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36 Years

Block 4
4149 Strandherd Drive

Traffic Impact Assessment

Block 4

4149 Strandherd Drive

Transportation Impact Assessment

Prepared By:

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

November 14, 2019
Revised: March 5, 2020

Novatech File: 117148
Ref: R-2019-176

NOVATECH
Engineers, Planners & Landscape Architects

March 5, 2020

City of Ottawa
Planning and Growth Management Department
110 Laurier Ave. W., 4th Floor,
Ottawa, Ontario K1P 1J1

Attention: **Mr. Sean Moore, MCIP, RPP**
Development Review, Planning, Infrastructure and Economic Development

Dear Mr. Moore:

Reference: **4149 Strandherd Drive**
Transportation Impact Assessment
Novatech File No. 117148

We are pleased to submit the following revised Transportation Impact Assessment in support of a Zoning Amendment and Site Plan Control for the above address. The structure and format of this report is in accordance with the City of Ottawa Transportation Impact Assessment Guidelines (June 2017). This revised TIA has been prepared to respond to comments received from the City in January 2020 and address changes to the site plan.

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

Yours truly,

NOVATECH

Patrick Hatton, P.Eng.
Project Manager | Transportation/Traffic

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

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EXECUTIVE SUMMARY

This Transportation Impact Assessment (TIA) report has been prepared in support of a Zoning Amendment and Site Plan Control application for 4149 Strandherd Drive.

The subject site is designated as 'Urban Employment Area' on Schedule 'B' of the City of Ottawa's Official Plan. It is currently zoned Business Park Industrial, Exception 2298, Height maximum 18.0 metres (IP[2298] H18) in the City of Ottawa Zoning By-law No. 2008-250. The development is in the CitiGate business park and must adhere to the CitiGate Design Guidelines.

The proposed development is planned to be completed in three phases consisting of:
Phase 1 (2021): 38,600 square foot auto dealership
Phase 2 (2022): 84,300 square foot office
Phase 3 (2024): a future hotel with up to 120 rooms

The proposed auto dealership will be located at the northwest corner of the Dealership Drive / Strandherd Drive intersection and will provide about 31 customer and employee parking spaces, 28 spaces for vehicles being serviced, and 152 spaces for new and used vehicles being sold. This phase will access the street network via one full-movement access along Dealership Drive and one right-in, right-out access along Strandherd Drive. The egress to Strandherd will be restricted between 7AM and 7PM. There will also be a gated access to the hotel site.

The office building with about 327 parking spaces is to the north of the auto dealership. Access will be via a right-in, right-out driveway onto Strandherd Drive. Connection will be made to the hotel site and its full movement driveways onto Dealership Drive.

The hotel will have about 109 parking spaces and is to the west of the auto dealership and the office. Access will be via 2 driveways onto Dealership Drive and the hotel will also connect to the phase 2 office development, sharing right-in, right-out access to Strandherd Drive. The hotel is not part of this site plan application, except for the easterly access to Dealership Drive and the gated access to the dealership.

A Community Transportation Study (CTS, Novatech Engineering, November 2012) was completed and approved by the City for the CitiGate development lands. The ultimate CitiGate development lands includes the subject site, and the traffic generated by the proposed development was accounted for in this CTS.

The City of Ottawa's 2013 Transportation Master Plan (TMP) identifies the widening of Strandherd Drive from two to four lanes between Fallowfield Road and Jockvale Road as part of the Affordable Network Plan. A section of this has been completed, between Fallowfield Road and Maravista Drive. The remainder of the Strandherd Drive widening is anticipated to be completed from 2019-2022. The design currently includes cycle tracks and sidewalks on both sides of Strandherd Drive, with a divided four lane cross section.

The study area intersections are:
1. the Strandherd Drive/Systemhouse Street/Maravista Drive signalized intersection;
2. the Strandherd Drive/Dealership Drive/Kennevale Drive signalized intersection; and,
3-7. the five proposed site driveway intersections.

The weekday AM and PM peak hours, as well as Saturday peak hour are considered to represent the "worst case" combination of site-generated traffic and peak traffic conditions of the adjacent roadways. Intersection capacity analysis has been completed for the weekday AM, PM, and Saturday peak hours. Analysis of potential transportation impacts has been completed for the 2024 opening year and the 2029 five-year horizon. Weekday AM and PM and Saturday traffic counts were completed by the City of Ottawa (2018) at the study area signalized intersections (see above).

Transportation Briefs were prepared for Barrhaven Honda (Novatech, 2015) and Myers Hyundai Barrhaven (McIntosh Perry, 2015). Estimated traffic volumes generated by the Honda and Hyundai sites have been added to the 2018 count data to obtain the 2018 peak hour traffic volumes at the study area's signalized intersections.

A 2% background growth rate was applied to through traffic on Strandherd Drive as requested by City Staff. Other study area developments have been accounted for separately. Background traffic volumes for the 2024 opening year and the 2029 horizon year were determined by applying the annual traffic growth rate to the 2018 peak hour traffic volumes and by adding the traffic from the new developments in the area. Site generated traffic was estimated using *Trip Generation Manual*, *10th Edition* (Institute of Transportation Engineers, Washington 2017). Site traffic was distributed and added to the projected background traffic to determine future total traffic volumes.

The main conclusions and recommendations of this TIA are:

Development Design and Parking

- Pedestrian facilities will be provided between the main buildings and the parking lots. New pedestrian walkways will be constructed, providing connectivity to the existing pedestrian facilities along Dealership Drive and planned sidewalk along Strandherd Drive.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed vehicular parking spaces meet the requirements of the ZBL for each site.
- The 32 proposed bicycle parking spaces at the north end of the office meet the minimum requirements of the ZBL.
- The 2 proposed bicycle parking spaces at the southwest corner of the auto dealership also meet the minimum requirements of the ZBL.
- Bicycle parking for the hotel will be reviewed at site plan submission for that phase.
- The number of barrier-free spaces meet the AODA requirements for each site.
- As per the City of Ottawa's Zoning By-law, one loading space is required for each of the auto dealership and office and one loading space is provided to each.
- The City of Ottawa's Zoning By-law indicates that 2 loading spaces are required for the hotel. Two loading spaces have been shown and the loading for the hotel will be reviewed prior to site plan submission for that phase.

Boundary Street MMLOS

- The City of Ottawa has prepared a Complete Street Design along Strandherd Drive with plans to implement the Design within the study horizon.

The results of the segment MMLOS analysis for Dealership Drive can be summarized as follows:

- Dealership Drive operates with a PLOS C, achieving the target PLOS C;
- With a BLOS of F, Dealership Drive misses the target BLOS E;
- Dealership Drive surpasses the target Auto LOS D, achieving an Auto LOS A; and,

- The cross section of Dealership Drive was recently reviewed and approved by the City during the plan of subdivision stage. No modifications to Dealership Drive are recommended.

Access Design

- The proposed development will be served by a total of five accesses. The accesses will be 7-9m wide, measured at the property line. The accesses meet all requirements of the City's Private Approach By-law.

Transit

- The proposed development is anticipated to generate an additional 24 transit trips (20 in, 4 out) during the weekday AM peak hour, 23 transit trips (5 in, 18 out) during the weekday PM peak hour, and 14 transit trips (8 in, 6 out) during the Saturday peak hour.
- The additional transit trips generated by the proposed development are not anticipated to have a significant impact on the operations of OC Transpo route 170 or 272.

Intersection MMLOS

- The City of Ottawa has prepared a Complete Street concept for Strandherd Drive with planned implementation by 2022. The concept includes cycle tracks, sidewalk, and added travel lanes. The City of Ottawa has completed its MMLOS analysis and considered the "trade-offs" when developing this Complete Streets design. The subject site is proposing to tie in to this concept and is not anticipated to have a major impact on non-auto MMLOS.

Existing Traffic

- During the Existing weekday AM as well as the Saturday peak hours, several movements were found to operate above City of Ottawa thresholds (v/c > 0.9).
- Additional through capacity is required on Strandherd Drive to accommodate the existing volumes, which will be provided by the modifications along Strandherd Drive to be constructed in the next two years.

2024 Background Traffic

- During the 2024 Saturday peak hour with existing signal timings, the Maravista intersection is expected to operate under failing conditions without site generated trips (SBT v/c ratio of 1.18).
- With signal timing adjustments, the Saturday peak hour is found to improve to LOS 'E'.
- Additional through capacity is required on Strandherd Drive to accommodate the projected volumes.
- Outside of the Maravista intersection's Saturday peak hour, the study intersections are expected to operate with LOS 'C' or better with 2024 future background traffic.

2024 Total Traffic

- The Maravista intersection is expected to operate under failing conditions with site generated trips (SB v/c ratio of 1.26).
- With signal timing adjustments during the Saturday peak hour, the Maravista intersection was found to improve to LOS 'E'.
- The site accesses are expected to operate with LOS 'C' or better under 2024 total traffic conditions, with an average delay of 16.8 seconds or less.
- 95th percentile eastbound queues on Dealership Drive at Strandherd Drive are expected to be stored within the 75m left turn lane and not block the auto driveway / Toyota driveway.

- The 95th percentile southbound through queues on Strandherd Drive at Dealership Drive of about 205 metres are expected to exceed the 110m southbound right turn lane length, blocking access to this lane and the site's Strandherd driveways.
- Capacity issues have been identified for the southbound through movement on Strandherd Drive at Maravista during the Saturday peak hour. To achieve the target Auto LOS 'D' a reduction of 100 southbound through vehicles is required.

2029 Background Traffic

- During the 2029 Saturday peak hour with existing signal timings, the Maravista intersection is expected to operate under failing conditions without site generated trips (SBT v/c ratio of 1.35).
- With signal timing adjustments, the SBT v/c during the Saturday peak hour was found to improve to 1.05.
- During the 2029 weekday PM peak hour, the southbound through movement at the Maravista intersection is expected to operate with LOS 'E' without site generated trips (SBT v/c ratio of 0.93).
- Outside of the Maravista intersection's weekday PM and Saturday peak hours, the study intersections are expected to operate with LOS 'D' or better with 2029 future background traffic.
- To achieve the target Auto LOS 'D' during the weekday PM peak hour, a reduction of 30 southbound through vehicles is required.
- To achieve the target Auto LOS 'D' during the Saturday peak hour, a reduction of 195 southbound through vehicles is required.

2029 Total Traffic

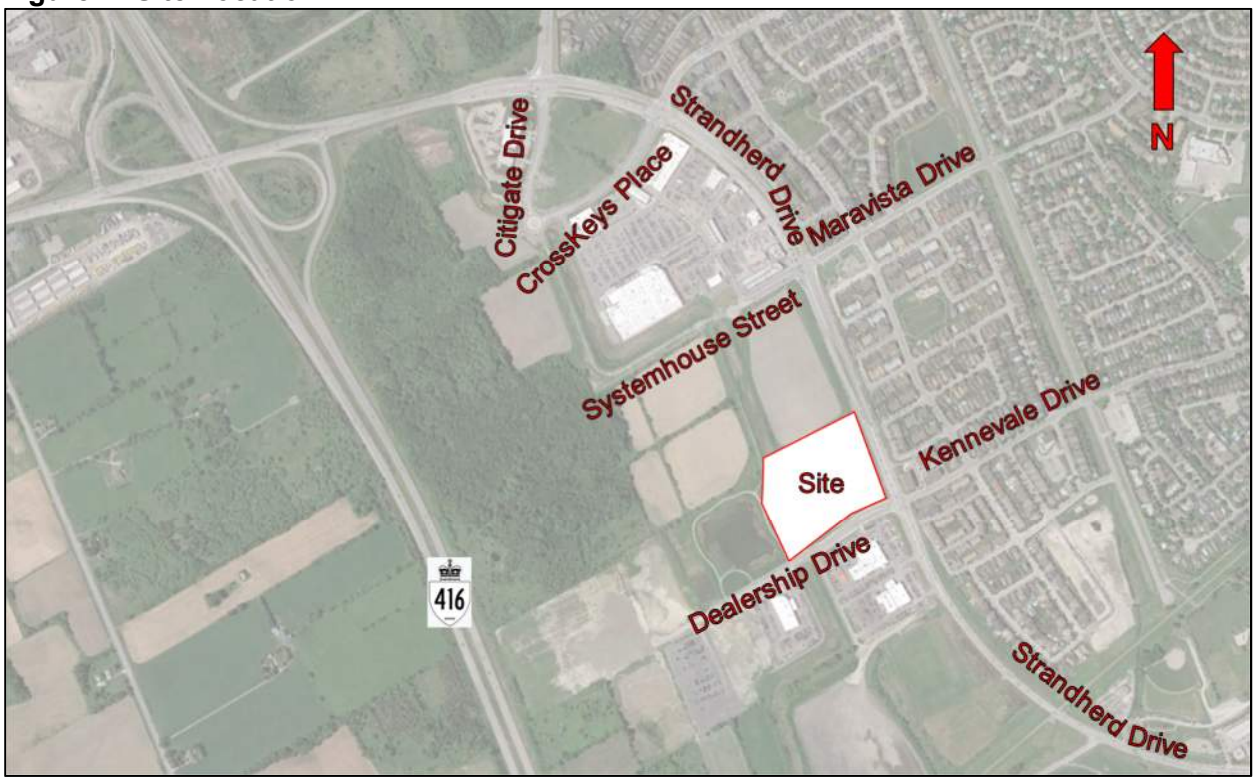
- The Maravista intersection is expected to operate under failing conditions with site generated trips (SBT v/c ratio of 1.43).
- With signal timing adjustments, the SBT v/c during the Saturday peak hour was found to improve to 1.11.
- The site accesses are expected to operate with LOS 'C' or better under 2029 total traffic conditions, with an average delay of 19.0 seconds or less.
- 95th percentile eastbound queues on Dealership Drive at Strandherd Drive are expected to be stored within the 75m left turn lane and not block the auto driveway / Toyota driveway.
- The 95th percentile southbound through queues on Strandherd Drive at Dealership Drive of about 250 metres are expected to exceed the 110m southbound right turn lane length, blocking access to this lane and the site's right-in, right-out driveways. These queues do not spill back to the Maravista intersection (about 490 metres to the north).
- To achieve the target Auto LOS 'D' during the weekday PM peak hour, a reduction of 90 southbound through vehicles is required.
- To achieve the target Auto LOS 'D' during the Saturday peak hour, a reduction of 280 southbound through vehicles is required.

1.0 INTRODUCTION

This Transportation Impact Assessment (TIA) report has been prepared in support of a Zoning Amendment and Site Plan Control application for 4149 Strandherd Drive (Block 4 of the CitiGate Business Park). The subject site (See **Figure 1**) is currently vacant and is surrounded by the following:

- Strandherd Drive and residential properties to the east;
- Dealership and commercial properties to the south; and,
- Vacant land to be developed as business park to the north and west.

Figure 1: Site Location



A Community Transportation Study (CTS) prepared by Novatech, dated November 2012, was completed and approved by the City for the CitiGate development lands. The ultimate CitiGate development lands includes the subject site. A Transportation Overview prepared by Novatech, dated July 2015 was submitted in support of a ZBL application for the subject site and the site to the north, to permit a reduced minimum lot size. Original plans for the site included 121,275 square feet of office space however the current plan has been revised to include a 38,566 square foot auto dealership, 84,300 square feet of office space, and a (up to) 120-room hotel. In addition, planned roadway modifications are being constructed along this section of Strandherd Drive per the City's Affordable Road Network. Therefore, this TIA will focus primarily on the following:

- Capacity requirements at the adjacent intersections;
- Changes to site generated trips with the revised site;
- Integration of the development with existing pedestrian, bicycle, and transit networks;
- On-site circulation and design; and,
- Site access.

2.0 PROPOSED DEVELOPMENT

The subject site is designated as 'Urban Employment Area' on Schedule 'B' of the City of Ottawa's Official Plan. It is currently zoned Business Park Industrial, Exception 2298, Height maximum 18.0 metres (IP[2298] H18) in the City of Ottawa Zoning By-law No. 2008-250. The proposed development will require a Zoning By-law Amendment to permit the proposed automobile dealership. 'Office' and 'hotel' are permitted uses on the Subject Property as per the current zoning.

The site is currently designated 'Employment Area' in the City of Ottawa Official Plan and 'Prestige Business Park" in the South Nepean Secondary Plan for Areas 9 and 10. The proposed development will require a Secondary Plan Amendment to permit an automobile dealership.

The proposed development is in the CitiGate business park, and as such, must adhere to the CitiGate Design Guidelines.

The site will be severed into three parcels and the proposed development is planned to be completed in three phases consisting of:
Phase 1 (2020): 38,600 square foot auto dealership
Phase 2 (2021): 84,300 square foot office
Phase 3 (2024): hotel with up to 120 rooms

The proposed auto dealership will be located at the northwest corner of the Dealership Drive Strandherd Drive intersection and will provide about 31 customer and employee parking spaces, 28 spaces for vehicles being serviced, and 152 spaces for new and used vehicles being sold. The proposed development will be served by one full-movement access along Dealership Drive and one right-in, right-out access along Strandherd Drive. The egress to Strandherd will be restricted between 7AM and 7PM. There will also be a gated connection to the Phase 3 (hotel) site.

The second phase will be an office building with about 327 parking spaces to the north of the auto dealership. Access will be provided via a second right-in, right-out driveway onto Strandherd Drive and shared access to Dealership via the hotel.

The third phase will be a hotel with about 109 parking spaces to the west of the auto dealership and office. Access will be provided via 2 driveways onto Dealership Drive and the hotel will also connect to the phase 2 office development and share access to Strandherd Drive. A gated connection to the auto dealership will also be provided. The third phase is not part of this site plan application, except for the easterly access to Dealership Drive and the Phase 1 connection. A separate site plan application will be filed in the future for the remaining Phase 3 development.

The preliminary site plan is included in **Appendix A**.

3.0 SCREENING

The City's 2017 TIA Guidelines identifies three triggers for completing a TIA report, including trip generation, location, and safety. The criteria for each trigger are outlined in the City's TIA Screening Form.

The proposed development satisfies each of the trip generation, location, and the safety triggers for completing a TIA. The TIA screening form is included in **Appendix B**.

4.0 SCOPING

4.1 Existing Conditions

4.1.1 Roadways

Strandherd Drive is an arterial road in Barrhaven that generally runs east-west, with a curvilinear alignment. Within the study area, it has a posted speed limit of 80 km/h, runs north-south and has a two-lane rural cross section, widening to four-lanes to the north. The Official Plan identifies a right-of-way (ROW) protection requirement of 44.5 metres for Strandherd Drive between Fallowfield Road and Crestway Drive.

Dealership Drive is a collector roadway with a two-lane urban cross section that extends westerly from Strandherd Drive. The street provides access to several auto dealerships and concrete sidewalk is provided on both sides. Dealership Drive has a regulatory speed of 50 km/h.

Kennevale Drive is a collector roadway with a two-lane urban cross section that extends easterly from Strandherd Drive. The street provides access to the residential subdivision and has concrete sidewalks on both sides. The posted speed limit on Kennevale Drive is 40 km/h.

Systemhouse Street is a collector roadway with a five-lane urban cross section that extends westerly from Strandherd Drive. Concrete sidewalk is provided on both sides. Systemhouse Street has a regulatory speed of 50 km/h.

Maravista Drive is a collector roadway with a two-lane urban cross section that extends easterly from Strandherd Drive. The street provides access to the residential subdivision and has concrete sidewalks on both sides. The posted speed limit on Maravista Drive is 40 km/h.

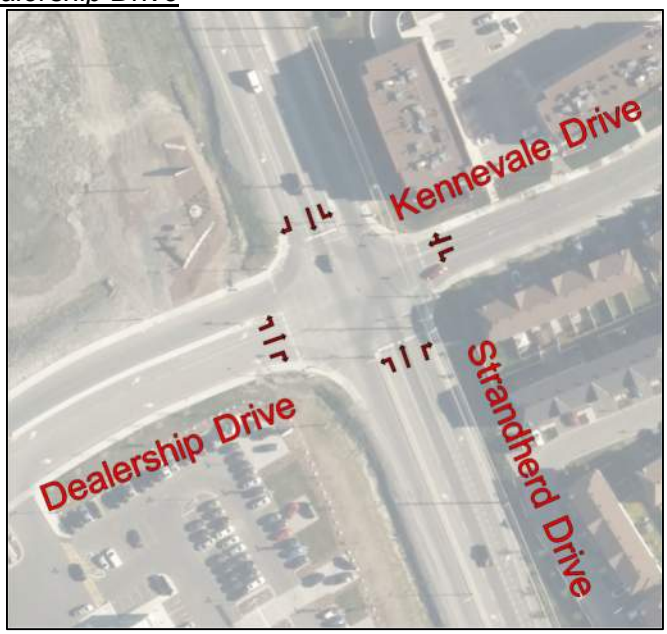
4.1.2 Intersections

Strandherd Drive at Maravista Drive / Systemhouse Street

- Signalized intersection
- Northbound: two left turn lanes, one through lane, one through/right turn shared lane.
- Southbound: one left turn lane, two through lanes, one right turn lane.
- Eastbound: two left turn lanes, one through/right shared lane.
- Westbound: one left turn lane, one through/right shared lane.
- Standard crosswalks are provided on all legs of the intersection.
- Cycle tracks are provided along Strandherd Drive at the intersection with two-stage left turn bicycle boxes.

Strandherd Drive at Kennevale Drive / Dealership Drive

- Signalized intersection
- Northbound/Southbound: one left turn lane, one through lane, one pocket bike lane, one right turn lane.
- Eastbound: one left turn lane, one through lane, one right turn lane.
- Westbound: one left turn lane, one through/right shared lane.
- Standard crosswalks are provided on all legs of the intersection.



4.1.3 Driveways

In accordance with the City's 2017 TIA guidelines, a review of adjacent driveways along the boundary roads are provided as follows:

Strandherd Drive, east side: one exit-only driveway for the shared parking for the multi-use development at the northeast corner of the Strandherd / Kennevale intersection. The driveway is approximately 55m north of the signalized intersection. There is an existing median along this section of Strandherd Drive.

Dealership Drive, south side: one driveway and Philsar Street provide access to the auto dealerships south of Dealership Drive opposite the site. The existing driveway is opposite the proposed driveway for the dealership (subject development, phase 1) and is approximately 72m west of the Strandherd Drive right of way (measured nearest edge to ROW). Philsar Street is approximately 99m west of this driveway.

4.1.4 Pedestrian and Cycling Facilities

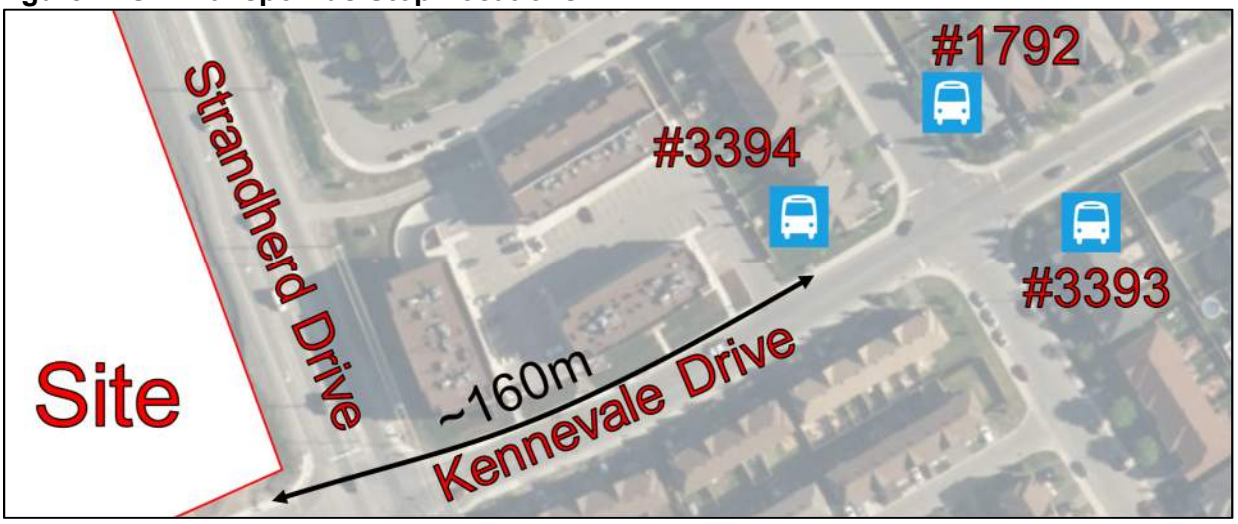
Strandherd Drive is identified as a spine cycling route with a major pathway in the City's Cycling Network. There are currently cycle tracks along Strandherd Drive to the north connecting to paved shoulders in the study area. There are pocket bicycle lanes at the Kennevale / Dealership intersection.

Concrete sidewalks are provided along both sides of Dealership Drive.

4.1.5 Transit

The nearest bus stops to the subject site are stop #3394 (serving route 170, located on the north side of Kennevale Drive), #3393 (serving routes 170 and 272, south side of Kennevale Drive), #1792 (serving route 272, located on the east side of Cobble Hill Drive at Kennevale Drive). These bus stop locations are shown in **Figure 2**.

Figure 2: OC Transpo Bus Stop Locations



OC Transpo Route 170 travels between Barrhaven Town Center Transit Station and Fallowfield Transit Station. It operates seven days a week, with all day service.

OC Transpo Route 272 travels between Tunney's Pasture and Cobble Hill Drive. It operates Monday to Friday, with peak period service. The 272 to Tunney's Pasture offers morning service, and the 272 to Cobble Hill Drive operates in the evening.

OC Transpo Route information is included in **Appendix C**.

4.1.6 Existing Area Traffic Management Measures

Currently, there are no existing Area Traffic Management (ATM) measures within the study area.

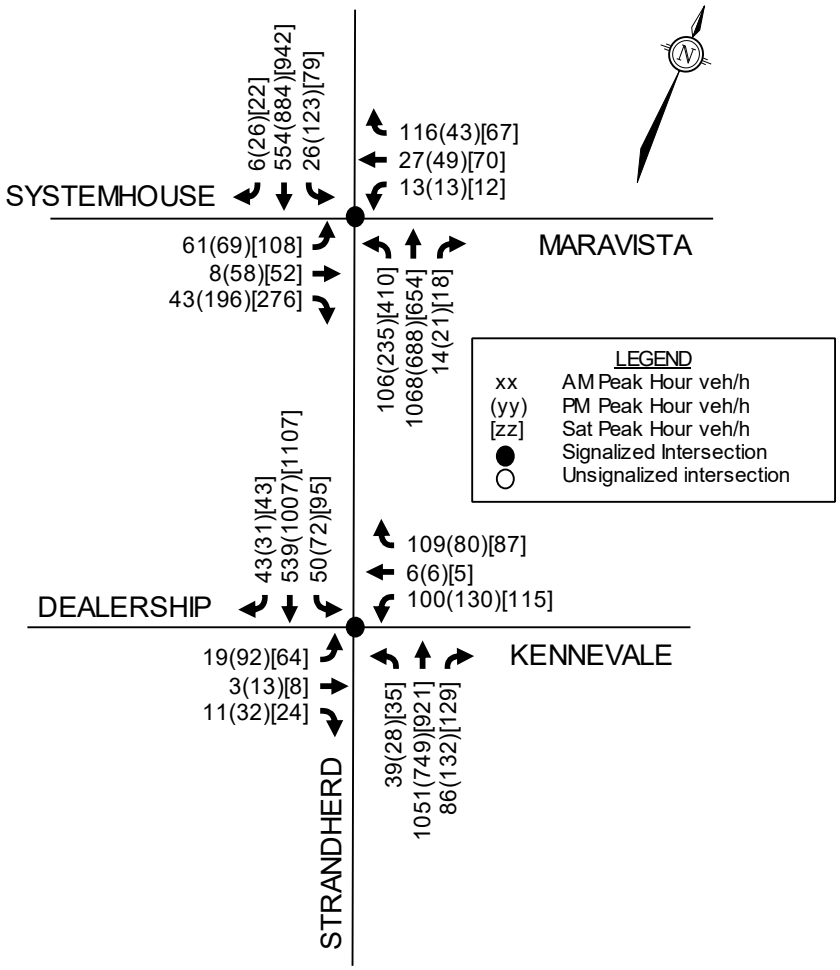
4.1.7 Existing Traffic Volumes

Traffic counts (See **Appendix D**) were completed by the City of Ottawa on Thursday, January 18, 2018 and Saturday, January 20, 2018 and reflect the existing pedestrian, cyclist and vehicular traffic volumes at each of the following Strandherd intersections:

- At Maravista Drive/Systemhouse Street; and,
- At Kennevale Drive/Dealership Drive.

Transportation Briefs were prepared for Barrhaven Honda (Novatech, 2015) and Myers Hyundai Barrhaven (McIntosh Perry, 2015) and excerpts from those briefs have been included in **Appendix F**. Estimated traffic volumes generated by the Honda and Hyundai sites have been added to the 2018 count data to obtain the existing peak hour traffic volumes at the existing study area intersections (See **Figure 3**). Saturday traffic counts at the Myers Hyundai Bells Corners automobile dealership (See **Appendix D**) were used to estimate Saturday auto dealership trips for the Honda and Hyundai sites.

Figure 3: Existing Traffic Volumes



4.1.8 Collision Records

Historical collision data (See **Appendix E**) from the last five years were obtained from the City's Public Works and Service Department for the Strandherd intersections with Systemhouse/Maravista and Kennevale/Dealership. The collision data have been evaluated to determine if there are identifiable collision patterns. **Table 1** summarizes the number and type of collisions at each intersection from January 1, 2014 to December 31, 2018.

Table 1: Reported Collisions (January 2014 – December 2018)

Intersection	Number of Collisions					
	SMV[1]/ Other	Rear-End	Angle	Turning Mvmt	Side-swipe	Total
Strandherd at Systemhouse/Maravista	2	9	4	1	2	18
Strandherd at Kennevale/ Dealership	4	22	2	8	0	36

1. SMV = Single Motor Vehicle

Strandherd Drive/Systemhouse Street/Maravista Drive
Four of the collisions caused an injury, but none caused fatalities. Of the collisions at this intersection, fourteen occurred in clear conditions, one in rain conditions, one in freezing rain conditions, and two in snowy conditions.

Of the nine rear end impacts four were eastbound vehicles, three were northbound vehicles, and two were southbound vehicles.

Strandherd Drive/Kennevale Drive/Dealership Drive
Six of the collisions caused an injury, but none caused fatalities. Of the collisions at this intersection, thirty-one occurred in clear conditions, three in rain conditions, and two in snowy conditions.

Of the twenty-two rear end impacts, seven were westbound vehicles, four were eastbound vehicles, three were northbound vehicles, and eight were southbound vehicles.

The rear end impacts on the SB approach at Dealership Drive is likely a result of heavy volume in the single through lane.

4.2 Planned Conditions

The City of Ottawa's 2013 Transportation Master Plan (TMP) identifies the widening of Strandherd Drive from two to four lanes between Fallowfield Road and Jockvale Road as part of the Affordable Network Plan. A section of this has been completed, between Fallowfield Road and Maravista Drive. The remainder of the Strandherd Drive widening is anticipated to be completed from 2020-2022. The design currently includes cycle tracks and sidewalks on both sides of Strandherd Drive, with a divided four lane cross section.

The TMP identifies the extension of Chapman Mills Drive as a new 4-lane road between Longfields Drive and Strandherd Drive in the Affordable Network Plan. The Chapman Mills Environmental Assessment (EA) was completed in 2016 and identified new eastbound/westbound travel lanes, parking lanes, median bus rapid transit (BRT) lanes, sidewalks and cycle tracks between Longfields Drive and a new collector road connecting to Strandherd Drive at Frasier Fields Way. West of the new collector road, an exclusive BRT corridor and multi-use pathway (MUP) was identified extending to Borrisokane Road. The new collector road is planned as a two-lane undivided road with sidewalks and cycle tracks and will be built as part of Minto's Harmony development.

The City of Ottawa is advancing the design of the realignment and extension of McKenna Casey Drive to Dealership Drive to 2020, including closure of McKenna Casey at the rail crossing.

Information on other study area developments that are likely to occur within the study's horizon is included in **Section 5.2.2**.

4.3 Study Area and Time Periods

4.3.1 Study Area

A boundary street review will be conducted for Dealership Drive and Strandherd Drive. The study area intersections include the proposed accesses and the signalized intersections of:

1. Strandherd Drive/Systemhouse Street/Maravista Drive; and,
2. Strandherd Drive/Kennevale Drive/Dealership Drive.

4.3.2 Time Periods and Horizon Years

The weekday AM and PM peak hours, as well as Saturday peak hour are considered to represent the "worst case" combination of site-generated traffic and peak traffic conditions of the adjacent roadways. Analysis will be completed for the 2024 build-out year and 2029 horizon year.

4.4 Exemptions Review

Possible exemptions from the final TIA, as outlined in the TIA Guidelines, were reviewed. The applicable exemptions for this site are shown in **Table 2**.

Table 2: TIA Exemptions

Module	Element	Exemption Criteria	Exemption Applies
Design Review Component			
4.1 Development Design	*4.1.2* Circulation and Access	• Only required for site plans	Not Exempt
	4.1.3 New Street Networks	• Only required for plans of subdivision	Exempt
4.2 Parking	*4.2.1* Parking Supply	• Only required for site plans	Not Exempt
	4.2.2 Spillover Parking	• Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	*All elements*	• Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time	Not Exempt
4.6 Neighbourhood Traffic Management	*4.6.1* Adjacent Neighbourhoods	• Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
4.8 Network Concept	*All elements*	• Only required when the proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by the established zoning	Exempt

5.0 FORECASTING

5.1 Development-Generated Traffic

5.1.1 Trip Generation

The site is currently approved for a 3.15-hectare corporate campus (office space with an estimated 121,275 square feet). The previous Transportation Studies for this development estimated the office trip generation as an Office Park (ITE Land Use 750) using rates of 110 employees per acre and 350 ft^2 of GFA per employee.

The proposed development is planned to consist of:

- 38,600 square foot auto dealership;
- 84,300 square foot office; and,
- A future (up to) 120-room hotel.

Initial plans for the office included 86,100 square feet of GFA and this larger area has been carried into the trip generation for the site.

Trips for the proposed Office and Hotel were estimated using *Trip Generation*, *10th Edition* (Institute of Transportation Engineers, Washington, 2017). Person trips were estimated using an ITE Trip to Person Trip conversion factor of 1.28, consistent with the TIA Guidelines (See **Table 3**).

Table 3: Person Trip Generation (Office and Hotel Development)

Land Use	Units[3]	Person Trips Generated[4]								
		AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Person Trip Generation for approved site (3.15 ha of corporate campus)[1]										
Block 4 Office	121.275	350	43	393	46	283	329	17	6	23
Person Trip Generation for Proposed Office and Hotel Sites[2]										
Office (ITE 710)	86.1	118	19	137	20	106	126	32	27	59
Hotel (ITE 310)	120	41	29	70	42	40	82	63	49	112
Total Person Trips (Proposed Office and Hotel Sites)		159	48	207	62	146	208	95	76	171

Notes:
1. Person trips generated by the approved site taken from *Citigate Blocks 3 & 4 Transportation Overview* (Novatech 2015)
2. Trip Generation for the associated Land Use from *Trip Generation 10th Edition* (Institute of Transportation Engineers, Washington, 2017). Trips have been increased by 28% to account for 10% non-auto mode share and average vehicle occupancy of 1.15.
3. Units are '1000 sq ft of GFA' for Block 4 and Office; Estimated Rooms for Hotel.
4. Person trips per hour for peak hours.

AM and PM peak hour trips for the auto dealership were estimated using *Trip Generation*, *10th Edition* (Institute of Transportation Engineers, Washington, 2017).

Since the number of Saturday ITE studies for an auto dealership is low (4), Saturday traffic counts at an Ottawa area auto dealership from 2017 were used to estimate the Saturday peak hour trips generated by the proposed auto dealership.

Traffic counts were conducted by Novatech on Saturday May 27th, 2017 at the Myers Hyundai Bells Corners automobile dealership (2164 Robertson Road, See **Appendix D**). These counts were used to estimate a Saturday auto dealership trip generation rate per 1000 square feet of GFA. The estimated trips generated by the proposed auto dealership are summarized in **Table 4**. As the auto dealership land use is largely auto dependent, it is assumed that the observed modal share at the Myers Hyundai Bells Corners site will be consistent with the subject site, and further adjustments are not required.

While the Saturday peak hour for auto dealership, office, and hotel are not expected to be simultaneous, this is considered conservative.

Table 4: Trip Generation (Auto Dealership)

Land Use	Units[2]	Vehicle Trips Generated[3]								
		AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Automobile Sales (New)[1] (ITE 840)	38.6	53	19	72	37	56	93	59	41	100

Notes:
1. AM and PM peak hour trip generation for the auto dealership taken from *Trip Generation 10th Edition* (Institute of Transportation Engineers, Washington, 2017). Saturday peak hour trip generation has been taken from recent count at the Myers Bells Corners site (See Appendix D).
2. Units are '1000 sq ft of GFA'.
3. Trips per hour for peak hours.

Trips by Modal Share

2011 Trans O-D Survey Report, for the South Nepean area identifies the current modal share values for the area and are based on all trips to/from the South Nepean district with an origin or destination beyond that area.

The modal shares for the proposed hotel are anticipated to be in line with the modal shares outlined in the O-D Survey, however, with lower transit use considering:

- There are no transit service improvements in the vicinity of the subject site that are planned within the horizon year of this study; and,
- The distance from express, city-wide transit service providing connections to the city's regional travel hubs.

Therefore, the Transit Mode share for the hotel development has been reduced to 5% with the difference added to the Auto Driver Mode. This assumption is considered conservative.

The modal share identified in the 2015 Transportation Overview has been applied to the proposed office development.

A full breakdown of the projected modal share trips is shown in **Table 5**.

Table 5: Person Trips by Modal Share

Travel Mode	Modal Share	AM Peak			PM Peak			Saturday Peak		
		IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Auto Dealership (See Table 4)										
Vehicle Trips		*53*	*19*	*72*	*37*	*56*	*93*	*59*	*41*	*100*
Auto Driver	Obs.	**53**	**19**	**72**	**37**	**56**	**93**	**59**	**41**	**100**
Office (See Table 3)										
Person Trips		*118*	*19*	*137*	*20*	*106*	*126*	*32*	*27*	*59*
Auto Driver	64%	**75**	**12**	**87**	**13**	**68**	**81**	**20**	**18**	**38**
Auto Passenger	16%	19	3	22	3	17	20	5	4	9
Transit	15%	18	3	21	3	16	19	5	4	9
Walking	2%	2	0	2	0	2	2	1	0	1
Bicycling	3%	4	1	5	1	3	4	1	1	2
Hotel (See Table 3)										
Person Trips		*41*	*29*	*70*	*42*	*40*	*82*	*63*	*49*	*112*
Auto Driver	85%	**35**	**25**	**60**	**36**	**34**	**70**	**54**	**42**	**96**
Auto Passenger	10%	4	3	7	4	4	8	6	5	11
Transit	5%	2	1	3	2	2	4	3	2	5
Walking	0%	0	0	0	0	0	0	0	0	0
Bicycling	0%	0	0	0	0	0	0	0	0	0
Total										
Auto Driver		**163**	**56**	**219**	**86**	**158**	**244**	**133**	**101**	**234**
Auto Passenger		23	6	29	7	21	28	11	9	20
Transit		20	4	24	5	18	23	8	6	14
Walking		2	0	2	0	2	2	1	0	1
Bicyling		4	1	5	1	3	4	1	1	2

The proposed development is estimated to generate 219 vehicle trips during the AM peak hour, 244 vehicle trips during the PM peak hour and 234 vehicle trips during the Saturday peak hour.

5.1.2 Trip Distribution / Assignment

The distribution of trips generated by the development has been estimated based on the observed and projected volumes along the study area roadways, particularly the observed traffic at the Dealership Drive intersection and at the Tomlinson office site.

The expected trip distributions for each development use are summarized in **Table 6**.

Table 6: Trip Distribution for Each Use

	Dealership	Office	Hotel
to/from the North	45%	60%	85%
to/from the East	10%	10%	0%
to/from the South	45%	30%	15%

Auto dealership trips: 83% of the trips entering from the north have been assigned to the right-in, access on Strandherd.

Office trips: 100% of the trips entering from the north and exiting to the south have been assigned to the right-in, right-out access on Strandherd.

Hotel trips: 30% of the trips entering from the north and 0% of the trips exiting to the south have been assigned to the right-in, right-out access on Strandherd. 20% of site trips have been assigned to the west driveway on Dealership Drive with the balance assigned to the central site driveway on Dealership Drive.

Site generated traffic volumes have been assigned to the study area intersections and are shown in **Figure 4**.

5.2 Background Traffic

5.2.1 General Background Growth Rate

A 2% background growth rate has been applied to through traffic on Strandherd Drive as requested by City of Ottawa staff. The background growth rate is intended to account for growth in regional traffic which is not anticipated on lower class roads.

Projected 2024 and 2029 traffic volumes (with 2% background growth of through traffic along Strandherd Drive) are shown in **Figures 5** and **6**, respectively.

