate study area.
29. A rural transit link is proposed along Aurora Road between Woodbine Avenue and Highway 48 (Ballantrae). A new GO Station is also contemplated approximately 1.2 kilometres to the northeast of the Site

Bicycle Mode Performance

30. Bicycle infrastructure within the study area is currently limited to narrow paved shoulders along Aurora Road, which have widths of less than 1.2 metres.
31. Future improvements to the area bicycle network include:
 - An on-street trail on Aurora Road between Woodbine Avenue and Warden Avenue; and
 - A Greenbelt Route (Oak Ridges Trail) on Slaters Road between Warden Avenue and Woodbine Avenue.

Pedestrian Mode Performance

32. There is currently no pedestrian infrastructure within the study area, with the exception of the narrow paved shoulders along Aurora Road discussed above.
33. Improvements to the area pedestrian network include the aforementioned trails on Aurora Road and Slaters Road.

Transportation Demand Management

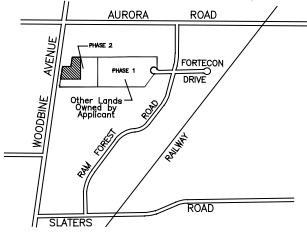
34. A Transportation Demand Management (TDM) plan has been prepared which will aim to reduce the overall reliance on single-occupant vehicles (SOVs) while promoting the use of more active and sustainable modes of transportation.
35. The following list represents a mix of infrastructure based and programmatic TDM strategies that could apply to the Site. The specific TDM strategies that will be implemented will be reviewed and confirmed as part of the future Site Plan Approval process.
- Carpool incentives, including an internal carpool program, and carpool promotional campaigns; and
 - Bicycle incentives, including the provision of on-site bicycle parking, bicycle repair stations, and bicycle information packages for new employees.

APPENDIX A:

Reduced Site Plan (not to scale)



KEY MAP



Subject Lands of Site Plan Approval Application

INFORMATION FOR PROPOSED LOT 2A

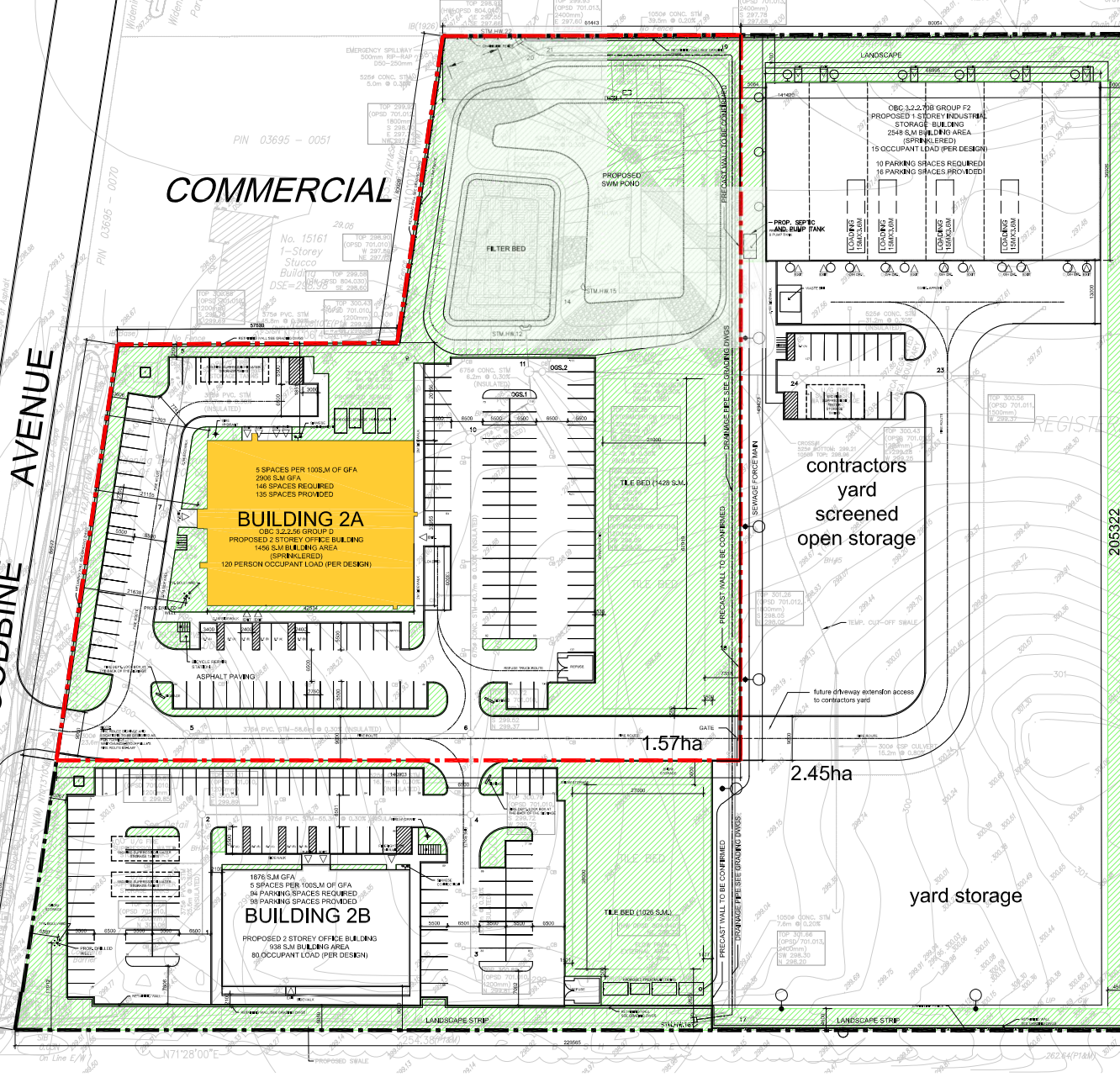
DESCRIPTION	
BLOCK 19, REGISTERED PLAN 65M-2571 PART LOT 20, CONCESSION 4 TOWN OF WHITCHURCH-STOUFFVILLE REGION OF YORK	
RE-ZONING REQUEST ZBA APPLICATION	
EBP+ EMPLOYMENT BUSINESS PARK	
PROPOSED LOT AREA:	15754 S.M., 1.57 Hectares, 3.68 Acres
PROPOSED BUILDING AREAS	
OFFICE BUILDING 2A	1457 S.M., 16672 S.F.
LOT COVERAGE	9.2%
PROPOSED TOTAL GROSS FLOOR AREA	OFFICE BUILDING 2A 2906 S.M.
PROPOSED LANDSCAPED AREA	7996 S.M., 50.8% (10% REQ'D)
PARKING	
PARKING SPACES REQUIRED	146 (INCL. 6 B.F. SPACES)
PARKING SPACES PROVIDED	134 (INCL. 6 B.F. SPACES)

INFORMATION FOR PROPOSED LOT 2B

DESCRIPTION	
BLOCK 19, REGISTERED PLAN 65M-2571 PART LOT 20, CONCESSION 4 TOWN OF WHITCHURCH-STOUFFVILLE REGION OF YORK	
RE-ZONING REQUEST ZBA APPLICATION	
EBP+ EMPLOYMENT BUSINESS PARK	
PROPOSED LOT AREA:	24496 S.M., 2.45 Hectares, 6.06 Acres
PROPOSED BUILDING AREAS	
OFFICE BUILDING 2B	938 S.M., 10066.5 S.F.
WAREHOUSE / INDOOR STORAGE	2546 S.M., 2426.4 S.F.
TOTAL BUILDING AREAS	3486 S.M., 3524.2 S.F.
LOT COVERAGE	14.2%
PROPOSED TOTAL GROSS FLOOR AREA	OFFICE BUILDING 2B 1876 S.M.
WAREHOUSE	2546 S.M., 4424 S.F.
TOTAL GROSS FLOOR AREA	4422 S.M.
PROPOSED LANDSCAPED AREA	9037 S.M., 20.6% (10% REQ'D)
PARKING	
PARKING SPACES REQUIRED	104 (INCL. 6 B.F. SPACES)
PARKING SPACES PROVIDED	114 (INCL. 6 B.F. SPACES)

COMMERCIAL

WOODBINE AVENUE



PHASE 1 SITE

CONTRACTOR TO CHECK ALL DIMENSIONS AND FOR CONFORMANCE WITH THE PROPOSED PLAN. ALL DIMENSIONS MAY BE SUBJECT TO CHANGE DUE TO DISCREPANCIES FROM THE CAD DEPARTMENTS AND/OR CHANGES TO THE PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE DIMENSIONS AND FOR THE PROPER MARKING OF THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER MARKING OF THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER MARKING OF THE SITE.

NO. 001-111111
DRAWING SHEET NUMBER

DRAWING SETS ISSUED	No.	DATE	BY
1. PRELIMINARY	1	08/12/21	PM
2. PRELIMINARY	2	08/12/21	PM
3. PRELIMINARY	3	08/12/21	PM
4. PRELIMINARY	4	08/12/21	PM

DRAWING SETS ISSUED	No.	DATE	BY
1. PRELIMINARY	1	08/12/21	PM
2. PRELIMINARY	2	08/12/21	PM
3. PRELIMINARY	3	08/12/21	PM
4. PRELIMINARY	4	08/12/21	PM

ALL PREVIOUS EDITIONS OF THIS DRAWING ARE SUPERSEDED.

REVISIONS TO DRAWING	No.	DATE	BY
1. PRELIMINARY	1	08/12/21	PM
2. PRELIMINARY	2	08/12/21	PM
3. PRELIMINARY	3	08/12/21	PM
4. PRELIMINARY	4	08/12/21	PM

NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION WITHOUT PERMIT

KNYMH
ARCHITECTURE • SOLUTIONS

KNYMH INC.
1000 BAYVIEW AVE. SUITE 101
BURLINGTON, ONTARIO L7R 4A1
T 905.635.6695
F 905.635.6694



LIMEN (Operating Entity)
SCAL Properties Ltd.
(Property Owner)

LIMEN
HEAD OFFICE 2A
FORTECON DRIVE
STOUFFVILLE, ONTARIO

PHASE 2 SITE PLAN

DRAWING SCALE: 1:400
PROJECT NUMBER: 21054

DRAWING SHEET NUMBER: SP1

APPENDIX B: Concept Functional Plan



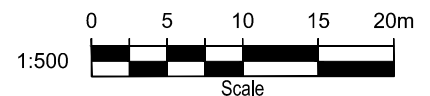
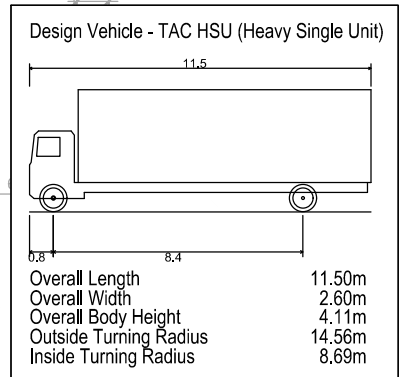
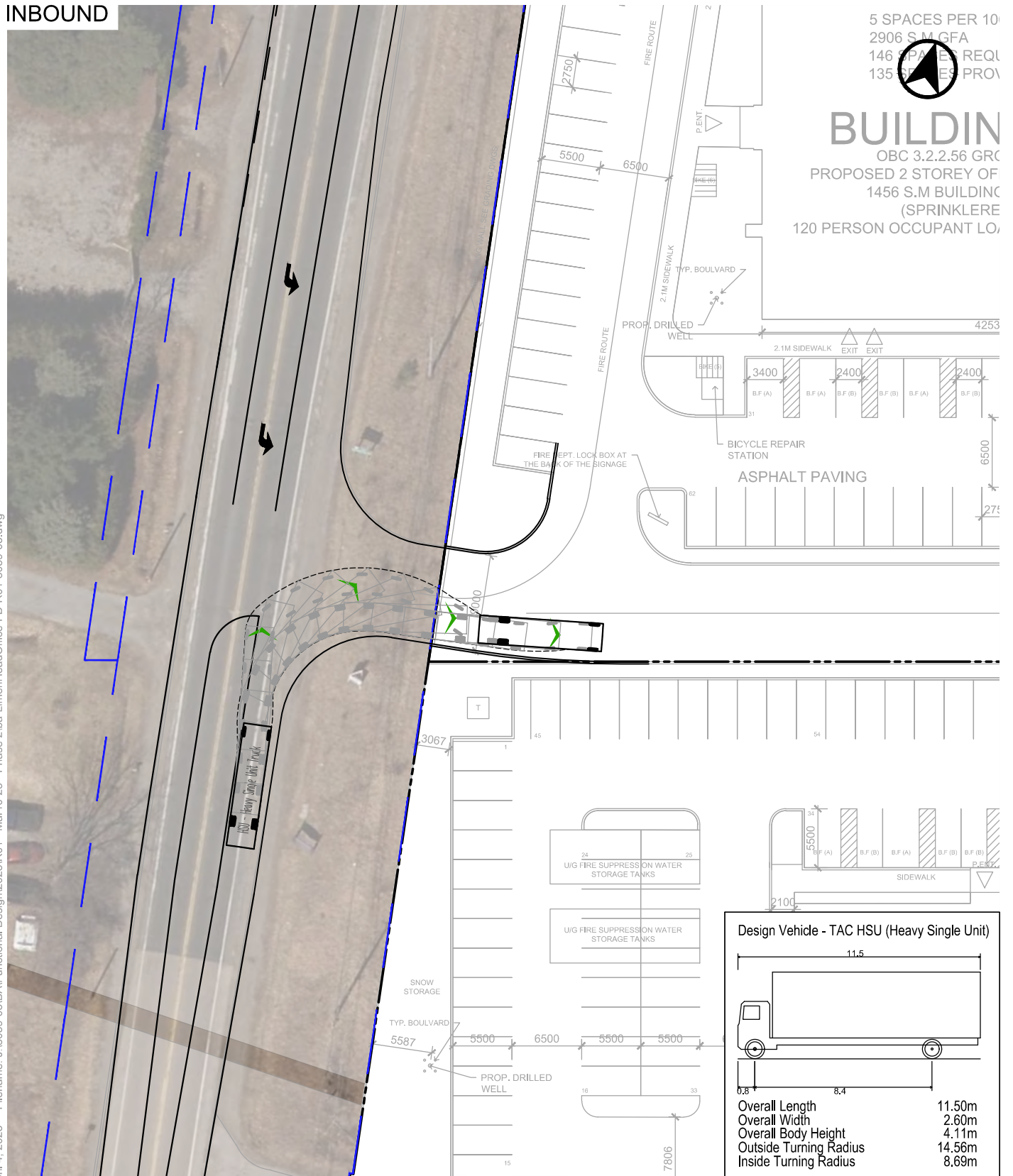
INBOUND

5 SPACES PER 10
2906 S.M.G.F.A
146 SPACES REQ
135 SPACES PROV



BUILDING

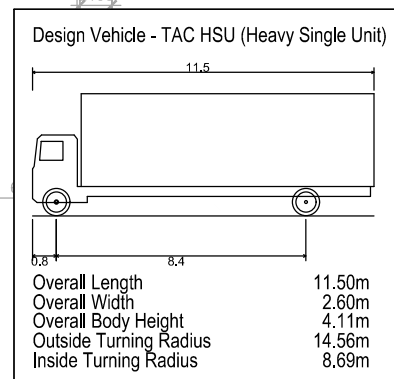
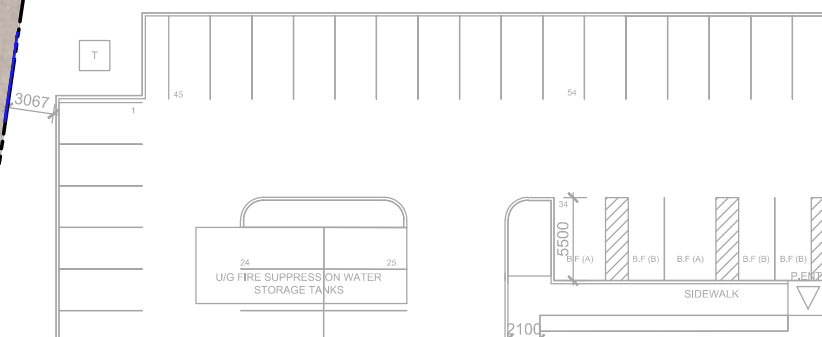
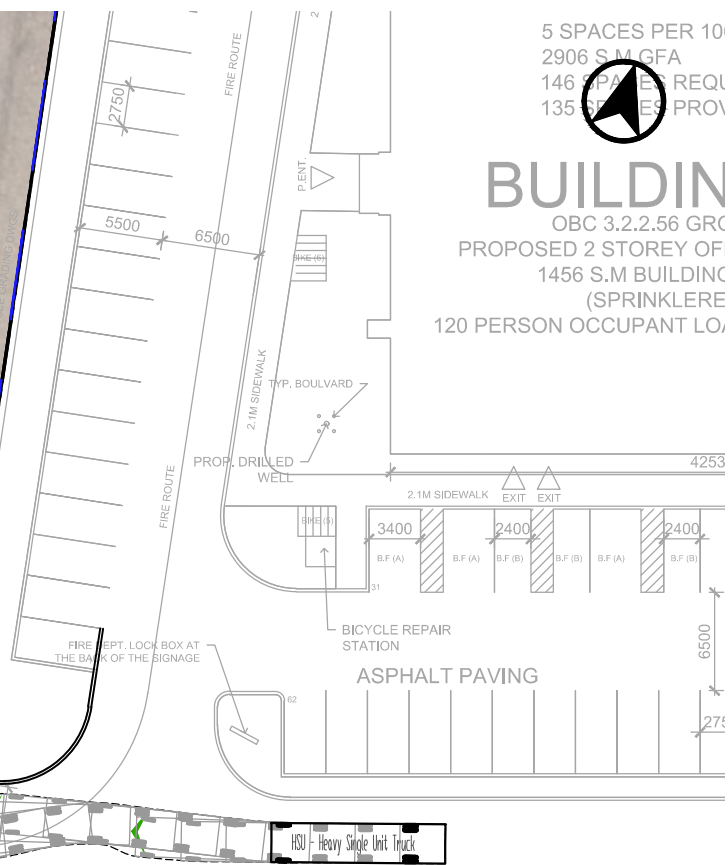
OBC 3.2.2.56 GR
PROPOSED 2 STOREY OF
1456 S.M BUILDING
(SPRINKLERE
120 PERSON OCCUPANT LO



LIMEN HEAD OFFICE
VEHICULAR MANOEUVRING DIAGRAM
SITE ACCESS - TAC HEAVY SINGLE-UNIT
(HSU)

Project: LIMEN HEAD OFFICE
Project No. 8059-03
Date: APRIL 4, 2023
Revised: --
Drawing No. **VMD-01**

OBC 3.2.2.56 GR
PROPOSED 2 STOREY OF
1456 S.M BUILDING
(SPRINKLERE
20 PERSON OCCUPANT LO,



A graphic scale bar for a 1:500 scale. The bar is divided into five equal segments, each representing 4 meters. The total length is 20 meters. The segments are colored in a repeating pattern of black and white. The scale is labeled '1:500' on the left and 'Scale' below the bar. Numerical labels 0, 5, 10, 15, and 20m are placed above the bar at regular intervals.



BA Group

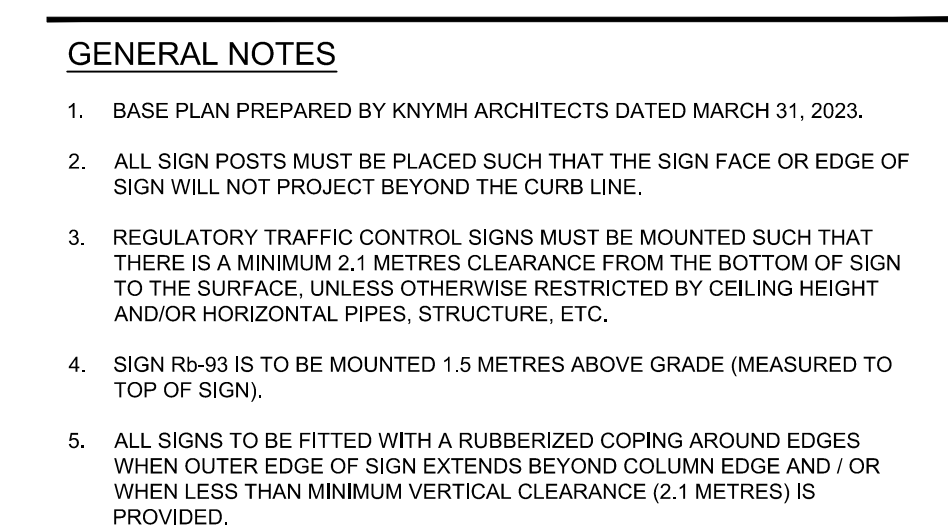
LIMEN HEAD OFFICE
VEHICULAR MANOEUVRING DIAGRAM
SITE ACCESS - TAC HEAVY SINGLE-UNIT
(HSU)

Project:	LIMEN HEAD OFFICE
Project No.	8059-03
Date:	APRIL 4, 2023
Revised:	--
Drawing No.	VMD-02

APPENDIX C:

Signage and Pavement Marking Plan





00	04-04-23	SW	ISSUED FOR SPA AND ZBA RESUBMISSION
00	MM-DD-YR	INT	REVISION NOTE

 **BA Group**

BA Consulting Group Ltd.
300 - 45 St. Clair Ave. W.
Toronto ON M4V 1K9

TEL 416 961 7110
EMAIL bagroup@bagroup.com

**MOVEMENT
IN URBAN
ENVIRONMENTS**
BAGROUP.COM

PHASE 2

TRAFFIC CONTROL PAVEMENT MARKING AND REGULATORY SIGNAGE PLAN

Date: APRIL 4, 2023

Project No.: 8059-03

Scale: 1:400



A horizontal graphic scale bar with alternating black and white segments. Above the bar, numerical values are marked at 0, 2, 4, 6, 8, 10, and 20m. The bar represents a total length of 20 meters.

TC-01

APPENDIX D: Vehicle Manoeuvring Diagrams



INBOUND RETAINING WALL SEE GRADING DWGS



OUTBOUND



Technical drawing of a truck chassis showing dimensions. The overall length is 9.33. The wheelbase is 4.17. The front overhang is 1.47 and the rear overhang is 1.4.

Overall Length	9.330m
Overall Width	2.440m
Overall Body Height	4.021m
Min Body Ground Clearance	0.250m
Track Width	2.440m
Lock-to-lock time	5.00s
Wall to Wall Turning Radius	11.700m

WASTE COLLECTION - TURTLE ISLAND FRONT LOADING REFUSE VEHICLE

Scale 0 5 10 15 20m

1:500

Drawing No. **VMD-01**

[illegible]

OUTBOUND

RETAINING WALL SEE GRADING DWGS

5 SPACES PER 100S.M OF GFA
2906 S.M GFA
146 SPACES REQUIRED
135 SPACES PROVIDED

BUILDING 2A
OBC 3.2.2.56 GROUP D
PROPOSED 2 STOREY OFFICE BUILDING
1456 S.M BUILDING AREA
(SPRINKLERED)
120 PERSON OCCUPANT LOAD (PER DESIGN)

LOADING SPACE
10m (L) x 3.0m (W) x 4.25m (H)

Design Vehicle - TURTLE ISLAND - REAR SLED

Overall Length	9.883m
Overall Width	2.552m
Overall Body Height	3.962m
Min Body Ground Clearance	0.321m
Max Track Width	2.550m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	11,768m