Figure 4: Site Generated Traffic Volumes

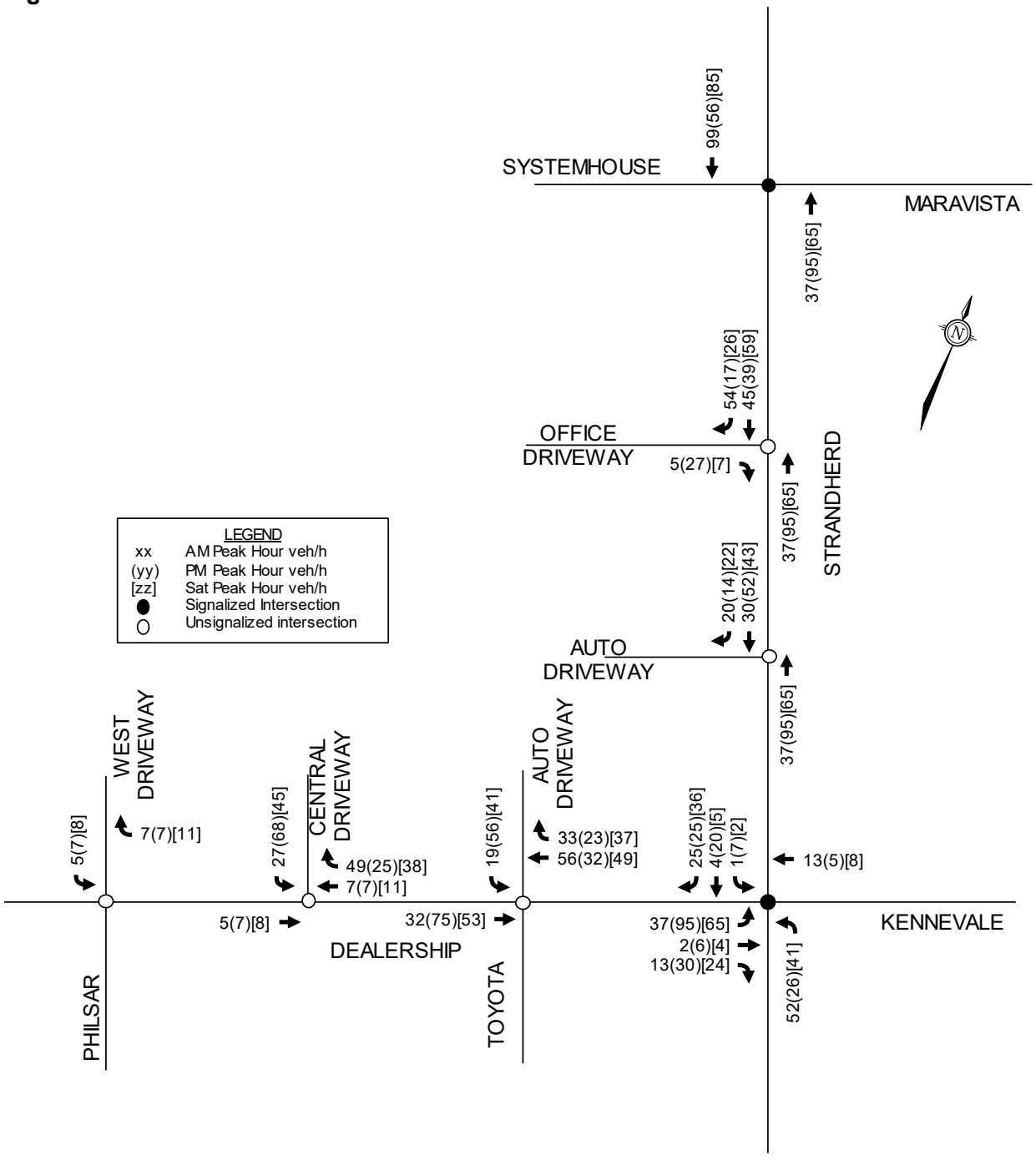


Figure 5: 2024 Background Traffic

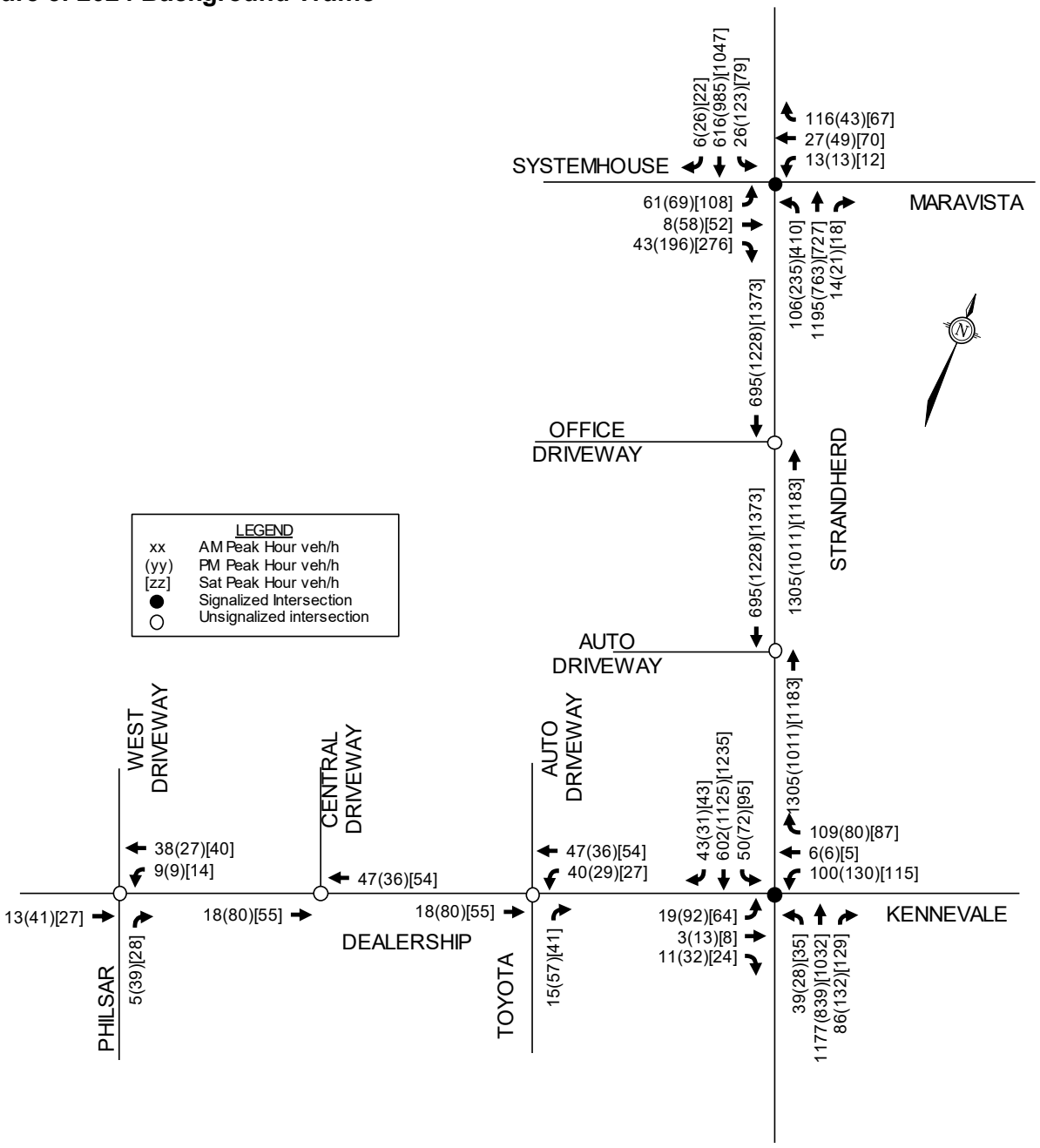
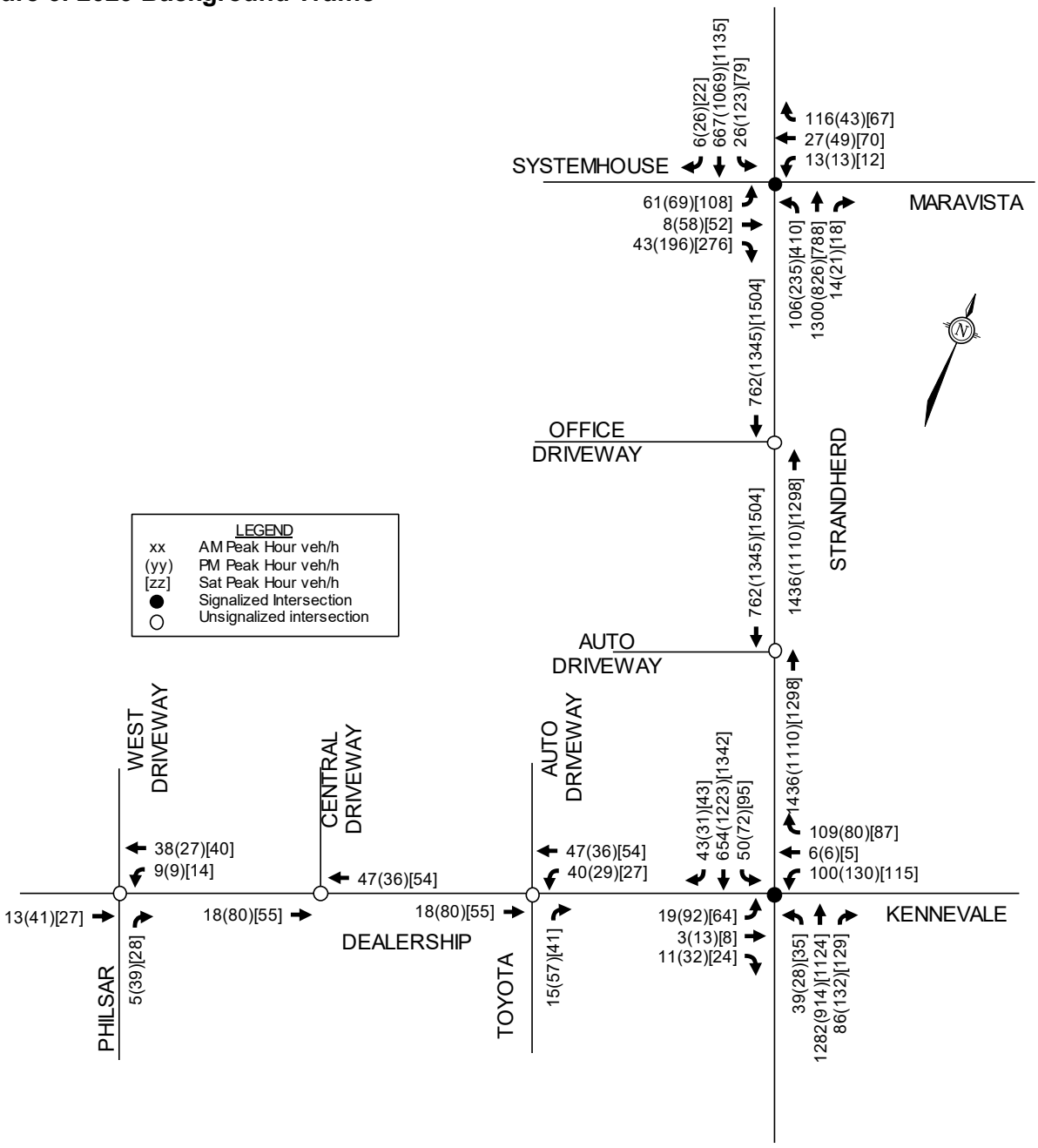


Figure 6: 2029 Background Traffic



5.2.2 Other Area Development

Other study area developments are likely to occur within this study's horizon (See **Table 7**).

Table 7: Other Background Developments

Development Name	Planned Development	Anticipated Buildout Horizon	Relevant Study[1]
Caivan Communities (3285 Borrisokane Road)	200 residential units	2020 (Trips added to background for 2024 and 2029)	TIA Report (Parsons, February 2018)
Glenview Homes (3387 Borrisokane Road)	208 residential units, a school	2022 (Trips added to background for 2024 and 2029)	CTS/TIS (Stantec, May 2017)
Minto Harmony (4025 Strandherd Drive)	601 residential units, a shopping centre, a school	2025 (Trips added to background for 2029)	CTS/TIS (Parsons, July 2017)
Half Moon Bay West (3345 Borrisokane Road)	1016 residential homes, 5.3 acres commercial	2024 (Trips added to background for 2024 and 2029)	CTS (Stantec, November 2016)
Fallowfield Hotel (4401 Fallowfield Road)	102 room hotel	2019 (Trips added to background for 2024 and 2029)	TIA Report (IBI Group, June 2018)
CitiGate Hotel (4433 Strandherd Drive)	99 room hotel	2020 (Trips added to background for 2024 and 2029)	TIA Report (Novatech, October 2018)
Citigate Development (Remaining Interim)	87,700 square feet of office, 39,220 square feet of auto sales	2029 (Trips added to background for 2029)	CTS Report (Novatech, November 2012)

Note: 1. Relevant Excerpts from each Study are included in Appendix F.

Many of the traffic studies for the other new developments in the area did not analyze the Saturday peak hour, only focusing on AM and PM peak hours. Saturday trips generated by these other background developments have been estimated by:

1. Using *Trip Generation, 10th Edition* (Institute of Transportation Engineers, Washington, 2017).
2. Converting the ITE trips to person trips using a factor of 1.28, consistent with the TIA guidelines. The Saturday peak hour person trips generated by each background development are summarized in **Table 8**.
3. Applying the modal share from each background development's transportation study to estimate the trips for each mode. A full breakdown of the projected Saturday peak hour person trips by modal share and arrival/departure is shown in **Table 9**.

Table 8: Other Area Development Saturday ITE Trip Generation

Land Use	Size	ITE Code	Saturday Peak			Person Trip Factor	In (pph)	Out (pph)	Total (vph)
			In	Out	Total				
3285 Borrisokane (Caivan Communities) Development									
Single Family	125 units	210	65	55	120	**x 1.28 →**	83	71	154
Townhouse	75 units	220	27	21	48		35	27	62
						Total	**118**	**98**	**216**
3387 Borrisokane (Glenview Homes) Development									
Single Family	116 units	210	60	52	112	**x 1.28 →**	77	67	144
Townhouse/Condo	92 units	220	37	29	66		47	37	84
Elementary School	30,000 ft^2	520	N/A	N/A	N/A		-	-	-
						Total	**124**	**104**	**228**
4025 Strandherd (Minto Harmony) Development									
Single Family	171 units	210	87	74	161	**x 1.28 →**	111	95	206
Townhouse/Condo	430 units	220	167	134	301		213	172	385
Elementary School	585 students	520	N/A	N/A	N/A		-	-	-
Shopping Centre	8,000 ft^2	820	20	18	38		26	23	49
						Total	**350**	**290**	**640**
3345 Borrisokane (Half Moon Bay) Development									
Single Family	552 units	210	270	230	500	**x 1.28 →**	346	294	640
Townhouse/Condo	464 units	220	182	143	325		233	183	416
Shopping Centre	35,000 ft^2	820	81	87	168		104	111	215
						Total	**683**	**588**	**1271**
4401 Fallowfield Hotel Development									
Hotel	102 rooms	310	42	33	75	**x 1.28 →**	54	42	96
						Total	**54**	**42**	**96**
4433 Strandherd Drive (CitiGate Hotel)									
Hotel	99 rooms	310	40	31	71	**x 1.28 →**	51	40	91
						Total	**51**	**40**	**91**
Remaining Interim CitiGate Development									
Office Park	87,700 ft^2	750	9	3	12	**x 1.28 →**	12	4	16
Dealership	39,220 ft^2	840	79	79	158		101	101	202
						Total	**113**	**105**	**218**

Table 9: Other Area Development Saturday Trips by Modal Share

Travel Mode	Modal Share	SATURDAY PEAK		
		In	Out	Total
3285 Borrisokane (Caivan Communities) Development				
Total Person Trips		118	98	216
Auto Driver	**55%**	**67**	**56**	**123**
Auto Passenger	15%	17	14	31
Transit	15%	17	14	31
Non-Auto	15%	17	14	31
3387 Borrisokane (Glenview Homes) Development				
Total Person Trips		124	104	228
Auto Driver	**90%**	**112**	**95**	**207**
Auto Passenger	3%	4	3	7
Transit	3%	4	3	7
Non-Auto	3%	4	3	7
4025 Strandherd (Minto Harmony) Development				
Total Person Trips		350	290	640
Auto Driver	**60%**	**211**	**175**	**386**
Auto Passenger	15%	52	43	95
Transit	15%	52	43	95
Non-Auto	10%	35	29	64
3345 Borrisokane (Half Moon Bay) Development				
Total Person Trips		683	588	1271
Auto Driver	**60%**	**410**	**353**	**763**
Auto Passenger	10%	68	59	127
Transit	30%	205	176	381
Non-Auto	0%	0	0	0
Pass-By Trips (Commercial)	30%	19	20	39
4401 Fallowfield Hotel Development				
Total Person Trips		54	42	96
Auto Driver	**82%**	**44**	**34**	**79**
Auto Passenger	11%	6	5	11
Transit	5%	3	2	5
Non-Auto	2%	1	1	1
4433 Strandherd Drive (CitiGate Hotel)				
Total Person Trips		51	40	91
Auto Driver	**85%**	**43**	**34**	**77**
Auto Passenger	10%	5	4	9
Transit	5%	3	2	5
Non-Auto	0%	0	0	0
Remaining CitiGate Development				
Total Person Trips		113	105	218
Auto Driver	**64%**	**72**	**67**	**139**
Auto Passenger	16%	18	17	35
Transit	15%	17	16	33
Non-Auto	5%	6	5	11

The weekday AM and PM as well as Saturday peak hour auto trips generated by future developments in the study area have been estimated by using the modal splits outlined in each development transportation study (See **Table 10**).

Table 10: Other Area Development Auto Driver Trips

Development Name	AM Peak			PM Peak			Saturday Peak		
	IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Caivan Communities (3285 Borrisokane Road)	41	88	129	86	60	146	67	56	123
Glenview Homes (3387 Borrisokane Road)	61	139	200	129	74	203	112	95	207
Minto Harmony (4025 Strandherd Drive)	183	330	513	285	189	474	211	175	386
Half Moon Bay West (3345 Borrisokane Road)	114	326	441	372	237	610	410	353	763
Fallowfield Hotel (4401 Fallowfield Road)	33	23	56	33	31	64	44	34	78
CitiGate Hotel (4433 Strandherd Drive)	29	20	48	27	26	53	43	34	77
Remaining Citigate Development	136	28	164	35	117	155	72	67	139

Other Area Development Trips were distributed and assigned to the study intersections in a manner consistent with the distribution assumptions outlined in each development's study.

Trips generated by future developments for the 2024 and 2029 horizon years are shown in **Figures 7 and 8**, respectively.

5.3 Future Background and Total Traffic

Future Background Traffic Volumes (**Figures 9 and 10**) and Total Traffic Volumes (**Figures 11 and 12)** have been projected for the Study Area intersections for the weekday AM and PM as well as the Saturday peak hours in 2024 and 2029.

Figure 7: 2024 Other Development Traffic

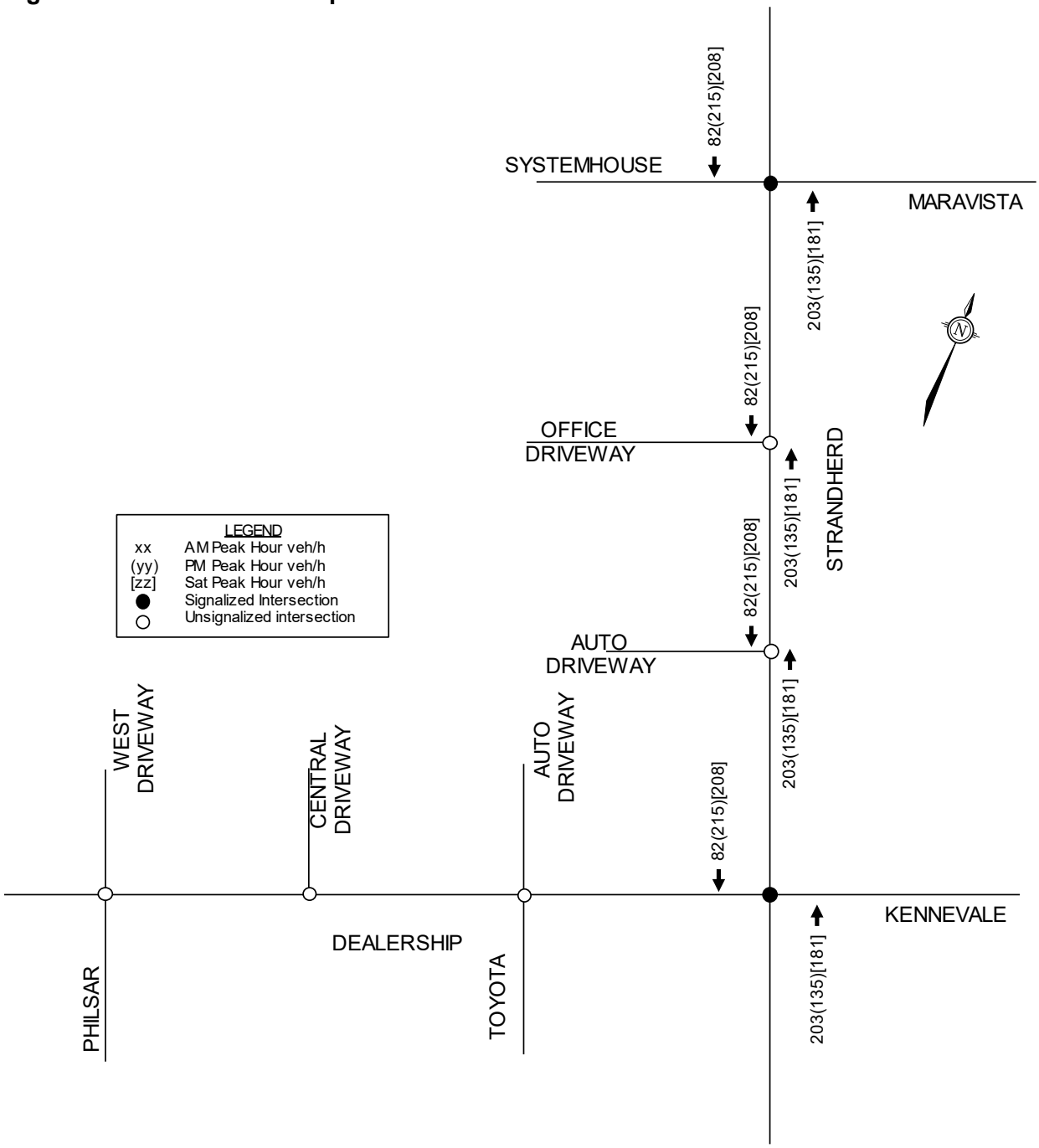


Figure 8: 2029 Other Development Traffic

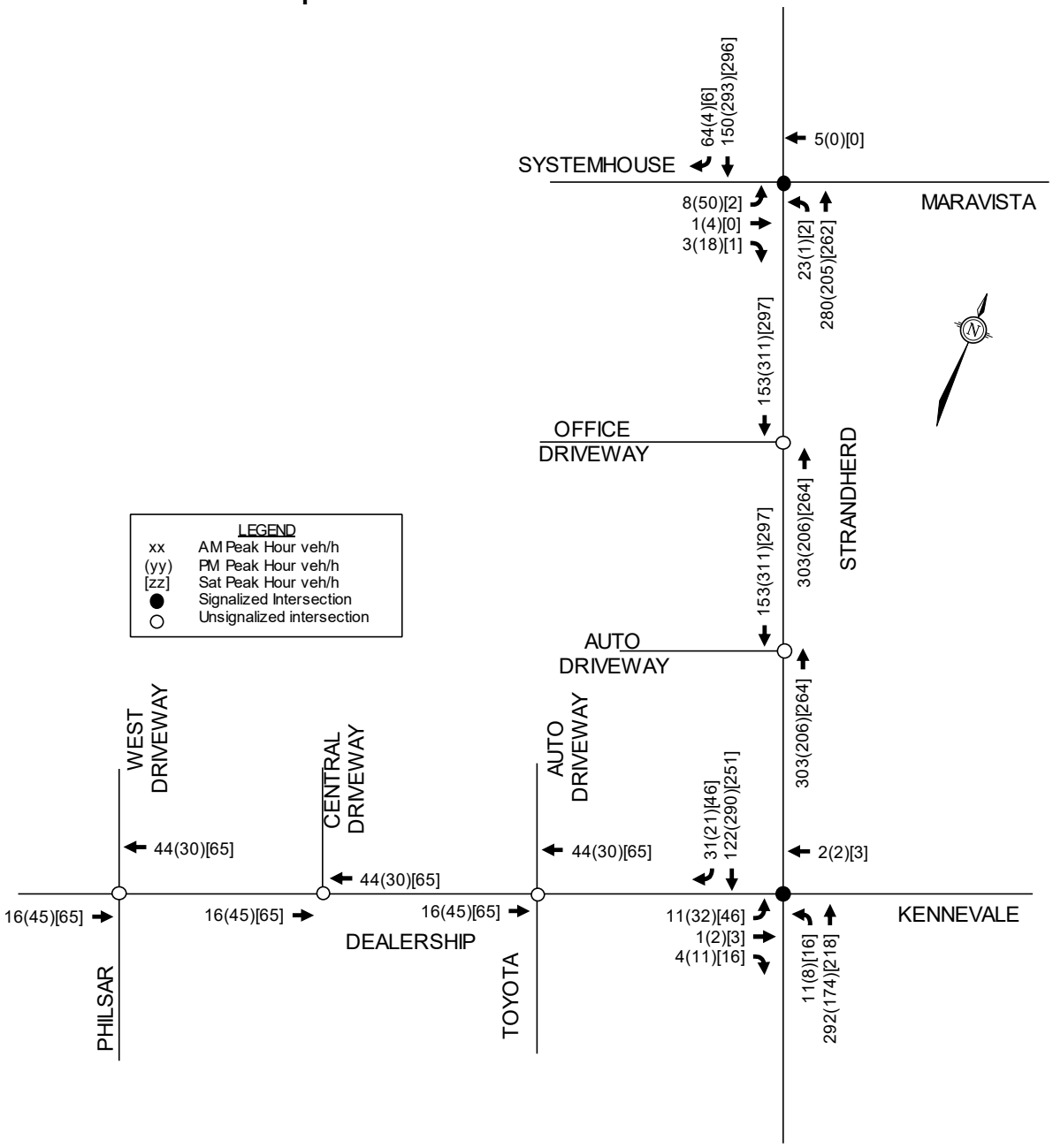


Figure 9: 2024 Background + Other Development Traffic

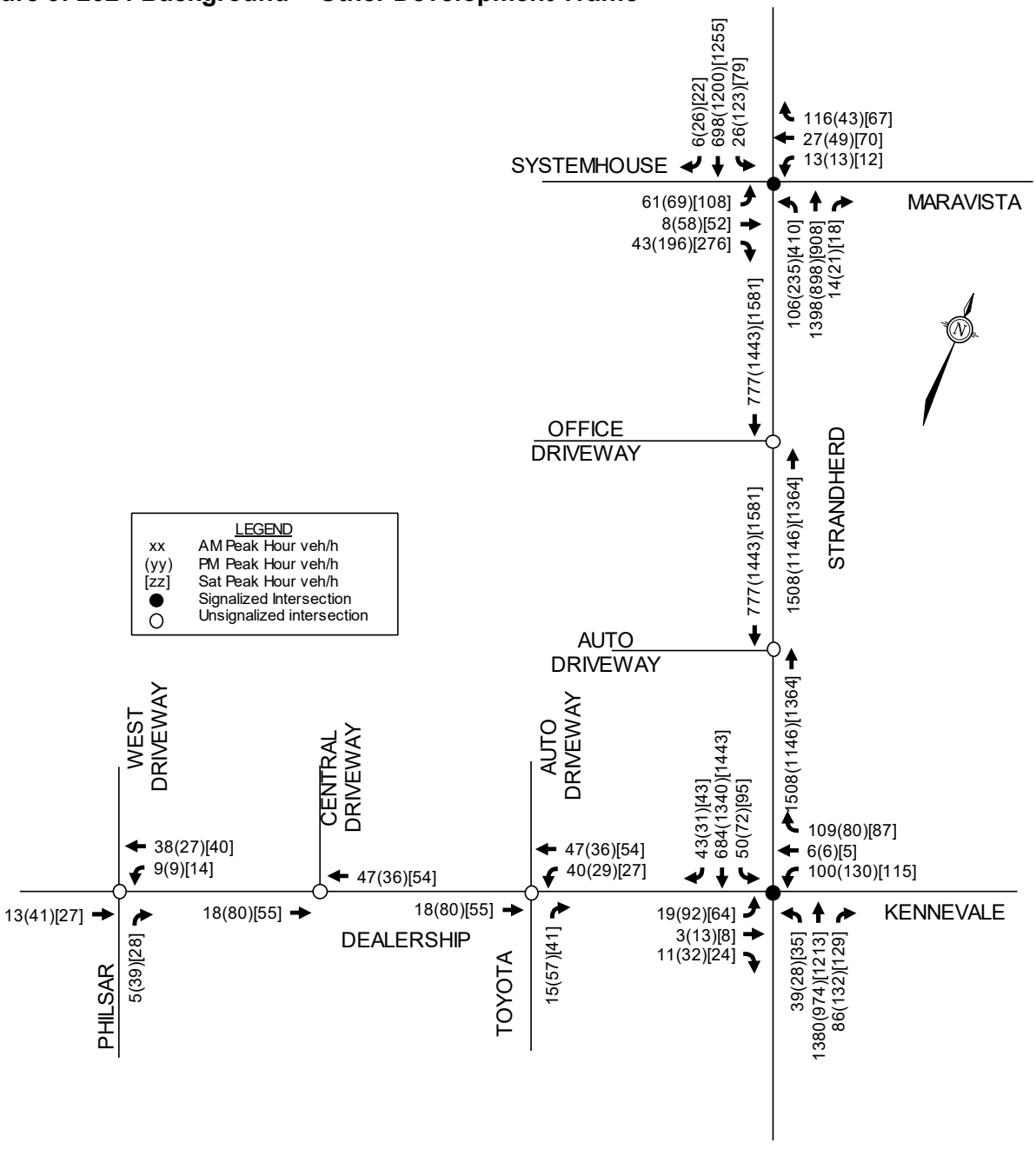


Figure 10: 2029 Background + Other Development Traffic

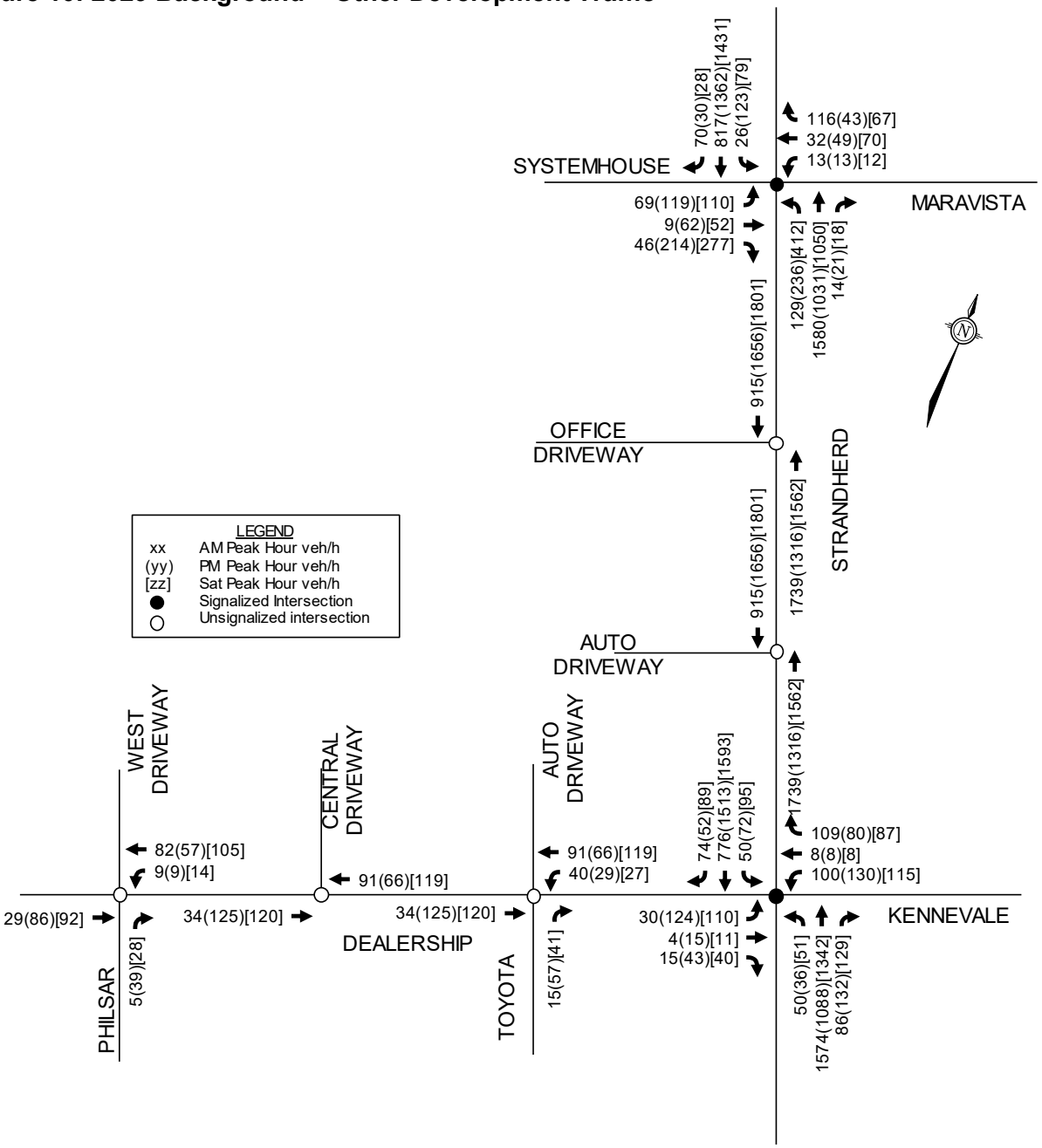


Figure 11: 2024 Total Traffic

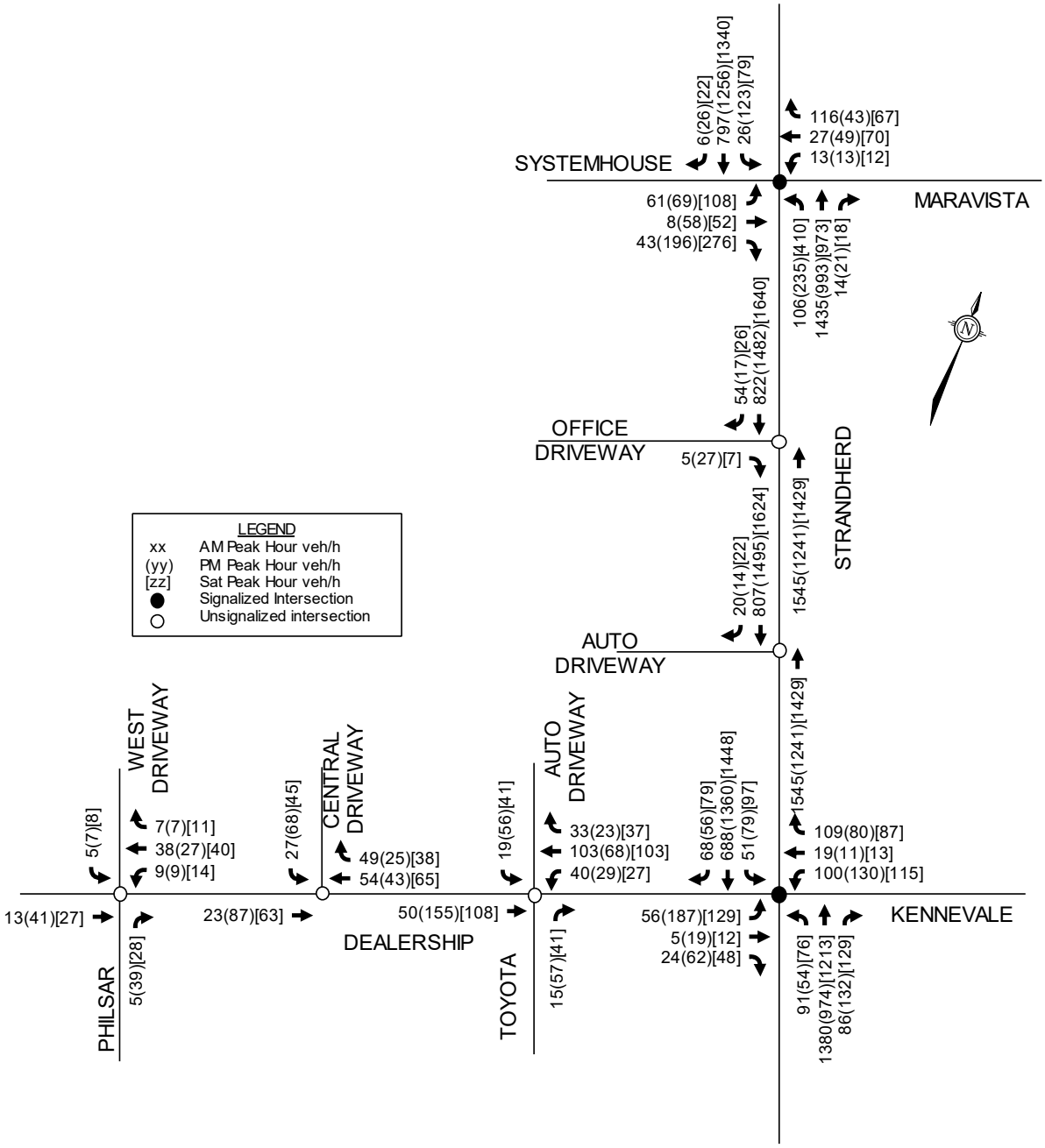
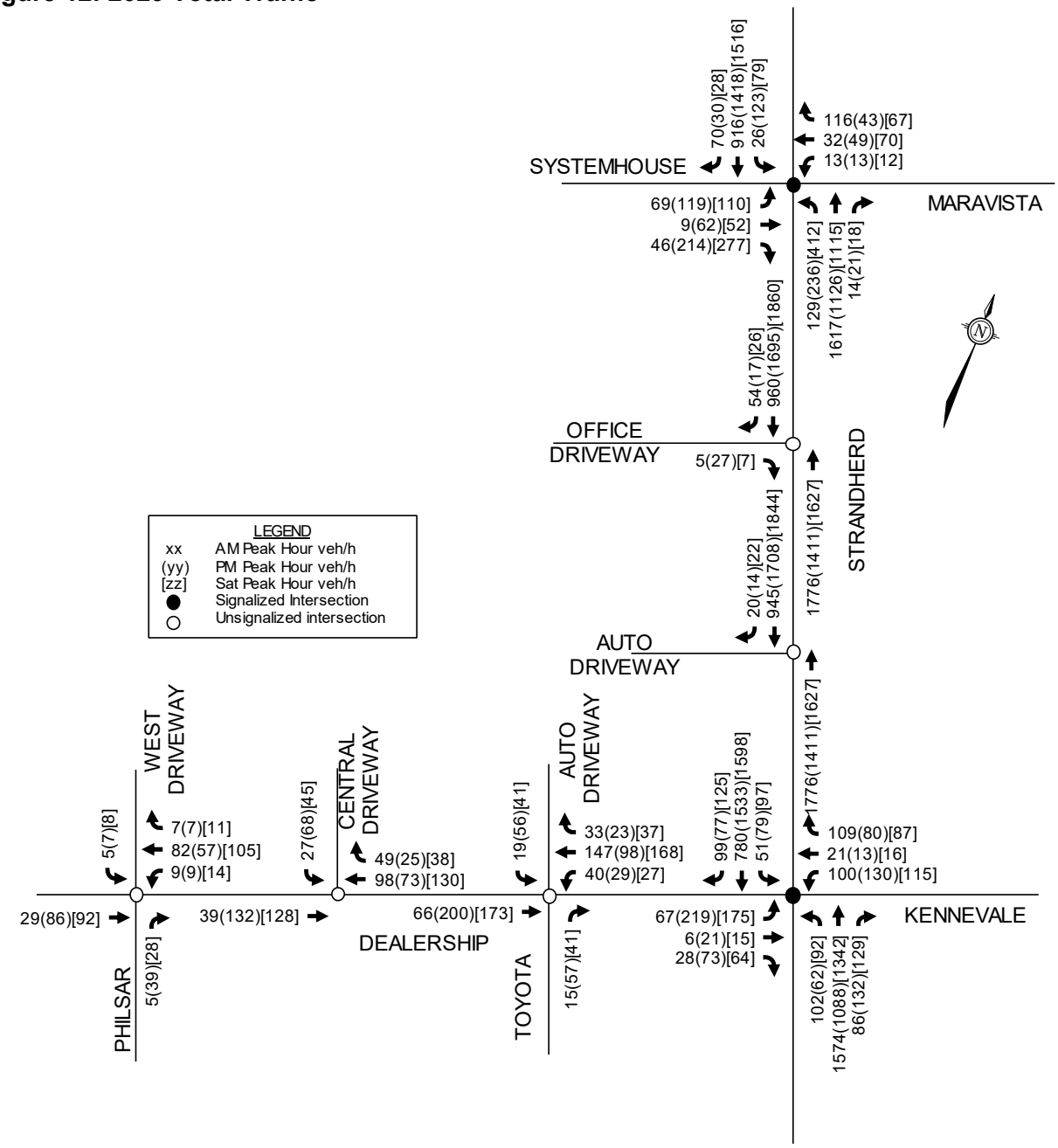


Figure 12: 2029 Total Traffic



6.0 ANALYSIS

6.1 Development Design

6.1.1 Design for Sustainable Modes

Pedestrian facilities will be provided between the auto dealership, office and the parking lots. New pedestrian walkways will be constructed, providing connectivity to the existing pedestrian facilities along Dealership Drive and soon to be constructed sidewalk on Strandherd Drive.

OC Transpo's service design guideline for peak period service is to provide service within a five minute (400m) walk of the home, school and work location of 95% of urban residents. The actual walking distances from the proposed exterior access doors to the nearest bus stops were measured. The existing bus stops near the subject site are described in **Section 4.1.5**.

Stops #3394, 1792, and 3393 are each less than a 400m walk distance from the front door of each development phase. Walking distances range from 200m (Auto dealership to stop #3394) to 385m (Hotel to stop #3393).

Auto and bicycle parking for the proposed development will be in accordance with the minimum requirement of the City's Zoning By-law (ZBL), as described in Section 6.2. Bicycle parking for the proposed office is located at the north face of the building, dealership bicycle parking is located south of the building, while bicycle parking for to proposed hotel will be reviewed at future site plan submission.

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

6.1.2 Circulation and Access

The proposed development will be served by five driveways (See **Section 6.4**). Each of the driveways are two-way and 7-9 metres in width. The right-out egress from the dealership site to Strandherd Drive will be restricted between 7AM and 7PM. After-hours egress is provided to accommodate delivery and pick up of vehicles into the unsecured portion of the site before and after being serviced. Fire routes are shown on the Site Plan (**Appendix A**) and circulation and access for waste collection and other services are provided. Turning paths of the WB-20 parts delivery vehicle were found to govern over the car carrier and WB-20 turning paths are included in **Appendix A**.

6.2 Parking

The subject site is located in Area C on Schedule 1 and 1A of the City of Ottawa's ZBL. Minimum vehicular and bicycle parking rates for the proposed uses are identified in the ZBL and are summarized in **Table 11**, which indicates that the proposed vehicular parking spaces and bicycle parking meet the minimum requirements of the ZBL for the auto dealership and office sites.

Minimum barrier-free parking and vehicle loading was reviewed for the subject site (See **Table 11**). The number of barrier-free parking spaces meet the AODA requirements. The parking and loading space requirements for the hotel will be reviewed as part of a future site plan submission.

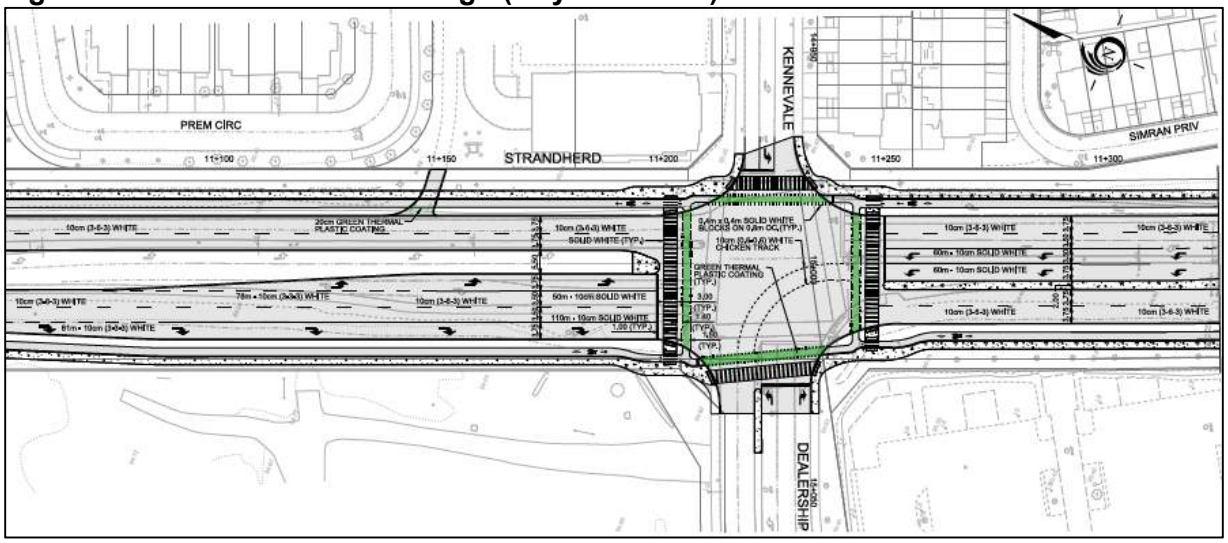
Table 11: Vehicular, Bicycle, Barrier Free Parking and Loading Requirements

Land Use	Rate	GFA/Units	Requirement	Provided
Vehicle Parking				
Automobile Dealership	2 / 100m^2 of showroom 2 / service bay 1 / 100m^2 of other area	800m^2 showroom 14 service bays 1500 m^2 other	59	59
Office	2.4 / 100 m^{2}of GFA	7,830 m^2	188	327
Hotel	1 / guest unit	109 units	109	109
Bicycle Parking				
Automobile Dealership	1 / 1500m^2 of GFA	3,580m^2	2	2
Office	1 / 250m^2 of GFA	7,830m^2	31	32
Hotel	1 / 1000m^2 of GFA	6,060m^2	6	TBD
Barrier Free Parking				
Automobile Dealership		~59 public spaces	3	3
Office		~188 public spaces	7	7
Hotel		~109 public spaces	5	5
Vehicle Loading Spaces				
Automobile Dealership	1 / 4999m^2 of GFA	3,580m^2	1	1
Office	1 / 9999m^2 of GFA	7,830m^2	1	1
Hotel	2 / 9999m^2 of GFA	6,060m^2	2	2

6.3 Boundary Streets

The City of Ottawa has prepared a complete street concept for Strandherd Drive with planned implementation in 2019-2022. The design (See **Figure 13**) includes cycle tracks, sidewalk, and added traffic lanes. The interface between the complete street concept and the subject development is shown on the site plan for the development (See **Appendix A**).

Figure 13: Strandherd Drive Design (City of Ottawa)



The subject development impacts the design as two additional right-in, right-out site driveways will access Strandherd Drive.

Schedule 'B' of the City of Ottawa's Official Plan indicates Dealership Drive is in an Urban Employment Area. Targets for pedestrian level of service (PLOS), bicycle level of service (BLOS), and vehicular level of service (Auto LOS) for Dealership Drive reflect those outlined for a collector road located within an employment area in Exhibit 22 of the MMLOS guidelines. As transit does not provide service on Dealership Drive, and it is not classified as a truck route, the transit level of service (TLOS) and truck level of service (TkLOS) have not been evaluated.

6.3.1 Pedestrian Level of Service (PLOS) – Dealership Drive

Exhibit 4 of the MMLOS guidelines has been used to evaluate the segment PLOS (See **Table 12**) of Dealership Drive. Exhibit 22 of the MMLOS guidelines suggests a target PLOS C for all road classes within an employment area.

Table 12: PLOS Segment Analysis

Sidewalk Width	Boulevard Width	Motor Vehicle Traffic Volume (AADT)	Presence of On-Street Parking	Operating Speed	Segment PLOS
Dealership Drive (North Side)					
2.0	0	< 3,000 vpd	No	60 km/h	C
Dealership Drive (South Side)					
2.0	0	< 3,000 vpd	No	60 km/h	C

6.3.2 Bicycle Level of Service (BLOS) – Dealership Drive

Exhibit 11 of the MMLOS guidelines has been used to evaluate the segment BLOS (See **Table 13**) of Dealership Drive. Exhibit 22 of the MMLOS guidelines suggests a target BLOS E for collector roads within an employment area not classified as cycling routes.

Table 13: BLOS Segment Analysis

Road Class	Bike Route	Type of Bikeway	Travel Lanes	Centerline Markings	Operating Speed	Segment BLOS
Dealership Drive						
Collector	N/A	Mixed Traffic	2	Yes	60 km/h	F

Figure 3.3 of Ontario Traffic Manual Book 18 indicates that Dealership Drive is on the boundary between shared roadway and designated cycling space.

6.3.3 Vehicular Level of Service (Auto LOS) – Dealership Drive

The lane capacity along Dealership Drive has been estimated (See **Table 14**) based on roadway classification and general characteristics. Exhibit 22 of the MMLOS guidelines suggests a target Auto LOS D for all roadways within an employment area. The typical lane capacity along the study area roadways are based on the City's guidelines for the TRANS Long-Range Transportation Model.

Table 14: Auto LOS Segment Analysis

Direction	Directional Capacity	Traffic Volumes			V/C Ratio and LOS					
		AM Peak	PM Peak	Sat Peak	AM Peak		PM Peak		Sat Peak	
					V/C	LOS	V/C	LOS	V/C	LOS
Dealership Drive – West of Strandherd										
EB	600 vph	33	137	96	0.06	A	0.23	A	0.16	A
WB	600 vph	88	65	83	0.15	A	0.11	A	0.14	A

6.3.4 Segment MMLOS Summary

The results of the segment MMLOS analysis for Dealership Drive can be summarized as follows:

- Dealership Drive operates with a PLOS C, achieving the target PLOS C;
- With a BLOS of F, Dealership Drive misses the target BLOS E;
- Dealership Drive surpasses the target Auto LOS D, achieving an Auto LOS A; and,
- The cross section of Dealership Drive was recently reviewed and approved by the City during the plan of subdivision stage. No modifications to Dealership Drive are recommended.

6.4 Access Intersections

The proposed development will be served by five driveways. Each driveway is intended to be STOP controlled with free flow traffic on Dealership Drive and Strandherd Drive. Each access meets the requirements of the City's Private Approach By-law and appropriate design guidelines:

- The Transportation Association of Canada (TAC) outlines minimum clear throat lengths for driveways based on the land use, development size, and type of roadway.
- Section 25 (a) of the City's Private Approach By-Law identifies a maximum number of private approaches that can be provided, based on the amount of frontage. Under the by-law the maximum number of two-way driveways for each site are:
  - Auto Dealership: 2 on Strandherd Drive, 2 on Dealership Drive
  - Office: 2 on Strandherd Drive
  - Hotel: 2 on Dealership Drive
- Section 25 (c) of the *Private Approach By-Law* identifies a maximum width requirement of 9.0m for any two-way private approach, as measured at the street line.
- Section 25 (m) of the *Private Approach By-Law* identifies a minimum driveway spacing along arterial and major collector roads.
- TAC corner clearance
  - collector from signal: 55m,
  - arterial from signal: advance of left turn storage.

Proposed driveway locations and information are identified in **Table 15.**

Table 15: Summary of Information - Proposed Driveways

Development Phase (# Parking Spaces)	Phase 1 - Auto Dealership (~59)		Phase 2 - Office (~328)	Phase 3 - Hotel (~115)	
Driveway Location (Street Class)	Strandherd Drive (arterial)	Dealership Drive (collector)	Strandherd Drive (arterial)	Dealership Drive (collector)	
Driveway Width at Property Line	8m	9m	8m	8m	7m
Spacing Provided	80m to Dealership Drive	75m to Strandherd Drive	75m to Phase 1 driveway	55m to Phase 1 driveway	37m to other Phase 3 driveway
Spacing Required (ZBL)	min 30m required (street) min 30m required (driveway)		min 60m required	min 9m required[1]	
Minimum Clear Throat Length[1] (m)	15	8	25	8	8
Provided Clear Throat Length (m)	20	15	25	8	8

Notes: 1. The Phase 3 development property is located beyond 46m of an arterial/major collector and its driveways are subject to Section 25, Subsection g.

2. Clear Throat Requirements for the Auto Dealership and Hotel consider 'Shopping Centre' and 'Motel', respectively.

The proposed driveway onto Dealership Drive has been located opposite the Toyota driveway. While this places the driveway within the merge taper for traffic on Dealership Drive, it better enables cross connections between the two sites and consolidates the conflicts to a single point.

The proposed westerly hotel driveway has been located opposite Philsar Street to consolidate the conflicts to a single point.

Traffic analysis of the driveway intersections is included in **Section 6.7** and indicates that with the implementation of the complete streets concept along Strandherd (**Figure 13**) all site accesses are expected to operate at LOS 'C' or better under both the 2024 and 2029 total traffic conditions, with an average delay of 19.0 seconds or less.

6.5 Transportation Demand Management

A review of the Transportation Demand Management (TDM) – *Measures Checklist* has been conducted. A copy of the TDM checklist is included in **Appendix G**.

The following measures will be implemented upon opening of the proposed office development:

- Display local area maps with walking/cycling access routes and key destinations at major entrances;
- Display relevant transit schedules and route maps at entrances;
- Provide online links to OC Transpo and STO information;
- Provide a dedicated ridematching portal at OttawaRideMatch.com;
- Provide a multimodal travel option information package for employees; and,
- Encourage flexible work hours and telework.

6.6 Transit

Based on the modal share presented in **Table 5**, the proposed development is anticipated to generate an additional 24 transit trips (20 in, 4 out) during the weekday AM peak hour, 23 transit trips (5 in, 18 out) during the weekday PM peak hour, and 14 transit trips (8 in, 6 out) during the Saturday peak hour.

It is anticipated that transit trips will arrive/depart the subject site via OC Transpo route 170 or route 272 and the additional transit trips generated by the site are not anticipated to have a significant impact on the operations of OC Transpo route 170 or 272.

6.7 Intersection Analysis

The City of Ottawa has prepared a complete street concept for Strandherd Drive with planned implementation in 2019-2022. The concept at the Kennevale Drive intersection (See **Figure 13**) includes cycle tracks, sidewalk, and added travel lanes. The City of Ottawa has completed its analysis and review of the "trade-offs" when developing this Complete Streets design and have already considered MMLOS factors in the development of its concept. It is anticipated that the site will have no major impact on non-auto MMLOS results.

Since the implementation of the Complete Street design is expected by 2024, auto LOS analysis for the 2024 and 2029 peak periods has been completed with the implementation of the design. Analysis has also been completed for the existing conditions. Auto LOS analysis for the existing as well as the 2024 and 2029 peak periods without and with the addition of site generated trips are summarized in the following sections. Intersection parameters in the analysis are consistent with the TIA guidelines (saturation flow rate: 1800 vphpl, existing conditions Peak Hour Factor (PHF): 0.9, future conditions PHF: 1.0).

The planned widening of Strandherd Drive and installation of northbound and southbound protection only signal phasing at the Dealership Drive / Kennevale Drive intersection are expected to mitigate collisions along Strandherd Drive at that intersection.

6.7.1 Existing Conditions Intersection Operations

Intersection capacity analysis has been completed for the existing traffic volumes (See **Figure 3**) are summarized in **Table 16**. Approaches where long queuing is expected are shown with the associated 50th and 95th percentile queue lengths in **Table 17**.

Existing signal timing plans obtained from the City of Ottawa are included in **Appendix H**. Detailed *Synchro 10* reports are included in **Appendix I**.

Table 16: Existing Conditions - Intersection Operations

Intersection		AM Peak			PM Peak			SAT Peak		
		Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
Existing Conditions										
Strandherd Drive @	Systemhouse Street/ Maravista Drive	0.65	B	NBT	0.65	B	SBT	**1.07**	**F**	**SBT**
	Dealership Drive/ Kennevale Drive	**1.00**	**F**	**NBT**	0.87	D	SBT	0.96	E	NBT

Table 17: Existing Conditions - Queuing

Intersection		Mvmt	AM Peak			PM Peak			SAT Peak		
			v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)
Existing Conditions											
Strandherd Drive @	Systemhouse Street/ Maravista Drive	NBT	0.65	45.2	m#199.6	0.52	39.7	#113.4	0.52	64.2	m79.5
		SBT	0.37	42.1	90.0	0.65	86.5	#174.8	**1.07**	**115.9**	**#177.0**
	Dealership Drive/ Kennevale Drive	NBT	**1.00**	**~291.6**	**#402.0**	0.74	131.3	#254.0	0.96	192.8	#323.6
		SBT	0.45	91.1	180.2	0.87	204.7	#349.2	0.95	238.0	m#247.2

#: volume for the 95th percentile cycle exceeds capacity
~: approach is above capacity

With existing traffic volumes and signal timings the following movements exceed the City of Ottawa threshold (v/c>0.9):

- Southbound through at the Maravista intersection during the Saturday peak hour.
- Northbound through at the Dealership Drive intersection during the AM and Saturday peak hours.
- Southbound through at the Dealership Drive intersection during the Saturday peak hour.

With existing traffic volumes and signal timings the southbound through movement at the Kennevale intersection approaches the City of Ottawa threshold with a v/c of 0.87 in the PM peak hour.

Additional through capacity is required on Strandherd Drive to accommodate the existing volumes, which will be provided by the modifications along Strandherd Drive to be constructed in the next two years.

6.7.2 2024 Intersection Operations – Future Background Traffic

Intersection capacity analysis has been completed for the projected 2024 background traffic volumes (See **Figure 9**) are summarized in **Table 18**. Approaches where long queuing is expected are shown with the associated 50th and 95th percentile queue lengths in **Table 19**.

Existing signal timing plans obtained from the City of Ottawa are included in **Appendix H**. Detailed *Synchro 10* reports are included in **Appendix I**.

Table 18: 2024 Background Traffic - Intersection Operations

Intersection		AM Peak			PM Peak			SAT Peak		
		Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
2024 Background Traffic										
Strandherd Drive @	Systemhouse Street/ Maravista Drive	0.75	C	NBT	0.77	C	SBT	**1.18**	**F**	**SBT**
	Dealership Drive/ Kennevale Drive	0.71	C	NBT	0.62	B	SBT	0.70	C	NBT

Table 19: 2024 Background Traffic - Queuing

Intersection		Mvmt	AM Peak			PM Peak			SAT Peak		
			v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)
2024 Background Traffic											
Strandherd Drive @	Systemhouse Street/ Maravista Drive	NBT	0.75	131.8	#285.2	0.59	75.7	#163.4	0.62	72.7	#148.1
		SBT	0.41	48.5	103.6	0.77	113.2	#232.3	**1.18**	**~154.8**	**#227.0**
	Dealership Drive/ Kennevale Drive	NBT	0.71	113.9	#217.5	0.56	78.5	137.8	0.70	109.3	#183.6
		SBT	0.31	75.7	105.7	0.62	38.8	70.5	0.65	104.4	192.9

#: volume for the 95th percentile cycle exceeds capacity
~: approach is above capacity

During the 2024 Saturday peak hour with existing signal timings, the southbound through movement at the Maravista intersection is expected to operate under failing conditions without site generated trips (SBT v/c ratio of 1.18). With an increased cycle length of 120 seconds, the Saturday peak hour southbound through at Maravista is found to improve to LOS 'E' (See **Appendix I**). Additional through capacity is required on Strandherd Drive to accommodate the projected volumes.

Outside of the Maravista intersection's Saturday peak hour, the study intersections are expected to operate with LOS 'C' or better with 2024 future background traffic. While the northbound and southbound through movements experience long queues during peak periods, all movements during the remaining analysis periods are expected to operate within capacity.

Meeting the target Auto LOS 'D' at the Maravista intersection would require a reduction of 20 southbound through vehicles during the Saturday peak hour (See **Appendix I**).

6.7.3 2024 Intersection Operations – Total Traffic with Site Generated Trips

Intersection capacity analysis has been completed for the projected 2024 total traffic with site generated trips (See **Figure 11**). The results of the analysis are summarized in **Table 20** for the weekday AM, PM, and Saturday peak hours. Approaches where long queuing is expected are shown with the associated 50th and 95th percentile queue lengths in **Table 21**.

Existing signal timing plans obtained from the City of Ottawa are included in **Appendix H**. Detailed *Synchro 10* reports are included in **Appendix I**.

Table 20: 2024 Total Traffic - Intersection Operations

Intersection		AM Peak			PM Peak			SAT Peak		
		Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
2024 Total Traffic										
Strandherd Drive @	Systemhouse Street/ Maravista Drive	0.77	C	NBT	0.80	C	SBT	**1.26**	**F**	**SBT**
	Dealership Drive/ Kennevale Drive	0.71	B	NBT	0.70	B	SBT	0.72	C	NBT
	Office RIRO	11.4 sec	B	EB	16.0 sec	C	EB	16.8 sec	C	EB
Dealership Drive @	Auto Driveway/Toyota	10.4 sec	B	SB	11.4 sec	B	SB	11.0 sec	B	SB
	Central Driveway	9.1 sec	A	SB	9.6 sec	A	SB	9.5 sec	A	SB
	West Driveway/ Philsar Street	9.0 sec	A	SB	9.5 sec	A	SB	9.5 sec	A	SB

Table 21: 2024 Total Traffic – Queuing

Intersection		Mvmt	AM Peak			PM Peak			SAT Peak		
			v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)
2024 Total Traffic											
Strandherd Drive @	Systemhouse Street/ Maravista Drive	NBT	0.77	140.5	#295.3	0.65	124.8	#189.2	0.66	80.0	#164.1
		SBT	0.47	57.6	#132.4	0.80	121.8	#247.0	**1.26**	**~174.8**	**#247.5**
	Dealership Drive/ Kennevale Drive	NBT	0.71	114.2	#217.5	0.60	91.7	137.8	0.72	115.6	#183.6
		SBT	0.34	78.6	106.5	0.70	31.7	73.1	0.69	115.7	194.2

#: volume for the 95th percentile cycle exceeds capacity
~: approach is above capacity

The southbound through movement at the Maravista intersection is expected to operate under failing conditions with site generated trips (SB v/c ratio of 1.26). These same deficiencies were noted in the 2024 background traffic scenario. With signal timing adjustments during the Saturday peak hour, the southbound through movement at the Maravista intersection was found to improve to LOS 'E'. Additional through capacity is required on Strandherd Drive to accommodate the projected volumes. This result is consistent with the recommendations of the approved 2012 CTS for the Citigate lands, and the 1991 Strandherd Drive ESR to protect for a six-lane cross section between Highway 416 and Jockvale Road.

The site accesses are expected to operate with LOS 'C' or better under 2024 total traffic conditions, with an average delay of 16.8 seconds or less.

The 95th percentile eastbound queues on Dealership Drive at Strandherd Drive are expected to be stored within the 75m left turn lane and not block the auto driveway / Toyota driveway.

The 95th percentile southbound through queues on Strandherd Drive at Dealership Drive of about 205 metres are expected to exceed the 110m southbound right turn lane length, blocking access to this lane and the site's right-in, right-out driveway. Drivers exiting the site at the office driveway

may have to rely on courtesy during peak hours or alternatively use the Dealership Drive accesses.

Meeting the target Auto LOS 'D' at the Maravista intersection would require a reduction of 100 southbound through vehicles during the Saturday peak hour (See **Appendix I**).

6.7.4 2029 Intersection Operations – Future Background Traffic

Intersection capacity analysis has been completed for the projected 2029 background traffic volumes (See **Figure 10**) are summarized in **Table 22** for the weekday AM, PM, and Saturday peak hours. Approaches where long queuing is expected are shown with the associated 50th and 95th percentile queue lengths in **Table 23**.

Existing signal timing plans obtained from the City of Ottawa are included in **Appendix H**. Detailed *Synchro 10* reports are included in **Appendix I**.

Table 22: 2029 Background Traffic - Intersection Operations

Intersection		AM Peak			PM Peak			SAT Peak		
		Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
2029 Background Traffic										
Strandherd Drive @	Systemhouse Street/ Maravista Drive	0.89	D	NBT	0.93	E	SBT	**1.35**	**F**	**SBT**
	Dealership Drive/ Kennevale Drive	0.80	C	NBT	0.70	B	SBT	0.77	C	NBT

Table 23: 2029 Background Traffic - Queuing

Intersection		Mvmt	AM Peak			PM Peak			SAT Peak		
			v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)
2029 Background Traffic											
Strandherd Drive @	Systemhouse Street/ Maravista Drive	NBT	0.89	85.6	#334.1	0.72	130.3	#200.0	0.71	89.2	#183.5
		SBT	0.51	61.0	#138.1	0.93	139.4	#274.8	**1.35**	**~196.6**	**#269.1**
	Dealership Drive/ Kennevale Drive	NBT	0.80	144.5	#268.4	0.62	92.1	160.2	0.77	129.5	#228.0
		SBT	0.36	97.7	120.8	0.70	23.8	m#97.3	0.74	128.2	#245.1

#: volume for the 95th percentile cycle exceeds capacity
~: approach is above capacity

During the 2029 Saturday peak hour with existing signal timings, the southbound through movement at the Maravista intersection is expected to operate under failing conditions without site generated trips (SBT v/c ratio of 1.35). With signal timing adjustments, the southbound through movement at the Maravista intersection during the Saturday peak hour is found to improve to a v/c of 1.05 (See **Appendix I**).

During the 2029 weekday PM peak hour with existing signal timings, the southbound through movement at the Maravista intersection is expected to operate above City Guidelines (v/c is over 0.90) without site generated trips (SBT v/c ratio of 0.93).

Outside of the Maravista intersection's weekday PM and Saturday peak hours, the study intersections are expected to operate with LOS 'D' or better with 2029 future background traffic. While the northbound and southbound through movements experience long queues during peak periods, all movements during the remaining analysis periods are expected to operate within capacity.

Meeting the target Auto LOS 'D' at the Maravista intersection would require a reduction of 30 southbound through vehicles during the weekday PM peak hour. Meeting the target Auto LOS 'D' at the Maravista intersection would require a reduction of 195 southbound through vehicles during the Saturday peak hour (See **Appendix I**).

6.7.5 2029 Intersection Operations – Total Traffic with Site Generated Trips

Intersection capacity analysis has been completed for the 2029 total traffic with site generated trips (See **Figure 12**). The results of the analysis are summarized in **Table 24** for the weekday AM, PM, and Saturday peak hours. Approaches where long queuing is expected are shown with the associated 50th and 95th percentile queue lengths in **Table 25**. Existing signal timing plans obtained from the City of Ottawa are included in **Appendix H**. Detailed *Synchro 10* reports are included in **Appendix I**.

Table 24: 2029 Total Traffic - Intersection Operations

Intersection		AM Peak			PM Peak			SAT Peak		
		Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt	Max. v/c or delay	LOS	Mvmt
2029 Total Traffic										
Strandherd Drive @	Systemhouse Street/ Maravista Drive	0.91	E	NBT	0.96	E	SBT	**1.43**	**F**	**SBT**
	Dealership Drive/ Kennevale Drive	0.80	C	NBT	0.82	D	SBT	0.83	D	NBT/ SBT
	Office RIRO	12.1 sec	B	EB	18.1 sec	C	EB	19.0 sec	C	EB
Dealership Drive @	Auto Driveway/Toyota	10.9 sec	B	SB	12.0 sec	B	SB	12.1 sec	B	SB
	Central Driveway	9.5 sec	A	SB	10.1 sec	B	SB	10.4 sec	B	SB
	West Driveway/ Philsar Street	9.4 sec	A	SB	10.0 sec	B	SB	10.3 sec	B	SB

Table 25: 2029 Total Traffic - Queuing

Intersection		Mvmt	AM Peak			PM Peak			SAT Peak		
			v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)	v/c	50th % Queue (m)	95th % Queue (m)
2029 Total Traffic											
Strandherd Drive @	Systemhouse Street/ Maravista Drive	NBT	0.91	135.1	#344.1	0.79	142.9	#226.0	0.75	97.3	#199.5
		SBT	0.57	71.2	#164.4	0.96	149.4	#289.0	**1.43**	**~216.6**	**#289.4**
	Dealership Drive/ Kennevale Drive	NBT	0.80	144.9	#268.4	0.69	113.6	160.2	0.83	149.1	#228.0
		SBT	0.39	98.3	121.2	0.82	23.5	m#89.2	0.83	155.6	#246.1

#: volume for the 95th percentile cycle exceeds capacity
~: approach is above capacity

The southbound through movement at the Maravista intersection is expected to operate under failing conditions with site generated trips (SB v/c ratio of 1.43). With signal timing adjustments, the southbound through movement at the Maravista intersection during the Saturday peak hour is found to improve to a v/c of 1.11 (See **Appendix I**). These same deficiencies were noted in the 2029 background traffic scenario and no further modifications are recommended based on the addition of site traffic.

During the 2029 weekday PM peak hour with existing signal timings, the southbound through movement at the Maravista intersection is expected to operate above City Guidelines (v/c is over 0.90) without site generated trips (SBT v/c ratio of 0.96).

The site accesses are expected to operate with LOS 'C' or better under 2029 total traffic conditions, with an average delay of 19.0 seconds or less.

The 95th percentile eastbound queues on Dealership Drive at Strandherd Drive are expected to be stored within the 75m left turn lane and not block the auto driveway / Toyota driveway.

The 95th percentile southbound through queues on Strandherd Drive at Dealership Drive of about 250 metres are expected to exceed the 110m southbound right turn lane length, blocking access to this lane and the site's right-in, right-out driveway. These queues do not spill back to the Maravista intersection (about 490 metres to the north).

Meeting the target Auto LOS 'D' at the Maravista intersection would require a reduction of 90 southbound through vehicles during the weekday PM peak hour. Meeting the target Auto LOS 'D' at the Maravista intersection would require a reduction of 280 southbound through vehicles during the Saturday peak hour (See **Appendix I**).

7.0 CONCLUSIONS AND RECOMMENDATIONS

Development Design and Parking

- Pedestrian facilities will be provided between the main buildings and the parking lots. New pedestrian walkways will be constructed, providing connectivity to the existing pedestrian facilities along Dealership Drive and planned sidewalk along Strandherd Drive.
- All required TDM-supportive design and infrastructure measures in the TDM checklist are met.
- The proposed vehicular parking spaces meet the requirements of the ZBL for each site.
- The 32 proposed bicycle parking spaces at the north end of the office meet the minimum requirements of the ZBL.
- The 2 proposed bicycle parking spaces at the south side of the auto dealership also meet the minimum requirements of the ZBL.
- Bicycle parking for the hotel will be reviewed at site plan submission for that phase.
- The number of barrier-free spaces for each site meet the AODA requirements.
- As per the City of Ottawa's Zoning By-law, one loading space is required for each of the auto dealership and office and one loading space is provided to each.
- The City of Ottawa's Zoning By-law indicates that 2 loading spaces are required for the hotel. Two loading spaces have been indicated and the loading for the hotel will be reviewed prior to site plan submission for that phase.

Boundary Street MMLOS

- The City of Ottawa has prepared a Complete Street Design along Strandherd Drive with plans to implement the Design within the study horizon.

The results of the segment MMLOS analysis for Dealership Drive can be summarized as follows:

- Dealership Drive operates with a PLOS C, achieving the target PLOS C;
- With a BLOS of F, Dealership Drive misses the target BLOS E;
- Dealership Drive surpasses the target Auto LOS D, achieving an Auto LOS A; and,
- The cross section of Dealership Drive was recently reviewed and approved by the City during the plan of subdivision stage. No modifications to Dealership Drive are recommended.

Access Design

- The proposed development will be served by a total of five accesses. The accesses will be 7-9m wide, measured at the property line. The accesses meet all requirements of the City's Private Approach By-law.

Transit

- The proposed development is anticipated to generate an additional 24 transit trips (20 in, 4 out) during the weekday AM peak hour, 23 transit trips (5 in, 18 out) during the weekday PM peak hour, and 14 transit trips (8 in, 6 out) during the Saturday peak hour.
- The additional transit trips generated by the proposed development are not anticipated to have a significant impact on the operations of OC Transpo route 170 or 272.

Intersection MMLOS

- The City of Ottawa has prepared a Complete Street concept for Strandherd Drive with planned implementation by 2022. The concept includes cycle tracks, sidewalk, and added travel lanes. The City of Ottawa has completed its MMLOS analysis and considered the

"trade-offs" when developing this Complete Streets design. The subject site is proposing to tie in to this concept and is not anticipated to have a major impact on non-auto MMLOS.

Existing Traffic

- During the Existing weekday AM as well as the Saturday peak hours, several movements were found to operate above City of Ottawa thresholds (v/c > 0.9).
- Additional through capacity is required on Strandherd Drive to accommodate the existing volumes, which will be provided by the modifications along Strandherd Drive to be constructed in the next two years.

2024 Background Traffic

- During the 2024 Saturday peak hour with existing signal timings, the Maravista intersection is expected to operate under failing conditions without site generated trips (SBT v/c ratio of 1.18).
- With signal timing adjustments, the Saturday peak hour is found to improve to LOS 'E'.
- Additional through capacity is required on Strandherd Drive to accommodate the projected volumes.
- Outside of the Maravista intersection's Saturday peak hour, the study intersections are expected to operate with LOS 'C' or better with 2024 future background traffic.

2024 Total Traffic

- The Maravista intersection is expected to operate under failing conditions with site generated trips (SB v/c ratio of 1.26).
- With signal timing adjustments during the Saturday peak hour, the Maravista intersection was found to improve to LOS 'E'.
- The site accesses are expected to operate with LOS 'C' or better under 2024 total traffic conditions, with an average delay of 16.8 seconds or less.
- 95th percentile eastbound queues on Dealership Drive at Strandherd Drive are expected to be stored within the 75m left turn lane and not block the auto driveway / Toyota driveway.
- The 95th percentile southbound through queues on Strandherd Drive at Dealership Drive of about 205 metres are expected to exceed the 110m southbound right turn lane length, blocking access to this lane and the site's Strandherd driveways.
- Capacity issues have been identified for the southbound through movement on Strandherd Drive at Maravista during the Saturday peak hour. To achieve the target Auto LOS 'D' a reduction of 100 southbound through vehicles is required.

2029 Background Traffic

- During the 2029 Saturday peak hour with existing signal timings, the Maravista intersection is expected to operate under failing conditions without site generated trips (SBT v/c ratio of 1.35).
- With signal timing adjustments, the SBT v/c during the Saturday peak hour was found to improve to 1.05.
- During the 2029 weekday PM peak hour, the southbound through movement at the Maravista intersection is expected to operate with LOS 'E' without site generated trips (SBT v/c ratio of 0.93).

- Outside of the Maravista intersection's weekday PM and Saturday peak hours, the study intersections are expected to operate with LOS 'D' or better with 2029 future background traffic.
- To achieve the target Auto LOS 'D' during the weekday PM peak hour, a reduction of 30 southbound through vehicles is required.
- To achieve the target Auto LOS 'D' during the Saturday peak hour, a reduction of 195 southbound through vehicles is required.

2029 Total Traffic

- The Maravista intersection is expected to operate under failing conditions with site generated trips (SBT v/c ratio of 1.43).
- With signal timing adjustments, the SBT v/c during the Saturday peak hour was found to improve to 1.11.
- The site accesses are expected to operate with LOS 'C' or better under 2029 total traffic conditions, with an average delay of 19.0 seconds or less.
- 95th percentile eastbound queues on Dealership Drive at Strandherd Drive are expected to be stored within the 75m left turn lane and not block the auto driveway / Toyota driveway.
- The 95th percentile southbound through queues on Strandherd Drive at Dealership Drive of about 250 metres are expected to exceed the 110m southbound right turn lane length, blocking access to this lane and the site's right-in, right-out driveways. These queues do not spill back to the Maravista intersection (about 490 metres to the north).
- To achieve the target Auto LOS 'D' during the weekday PM peak hour, a reduction of 90 southbound through vehicles is required.
- To achieve the target Auto LOS 'D' during the Saturday peak hour, a reduction of 280 southbound through vehicles is required.

NOVATECH

Prepared by:

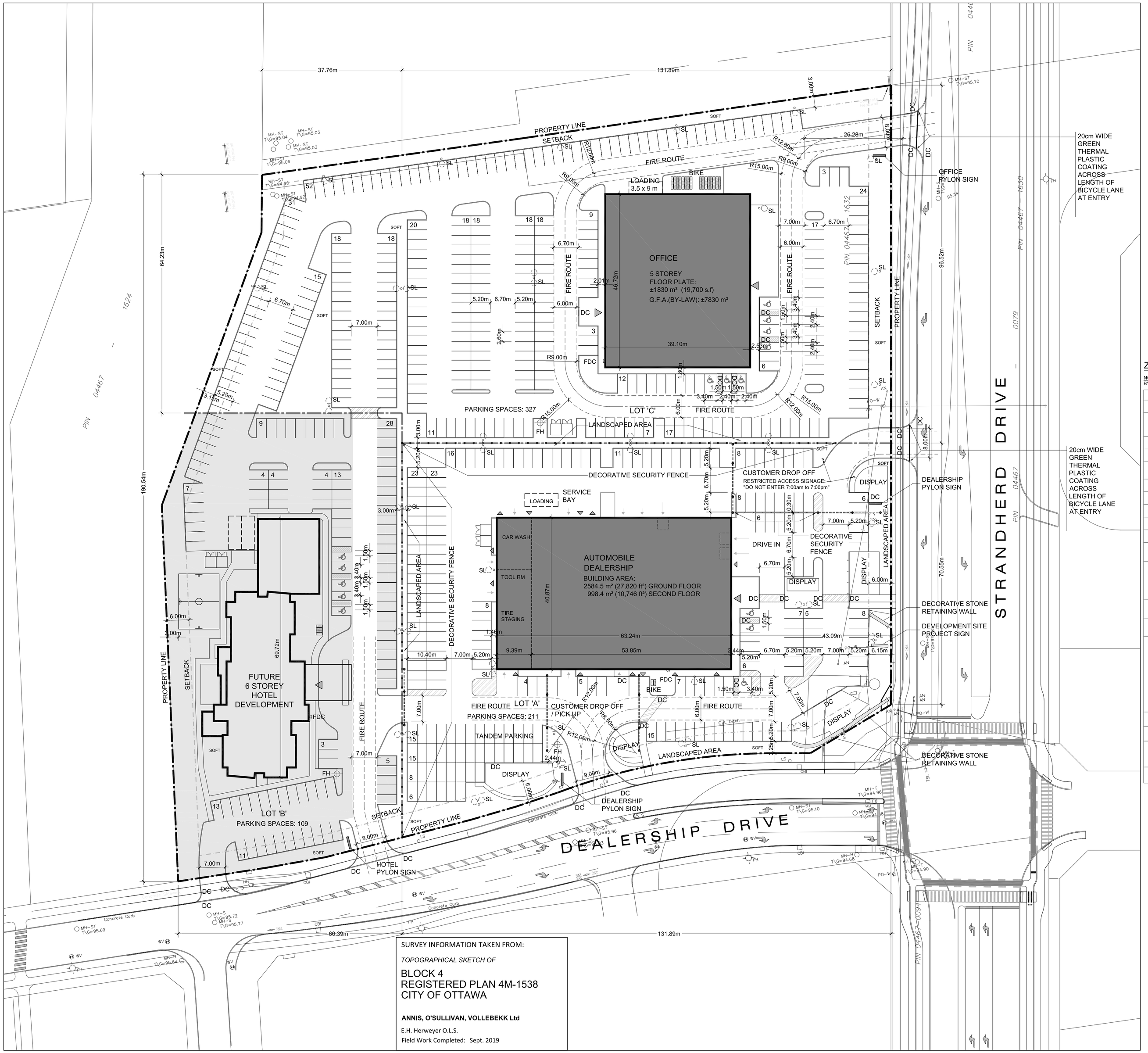
Patrick Hatton, P.Eng.
Project Manager | Transportation/Traffic

Reviewed by:

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

APPENDIX A

Site Plan



SURVEY INFORMATION TAKEN FROM:

TOPOGRAPHICAL SKETCH OF

BLOCK 4
REGISTERED PLAN 4M-1538
CITY OF OTTAWA

ANNIS, O'SULLIVAN, VOLLEBEKK Ltd

E.H. Herweyer O.L.S.
Field Work Completed: Sept. 2019

1 A001 SITE PLAN
SCALE 1:500

CONSULTANTS

ARCHITECT
N45 Architecture Inc.
The Sovereign Building
71 Bank Street, 7th Floor
Ottawa, Ontario K1P 5N2 | Tel: 613-224-0095

CIVIL & TRANSPORTATION
NOVATECH Engineers, Planners & Landscape Architects
240 Michael Cowpland Drive, Suite 200
Ottawa, Ontario, K2M 1P6 | Tel: 613.254.9643

LANDSCAPE & TREE CONSERVATION REPORT
DOUGLAS & RUHLAND ASSOCIATES LTD.
Suite 200 - 1750 Courtwood Crescent
Ottawa, Ontario K2C 2B5 | Tel: 613 224-4744

STRUCTURAL
Adjelelan Allen Rubeli Ltd.
75 Albert Street, Suite 1005
Ottawa, Ontario K1P 5E7 | Tel: 613-232-5786

MECHANICAL & ELECTRICAL
Goodkey, Weedmark & Associates Limited
Consulting Engineers
1688 Woodward Drive
Ottawa, Ontario, K2C 3R8 | Tel: 613-727-5111

GEOTECHNICAL REPORT PROVIDED TO OWNER BY:
Paterson Group Inc.
154 Colonnade Road South
Ottawa, Ontario, K2E 7J5 | Tel.: (613) 226-7381

SURVEY PLAN INFORMATION PROVIDED TO OWNER BY:
ANNIS, O'SULLIVAN, VOLLEBEKK Ltd
14 Concourse Gate, suite 500
Nepean, Ontario, K2E 7S6 | Tel.: (613) 727-0850

OWNER
Myers Aytomotive Group
1200 Baseline Rd #2
Ottawa, Ontario K2C 0A6

ZONING INFORMATION

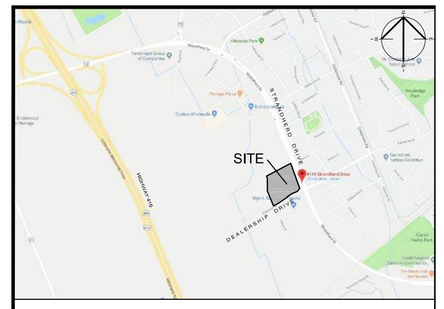
NOTE: ALL ZONING DEFINITIONS AND REQUIREMENTS AS PER CITY OF OTTAWA ZONING BY-LAW 2008-250

ZONING MECHANISM	REQUIRED	PROVIDED
ADDRESS	4149 STRANDHERD DRIVE	
DEFINITION	IP [2298] H(18) BUSINESS PARK INDUSTRIAL ZONE	AUTOMOBILE DEALERSHIP OFFICE
MIN.LOT WIDTH	NO	
MIN. LOT AREA	4000 m²	33952 m²
MIN. FRONT / CORNER SIDE YARD SETBACK	6 m	> 6 m
MIN. INT. SIDE YARD SETBACK	3 m	> 3 m
MIN. REAR YARD SETBACK	6 m	> 6 m
MAX. LOT COVERAGE	55 %	
MAX. BUILDING HEIGHT	18 m	<18 m
MAX. FLOOR SPACE INDEX	2	
MIN. WIDTH OF LANDSCAPING	3 m ABUTTING A STREET, 0 m IN ALL OTHER CASES	
PARKING SPACE LANDSCAPED BUFFER	6 m ABUTTING STRANDHERD DR., 3 m ABUTTING O'Keefe DRAINAGE CORRIDOR	6 m ABUTTING STRANDHERD DR., 3 m ABUTTING O'Keefe DRAINAGE CORRIDOR
STANDARD PARKING SPACE	2.6m WIDTH x 5.2m LENGTH	2.6m WIDTH x 5.2m LENGTH
ACCESSIBLE PARKING SPACE	3.66m WIDTH x 5.2m LENGTH	3.66m WIDTH x 5.2m LENGTH
PARKING REQUIREMENTS AREA C: SUBURBAN	AUTO. DEALERSHIP: 59 SALES/SHOWROOM: 16 (2 / 100 m² G.F.A) SERVICE AREA: 28 (2 / BAY) OTHER AREA: 15 (1 / 100 m² G.F.A)	59 PROVIDED 152 (INVENTORY) 211 TOTAL
	OFFICE: ±188 (2.4 / 100 m² G.F.A)	327
	HOTEL : 109 (1 / ROOM)	109
BARRIER-FREE PARKING	15	15
LOADING SPACES	1 / BUILDING	1 / BUILDING
BICYCLE PARKING RATE	OFFICE: 32 (1 / 250 m² of G.F.A.) OTHER: 1 / 1500 m² of G.F.A REQUIRED SPACES: X	32 (Office) 2 (Dealership) 4 (Hotel)
GROSS FLOOR AREA		OFFICE: ±7830 m²

LEGEND

- PROPERTY LINE
- YARD SETBACK
- DECORATIVE SECURITY FENCE SEE LANDSCAPE
- PROPOSED BUILDING
- SOFT — LANDSCAPED AREA
- MAIN ENTRANCE
- GARBAGE ENCLOSURE
- DC — DEPRESSED CURB
- PAINTED AREA
- SLIDING SECURITY GATE SEE LANDSCAPE
- FUTURE DEVELOPMENT
- FDC — FIRE DEPARTMENT CONNECTION
- SL — SITE LIGHTING- SEE ELEC SITE PLAN
- FH — FIRE HYDRANT- SEE CIVIL