LIMEN HEAD OFFICE

VEHICULAR MANOEUVRING DIAGRAM

BUILDING 2A

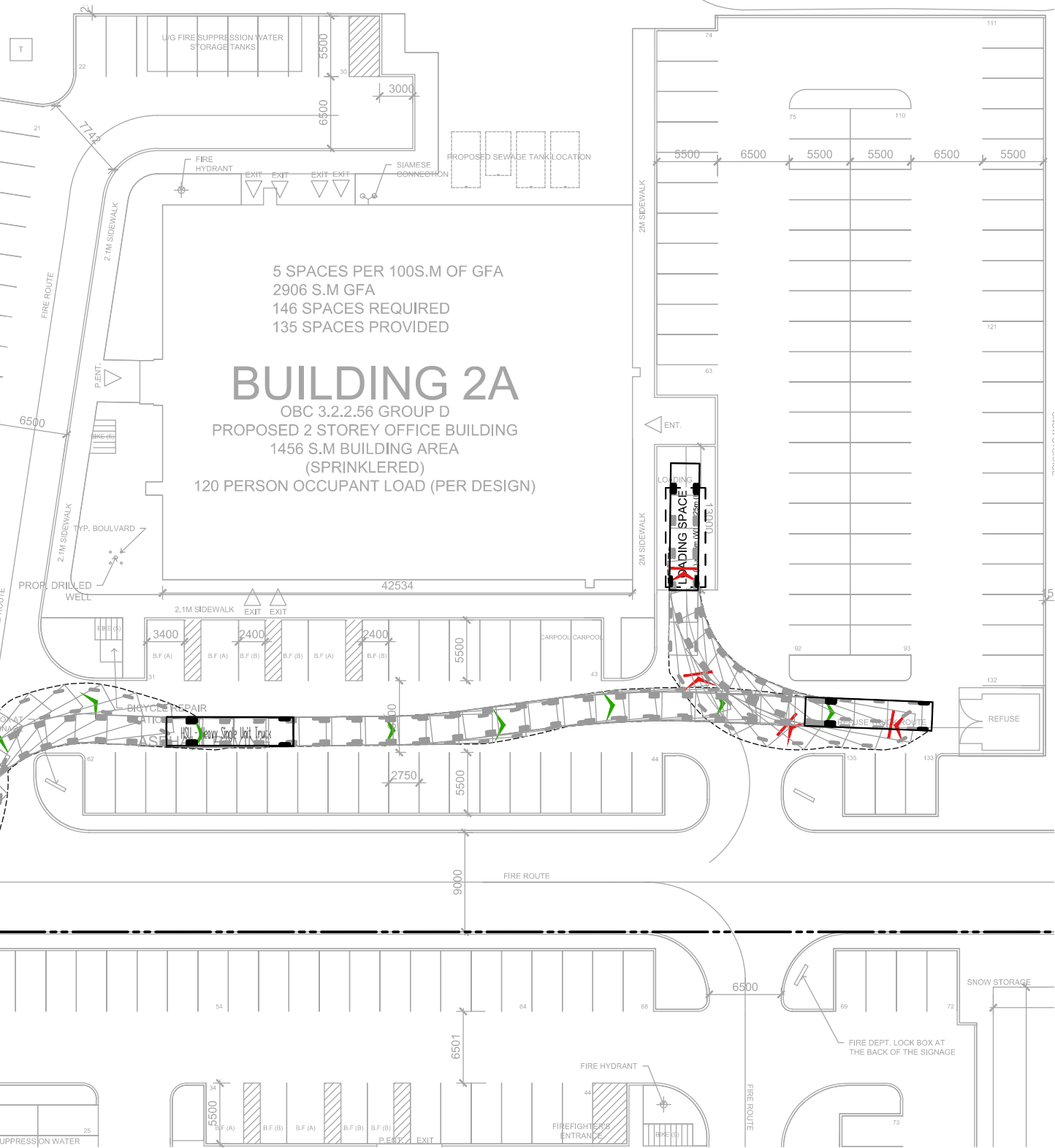
WASTE COLLECTION - TURTLE ISLAND REAR LOADING REFUSE VEHICLE

Project: LIMEN YARD FACILITY
Project No. 8059-03
Date: APRIL 4, 2023
Revised: -

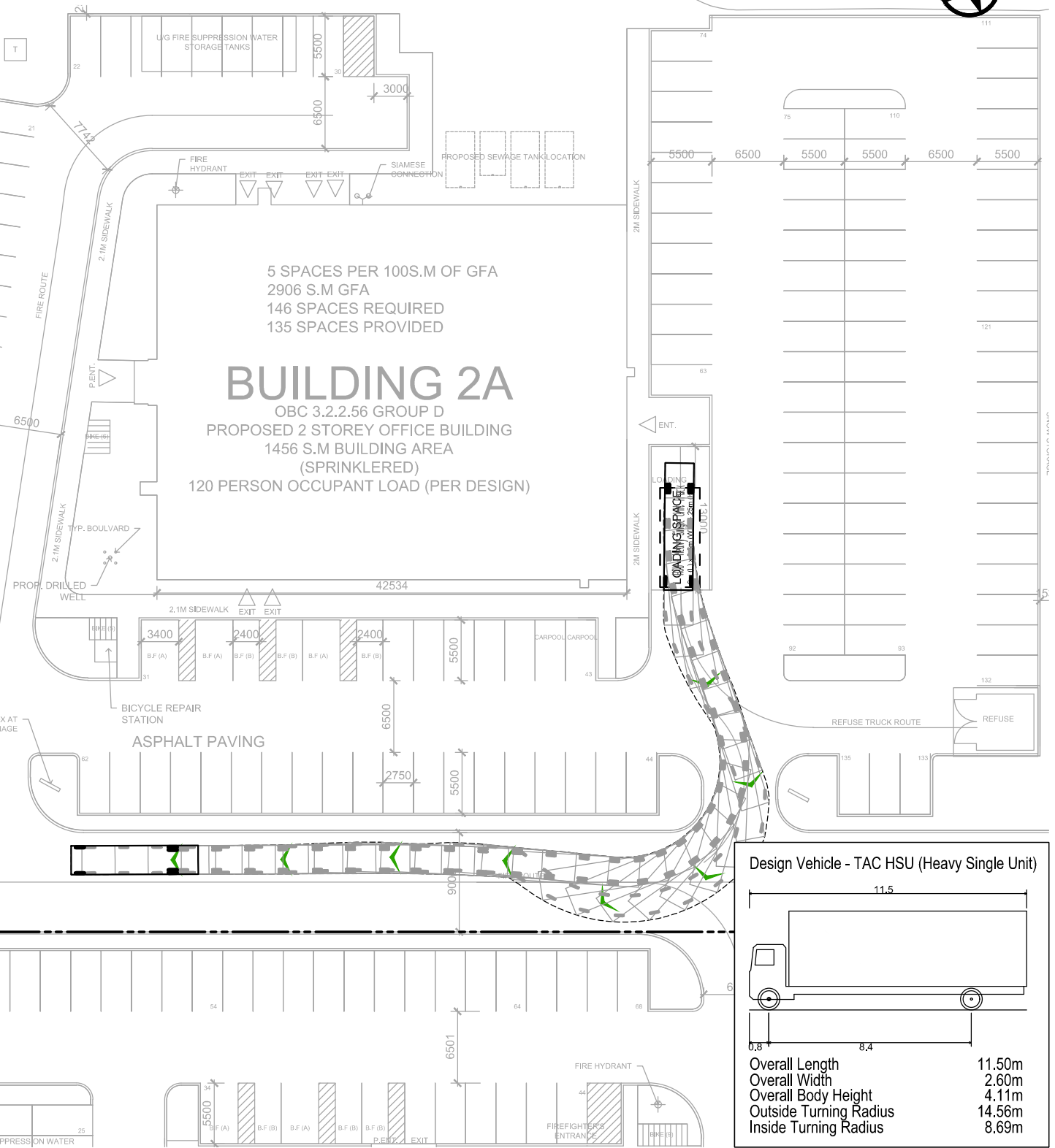
Scale 0 5 10 15 20m
1:500

Drawing No. VMD-02

INBOUND



OUTBOUND



Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length	11.50m
Overall Width	2.60m
Overall Body Height	4.11m
Outside Turning Radius	14.56m
Inside Turning Radius	8.69m

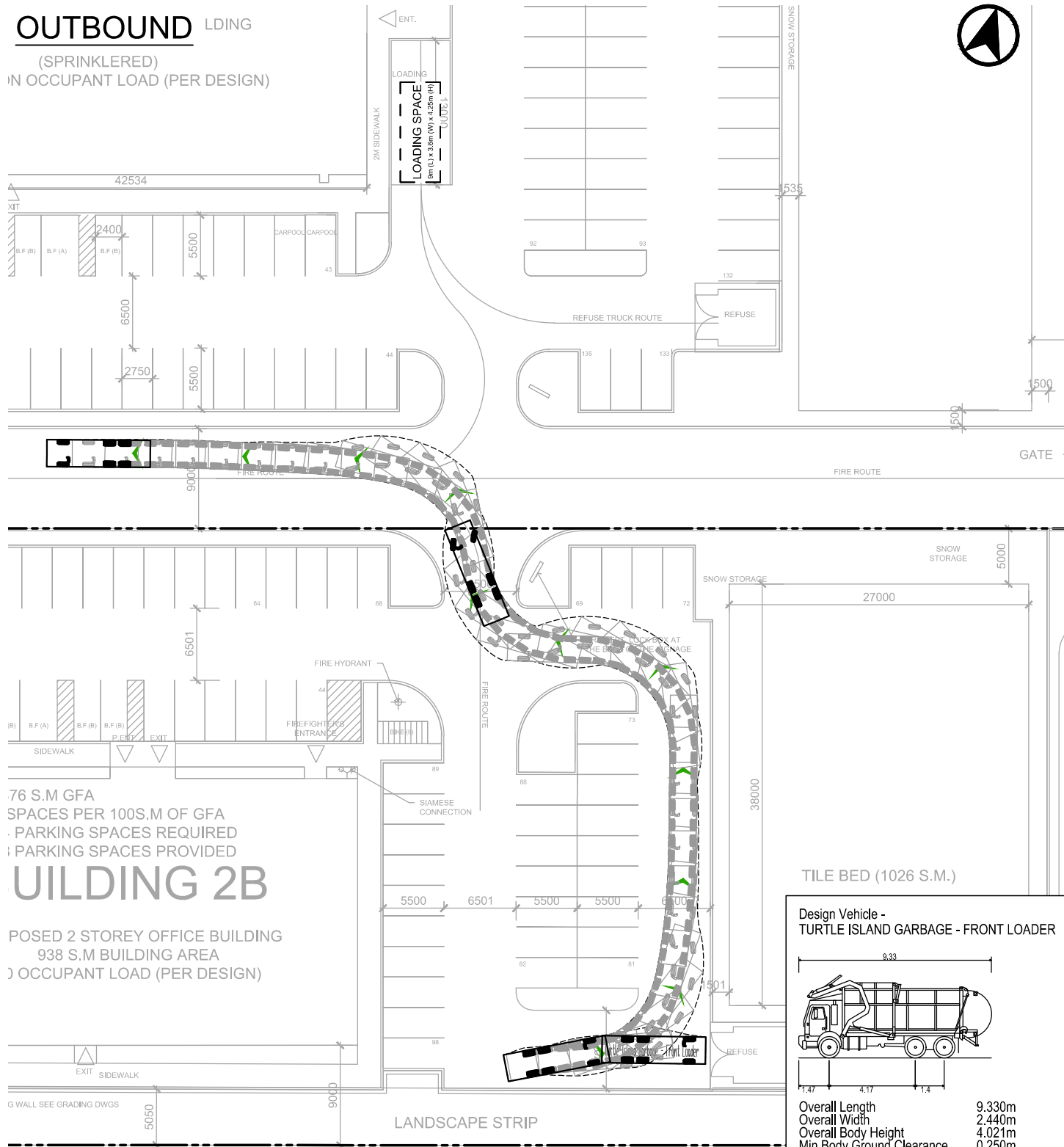
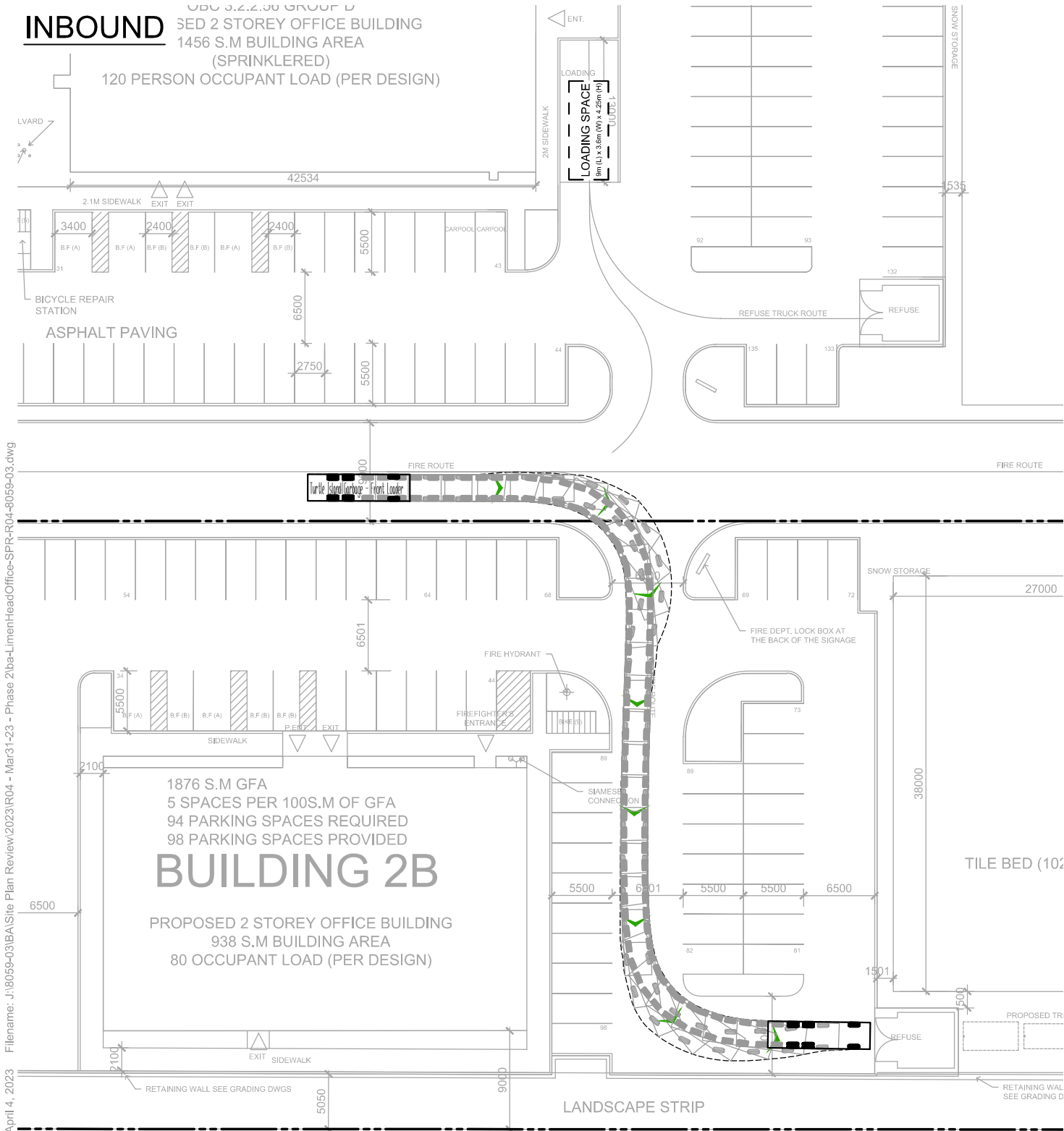


LIMEN HEAD OFFICE
VEHICULAR MANOEUVRING DIAGRAM
BUILDING 2A
LOADING SPACE - TAC HEAVY SINGLE UNIT VEHICLE

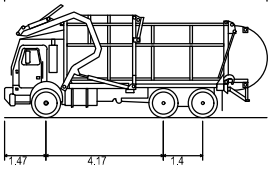
Project: LIMEN YARD FACILITY
Project No. 8059-03
Date: APRIL 4, 2023
Revised: -

Scale 0 5 10 15 20m
1:500

Drawing No. VMD-03



**Design Vehicle -
TURTLE ISLAND GARBAGE - FRONT LOADER**



Overall Length 9.330m
Overall Width 2.440m
Overall Body Height 4.021m
Min Body Ground Clearance 0.250m
Track Width 2.440m
Lock-to-lock time 5.00s
Wall to Wall Turning Radius 11.700m

[illegible]

OUTBOUND LANDING (SPRINKLERED)
IN OCCUPANT LOAD (PER DESIGN)

ENT. LOADING 3.0m (10') x 3.0m (10') x 2.5m (8')

2M SIDEWALK

42534

2400

5500

CARPPOOL CARPOOL

6500

2750

5500

900

92

93

132

REFUSE

135

133

535

1500

1500

GATE

SNOW STORAGE

5000

27000

38000

6501

64

68

6300

69

72

73

68

62

81

5500

5500

5500

6500

1501

REFUSE

98

9000

5050

LANDSCAPE STRIP

76 S.M GFA
SPACES PER 100S.M OF GFA
PARKING SPACES REQUIRED
PARKING SPACES PROVIDED

BUILDING 2B

POSED 2 STOREY OFFICE BUILDING
938 S.M BUILDING AREA
OCCUPANT LOAD (PER DESIGN)

SNOW STORAGE

5000

27000

38000

6501

64

68

6300

69

72

73

68

62

81

5500

5500

5500

6500

1501

REFUSE

98

9000

5050

LANDSCAPE STRIP

76 S.M GFA
SPACES PER 100S.M OF GFA
PARKING SPACES REQUIRED
PARKING SPACES PROVIDED

BUILDING 2B

POSED 2 STOREY OFFICE BUILDING
938 S.M BUILDING AREA
OCCUPANT LOAD (PER DESIGN)

SNOW STORAGE

5000

27000

38000

6501

64

68

6300

69

72

73

68

62

81

5500

5500

5500

6500

1501

REFUSE

98

9000

5050

LANDSCAPE STRIP

Design Vehicle - TURTLE ISLAND - REAR SLED

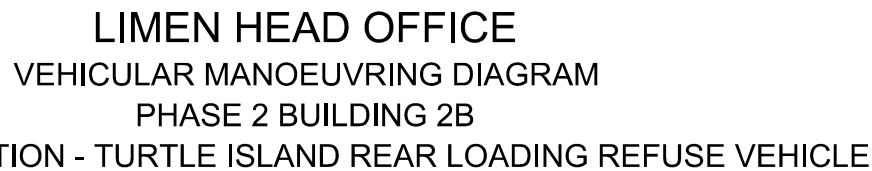
9.883

8.889

4.899

1.27

Overall Length 9.883m
Overall Width 2.552m
Overall Body Height 3.962m
Min Body Ground Clearance 0.321m



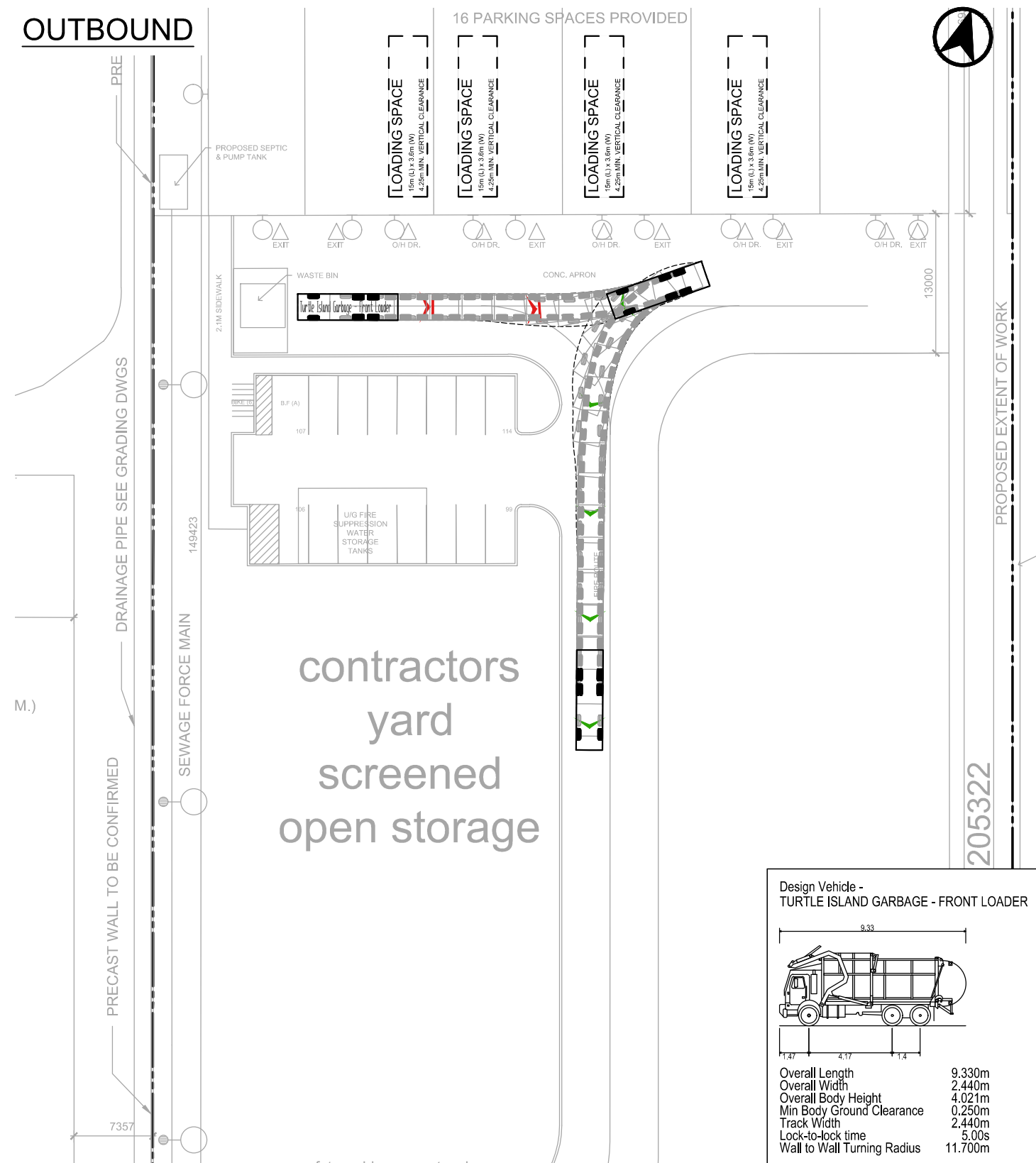
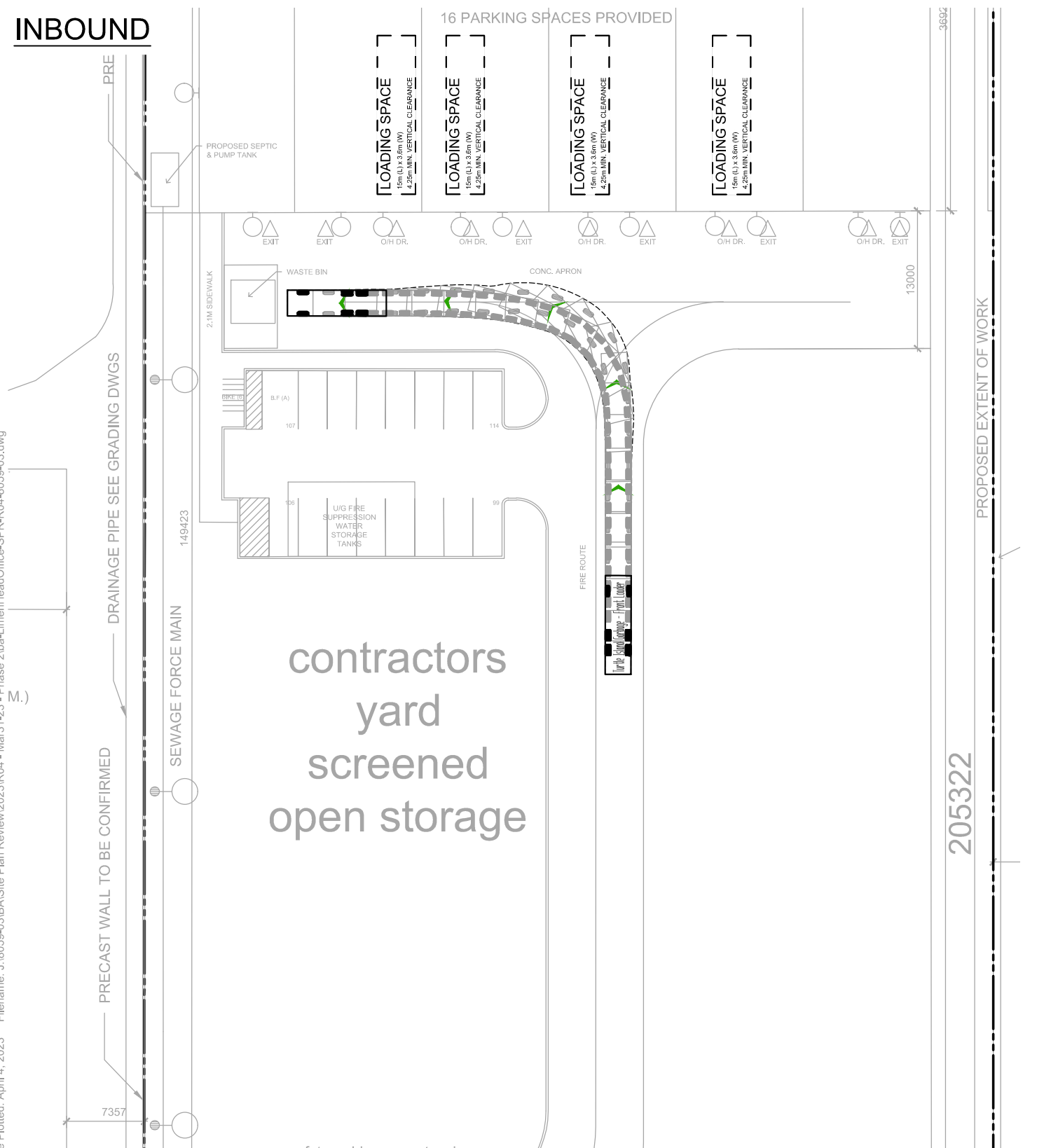
Scale

0 5 10 15 20m

1:500

Drawing No.

VMD-05



LIMEN HEAD OFFICE

VEHICULAR MANOEUVRING DIAGRAM

PHASE 2 - CONTRACTORS YARD

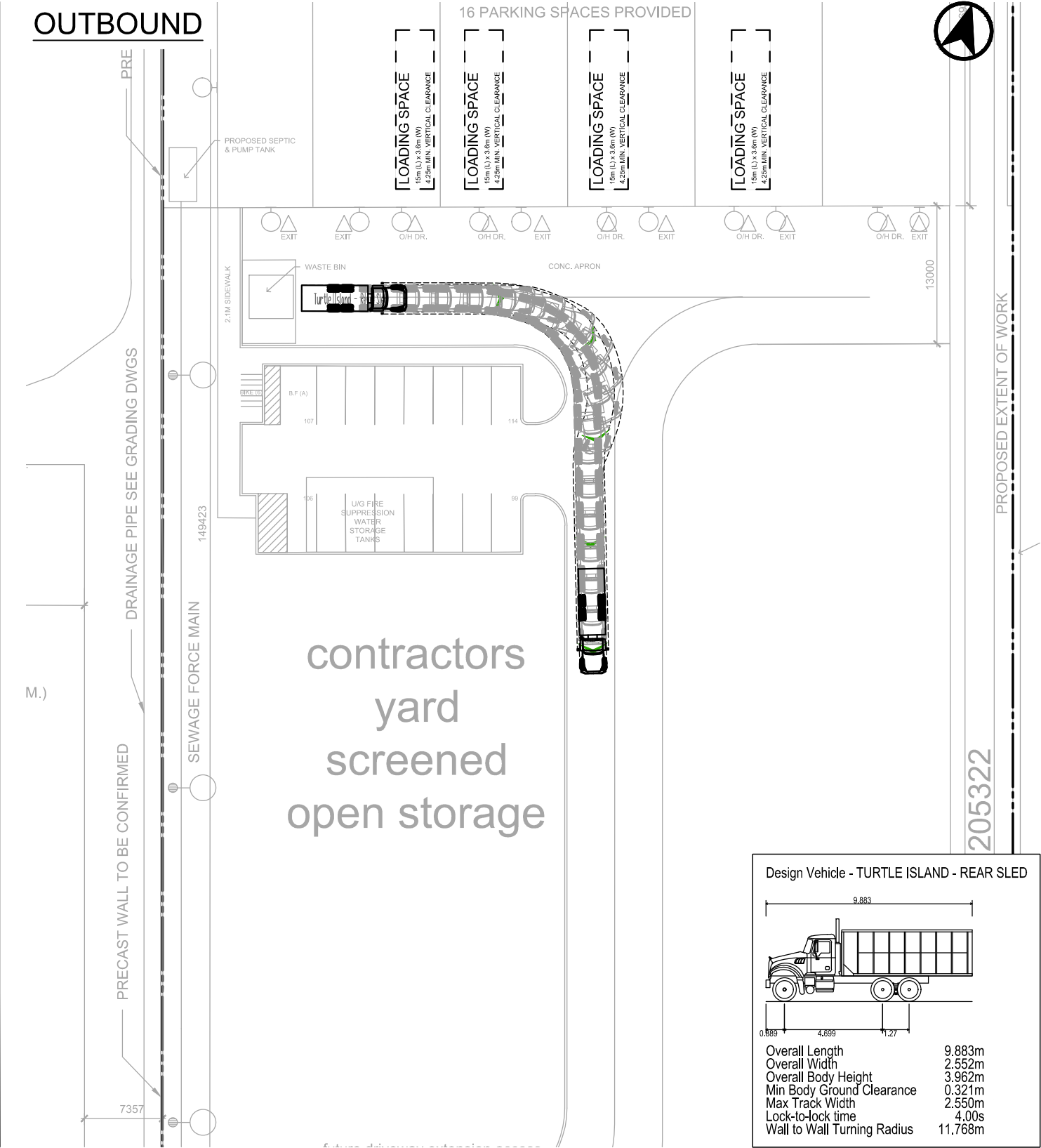
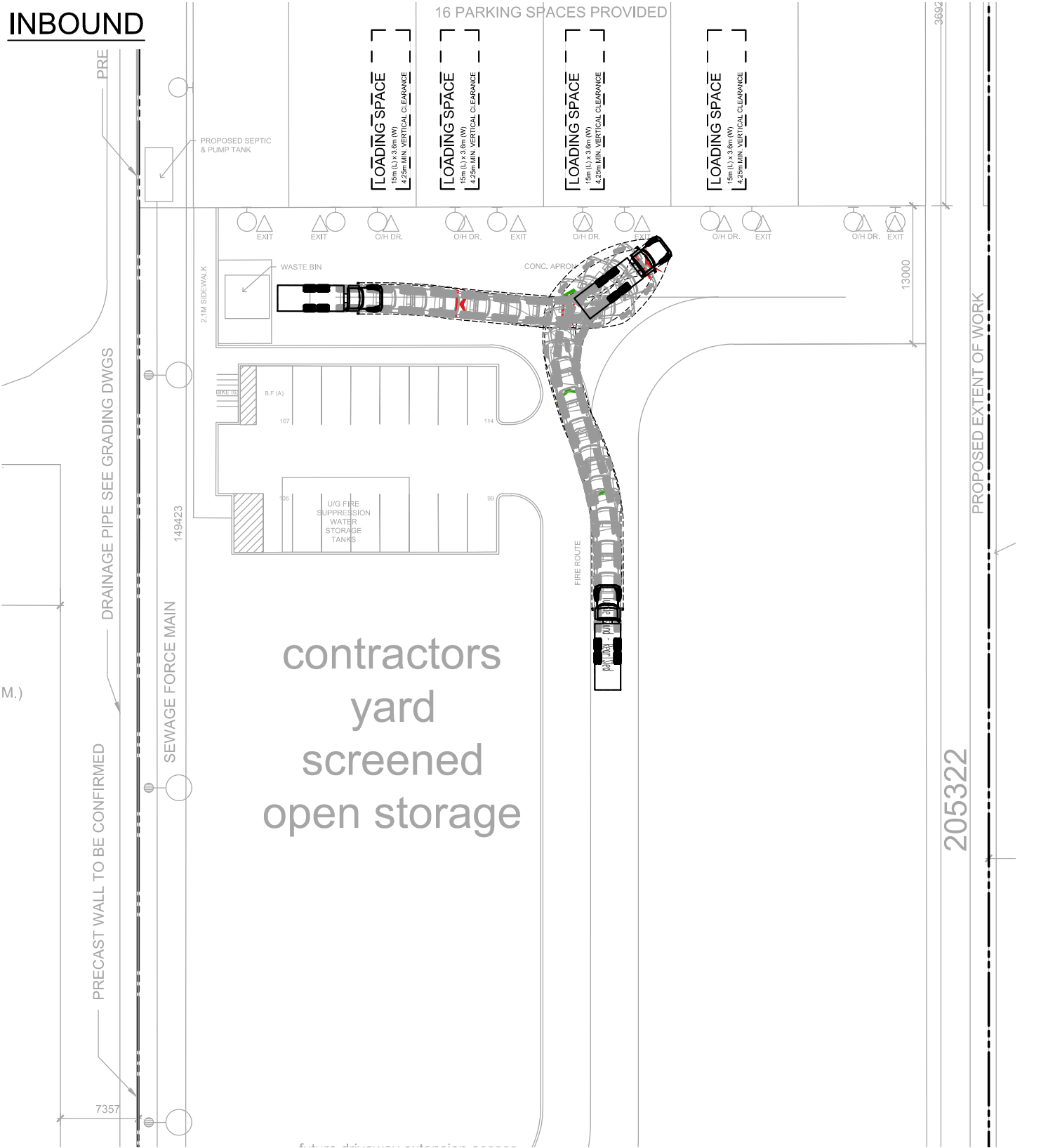
WASTE COLLECTION - TURTLE ISLAND FRONT LOADING REFUSE VEHICLE

Project: LIMEN YARD FACILITY
Project No. 8059-03
Date: APRIL 4, 2023
Revised: -

Scale 0 5 10 15 20m
1:500

Drawing No. **VMD-06**

Date Plotted: April 4, 2023 Filename: J:\8059-03\BA\Site Plan Review\2023\R04 - Mar31-23 - Phase 2\ba-LimenHeadOffice-SPR-R04-8059-03.dwg



Design Vehicle - TURTLE ISLAND - REAR SLED

9.883

0.889 4.899 11.27

Overall Length 9.883m
Overall Width 2.552m
Overall Body Height 3.962m
Min Body Ground Clearance 0.321m
Max Track Width 2.550m
Lock-to-lock time 4.00s
Wall to Wall Turning Radius 11.768m



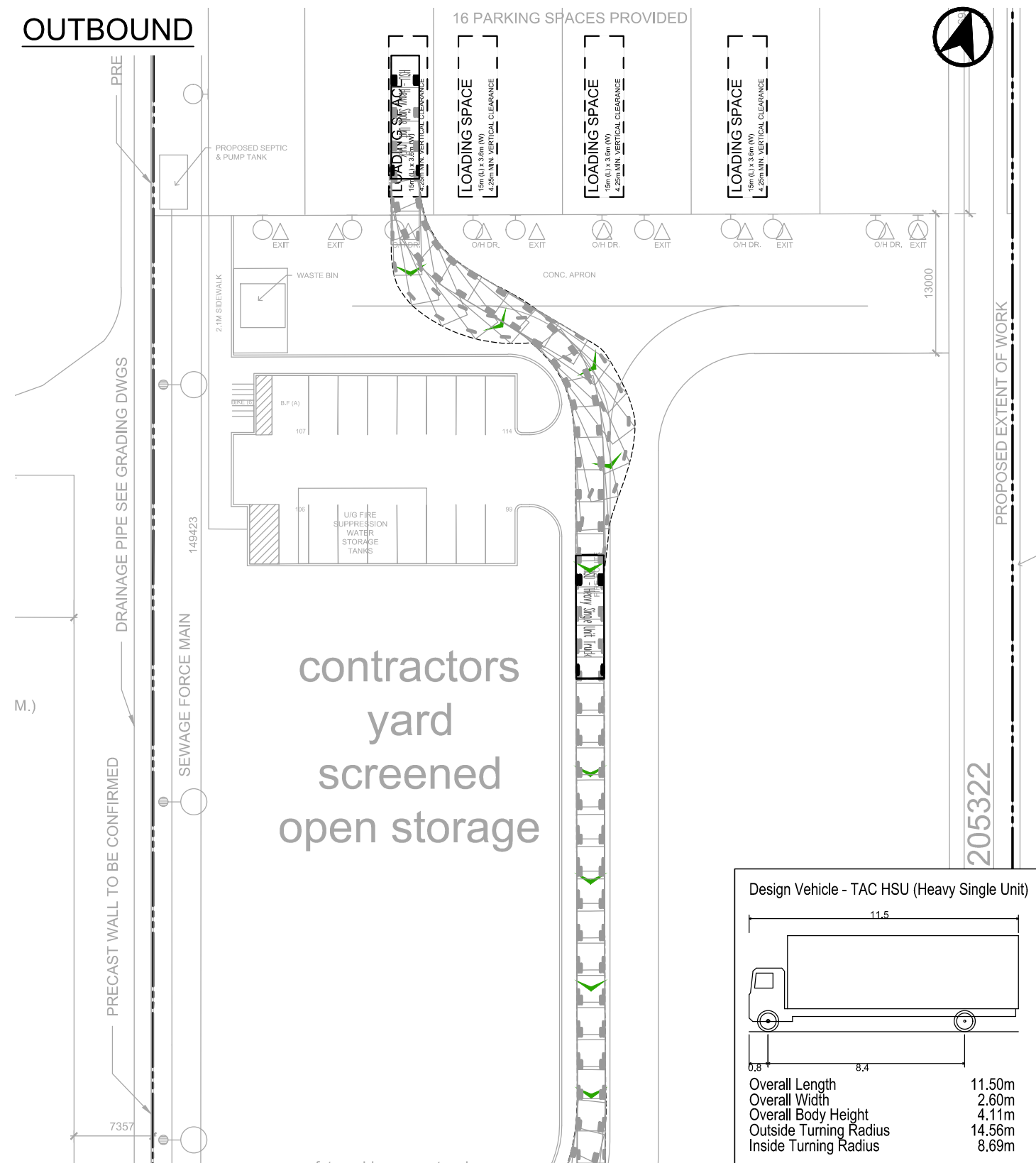
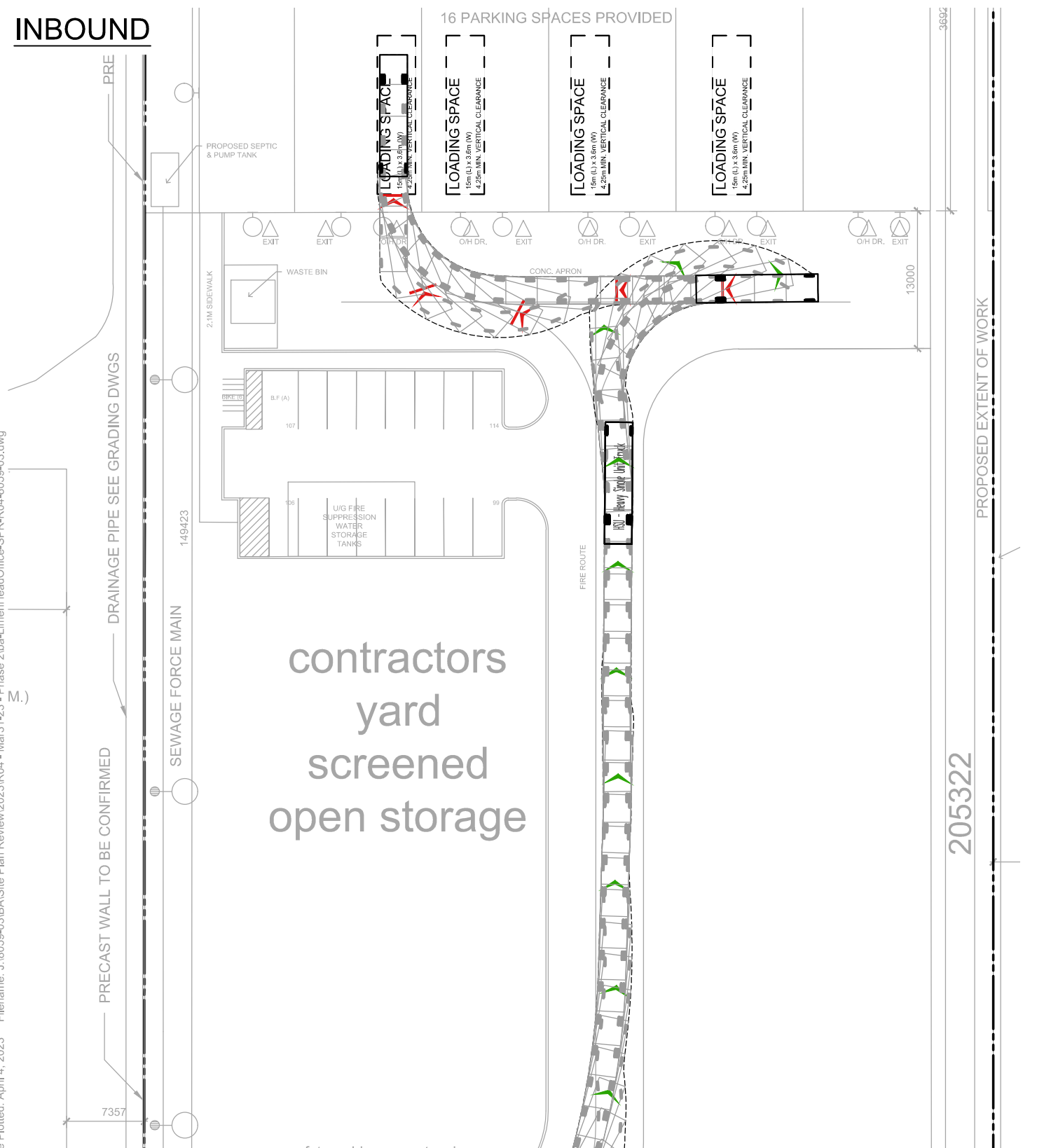
LIMEN HEAD OFFICE
VEHICULAR MANOEUVRING DIAGRAM
PHASE 2 - CONTRACTORS YARD

WASTE COLLECTION - TURTLE ISLAND REAR LOADING REFUSE VEHICLE

Project: LIMEN YARD FACILITY
Project No. 8059-03
Date: APRIL 4, 2023
Revised: -

Scale 1:500

Drawing No. **VMD-07**



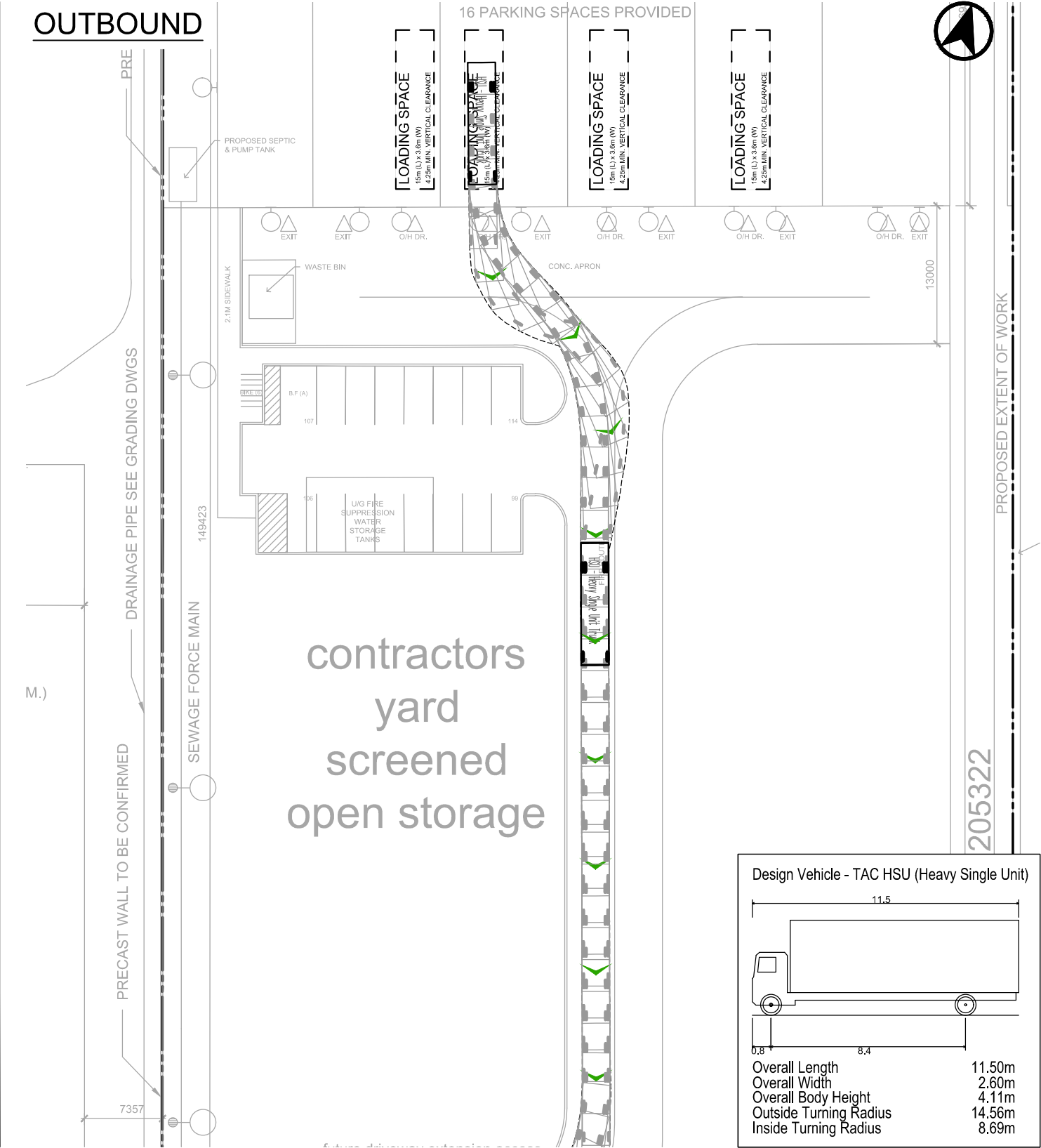
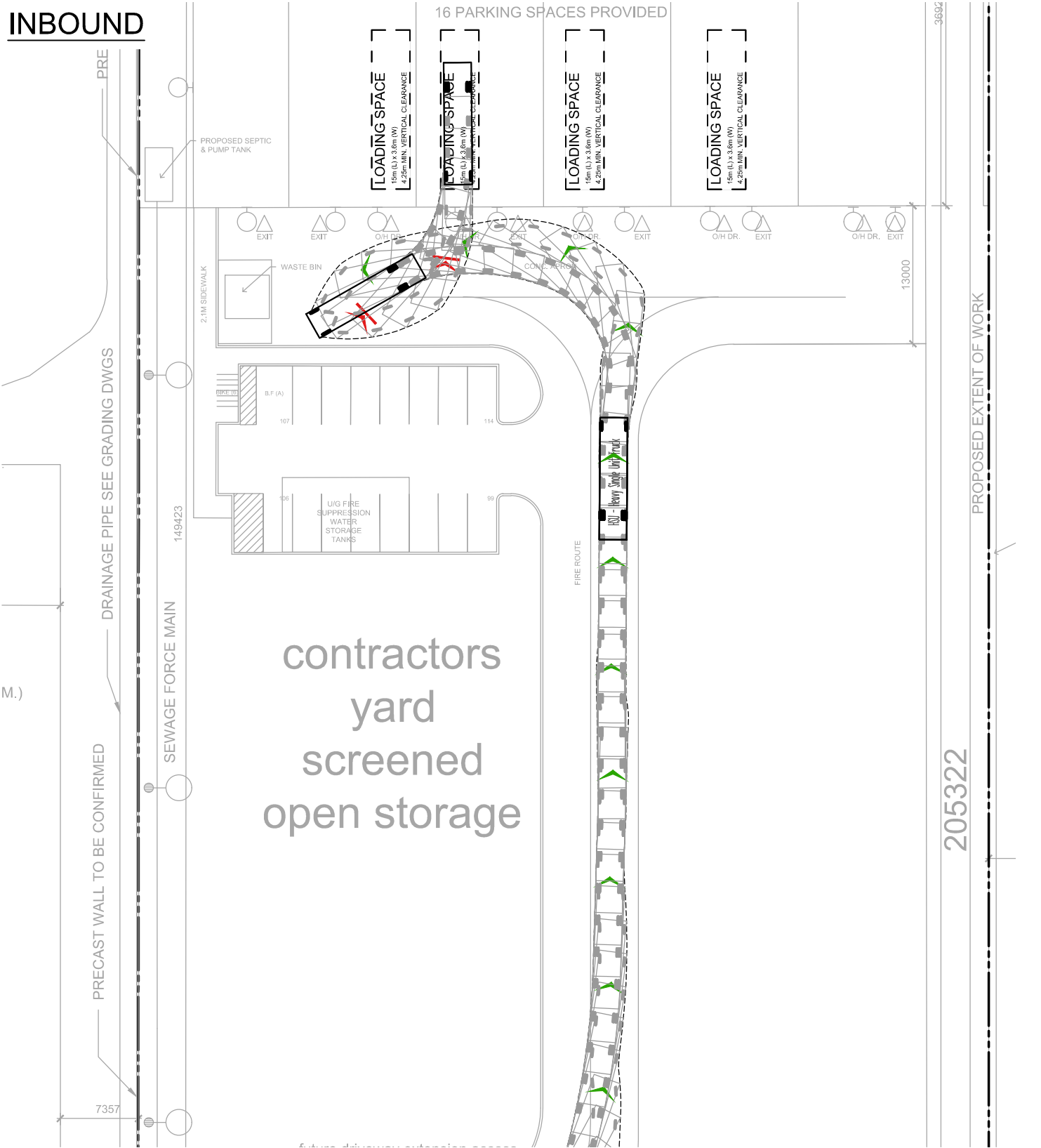
LIMEN HEAD OFFICE
VEHICULAR MANOEUVRING DIAGRAM
PHASE 2 - CONTRACTORS YARD
LOADING SPACE 1 - TAC HEAVY SINGLE UNIT VEHICLE

Project: LIMEN YARD FACILITY
Project No. 8059-03
Date: APRIL 4, 2023
Revised: -

Scale 0 5 10 15 20m
1:500

Drawing No. VMD-08

Date Plotted: April 4, 2023 Filename: J:\8059-03\BA\Site Plan Review\2023\R04 - Mar31-23 - Phase 2\ba-LimenHeadOffice-SPR-R04-8059-03.dwg



Design Vehicle - TAC HSU (Heavy Single Unit)

Overall Length 11.50m
Overall Width 2.60m
Overall Body Height 4.11m
Outside Turning Radius 14.56m
Inside Turning Radius 8.69m