MYERS AUTOMOTIVE GROUP



KEY PLAN

no.	revision	date
	ISSUED FOR S.P.C. RESUBMITAL	MAR. 06, 2020
	ISSUED FOR CIRCULATION	FEB. 10, 2020
	ISSUED FOR REVIEW	JAN. 24, 2020
	ISSUED FOR SITE PLAN CONTROL	NOV. 06, 2019

N45 ARCHITECTURE INC.
71 Bank Street, 7th Floor - Ottawa, Ontario, K1P 5N2
tel. 613.224.0095 fax 613.224.9811

project
COMMERCIAL PROPERTY DEVELOPMENT

4149 STRANDHERD DR,
NEPEAN, ONTARIO

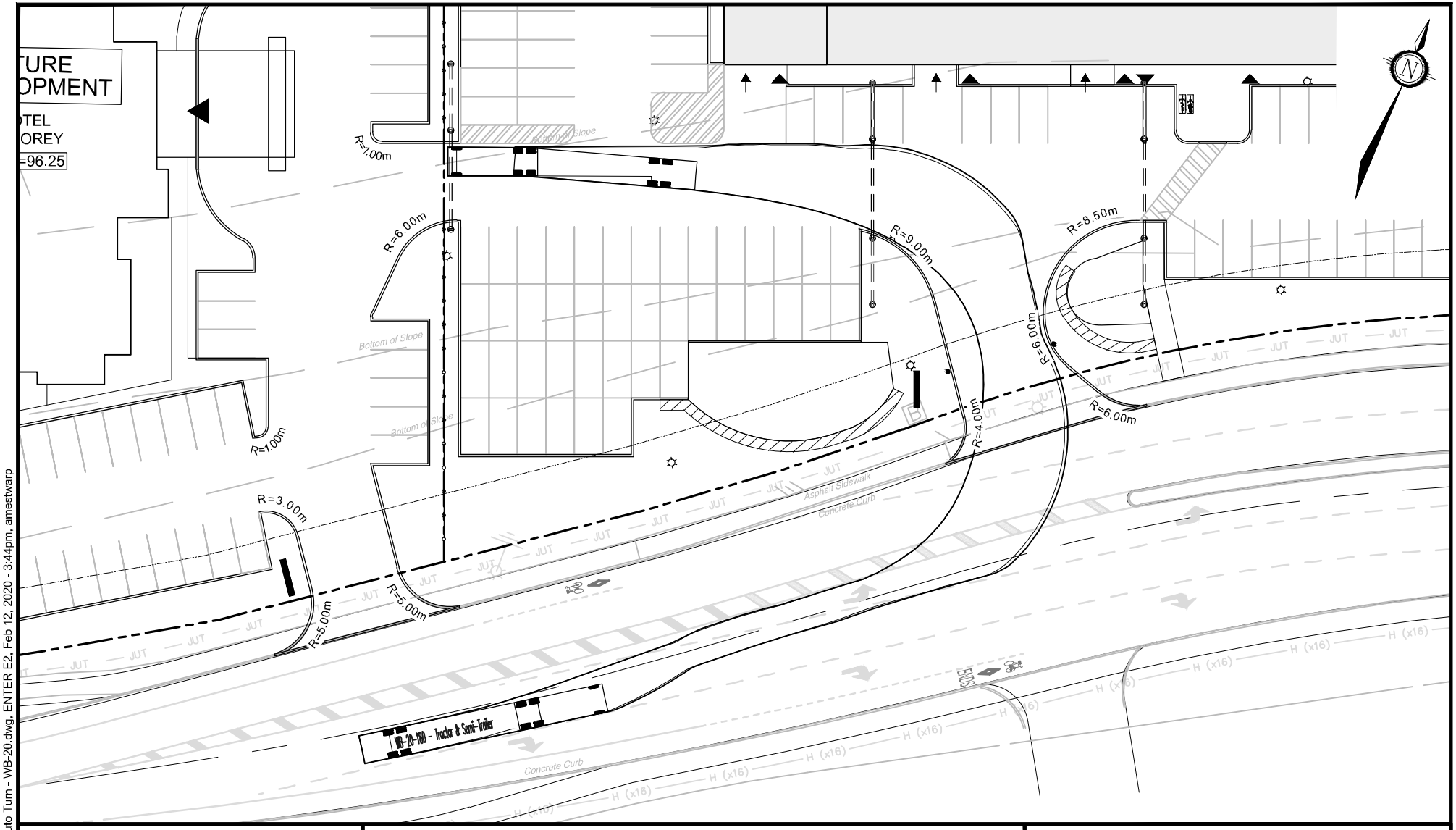
construction north

seal
ONTARIO ASSOCIATION OF ARCHITECTS
RICHARD C. MATTHEWS
LICENCE 2966

drawing title
SITE PLAN

scale	drawn by
1:500	
date	checked by
NOV. 06, 2019	
project number	drawing number
19-471	A-001
	revision

DO NOT SCALE DRAWINGS



NOVATECH

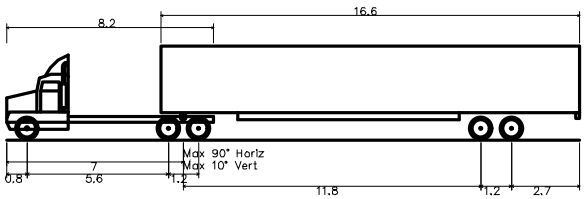
Engineers, Planners & Landscape Architects

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

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LEGEND

PROPERTY LINE



WB-20-180 – Tractor & Semi-Trailer	
Overall Length	22.700m
Overall Width	2.600m
Overall Body Height	3.730m
Min Body Ground Clearance	0.435m
Track Width	2.600m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	14.300m

4149 STRANDHERD DRIVE

DEALERSHIP DRIVE
ENTER - EAST BOUND
(WB-20 DESIGN VEHICLE)

SCALE 1 : 500 (0 5 10 15 20)

DATE JAN 2020 | JOB 117148 | FIGURE 1

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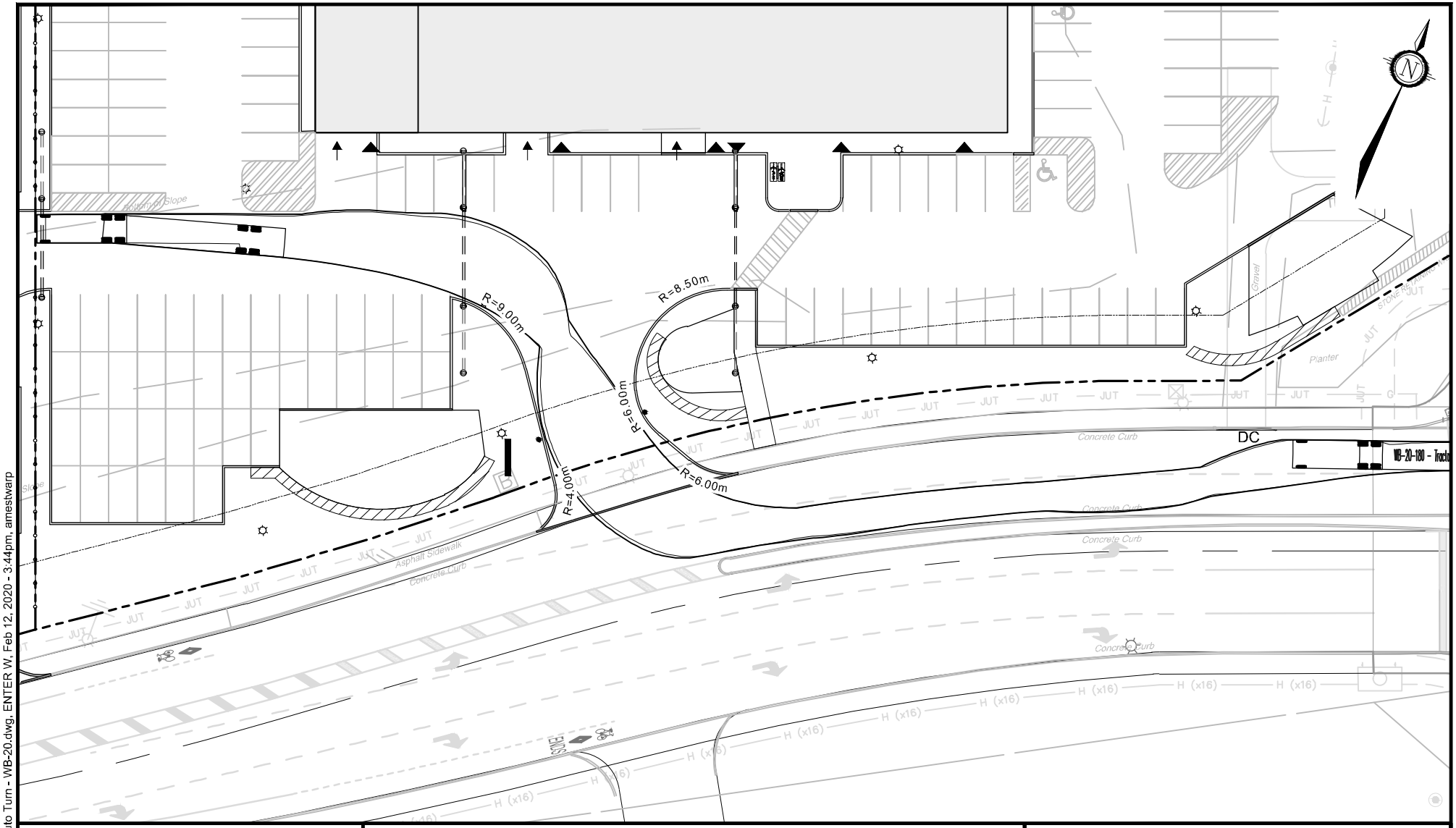
SHT8X11.DWG - 216mmx279mm



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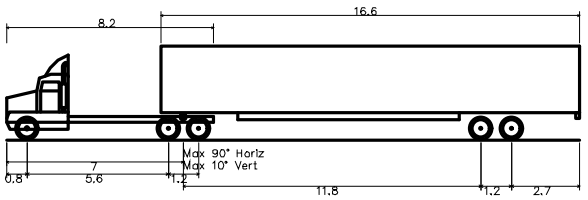
LEGEND

PROPERTY LINE



WB-20-180 - Tractor & Semi-Trailer

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

4149 STRANDHERD DRIVE

DEALERSHIP DRIVE
ENTER - WEST BOUND
(WB-20 DESIGN VEHICLE)

SCALE 1 : 500 (0 5 10 15 20)

DATE JAN 2020 | JOB 117148 | FIGURE 2

SHT8X11.DWG - 216mmx279mm

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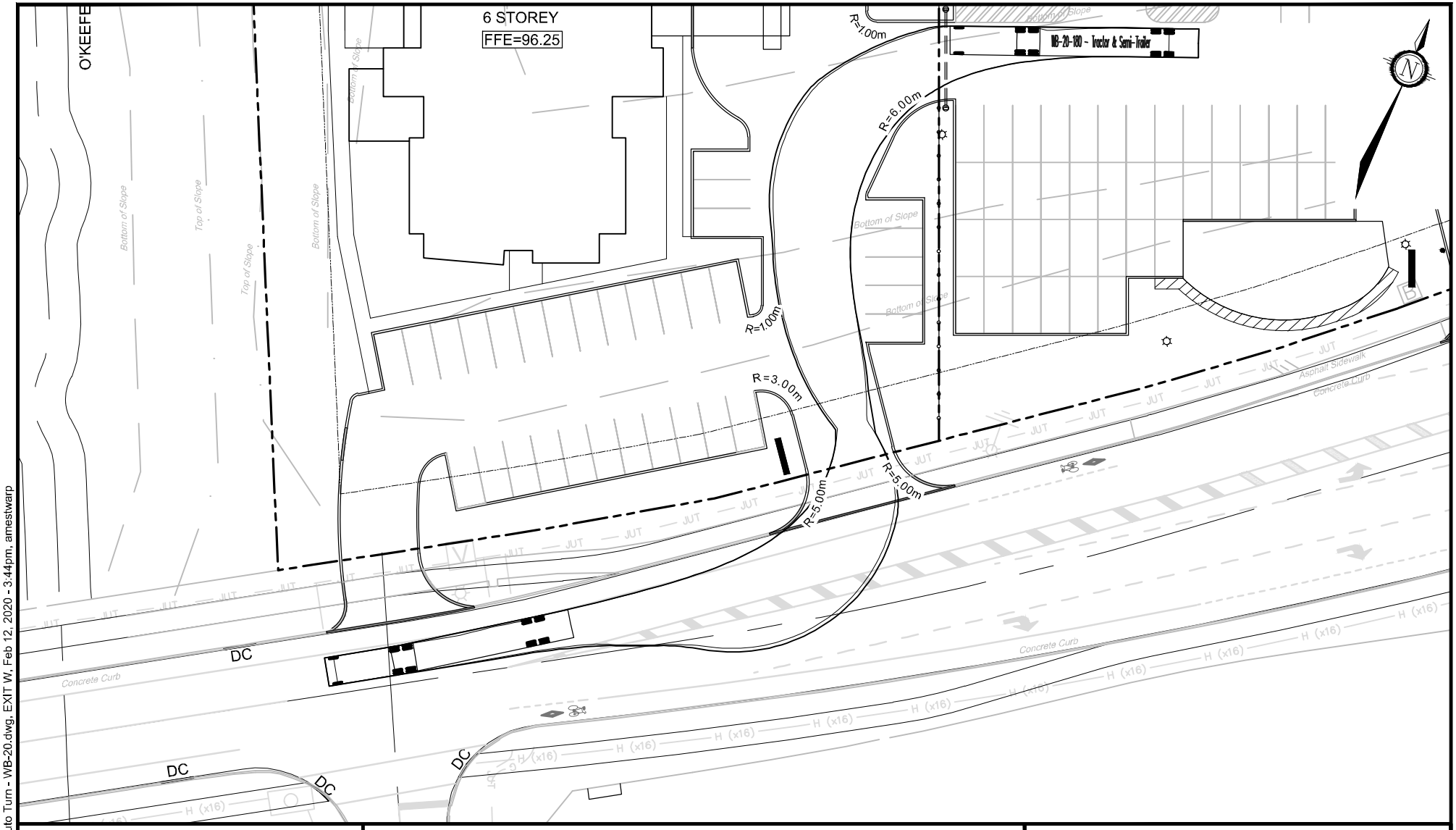

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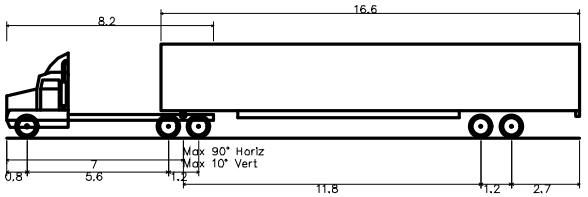
LEGEND

PROPERTY LINE



WB-20-180 - Tractor & Semi-Trailer

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

4149 STRANDHERD DRIVE

DEALERSHIP DRIVE
EXIT - WEST BOUND
(WB-20 DESIGN VEHICLE)

SCALE 1 : 500 (0 5 10 15 20)

DATE JAN 2020 | JOB 117148 | FIGURE 3

SHT8X11.DWG - 216mmx279mm

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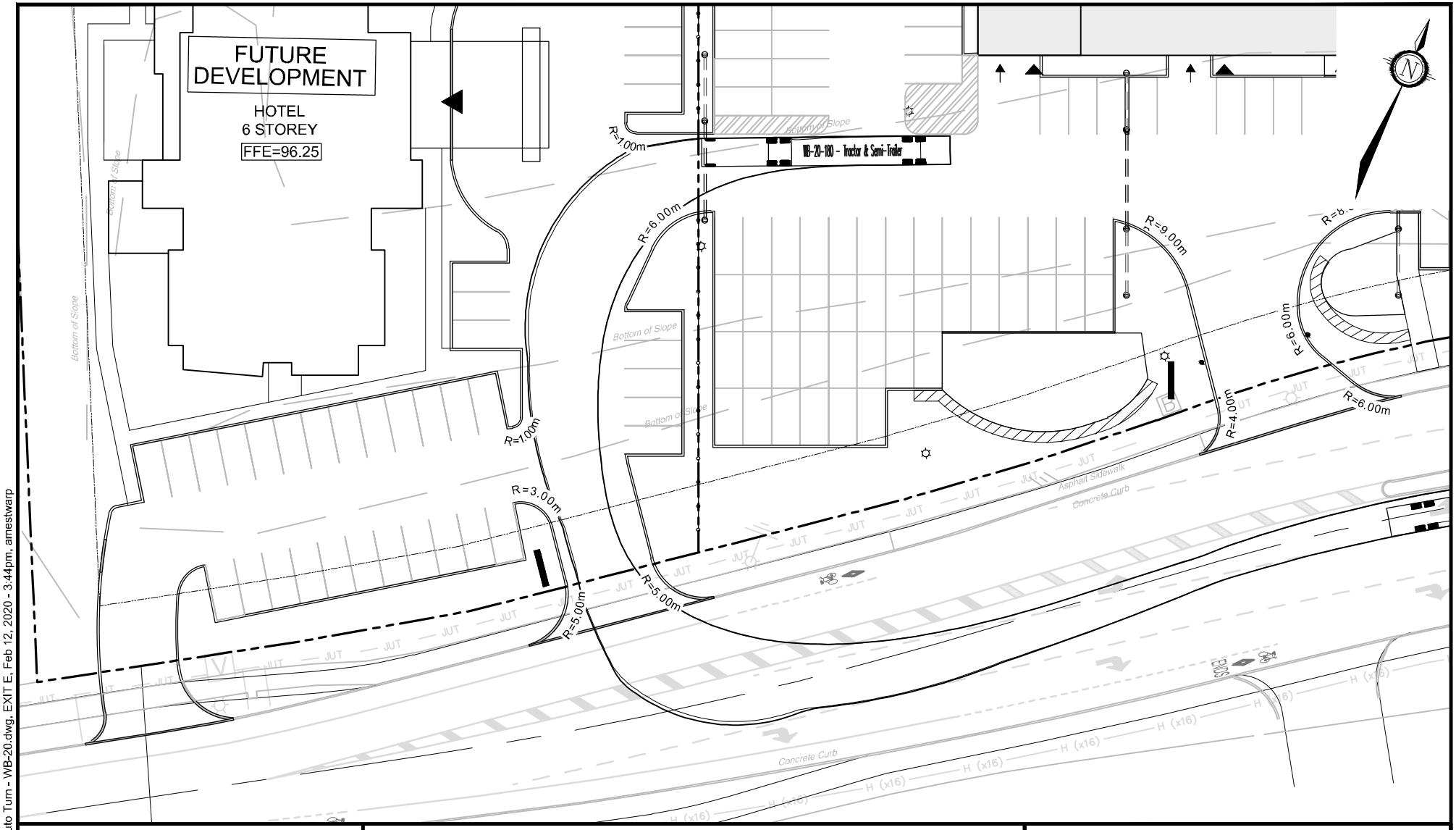

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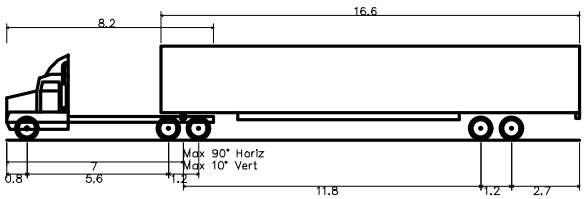
LEGEND

PROPERTY LINE



WB-20-180 - Tractor & Semi-Trailer

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

4149 STRANDHERD DRIVE

DEALERSHIP DRIVE
EXIT - EAST BOUND
(WB-20 DESIGN VEHICLE)

SCALE 1 : 500 (0 5 10 15 20)

DATE JAN 2020 | JOB 117148 | FIGURE 4

SHT8X11.DWG - 216mmx279mm

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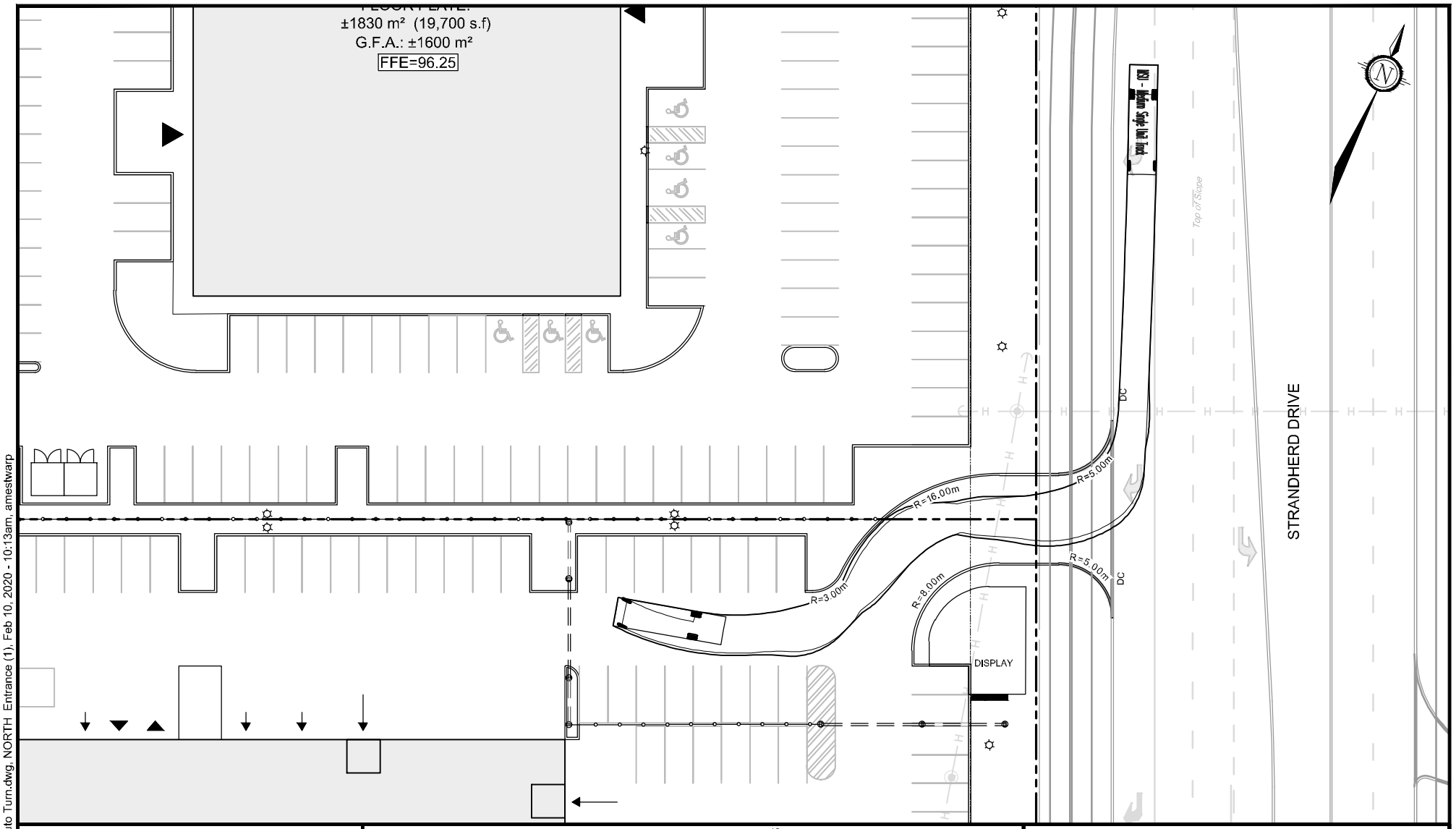

M:\2017\117148\CAD\Design\Figures\AutoTurn\Auto Turn.dwg, NORTH Entrance (1), Feb 10, 2020 - 10:13am, amestwarp

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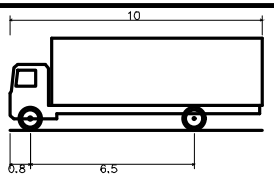
Website www.novatech-eng.com

LEGEND

- PROPERTY LINE
- H EXISTING OVERHEAD HYDRO
- EXISTING HYDRO POLE



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

4149 STRANDHERD DRIVE

STRANDHERD DRIVE
ENTER - SOUTH BOUND
(MSU DESIGN VEHICLE)

SCALE 1 : 500 (0 5 10 15 20)

DATE JAN 2020 | JOB 117148 | FIGURE 5

SHT8X11.DWG - 216mmx279mm

APPENDIX B

TIA Screening Form

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	4149 Strandherd Road
Description of Location	Corner of Strandherd and Dealership Drive
Land Use Classification	Business Park
Development Size (units)	
Development Size (m^2)	Phase 1 - 3583m2, Phase 2 - 7830m2, Phase 3 - 120 hotel rooms
Number of Accesses and Locations	2 accesses to Strandherd; 3 accesses to Dealership Drive
Phase of Development	3 phase development - Auto dealership, office building, hotel
Buildout Year	Phase 1 - 2020, Phase 2 - 2021/22, Phase 3 - 2024

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

2. Trip Generation Trigger

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

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

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

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

3. Location Triggers

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

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

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

4. Safety Triggers

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

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

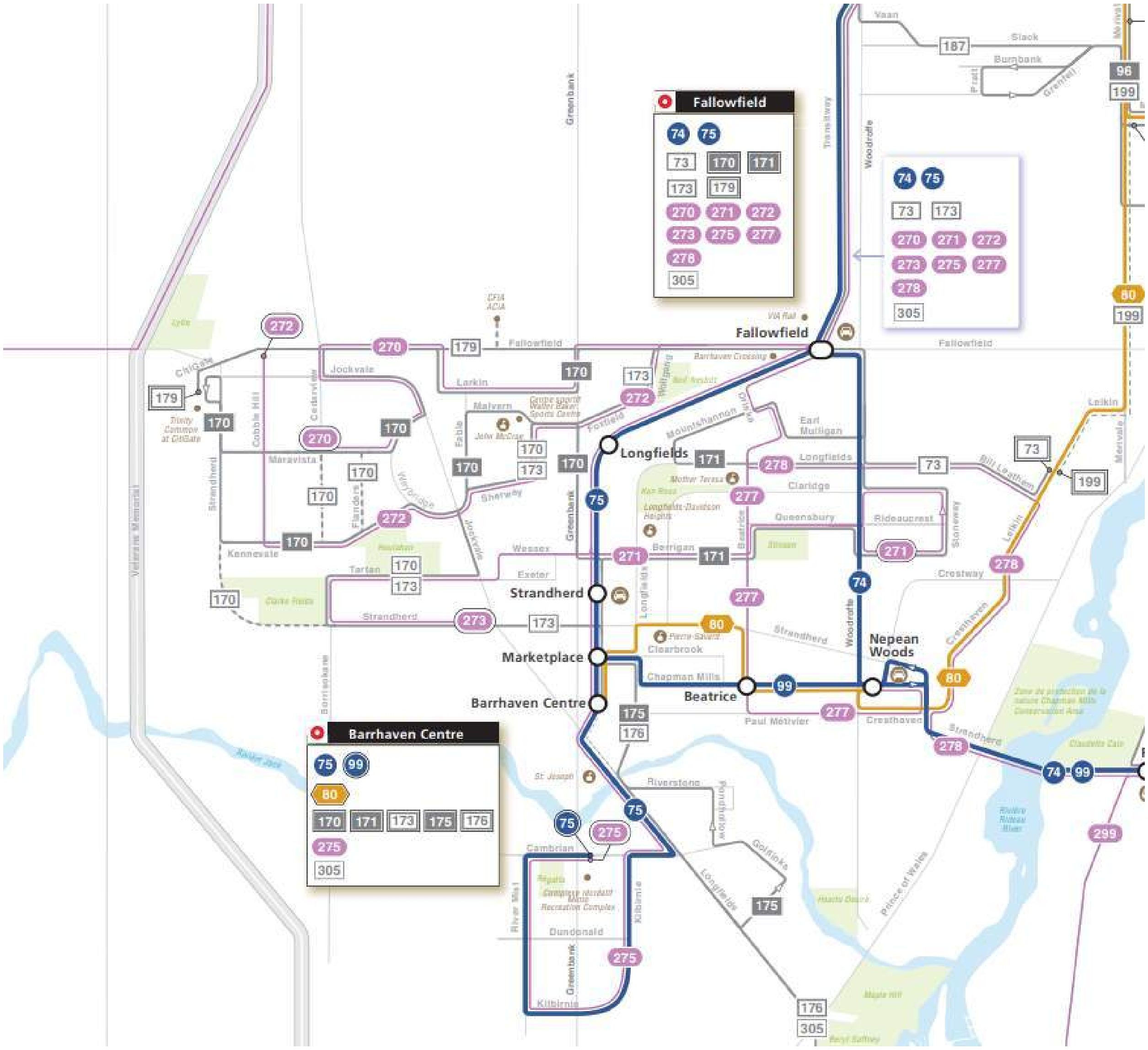
5. Summary

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

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

APPENDIX C

OC Transpo System Information

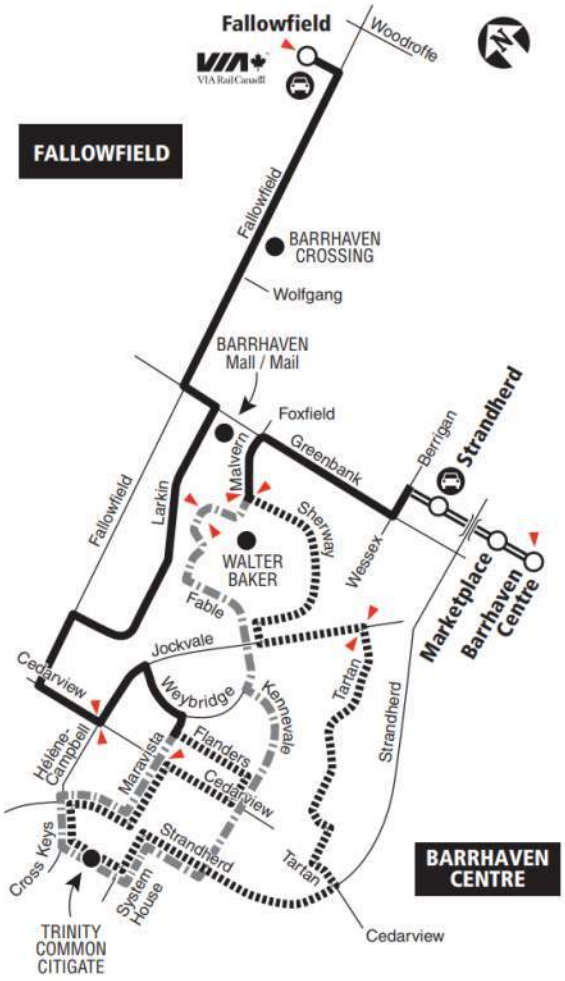


Fallowfield
74 75
73 170 171
173 179
270 271 272
273 275 277
278
305
Barrhaven Centre
75 99
80
170 171 173 175 176
275
305
Fallowfield
Longfields
Strandherd
Marketplace
Barrhaven Centre
Beatrice
Nepean Woods
Woodroffe
Greenbank
Transitway
Jockvale
Larkin
Malvern
Fable
Cedarview
Cobble Hill
Maravista
Strandherd
Kennevale
Tartan
Wessex
Exeter
Longfields
Berrigan
Mountshannon
Earl Mulligan
Claridge
Queensbury
Rideaucrest
Stoneway
Crestway
Leikin
Bill Leathem
Crestway
Cresthaven
Paul Metivier
Chapman Mills
Clearbrook
Riverstone
Cambrian
Dundonald
Kilbirnie
Prince of Wales
Vaan
Slack
Burnbank
Grenfell
Pratt
Merivale
Veterans Memorial
Citigate
Borrisokane
Longfields
Golflinks

170 FALLOWFIELD / BARRHAVEN CENTRE

Local

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



Transitway & Station

Evenings and weekends only /
Soirs et fins de semaine seulement

No service evenings and weekends /
Pas de service le soir et les fins de semaine

Park & Ride / Parc-o-bus

Timepoint / Heures de passage

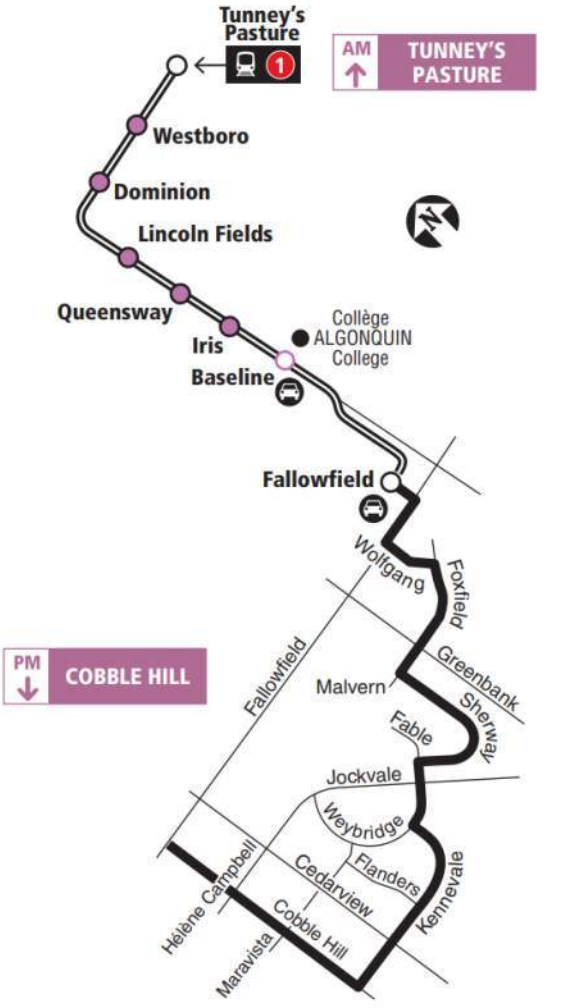
272 Connexion

COBBLE HILL / TUNNEY'S PASTURE

Monday to Friday / Lundi au vendredi

Peak periods only

Périodes de pointe seulement



Transitway & Station

Limited stops: Off only in AM / No stop in PM
Arrêts limités : Débarquement en AM seul. / Aucun arrêt en PM

AM: Off only - PM: Full Service
AM: Débarquement seul. - PM: Service complet

Park & Ride / Parc-o-bus

APPENDIX D

Traffic Count Data

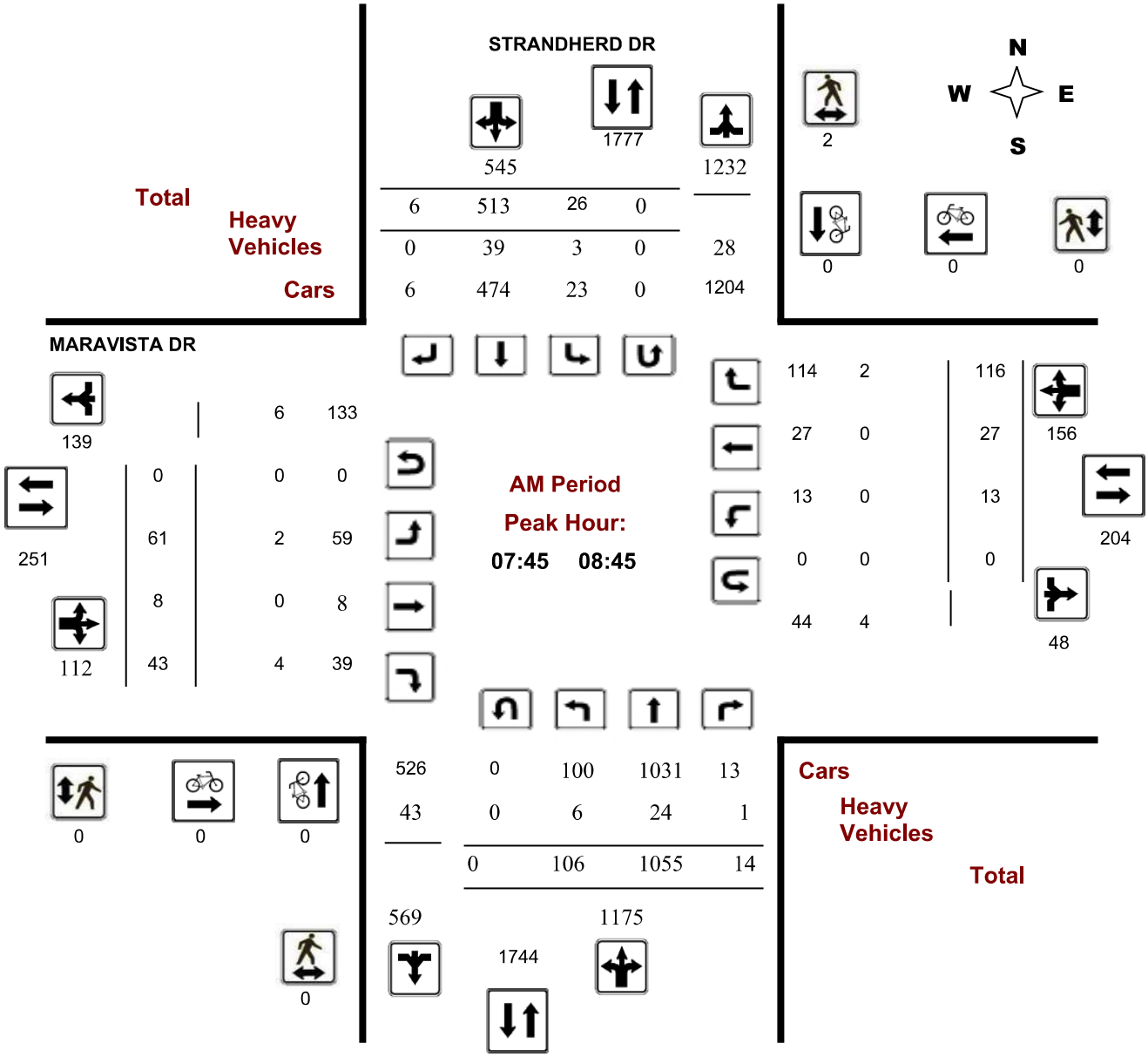
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

MARAVISTA DR @ STRANDHERD DR

Survey Date: Thursday, January 18, 2018 **WO No:** 37426

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



Comments

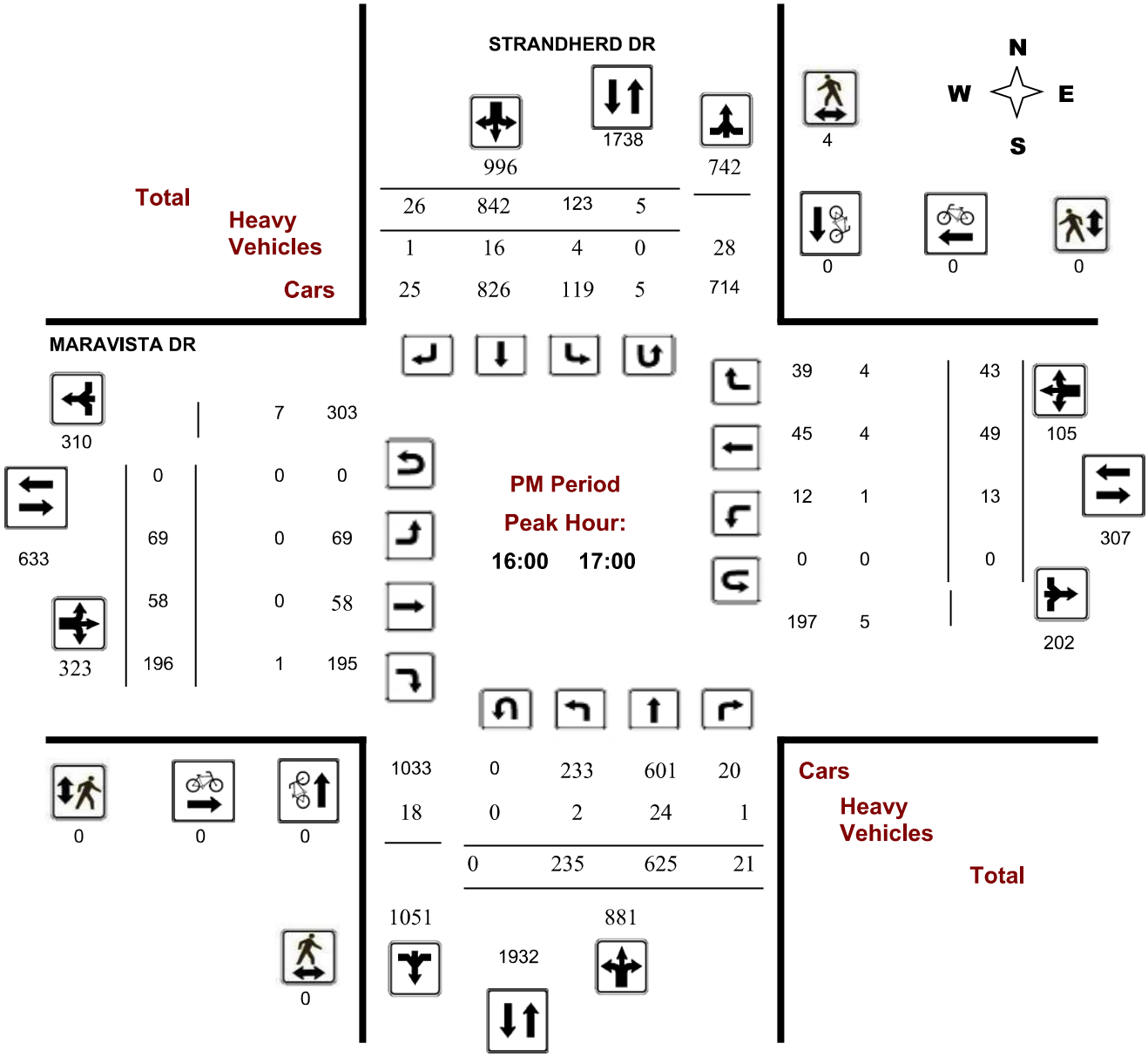
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