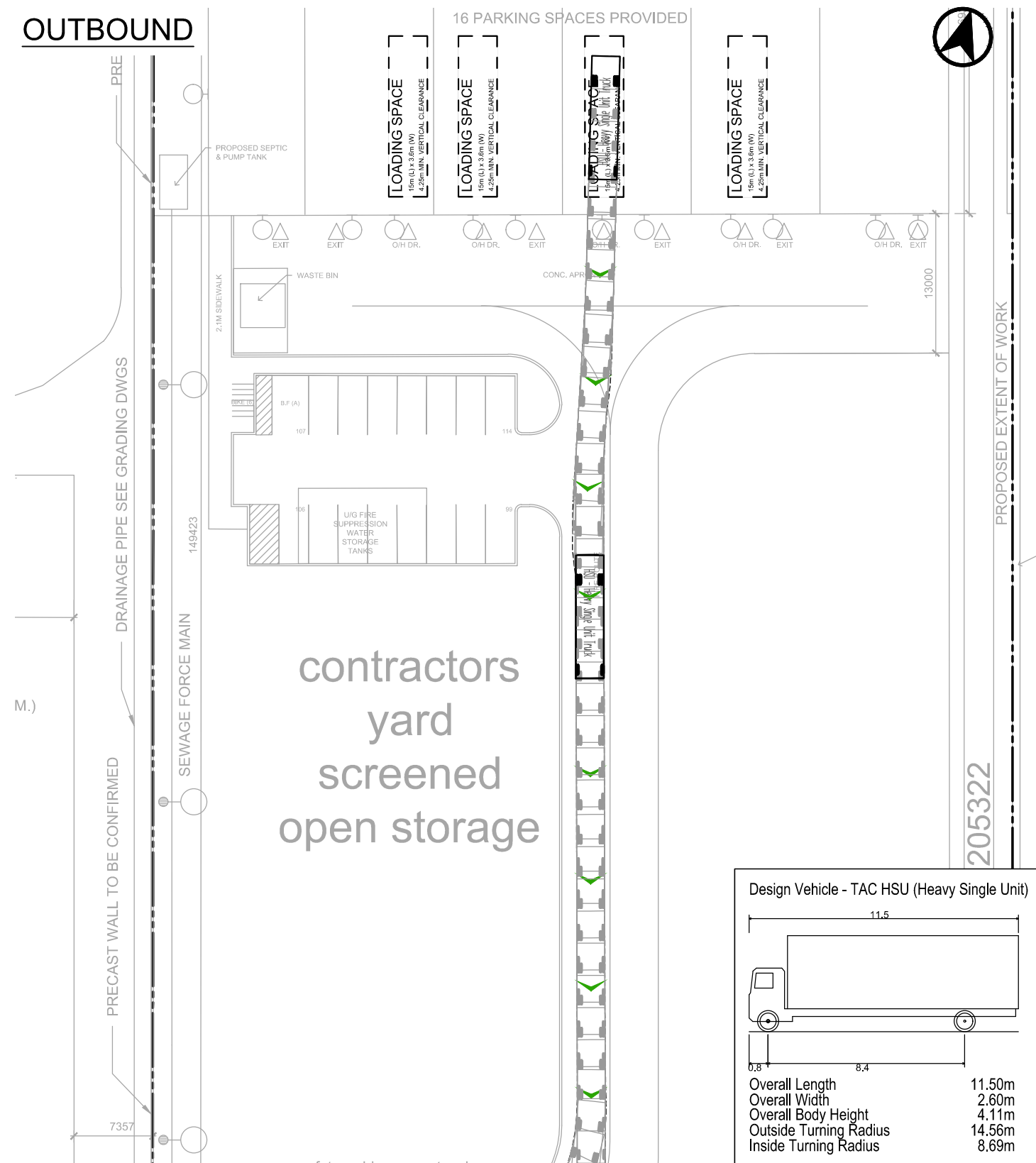
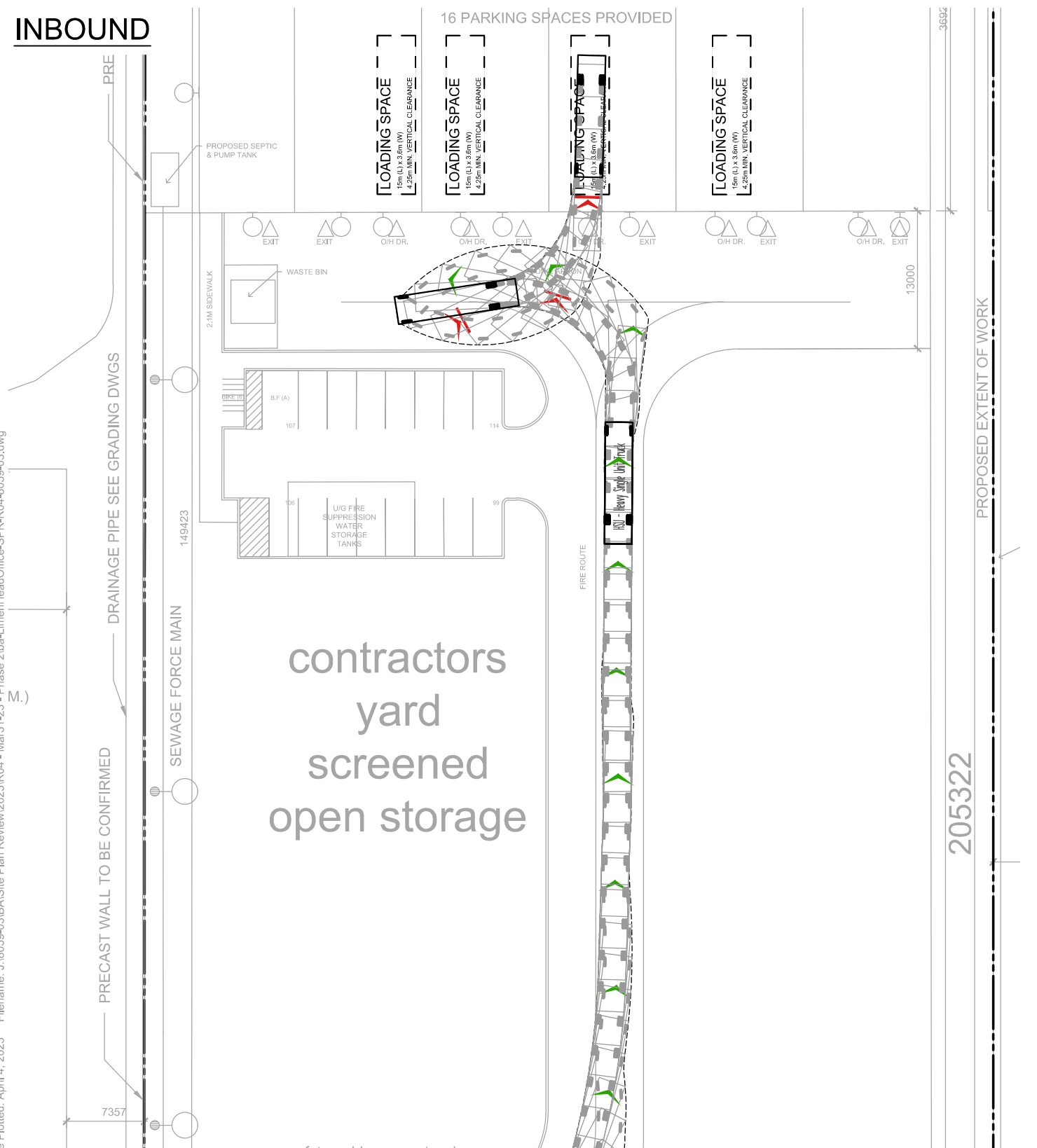


LIMEN HEAD OFFICE
VEHICULAR MANOEUVRING DIAGRAM
PHASE 2 - CONTRACTORS YARD
LOADING SPACE 2 - TAC HEAVY SINGLE UNIT VEHICLE

Project: LIMEN YARD FACILITY
Project No. 8059-03
Date: APRIL 4, 2023
Revised: -

Scale 1:500

Drawing No. **VMD-09**



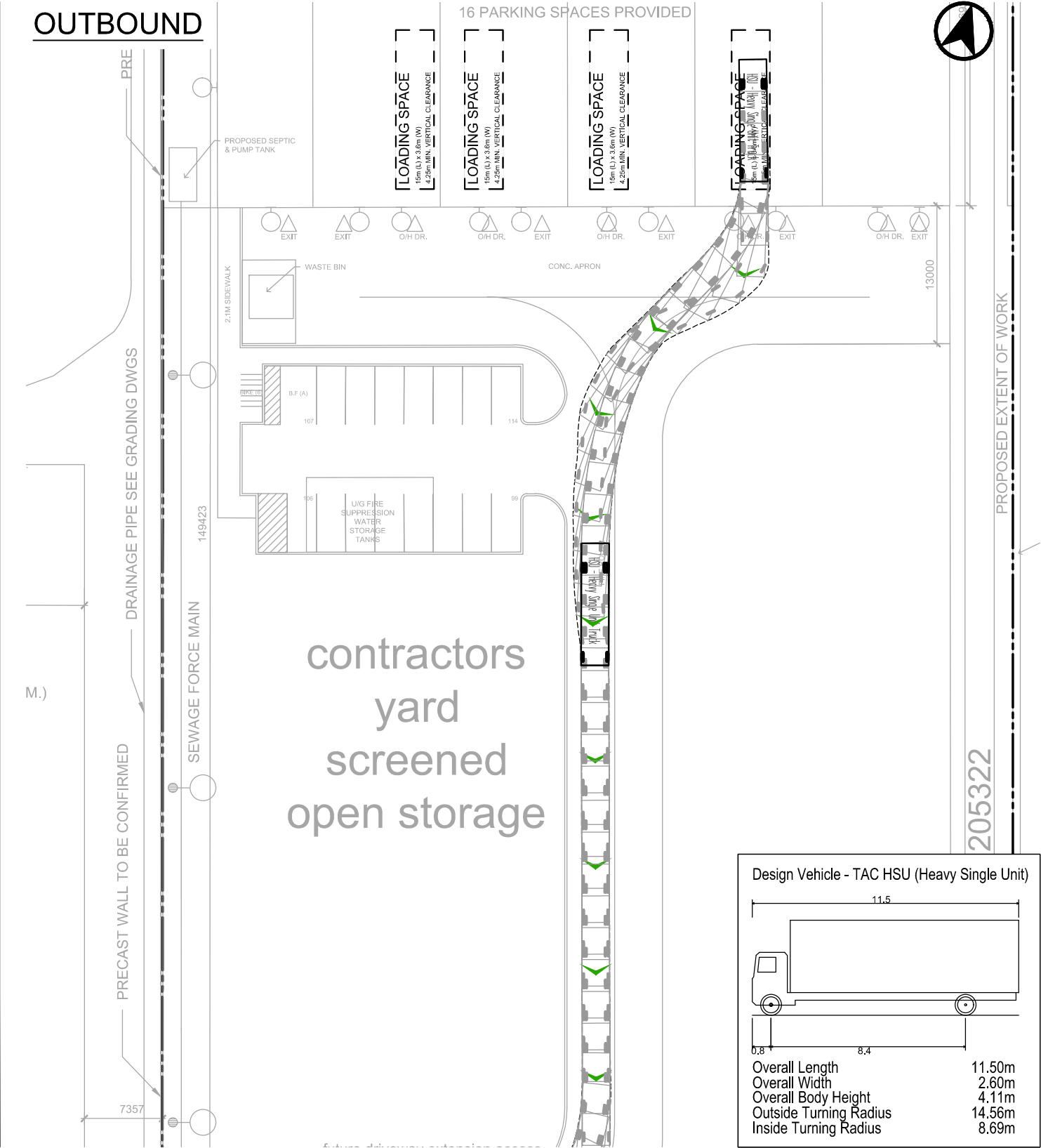
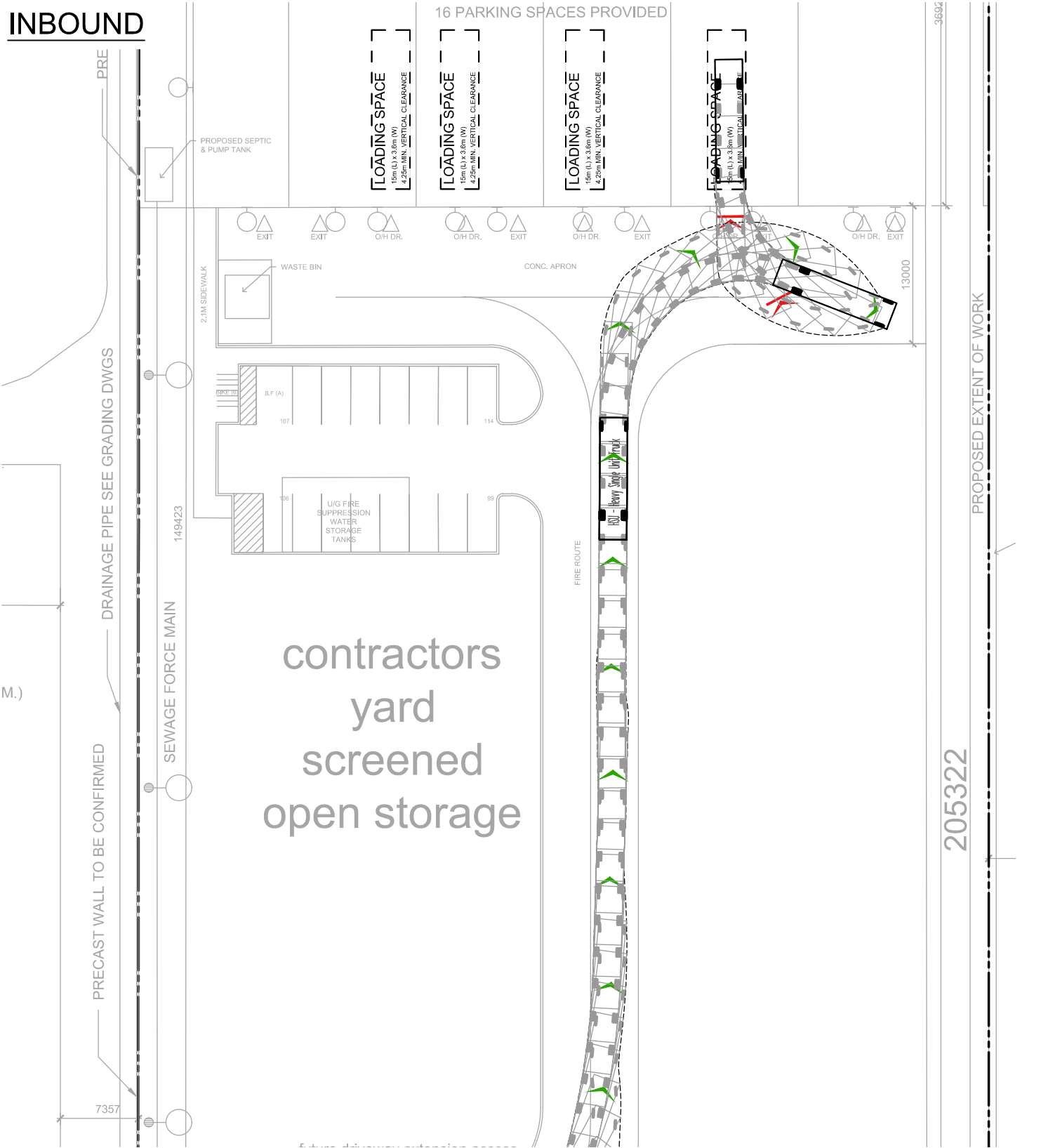
LIMEN HEAD OFFICE
VEHICULAR MANOEUVRING DIAGRAM
PHASE 2 - CONTRACTORS YARD
LOADING SPACE 3 - TAC HEAVY SINGLE UNIT VEHICLE

Project: LIMEN YARD FACILITY
Project No. 8059-03
Date: APRIL 4, 2023
Revised: -

Scale 0 5 10 15 20m
1:500

Drawing No. VMD-10

Date Plotted: April 4, 2023 Filename: J:\8059-03\BA\Site Plan Review\2023\R04 - Mar31-23 - Phase 2\ba-LimenHeadOffice-SPR-R04-8059-03.dwg



LIMEN HEAD OFFICE
VEHICULAR MANOEUVRING DIAGRAM
PHASE 2 - CONTRACTORS YARD
LOADING SPACE 4 - TAC HEAVY SINGLE UNIT VEHICLE

Project: LIMEN YARD FACILITY
Project No. 8059-03
Date: APRIL 4, 2023
Revised: -

Scale 1:500

0 5 10 15 20m

Drawing No. **VMD-11**

APPENDIX E: Turning Movement Counts (TMCs)





Turning Movement Count (1 . AURORA RD & WOODBINE AVE)

Start Time	N Approach WOODBINE AVE						E Approach AURORA RD						S Approach WOODBINE AVE						W Approach AURORA RD						Int. Total (15 min)	Int. Total (1 hr)	
	Right N-W	Thru N-S	Left N-E	UTurn N-N	Peds N:	Approach Total	Right E-N	Thru E-W	Left E-S	UTurn E-E	Peds E:	Approach Total	Right S-E	Thru S-N	Left S-W	UTurn S-S	Peds S:	Approach Total	Right W-S	Thru W-E	Left W-N	UTurn W-W	Peds W:	Approach Total			
07:00:00	14	40	20	0	0	74	11	61	6	0	0	78	4	3	5	0	0	12	7	46	4	0	0	57	221		
07:15:00	20	41	19	0	0	80	10	65	12	0	0	87	5	8	9	0	0	22	6	53	6	0	0	65	254		
07:30:00	40	59	24	0	0	123	9	92	3	0	0	104	5	13	16	0	0	34	9	52	5	0	0	66	327		
07:45:00	37	62	23	0	0	122	14	94	3	0	0	111	4	11	11	0	0	26	17	70	10	0	0	97	356	1158	
08:00:00	18	52	15	0	0	85	14	77	11	0	0	102	3	6	11	0	0	20	12	64	11	0	0	87	294	1231	
08:15:00	16	45	13	0	0	74	7	78	3	1	0	89	3	18	5	0	0	26	11	64	6	0	0	81	270	1247	
08:30:00	11	37	28	0	0	76	10	79	12	0	0	101	2	24	13	0	0	39	12	63	4	0	0	79	295	1215	
08:45:00	14	28	20	0	0	62	10	73	5	0	0	88	7	15	15	0	0	37	10	67	4	0	0	81	268	1127	
BREAK																											
16:00:00	8	23	16	0	0	47	31	86	8	0	0	125	10	79	13	0	0	102	15	80	28	0	0	123	397		
16:15:00	7	24	15	0	0	46	37	90	7	0	0	134	8	50	18	0	0	76	14	84	10	0	0	108	364		
16:30:00	8	16	9	0	0	33	18	90	6	0	0	114	5	62	18	0	0	85	17	90	27	0	0	134	366		
16:45:00	13	12	18	0	0	43	23	93	4	0	0	120	7	53	16	0	0	76	13	82	38	0	0	133	372	1499	
17:00:00	12	15	17	0	0	44	29	102	7	0	0	138	10	64	23	0	0	97	12	101	22	0	0	135	414	1516	
17:15:00	9	18	8	0	0	35	22	77	3	0	0	102	3	59	23	0	0	85	9	77	10	0	0	96	318	1470	
17:30:00	9	16	12	0	0	37	24	110	4	0	0	138	7	50	20	0	0	77	18	73	13	0	0	104	356	1460	
17:45:00	7	11	10	0	0	28	17	79	1	0	0	97	2	42	10	0	0	54	14	93	10	0	0	117	296	1384	
Grand Total	243	499	267	0	0	1009	286	1346	95	1	0	1728	85	557	226	0	0	868	196	1159	208	0	0	1563	5168	-	
Approach%	24.1%	49.5%	26.5%	0%		-	16.6%	77.9%	5.5%	0.1%		-	9.8%	64.2%	26%	0%		-	12.5%	74.2%	13.3%	0%		-	-	-	
Totals %	4.7%	9.7%	5.2%	0%		19.5%	5.5%	26%	1.8%	0%		33.4%	1.6%	10.8%	4.4%	0%		16.8%	3.8%	22.4%	4%	0%		30.2%	-	-	
Heavy	9	25	32	0		-	16	112	8	0		-	10	18	10	0		-	15	103	10	0		-	-	-	
Heavy %	3.7%	5%	12%	0%		-	5.6%	8.3%	8.4%	0%		-	11.8%	3.2%	4.4%	0%		-	7.7%	8.9%	4.8%	0%		-	-	-	
Bicycles	0	1	0	0		-	0	0	0	0		-	0	0	0	0		-	0	0	0	0		-	-	-	
Bicycle %	0%	0.2%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	-	-	



Peak Hour: 07:30 AM - 08:30 AM Weather: Broken Clouds (12.15 °C)

Start Time	N Approach WOODBINE AVE						E Approach AURORA RD						S Approach WOODBINE AVE						W Approach AURORA RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	40	59	24	0	0	123	9	92	3	0	0	104	5	13	16	0	0	34	9	52	5	0	0	66	327
07:45:00	37	62	23	0	0	122	14	94	3	0	0	111	4	11	11	0	0	26	17	70	10	0	0	97	356
08:00:00	18	52	15	0	0	85	14	77	11	0	0	102	3	6	11	0	0	20	12	64	11	0	0	87	294
08:15:00	16	45	13	0	0	74	7	78	3	1	0	89	3	18	5	0	0	26	11	64	6	0	0	81	270
Grand Total	111	218	75	0	0	404	44	341	20	1	0	406	15	48	43	0	0	106	49	250	32	0	0	331	1247
Approach%	27.5%	54%	18.6%	0%		-	10.8%	84%	4.9%	0.2%		-	14.2%	45.3%	40.6%	0%		-	14.8%	75.5%	9.7%	0%		-	-
Totals %	8.9%	17.5%	6%	0%		32.4%	3.5%	27.3%	1.6%	0.1%		32.6%	1.2%	3.8%	3.4%	0%		8.5%	3.9%	20%	2.6%	0%		26.5%	-
PHF	0.69	0.88	0.78	0		0.82	0.79	0.91	0.45	0.25		0.91	0.75	0.67	0.67	0		0.78	0.72	0.89	0.73	0		0.85	-
Heavy	4	11	5	0		20	8	46	1	0		55	4	4	4	0		12	3	24	3	0		30	-
Heavy %	3.6%	5%	6.7%	0%		5%	18.2%	13.5%	5%	0%		13.5%	26.7%	8.3%	9.3%	0%		11.3%	6.1%	9.6%	9.4%	0%		9.1%	-
Lights	107	207	70	0		384	36	295	19	1		351	11	44	39	0		94	46	226	29	0		301	-
Lights %	96.4%	95%	93.3%	0%		95%	81.8%	86.5%	95%	100%		86.5%	73.3%	91.7%	90.7%	0%		88.7%	93.9%	90.4%	90.6%	0%		90.9%	-
Single-Unit Trucks	3	6	3	0		12	4	32	0	0		36	3	3	0	0		6	0	18	1	0		19	-
Single-Unit Trucks %	2.7%	2.8%	4%	0%		3%	9.1%	9.4%	0%	0%		8.9%	20%	6.3%	0%	0%		5.7%	0%	7.2%	3.1%	0%		5.7%	-
Buses	0	3	2	0		5	3	2	0	0		5	0	0	1	0		1	2	0	2	0		4	-
Buses %	0%	1.4%	2.7%	0%		1.2%	6.8%	0.6%	0%	0%		1.2%	0%	0%	2.3%	0%		0.9%	4.1%	0%	6.3%	0%		1.2%	-
Articulated Trucks	1	2	0	0		3	1	12	1	0		14	1	1	3	0		5	1	6	0	0		7	-
Articulated Trucks %	0.9%	0.9%	0%	0%		0.7%	2.3%	3.5%	5%	0%		3.4%	6.7%	2.1%	7%	0%		4.7%	2%	2.4%	0%	0%		2.1%	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-



Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (17.46 °C)

Start Time	N Approach WOODBINE AVE						E Approach AURORA RD						S Approach WOODBINE AVE						W Approach AURORA RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	7	24	15	0	0	46	37	90	7	0	0	134	8	50	18	0	0	76	14	84	10	0	0	108	364
16:30:00	8	16	9	0	0	33	18	90	6	0	0	114	5	62	18	0	0	85	17	90	27	0	0	134	366
16:45:00	13	12	18	0	0	43	23	93	4	0	0	120	7	53	16	0	0	76	13	82	38	0	0	133	372
17:00:00	12	15	17	0	0	44	29	102	7	0	0	138	10	64	23	0	0	97	12	101	22	0	0	135	414
Grand Total	40	67	59	0	0	166	107	375	24	0	0	506	30	229	75	0	0	334	56	357	97	0	0	510	1516
Approach%	24.1%	40.4%	35.5%	0%		-	21.1%	74.1%	4.7%	0%		-	9%	68.6%	22.5%	0%		-	11%	70%	19%	0%		-	-
Totals %	2.6%	4.4%	3.9%	0%		10.9%	7.1%	24.7%	1.6%	0%		33.4%	2%	15.1%	4.9%	0%		22%	3.7%	23.5%	6.4%	0%		33.6%	-
PHF	0.77	0.7	0.82	0		0.9	0.72	0.92	0.86	0		0.92	0.75	0.89	0.82	0		0.86	0.82	0.88	0.64	0		0.94	-
Heavy	1	2	11	0		14	0	17	3	0		20	0	5	2	0		7	3	25	2	0		30	-
Heavy %	2.5%	3%	18.6%	0%		8.4%	0%	4.5%	12.5%	0%		4%	0%	2.2%	2.7%	0%		2.1%	5.4%	7%	2.1%	0%		5.9%	-
Lights	39	65	48	0		152	107	358	21	0		486	30	224	73	0		327	53	332	95	0		480	-
Lights %	97.5%	97%	81.4%	0%		91.6%	100%	95.5%	87.5%	0%		96%	100%	97.8%	97.3%	0%		97.9%	94.6%	93%	97.9%	0%		94.1%	-
Single-Unit Trucks	1	1	5	0		7	0	11	1	0		12	0	3	1	0		4	2	17	2	0		21	-
Single-Unit Trucks %	2.5%	1.5%	8.5%	0%		4.2%	0%	2.9%	4.2%	0%		2.4%	0%	1.3%	1.3%	0%		1.2%	3.6%	4.8%	2.1%	0%		4.1%	-
Buses	0	0	0	0		0	0	2	1	0		3	0	1	1	0		2	0	0	0	0		0	-
Buses %	0%	0%	0%	0%		0%	0%	0.5%	4.2%	0%		0.6%	0%	0.4%	1.3%	0%		0.6%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	1	6	0		7	0	4	1	0		5	0	1	0	0		1	1	8	0	0		9	-
Articulated Trucks %	0%	1.5%	10.2%	0%		4.2%	0%	1.1%	4.2%	0%		1%	0%	0.4%	0%	0%		0.3%	1.8%	2.2%	0%	0%		1.8%	-
Bicycles on Road	0	1	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	%	-	-	-	-	-	%	-	-	-	-	-	%	-	-	-	-	-	%	-	-

Peak Hour: 07:30 AM - 08:30 AM Weather: Broken Clouds (12.15 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (17.46 °C)



Turning Movements Diagram

Peak Hour Report: AM Period

Location..... Woodbine Avenue & Slaters Road

GeoID..... 6EE3073D

Municipality. Whitchurch-Stouffville

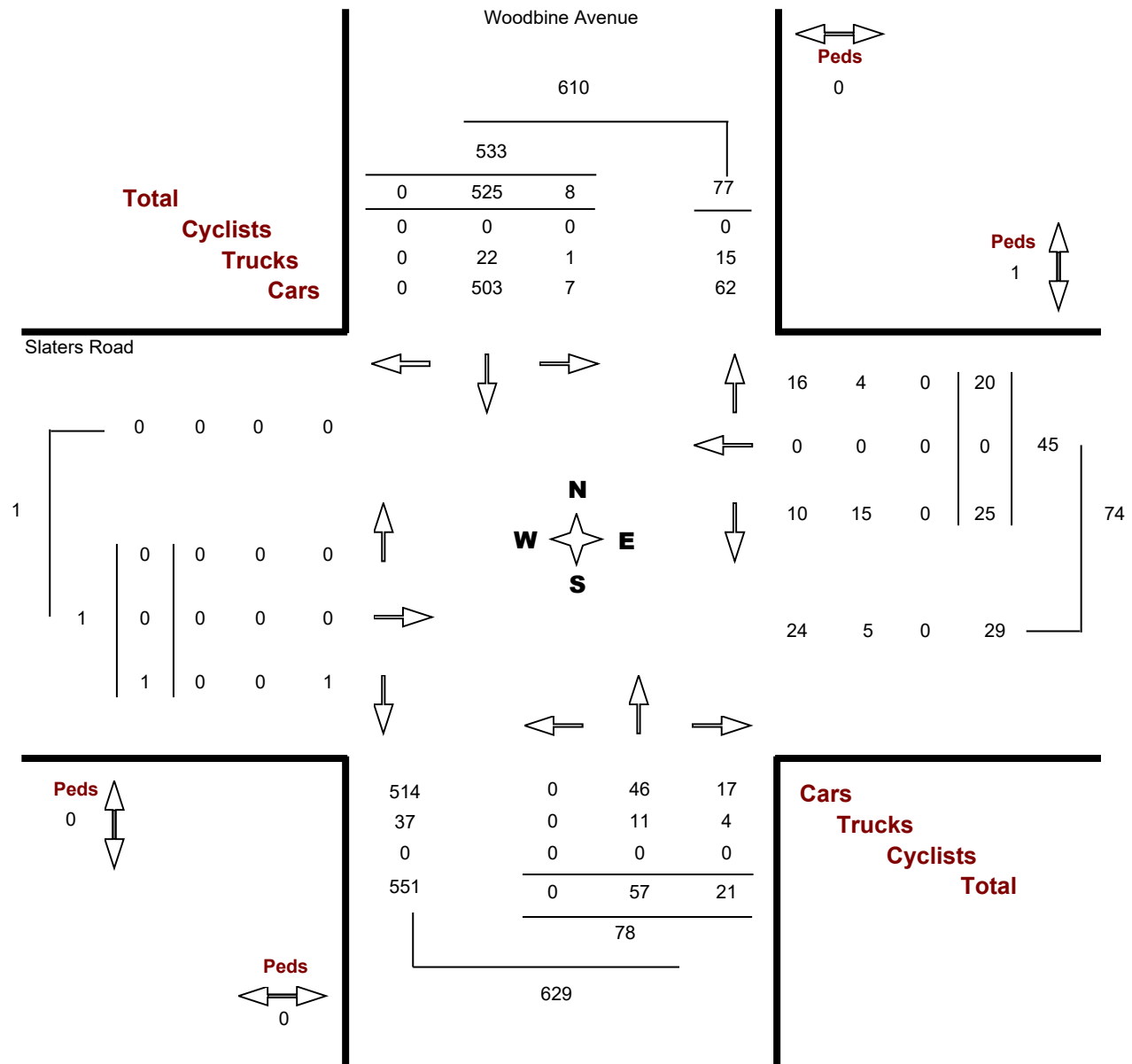
Count Date. Thursday, 17 October, 2013

Traffic Cont. Stop sign

Count Period. 07:00 AM — 09:00 AM

Major Dir..... None

Peak Hour.... 07:00 AM — 08:00 AM

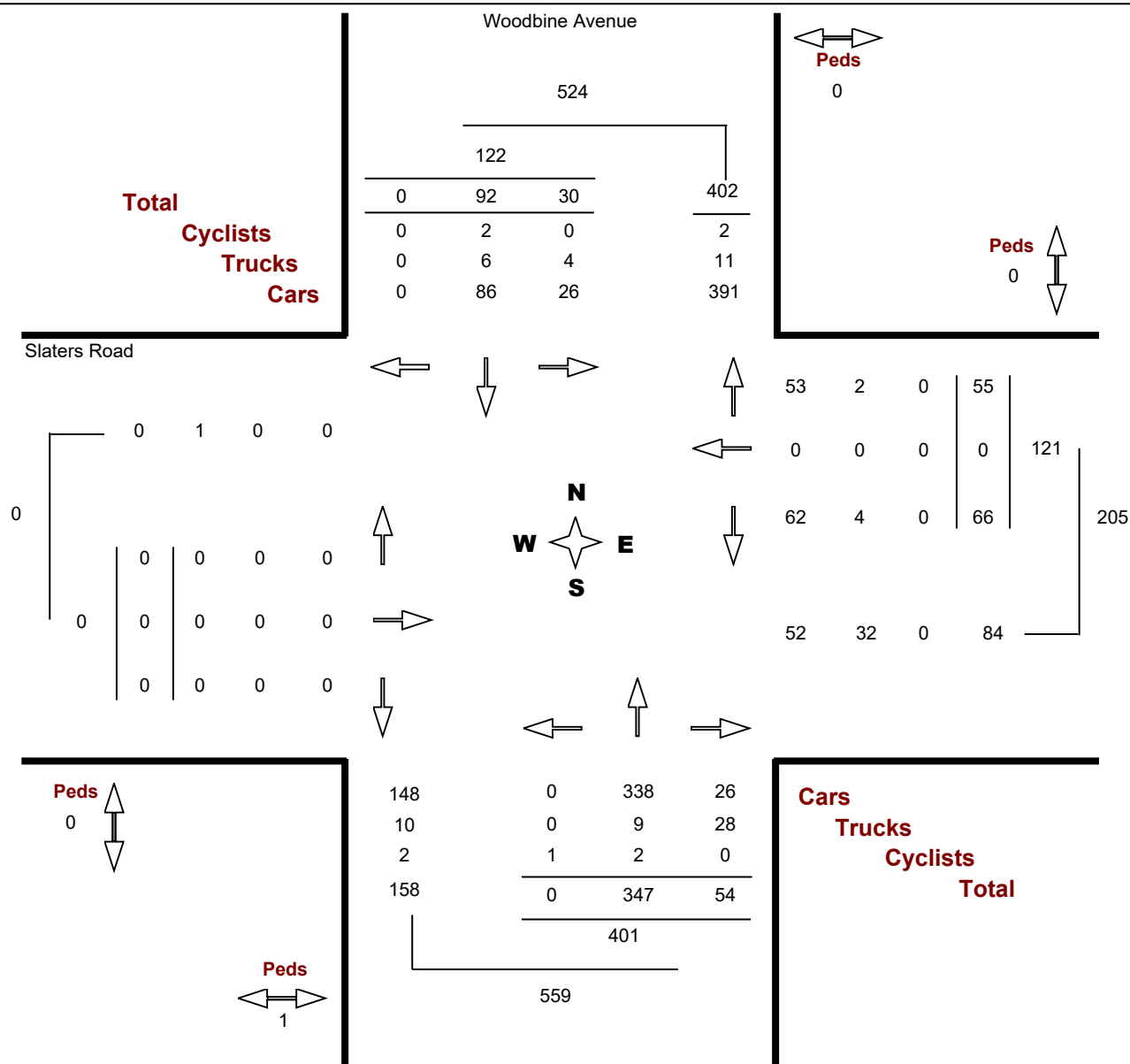


Notes:

Peak Hour.... 12:15 PM – 01:15 PM

Notes:

Peak Hour.... 04:15 PM – 05:15 PM



Notes:



Turning Movement Count (5 . SLATERS RD & WOODBINE AVE)

Start Time	N Approach WOODBINE AVE						E Approach SLATERS RD						S Approach WOODBINE AVE						W Approach SLATERS RD						Int. Total (15 min)	Int. Total (1 hr)	
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total			
07:00:00	0	52	2	0	0	54	0	0	10	0	0	10	8	7	0	0	0	15	0	0	0	0	0	0	79		
07:15:00	0	58	2	0	0	60	3	0	5	0	0	8	5	16	0	0	0	21	0	0	0	0	0	0	89		
07:30:00	0	75	4	0	0	79	4	0	10	0	0	14	7	29	0	0	0	36	0	0	0	0	0	0	129		
07:45:00	0	70	8	0	0	78	2	0	12	0	0	14	23	19	0	0	0	42	0	0	0	0	0	0	134	431	
08:00:00	0	69	9	0	0	78	3	0	5	0	0	8	13	18	0	0	0	31	0	0	0	0	0	0	117	469	
08:15:00	0	51	2	0	0	53	0	0	10	0	0	10	11	16	0	0	0	27	0	0	0	0	0	0	90	470	
08:30:00	0	57	4	0	0	61	2	0	12	0	0	14	7	31	0	0	0	38	0	0	0	0	0	0	113	454	
08:45:00	0	37	3	0	0	40	3	0	12	0	0	15	8	30	0	0	1	38	0	0	0	0	1	0	93	413	
BREAK																											
16:00:00	0	31	3	0	0	34	7	0	11	0	0	18	11	94	0	0	0	105	0	0	0	0	0	0	157		
16:15:00	0	40	4	0	0	44	2	0	16	0	0	18	6	60	0	0	0	66	0	0	0	0	1	0	128		
16:30:00	1	33	1	0	0	35	6	0	15	0	0	21	9	76	0	0	0	85	0	0	0	0	2	0	141		
16:45:00	0	24	1	0	0	25	0	0	12	0	0	12	8	82	0	0	0	90	0	0	0	0	0	0	127	553	
17:00:00	0	31	1	0	0	32	19	0	43	0	0	62	5	75	0	0	0	80	0	0	0	0	0	0	174	570	
17:15:00	0	21	1	0	0	22	5	0	13	0	0	18	5	77	0	0	0	82	0	0	0	0	0	0	122	564	
17:30:00	0	30	1	0	0	31	4	0	1	0	0	5	5	67	0	0	0	72	0	0	0	0	1	0	108	531	
17:45:00	0	21	2	0	0	23	3	0	8	0	0	11	8	44	0	0	0	52	0	0	0	0	1	0	86	490	
Grand Total	1	700	48	0	0	749	63	0	195	0	0	258	139	741	0	0	1	880	0	0	0	0	6	0	1887	-	
Approach%	0.1%	93.5%	6.4%	0%		-	24.4%	0%	75.6%	0%		-	15.8%	84.2%	0%	0%		-	0%	0%	0%	0%		-	-	-	
Totals %	0.1%	37.1%	2.5%	0%		39.7%	3.3%	0%	10.3%	0%		13.7%	7.4%	39.3%	0%	0%		46.6%	0%	0%	0%	0%		0%	-	-	
Heavy	0	40	9	0		-	10	0	37	0		-	32	28	0	0		-	0	0	0	0		-	-	-	
Heavy %	0%	5.7%	18.8%	0%		-	15.9%	0%	19%	0%		-	23%	3.8%	0%	0%		-	0%	0%	0%	0%		-	-	-	
Bicycles	0	4	1	0		-	2	0	1	0		-	1	0	0	0		-	0	0	0	0		-	-	-	
Bicycle %	0%	0.6%	2.1%	0%		-	3.2%	0%	0.5%	0%		-	0.7%	0%	0%	0%		-	0%	0%	0%	0%		-	-	-	



Peak Hour: 07:30 AM - 08:30 AM Weather: Broken Clouds (12.15 °C)

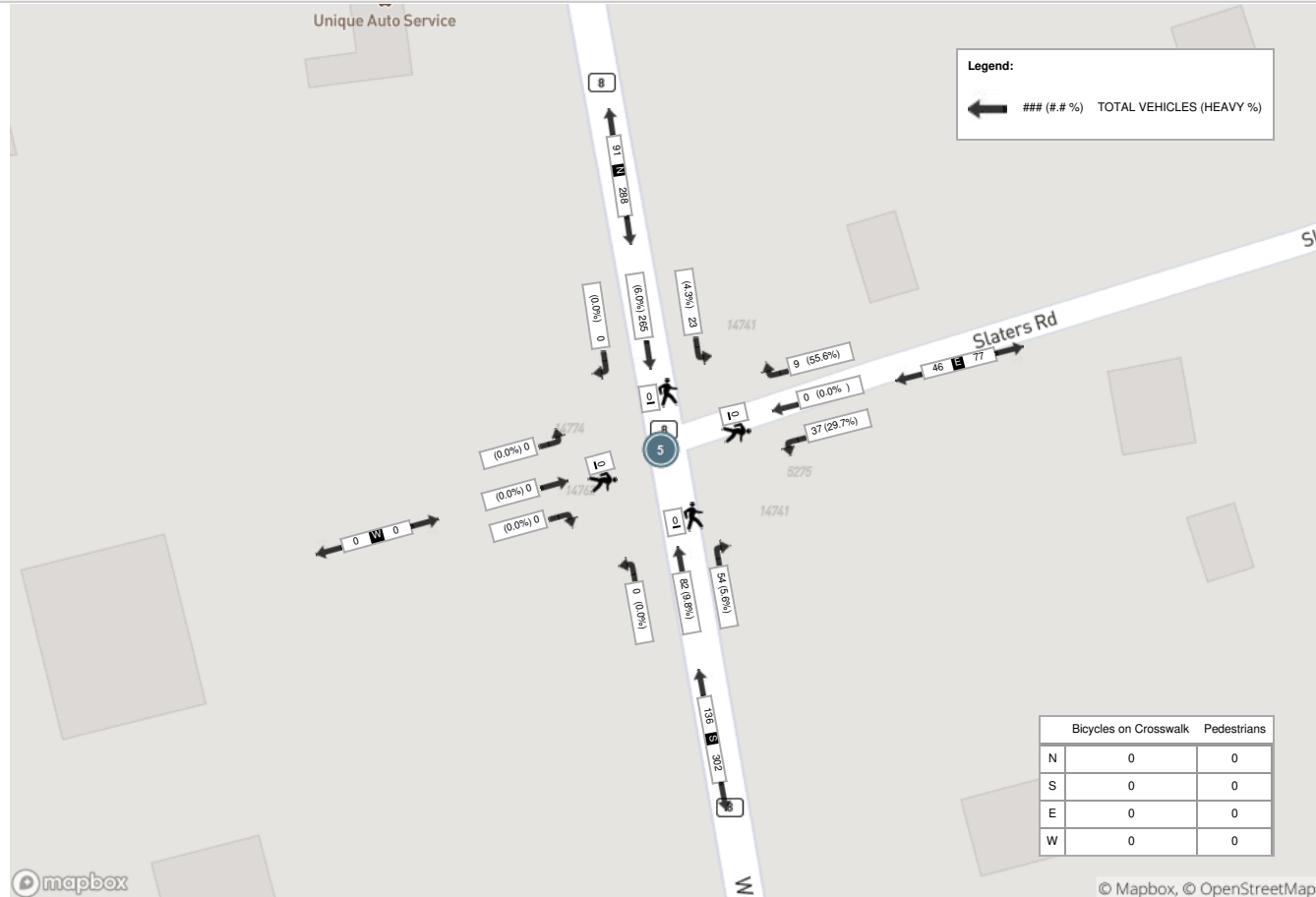
Start Time	N Approach WOODBINE AVE						E Approach SLATERS RD						S Approach WOODBINE AVE						W Approach SLATERS RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
07:30:00	0	75	4	0	0	79	4	0	10	0	0	14	7	29	0	0	0	36	0	0	0	0	0	0	129
07:45:00	0	70	8	0	0	78	2	0	12	0	0	14	23	19	0	0	0	42	0	0	0	0	0	0	134
08:00:00	0	69	9	0	0	78	3	0	5	0	0	8	13	18	0	0	0	31	0	0	0	0	0	0	117
08:15:00	0	51	2	0	0	53	0	0	10	0	0	10	11	16	0	0	0	27	0	0	0	0	0	0	90
Grand Total	0	265	23	0	0	288	9	0	37	0	0	46	54	82	0	0	0	136	0	0	0	0	0	0	470
Approach%	0%	92%	8%	0%		-	19.6%	0%	80.4%	0%		-	39.7%	60.3%	0%	0%		-	0%	0%	0%	0%		-	-
Totals %	0%	56.4%	4.9%	0%		61.3%	1.9%	0%	7.9%	0%		9.8%	11.5%	17.4%	0%	0%		28.9%	0%	0%	0%	0%		0%	-
PHF	0	0.88	0.64	0		0.91	0.56	0	0.77	0		0.82	0.59	0.71	0	0		0.81	0	0	0	0		0	-
Heavy	0	16	1	0		17	5	0	11	0		16	3	8	0	0		11	0	0	0	0		0	-
Heavy %	0%	6%	4.3%	0%		5.9%	55.6%	0%	29.7%	0%		34.8%	5.6%	9.8%	0%	0%		8.1%	0%	0%	0%	0%		0%	-
Lights	0	249	22	0		271	4	0	26	0		30	51	74	0	0		125	0	0	0	0		0	-
Lights %	0%	94%	95.7%	0%		94.1%	44.4%	0%	70.3%	0%		65.2%	94.4%	90.2%	0%	0%		91.9%	0%	0%	0%	0%		0%	-
Single-Unit Trucks	0	4	1	0		5	2	0	7	0		9	2	3	0	0		5	0	0	0	0		0	-
Single-Unit Trucks %	0%	1.5%	4.3%	0%		1.7%	22.2%	0%	18.9%	0%		19.6%	3.7%	3.7%	0%	0%		3.7%	0%	0%	0%	0%		0%	-
Buses	0	8	0	0		8	1	0	0	0		1	0	2	0	0		2	0	0	0	0		0	-
Buses %	0%	3%	0%	0%		2.8%	11.1%	0%	0%	0%		2.2%	0%	2.4%	0%	0%		1.5%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	4	0	0		4	2	0	4	0		6	1	3	0	0		4	0	0	0	0		0	-
Articulated Trucks %	0%	1.5%	0%	0%		1.4%	22.2%	0%	10.8%	0%		13%	1.9%	3.7%	0%	0%		2.9%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	0		-	-	-	-	-	0	-	-	-	-	0		-	-
Pedestrians%	-	-	-	-	0%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0		-	-	-	-	0		-	-	-	-	0		-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-
Bicycles on Road	0	0	1	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-



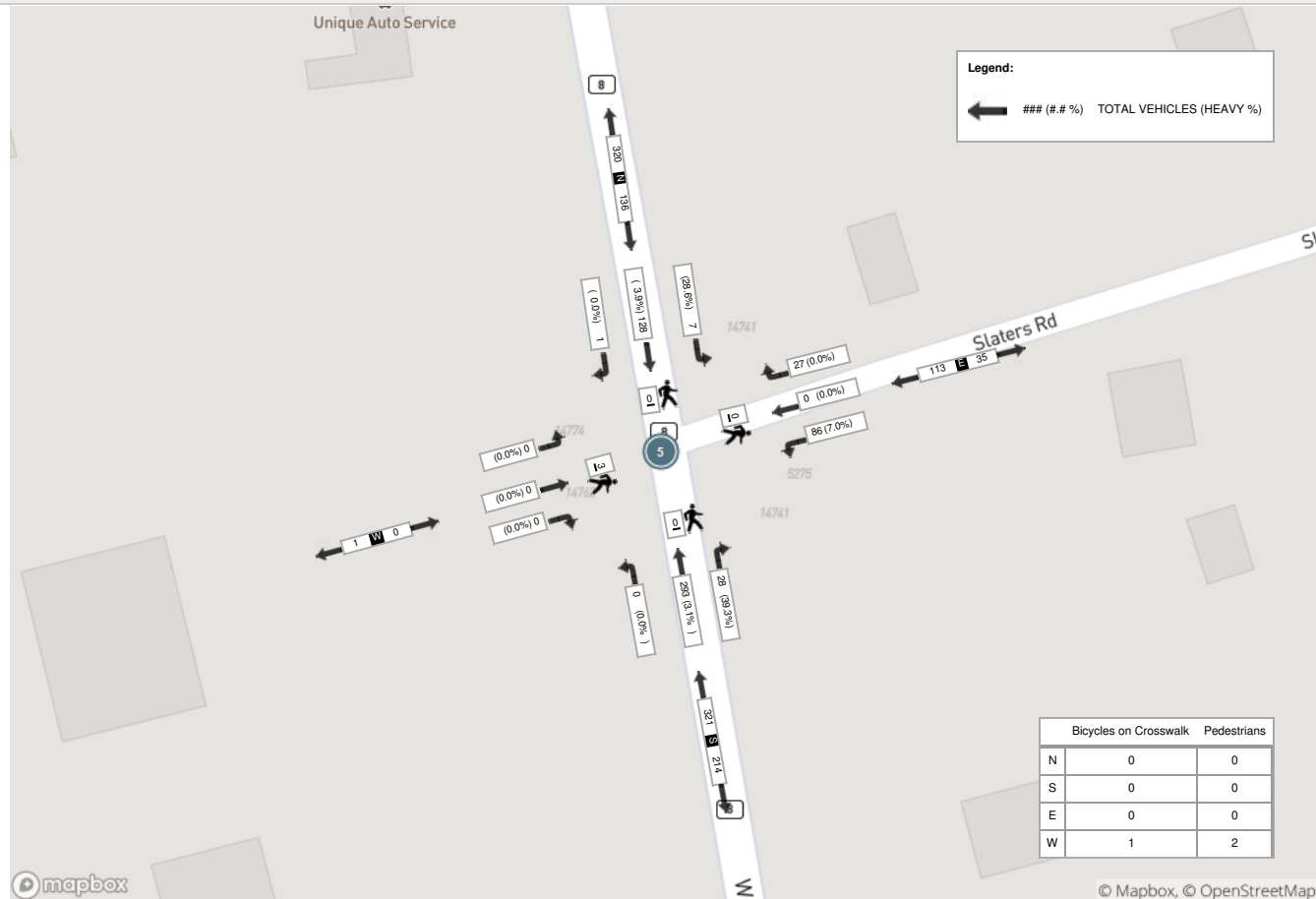
Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (17.46 °C)

Start Time	N Approach WOODBINE AVE						E Approach SLATERS RD						S Approach WOODBINE AVE						W Approach SLATERS RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	0	40	4	0	0	44	2	0	16	0	0	18	6	60	0	0	0	66	0	0	0	0	1	0	128
16:30:00	1	33	1	0	0	35	6	0	15	0	0	21	9	76	0	0	0	85	0	0	0	0	2	0	141
16:45:00	0	24	1	0	0	25	0	0	12	0	0	12	8	82	0	0	0	90	0	0	0	0	0	0	127
17:00:00	0	31	1	0	0	32	19	0	43	0	0	62	5	75	0	0	0	80	0	0	0	0	0	0	174
Grand Total	1	128	7	0	0	136	27	0	86	0	0	113	28	293	0	0	0	321	0	0	0	0	3	0	570
Approach%	0.7%	94.1%	5.1%	0%		-	23.9%	0%	76.1%	0%		-	8.7%	91.3%	0%	0%		-	0%	0%	0%	0%		-	-
Totals %	0.2%	22.5%	1.2%	0%		23.9%	4.7%	0%	15.1%	0%		19.8%	4.9%	51.4%	0%	0%		56.3%	0%	0%	0%	0%		0%	-
PHF	0.25	0.8	0.44	0		0.77	0.36	0	0.5	0		0.46	0.78	0.89	0	0		0.89	0	0	0	0		0	-
Heavy	0	5	2	0		7	0	0	6	0		6	11	9	0	0		20	0	0	0	0		0	-
Heavy %	0%	3.9%	28.6%	0%		5.1%	0%	0%	7%	0%		5.3%	39.3%	3.1%	0%	0%		6.2%	0%	0%	0%	0%		0%	-
Lights	1	123	5	0		129	27	0	80	0		107	17	284	0	0		301	0	0	0	0		0	-
Lights %	100%	96.1%	71.4%	0%		94.9%	100%	0%	93%	0%		94.7%	60.7%	96.9%	0%	0%		93.8%	0%	0%	0%	0%		0%	-
Single-Unit Trucks	0	3	1	0		4	0	0	1	0		1	7	4	0	0		11	0	0	0	0		0	-
Single-Unit Trucks %	0%	2.3%	14.3%	0%		2.9%	0%	0%	1.2%	0%		0.9%	25%	1.4%	0%	0%		3.4%	0%	0%	0%	0%		0%	-
Buses	0	1	0	0		1	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	-
Buses %	0%	0.8%	0%	0%		0.7%	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.6%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	1	1	0		2	0	0	5	0		5	4	3	0	0		7	0	0	0	0		0	-
Articulated Trucks %	0%	0.8%	14.3%	0%		1.5%	0%	0%	5.8%	0%		4.4%	14.3%	1%	0%	0%		2.2%	0%	0%	0%	0%		0%	-
Pedestrians	-	-	-	-	0	-	-	-	-	0		-	-	-	-	-	0	-	-	-	-	-	2	-	-
Pedestrians%	-	-	-	-	0%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	-	66.7%	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0		-	-	-	-	0		-	-	-	-	-	1	-	-
Bicycles on Crosswalk%	-	-	-	-	0%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	-	33.3%	-	-
Bicycles on Road	0	4	0	0	0	-	2	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	-	0%	-	-

Peak Hour: 07:30 AM - 08:30 AM Weather: Broken Clouds (12.15 °C)



Peak Hour: 04:15 PM - 05:15 PM Weather: Overcast Clouds (17.46 °C)

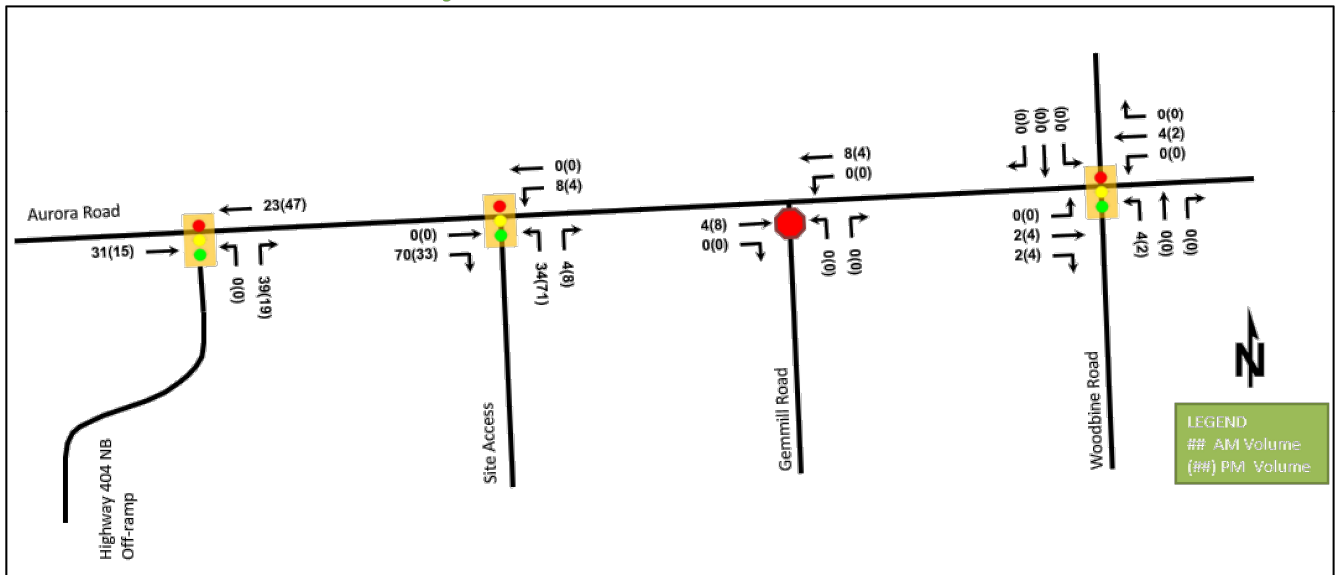


APPENDIX F:

Background Development Traffic Volumes



Figure 9: Total New Site Generation Auto Volumes



Date Plotted: February 22, 2023 Filename: P:\8059\03\Graphics\CAD\Phase 2\FigE1-03-BD_2159.dwg



Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\FigE2-03-BD_5532.dwg

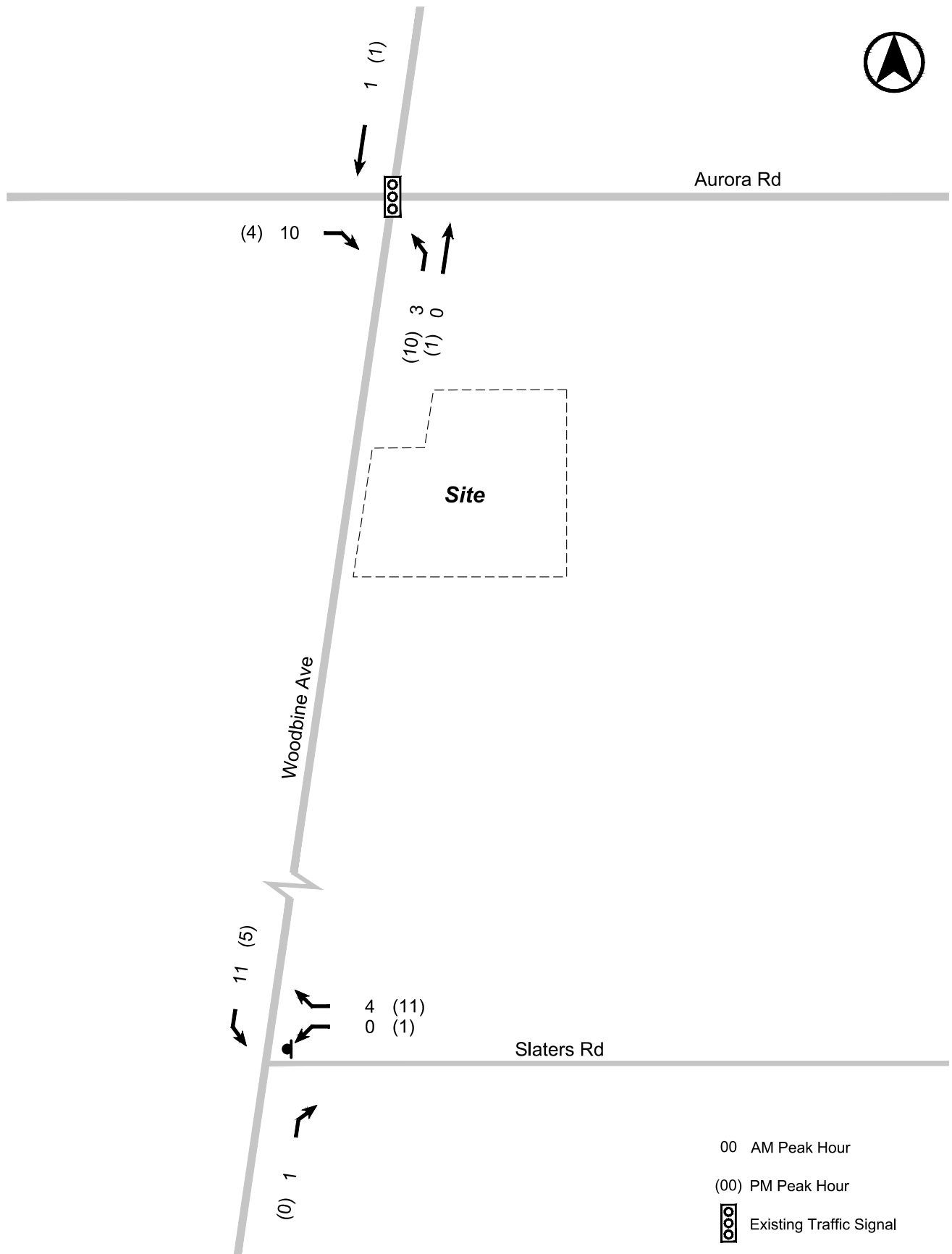


FIGURE E2 BACKGROUND DEVELOPMENT - 5532 SLATERS ROAD

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\FigE3-03-BD_14609.dwg

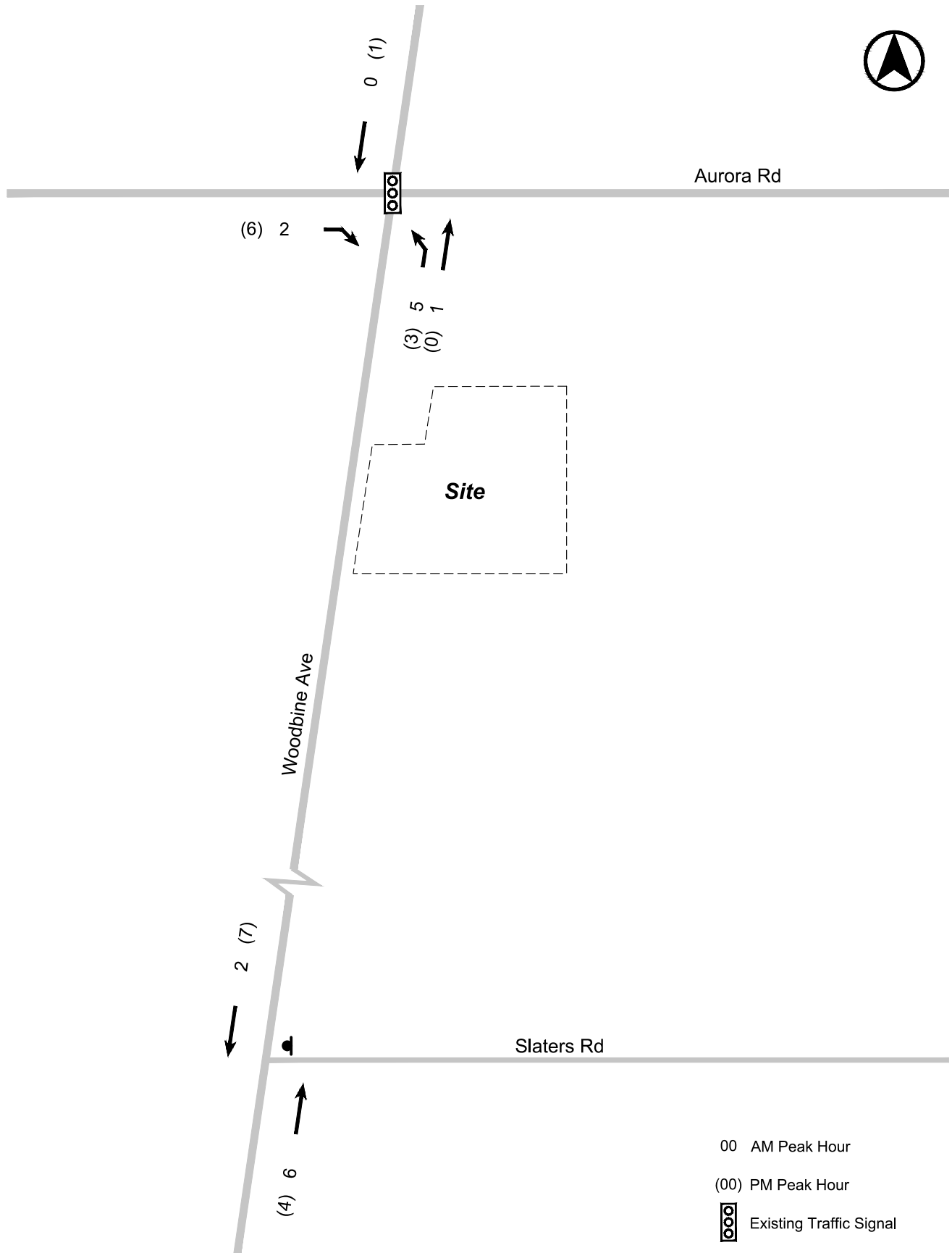


FIGURE E3 BACKGROUND DEVELOPMENT - 14609 WOODBINE AVENUE

Date Plotted: February 22, 2023 Filename: P:\80\59\03\Graphics\CAD\Phase 2\FigE4-03-BD_15123.dwg

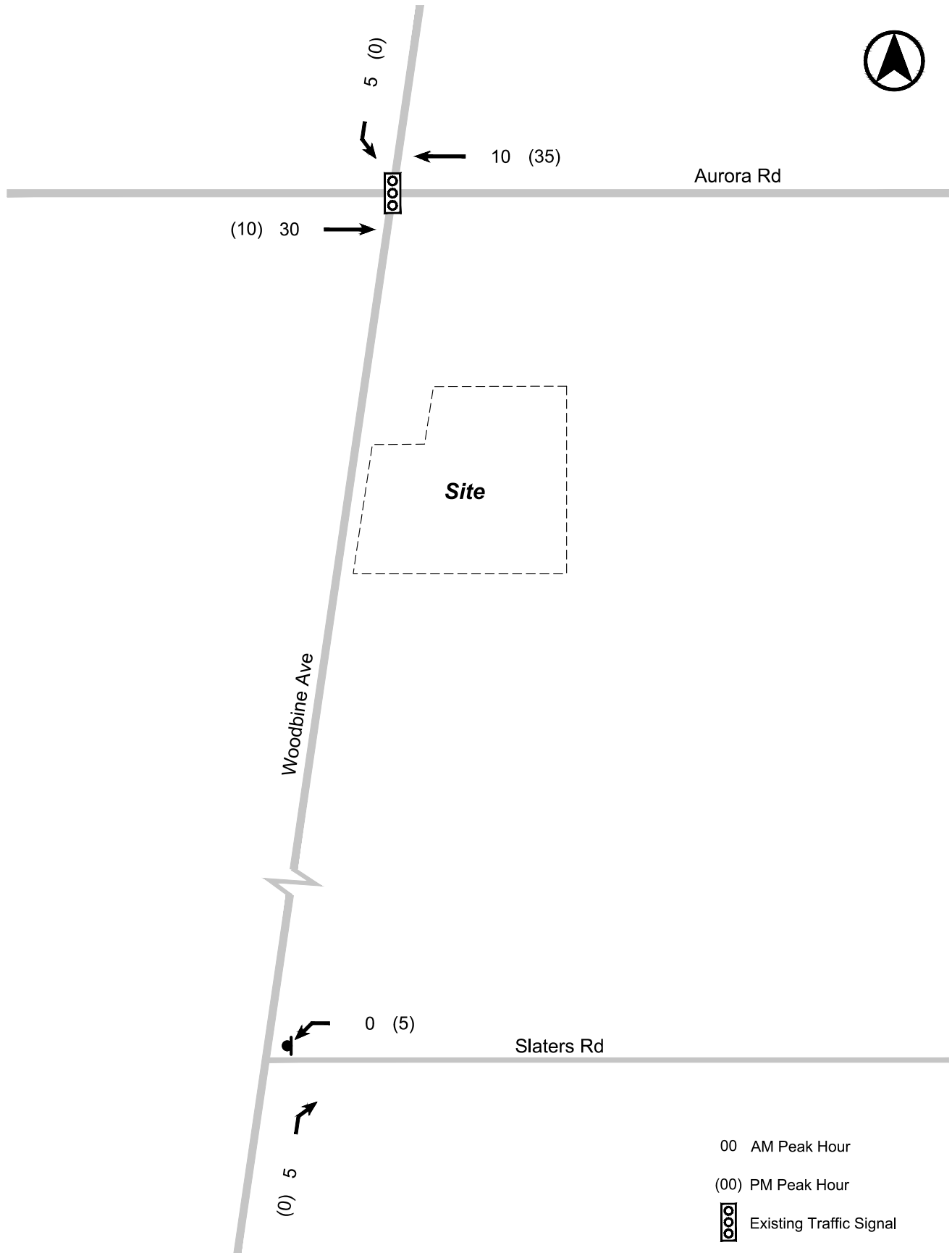


FIGURE E4 BACKGROUND DEVELOPMENT - 15123 WOODBINE AVE PHASE 1

APPENDIX G: Synchro Worksheets



HCM Signalized Intersection Capacity Analysis

Existing (AM)

1: Woodbine Ave & Aurora Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	←	↖	↗	→	↖	↗	←	↖	↗	←	↖
Traffic Volume (vph)	30	305	115	25	410	55	45	50	15	90	520
Flt Volume (vph)	30	305	115	25	410	55	45	50	15	90	520
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fibp. ped/bikes	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1743	1818	1604	1810	1754	1441	1743	3519	1339	1776	3619
Flt Permitted	0.44	1.00	1.00	0.55	1.00	1.00	0.36	1.00	1.00	0.72	1.00
Satd. Flow (perm)	812	1818	1604	1051	1754	1441	665	3519	1339	1342	3619
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	34	347	131	28	466	62	51	57	17	102	591
RTOR Reduction (vph)	0	0	41	0	31	0	0	13	0	0	56
Lane Group Flow (vph)	34	347	90	28	466	32	51	57	4	102	591
Confl. Bikes (#/hr)	9%	10%	6%	5%	14%	18%	9%	8%	27%	7%	5%
Heavy Vehicles (%)	Permi	NA	Permi	Permi	Permi	Permi	Permi	NA	Permi	Permi	NA
Turn Type	Permi	NA	Permi	Permi	Permi	Permi	Permi	NA	Permi	Permi	NA
Protected Phases	6	6	2	2	2	2	8	8	8	4	4
Permitted Phases	6	6	2	2	2	2	8	8	8	4	4
Actuated Green, G (s)	33.3	33.3	33.3	33.3	33.3	33.3	16.7	16.7	16.7	16.7	16.7
Effective Green, g (s)	33.3	33.3	33.3	33.3	33.3	33.3	16.7	16.7	16.7	16.7	16.7
Actuated p/C Ratio	0.51	0.51	0.51	0.51	0.51	0.51	0.26	0.26	0.26	0.26	0.26
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	415	931	821	538	888	738	170	904	344	344	929
v/s Ratio Prot	0.19			c0.27			0.02				c0.16
v/s Ratio Perm	0.04		0.06	0.03		0.02	0.08		0.00	0.08	0.04
v/s Ratio	0.08	0.37	0.11	0.05	0.52	0.04	0.30	0.06	0.01	0.30	0.64
Uniform Delay, d1	8.1	9.6	8.2	7.9	10.5	7.9	19.4	18.2	18.0	19.4	21.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.1	0.3	0.2	2.1	0.1	1.0	0.0	0.0	0.5	1.4
Delay (s)	8.5	10.7	8.5	8.1	12.7	8.0	20.4	18.3	18.0	19.9	22.9
Level of Service	A	B	A	A	A	A	C	B	B	B	C
Approach Delay (s)	10.0				11.9			19.1		21.9	
Approach LOS	A				B			B		C	
Intersection Summary											
HCM 2000 Control Delay			15.9		HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56								
Actuated Cycle Length (s)			65.0		Sum of lost time (s)				15.0		
Intersection Capacity Utilization			74.1%		ICU Level of Service				D		
Analysis Period (min)			15								
Critical Lane Group											

Queues Existing (AM)

Existing (AM)

1: Woodbine Ave & Aurora Rd

Lane Group												
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
												
Lane Configurations	30	305	115	25	410	55	45	50	15	90	520	
Traffic Volume (vph)	30	305	115	25	410	55	45	50	15	90	520	
Future Volume (vph)	34	347	131	28	466	63	51	57	17	102	591	
Lane Group Flow (vph)	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Turn Type	6	6	6	2	2	2	8	8	4	4	4	
Protected Phases	6	6	6	2	2	2	8	8	4	4	4	
Permitted Phases	6	6	6	2	2	2	8	8	4	4	4	
Detector Phase	6	6	6	2	2	2	8	8	4	4	4	
Switch Phase	6	6	6	2	2	2	8	8	4	4	4	
Minimum Initial (s)	20.0	20.0	20.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0	14.0	
Minimum Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	21.5	21.5	21.5	21.5	21.5	
Total Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	27.5	27.5	27.5	27.5	27.5	
Total Split (%)	57.7%	57.7%	57.7%	57.7%	57.7%	57.7%	42.3%	42.3%	42.3%	42.3%	42.3%	
Yellow Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Last Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	
Lead-Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	
v/c Ratio	0.08	0.37	0.15	0.05	0.52	0.08	0.30	0.06	0.04	0.30	0.64	
Control Delay	10.0	11.7	4.7	9.5	13.9	2.6	23.5	17.2	0.2	21.0	24.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	10.0	11.7	4.7	9.5	13.9	2.6	23.5	17.2	0.2	21.0	24.5	
Queue Length 50th (m)	2.0	24.4	2.7	1.6	36.2	0.0	5.2	2.8	0.0	10.4	35.0	
Queue Length 95th (m)	6.7	45.2	10.9	5.7	65.4	4.4	12.9	6.2	0.0	20.3	45.5	
Internal Link Dist (m)	519.5											
Turn Bay Length (m)	140.0	70.0										
Base Capacity (vph)	415	931	863	538	898	775	204	1082	464	412	1113	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.37	0.15	0.05	0.52	0.08	0.25	0.05	0.04	0.25	0.53	
Intersection Summary												
Cycle Length: 65												
Actuated Cycle Length: 65												
Offset: 0 (0%), Referenced to Phase 2:WBTl and 6:EBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
Splits and Phases: 1: Woodbine Ave & Aurora Rd												
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Queues Existing (PM)

1: Woodbine Ave & Aurora Rd

Existing (PM)

Lane Group															
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
															
Lane Configurations															
95	365	65	25	400	115	110	335	45	60	80	40				
Traffic Volume (vph)															
95	365	65	25	400	115	110	335	45	60	80	40				
Future Volume (vph)															
103	397	71	27	435	125	120	364	49	65	87	43				
Future Flow (vph)															
Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm				
Turn Type															
Protected Phases															
6	6	6	2	2	2	8	8	8	4	4	4				
Permitted Phases															
6	6	6	2	2	2	8	8	8	4	4	4				
Detector Phase															
Switch Phase															
Minimum Initial (s)															
20.0	20.0	20.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0	14.0	14.0				
37.5	37.5	37.5	37.5	37.5	37.5	21.5	21.5	21.5	21.5	21.5	21.5				
Minimum Split (s)															
37.5	37.5	37.5	37.5	37.5	37.5	27.5	27.5	27.5	27.5	27.5	27.5				
Total Split (s)															
57.1%	57.1%	57.1%	57.1%	57.1%	57.1%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%				
Total Split (%)															
5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5				
Yellow Time (s)															
2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0				
All-Red Time (s)															
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Lost Time Adjust (s)															
7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5				
Total Lost Time (s)															
Lead/Lag															
Lead-Lag Optimize?															
Recall Mode															
C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min				
0.20	0.39	0.08	0.05	0.42	0.13	0.40	0.44	0.11	0.33	0.11	0.10				
v/c Ratio															
9.1	10.2	2.3	7.8	10.5	4.0	25.7	23.4	3.3	25.9	20.1	2.8				
Control Delay															
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Queue Delay															
9.1	10.2	2.3	7.8	10.5	4.0	25.7	23.4	3.3	25.9	20.1	2.8				
Total Delay															
5.9	25.8	0.0	1.4	28.9	2.6	13.2	21.2	0.0	7.0	4.6	0.0				
Queue Length 50th (m)															
14.9	47.8	4.9	5.2	52.7	10.1	25.9	31.1	4.5	16.7	9.4	3.4				
Queue Length 95th (m)															
Internal Link Dist (m)															
Turn Bay Length (m)															
140.0	70.0	65.0	10.0	70.0	10.0	70.0	10.0	50.0	10.0	50.0	10.0				
Base Capacity (vph)															
516	1019	917	497	1039	961	416	1146	575	276	1135	549				
Starvation Cap Reductn															
0	0	0	0	0	0	0	0	0	0	0	0				
Spillback Cap Reductn															
0	0	0	0	0	0	0	0	0	0	0	0				
Storage Cap Reductn															
0	0	0	0	0	0	0	0	0	0	0	0				
Reduced v/c Ratio															
0.20	0.39	0.08	0.05	0.42	0.13	0.29	0.32	0.09	0.24	0.08	0.08				
Intersection Summary															
Cycle Length: 65															
Actuated Cycle Length: 65															
Offset: 0 (0%), Referenced to phase 2:WBTl and 6:EBTL, Start of Green															
Natural Cycle: 60															
Control Type: Actuated-Coordinated															

HCM Unsignalized Intersection Capacity Analysis

5: Woodbine Ave & Slaters Rd

Existing (AM)

Movement	WBL	WBR	NBT	NBR	SBL SBT
Lane Configurations					
Traffic Volume (veh/h)	40	25	85	55	25 635
Future Volume (Veh/h)	40	25	85	55	25 635
Sign Control	Stop		Free		Free
Grade	0%		0%		0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	45	28	97	62	28 722
Pedestrians					
Lane Width (m)					
Walking Speed (m/s)					
Percent Blockage					
Right turn flare (veh)			None		None
Median type					
Median storage (veh)					
Upstream signal (m)					
pX, platoon unblocked	875	97			159
vC, conflicting volume					
vC1, stage 1 conf vol					
vC2, stage 2 conf vol					
vCu, unblocked vol	875	97			159
iC, single (s)	6.7	6.8			4.1
iC, 2 stage (s)					
fF (s)	3.8	3.8			2.2
p0 queue free %	84	97			98
cM capacity (veh/h)	280	830			1408
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	73	97	62	28	722
Volume Left	45	0	0	28	0
Volume Right	28	0	62	0	0
cSH	376	1700	1700	1408	1700
Volume to Capacity	0.19	0.06	0.04	0.02	0.42
Queue Length 95th (m)	5.7	0.0	0.0	0.5	0.0
Control Delay (s)	16.9	0.0	0.0	7.6	0.0
Lane LOS	C		A		
Approach Delay (s)	16.9	0.0		0.3	
Approach LOS	C				
Intersection Summary					
Average Delay			1.5		
Intersection Capacity Utilization			42.2%		A
Analysis Period (min)			15		

HCM Unsignalized Intersection Capacity Analysis

5: Woodbine Ave & Slaters Rd

Existing (PM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		↑	↑	↓	↓
Traffic Volume (veh/h)	90	65	425	65	35	135
Future Volume (Veh/h)	90	65	425	65	35	135
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	110	79	518	79	43	165
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	769	518			597	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VC, unblocked vol	769	518			597	
IC, single (s)	6.5	6.2			4.4	
IC, 2 stage (s)						
IF (s)	3.6	3.3			2.5	
p0 queue free %	68	86			95	
CM capacity (veh/h)	344	562			860	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	189	518	79	43	165	
Volume Left	110	0	0	43	0	
Volume Right	79	0	79	0	0	
cSH	411	1700	1700	860	1700	
Volume to Capacity	0.46	0.30	0.05	0.05	0.10	
Queue Length 95th (m)	18.9	0.0	0.0	1.3	0.0	
Control Delay (s)	21.0	0.0	0.0	9.4	0.0	
Lane LOS	C	C	A	A	A	
Approach Delay (s)	21.0	0.0		1.9		
Approach LOS	C					
Intersection Summary						
Average Delay			4.4			A
Intersection Capacity Utilization			43.3%			
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: Woodbine Ave & Aurora Rd

Existing (PM)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Traffic Volume (vph)	95	365	65	25	400	115	110	335	45	60	80	40
Future Volume (vph)	95	365	65	25	400	115	110	335	45	60	80	40
Ideal Flow (vphpb)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
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
Flbb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1869	1619	1681	1905	1700	1845	3725	1700	1597	3689	1615
Flt Permitted	0.48	1.00	1.00	0.52	1.00	1.00	0.70	1.00	1.00	0.53	1.00	1.00
Satd. Flow (perm)	946	1869	1619	912	1905	1700	1355	3725	1700	899	3689	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	397	71	27	435	125	120	364	49	65	87	43
RTOR Reduction (vph)	0	0	32	0	0	34	0	0	38	0	0	33
Lane Group Flow (vph)	103	397	39	27	435	91	120	364	11	65	87	10
Confit. Bikes (#/hr)												1
Heavy Vehicles (%)	2%	7%	5%	13%	5%	0%	3%	2%	0%	19%	3%	3%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	6	6	6	2	2	8	8	8	8	4	4	4
Permitted Phases												
Actuated Green, G (s)	35.5	35.5	35.5	35.5	35.5	35.5	14.5	14.5	14.5	14.5	14.5	14.5
Effective Green, g (s)	35.5	35.5	35.5	35.5	35.5	35.5	14.5	14.5	14.5	14.5	14.5	14.5
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.55	0.55	0.22	0.22	0.22	0.22	0.22	0.22
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	516	1020	884	498	1040	928	302	830	379	200	822	360
v/s Ratio Prot	0.11	0.21		0.23			0.10				0.02	
v/s Ratio Perm	0.20	0.39	0.04	0.05	0.42	0.10	0.40	0.44	0.03	0.33	0.11	0.03
Uniform Delay, d1	7.5	8.5	6.9	6.9	8.7	7.1	21.5	21.7	19.7	21.2	20.1	19.7
Progression 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
Incremental Delay, d2	0.9	1.1	0.1	0.2	1.2	0.2	0.9	0.4	0.0	1.0	0.1	0.0
Delay (s)	8.4	9.6	7.0	7.1	9.9	7.3	22.4	22.1	19.8	22.1	20.1	19.8
Level of Service	A	A	A	A	A	A	C	C	B	C	C	B
Approach Delay (s)	9.1			9.2			22.0			20.7		
Approach LOS	A			A			C			C		
Intersection Summary												
HCM 2000 Control Delay			14.0							B		
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			65.0							15.0		
Intersection Capacity Utilization			91.6%							F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

Future Background - 5-year Horizon (AM)

Future Background - 5-year Horizon (AM)

Future Background - 5-year Horizon (AM)