MARAVISTA DR @ STRANDHERD DR

Survey Date: Thursday, January 18, 2018 **WO No:** 37426

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



Comments

Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

MARAVISTA DR @ STRANDHERD DR

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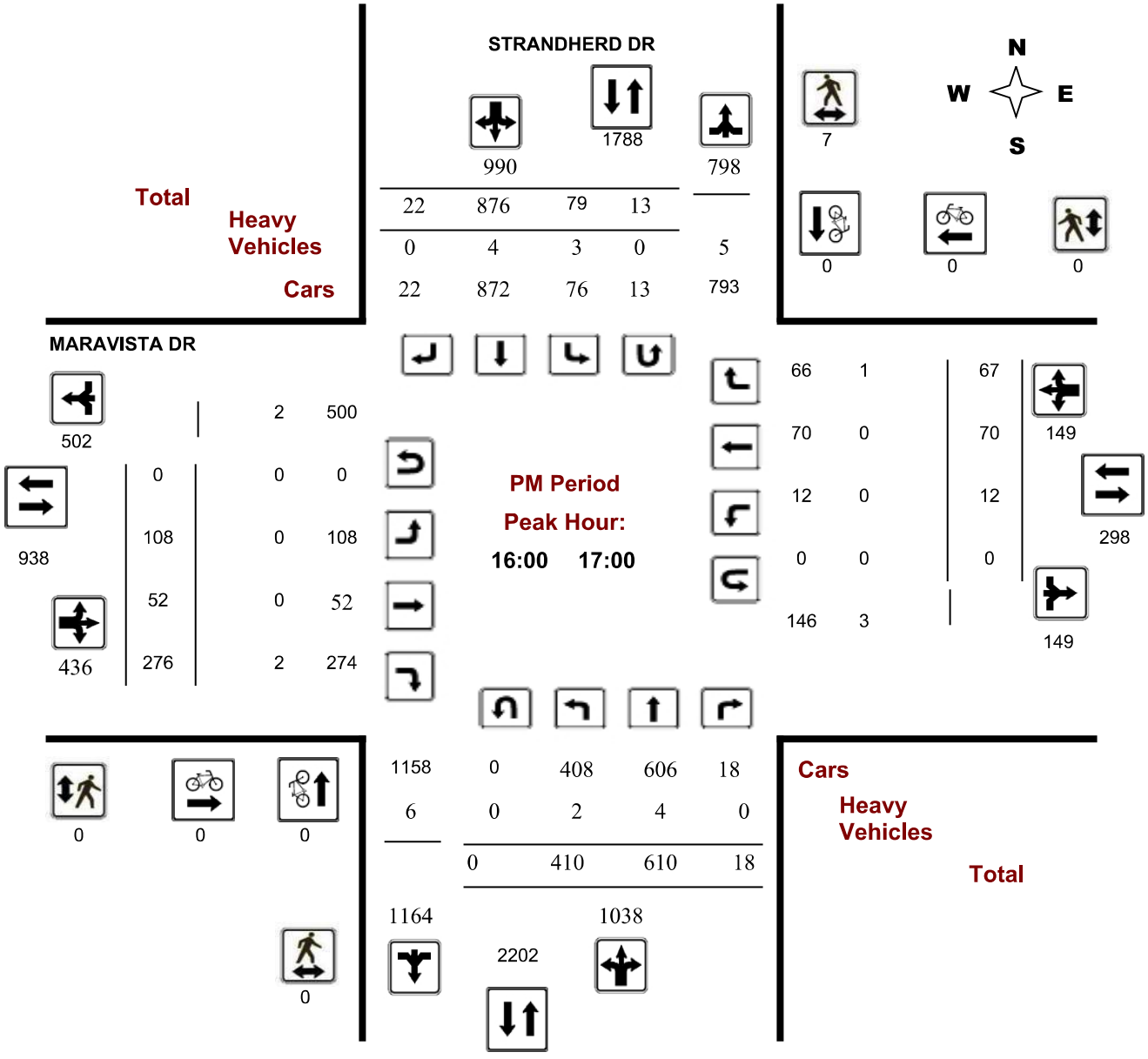
Start Time: 07:00 **Device:** Miovision



Comments

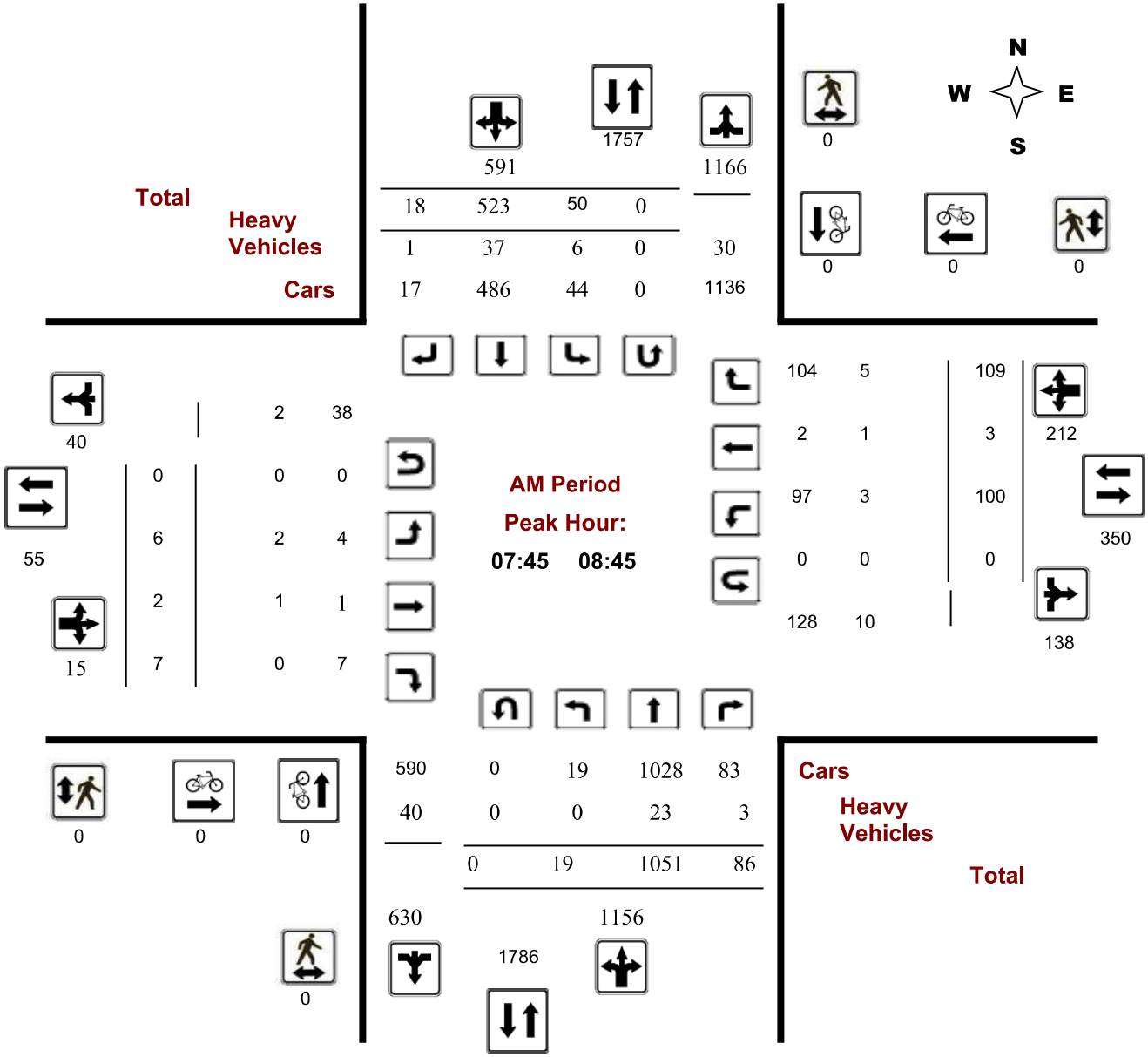
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

STRANDHERD @ KENNEVALE DR

Survey Date: Thursday, January 18, 2018 **WO No:** 37427

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



Comments

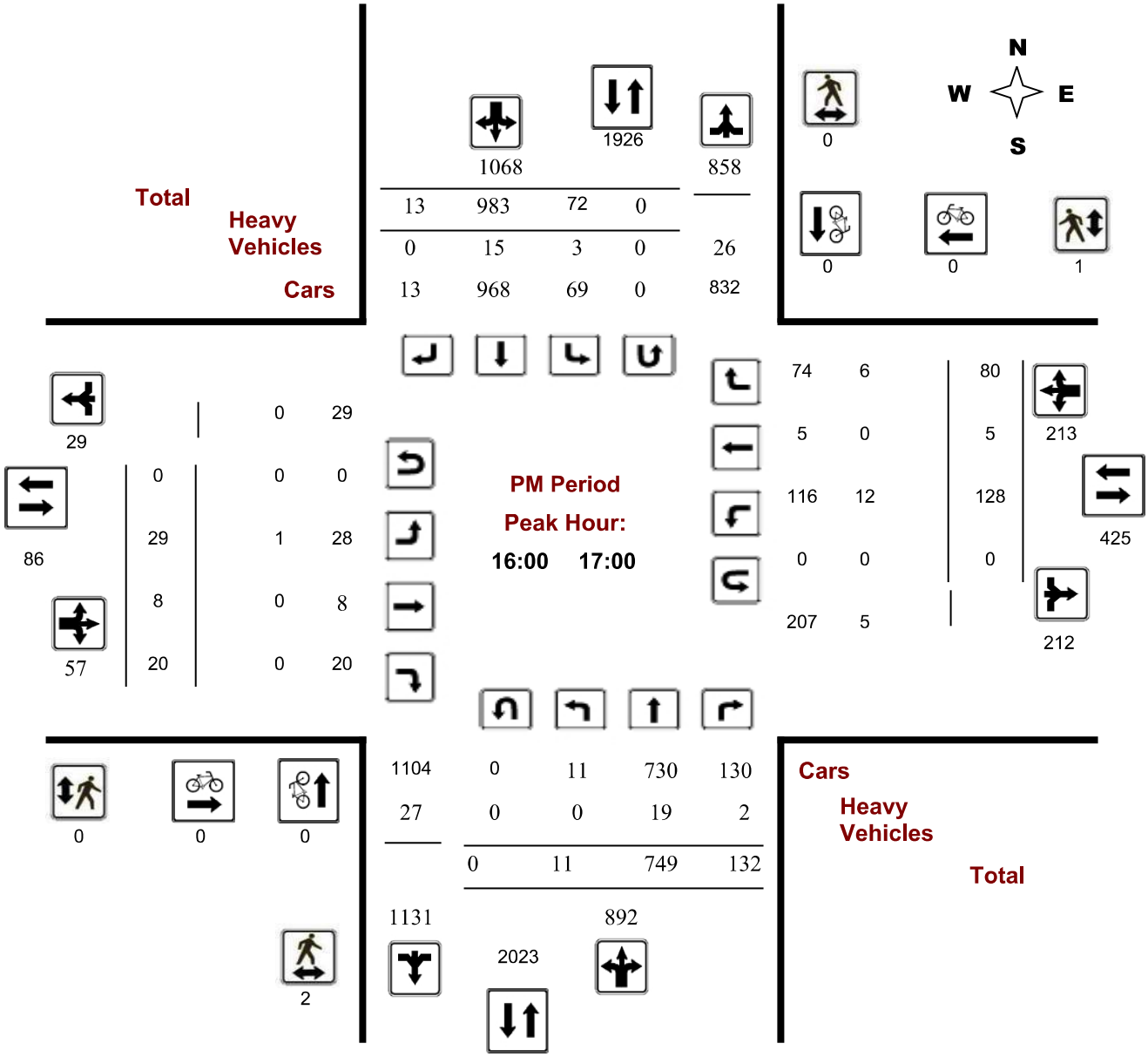
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

STRANDHERD @ KENNEVALE DR

Survey Date: Thursday, January 18, 2018 **WO No:** 37427

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



Comments

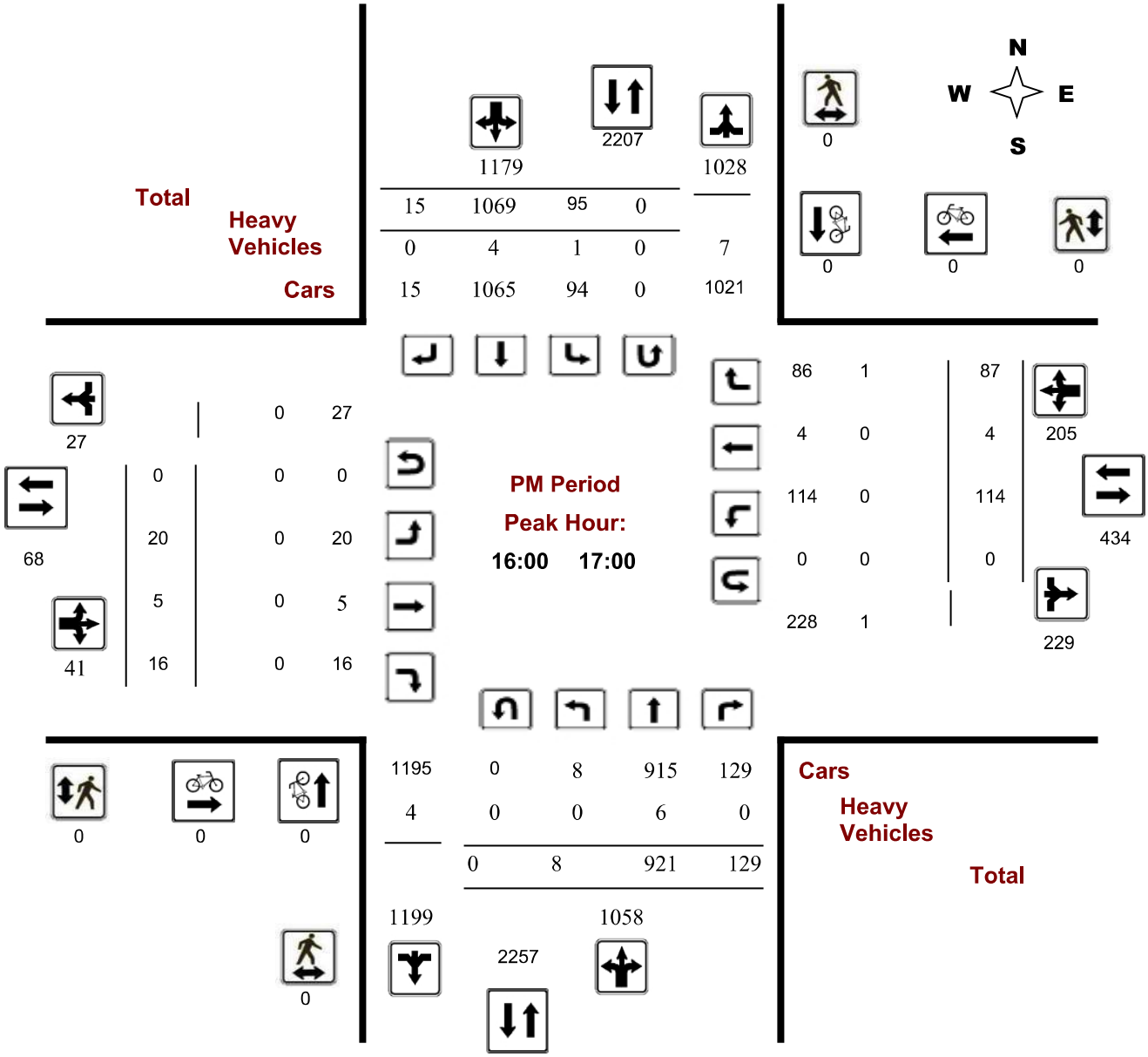
Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

STRANDHERD @ KENNEVALE DR

Survey Date: Saturday, January 20, 2018 **WO No:** 37464

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

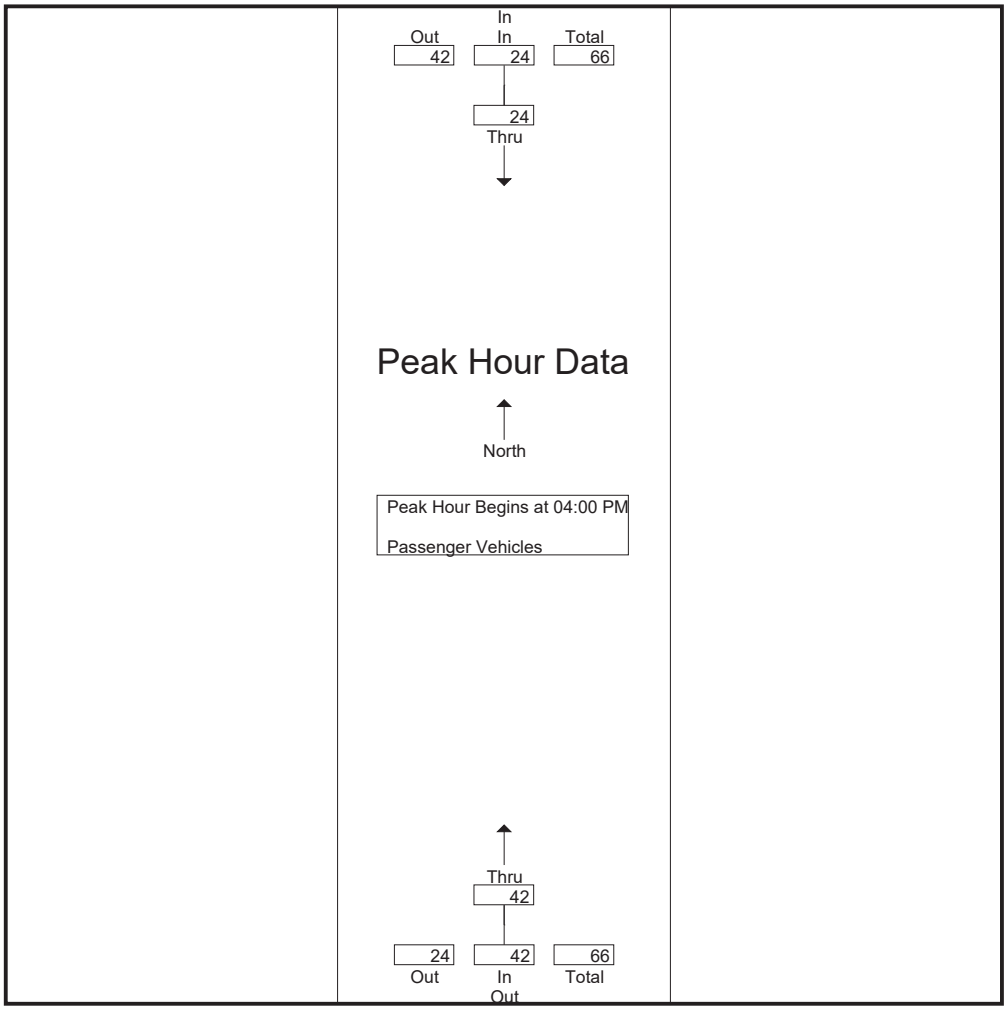


Comments

NOVATECH
Engineers, Planners & Landscape Architects

File Name : 117074 - myers bells corners wkdy count
Site Code : 117074__
Start Date : 17/05/2017
Page No : 4

	In Southbound		Out Northbound		
Start Time	Thru	App. Total	Thru	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1					
Peak Hour for Entire Intersection Begins at 04:00 PM					
04:00 PM	6	6	8	8	14
04:15 PM	4	4	11	11	15
04:30 PM	6	6	11	11	17
04:45 PM	**8**	**8**	**12**	**12**	**20**
Total Volume	24	24	42	42	66
% App. Total	100		100		
PHF	.750	.750	.875	.875	.825



NOVATECH
Engineers, Planners & Landscape Architects

Weather: Sunny
Serial Number: N/A
Collected By: Harry Fang
Notes: Myers Hyundai (Bells Corners)

File Name : 117074 - Myers Bells Corners SAT count
Site Code : 117074__
Start Date : 27/05/2017
Page No : 1

Groups Printed- Class 1

	IN Southbound		OUT Northbound		
Start Time	Thru	App. Total	Thru	App. Total	Int. Total
11:00 AM	4	4	6	6	10
11:15 AM	5	5	1	1	6
11:30 AM	0	0	4	4	4
11:45 AM	3	3	4	4	7
Total	12	12	15	15	27
12:00 PM	1	1	4	4	5
12:15 PM	4	4	6	6	10
12:30 PM	4	4	7	7	11
12:45 PM	7	7	3	3	10
Total	16	16	20	20	36
01:00 PM	3	3	4	4	7
01:15 PM	6	6	5	5	11
01:30 PM	7	7	1	1	8
01:45 PM	5	5	8	8	13
Total	21	21	18	18	39
02:00 PM	8	8	5	5	13
02:15 PM	9	9	6	6	15
02:30 PM	0	0	5	5	5
02:45 PM	4	4	9	9	13
Total	21	21	25	25	46
03:00 PM	4	4	7	7	11
03:15 PM	2	2	7	7	9
03:30 PM	3	3	6	6	9
03:45 PM	2	2	4	4	6
Total	11	11	24	24	35
Grand Total	81	81	102	102	183
Apprch %	100		100		
Total %	44.3	44.3	55.7	55.7	

APPENDIX E

Collision Records

City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2014 **To:** December 31, 2018

Location: KENNEVALE DR @ STRANDHERD DR

Traffic Control: Traffic signal

Total Collisions: 36

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-04, Sat,13:21	Clear	SMV other	Non-fatal injury	Wet	West	Turning left	Automobile, station wagon	Pole (utility, power)	
2014-Mar-17, Mon,18:08	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	
2014-Mar-17, Mon,22:03	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Unknown	Unknown	Other motor vehicle	
2014-Jun-12, Thu,08:30	Rain	Rear end	Non-fatal injury	Wet	West	Slowing or stopping	Pick-up truck	Other motor vehicle	
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2014-Jun-23, Mon,17:05	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Passenger van	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2014-Jul-18, Fri,13:13	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	

					South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2014-Aug-21, Thu,17:41	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Passenger van	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2014-Oct-01, Wed,18:33	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2014-Oct-01, Wed,10:29	Clear	Other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Debris falling off vehicle
					South	Going ahead	Unknown	Other
2015-Aug-23, Sun,10:17	Clear	Turning movement	Non-fatal injury	Dry	North	Turning left	Passenger van	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2015-Aug-24, Mon,17:45	Clear	Angle	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-10, Tue,15:58	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle

2015-Nov-06, Fri,18:31	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Stopped	Passenger van	Other motor vehicle
2016-Jan-30, Sat,10:18	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2016-Jan-17, Sun,15:45	Snow	Turning movement	P.D. only	Loose snow	South	Turning left	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Dec-08, Tue,07:35	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Passenger van	Other motor vehicle
					North	Slowing or stopping	Pick-up truck	Other motor vehicle
2016-Apr-08, Fri,15:40	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Nov-09, Wed,18:03	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2017-Oct-07, Sat,16:48	Clear	Turning movement	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle

					North	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jun-19, Mon,06:53	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Delivery van	Other motor vehicle
2017-Jan-28, Sat,15:55	Clear	Rear end	P.D. only	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					North	Stopped	Passenger van	Other motor vehicle
2017-Jan-30, Mon,08:30	Clear	Rear end	P.D. only	Ice	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2017-Apr-27, Thu,08:50	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2017-May-01, Mon,22:33	Clear	Other	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Pole (sign, parking meter)
					South	Stopped	Pick-up truck	Other motor vehicle
2017-May-02, Tue,16:00	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2017-Jun-08, Thu,17:15	Clear	Turning movement	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle

					South	Turning left	Automobile, station wagon	Other motor vehicle
2017-May-27, Sat,17:52	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2017-Oct-28, Sat,18:35	Rain	Angle	P.D. only	Wet	West	Turning right	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Jan-15, Mon,03:35	Clear	SMV other	P.D. only	Slush	North	Going ahead	Automobile, station wagon	Skidding/sliding
2018-Mar-17, Sat,13:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Turning right	Automobile, station wagon	Other motor vehicle
2018-Apr-02, Mon,12:57	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2018-Dec-03, Mon,07:20	Rain	Rear end	P.D. only	Wet	West	Going ahead	Truck-other	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2018-Dec-17, Mon,15:00	Snow	Turning movement	P.D. only	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle

2018-Dec-19, Wed,16:00	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-07, Sun,13:53	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Oct-09, Tue,16:15	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: MARAVISTA DR @ STRANDHERD DR

Traffic Control: Traffic signal **Total Collisions:** 18

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-17, Tue,07:23	Clear	Angle	P.D. only	Ice	West	Turning right	Pick-up truck	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-May-29, Fri,11:34	Clear	Angle	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Cyclist	
					West	Going ahead	Bicycle	Other motor vehicle	
2016-May-31, Tue,14:10	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	

2017-Oct-12, Thu,12:32	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					North	Making "U" turn	Automobile, station wagon	Other motor vehicle
2017-Mar-24, Fri,21:54	Freezing Rain	SMV other	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Skidding/sliding
2017-Mar-13, Mon,15:20	Clear	Rear end	P.D. only	Dry	East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jun-01, Thu,16:49	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2017-May-18, Thu,17:23	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jan-08, Mon,12:00	Snow	Rear end	Non-fatal injury	Loose snow	East	Unknown	Unknown	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jan-03, Wed,17:07	Clear	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle

2017-Nov-04, Sat,18:19	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2017-Sep-26, Tue,19:50	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jul-01, Sun,17:16	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Passenger van	Other motor vehicle
2018-Dec-10, Mon,19:00	Clear	Sideswipe	P.D. only	Dry	West	Overtaking	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Sep-04, Tue,09:40	Clear	Rear end	P.D. only	Dry	East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Dec-21, Fri,13:58	Rain	Rear end	P.D. only	Wet	North	Stopped	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Nov-16, Fri,16:00	Snow	SMV other	P.D. only	Loose snow	South	Going ahead	Automobile, station wagon	Skidding/sliding
2018-Dec-23, Sun,21:25	Clear	Rear end	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle

					East	Stopped	Automobile, station wagon	Other motor vehicle	

Location: MCKENNA CASEY DR @ STRANDHERD DR

Traffic Control: Stop sign **Total Collisions:** 5

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Jan-20, Tue,16:13	Clear	Rear end	P.D. only	Ice	East	Slowing or stopping	Automobile, station wagon	Skidding/sliding	
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2017-Dec-13, Wed,16:02	Snow	Rear end	P.D. only	Slush	West	Slowing or stopping	Truck - dump	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Dec-12, Tue,18:21	Snow	Turning movement	P.D. only	Loose snow	West	Turning left	Delivery van	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Jul-26, Wed,11:01	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-19, Wed,16:55	Clear	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	

Location: STRANDHERD DR @ CEDARVIEW RD/TARTAN DR

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

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped

2014-May-25, Sun,12:45	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Slowing or stopping	Pick-up truck	Other motor vehicle
2014-Jun-11, Wed,16:36	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2014-Jun-24, Tue,18:43	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Passenger van	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2014-Jul-15, Tue,09:52	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2014-Sep-21, Sun,12:15	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Passenger van	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2014-Dec-16, Tue,13:21	Clear	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2014-Nov-17, Mon,09:40	Snow	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Passenger van	Other motor vehicle
2015-May-02, Sat,18:09	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle

					West	Going ahead	Passenger van	Other motor vehicle
2014-Dec-18, Thu,19:06	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2014-Dec-16, Tue,15:00	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Slowing or stopping	Pick-up truck	Other motor vehicle
2015-Jun-28, Sun,13:23	Rain	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-Mar-31, Tue,19:09	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-May-25, Mon,16:50	Rain	Rear end	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2015-Sep-12, Sat,14:46	Rain	Rear end	P.D. only	Wet	West	Going ahead	Passenger van	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle

					West	Stopped	Automobile, station wagon	Other motor vehicle
2015-Jun-16, Tue,06:04	Rain	SMV other	Non-fatal injury	Wet	West	Slowing or stopping	Pick-up truck	Skidding/sliding
2015-Aug-20, Thu,18:20	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2015-Aug-13, Thu,10:00	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2016-Aug-04, Thu,13:20	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
2016-May-08, Sun,20:00	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2016-Aug-02, Tue,20:57	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Sep-19, Mon,22:30	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle

2016-Oct-16, Sun,11:45	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Oct-17, Mon,20:18	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Feb-06, Sat,17:26	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-12, Thu,11:26	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Going ahead	Pick-up truck	Other motor vehicle
2015-Oct-20, Tue,12:34	Clear	Angle	Non-fatal injury	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Dec-02, Wed,08:46	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2015-Dec-21, Mon,13:23	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Jan-15, Fri,12:02	Clear	Rear end	P.D. only	Wet	East	Unknown	Unknown	Other motor vehicle

					East	Stopped	Automobile, station wagon	Other motor vehicle
2017-Aug-12, Sat,19:16	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2017-Jan-21, Sat,15:01	Clear	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2016-Dec-02, Fri,13:33	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle
					South	Stopped	Pick-up truck	Other motor vehicle
2017-Jun-12, Mon,13:03	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Truck - tank	Other motor vehicle
					East	Slowing or stopping	Passenger van	Other motor vehicle
2017-Jul-21, Fri,09:22	Clear	Turning movement	Non-fatal injury	Dry	East	Turning left	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Nov-25, Sat,14:07	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle
2017-Dec-08, Fri,01:22	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

2018-Apr-07, Sat,17:29	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2018-Apr-02, Mon,18:22	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2018-Jul-05, Thu,11:00	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Jul-12, Thu,10:08	Clear	Sideswipe	P.D. only	Dry	North	Overtaking	Unknown	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2018-Oct-11, Thu,16:22	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Oct-17, Wed,07:45	Rain	Turning movement	P.D. only	Wet	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Automobile, station wagon	Other motor vehicle
2018-Oct-22, Mon,11:58	Clear	Turning movement	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle

2018-Dec-30, Sun,18:56	Clear	Rear end	P.D. only	Wet	North	Going ahead	Tow truck	Other motor vehicle	
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Dec-25, Tue,08:03	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Pole (utility, power)	

Location: STRANDHERD DR btwn CEDARVIEW RD & MCKENNA CASEY DR

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

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Dec-04, Thu,16:38	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2015-Feb-08, Sun,08:45	Snow	Approaching	Non-fatal injury	Loose snow	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Nov-26, Sat,14:39	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-Dec-22, Fri,16:50	Clear	Sideswipe	P.D. only	Dry	West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Aug-04, Sat,14:19	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Pick-up truck	Other motor vehicle	

					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: STRANDHERD DR btwn Continuation of STRANDHERD DR & MCKENNA CASEY DR

Traffic Control: Traffic gate **Total Collisions:** 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Apr-10, Thu,13:08	Clear	SMV other	P.D. only	Dry	East	Going ahead	Truck - dump	Other	
2014-May-15, Thu,08:28	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	
					North	Slowing or stopping	Pick-up truck	Other motor vehicle	
2014-Jul-23, Wed,08:03	Clear	Rear end	Non-fatal injury	Dry	North	Slowing or stopping	Delivery van	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Jul-21, Tue,14:48	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2016-Feb-22, Mon,18:14	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2017-May-21, Sun,12:34	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	

2018-Apr-17, Tue,15:16	Snow	Rear end	Non-fatal injury	Wet	North	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Aug-19, Sun,00:29	Clear	SMV other	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Ran off road	
2018-Nov-20, Tue,16:51	Clear	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	

Location: STRANDHERD DR btwn KENNEVALE DR & Continuation of STRANDHERD DR

Traffic Control: No control **Total Collisions:** 4

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-Feb-06, Fri,20:38	Drifting Snow	SMV other	P.D. only	Ice	South	Going ahead	Automobile, station wagon	Ran off road	
2015-Jul-10, Fri,12:13	Clear	Turning movement	P.D. only	Dry	East	Making "U" turn	Construction equipment	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	
2017-Mar-02, Thu,08:33	Snow	Rear end	Non-fatal injury	Loose snow	North	Slowing or stopping	Pick-up truck	Other motor vehicle	
					North	Stopped	Pick-up truck	Other motor vehicle	
2017-Nov-17, Fri,17:20	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	

Location: STRANDHERD DR btwn MARAVISTA DR & KENNEVALE DR

Traffic Control: No control

Total Collisions: 8

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2015-May-07, Thu,07:30	Clear	Sideswipe	P.D. only	Dry	South	Pulling away from shoulder or curb	Automobile, station wagon	Other motor vehicle	
					South	Going ahead	Pick-up truck	Other motor vehicle	
2015-Jul-10, Fri,18:10	Clear	Other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Debris falling off vehicle	
					East	Going ahead	Tow truck	Other	
2016-Mar-18, Fri,17:20	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2015-Nov-26, Thu,13:35	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	School bus	Other motor vehicle	
2016-May-11, Wed,17:38	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Aug-18, Fri,09:50	Rain	SMV other	P.D. only	Wet	North	Going ahead	Passenger van	Ran off road	
2017-Sep-28, Thu,18:07	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	

					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2018-Apr-11, Wed,14:59	Clear	Rear end	P.D. only	Dry	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle

APPENDIX F

Excerpts from Relevant Traffic Studies

Table 1: ITE Vehicle Trip Generation

Land Use	ITE Code	GFA (sqft.)	AM Peak (VPH)			PM Peak (VPH)		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Automobile Sales	841	26,060	38	13	50	27	41	68

3.4 Trip Distribution

The trip distribution has been based off of the *CitiGate Highway 416 Employment Lands Community Transportation Study (CTS)* which included the subject site.

The distribution of vehicular trips generated by the proposed development during the weekday AM and PM peak hours can be summarized as follows:

- 65% to/from the north via Strandherd Drive;
- 30% to/from the south via Strandherd Drive;
- 5% to/from the east via Kennevale Drive.

All site trips have been assigned to a single site access onto Dealership Drive as a worst-case scenario. The projected peak hour trips generated by the proposed development are shown in **Figure 4**.

The projected total traffic volumes are shown in **Figure 5**.

4.0 INTERSECTION ANALYSIS

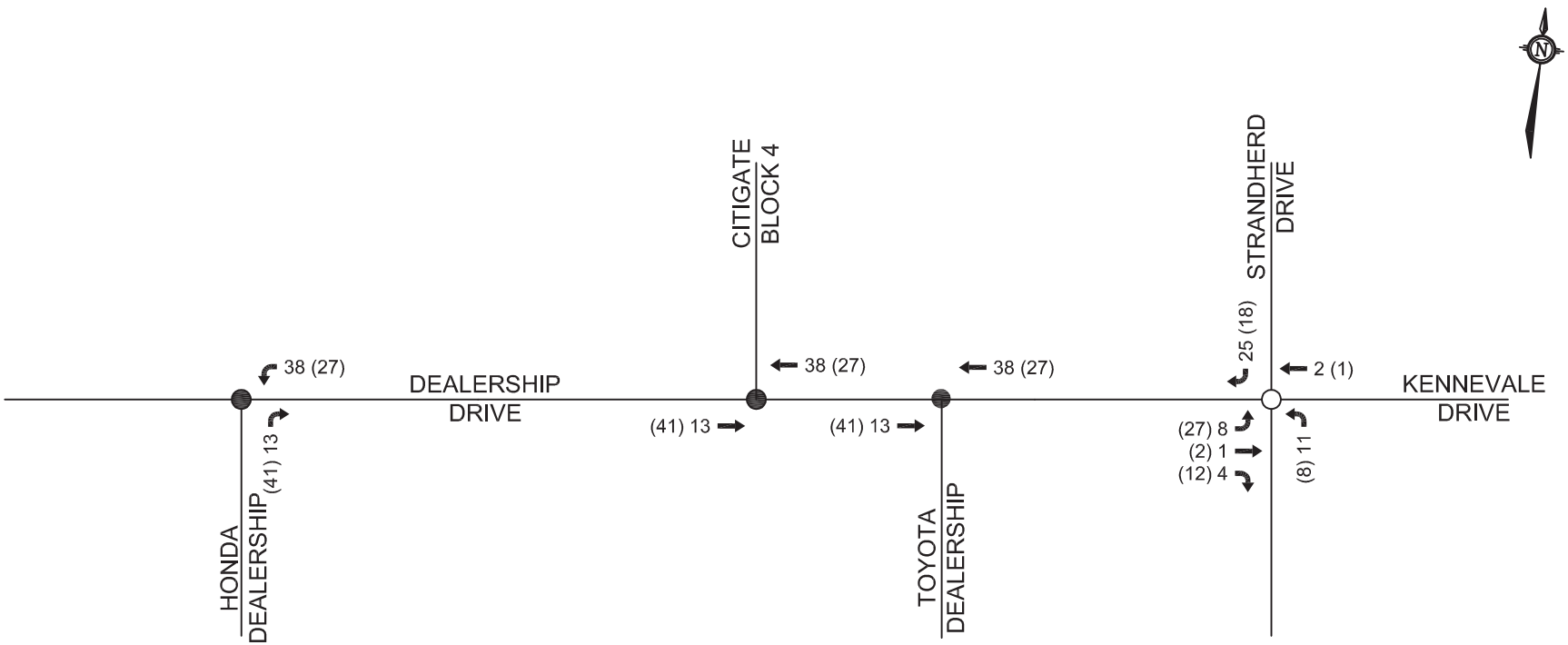
4.1 Existing Traffic

Intersection capacity analysis has been completed for the existing traffic condition during the weekday AM and PM peak hours. The analysis is based on the lane configurations designed as part of the on-going construction work along Strandherd Drive. The traffic signal timing data was optimized as the existing timing plan for the area reflects construction conditions. Pedestrian walk times and clearance intervals were based on the proposed interim design being constructed as part of the on-going Strandherd Drive widening and the ultimate timing plans identified as part of the *CitiGate Highway 416 Employment Lands Community Transportation Study (CTS).*

The results of the analysis are summarized in **Table 2** for the weekday AM and PM peak hours. Detailed reports are included in **Appendix C**. All movements currently operate at an acceptable LOS 'D' or better during both the AM and PM peak hours.

Table 2: Existing Peak Hour Intersection Operations

Intersection	AM Peak			PM Peak		
	Max v/c or Delay	LOS	Movement	Max v/c or Delay	LOS	Movement
Strandherd Drive & Kennevale Drive	0.68	B	NBT	0.89	D	SBT



NOVATECH
Engineers, Planners & Landscape Architects
Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario, Canada K2M 1P6

Telephone (613) 254-9643
Facsimile (613) 254-5867
Website www.novatech-eng.com

LEGEND

- Unsignalized Intersection
- Signalized Intersection

xx VPH AM Peak Hour
(xx) VPH PM Peak Hour

Barrhaven Honda Dealership

Peak Hour Site Trips

10/09/2015 115136 FIGURE 4

5.0 SITE GENERATED TRAFFIC

5.1 Traffic Generation

The proposed subject site development is expected to be the Myers Hyundai Barrhaven automobile dealership. The site is expected to consist of a 35 360 sq-ft two-storey structure.

Site traffic volumes generated by the proposed development were estimated using the *ITE Trip Generation Manual (9th Edition)*. The ITE Trip Generation Manual rates generally include a built-in 10% modal share, therefore this manual will be sufficient in estimating the proposed development's trip ends in this impact study.

The weekday a.m. and p.m. peak hour total automobile trips per hour for the subject site development are summarized in **Table 5.1.1**.

Table 5.1.1: Development Trip Generation

Period	GFA (1000sqft)	ITE Land Use	Equation	Total Trips	Inbound	Outbound
AM	35.36	841: Automobile Sales	T=0.92(X)	**33**	25	8
PM	35.36		T=1.91(X)+23.74	**92**	37	55

Traffic generated by the new development will consist of 'primary' trips. For 'primary' trips, the new development is the ultimate destination and their presence on the adjacent roadway is directly attributable to the new development. 'Pass-by' trips consist of traffic which is already present on the adjacent road network and access the site due to its convenient location. 'Pass-by' trips were not considered in the analysis as no 'Pass-by' trips are expected due to the nature of the development.

5.2 Traffic Distribution

To remain consistent with the other traffic studies completed in the area the trip distribution from the Novatech 2012 study was applied to the Myers Hyundai Barrhaven Site.

The traffic patterns / percentages for the proposed development are shown in **Table 5.2.1**.

Table 5.2.1: Development Trip Distribution

To/From	Via	%
N	Strandherd N	10
S	Strandherd S	10
E	Kennevale	5
E	Strandherd N	30
E	Strandherd S	20
W	Strandherd N	25

Figure 7 below shows the development traffic volumes for the morning and afternoon peak hours.

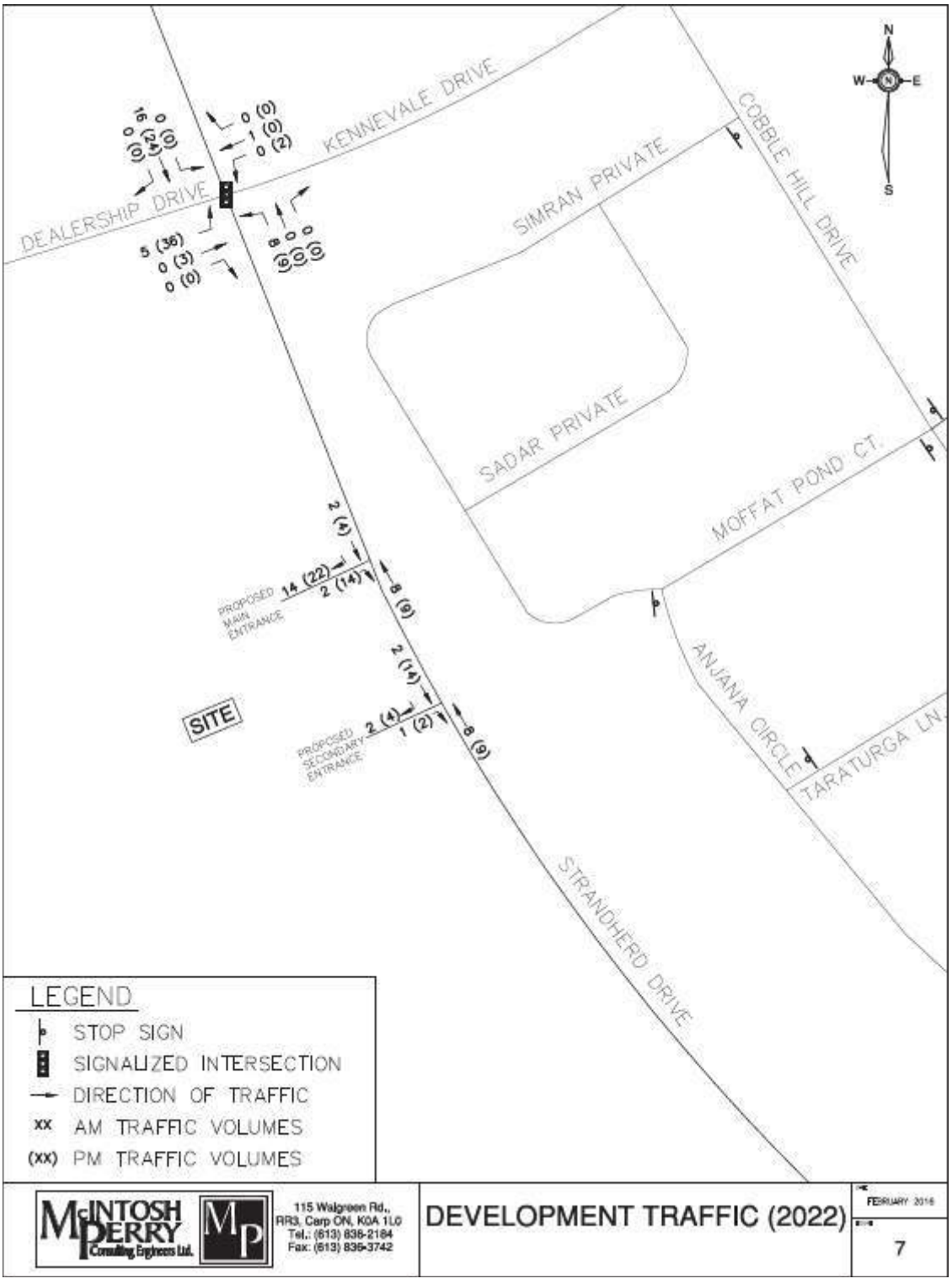


Figure 7: Site Generated Traffic Volumes

4. STUDY AREA

4.1. INTERSECTION ANALYSIS

The TIA will examine the intersections of at: Strandherd Drive at Andora Avenue, Strandherd Drive at Fraser Fields Way and Strandherd Drive at Borrisokane Road.