1: Woodbine Ave & Aurora Rd

1: Woodbine Ave & Aurora Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	370	145	25	470	60	65	55	15	105	575	120
Future Volume (vph)	35	370	145	25	470	60	65	55	15	105	575	120
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Flt Flow (prot)	1743	1818	1604	1810	1754	1441	1743	3519	1339	1776	3619	1600
Flt Permitted	0.98	1.00	1.00	0.48	1.00	1.00	0.92	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	691	1818	1604	912	1754	1441	584	3519	1339	1334	3619	1600
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	40	420	165	28	534	68	74	62	17	119	653	136
RTOR Reduction (vph)	0	0	38	0	0	34	0	0	12	0	0	56
Lane Group Flow (vph)	0	420	127	28	534	34	74	63	5	119	653	80
Confli. Bikes (#/hr)												
Heavy Vehicles (%)	9%	10%	6%	5%	14%	18%	9%	8%	27%	7%	5%	4%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	6	6	2	2	8	8	8	8	4	4	4	4
Permitted Phases	6	6	2	2	8	8	8	8	4	4	4	4
Actuated Green, G (s)	32.5	32.5	32.5	32.5	32.5	32.5	17.5	17.5	17.5	17.5	17.5	17.5
Effective Green, g (s)	32.5	32.5	32.5	32.5	32.5	32.5	17.5	17.5	17.5	17.5	17.5	17.5
Actuated Q/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.27	0.27	0.27	0.27	0.27	0.27
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	345	909	802	456	877	720	157	947	360	359	974	430
v/s Ratio Prot	0.23			0.30			0.02			0.018		
v/s Ratio Perm	0.06	0.08	0.03		0.02	0.13		0.00	0.09		0.05	
v/c Ratio	0.12	0.46	0.16	0.06	0.61	0.05	0.47	0.07	0.01	0.33	0.19	0.19
Uniform Delay, d1	8.6	10.6	8.8	8.4	17.7	8.3	19.9	17.7	17.4	19.1	21.2	18.3
Progression 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
Incremental Delay, d2	0.7	1.7	0.4	0.3	3.1	0.1	2.2	0.0	0.0	0.5	1.8	0.2
Delay (s)	9.3	12.3	9.2	8.6	14.8	8.4	22.1	17.7	17.4	19.6	23.0	18.5
Level of Service	A	B	A	A	B	A	C	B	B	B	C	B
Approach Delay (s)		11.3			13.9		19.8		21.9			
Approach LOS		B			B		B		C			
Intersection Summary												
HCN 2000 Control Delay	16.7											
HCN 2000 Volume to Capacity ratio	0.63											
Actuated Cycle Length (s)	65.0											
Intersection Capacity Utilization	75.5%											
Analysis Period (min)	15											
c Critical Lane Group												

Lane Group														
EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
														
Lane Configurations														
Traffic Volume (vph)	35	370	145	25	470	60	65	55	15	105	575	120	120	120
Future Volume (vph)	35	370	145	25	470	60	65	55	15	105	575	120	120	120
Lane Group Flow (vph)	40	420	165	28	534	68	74	63	17	119	653	136	136	136
Turn Type	Perm	NA	Perm	Perm	Perm	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	Perm
Protected Phases	6	6	6	2	2	2	8	8	8	4	4	4	4	4
Permitted Phases	6	6	6	2	2	2	8	8	8	4	4	4	4	4
Detector Phase														
Switch Phase														
Minimum Initial (s)	20.0	20.0	20.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Minimum Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
Total Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (%)	57.7%	57.7%	57.7%	57.7%	57.7%	57.7%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%
Yellow Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Last Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Total Lag														
Lead-Lag Optimize?														
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None	None	None
v/c Ratio	0.12	0.46	0.20	0.06	0.61	0.09	0.47	0.07	0.04	0.33	0.67	0.28	0.33	0.33
Control Delay	10.9	13.3	6.4	10.0	16.1	2.9	30.1	16.8	0.2	21.1	24.6	10.4	10.4	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	13.3	6.4	10.0	16.1	2.9	30.1	16.8	0.2	21.1	24.6	10.4	10.4	10.4
Queue Length 50th (m)	2.5	32.3	5.6	1.7	45.4	0.0	7.8	3.1	0.0	12.0	38.6	5.8	5.8	5.8
Queue Length 95th (m)	7.8	56.3	15.3	5.8	78.7	5.0	18.8	6.7	0.0	23.2	50.7	18.5	18.5	18.5
Internal Link Dist (m)	519.5				747.7		208.3				180.4			
Turn Bay Length (m)	140.0		70.0	65.0	10.0	70.0			10.0	50.0		10.0		
Base Capacity (vph)	344	909	840	455	877	758	179	1082	464	410	1113	544	410	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.46	0.20	0.06	0.61	0.09	0.41	0.06	0.04	0.29	0.59	0.25	0.29	0.25
Intersection Summary														
Cycle Length: 65														
Actuated Cycle Length: 65														
Offset: 0 (0%), Referenced to Phase 2:WBTL and 6:EBTL, Start of Green														
Natural Cycle: 60														
Control Type: Actuated-Coordinated														
Splits and Phases: 1: Woodbine Ave & Aurora Rd														
														
Ø2 (R)														
37.5 s														
														
Ø6 (R)														
37.5 s														

Queues

Future Background - 5-year Horizon (PM)

1: Woodbine Ave & Aurora Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↰	↱	↰	↱	↰	↱	↰	↱	↰	↱
Traffic Volume (vph)	105	415	80	30	475	125	135	370	50	65	95	45
Future Volume (vph)	105	415	80	30	475	125	135	370	50	65	95	45
Lane Group Flow (vph)	114	451	87	33	516	136	147	402	54	71	103	49
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	6	6	2	2	2	2	8	8	8	4	4	4
Permitted Phases	6	6	6	2	2	2	8	8	8	4	4	4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0	14.0	14.0
Minimum Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	21.5	21.5	21.5	21.5	21.5	21.5
Total Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (%)	57.7%	57.7%	57.7%	57.7%	57.7%	57.7%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%
Yellow Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode												
v/c Ratio	0.27	0.45	0.10	0.07	0.51	0.14	0.47	0.46	0.12	0.35	0.12	0.11
Control Delay	11.0	11.5	2.7	8.7	12.3	4.7	26.5	23.0	3.9	25.6	19.3	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	11.5	2.7	8.7	12.3	4.7	26.5	23.0	3.9	25.6	19.3	3.1
Queue Length 50th (m)	6.8	30.4	0.0	1.8	36.2	3.2	16.6	23.7	0.0	7.8	5.5	0.0
Queue Length 95th (m)	18.7	59.7	6.1	6.5	70.2	12.0	29.8	32.5	5.0	17.2	10.2	4.3
Internal Link Dist (m)		519.5		747.7			208.3				180.4	
Turn Bay Length (m)	140.0		70.0	65.0		10.0	70.0		10.0	50.0		10.0
Base Capacity (vph)	430	1000	906	440	1019	944	410	1146	575	266	1135	549
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.45	0.10	0.07	0.51	0.14	0.36	0.35	0.09	0.27	0.09	0.09
Intersection Summary												

Cycle Length: 65

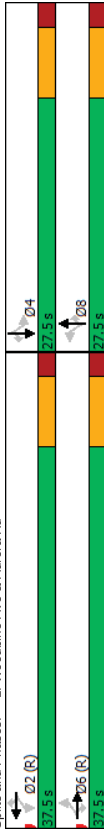
Actuated Cycle Length: 65

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

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 1: Woodbine Ave & Aurora Rd



02-23-2023

BA Group

Synchro 11 Report

HCM Unsignalized Intersection Capacity Analysis

Future Background - 5-year Horizon (AM)

5: Woodbine Ave & Slaters Rd

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱
Traffic Volume (veh/h)	40	30	105	60	35	710
Future Volume (Veh/h)	40	30	105	60	35	710
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	45	34	119	68	40	807
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)			None			None
Median type						
Median storage (veh)						
Upstream signal (m)						
pK, platoon unblocked						
vC, conflicting volume	1006	119			187	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1006	119			187	
IC, single (s)	6.7	6.8			4.1	
IC, 2 stage (s)						
IF (s)	3.8	3.8			2.2	
p0 queue free %	80	96			97	
CM capacity (veh/h)	231	805			1375	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	79	119	68	40	807	
Volume Left	45	0	0	40	0	
Volume Right	34	0	68	0	0	
CSH	333	1700	1700	1375	1700	
Volume to Capacity	0.24	0.07	0.04	0.03	0.47	
Queue Length 95th (m)	7.3	0.0	0.0	0.7	0.0	
Control Delay (s)	19.1	0.0	0.0	7.7	0.0	
Lane LOS	C	C	A	A	A	
Approach Delay (s)	19.1	0.0		0.4		
Approach LOS	C					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			46.2%			A
Analysis Period (min)			15			

02-23-2023

BA Group

Synchro 11 Report

HCM Unsignalized Intersection Capacity Analysis Future Background - 5-year Horizon (PM)

5: Woodbine Ave & Slaters Rd

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		↑	↑	↑	↑
Traffic Volume (veh/h)	95	75	480	65	40	165
Future Volume (Veh/h)	95	75	480	65	40	165
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	116	91	585	79	49	201
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	884	585			664	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VC, unblocked vol	884	585			664	
IC, single (s)	6.5	6.2			4.4	
IC, 2 stage (s)						
IF (s)	3.6	3.3			2.5	
p0 queue free %	60	82			94	
CM capacity (veh/h)	291	515			810	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	207	585	79	49	201	
Volume Left	116	0	0	49	0	
Volume Right	91	0	79	0	0	
cSH	360	1700	1700	810	1700	
Volume to Capacity	0.58	0.34	0.05	0.06	0.12	
Queue Length 95th (m)	27.6	0.0	0.0	1.5	0.0	
Control Delay (s)	27.7	0.0	0.0	9.7	0.0	
Lane LOS	D	A		A		
Approach Delay (s)	27.7	0.0		1.9		
Approach LOS	D					
Intersection Summary						
Average Delay			5.5			A
Intersection Capacity Utilization			47.2%			
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis Future Background - 5-year Horizon (PM)

1: Woodbine Ave & Aurora Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBT
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	105	415	80	30	475	125	135	370	50	65	95	45
Future Volume (vph)	105	415	80	30	475	125	135	370	50	65	95	45
Ideal Flow (vphpb)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
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
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1869	1619	1681	1905	1700	1845	3725	1700	1597	3689	1615
Flt Permitted	0.41	1.00	1.00	0.46	1.00	1.00	0.69	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	804	1869	1619	823	1905	1700	1334	3725	1700	866	3689	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	451	87	33	516	136	147	402	54	71	103	49
RTOR Reduction (vph)	0	0	40	0	0	35	0	0	0	41	0	0
Lane Group Flow (vph)	114	451	47	33	516	101	147	402	13	71	103	11
Conf. Bikes (#/hr)												
Heavy Vehicles (%)	2%	7%	5%	13%	5%	0%	3%	2%	0%	19%	3%	3%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	6	6	6	2	2	2	8	8	8	4	4	4
Permitted Phases	34.8	34.8	34.8	34.8	34.8	34.8	15.2	15.2	15.2	15.2	15.2	15.2
Actuated Green, G (s)	34.8	34.8	34.8	34.8	34.8	34.8	15.2	15.2	15.2	15.2	15.2	15.2
Effective Green, g (s)	34.8	34.8	34.8	34.8	34.8	34.8	15.2	15.2	15.2	15.2	15.2	15.2
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.23	0.23	0.23	0.23	0.23	0.23
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	430	1000	866	440	1019	910	311	871	397	202	862	377
v/s Ratio Prot	0.24			0.27			0.11				0.03	
v/s Ratio Perm	0.14		0.03	0.04		0.06	0.11		0.01	0.08		0.01
v/c Ratio	0.27	0.45	0.05	0.07	0.51	0.11	0.47	0.46	0.03	0.35	0.12	0.03
Uniform Delay, d1	8.2	9.2	7.2	7.3	9.6	7.5	21.4	21.4	19.2	20.8	19.6	19.2
Progression 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
Incremental Delay, d2	1.5	1.5	0.1	0.3	1.8	0.2	1.1	0.4	0.0	1.1	0.1	0.0
Delay (s)	9.7	10.7	7.3	7.6	11.4	7.7	22.6	21.8	19.3	21.8	19.7	19.2
Level of Service	A	B	A	A	B	A	C	C	B	C	B	B
Approach Delay (s)		10.1			10.5			21.7			20.3	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			14.5							B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			65.0							15.0		
Intersection Capacity Utilization			94.1%							F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Woodbine Ave & Aurora Rd

Future Total - 5-year Horizon (AM)

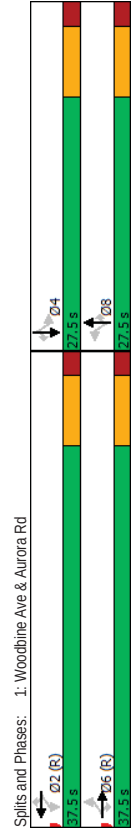
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	370	215	25	470	60	80	55	15	105	590	120
Traffic Volume (vph)	35	370	215	25	470	60	80	55	15	105	590	120
Future Volume (vph)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Ideal Flow (vphpl)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Total Lost time (s)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	0.98
Fltn. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fltn. Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1743	1818	1604	1810	1754	1441	1743	3519	1339	1776	3619	1600
Fltn. Permitted	0.98	1.00	1.00	0.48	1.00	1.00	0.31	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	689	1818	1604	911	1754	1441	561	3519	1339	1334	3619	1600
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	40	420	244	28	534	68	91	62	17	119	670	136
RTOR Reduction (vph)	0	0	38	0	0	34	0	0	12	0	0	55
Lane Group Flow (vph)	40	420	206	28	534	34	91	63	5	119	670	81
Confit. Bikes (#/hr)												1
Heavy Vehicles (%)	9%	10%	6%	5%	14%	18%	9%	8%	27%	7%	5%	4%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	Perm	NA	Perm	NA
Protected Phases	6	6	6	2	2	2	8	8	8	4	4	4
Permitted Phases	6	32.4	32.4	32.4	32.4	32.4	17.6	17.6	17.6	17.6	17.6	17.6
Actuated Green, G (s)	32.4	32.4	32.4	32.4	32.4	32.4	17.6	17.6	17.6	17.6	17.6	17.6
Effective Green, g (s)	32.4	32.4	32.4	32.4	32.4	32.4	17.6	17.6	17.6	17.6	17.6	17.6
Actuated G/C Ratio	0.50	0.50	0.50	0.50	0.50	0.50	0.27	0.27	0.27	0.27	0.27	0.27
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	343	906	799	454	874	718	151	952	362	361	979	433
v/s Ratio Prot	0.23			c0.30			0.02				c0.19	
v/s Ratio Perm	0.06	0.13	0.03	0.02	0.16	0.02	0.00	0.09	0.00	0.09	0.05	0.05
v/s Ratio	0.12	0.46	0.26	0.06	0.61	0.05	0.60	0.07	0.01	0.33	0.68	0.19
Uniform Delay, d1	8.7	10.6	9.4	8.4	11.8	8.4	20.7	17.6	17.3	19.0	21.2	18.2
Progression 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
Incremental Delay, d2	0.7	1.7	0.8	0.3	3.2	0.1	6.6	0.0	0.0	0.5	2.0	0.2
Delay (s)	9.4	12.3	10.2	8.7	14.9	8.5	27.3	17.6	17.4	19.5	23.2	18.4
Level of Service	A	B	B	A	B	A	C	B	B	B	C	B
Approach Delay (s)		11.4			14.0			22.7			22.0	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay												
HCM 2000 Volume to Capacity ratio												
Actuated Cycle Length (s)												
Intersection Capacity Utilization												
Analysis Period (min)												
c Critical Lane Group												

Queues

1: Woodbine Ave & Aurora Rd

Future Total - 5-year Horizon (AM)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	35	370	215	25	470	60	80	55	15	105	590	120
Traffic Volume (vph)	35	370	215	25	470	60	80	55	15	105	590	120
Future Volume (vph)	40	420	244	28	534	68	91	63	17	119	670	136
Lane Group Flow (vph)	40	420	206	28	534	34	91	63	5	119	670	81
Turn Type	Perm	NA	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	6	6	6	2	2	2	8	8	8	4	4	4
Permitted Phases	6	6	6	2	2	2	8	8	8	4	4	4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase	6	6	6	2	2	2	8	8	8	4	4	4
Minimum Initial (s)	20.0	20.0	20.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0	14.0	14.0
Minimum Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	21.5	21.5	21.5	21.5	21.5	21.5
Total Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (%)	57.7%	57.7%	57.7%	57.7%	57.7%	57.7%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%
Yellow Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/s Ratio	0.12	0.46	0.29	0.06	0.61	0.09	0.60	0.07	0.04	0.33	0.68	0.28
Control Delay	10.9	13.4	8.1	10.0	16.2	2.9	38.4	16.7	0.2	21.0	24.8	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.9	13.4	8.1	10.0	16.2	2.9	38.4	16.7	0.2	21.0	24.8	10.4
Queue Length 50th (m)	2.5	32.6	11.2	1.7	46.0	0.0	9.9	3.1	0.0	12.0	39.5	5.7
Queue Length 95th (m)	7.8	56.3	24.7	5.8	78.7	5.0	#26.2	6.7	0.0	23.2	52.2	16.5
Internal Link Dist (m)		519.5			747.7		208.3				180.4	
Turn Bay Length (m)	140.0		70.0	65.0	10.0	70.0	10.0	50.0	10.0	50.0	10.0	10.0
Base Capacity (vph)	343	905	837	453	873	756	172	1082	464	410	1113	544
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.46	0.29	0.06	0.61	0.09	0.53	0.06	0.04	0.29	0.60	0.25
Intersection Summary												
Cycle Length: 65												
Actuated Cycle Length: 65												
Offset: 0 (0%), Referenced to phase 2/WBTL and 6/EBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												



HCM Unsignalized Intersection Capacity Analysis
 9: Woodbine Ave & Building 2A Access

Future Total - 5-year Horizon (AM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		P		P	P
Traffic Volume (veh/h)	0	15	135	0	85	745
Future Volume (Veh/h)	0	15	135	0	85	745
Sign Control	Stop		Free		Free	Free
Grade	0%		0%		0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	147	0	92	810
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						352
Upstream signal (m)						
pX platoon unblocked	0.75					
VC, conflicting volume	1141	147			147	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1021	147			147	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			94	
CM capacity (veh/h)	184	900			1435	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	16	147	92	810		
Volume Left	0	0	92	0		
Volume Right	16	0	0	0		
cSH	900	1700	1435	1700		
Volume to Capacity	0.02	0.09	0.06	0.48		
Queue Length 95th (m)	0.4	0.0	1.6	0.0		
Control Delay (s)	9.1	0.0	7.7	0.0		
Lane LOS	A	A	A			
Approach Delay (s)	9.1	0.0	0.8			
Approach LOS	A					
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			49.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: Woodbine Ave & Slaters Rd

Future Total - 5-year Horizon (AM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		P		P	P
Traffic Volume (veh/h)	40	30	105	60	35	710
Future Volume (Veh/h)	40	30	105	60	35	710
Sign Control	Stop		Free		Free	Free
Grade	0%		0%		0%	0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	45	34	119	68	40	807
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1006	119			187	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1006	119			187	
IC, single (s)	6.7	6.8			4.1	
IC, 2 stage (s)						
IF (s)	3.8	3.8			2.2	
p0 queue free %	80	96			97	
CM capacity (veh/h)	231	805			1375	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	79	119	68	40	807	
Volume Left	45	0	0	40	0	
Volume Right	34	0	68	0	0	
cSH	333	1700	1700	1375	1700	
Volume to Capacity	0.24	0.07	0.04	0.03	0.47	
Queue Length 95th (m)	7.3	0.0	0.0	0.7	0.0	
Control Delay (s)	19.1	0.0	0.0	7.7	0.0	
Lane LOS	C			A		
Approach Delay (s)	19.1	0.0		0.4		
Approach LOS	C					
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			46.2%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

Future Total - 5-year Horizon (PM)

1: Woodbine Ave & Aurora Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	415	95	30	475	125	205	380	50	65	95	45
Future Volume (vph)	105	415	95	30	475	125	205	380	50	65	95	45
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
Fibp. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Frt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1869	1619	1681	1905	1700	1845	3725	1700	1597	3689	1615
Flt Permitted	0.40	1.00	1.00	0.46	1.00	1.00	0.69	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)	782	1869	1619	806	1905	1700	1334	3725	1700	857	3689	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	451	103	33	516	136	223	413	54	71	103	49
RTOR Reduction (vph)	0	0	50	0	0	37	0	0	40	0	0	36
Lane Group Flow (vph)	114	451	53	33	516	99	223	413	14	71	103	13
Confl. Bikes (#/hr)	2%	7%	5%	13%	5%	0%	3%	2%	0%	19%	3%	3%
Heavy Vehicles (%)	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Turn Type	6	6	6	2	2	8	8	8	8	4	4	4
Protected Phases	6	6	6	2	2	8	8	8	8	4	4	4
Permitted Phases	33.3	33.3	33.3	33.3	33.3	33.3	16.7	16.7	16.7	16.7	16.7	16.7
Actuated Green, G (s)	33.3	33.3	33.3	33.3	33.3	33.3	16.7	16.7	16.7	16.7	16.7	16.7
Effective Green, g (s)	0.51	0.51	0.51	0.51	0.51	0.51	0.26	0.26	0.26	0.26	0.26	0.26
Actuated p/C Ratio	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	4.00	957	829	412	975	870	342	957	436	220	947	414
Lane Grp Cap (vph)	300	957	829	412	975	870	342	957	436	220	947	414
v/s Ratio Prot	0.24	0.24	0.03	0.04	c0.27	0.06	c0.17	0.11	0.01	0.08	0.03	0.01
v/s Ratio Perm	0.15	0.15	0.03	0.04	0.03	0.11	0.65	0.43	0.03	0.32	0.11	0.03
v/s Ratio	0.28	0.47	0.06	0.08	0.53	0.11	0.65	0.43	0.03	0.32	0.11	0.03
Uniform Delay, d1	9.1	10.2	8.0	8.1	10.6	8.2	21.6	20.2	18.1	19.6	18.5	18.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.8	1.7	0.1	0.4	2.1	0.3	4.4	0.3	0.0	0.9	0.1	0.0
Delay (s)	10.8	11.9	8.1	8.4	12.7	8.5	26.0	20.5	18.1	20.4	18.5	18.1
Level of Service	B	B	A	A	A	A	C	C	B	C	B	B
Approach Delay (s)	11.1	11.1	11.6	11.6	11.6	11.6	22.1	22.1	19.0	19.0	19.0	19.0
Approach LOS	B	B	B	B	B	B	C	C	B	B	B	B
Intersection Summary												
HCN 2000 Control Delay	15.4		HCN 2000 Level of Service		B							
HCN 2000 Volume to Capacity ratio	0.57											
Actuated Cycle Length (s)	65.0		Sum of lost time (s)		15.0							
Intersection Capacity Utilization	94.1%		ICU Level of Service		F							
Analysis Period (min)	15											
Critical Lane Group												

Queues

Future Total - 5-year Horizon (PM)

1: Woodbine Ave & Aurora Rd

[illegible]

HCM Unsignalized Intersection Capacity Analysis
 9: Woodbine Ave & Building 2A Access

Future Total - 5-year Horizon (PM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		P		P	P
Traffic Volume (veh/h)	0	80	555	0	15	205
Future Volume (Veh/h)	0	80	555	0	15	205
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	87	603	0	16	223
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						352
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	858	603			603	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	858	603			603	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	83			98	
CM capacity (veh/h)	322	499			975	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	87	603	16	223		
Volume Left	0	0	16	0		
Volume Right	87	0	0	0		
cSH	499	1700	975	1700		
Volume to Capacity	0.17	0.35	0.02	0.13		
Queue Length 95th (m)	5.0	0.0	0.4	0.0		
Control Delay (s)	13.7	0.0	8.8	0.0		
Lane LOS	B	B	A			
Approach Delay (s)	13.7	0.0	0.6			
Approach LOS	B					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			40.8%			A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: Woodbine Ave & Slaters Rd

Future Total - 5-year Horizon (PM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		P		P	P
Traffic Volume (veh/h)	95	75	480	65	40	165
Future Volume (Veh/h)	95	75	480	65	40	165
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	116	91	585	79	49	201
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	884	585			664	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	884	585			664	
IC, single (s)	6.5	6.2			4.4	
IC, 2 stage (s)						
IF (s)	3.6	3.3			2.5	
p0 queue free %	60	82			94	
CM capacity (veh/h)	291	515			810	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	207	585	79	49	201	
Volume Left	116	0	0	49	0	
Volume Right	91	0	79	0	0	
cSH	360	1700	1700	810	1700	
Volume to Capacity	0.58	0.34	0.05	0.06	0.12	
Queue Length 95th (m)	27.6	0.0	0.0	1.5	0.0	
Control Delay (s)	27.7	0.0	0.0	9.7	0.0	
Lane LOS	D	D		A		
Approach Delay (s)	27.7	0.0		1.9		
Approach LOS	D					
Intersection Summary						
Average Delay			5.5			
Intersection Capacity Utilization			47.2%			A
Analysis Period (min)			15			

Queues

Future Background - 10-year Horizon (PM)

1: Woodbine Ave & Aurora Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	115	455	90	30	520	140	150	410	55	75	100	50
Future Volume (vph)	115	455	90	30	520	140	150	410	55	75	100	50
Lane Group Flow (vph)	125	495	98	33	565	152	163	446	60	82	109	54
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	6	6	2	2	2	2	8	8	8	4	4	4
Permitted Phases	6	6	6	2	2	2	8	8	8	4	4	4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0	14.0	14.0
Minimum Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	21.5	21.5	21.5	21.5	21.5	21.5
Total Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (%)	57.7%	57.7%	57.7%	57.7%	57.7%	57.7%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%
Yellow Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.33	0.50	0.11	0.08	0.56	0.16	0.51	0.50	0.13	0.41	0.12	0.12
Control Delay	12.9	12.7	2.8	9.4	13.7	5.4	26.9	22.9	4.4	26.8	18.8	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	12.7	2.8	9.4	13.7	5.4	26.9	22.9	4.4	26.8	18.8	3.7
Queue Length 50th (m)	7.7	34.5	0.0	1.8	41.1	4.1	18.6	26.6	0.0	9.1	5.8	0.0
Queue Length 95th (m)	22.7	70.5	6.8	6.9	83.4	14.4	31.8	34.9	5.8	19.1	10.3	4.9
Internal Link Dist (m)	519.5				747.7		208.3				180.4	
Turn Bay Length (m)	140.0	70.0	65.0	10.0	70.0	10.0	70.0	10.0	50.0	10.0	50.0	10.0
Base Capacity (vph)	379	987	901	396	1006	933	408	1146	575	255	1135	549
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.50	0.11	0.08	0.56	0.16	0.40	0.39	0.10	0.32	0.10	0.10
Intersection Summary												

Cycle Length: 65

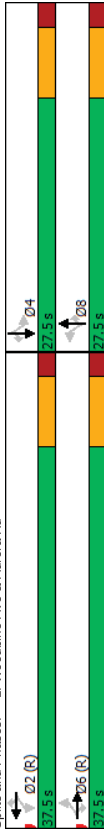
Actuated Cycle Length: 65

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

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 1: Woodbine Ave & Aurora Rd



02-23-2023

BA Group

Synchro 11 Report

HCM Unsignalized Intersection Capacity Analysis

Future Background - 10-year Horizon (AM)

5: Woodbine Ave & Slaters Rd

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↰	↰	↰	↰
Traffic Volume (veh/h)	40	30	120	60	35	790
Future Volume (Veh/h)	40	30	120	60	35	790
Sign Control	Stop	Free	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	45	34	136	68	40	898
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)			None			None
Median type						
Median storage (veh)						
Upstream signal (m)						
pK, platoon unblocked						
vC, conflicting volume	1114	136			204	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol	1114	136			204	
IC, single (s)	6.7	6.8			4.1	
IC, 2 stage (s)						
IF (s)	3.8	3.8			2.2	
p0 queue free %	77	96			97	
CM capacity (veh/h)	197	787			1356	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	79	136	68	40	898	
Volume Left	45	0	0	40	0	
Volume Right	34	0	68	0	0	
CSH	291	1700	1700	1356	1700	
Volume to Capacity	0.27	0.08	0.04	0.03	0.53	
Queue Length 95th (m)	8.6	0.0	0.0	0.7	0.0	
Control Delay (s)	21.9	0.0	0.0	7.7	0.0	
Lane LOS	C	C	A	A	A	
Approach Delay (s)	21.9	0.0		0.3		
Approach LOS	C					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			50.2%			
ICU Level of Service						A
Analysis Period (min)			15			

02-23-2023

BA Group

Synchro 11 Report

HCM Unsignalized Intersection Capacity Analysis Future Background - 10-year Horizon (PM)
5: Woodbine Ave & Slaters Rd

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		↑	↑	↑	↑
Traffic Volume (veh/h)	95	75	540	65	40	180
Future Volume (Veh/h)	95	75	540	65	40	180
Sign Control	Stop	Stop	Free	Free	Free	Free
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	116	91	659	79	49	220
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	977	659			738	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
IC, single (s)	977	659			738	
IC, 2 stage (s)	6.5	6.2			4.4	
IF (s)	3.6	3.3			2.5	
p0 queue free %	54	81			94	
CM capacity (veh/h)	255	467			757	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	207	659	79	49	220	
Volume Left	116	0	0	49	0	
Volume Right	91	0	79	0	0	
cSH	318	1700	1700	757	1700	
Volume to Capacity	0.65	0.39	0.05	0.06	0.13	
Queue Length 95th (m)	34.1	0.0	0.0	1.7	0.0	
Control Delay (s)	35.1	0.0	0.0	10.1	0.0	
Lane LOS	E	E	B	B		
Approach Delay (s)	35.1	0.0		1.8		
Approach LOS	E					
Intersection Summary						
Average Delay			6.4			A
Intersection Capacity Utilization			48.1%			
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis Future Background - 10-year Horizon (PM)
1: Woodbine Ave & Aurora Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Traffic Volume (vph)	115	455	90	30	520	140	150	410	55	75	100	50
Future Volume (vph)	115	455	90	30	520	140	150	410	55	75	100	50
Ideal Flow (vphpb)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frbp, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1863	1869	1619	1681	1905	1700	1845	3725	1700	1597	3689	1615
Flt Permitted	0.37	1.00	1.00	0.42	1.00	1.00	0.68	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	717	1869	1619	751	1905	1700	1326	3725	1700	830	3689	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	495	98	33	565	152	163	446	60	82	109	54
RTOR Reduction (vph)	0	0	46	0	0	36	0	0	46	0	0	41
Lane Group Flow (vph)	125	495	52	33	565	116	163	446	14	82	109	13
Conf. Bikes (#/hr)												
Heavy Vehicles (%)	2%	7%	5%	13%	5%	0%	3%	2%	0%	19%	3%	3%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	6	6	2	2	2	8	8	8	8	4	4	4
Permitted Phases	34.3	34.3	34.3	34.3	34.3	34.3	15.7	15.7	15.7	15.7	15.7	15.7
Actuated Green, G (s)	34.3	34.3	34.3	34.3	34.3	34.3	15.7	15.7	15.7	15.7	15.7	15.7
Effective Green, g (s)	34.3	34.3	34.3	34.3	34.3	34.3	15.7	15.7	15.7	15.7	15.7	15.7
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53	0.53	0.24	0.24	0.24	0.24	0.24	0.24
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	378	886	854	396	1005	897	320	899	410	200	891	390
v/s Ratio Prot	0.26			0.30			0.12					
v/s Ratio Perm	0.17		0.03	0.04		0.07	0.12		0.01	0.10		0.01
v/c Ratio	0.33	0.50	0.06	0.08	0.56	0.13	0.51	0.50	0.04	0.41	0.12	0.03
Uniform Delay, d1	8.8	9.9	7.5	7.6	10.3	7.8	21.3	21.2	18.9	20.8	19.3	18.8
Progression 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
Incremental Delay, d2	2.3	1.8	0.1	0.4	2.3	0.3	1.3	0.4	0.0	1.4	0.1	0.0
Delay (s)	11.1	11.7	7.6	8.0	12.6	8.1	22.6	21.7	18.9	22.1	19.3	18.9
Level of Service	B	B	A	A	B	A	C	C	B	C	B	B
Approach Delay (s)		11.0			11.5			21.6			20.2	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			15.1							B		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			65.0							15.0		
Intersection Capacity Utilization			96.1%							F		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Woodbine Ave & Aurora Rd

Future Total - 10-year Horizon (AM)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	35	405	230	30	515	65	85	60	20	115	650	135
Future Volume (vph)	35	405	230	30	515	65	85	60	20	115	650	135
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
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	0.98
Flph. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Satd. Flow (prot)	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Flt Permitted	0.33	1.00	1.00	0.44	1.00	1.00	0.26	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	597	1818	1604	833	1754	1441	479	3519	1339	1328	3619	1600
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	40	460	261	34	585	74	97	68	23	131	739	153
RTOR Reduction (vph)	0	0	39	0	0	38	0	0	17	0	0	55
Lane Group Flow (vph)	40	460	222	34	585	36	97	68	6	131	739	98
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	9%	10%	6%	5%	14%	18%	9%	8%	27%	7%	5%	4%
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	6		6	2		2	8		8		4	
Actuated Green, G (s)	31.8	31.8	31.8	31.8	31.8	31.8	18.2	18.2	18.2	18.2	18.2	18.2
Effective Green, g (s)	31.8	31.8	31.8	31.8	31.8	31.8	18.2	18.2	18.2	18.2	18.2	18.2
Actuated G/C Ratio	0.49	0.49	0.49	0.49	0.49	0.49	0.28	0.28	0.28	0.28	0.28	0.28
Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	292	889	784	407	858	704	134	985	374	371	1013	448
v/s Ratio Prot	0.25						0.33					0.20
v/s Ratio Perm	0.07	0.14	0.04	0.03	0.20			0.02	0.00	0.10		0.06
v/c Ratio	0.14	0.52	0.28	0.08	0.68	0.05	0.72	0.07	0.02	0.35	0.73	0.22
Uniform Delay, d1	9.1	11.4	9.8	8.8	12.7	8.7	21.1	17.2	16.9	18.7	21.2	18.0
Progression 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
Incremental Delay, d2	1.0	2.1	0.9	0.4	4.4	0.1	17.5	0.0	0.0	0.6	2.7	0.2
Delay (s)	10.1	13.5	10.7	9.2	17.1	8.8	38.7	17.2	16.9	19.3	23.8	18.2
Level of Service	B	B	B	A	B	A	D	B	B	B	C	B
Approach Delay (s)	12.4			15.8			28.2			22.4		
Approach LOS	B			B			C			C		
Intersection Summary												
HCM 2000 Control Delay	HCM 2000 Level of Service											
HCM 2000 Volume to Capacity ratio	0.70											
Actuated Cycle Length (s)	Sum of lost time (s)											
Intersection Capacity Utilization	77.5%											
Analysis Period (min)	15											
c Critical Lane Group	D											

02-23-2023

BA Group

Synchro 11 Report

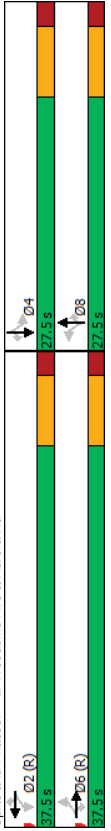
Queues

1: Woodbine Ave & Aurora Rd

Future Total - 10-year Horizon (AM)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	35	405	230	30	515	65	85	60	20	115	650	135
Future Volume (vph)	35	405	230	30	515	65	85	60	20	115	650	135
Lane Group Flow (vph)	40	460	261	34	585	74	97	68	23	131	739	153
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	6		6	2		2	8		8		4	
Permitted Phases	6	6	6	2	2	2	8	8	8	4	4	4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	20.0	20.0	20.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0	14.0	14.0
Minimum Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	21.5	21.5	21.5	21.5	21.5	21.5
Total Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (%)	57.7%	57.7%	57.7%	57.7%	57.7%	57.7%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%
Yellow Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	None	None	None	None	None	None
v/c Ratio	0.14	0.52	0.32	0.08	0.68	0.10	0.72	0.07	0.05	0.35	0.73	0.30
Control Delay	11.6	14.6	8.7	10.5	18.5	3.2	53.6	16.4	0.2	21.0	25.7	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	14.6	8.7	10.5	18.5	3.2	53.6	16.4	0.2	21.0	25.7	11.2
Queue Length 50th (m)	2.7	39.3	13.3	2.3	56.0	0.0	10.6	3.2	0.0	12.7	42.7	7.1
Queue Length 95th (m)	8.1	63.1	26.9	6.7	89.6	5.6	#32.1	7.1	0.0	25.2	58.1	18.9
Internal Link Dist (m)		519.5			747.7		208.3					180.4
Turn Bay Length (m)	140.0		70.0	65.0		10.0	70.0		10.0	50.0		10.0
Base Capacity (vph)	291	889	823	407	858	744	147	1082	464	408	1113	544
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.52	0.32	0.08	0.68	0.10	0.66	0.06	0.05	0.32	0.66	0.28
Intersection Summary												
Cycle Length: 65												
Actuated Cycle Length: 65												
Offset: 0 (0%), Referenced to phase 2/WBTL and 6/EBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												

Splits and Phases: 1- Woodbine Ave & Aurora Rd



02-23-2023

BA Group

Synchro 11 Report

HCM Unsignalized Intersection Capacity Analysis
 9: Woodbine Ave & Building 2A Access

Future Total - 10-year Horizon (AM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		P	P	P	P
Traffic Volume (veh/h)	0	15	150	0	85	825
Future Volume (Veh/h)	0	15	150	0	85	825
Sign Control	Stop		Free		Free	Free
Grade	0%		0%		0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	163	0	92	897
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						352
Upstream signal (m)						
pX platoon unblocked	0.73					
VC, conflicting volume	1244	163			163	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1149	163			163	
IC, single (s)	6.4	6.2			4.1	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
p0 queue free %	100	98			94	
CM capacity (veh/h)	150	882			1416	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	16	163	92	897		
Volume Left	0	0	92	0		
Volume Right	16	0	0	0		
cSH	882	1700	1416	1700		
Volume to Capacity	0.02	0.10	0.06	0.53		
Queue Length 95th (m)	0.4	0.0	1.7	0.0		
Control Delay (s)	9.2	0.0	7.7	0.0		
Lane LOS	A	A	A	A		
Approach Delay (s)	9.2	0.0	0.7			
Approach LOS	A					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			53.4%			A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 5: Woodbine Ave & Slaters Rd

Future Total - 10-year Horizon (AM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		P	P	P	P
Traffic Volume (veh/h)	40	30	120	60	35	790
Future Volume (Veh/h)	40	30	120	60	35	790
Sign Control	Stop		Free		Free	Free
Grade	0%		0%		0%	0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	45	34	136	68	40	898
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
pX platoon unblocked						
VC, conflicting volume	1114	136			204	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCu, unblocked vol	1114	136			204	
IC, single (s)	6.7	6.8			4.1	
IC, 2 stage (s)						
IF (s)	3.8	3.8			2.2	
p0 queue free %	77	96			97	
CM capacity (veh/h)	197	787			1356	
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	79	136	68	40	898	
Volume Left	45	0	0	40	0	
Volume Right	34	0	68	0	0	
cSH	291	1700	1700	1356	1700	
Volume to Capacity	0.27	0.08	0.04	0.03	0.53	
Queue Length 95th (m)	8.6	0.0	0.0	0.7	0.0	
Control Delay (s)	21.9	0.0	0.0	7.7	0.0	
Lane LOS	C			A		
Approach Delay (s)	21.9	0.0		0.3		
Approach LOS	C					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			50.2%			A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

Future Total - 10-year Horizon (PM)

1: Woodbine Ave & Aurora Rd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	↑	→	←	↑	→	←	↑	→	←	↑	→
Traffic Volume (vph)	115	455	105	30	520	140	220	420	55	75	100	50
Future Volume (vph)	115	455	105	30	520	140	220	420	55	75	100	50
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Lost time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
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	0.98
Flbx. ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1863	1869	1619	1681	1905	1700	1845	3725	1700	1597	3689	1615
Flt Permitted	0.95	1.00	1.00	0.41	1.00	1.00	0.68	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)	693	1869	1619	732	1905	1700	1326	3725	1700	821	3689	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	495	114	33	565	152	239	457	60	82	109	54
RTOR Reduction (vph)	0	0	56	0	0	38	0	0	44	0	0	40
Lane Group Flow (vph)	125	495	58	33	565	114	239	457	16	82	109	14
Confl. Bikes (#/hr)	2	7	5	13	5	0	3	2	0	19	3	3
Heavy Vehicles (%)	Perm	NA	Perm	Perm	NA	Perm	Perm	2	Perm	Perm	NA	Perm
Turn Type	Permitted Phases	6	6	2	2	2	8	8	8	4	4	4
Permitted Phases	Actuated Green, G (s)	32.9	32.9	32.9	32.9	32.9	17.1	17.1	17.1	17.1	17.1	17.1
Actuated Green, G (s)	Effective Green, g (s)	32.9	32.9	32.9	32.9	32.9	17.1	17.1	17.1	17.1	17.1	17.1
Effective Green, g (s)	Actuated G/C Ratio	0.51	0.51	0.51	0.51	0.51	0.26	0.26	0.26	0.26	0.26	0.26
Actuated G/C Ratio	Clearance Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Clearance Time (s)	Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	Lane Grp Cap (vph)	350	946	819	370	964	860	348	979	447	215	970
Lane Grp Cap (vph)	v/s Ratio Prot	0.26	0.18	0.04	0.05	0.07	c0.30	0.12	0.01	0.10	0.03	0.03
v/s Ratio Prot	v/s Ratio Perm	0.36	0.52	0.07	0.09	0.59	0.13	0.69	0.47	0.04	0.38	0.11
v/s Ratio Perm	Uniform Delay, d1	9.7	10.8	8.2	8.3	11.3	8.5	21.5	20.1	17.8	19.6	18.2
Uniform Delay, d1	Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Progression Factor	Incremental Delay, d2	2.8	2.1	0.2	0.5	2.6	0.3	5.5	0.4	0.0	1.1	0.1
Incremental Delay, d2	Delay (s)	12.5	12.9	8.4	8.8	13.9	8.8	27.1	20.5	17.8	20.7	18.2
Delay (s)	Level of Service	B	B	A	A	B	A	C	B	C	B	B
Level of Service	Approach Delay (s)	12.1	12.1	12.6	12.6	12.6	22.4	22.4	19.0	19.0	19.0	19.0
Approach Delay (s)	Approach LOS	B	B	B	B	B	C	C	B	B	B	B
Approach LOS	Intersection Summary											
Intersection Summary	HCM 2000 Control Delay	16.1										
HCM 2000 Control Delay	HCM 2000 Volume to Capacity ratio	0.62										
HCM 2000 Volume to Capacity ratio	Actuated Cycle Length (s)	65.0										
Actuated Cycle Length (s)	Sum of lost time (s)	15.0										
Sum of lost time (s)	Intersection Capacity Utilization	96.1%										
Intersection Capacity Utilization	Analysis Period (min)	15										
Analysis Period (min)	c Critical Lane Group											
c Critical Lane Group												

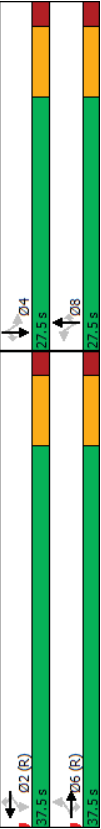
Queues

Future Total - 10-year Horizon (PM)

1: Woodbine Ave & Aurora Rd

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	↑	→	←	↑	→	←	↑	→	←	↑	→
Traffic Volume (vph)	115	455	105	30	520	140	220	420	55	75	100	50
Future Volume (vph)	115	455	105	30	520	140	220	420	55	75	100	50
Lane Group Flow (vph)	125	495	114	33	565	152	239	457	60	82	109	54
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	6	6	2	2	2	2	8	8	8	4	4	4
Permitted Phases	6	6	6	2	2	2	8	8	8	4	4	4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase	6	6	6	2	2	2	8	8	8	4	4	4
Minimum Initial (s)	20.0	20.0	20.0	30.0	30.0	30.0	14.0	14.0	14.0	14.0	14.0	14.0
Minimum Initial (s)	37.5	37.5	37.5	37.5	37.5	37.5	21.5	21.5	21.5	21.5	21.5	21.5
Minimum Split (s)	37.5	37.5	37.5	37.5	37.5	37.5	27.5	27.5	27.5	27.5	27.5	27.5
Total Split (s)	57.7%	57.7%	57.7%	57.7%	57.7%	57.7%	42.3%	42.3%	42.3%	42.3%	42.3%	42.3%
Total Split (%)	Yellow Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Yellow Time (s)	All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
All-Red Time (s)	Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjust (s)	Lost Time (s)	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Lost Time (s)	Lead/Lag											
Lead/Lag	Lead-Lag Optimize?											
Lead-Lag Optimize?	Recall Mode	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min	C-Min
Recall Mode	v/s Ratio	0.36	0.52	0.13	0.09	0.59	0.17	0.68	0.47	0.12	0.38	0.11
v/s Ratio	Control Delay	14.6	14.1	2.8	10.4	15.2	5.9	31.9	21.3	4.2	24.3	17.5
Control Delay	Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	Total Delay	14.6	14.1	2.8	10.4	15.2	5.9	31.9	21.3	4.2	24.3	17.5
Total Delay	Queue Length 50th (m)	9.0	39.9	0.0	2.1	47.5	4.7	26.9	25.2	0.0	8.4	5.4
Queue Length 50th (m)	Queue Length 95th (m)	23.1	70.5	7.4	6.9	83.4	14.4	47.1	35.7	5.8	19.1	10.3
Queue Length 95th (m)	Internal Link Dist (m)	519.5										
Internal Link Dist (m)	Turn Bay Length (m)	140.0	70.0	65.0	65.0	10.0	70.0	10.0	50.0	10.0	50.0	10.0
Turn Bay Length (m)	Base Capacity (vph)	350	945	875	370	963	897	408	1146	575	252	1135
Base Capacity (vph)	Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	Reduced v/c Ratio	0.36	0.52	0.13	0.09	0.59	0.17	0.59	0.40	0.10	0.33	0.10
Reduced v/c Ratio	Intersection Summary											
Intersection Summary	Cycle Length: 65											
Cycle Length: 65	Actuated Cycle Length: 65											
Actuated Cycle Length: 65	Offset: 0 (0%), Referenced to phase 2/WBTL and 6/EBTL, Start of Green											
Offset: 0 (0%), Referenced to phase 2/WBTL and 6/EBTL, Start of Green	Natural Cycle: 60											
Natural Cycle: 60	Control Type: Actuated-Coordinated											
Control Type: Actuated-Coordinated												

Splits and Phases: 1: Woodbine Ave & Aurora Rd



HCM Unsignalized Intersection Capacity Analysis
 9: Woodbine Ave & Building 2A Access

Future Total - 10-year Horizon (PM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		P	P	P	P
Traffic Volume (veh/h)	0	80	615	0	15	220
Future Volume (Veh/h)	0	80	615	0	15	220
Sign Control	Stop	0%	Free	0%	Free	0%
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	87	688	0	16	239
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						352
Upstream signal (m)						
PX platoon unblocked						
VC, conflicting volume	939	668			668	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol	939	668			668	
VCu, unblocked vol	6.4	6.2			4.1	
IC, single (s)						
IC, 2 stage (s)	3.5	3.3			2.2	
IF (s)	100	81			98	
p0 queue free %	288	458			922	
CM capacity (veh/h)						
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	87	668	16	239		
Volume Left	0	0	16	0		
Volume Right	87	0	0	0		
CSH	458	1700	922	1700		
Volume to Capacity	0.19	0.39	0.02	0.14		
Queue Length 95th (m)	5.5	0.0	0.4	0.0		
Control Delay (s)	14.7	0.0	9.0	0.0		
Lane LOS	B	B	A	A		
Approach Delay (s)	14.7	0.0	0.6			
Approach LOS	B					
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			44.0%		ICU Level of Service	A
Analysis Period (min)			15			

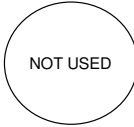
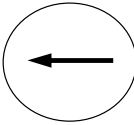
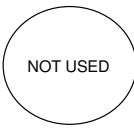
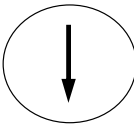
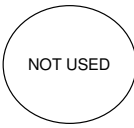
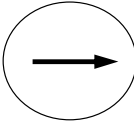
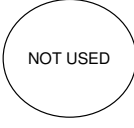
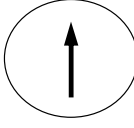
HCM Unsignalized Intersection Capacity Analysis
 5: Woodbine Ave & Slaters Rd

Future Total - 10-year Horizon (PM)

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		P	P	P	P
Traffic Volume (veh/h)	95	75	540	65	40	180
Future Volume (Veh/h)	95	75	540	65	40	180
Sign Control	Stop	0%	Free	0%	Free	0%
Grade	0%	0%	0%	0%	0%	0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	116	91	659	79	49	220
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (m)						
PX platoon unblocked						
VC, conflicting volume	977	659			738	
VC1, stage 1 conf vol						
VC2, stage 2 conf vol	977	659			738	
VCu, unblocked vol	6.5	6.2			4.4	
IC, single (s)						
IC, 2 stage (s)	3.6	3.3			2.5	
IF (s)	54	81			94	
p0 queue free %	255	467			757	
CM capacity (veh/h)						
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	207	659	79	49	220	
Volume Left	116	0	0	49	0	
Volume Right	91	0	79	0	0	
CSH	318	1700	1700	757	1700	
Volume to Capacity	0.65	0.39	0.05	0.06	0.13	
Queue Length 95th (m)	34.1	0.0	0.0	1.7	0.0	
Control Delay (s)	35.1	0.0	0.0	10.1	0.0	
Lane LOS	E	E	B	B	B	
Approach Delay (s)	35.1	0.0		1.8		
Approach LOS	E					
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utilization			48.1%		ICU Level of Service	A
Analysis Period (min)			15			

APPENDIX H: Signal Timing Plans (STPs)



NEMA Phase (York)		Free	Phase Mode (Fixed/Demanded/Callable)	Remarks
		All Day		
	Local Plan System Plan	Pattern 99 Plan 99		
1. 	WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT			Pedestrian Minimums: EWWK = 0 sec., EWFD = 0 sec. NSWK = 0 sec., NSFD = 0 sec. Emergency vehicle pre-emption 3: Serve EWG/EWDW min 20 secs and up to 100 secs if there are continuous emergency calls in EW direction.
2. Westbound  Aurora Rd (YR 15)	WLK 0 FDW 0 MIN 30 EXT 0 MAX1 30 MAX2 0 AMB 5.5 ALR 2.0 SPLIT		Fixed	Emergency vehicle pre-emption 4: Serve NSG/NSDW min 20 secs and up to 100 secs if there are continuous emergency calls in NS direction. NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NSG is served. If ongoing vehicle demand exists on the stopbar loop, the NSG is capable of providing vehicle extensions up to the maximum green split during coordinated operation or serves MAX1 during Free operation. If a pedestrian call is received, the pedestrian minimum will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
3. 	WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT			
4. Southbound  Woodbine (YR 8)	WLK 0 FDW 0 MIN 14 EXT 4 MAX1 20 MAX2 0 AMB 5.5 ALR 2.0 SPLIT		Callable by stopbar loop Extendable by stopbar loop.	During coordinated operation, the signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand.
5. 	WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT			During free plan, signal rests in EWWK and does not cycle through EWFD unless there is side street vehicle or pedestrian demand. EWFD reverts to EWWK if there is no side street demand at the end of the EWFD.
6. Eastbound  Aurora Rd (YR 15)	WLK 0 FDW 0 MIN 30 EXT 0 MAX1 30 MAX2 0 AMB 5.5 ALR 2.0 SPLIT		Fixed	
7. 	WLK FDW MIN EXT MAX1 MAX2 AMB ALR SPLIT			LEGEND: SA - Semi-Actuated signal WLK - Walk time FDW - Flashing Don't Walk time MIN - Minimum green time EXT - Extension time MAX1 - Maximum green time 1 MAX2 - Maximum green time 2 AMB - Amber ALR - All Red CL - Cycle Length OF - Offset VP - Vehicle Permissive NSWK - North/South Walk EWWK - East/West Walk NSG - North/South Green EWG - East/West Green NSFD - North/South Flashing Don't Walk EWFD - East/West Flashing Don't Walk TSP - Transit Priority APS - Audible Pedestrian Signal RLC - Red Light Camera
8. Northbound  Woodbine (YR 8)	WLK 0 FDW 0 MIN 14 EXT 4 MAX1 20 MAX2 0 AMB 5.5 ALR 2.0 SPLIT		Callable by stopbar loop Extendable by stopbar loop.	
	CL OF VP	0 (FREE) 0 (FREE) 0 (FREE)		

NOTES: No pedestrian crossing
Right Turn Channelized all directions