5. TIME PERIODS

The weekday morning and afternoon peak hours are considered the appropriate time periods for operational analysis for this subdivision.

6. HORIZON YEARS

For the purposes of the operational analysis it is assumed that the subject development will be fully built and occupied by 2020. This will necessitate the analysis of 2020 and 2025 horizons.

7. BACKGROUND GROWTH

For this TIA it is proposed that a 2% background growth rate be applied to account for background traffic growth beyond the Study Area. This is considered an appropriate background growth rate as there is a substantial amount of traffic growth being accounted for as part of the explicit traffic growth from nearby proposed developments including Citi-Gate, 4401 Fallowfield Road, and 4025 Strandherd Drive.

8. EXEMPTIONS REVIEW

The following exemptions are anticipated:

- 4.1.2 Circulation and Access – only required for site plans, this is a draft plan of subdivision
- 4.2 Parking – this is a draft plan of subdivision
- 4.6.1 it is not anticipated that traffic will utilize the adjacent road network of the subdivision to the north of the proposed development.

9. DEVELOPMENT-GENERATED TRAVEL DEMAND

9.1. TRIP GENERATION

9.1.1. TRIP GENERATION RATES

Appropriate trip generation rates for the proposed development were obtained from the TRANS Trip Generation Study and have been summarized in Table 3.

Table 3: TRANS Trip Generation Study Vehicle Trip Generation Rates

Land Use	Data Source	Vehicle Trip Rates	
		AM Peak	PM Peak
Single – Detached	LUC 210	0.70	0.90
Townhouses	LUC 224	0.54	0.71
Reference : TRANS Trip Generation Residential Trip Rates – Table 6.3			

The above trip generation rates are used estimate the number of vehicles trips. To understand the number of person trips it is necessary to convert the above vehicle trip rates to person trip rates.

The following base mode shares for suburban areas were obtained from the TRANS Trip Generation Study and have been summarized in Table 4.

Table 4: TRANS Trip Generation Report Mode Shares - Suburban

Land Use	Data Source	Peak Hour	Suburban Mode Shares		
			Vehicle Trips	Transit Share	Non-Motorized
Single – Detached	LUC 210	AM	55%	25%	9%
		PM	64%	19%	6%
Townhouses	LUC 224	AM	55%	27%	8%
		PM	61%	22%	6%
Reference : TRANS Trip Generation Residential Trip Rates – Table 3.13					

Using the above vehicle mode share percentages person trip generation rates were developed by taking the vehicle trip rates in Table 3 and divided them by the vehicle mode share percent in Table 4. The person trip generation rates are documented in Table 5.

Table 5: TRANS Trip Generation Report Person Trip Generation Rates

Land Use	Data Source	Vehicle Trip Rates	
		AM Peak	PM Peak
Single – Detached	LUC 210	1.27	1.41
Townhouses	LUC 224	0.98	1.16

To determine the trip generation characteristics of the proposed development the rates presented in Table 5 were used with the proposed unit counts to determine the person trip generation. Table 6 summarizes the AM and PM peak hour person trips by land use.

Table 6: Modified Person Trip Generation Rates

Land Use	Units	AM Peak (Person Trips/h)			PM Peak (Person Trips/h)		
		In	Out	Total	In	Out	Total
Single – Detached	125	46	113	159	109	67	176
Townhouses	75	27	47	74	46	41	87
Total Person Trips		**73**	**160**	**233**	**155**	**108**	**263**

9.1.2. MODE SHARES

While the TRANS Trip Generation Study presents mode shares for aggregate areas (i.e. Suburban, Urban Area, Core Area, etc.) these are broad areas. To further refine the mode share the TRANS O-D Survey has been reviewed. The mode share targets for the development have been summarized in Table 7 below.

Table 7: Mode Share Targets for the Development

Travel Mode	Mode Share Target
Auto Driver	55%
Auto Passenger	15%
Transit	15%
Walking	7.5%
Cycling	7.5%

The modes shares presented in Table 7 have been estimated using the 2011 OD Survey Data for the South Nepean traffic zone. As this is a proposed residential subdivision, in an established suburban area, the mode share is not anticipated change greatly during the study horizons. While a Bus Rapid Transit facility is proposed along the Future Chapman Mills Drive Extension, it is assumed that this development could be fully built-out prior to the completion of that transit facility. Therefore, the existing mode shares have been carried forward as the Mode Share Targets for the purposes of this analysis.

Using the mode share and total person trips, both documented above, the person trips by mode were estimated. The person trips shown in Table 6 for the proposed site were reduced by modal share values above, with the total site-generated traffic summarized in Table 8.

Table 8: Total Site Trip Generation

Travel Mode	Mode Share	AM Peak (Person Trips/hr)			PM Peak (Person Trips/hr)		
		In	Out	Total	In	Out	Total
Auto Driver	55%	41	88	129	86	60	146
Auto Passenger	15%	11	24	35	23	16	39
Transit	15%	11	24	35	23	16	39
Non-motorized	15%	10	24	34	23	16	39
Total Person Trips	100%	73	160	233	155	108	263

As shown in Table 8, the resulting number of potential 'new' two-way vehicle trips for the proposed development is approximately 129 and 146 veh/h during the weekday morning and afternoon peak hours, respectively.

9.2. TRIP DISTRIBUTION

The vehicle traffic distribution was developed using the 2011 NCR Household Origin – Destination Survey. The resultant distribution is outlined in Table 9.

Table 9: Traffic Distribution

To/From	AM Peak Hour
North	80%
South	5%
East	5%
West	10%
Total	**100%**

9.3. TRIP ASSIGNMENT

New site generated trips were assigned to the Study Area intersections using the above distribution, turning movement splits, proximity / connectivity to major transportation infrastructure (i.e. Highway 417), and the proposed access configuration. Figure 8 below displays the percentage assignment and Figure 9 shows the resulting volume assignment of the new site generated trip used in this analysis.

Figure 8: Percent Assignment

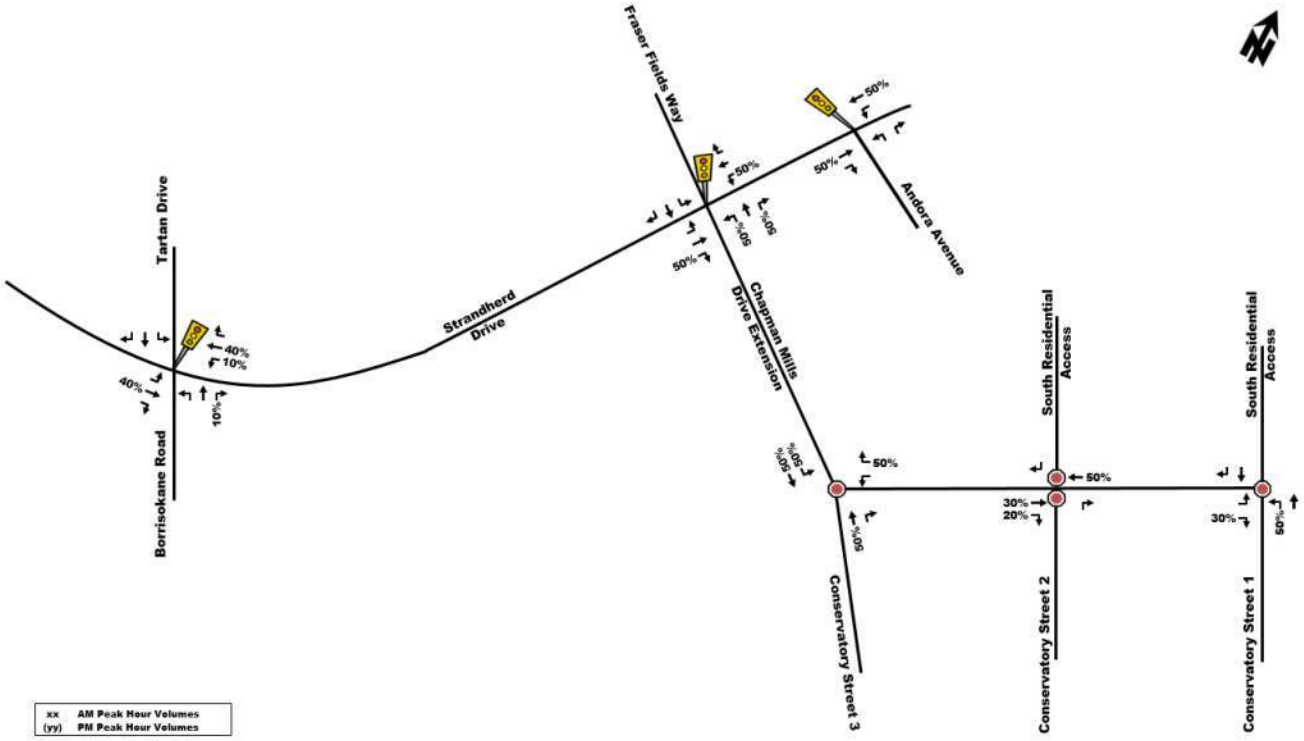
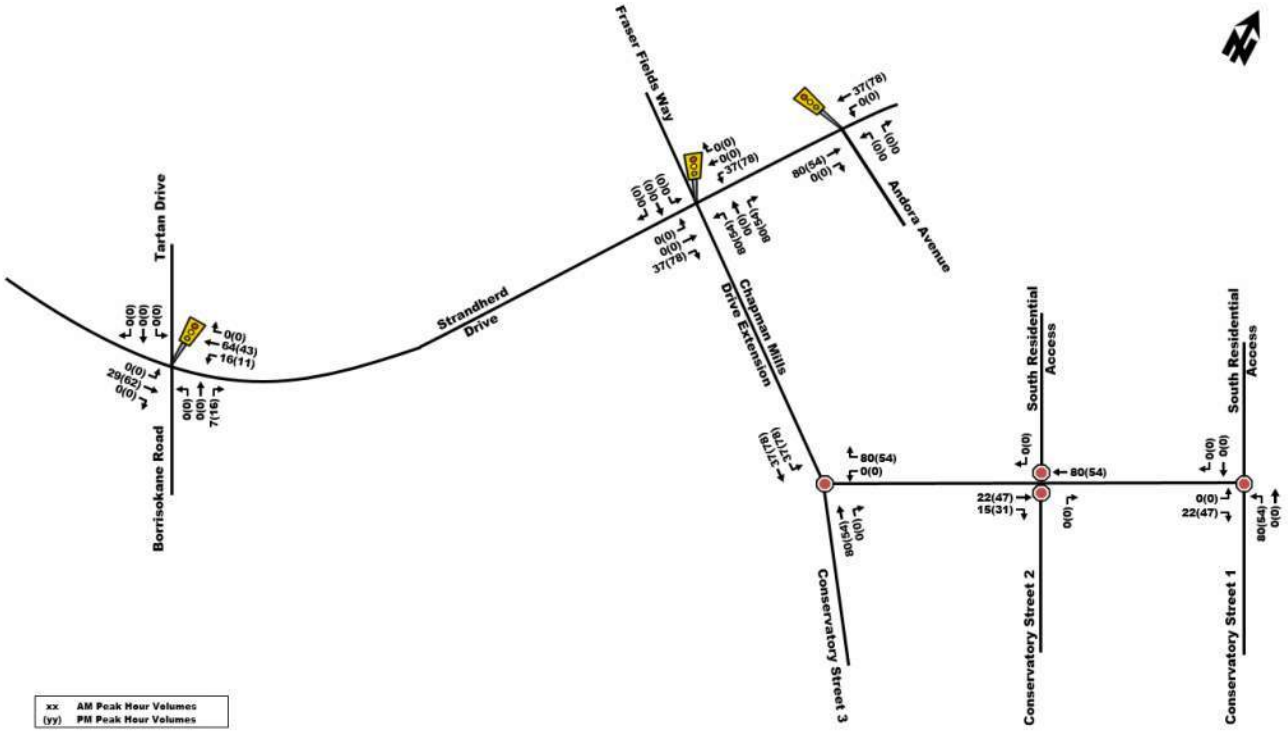


Figure 9: Site Generated Trip Volumes



10. BACKGROUND NETWORK TRAFFIC

10.1. CHANGES TO THE BACKGROUND TRANSPORTATION NETWORK

Please see Section 3.1.

10.2. OTHER AREA DEVELOPMENTS

The City of Ottawa's Development Applications webtool has been used to determine if there are proposed developments within the area of influence of the proposed development. These developments have been discussed in greater detail in Section 3.2. Figure 10, Figure 11, and Figure 12 document the traffic impact of each of the Citi-Gate Development, 4401 Fallowfield, and 4025 Strandherd Drive, on the subject development.

3.4 SITE TRAFFIC GENERATION

3.4.1 Land Use and Trip Generation Rates

The *Institute of Transportation Engineers (ITE) Trip Generation Manual (9th Edition)* was used to estimate traffic generated by the subject site. The ITE land use codes 210 – Single Family Homes, 230 – Condo / Townhomes, and 520 – Elementary School were thought to be most representative of the proposed land uses.

As the school board has an option on the school block for seven years, there are no concepts or drawings prepared for the school at this time. In order to assess the trip generation of the proposed school, the size of the future school was estimated using a similar sized property for an elementary school in Barrhaven South. It was assumed that the proposed school will be approximately 30,000 square feet in size.

Table 3 summarizes the trip rates obtained from the *ITE Trip Generation Manual* and the ensuing sections describe the methodology used to convert these trips to person trips across all modes of transportation.

Table 3 Trips Generated by the Proposed Residential Development

ITE LAND USE			MORNING PEAK HOUR			AFTERNOON PEAK HOUR		
			In	Out	Total	In	Out	Total
Step 1: ITE Trip Generation Rates								
210 – Single Family Homes	Units	116	0.20	0.58	0.78	0.66	0.38	1.04
230 – Condo / Townhomes	Units	92	0.09	0.43	0.52	0.41	0.20	0.61
520 – Elementary School	1000's sq. ft.	30	2.91	2.29	5.20	0.54	0.67	1.21
Step 2: Conversion from Auto Trips to Person Trips								
210 – Single Family Homes	Trip Gen		23	68	91	76	44	120
	Transit Share	10%	2	7	9	8	4	12
	Auto Occupancy	1.1	2	7	9	8	4	12
	Total Person Trips		27	82	109	92	52	144
230 – Condo / Townhomes	Trip Gen		8	40	48	38	18	56
	Transit Share	10%	1	4	5	4	2	6
	Auto Occupancy	1.1	1	4	5	4	2	6
	Total Person Trips		10	48	58	46	22	68
520 – Elementary School	Trip Gen		88	69	157	16	20	36
	Transit Share	10%	9	7	16	2	2	4
	Auto Occupancy	1.1	9	7	16	2	2	4
	Total Person Trips		106	83	189	20	24	44

ITE LAND USE			MORNING PEAK HOUR			AFTERNOON PEAK HOUR		
			In	Out	Total	In	Out	Total
Step 3: Person Trips by Modal Share								
210 – Single Family Homes	Auto	90%	24	74	98	83	47	130
	Passenger / Active Modes	10%	3	8	11	9	5	14
230 – Condo / Townhomes	Auto	90%	9	43	52	41	20	61
	Passenger / Active Modes	10%	1	5	6	5	2	7
520 – Elementary School	Auto	90%	95	75	170	18	22	40
	Passenger / Active Modes	10%	11	8	19	2	2	4
Step 4: Internal Capture Trips								
210 – Single Family Homes	Auto Trips		24	74	98	83	47	130
	Internal Capture	0%	0	0	0	0	0	0
	Net New Auto Trips		24	74	98	83	47	130
230 – Condo / Townhomes	Auto Trips		9	43	52	41	20	61
	Internal Capture	0%	0	0	0	0	0	0
	Net New Auto Trips		9	43	52	41	20	61
520 – Elementary School	Auto Trips		95	75	170	18	22	40
	Internal Capture	70%	67	53	120	13	15	28
	Net New Auto Trips		28	22	50	5	7	12
Step 5: Net New Auto Trips								
Total Development	Auto Trips		128	192	320	142	89	231
	Internal Capture		67	53	120	13	15	28
	Net New Auto Trips		61	139	200	129	74	203

3.4.2 Conversion of ITE Rates to Person Trips

The notion of quantifying the volume of "person" trips expected to be generated by a given development is becoming a commonly accepted practice. It is aimed at quantifying the expected demands across the primary modes of transportation.

In order to convert ITE rates to person trips, the rates obtained from the ITE Trip Generation Manual were adjusted to account for the transit modal share and auto occupancy thought to be inherent within the ITE rates. An assumed transit share of 10% was thought to be inherent within the ITE rates and an auto occupancy rate of 1.1 persons per vehicle was also assumed to be inherent within the ITE rates.

Step 2 of **Table 3** outlines the conversion from auto trips to person trips.

3.4.3 Net New Site Trips

To reflect Barrhaven South travel characteristics, the person trips were assigned to the four primary modal shares (i.e. auto, passenger, transit, and active moves). Based on the lack of transit service and active modes facilities in the immediate study area, it was assumed that the auto modal share will be 90%, with the remaining 10% encompassing passenger, transit, and active modes. The proposed development is anticipated to generate 356 and 256 person trips during the AM and PM peak hours, respectively. In terms of vehicle trips, the proposed development is anticipated to generate 200 and 203 net new auto trips (two-way) during the AM and PM peak hours, respectively.

Step 3 of **Table 3** summarizes the expected person trips by modal share.

3.4.4 Internal Capture

When predicting trips that are associated with different land use types the interaction between those land use types must be accounted for by applying the principals of internal capture adjustments. Internal capture trips are trips which are shared between two or more uses within a given area. A portion of the generated trips for each individual land use is therefore drawn from the adjacent land uses. Internal capture adjustments were made to account for vehicles that visit more than one land use within the subject development. Since these trips are contained within the development area, accounting for each trip separately on the roadway network would result in "double-counting". For this reason, complementary land uses ultimately had their net new trips adjusted to reflect these synergies.

As the catchment area of the elementary school will largely consist of the subject development, the majority of the trips that the elementary school will generate will originate from the immediate area. For this reason, the elementary school was assumed to have an internal capture rate of 70%.

Step 4 of **Table 3** summarizes the internal capture trips for the subject development and Step 5 summarizes the net new auto trips.

3.4.5 Traffic Distribution and Assignment

The distribution of traffic to / from the study area was determined through examination of the TRANS Committee's 2011 Origin-Destination (O-D) Survey for the South Nepean District.

Table 4 provides a summary of the estimated distribution for the traffic generated by the proposed development.

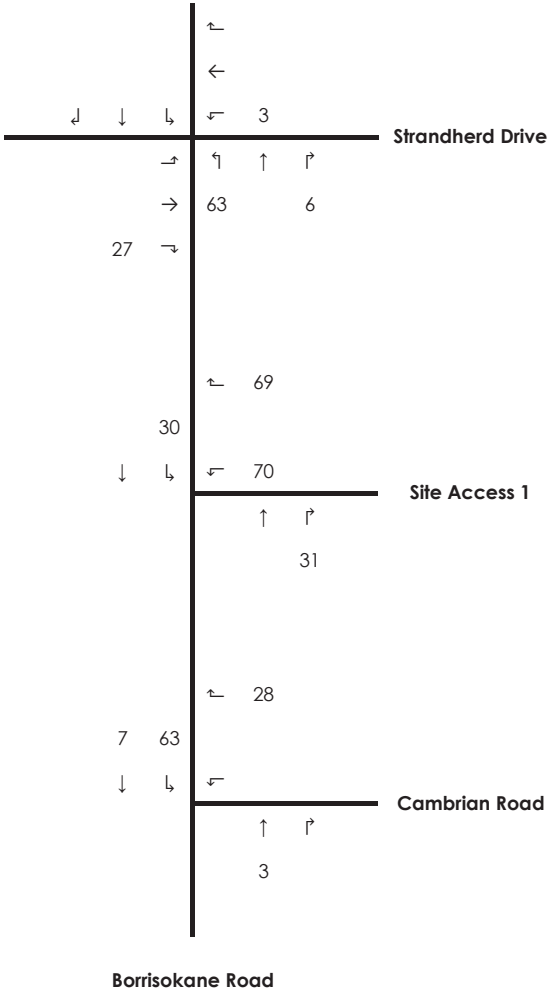
The anticipated site traffic generated by the proposed residential development was assigned to the boundary road network using a logical pattern of primary roads (i.e. along arterials and collectors) which can be seen in **Table 4** below.

Table 4 Traffic Distribution from the South Nepean District

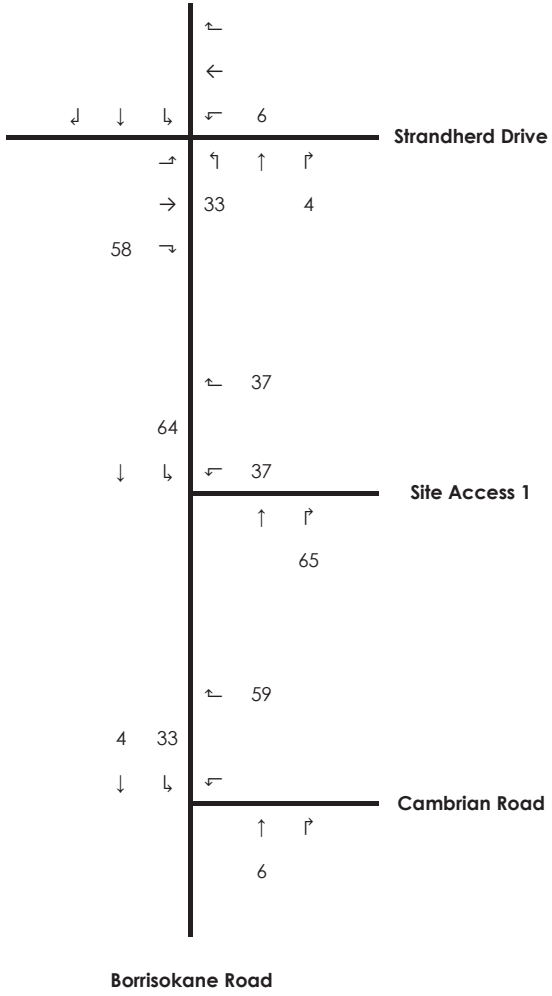
CARDINAL DIRECTION	VIA (TO / FROM)			
	% Distribution	Borrisokane North	Borrisokane South	Existing Greenbank North
North	25%	20%		5%
East	25%	12.5%		12.5%
South	5%		5%	
West	5%	5%		
Internal (South Nepean)	40%	12%		28%
Total	**100%**	**49.5%**	**5%**	**45.5%**

Figure 8 illustrates the assignment of total site traffic volumes to the boundary road network.

AM Peak Hour



PM Peak Hour



Stantec

Glenview

3387 Borrisokane Road

Figure 8: 3387 Borrisokane Road Site Traffic

3 DEMAND FORECASTING

3.1 Background Traffic Growth

To account for background traffic growth along Strandherd Drive, several planned developments have been considered. This includes volumes generated by the 4401 Fallowfield and the Citi-Gate developments. These volumes account for the majority of additional auto trips on Strandherd Drive. **Appendix D** contains excerpts from each report, detailing the site generated traffic for each proposed development.

This study assumes that the mode share will remain stable (a conservative estimate) as the City of Ottawa is targeting growth in transit ridership, particularly in neighbourhoods South of the Jock River. If there is to be a shift in mode share (i.e. increase in transit), then the number of vehicle trips would have to decrease to accomplish this goal. To account for this effect, the background growth rate in addition to the developments explicitly added to the network, is considered negligible in the following analysis.

A portion of the South Nepean Town Centre traffic demand was a third component of the background traffic model. It was estimated that 10% of the total traffic from the SNTC would be assigned to Chapman Mills Drive between Longfields Drive and Strandherd Drive. This was derived by examining the Chapman Mills EA Needs Assessment.

The implementation of the Chapman Mills Drive Extension will also impact existing traffic on Strandherd Drive. Existing traffic on Strandherd Drive was reassigned to estimate the impact of the diversion of traffic away from Strandherd Drive.

Figure 12 shows the projected Chapman Mills Drive Extension traffic volumes and the diverted traffic from Strandherd Drive onto Chapman Mills Drive

Figure 13 shows the future background traffic volumes for the 2025 horizon.

3.2 Site Trip Generation

The number of vehicle trips has been estimated, based on the proposed land uses, to project the impact of the proposed development on the surrounding road network.

Table 3 documents the proposed land uses, the ITE Land Use Codes, and the independent variables that are being proposed for the Clarke Development.

Table 3: Clarke Development Proposed Land Uses

Land Use	Data Source	Independent Variable
Single Family Homes (Stage 1)	ITE 210	146 Units
Townhouse / Condominium (Stage 1)	ITE 230	262 Units
Back to Back Townhouse (Stage 1)		12 Units
Condominium (Stage 1)		24 Units
Townhouse / Condominium (Stage 2)		132 Units
Single Family Homes (Stage 2)	ITE 210	25 Units
Elementary School (Stage 1)	ITE 520	585 Students
Shopping Centre (Local Commercial east of Chapman Mills) (Stage 1)	ITE 820	8,000 ft^2

The ITE Land Use Codes and independent variables described above were used to develop the baseline automobile trip generation. The baseline automobile trip generation is multiplied by 1.30 to estimate the number of peak hour person trips that could be generated by the proposed development. The 2011 NCR Household Origin – Destination Survey was reviewed to determine the mode share characteristics of the subject area, specifically, the South Nepean Area.

Table 4 documents the mode share based on O-D survey.

Table 4: South Nepean Existing Mode Share	
Travel Modes	**Mode Share**
Auto Driver	60%
Auto Passenger	15%
Transit	15%
Non-motorized	10%
Total Person Trips	100%

As described above, the gross total trip generation was derived based on the ITE Trip Generation Manual, 9th Edition, the proposed land uses, and the existing mode share.

Table 5 summarizes the total site trip generation.

Appendix E contains a detailed trip generation breakdown.

Table 5: Site Trip Generation						
Travel Mode	**AM Peak (veh/hr)**			**PM Peak (veh/hr)**		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Single Family Homes	24	72	96	77	47	124
Elementary School	113	93	206	33	36	69
Townhouse / Condominium	20	99	119	93	46	139
Shopping Centre	16	11	27	41	45	86
Townhouse / Condominium – Stage 2	9	42	51	39	20	59
Single Family Homes – Stage 2	6	18	24	17	10	27
Shopping Centre Pass-by (35%)	-5	-5	-10	-15	-15	-30
Total 'New' Auto Trips	**183**	**330**	**513**	**285**	**189**	**474**

3.3 Vehicle Traffic Distribution and Assignment

The vehicle traffic distribution and assignment was developed using The 2011 NCR Household Origin – Destination Survey, South Nepean section. The resultant distribution is outlined in **Table 6.**

Table 6: Traffic Distribution	
To/From	**Percentage**
North	80%
South	5%
East	5%
West	10%
Total	100%

The new site generated trips were assigned to the study area intersections using the above distributions, the existing turning movement patterns, and the proposed access locations. **Figure 10** and **Figure 11** document the site generated traffic of Stage 1 and Stage 2, respectively.

3.4 Projected Intersection Volumes

The background traffic volumes were combined with the site traffic volumes to determine the weekday AM and PM peak hour total traffic forecasts. The future total traffic volumes for the 2025 horizon years with Stage 1 and with both Stage 1 and Stage 2 are shown in **Figure 14** and **Figure 15**, respectively.

Table 3 Trips Generated by the Proposed Development

Step 1: ITE Trip Generation Rates									
Land Parcel	**Land Use Code**	**Units / GFA (1000's SF)**	**AM Peak Hour**			**PM Peak Hour**		
			Inbound	**Outbound**	**Rate**	**Inbound**	**Outbound**	**Rate**
Residential - Singles	210 - Single Detached Houses	552	25%	75%	0.72	63%	37%	0.89
Residential - Towns	230 - Residential Condo / Townhouse	464	17%	83%	0.38	67%	33%	0.46
Commercial	820 - Shopping Centre	35	62%	38%	2.36	48%	52%	8.50

Step 2: Conversion to Person Trips									
Land Parcel	**Land Use Code**			**AM Peak Hour**			**PM Peak Hour**		
				Inbound	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
Residential - Singles	210 - Single Detached Houses	Trip Gen		99	297	396	308	181	489
		Transit Share	10%	10	30	40	31	18	49
		Auto Occupancy	1.1	10	30	40	31	18	49
		Total Person Trips		119	357	476	370	217	587
Residential - Towns	230 - Residential Condo / Townhouse	Trip Gen		30	146	176	142	70	212
		Transit Share	10%	3	15	18	14	7	21
		Auto Occupancy	1.1	3	15	18	14	7	21
		Total Person Trips		36	176	212	170	84	254
Commercial	820 - Shopping Centre	Trip Gen		51	31	82	141	153	294
		Transit Share	10%	5	3	8	14	15	29
		Auto Occupancy	1.1	5	3	8	14	15	29
		Total Person Trips		61	37	98	169	183	352

Step 3: Modal Share Adjustments									
Land Parcel	**Land Use Code**			**AM Peak Hour**			**PM Peak Hour**		
				Inbound	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
Residential - Singles	210 - Single Detached Houses	Auto	60%	71	214	285	222	130	352
		Passenger	10%	12	36	48	37	22	59
		Transit	30%	36	107	143	111	65	176
		Walk / Bike	0%	0	0	0	0	0	0
Residential - Towns	230 - Residential Condo / Townhouse	Trip Gen	60%	21	105	126	102	50	152
		Transit Share	10%	4	18	22	17	8	25
		Auto Occupancy	30%	11	53	64	51	26	77
		Total Person Trips	0%	0	0	0	0	0	0
Commercial	820 - Shopping Centre	Auto	60%	37	22	59	101	110	211
		Passenger	10%	6	4	10	17	18	35
		Transit	30%	18	11	29	51	55	106
		Walk / Bike	0%	0	0	0	0	0	0

Step 4: Pass-By and Internal Capture									
Land Parcel	**Land Use Code**			**AM Peak Hour**			**PM Peak Hour**		
				Inbound	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
Residential - Singles	210 - Single Detached Houses	Auto Trips		71	214	285	222	130	352
		Pass-By	0	0	0	0	0	0	0
		Internal Capture	0	0	0	0	0	0	0
		Net New Auto Trips		71	214	285	222	130	352
Residential - Towns	230 - Residential Condo / Townhouse	Auto Trips		21	105	126	102	50	152
		Pass-By	0	0	0	0	0	0	0
		Internal Capture	0	0	0	0	0	0	0
		Net New Auto Trips		21	105	126	102	50	152
Commercial	820 - Shopping Centre	Auto Trips		37	22	59	101	110	211
		Pass-By	15	15	30	53	53	106	106
		Net New Auto Trips		22	7	30	48	57	106

Step 5: Net New Auto Trips							
Land Parcel	**Land Use Code**	**AM Peak Hour**			**PM Peak Hour**		
		Inbound	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
Residential		92	319	411	324	180	504
Commercial		22	7	30	48	57	106

3.3.2 Conversion of ITE Rates to Person Trips

The notion of quantifying the volume of "person" trips expected to be generated by a given development is becoming a commonly accepted practice. It is aimed at quantifying the expected demands across the primary modes of transportation.

In order to convert ITE rates to person trips, the rates obtained from the ITE Trip Generation Manual were adjusted to account for the transit modal share and auto occupancy thought to be inherent within the ITE rates. An assumed transit share of 10% was thought to be inherent within the ITE rates and an auto occupancy rate of 1.1 persons per vehicle was also assumed to be inherent within the ITE rates. The proposed development is anticipated to generate 786 and 1193 person trips during the AM and PM peak hours, respectively.

Step 2 of **Table 3** outlines the conversion from auto trips to person trips.

3.3.3 Modal Share Adjustments

To reflect local Ottawa travel characteristics, the person trips were assigned to the four primary modal shares (i.e. auto, passenger, transit, and active moves) according to the TRANS Committee's 2011 Origin-Destination (O-D) Survey for the South Nepean District. In terms of auto trips, the proposed development is anticipated to generate 470 and 715 auto trips (two-way) during the AM and PM peak hours, respectively.

Step 3 of **Table 3** summarizes the expected person trips by modal share.

3.3.4 Pass-By Trips

Pass-by trips are considered intermediate stops between an origin and a destination. They are site trips that are drawn from existing traffic volumes on the road network that are "passing-by" the site. While the total number of trips generated by a given development remains the same, the turning movements at study area intersections / site accesses require adjustments to reflect pass-by traffic. The rate of pass-by traffic is based on the specific land use, and in this case, a pass-by rate was applied to the commercial portion of the development. As outlined in the *ITE Trip Generation Manual*, the pass-by rate for a commercial development of approximately 35,000 ft^2 is 50%.

Following the application of the pass-by rates, the proposed development is expected to generate approximately 441 and 610 net new auto trips (two-way) during the AM and PM peak hours, respectively.

Step 4 of **Table 3** summarizes the expected pass-by trips.

Figure 7 illustrates the site trips the proposed development is anticipated to generate prior to accounting for pass-by trips.

Figure 8 illustrates the pass-by trips the proposed development is anticipated to generate.

3.3.5 Traffic Distribution and Assignment

The distribution of traffic to / from the study area was determined through examination of the TRANS Committee's *2011 Origin-Destination (O-D) Survey* for the South Nepean District.

Table 4 and **Table 5** provide a summary of the estimated distribution for the traffic generated by the proposed development.

The anticipated site traffic generated by the proposed development was assigned to the boundary road network using a logical pattern of primary roads (i.e. along arterials and collectors) and in consideration of the future road network (i.e. the future Realigned Greenbank Road) which can be seen in both tables below.

Table 4 Residential Traffic Distribution from the South Nepean District

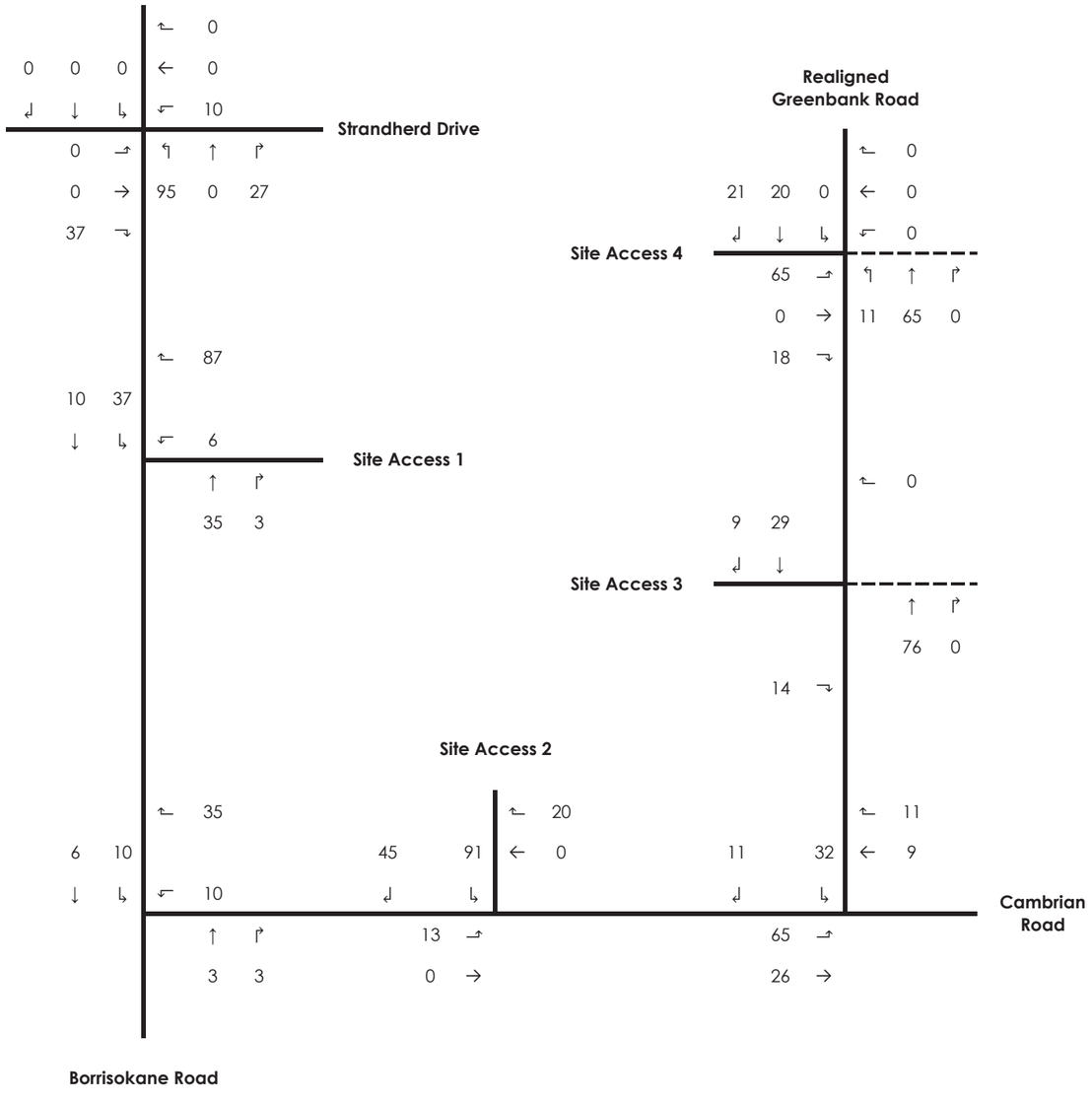
Cardinal Direction	Via (to / from)				
	% Distribution	Borrisokane North	Borrisokane South	Cambrian Road East	Realigned Greenbank North
North	25%	10%			15%
East	25%	12.5%		7.5%	5%
South	5%		5%		
West	5%	4.5%			0.5%
Internal (South Nepean)	40%	10%		10%	20%
Total	100%	37%	5%	17.5%	40.5%

Table 5 Commercial Traffic Distribution from the South Nepean District

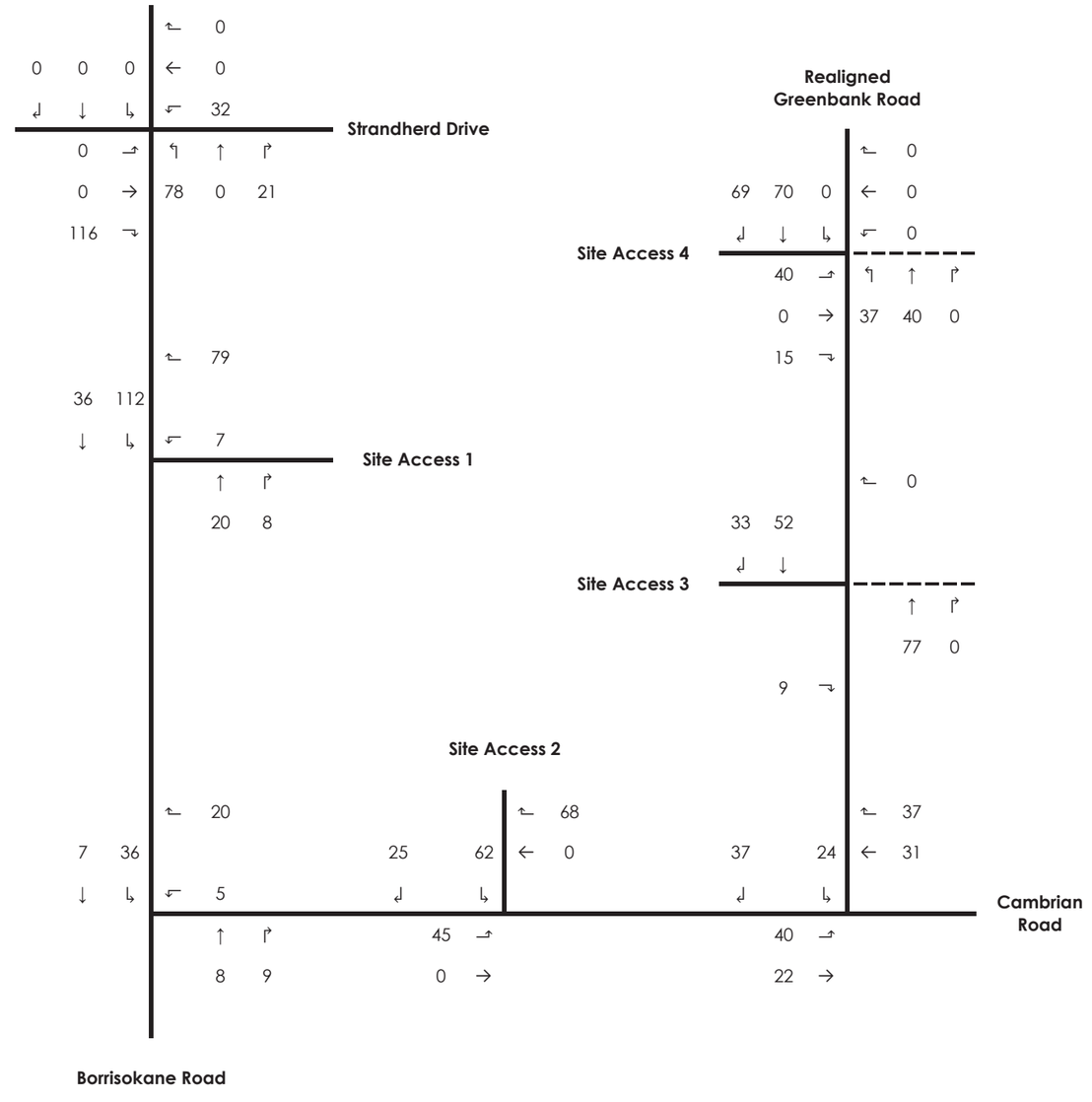
Cardinal Direction	Via (to / from)				
	% Distribution	Borrisokane North	Borrisokane South	Cambrian Road East	Realigned Greenbank North
North	25%	22.5%			2.5%
East	25%	12.5%		7.5%	5%
South	5%		5%		
West	5%	5%			
Internal (South Nepean)	40%	16%		16%	8%
Total	100%	56%	5%	23.5%	15.5%

Figure 9 illustrates the net new site traffic volumes for the proposed development.

AM Peak Hour



PM Peak Hour



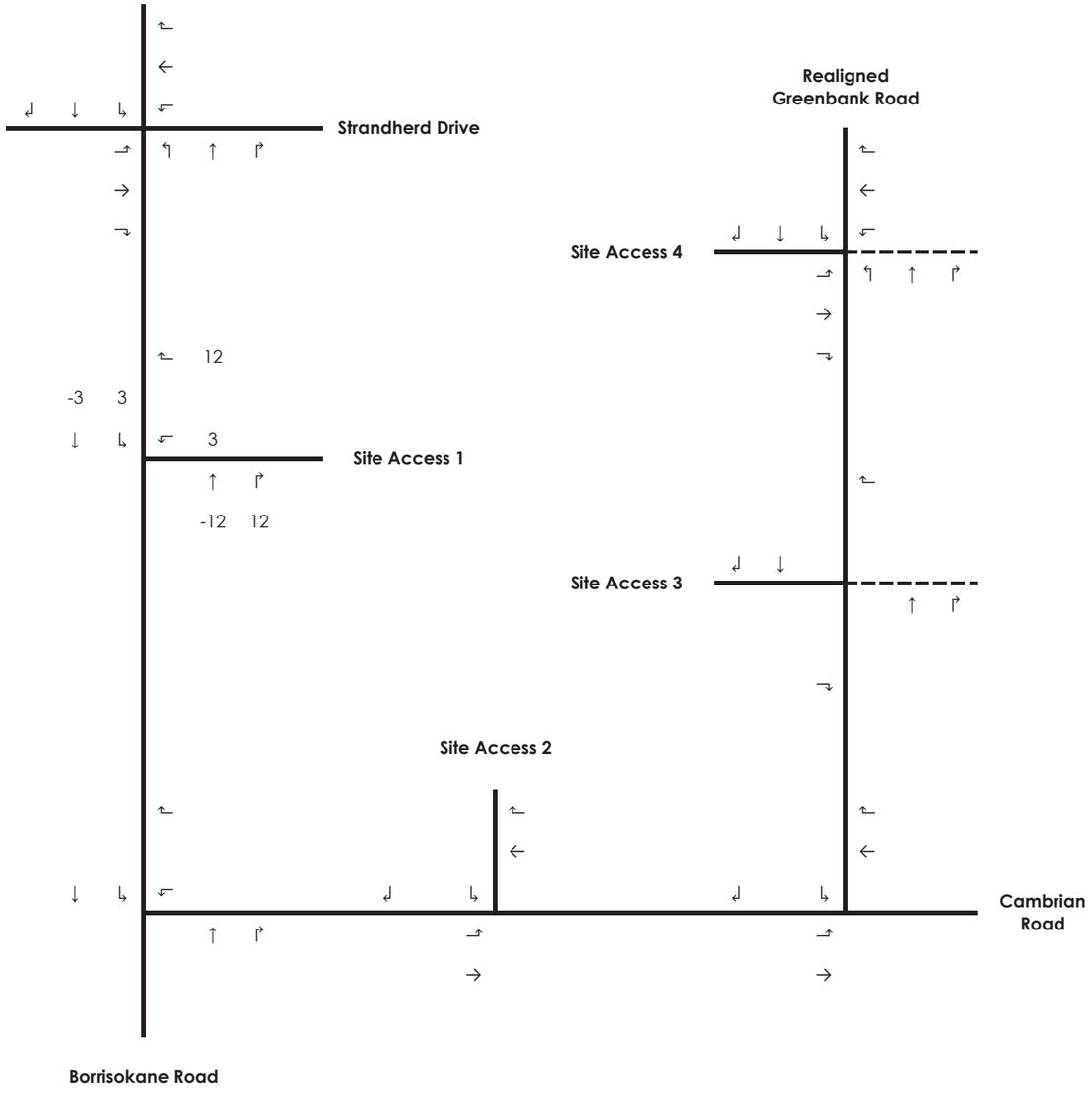
Stantec

Mattamy Homes

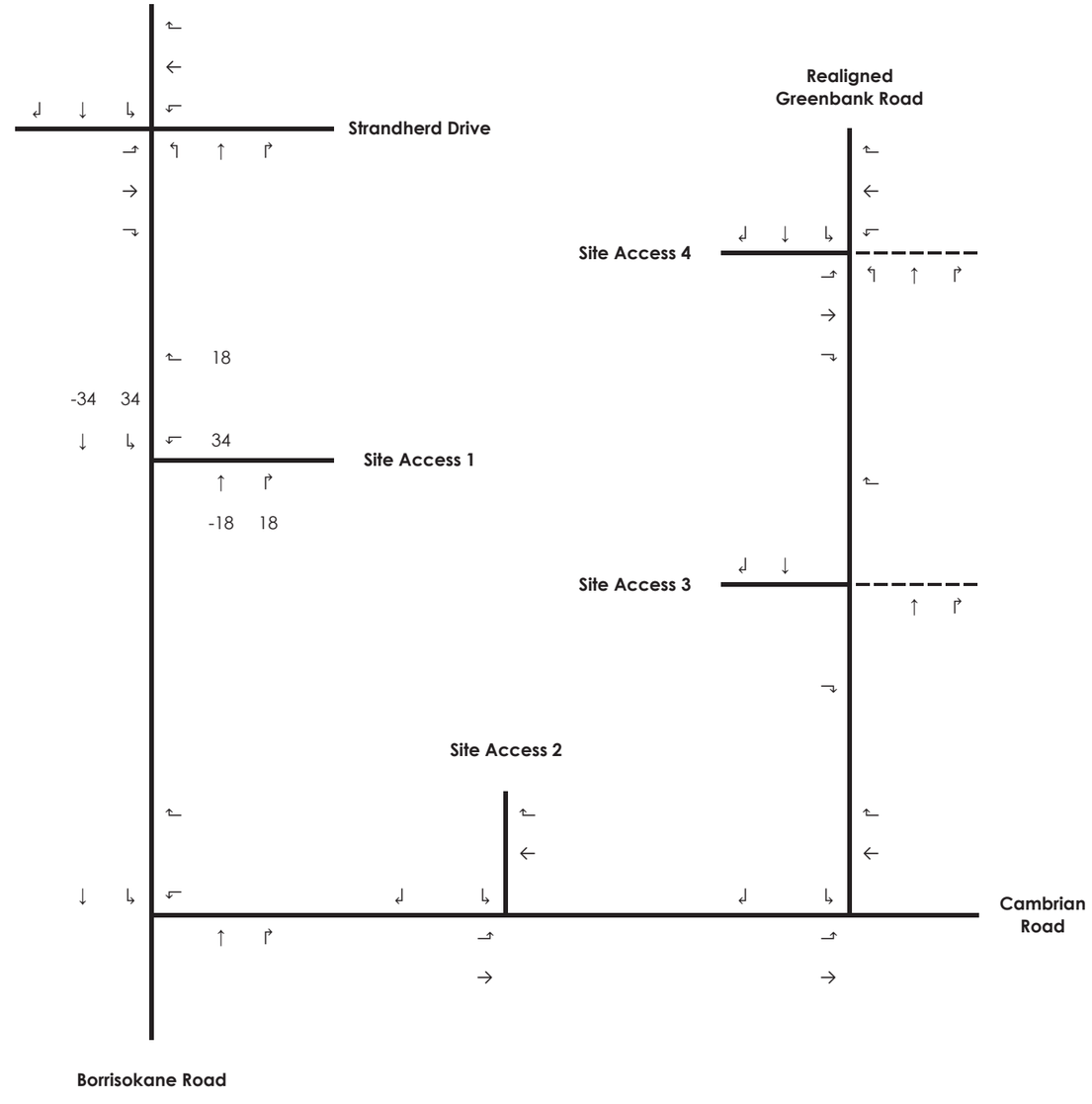
Half Moon Bay West

Figure 7: Site Traffic Volumes

AM Peak Hour



PM Peak Hour



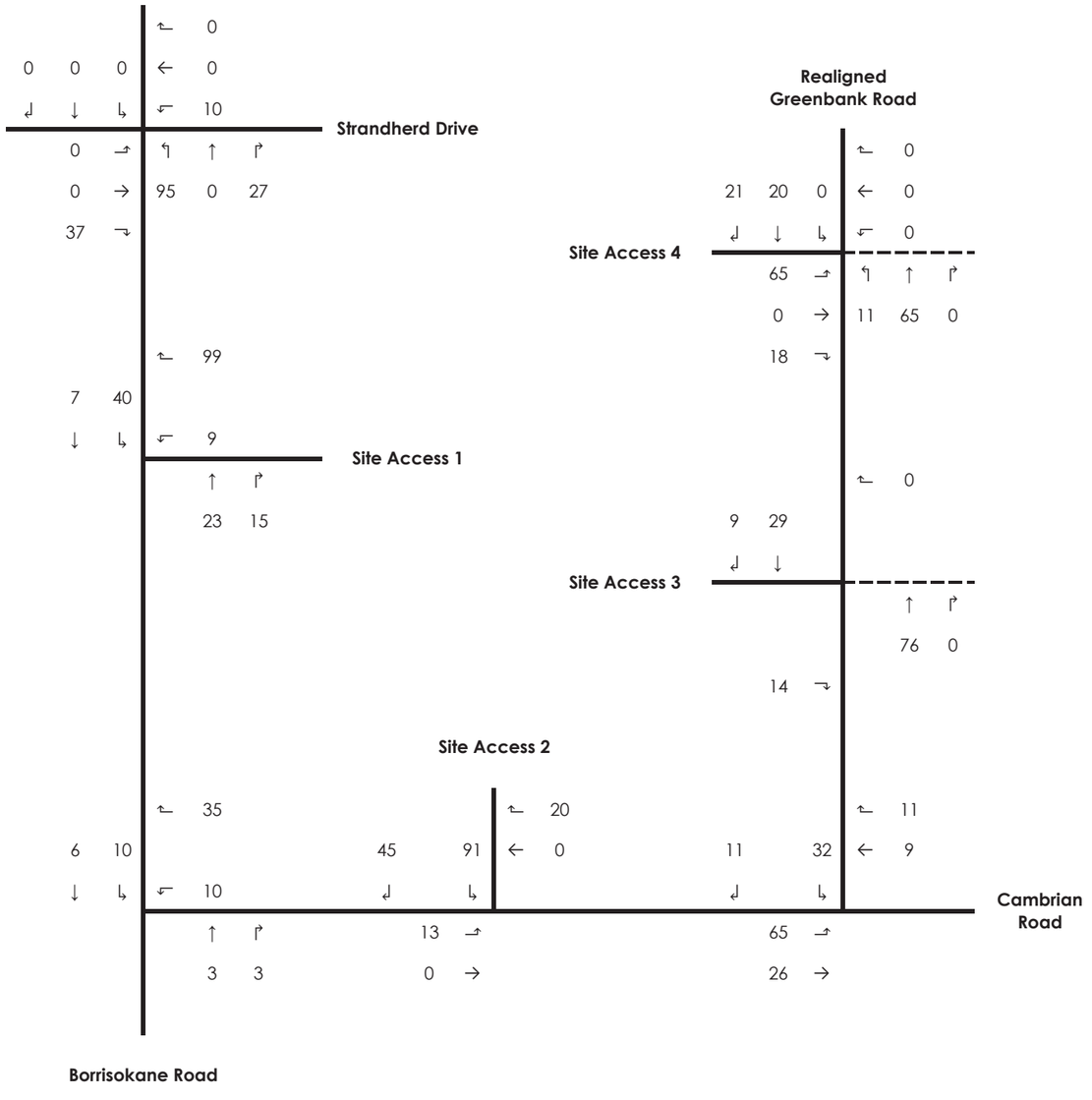
Stantec

Mattamy Homes

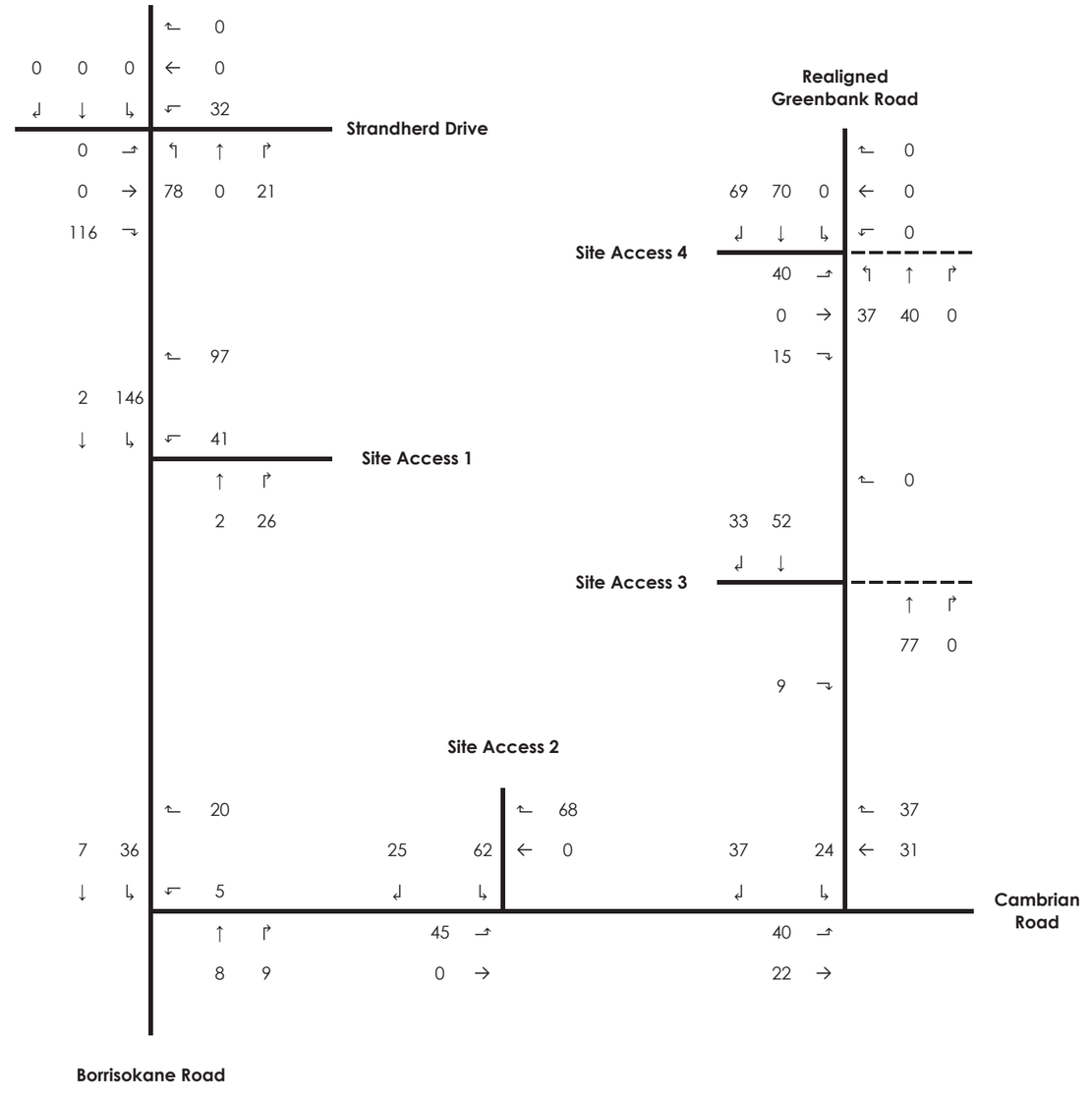
Half Moon Bay West

Figure 8: Pass-By Traffic Volumes

AM Peak Hour



PM Peak Hour



Stantec

Mattamy Homes

Half Moon Bay West

Figure 9: Net New Site Traffic Volumes

3 Forecasting

The purpose of the Forecasting section is to "generate the future transportation demand number required to analyze pre and post-development network performance to determine if a network modification is required to offset development impacts." [3]

3.1 Development-Generated Traffic

3.1.1 Base Trip Generation Rates

The peak hour vehicular traffic volumes from the subject development were determined using peak hour trip generation rates from the ITE Manual. A summary of the vehicular trip generation results for the proposed development has been summarized in Table 5.

The relevant extracts from the ITE Manual have been provided in Appendix E.

TABLE 5 – ITE Development Trip Generation Results

LAND USE (ITE CODE)	SIZE	PERIOD	GENERATED TRIPS (VPH)		
			IN	OUT	TOTAL
Hotel (310)	102 rooms	AM	32	22	54
		PM	31	30	61
		SAT	42	33	75

Note: The trip generation values indicated for the Saturday peak hour represent the peak generation of the hotel, which is not likely to coincide with the peak hour of adjacent street traffic.

vph = vehicles per hour; DU = Dwelling Units

Formula Rate and Splits for Hotels:

AM: T = 0.53(X) IN: 59%; OUT: 41%

PM: T = 0.60(X) IN: 51%; OUT: 49%

SAT: T = 0.69(X) + 4.32 IN: 56%; OUT: 44%

3.1.2 Person-Trips

The City's TIA Guidelines require trip generation to be expressed in terms of 'person-trips' rather than automobile trips in order to clearly identify the multi-modal demands of a development on the adjacent transportation network. Trip generation rates published by ITE are typically based on historical data from suburban areas with little to no access to public transit. The City of Ottawa TIA Guidelines suggest the use of a 1.28 conversion factor to obtain the equivalent number of person-trips when applying ITE data. This conversion factor is calculated under the assumption that a 1.15 auto occupancy rate is inherent to this data and that roughly 10% of trips are by non-auto modes and thus not captured in the rates. The results of applying these factors have been summarized in Table 6.

TABLE 6 – Development Person Trip Generation Results

LAND USE (ITE CODE)	FACTOR	PERIOD	GENERATED TRIPS (PPH)		
			IN	OUT	TOTAL
Hotel (310)	1.28	AM	41	28	69
		PM	40	38	78
		SAT	54	42	96

[3] Ottawa 2017 Transportation Impact Assessment Guidelines, p. 27

3.1.3 Mode Share

3.1.3.1 Existing Mode Share

The 2011 TRANS Origin-Destination Survey provides approximations of the existing modal share within the South Nepean Traffic Assessment Zone (TAZ). Of the available data, the weekday PM Peak inbound direction (i.e. To District) was determined to be the most appropriate existing mode share reference, as it coincides with the peak period of adjacent street traffic.

3.1.3.2 Targeted Mode Share for the Development

Given the type of development proposed and its context, the mode share specific to this development may vary from the average mode share experienced in the South Nepean Traffic Assessment Zone. As discussed below, adjustments were made to the Auto Driver Mode and Transit Mode shares to better represent the mode shares for the proposed development.

There are no transit service improvements in the vicinity of the subject development that are planned within the horizon periods of this study. Given the distance from express, city-wide transit service providing connections to the city's regional travel hubs, there may be a decreased likelihood that guests of the proposed hotel will travel by public transportation. Therefore, the Transit Modal Split (TMS) has been reduced substantially from 24% to 5%. The difference in mode shares from the reduction in the Transit Modal Split (TMS) was shifted over to the Auto Driver Mode. This assumption should be considered conservative.

Table 7 summarizes the existing mode share for the local South Nepean area, and appropriate adjustments based on the context of the subject site. Relevant extracts from the 2011 OD Survey are provided in Appendix F.

TABLE 7 – Proposed Mode Shares for South Nepean (2011 OD Survey)

TRAVEL MODE	EXISTING MODE SHARE (2011 OD SURVEY)	ADJUSTED MODE SHARE
Auto Driver	63%	82%
Transit	24%	5%
Auto Passenger	11%	No Change
Cycling	0%	
Walking	0%	
Other (e.g. taxi)	2%	
Total	100%	100%

3.1.4 Trip Reduction Factors

3.1.4.1 Deduction of Existing Development Trips

Not Applicable. The site has no existing trip generation.

3.1.4.2 Pass-By Traffic

Not Applicable. The site will not generate pass-by traffic.

3.1.4.3 Synergy/Internalization

Not Applicable. The site will have only one land use.

3.1.5 Trip Generation Summary

Table 8 summarizes the net number of person-trips the proposed development is expected to generate during the weekday morning and weekday afternoon peak hours of adjacent traffic.

The mode share target in Table 7 were applied to person trips results from Table 6 to estimate the number of development generated trips by mode, as shown in Table 8.

TABLE 8 – Development Generated Traffic by Mode

TRAVEL MODE	PEAK PERIOD TRIPS BY MODE								
	AM PK HR			PM PK HR			SAT PK HR		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Auto Driver (82%)	33	23	56	33	31	64	44	34	78
Transit (5%)	2	1	3	4	4	8	3	2	5
Auto Passenger (11%)	4	3	7	4	4	8	6	5	11
Cycling (0%)	0	0	0	0	0	0	0	0	0
Walking (0%)	0	0	0	0	0	0	0	0	0
Other (2%)	1	1	2	1	1	2	1	1	2

The proposed development was expected to generate approximately 47 morning peak hour, 55 afternoon peak hour and 66 Saturday vehicular trips at full buildout, based on the ITE Trip Generation Manual and modal share assumptions.

3.1.6 Trip Distribution

The trip distribution shown below was applied to development traffic (both background and site generated) within the study area. The distribution was based on previous studies and competed roadway infrastructure projects, and is summarized in Table 9.

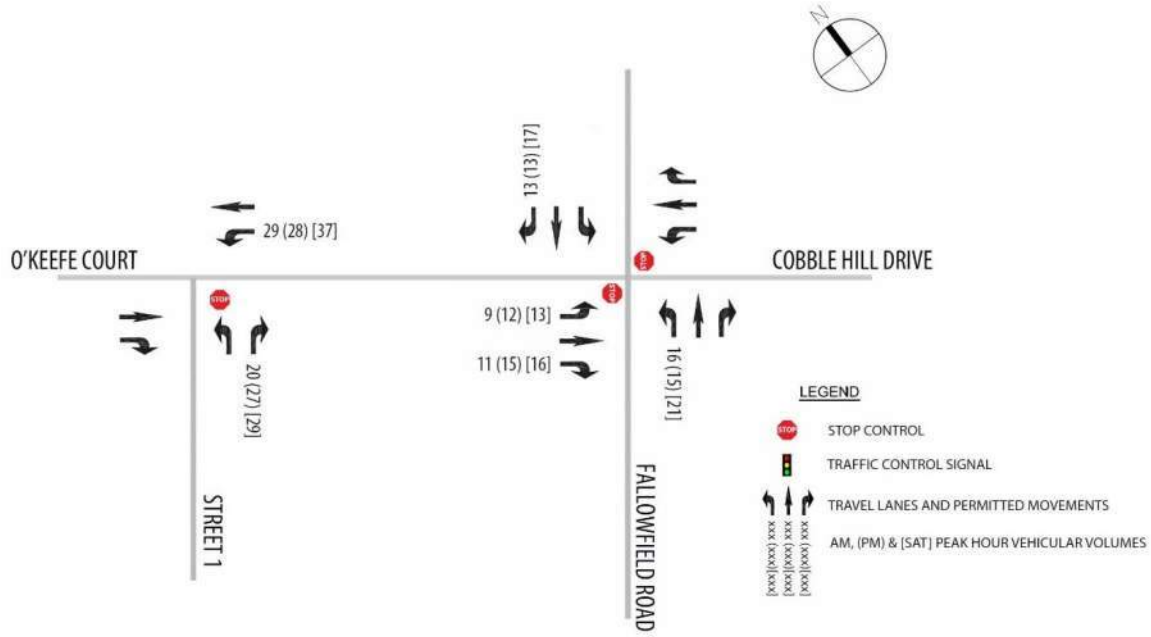
TABLE 9 – Development Generated Traffic by Mode

TO/ FROM	DISTRIBUTION
Fallowfield Road, North of O'Keefe Court	45%
Fallowfield Road, South of O'Keefe Court	55%
Total	100%

3.1.7 Trip Assignment

Utilizing the estimated number of new auto trips and applying the above distribution, future site-generated traffic volumes are illustrated in Exhibit 10 as follows:

EXHIBIT 10 - Site-Generated Traffic



- Based on the anticipated turning movement volumes illustrated in Exhibit 10 above, it was not expected that there will be any operational impacts at either of the proposed site access driveways or the O'Keefe Court and Street 1 intersection. All of the site generated traffic will be required to access/ egress the subject site via the Street 1 and O'Keefe Court intersection, and will be distributed between the two (2) driveways, thereby further reducing the risk of traffic operational issues.

3.2 Background Network Traffic

The purpose of this module of the TIA Guidelines is to develop future background traffic volumes by building on existing volumes through the application of site generated traffic volumes from the application of an annual growth rate to capture any non-specific background traffic growth that the study area may experience.

3.2.1 Transportation Network Plans

There are no changes to the transportation network planned within the study area in the Transportation Master Plan's (TMP) Affordable Network, and no background network road modifications are expected to be required to accommodate traffic generated from the subject site.

3.2.2 Background Growth

Two future background horizons were analyzed in the report, as required by City staff:

1. Year 2019 – Opening Day; Full occupancy of the proposed development
2. Year 2024 – Opening Day plus 5 years

A 2% background growth rate along Fallowfield Road was used in this study to account for regional growth along the adjacent road network. This growth rate was applied to through movements along Fallowfield Road to assess the need for interim modifications at the intersection of Fallowfield Road and O'Keefe Court that may be required in advance of the further development within the study area. Once the future adjacent developments discussed in Section 2.4.3 are

using land use code 310 for a Hotel in the ITE *Trip Generation Manual*, 10th Edition. Person trips were calculated using an ITE Trip to Person Trip factor of 1.28, consistent with the TIA Guidelines. The Person Trips generated by the proposed development are summarized in **Table 3**.

Table 3: Person Trip Generation (using the ITE Trip Generation Manual)

Land Use	ITE Code	Units/ GFA	AM Peak (PPH)			PM Peak (PPH)			Sat (PPH)		
			IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Proposed Development											
Hotel	310	99 Rooms	34	23	57	32	30	62	51	40	91

The modal shares for the proposed development are anticipated to be consistent with the modal shares outlined in the 2011 *Trans O-D Survey Report*, for the South Nepean area. The modal share values applied to the trips generated by the proposed development are based on all trips to/from the South Nepean district with an origin or destination beyond that area. As discussed below, adjustments have been made to the Auto Driver Mode and Transit Mode shares to better represent the mode shares for the proposed development.

There are no transit service improvements in the vicinity of the subject site that are planned within the horizon year of this study. Given the distance from express, city-wide transit service providing connections to the city's regional travel hubs, there may be a decreased likelihood that guests of the proposed hotel will travel by public transportation. Therefore, the Transit Mode share has been reduced substantially from 25% to 5%. The difference in mode shares from the reduction in Transit Mode was added to the Auto Driver Mode. This assumption is considered conservative.

A full breakdown of the projected person trips by modal share are shown in **Table 4**.

Table 4: Person Trips by Modal Share

Travel Mode	Modal Share	AM Peak			PM Peak			Saturday		
		IN	OUT	TOT	IN	OUT	TOT	IN	OUT	TOT
Proposed Development										
Hotel Person Trips		*34*	*23*	*57*	*32*	*30*	*62*	*51*	*40*	*91*
Auto Driver	85%	**29**	**20**	**48**	**27**	**26**	**53**	**43**	**34**	**77**
Auto Passenger	10%	3	2	6	3	3	6	5	4	9
Transit	5%	2	1	3	2	1	3	3	2	5
Non-Auto	0%	0	0	0	0	0	0	0	0	0

From the previous table, the proposed development is projected to generate an additional 48 vehicle trips during the AM peak hour, 53 vehicle trips during the PM peak hour and 77 vehicle trips during the Saturday peak.

5.1.2 Trip Distribution

The distribution of trips generated by the hotel has been estimated based on the AADT along the study area roadways, consistent with the 2012 CitiGate CTS. The trip distribution for the proposed development is as follows:

- 30% to/from the north via Highway 416
- 10% to/from the east via Fallowfield Road
- 15% to/from the east via Strandherd Drive
- 25% to/from the south via Highway 416
- 20% to/from the west via Fallowfield Road

All trips coming from the north or south via Highway 416, and from the east or west via Fallowfield Road have been assigned to CitiGate Drive at the Strandherd Drive/CitiGate Drive/Fallowfield Road intersection. Of the 15% of the trips from the east via Strandherd Drive, 5% have been assumed to turn left onto CrossKeys Place at the Strandherd Drive/CrossKeys Place/Hélène Campbell Road intersection and use the roundabout at CrossKeys Place/CitiGate Drive, and 10% have been assigned to the left turning movement onto CitiGate Drive at the Strandherd Drive/CitiGate Drive/Fallowfield Road intersection.

Site generated traffic volumes are shown in **Figure 4**.

5.2 Background Traffic

5.2.1 General Background Growth Rate

A review of other recent transportation studies in the vicinity of the subject site was conducted in order to establish a base background growth rate.

The CitiGate CTS completed by Novatech in 2012 assumed a background growth rate of 1% as a significant portion of adjacent development traffic was accounted for separately. This approach was consistent with the 4401 Fallowfield Road CTS published by IBI Group in 2015, and the CitiGate Retail Development TIS published by Parsons in 2015.

A 1% background growth factor is assumed for the purpose of this report, in light of the other study area developments that have been accounted for separately. This approach is consistent with other recent transportation studies in the area.

The 1% growth rate was applied to Strandherd Drive, Fallowfield Road, and the Highway 416 ramps. It was not applied to Hélène Campbell Road as the background growth rate is intended to account for growth in regional traffic which is not anticipated on lower class roads. The background growth rate was not applied to CitiGate Drive and CrossKeys Place, as growth on these roads is highly development-driven and has been accounted for separately.

Background growth within the study area for the 2020 build-out and 2025 horizon years is shown in **Figures 5** and **6**.

Figure 4: Site Generated Traffic Volumes

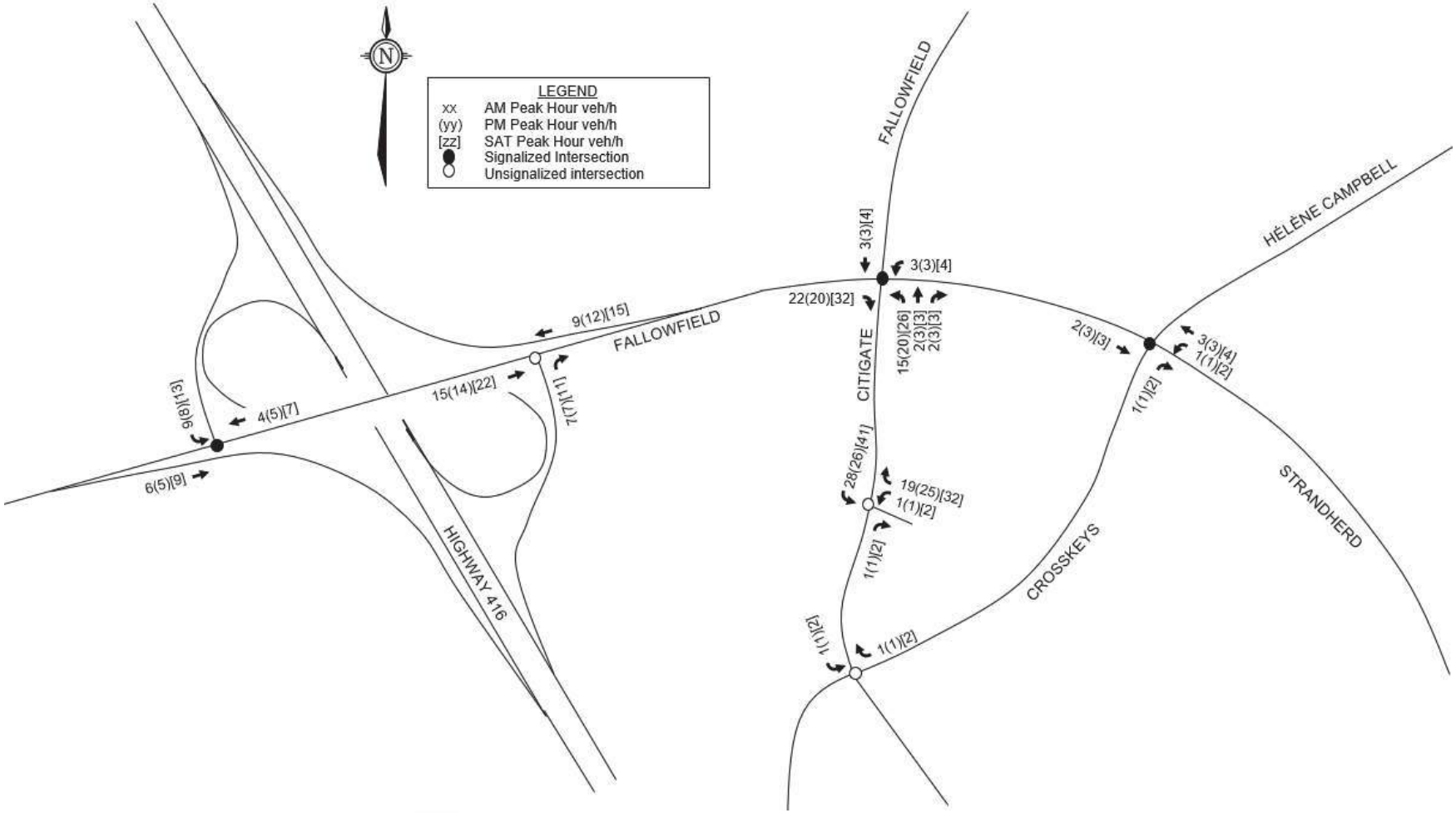


Table 5: Intersection Operations – 2029 Background Traffic

Intersection	AM Peak			PM Peak			Saturday Peak		
	max. v/c or delay	LOS	move-ment	max. v/c or delay	LOS	move-ment	max. v/c or delay	LOS	move-ment
Fallowfield/ 416 SB off-ramp	0.68	B	SBL	0.84	D	SBL	0.64	B	SBL
Fallowfield/ 416 NB off-ramp	0.52	A	EB	0.74	C	EB	0.37	A	EB
Fallowfield/ Strandherd	**1.02**	**F**	**WBT**	0.66	B	EBL			
Fallowfield/ Cedarview	0.65	B	EBT	0.71	C	SBT/R			
Strandherd/ Jockvale	0.76	C	WBR	0.55	A	SBT			
Strandherd/ Maravista	0.60	A	WBR	0.54	A	SBT			
Strandherd/ Kennevale	0.66	B	WBT/R	0.61	B	SBT			
Strandherd/ Cedarview	0.74	C	NBL	0.68	B	EBT/R			

Notes:
1. Reassignment of the previously recommended shared left/right turn lane to a second left turn lane and construction of a dedicated right turn assumed at the 416 SB off-ramp/Fallowfield Road intersection.
2. A channelized westbound right turn lane assumed at the Fallowfield Road/Strandherd Drive intersection.

Acceptable operating conditions are expected for all movements with the exception of the westbound approach of the Fallowfield Road/Strandherd Drive intersection in the a.m. peak.

The City defines the overall v/c ratio for an intersection as the sum of equivalent volumes for all critical movements divided by the sum of capacities for all critical movements, assuming the that v/c ratios for critical movements can be equalized. The eastbound left and westbound through movements are considered critical at the Fallowfield Road/Strandherd Drive intersection. The overall v/c for the intersection is 0.82 in the a.m. peak, which is an acceptable level of service based on the City's criteria and no mitigation measures are required.

3.8. Trip Generation

Trips generated by the proposed development have been estimated using the peak hour rates identified in the *ITE Trip Generation Manual, 8th Edition* for the following land uses and sizes:

Table 6: Proposed Land Uses and Sizes

Land Use	ITE Code	Interim	Ultimate
Shopping centre	820	350, 000 ft^2	350, 000 ft^2
Hotel	310	N/A	200 rooms
Gas Station	946	8 fuel positions	8 fuel positions

Land Use	ITE Code	Interim	Ultimate
Business Park	770	N/A	16.56 ha
Office Park	750	6.07 ha (15 ac)	67.65 ha
New Car Sales	841	8.6 ha	10.5 ha

Employment projections for the Business Park and Prestige Business Park lands were estimated using rates of 75 employees/ha and 110 employees/ha respectively. The employment projections were converted to gross floor area (GFA) using the following assumptions, which are based on figures identified in the City's 2009 *Development Charges Background Study*: a square foot per employee figure of 350 for commercial uses and 900 for industrial uses. The ITE Business Park land use represents an average mix of 20 to 30 percent office/commercial and 70 to 80 percent industrial/warehousing. A 30/70 mix was assumed for this study and the 350 ft^2 per employee figure was applied for the office/commercial component and the 900 ft^2 figure was applied for the industrial/warehousing component.

The existing woodlot comprises 6 hectares of the Prestige Business Park lands and 7.3 hectares of the Business Park lands. Half of the woodlot lands are assumed to be developed for the purpose of this assessment. Three hectares have been deducted from the Prestige Business Park land area and approximately 3.6 hectares have been deducted from the Business Park land area.

GFA for the Prestige Business Park is estimated at 2,488,500 ft^2 for the buildout condition and 233,800 ft^2 in the interim. GFA for the Business Park lands is estimated at 711,700 ft^2 at full buildout, with no Business Park development anticipated in the interim.

GFA for the car dealerships has been estimated assuming a 20% building coverage. This results in a GFA of 226,040 ft^2 at full buildout and 185,145 ft^2 in the interim, assuming seven hectares of land owned by Strandherd Drive Inc. and 4 acres of land owned by others.

The trip generation surveys compiled in the *ITE Trip Generation Manual* only record vehicle trips, and the sites surveyed are typically located in suburban locations in the United States where non-auto modes of transportation typically have a modal share of 10% or less. Where multiple modes of transportation are readily available, it is considered good practice to express projected trip generation volumes in terms of person trips, instead of vehicle trips. To convert ITE vehicle trip rates to person trip rates, two adjustment factors have been applied:

- Vehicle occupancy factor: **1.23** (taken from the TRANS 2005 O-D Survey Report)
- Non-auto usage factor: **1.1** (non-auto trips not counted in ITE surveys, assumed 10%)

Combining the two factors gives an overall vehicle trip to person trip adjustment factor of approximately 1.35. The conversion of vehicle trips into person trips for each land use is shown in the following table.

Table 7: Site-Generated Person Trips

Land Use	Size	AM Peak			PM Peak			Saturday Peak		
		In	Out	Total	In	Out	Total	In	Out	Total
Interim										
Shopping centre	350, 000 ft^2	289	184	473	975	1014	1989	1358	1254	2612
Gas Station	8 fuel pos.	48	47	95	57	55	112	81	81	162
Office Park	233,800 ft^2	535	66	601	72	442	514	33	12	45
New Car Sales	185,145 ft^2	376	132	508	253	395	648	379	364	743
Interim		**1248**	**429**	**1677**	**1357**	**1906**	**3263**	**1851**	**1711**	**3562**
Ultimate Concept										
Shopping centre	350, 000 ft^2	289	184	473	975	1014	1989	1358	1254	2612
Hotel	200 rooms	59	38	97	63	55	118	79	62	141
Gas Station	8 fuel pos.	48	47	95	57	55	112	81	81	162
Business Park	711,700 ft^2	1110	212	1322	285	954	1239	110	110	220
Office Park	2,488,500 ft^2	4246	525	4771	592	3636	4228	348	122	470
New Car Sales	226,040 ft^2	459	161	620	308	482	790	462	444	906
Ultimate Concept		**6211**	**1167**	**7378**	**2280**	**6196**	**8476**	**2438**	**2073**	**4511**

The number of car trips that the site will generate has been estimated by categorizing the person trips by modal share. The modal share assumptions used in this study are based on the BS CTS, which are as follows for the ultimate and interim development scenarios:

- Ultimate modal share: 23% transit, 2.5% cycling, 5% walking, and 69.5% auto
- Interim modal share: 15% transit, 2% cycling, 3% walking, and 80% auto

As noted in the BS CTS, these assumptions reflect a number of planned City improvements that will promote a higher transit modal share within the study area, including the following projects:

- Southwest Transitway Extension (Barrhaven Town Centre to Cambrian Road)
- Barrhaven-Riverside South Transitway, and
- Connection of the North-South LRT line to the Southwest Transitway.

Trips generated by the gas station and the hotel are assumed to be auto trips given the nature of the land use.

A breakdown of the projected number of trips by modal share is shown in the following table.

Table 8: Site-Generated Trips by Modal Share

Travel Mode	Modal Share	AM Peak			PM Peak			Saturday Peak		
		In	Out	Total	In	Out	Total	In	Out	Total
Interim										
Total Person Trips		1248	429	1677	1357	1906	3263	1851	1711	3562
Auto Driver	**64%**	**816**	**291**	**1107**	**889**	**1240**	**2129**	**1214**	**1125**	**2339**
Auto Passenger	16%	192	61	253	208	296	504	283	261	544
Transit	15%	180	57	237	195	278	473	265	245	510
Non-Auto	5%	60	20	80	65	92	157	89	80	169
Ultimate Concept										
Total Person Trips		6211	1167	7378	2280	6196	8476	2438	2073	4511
Auto Driver	**56%**	**3563**	**704**	**4267**	**1330**	**3518**	**4848**	**1436**	**1224**	**2660**
Auto Passenger	13.5%	824	146	970	292	822	1113	308	261	568
Transit	23%	1404	249	1653	497	1400	1897	524	444	968
Non-Auto	7.5%	420	68	488	161	456	618	170	144	315

The *ITE Trip Generation Handbook* outlines a method for determining the number of internal trips generated at mixed-use developments. Internal trips are trips that are made on-site without using the external roadway system. The ITE Handbook provides internal capture rates for various combinations of office, retail and residential land uses. The number of internal trips is limited by the land use with the lower internal capture rate, which in this case is the retail component. Tables 7.1 and 7.2 of the ITE Handbook suggest that the internal capture rate of trips from a retail use to an office use and trips to a retail use from an office use is in the order of 2 to 3%. For the purpose of this assessment, the number of internal trips generated by the development is considered insignificant.

The ITE Handbook also outlines a method for determining the number of pass-by trips that are generated by certain types of developments. Pass-by trips are made as an intermediate stop on the way to another destination and primary trips are made for the specific purpose of visiting the site. The retail and gas station land uses are expected to generate both pass-by and primary trips. The pass-by trips are only added at the access points and not the study area intersections as they are already accounted for on the adjacent road system. The number of pass-by trips generated by the development has been estimated using percentages identified in the ITE Handbook. A rate of 30% has been assumed for the retail component of development and a rate of 60% has been assumed for the gas station.

Primary and pass-by trips generated by the proposed development are summarized in the following table for the weekday and Saturday peak hours.

Table 9: Pass-by and Primary Trips

Trip Type	AM Peak			PM Peak			Saturday Peak		
	In	Out	Total	In	Out	Total	In	Out	Total
Interim									
Total Vehicle Trips	**816**	**291**	**1107**	**889**	**1240**	**2129**	**1214**	**1125**	**2339**
Pass-by Trips	75	75	150	225	225	450	300	300	600
Primary Trips	741	216	957	664	1015	1679	914	825	1739
Ultimate Concept									
Total Vehicle Trips	**3563**	**704**	**4267**	**1330**	**3518**	**4848**	**1436**	**1224**	**2660**
Pass-by Trips	69	69	138	202	202	404	269	269	538
Primary Trips	3494	635	4129	1128	3316	4444	1167	955	2122

3.9. Vehicle Trip Distribution

The distribution of new vehicle trips generated by the development has been estimated based on the existing pattern of traffic entering the study area in the a.m. peak and leaving the study area in the p.m. peak. The trip distribution assumptions for the interim development scenario are summarized as follows.

- 10% to/from the north via Highway 416
- 20% to/from the east via Fallowfield Road and Jockvale Road
- 15% to/from the east via Maravista Drive, Kennevale Drive and Tartan Drive
- 20% to/from the east via Strandherd Drive
- 10% to/from the south via Cedarview Road and Highway 416
- 25% to/from the west via Fallowfield Road

For the ultimate development scenario, 5% of traffic has been redistributed from Fallowfield Road to the McKenna Casey Drive connection at the 416 underpass. This route may become an attractive alternative for site traffic in the event of congested traffic conditions on Strandherd Drive.

The distribution of trips generated by the hotel has been estimated based on the Average Annual Daily Traffic (AADT) of the arterial study area roads. The trip distribution assumptions for hotel trips are as follows:

- 30% to/from the north via Highway 416
- 10% to/from the east via Fallowfield Road
- 15% to/from the east via Strandherd Drive
- 25% to/from the south via Highway 416
- 20% to/from the west via Fallowfield Road

The distribution of pass-by trips generated by the retail and gas station components has been estimated based on the existing peak hour traffic patterns adjacent to the site.

Trips generated by the shopping centre have been assigned equally between the Street Three, Right-in Right-out driveway and Street Four accesses.

The hotel, the gas station and the interim Prestige Business Park area will all be located at the north end of the site near the Street One/Fallowfield Road/Strandherd Drive access. Trips generated by these uses have been assigned as follows:

- Trips to/from the north or west will use the Street One access
- Trips to/from the south will use the Street Three access
- Trips to/from the east will use Fallowfield Road or Jockvale Road

The trip assignment for the ultimate Business Park and Prestige Business Park areas is based on the site layout, the proposed road pattern, and logical routing assumptions. Trips with origins and destinations north or south of the subject site have been assigned as follows:

- 40% of trips will use Street One or Street Three
- 35% of trips will use Street Four
- 25% of trips will use Street Five

Trips to and from the east via Fallowfield Road, Jockvale Road, Maravista Drive, and Kennevale Drive have been assigned according to the trip distribution assumptions noted above.

Trips generated by the car dealerships have been assigned to the Street Five access.

Interim and ultimate site traffic is shown in **Figures 9** and **10** for the weekday and Saturday peak hours.

Total traffic for the 2019 and 2029 horizon years has been calculated by adding the peak hour site traffic with the projected background traffic. The 2019 and 2029 total traffic volumes are shown in **Figures 11** and **12**.

3.10. Transit Trip Distribution

The distribution of transit trips generated by the interim development has been derived from the data presented in Exhibits 6-2 and 6-3 of the *2005 Trans O-D Survey Report.* Copies of these exhibits are included in **Appendix G**.

The top origins and destinations for all arrivals and departures within the South Nepean District are summarized in Table 10.

Table 10: Top Origins/Destinations of South Nepean District

AM Peak Origin of Arrivals	% Trips	PM Peak Destination of Departures	% Trips
South Nepean	65%	South Nepean	55%
Merivale	6%	Merivale	12%

APPENDIX G

TDM – Supportive Development Design Checklist

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	N/A, No rapid transit stops or stations within 600m
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	✓

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	✓
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	✓
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	✓
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	✓
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	✓
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	✓
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	N/A, less than 50 spaces
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	N/A
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	N/A
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	N/A
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	✓ Parking meets zoning requirements
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	

TDM Measures Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

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

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

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

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		1. TDM PROGRAM MANAGEMENT	
		1.1 Program coordinator	
BASIC	★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	
		1.2 Travel surveys	
BETTER		1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	
		2. WALKING AND CYCLING	
		2.1 Information on walking/cycling routes & destinations	
BASIC		2.1.1 Display local area maps with walking/cycling access routes and key destinations at major entrances	✓
		2.2 Bicycle skills training *Commuter travel*	
BETTER	★	2.2.1 Offer on-site cycling courses for commuters, or subsidize off-site courses	
		2.3 Valet bike parking *Visitor travel*	
BETTER		2.3.1 Offer secure valet bike parking during public events when demand exceeds fixed supply (e.g. for festivals, concerts, games)	

		TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		3. TRANSIT	
		3.1 Transit information	
BASIC	3.1.1	Display relevant transit schedules and route maps at entrances	✓
BASIC	3.1.2	Provide online links to OC Transpo and STO information	✓
BETTER	3.1.3	Provide real-time arrival information display at entrances	
		3.2 Transit fare incentives	
		Commuter travel	
BETTER	3.2.1	Offer preloaded PRESTO cards to encourage commuters to use transit	
BETTER ★	3.2.2	Subsidize or reimburse monthly transit pass purchases by employees	
		Visitor travel	
BETTER	3.2.3	Arrange inclusion of same-day transit fare in price of tickets (e.g. for festivals, concerts, games)	N/A
		3.3 Enhanced public transit service	
		Commuter travel	
BETTER	3.3.1	Contract with OC Transpo to provide enhanced transit services (e.g. for shift changes, weekends)	
		Visitor travel	
BETTER	3.3.2	Contract with OC Transpo to provide enhanced transit services (e.g. for festivals, concerts, games)	N/A
		3.4 Private transit service	
		Commuter travel	
BETTER	3.4.1	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for shift changes, weekends)	
		Visitor travel	
BETTER	3.4.2	Provide shuttle service when OC Transpo cannot offer sufficient quality or capacity to serve demand (e.g. for festivals, concerts, games)	N/A

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		4.	**RIDESHARING**	
		4.1	**Ridematching service**	
			Commuter travel	
BASIC	★	4.1.1	Provide a dedicated ridematching portal at OttawaRideMatch.com	✓
		4.2	**Carpool parking price incentives**	
			Commuter travel	
BETTER		4.2.1	Provide discounts on parking costs for registered carpools	
		4.3	**Vanpool service**	
			Commuter travel	
BETTER		4.3.1	Provide a vanpooling service for long-distance commuters	
		5.	**CARSHARING & BIKESHARING**	
		5.1	**Bikeshare stations & memberships**	
BETTER		5.1.1	Contract with provider to install on-site bikeshare station for use by commuters and visitors	
			Commuter travel	
BETTER		5.1.2	Provide employees with bikeshare memberships for local business travel	
		5.2	**Carshare vehicles & memberships**	
			Commuter travel	
BETTER		5.2.1	Contract with provider to install on-site carshare vehicles and promote their use by tenants	
BETTER		5.2.2	Provide employees with carshare memberships for local business travel	
		6.	**PARKING**	
		6.1	**Priced parking**	
			Commuter travel	
BASIC	★	6.1.1	Charge for long-term parking (daily, weekly, monthly)	
BASIC		6.1.2	Unbundle parking cost from lease rates at multi-tenant sites	
			Visitor travel	
BETTER		6.1.3	Charge for short-term parking (hourly)	

			TDM measures: *Non-residential developments*	Check if proposed & add descriptions
		7.	**TDM MARKETING & COMMUNICATIONS**	
		7.1	**Multimodal travel information**	
			Commuter travel	
BASIC	★	7.1.1	Provide a multimodal travel option information package to new/relocating employees and students	✓
			Visitor travel	
BETTER	★	7.1.2	Include multimodal travel option information in invitations or advertising that attract visitors or customers (e.g. for festivals, concerts, games)	N/A
		7.2	**Personalized trip planning**	
			Commuter travel	
BETTER	★	7.2.1	Offer personalized trip planning to new/relocating employees	
		7.3	**Promotions**	
			Commuter travel	
BETTER		7.3.1	Deliver promotions and incentives to maintain awareness, build understanding, and encourage trial of sustainable modes	
		8.	**OTHER INCENTIVES & AMENITIES**	
		8.1	**Emergency ride home**	
			Commuter travel	
BETTER	★	8.1.1	Provide emergency ride home service to non-driving commuters	
		8.2	**Alternative work arrangements**	
			Commuter travel	
BASIC	★	8.2.1	Encourage flexible work hours	✓
BETTER		8.2.2	Encourage compressed workweeks	✓
BETTER	★	8.2.3	Encourage telework	✓
		8.3	**Local business travel options**	
			Commuter travel	
BASIC	★	8.3.1	Provide local business travel options that minimize the need for employees to bring a personal car to work	
		8.4	**Commuter incentives**	
			Commuter travel	
BETTER		8.4.1	Offer employees a taxable, mode-neutral commuting allowance	
		8.5	**On-site amenities**	
			Commuter travel	
BETTER		8.5.1	Provide on-site amenities/services to minimize mid-day or mid-commute errands	

APPENDIX H

Signal Timing Plans

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

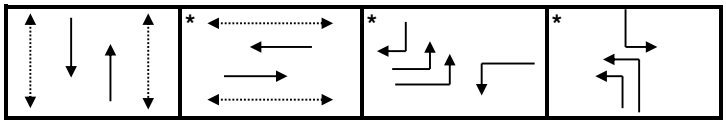
Intersection:	**Main:** Strandherd	**Side:**	Maravista / Systemhouse
Controller:	**ATC-3**	**TSD:**	**6728**
Author:	Matthew Anderson	**Date:**	22-Oct-2019

Existing Timing Plans†

	Plan						**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	**Evening** 12	***Walk***	***DW***	***A+R***
Cycle	120	110	120	110	110	120			
Offset	83	0	82	X	0	X			
NB Thru	38	37	40	33	37	33	7	17	4.6+2.1
SB Thru	38	37	40	33	37	33	7	17	4.6+2.1
EB Thru	47	47	47	47	47	47	7	32	3.3+4.3
WB Thru	47	47	47	47	47	47	7	32	3.3+4.3
EB Left (fp)	20	13	15	15	13	20	-	-	3.3+4.3
WB Left (fp)	20	13	15	15	13	20	-	-	3.3+4.3
SB Right	20	13	15	15	13	20	-	-	3.3+4.3
NB Left (fp)	15	13	18	15	13	20	-	-	4.6+2.0
SB Left (fp)	15	13	18	15	13	20	-	-	4.6+2.0

Phasing Sequence‡

Plan: All



Notes:

1) For Plan 1, if there are no pedestrian crossing actuations for the EW movements, the EW thru movements will be forced off 19 seconds early.
2) For Plan 3, if there are no pedestrian crossing actuations for the EW movements, the EW thru movements will be forced off 9 seconds early.

Schedule

Weekday

Time	Plan
0:15	4
6:00	1
9:30	2
15:00	3
18:30	2
20:00	12
22:30	4

Weekends

Time	Plan
0:15	4
8:30	12
10:00	5
18:00	12
22:30	4

Notes

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

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

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $57.63 ($51 + HST)

Traffic Signal Timing

City of Ottawa, Transportation Services Department

Traffic Signal Operations Unit

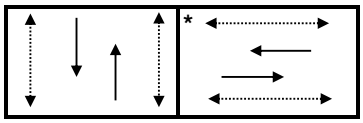
Intersection:	**Main:**	Strandherd	**Side:**	Kennevale / Dealership	
Controller:	**ATC3**		**TSD:**	**6715**	
Author:	Matthew Anderson		**Date:**	22-Oct-2019	

Existing Timing Plans†

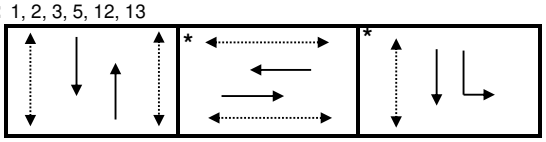
	Plan							**Ped Minimum Time**		
	AM Peak 1	**Off Peak** 2	**PM Peak** 3	**Night** 4	**Weekend** 5	**Evening** 12	**PM Heavy** 13	***Walk***	***DW***	***A+R***
Cycle	120	110	120	80	110	95	120			
Offset	29	93	57	X	93	X	57			
NB Thru	75	65	72	47	65	47	62	7	17	4.6+1.8
SB Thru	87	77	87	47	77	62	77	7	17	4.6+1.8
EB Thru	33	33	33	33	33	33	43	7	19	3.3+3.3
WB Thru	33	33	33	33	33	33	43	7	19	3.3+3.3
SB Left	12	12	15	-	12	15	15	-	-	4.6+1.8

Phasing Sequence‡

Plan: 4



Plan: 1, 2, 3, 5, 12, 13



Notes: 1) Plan 13 has a maximum recall for the EW thru movments.

Schedule

Weekday

Time	Plan
0:15	4
6:00	1
9:30	2
15:00	3
15:30	13
18:00	3
18:30	2
20:00	12
22:30	4

Weekend

Time	Plan
0:15	4
8:30	12
10:00	5
18:00	12
22:30	4

Notes

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

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

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◄·····► Pedestrian signal

Cost is $57.63 ($51 + HST)

APPENDIX I

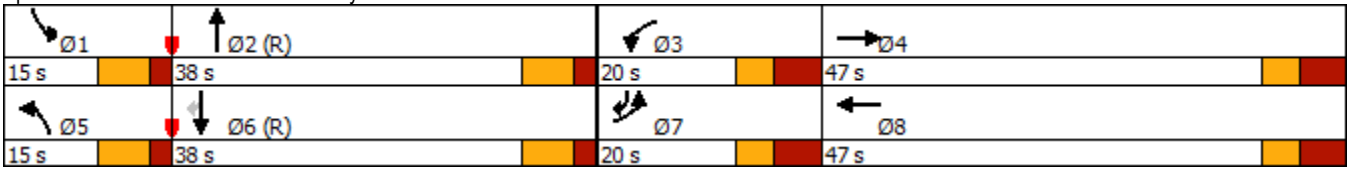
Synchro Reports

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	8	43	13	27	116	106	1068	14	26	554	6
Future Volume (vph)	61	8	43	13	27	116	106	1068	14	26	554	6
Satd. Flow (prot)	3216	1525	0	1658	1515	0	3216	3309	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1525	0	1658	1515	0	3216	3309	0	1658	3316	1483
Satd. Flow (RTOR)		48			129			1				102
Lane Group Flow (vph)	68	57	0	14	159	0	118	1203	0	29	616	7
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	20.0	47.0		20.0	47.0		15.0	38.0		15.0	38.0	20.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.9	22.7		6.6	16.0		9.5	67.6		7.6	60.8	72.7
Actuated g/C Ratio	0.07	0.19		0.06	0.13		0.08	0.56		0.06	0.51	0.61
v/c Ratio	0.32	0.17		0.15	0.51		0.46	0.65		0.28	0.37	0.01
Control Delay	57.0	13.6		57.2	16.5		65.7	18.9		59.4	22.6	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	57.0	13.6		57.2	16.5		65.7	18.9		59.4	22.6	0.0
LOS	E	B		E	B		E	B		E	C	A
Approach Delay		37.2			19.8			23.1			24.0	
Approach LOS		D			B			C			C	
Queue Length 50th (m)	8.0	1.7		3.2	6.7		15.2	45.2		6.6	42.1	0.0
Queue Length 95th (m)	15.1	10.5		9.9	20.2		m13.8	m#199.6		16.0	90.0	0.0
Internal Link Dist (m)		194.3			175.3			359.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	332	535		171	584		261	1865		121	1678	938
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.20	0.11		0.08	0.27		0.45	0.65		0.24	0.37	0.01

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 23.9 — Intersection LOS: C
Intersection Capacity Utilization 74.4% — ICU Level of Service D
Analysis Period (min) 15
Description: Phase 5
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	3	11	100	6	109	39	1051	86	50	539	43
Future Volume (vph)	19	3	11	100	6	109	39	1051	86	50	539	43
Satd. Flow (prot)	1658	1745	1483	1658	1467	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.615			0.756			0.438			0.047		
Satd. Flow (perm)	1073	1745	1483	1319	1467	0	764	1745	1483	82	1745	1453
Satd. Flow (RTOR)			89		121				91			48
Lane Group Flow (vph)	21	3	12	111	128	0	43	1168	96	56	599	48
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Total Split (s)	33.0	33.0	33.0	33.0	33.0		75.0	75.0	75.0	12.0	87.0	87.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Act Effct Green (s)	15.6	15.6	15.6	15.6	15.6		80.6	80.6	80.6	91.4	91.4	91.4
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.13		0.67	0.67	0.67	0.76	0.76	0.76
v/c Ratio	0.15	0.01	0.04	0.65	0.43		0.08	1.00	0.09	0.37	0.45	0.04
Control Delay	46.4	42.0	0.3	66.1	13.6		9.9	47.8	2.5	19.3	18.0	3.5
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	46.4	42.0	0.3	66.1	13.6		9.9	47.8	2.5	19.3	18.0	3.5
LOS	D	D	A	E	B		A	D	A	B	B	A
Approach Delay		30.6			38.0			43.2			17.1	
Approach LOS		C			D			D			B	
Queue Length 50th (m)	4.5	0.6	0.0	25.3	1.5		3.4	~291.6	0.4	7.9	91.1	0.0
Queue Length 95th (m)	11.5	3.3	0.0	41.8	17.8		9.8	#402.0	7.4	10.0	180.2	7.4
Internal Link Dist (m)		577.3			162.4			334.0			378.1	
Turn Bay Length (m)	75.0		100.0	50.0			110.0		40.0	150.0		90.0
Base Capacity (vph)	236	383	395	290	417		513	1171	1026	151	1328	1117
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	0.09	0.01	0.03	0.38	0.31		0.08	1.00	0.09	0.37	0.45	0.04

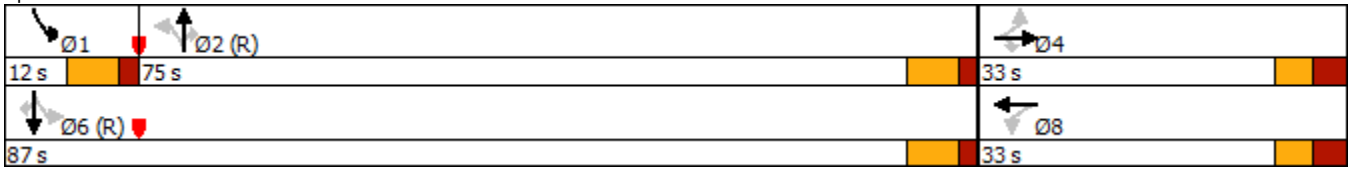
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 29 (24%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 34.5 — Intersection LOS: C
Intersection Capacity Utilization 81.7% — ICU Level of Service D
Analysis Period (min) 15
Description: Phase 5

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Strandherd & Kennevale

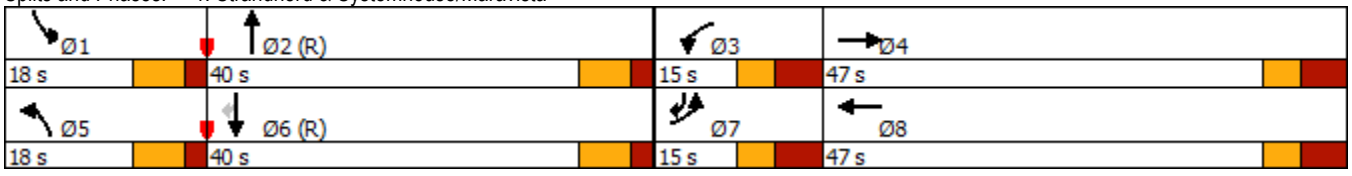


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	58	196	13	49	43	235	688	21	123	884	26
Future Volume (vph)	69	58	196	13	49	43	235	688	21	123	884	26
Satd. Flow (prot)	3216	1543	0	1658	1609	0	3216	3302	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1543	0	1658	1609	0	3216	3302	0	1658	3316	1483
Satd. Flow (RTOR)		152			40			2				102
Lane Group Flow (vph)	77	282	0	14	102	0	261	787	0	137	982	29
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	15.0	47.0		15.0	47.0		18.0	40.0		18.0	40.0	15.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.1	24.0		6.4	17.9		14.1	54.5		14.7	55.1	66.1
Actuated g/C Ratio	0.06	0.20		0.05	0.15		0.12	0.45		0.12	0.46	0.55
v/c Ratio	0.41	0.66		0.16	0.37		0.69	0.52		0.68	0.65	0.03
Control Delay	60.9	26.0		57.8	29.1		64.0	26.1		67.6	30.8	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	60.9	26.0		57.8	29.1		64.0	26.1		67.6	30.8	0.1
LOS	E	C		E	C		E	C		E	C	A
Approach Delay		33.5			32.6			35.5			34.4	
Approach LOS		C			C			D			C	
Queue Length 50th (m)	9.1	27.5		3.2	14.1		31.5	39.7		30.6	86.5	0.0
Queue Length 95th (m)	17.0	47.9		9.9	23.2		m#50.8	#113.4		#66.9	#174.8	0.0
Internal Link Dist (m)		194.3			175.3			359.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	198	608		102	555		378	1501		202	1521	863
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.39	0.46		0.14	0.18		0.69	0.52		0.68	0.65	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 82 (68%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 34.6 — Intersection LOS: C
Intersection Capacity Utilization 66.2% — ICU Level of Service C
Analysis Period (min) 15
Description: Phase 5
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

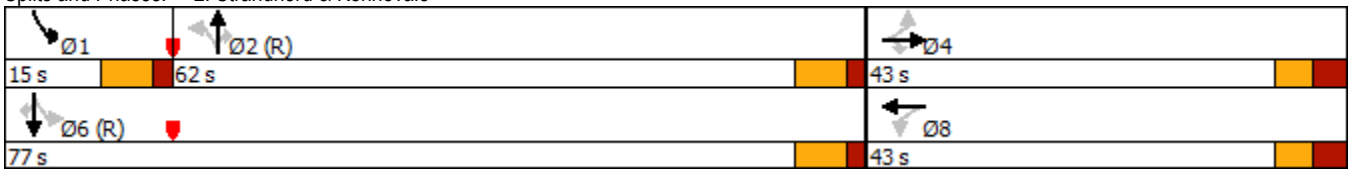


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	13	32	130	6	80	28	749	132	72	1007	31
Future Volume (vph)	92	13	32	130	6	80	28	749	132	72	1007	31
Satd. Flow (prot)	1658	1745	1483	1658	1473	0	1658	1745	1483	1658	1745	1483
Flt Permitted	0.695			0.748			0.153			0.188		
Satd. Flow (perm)	1213	1745	1447	1305	1473	0	267	1745	1450	328	1745	1453
Satd. Flow (RTOR)			89		89				91			33
Lane Group Flow (vph)	102	14	36	144	96	0	31	832	147	80	1119	34
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Total Split (s)	43.0	43.0	43.0	43.0	43.0		62.0	62.0	62.0	15.0	77.0	77.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Act Effct Green (s)	18.6	18.6	18.6	18.6	18.6		76.9	76.9	76.9	88.4	88.4	88.4
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16		0.64	0.64	0.64	0.74	0.74	0.74
v/c Ratio	0.55	0.05	0.12	0.72	0.32		0.18	0.74	0.15	0.25	0.87	0.03
Control Delay	56.4	40.2	0.8	66.6	12.5		16.0	23.0	5.4	13.6	40.8	9.3
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	56.4	40.2	0.8	66.6	12.5		16.0	23.0	5.4	13.6	40.8	9.3
LOS	E	D	A	E	B		B	C	A	B	D	A
Approach Delay		41.8			45.0			20.2			38.2	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	22.5	2.8	0.0	32.6	1.4		2.9	131.3	4.8	6.1	204.7	0.0
Queue Length 95th (m)	37.8	8.2	0.0	51.1	15.1		10.7	#254.0	16.2	m27.0	#349.2	m8.7
Internal Link Dist (m)		577.3			162.4			334.0			378.1	
Turn Bay Length (m)	75.0		100.0	50.0			110.0		40.0	150.0		90.0
Base Capacity (vph)	367	529	500	395	508		171	1117	961	341	1286	1079
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	0.28	0.03	0.07	0.36	0.19		0.18	0.74	0.15	0.23	0.87	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 57 (48%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 32.1 — Intersection LOS: C
Intersection Capacity Utilization 89.8% — ICU Level of Service E
Analysis Period (min) 15
Description: Phase 5
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Strandherd & Kennevale

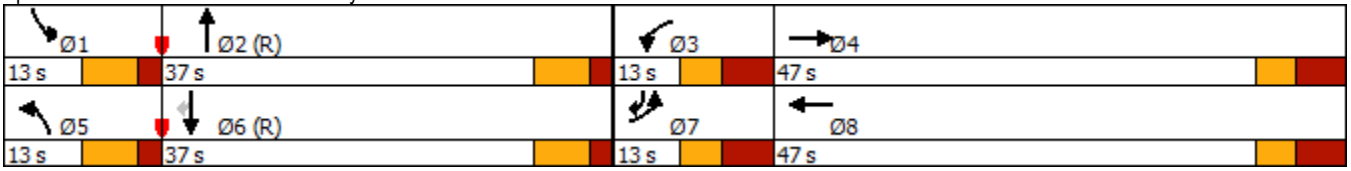


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	52	276	12	70	67	410	654	18	79	942	22
Future Volume (vph)	108	52	276	12	70	67	410	654	18	79	942	22
Satd. Flow (prot)	3281	1543	0	1691	1620	0	3281	3368	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1543	0	1691	1620	0	3281	3368	0	1626	3382	1513
Satd. Flow (RTOR)		270			48			2				111
Lane Group Flow (vph)	120	365	0	13	152	0	456	747	0	88	1047	24
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		13.0	37.0		13.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		26.3	46.9		11.2	31.8	43.9
Actuated g/C Ratio	0.05	0.24		0.05	0.16		0.24	0.43		0.10	0.29	0.40
v/c Ratio	0.75	0.64		0.16	0.50		0.58	0.52		0.54	1.07	0.04
Control Delay	78.9	15.2		54.6	31.4		42.0	34.7		60.5	88.3	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	78.9	15.2		54.6	31.4		42.0	34.7		60.5	88.3	0.1
LOS	E	B		D	C		D	C		E	F	A
Approach Delay		31.0			33.2			37.4			84.4	
Approach LOS		C			C			D			F	
Queue Length 50th (m)	13.3	16.7		2.7	21.5		50.4	64.2		17.9	115.9	0.0
Queue Length 95th (m)	#27.7	39.5		9.0	30.4		m#93.4	m79.5		#48.2	#177.0	0.0
Internal Link Dist (m)		194.3			175.3			359.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	161	725		83	611		783	1436		164	976	669
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.75	0.50		0.16	0.25		0.58	0.52		0.54	1.07	0.04

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 54.2 — Intersection LOS: D
Intersection Capacity Utilization 88.6% — ICU Level of Service E
Analysis Period (min) 15
Description: Phase 5
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

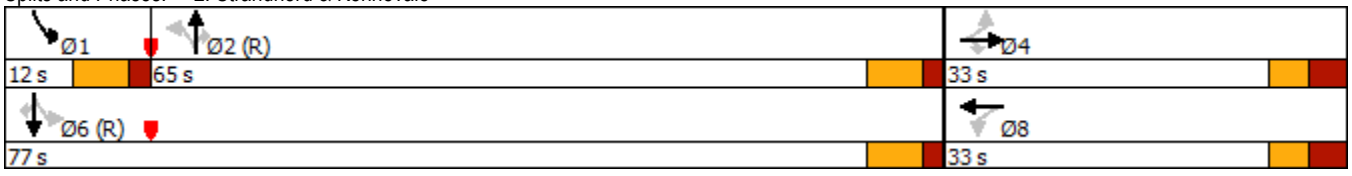


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	8	24	115	5	87	35	921	129	95	1107	43
Future Volume (vph)	64	8	24	115	5	87	35	921	129	95	1107	43
Satd. Flow (prot)	1691	1780	1513	1691	1481	0	1691	1762	1513	1674	1780	1513
Flt Permitted	0.690			0.752			0.083			0.061		
Satd. Flow (perm)	1228	1780	1480	1339	1481	0	148	1762	1479	108	1780	1478
Satd. Flow (RTOR)			97		97				99			46
Lane Group Flow (vph)	71	9	27	128	103	0	39	1023	143	106	1230	48
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8			2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Total Split (s)	33.0	33.0	33.0	33.0	33.0		65.0	65.0	65.0	12.0	77.0	77.0
Total Lost Time (s)	6.6	6.6	6.6	6.6	6.6		6.4	6.4	6.4	6.4	6.4	6.4
Act Effct Green (s)	16.7	16.7	16.7	16.7	16.7		66.3	66.3	66.3	80.3	80.3	80.3
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15		0.60	0.60	0.60	0.73	0.73	0.73
v/c Ratio	0.38	0.03	0.09	0.63	0.34		0.44	0.96	0.15	0.57	0.95	0.04
Control Delay	45.9	35.9	0.6	56.5	11.4		35.0	43.1	4.7	28.2	46.2	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
Total Delay	45.9	35.9	0.6	56.5	11.4		35.0	43.1	4.7	28.2	46.2	10.4
LOS	D	D	A	E	B		C	D	A	C	D	B
Approach Delay		33.6			36.4			38.3			43.6	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	14.0	1.7	0.0	26.4	1.1		4.2	192.8	3.6	17.6	238.0	2.9
Queue Length 95th (m)	25.0	5.6	0.0	41.3	14.3		#21.8	#323.6	13.8	m21.3	m#247.2	m4.9
Internal Link Dist (m)		577.3			162.4			334.0			378.1	
Turn Bay Length (m)	75.0		100.0	50.0			110.0		40.0	150.0		90.0
Base Capacity (vph)	294	427	428	321	429		89	1062	931	186	1299	1091
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	0.24	0.02	0.06	0.40	0.24		0.44	0.96	0.15	0.57	0.95	0.04

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 93 (85%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 40.5 — Intersection LOS: D
Intersection Capacity Utilization 107.8% — ICU Level of Service G
Analysis Period (min) 15
Description: Phase 5
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Strandherd & Kennevale

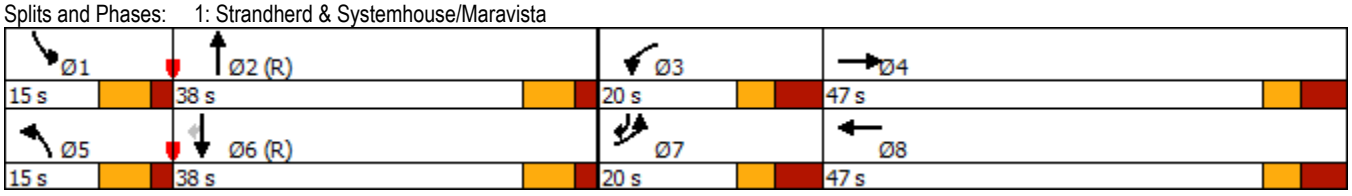


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	8	43	13	27	116	106	1398	14	26	698	6
Future Volume (vph)	61	8	43	13	27	116	106	1398	14	26	698	6
Satd. Flow (prot)	3216	1507	0	1658	1516	0	3216	3312	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1507	0	1658	1516	0	3216	3312	0	1658	3316	1450
Satd. Flow (RTOR)		43			116			1				102
Lane Group Flow (vph)	61	51	0	13	143	0	106	1412	0	26	698	6
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	20.0	47.0		20.0	47.0		15.0	38.0		15.0	38.0	20.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.7	22.5		6.6	15.9		9.2	68.1		7.4	61.3	68.1
Actuated g/C Ratio	0.06	0.19		0.06	0.13		0.08	0.57		0.06	0.51	0.57
v/c Ratio	0.30	0.16		0.14	0.48		0.43	0.75		0.25	0.41	0.01
Control Delay	56.8	14.1		57.1	16.3		73.4	17.5		59.1	23.0	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	56.8	14.1		57.1	16.3		73.4	17.5		59.1	23.0	0.0
LOS	E	B		E	B		E	B		E	C	A
Approach Delay		37.4			19.7			21.4			24.1	
Approach LOS		D			B			C			C	
Queue Length 50th (m)	7.2	1.5		3.0	6.0		12.7	131.8		6.0	48.5	0.0
Queue Length 95th (m)	13.9	9.9		9.4	18.8		m15.9	#285.2		14.9	103.6	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	332	526		171	575		257	1879		120	1694	923
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.18	0.10		0.08	0.25		0.41	0.75		0.22	0.41	0.01

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 22.8 — Intersection LOS: C
Intersection Capacity Utilization 80.2% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

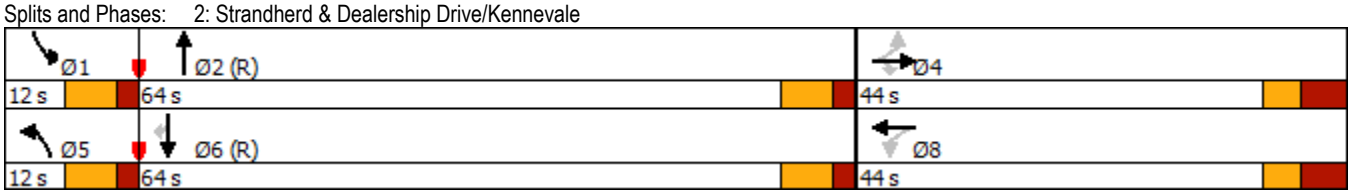


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	3	11	100	6	109	39	1380	86	50	684	43
Future Volume (vph)	19	3	11	100	6	109	39	1380	86	50	684	43
Satd. Flow (prot)	1658	1745	1483	1658	1478	0	3216	3282	0	1658	3316	1483
Flt Permitted	0.683			0.756			0.950			0.950		
Satd. Flow (perm)	1191	1745	1464	1318	1478	0	3216	3282	0	1658	3316	1463
Satd. Flow (RTOR)			94		109			7				102
Lane Group Flow (vph)	19	3	11	100	115	0	39	1466	0	50	684	43
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	64.0		12.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	17.9	17.9	17.9	17.9	17.9		6.4	75.7		8.1	79.8	79.8
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15		0.05	0.63		0.07	0.66	0.66
v/c Ratio	0.11	0.01	0.04	0.51	0.37		0.23	0.71		0.45	0.31	0.04
Control Delay	40.2	36.0	0.3	53.7	11.1		57.7	20.0		51.6	22.1	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	40.2	36.0	0.3	53.7	11.1		57.7	20.0		51.6	22.1	8.1
LOS	D	D	A	D	B		E	B		D	C	A
Approach Delay		26.5			30.9			21.0			23.2	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	4.1	0.6	0.0	22.7	1.3		4.5	113.9		11.2	75.7	1.7
Queue Length 95th (m)	9.0	2.8	0.0	32.4	14.3		10.4	#217.5		#29.3	105.7	13.7
Internal Link Dist (m)		459.3			162.4			334.0			761.8	
Turn Bay Length (m)	75.0		100.0	40.0			60.0			50.0		110.0
Base Capacity (vph)	361	529	509	399	524		171	2072		111	2205	1007
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.05	0.01	0.02	0.25	0.22		0.23	0.71		0.45	0.31	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 29 (24%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 22.6 — Intersection LOS: C
Intersection Capacity Utilization 68.9% — ICU Level of Service C
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

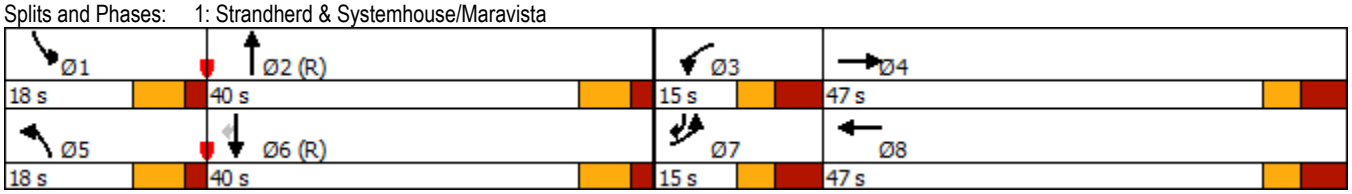


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	58	196	13	49	43	235	898	21	123	1200	26
Future Volume (vph)	69	58	196	13	49	43	235	898	21	123	1200	26
Satd. Flow (prot)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1450
Satd. Flow (RTOR)		151			39			2				102
Lane Group Flow (vph)	69	254	0	13	92	0	235	919	0	123	1200	26
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	15.0	47.0		15.0	47.0		18.0	40.0		18.0	40.0	15.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.0	23.4		6.4	17.4		13.0	56.4		13.3	56.7	62.8
Actuated g/C Ratio	0.06	0.20		0.05	0.14		0.11	0.47		0.11	0.47	0.52
v/c Ratio	0.37	0.61		0.15	0.34		0.67	0.59		0.67	0.77	0.03
Control Delay	59.9	22.6		57.5	28.0		52.4	35.5		69.3	33.0	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	59.9	22.6		57.5	28.0		52.4	35.5		69.3	33.0	0.1
LOS	E	C		E	C		D	D		E	C	A
Approach Delay		30.6			31.7			38.9			35.7	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	8.1	21.0		3.0	12.1		27.8	75.7		27.8	113.2	0.0
Queue Length 95th (m)	15.7	40.4		9.5	20.8		#45.7	#163.4		#58.5	#232.3	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	198	601		102	555		355	1554		188	1566	813
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.42		0.13	0.17		0.66	0.59		0.65	0.77	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 36.3 — Intersection LOS: D
Intersection Capacity Utilization 77.8% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

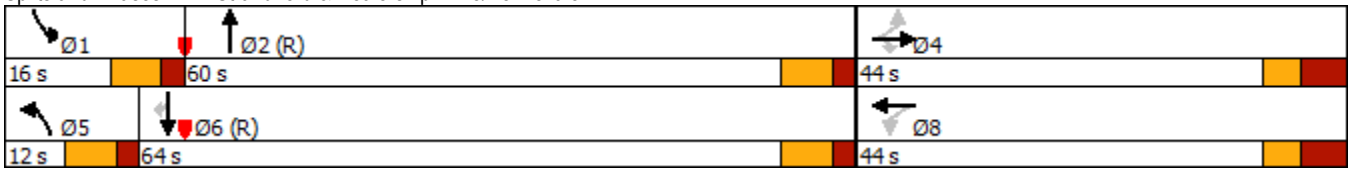


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	13	32	130	6	80	28	974	132	72	1340	31
Future Volume (vph)	92	13	32	130	6	80	28	974	132	72	1340	31
Satd. Flow (prot)	1658	1745	1483	1658	1482	0	3216	3247	0	1658	3316	1483
Flt Permitted	0.701			0.749			0.950			0.950		
Satd. Flow (perm)	1222	1745	1462	1304	1482	0	3216	3247	0	1658	3316	1463
Satd. Flow (RTOR)			94		80			16				102
Lane Group Flow (vph)	92	13	32	130	86	0	28	1106	0	72	1340	31
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	60.0		16.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	19.6	19.6	19.6	19.6	19.6		6.1	72.5		9.6	78.3	78.3
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16		0.05	0.60		0.08	0.65	0.65
v/c Ratio	0.46	0.05	0.10	0.61	0.28		0.17	0.56		0.55	0.62	0.03
Control Delay	50.3	36.9	0.6	56.8	11.2		56.9	18.3		67.8	12.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	50.3	36.9	0.6	56.8	11.2		56.9	18.3		67.8	12.3	0.0
LOS	D	D	A	E	B		E	B		E	B	A
Approach Delay		37.4			38.7			19.3			14.8	
Approach LOS		D			D			B			B	
Queue Length 50th (m)	20.3	2.7	0.0	29.4	1.2		3.2	78.5		17.9	38.8	0.0
Queue Length 95th (m)	30.3	6.9	0.0	41.3	12.7		8.1	137.8		m25.1	70.5	m0.0
Internal Link Dist (m)		459.3			162.4			334.0			761.8	
Turn Bay Length (m)	75.0		100.0	40.0			60.0			50.0		110.0
Base Capacity (vph)	370	529	508	395	505		164	1967		142	2162	989
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.25	0.02	0.06	0.33	0.17		0.17	0.56		0.51	0.62	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 19.4 — Intersection LOS: B
Intersection Capacity Utilization 75.5% — ICU Level of Service D
Analysis Period (min) 15
Description: Timing 13
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	52	276	12	70	67	410	908	18	79	1255	22
Future Volume (vph)	108	52	276	12	70	67	410	908	18	79	1255	22
Satd. Flow (prot)	3281	1520	0	1691	1624	0	3281	3370	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1520	0	1691	1624	0	3281	3370	0	1626	3382	1481
Satd. Flow (RTOR)		270			49			2				111
Lane Group Flow (vph)	108	328	0	12	137	0	410	926	0	79	1255	22
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		13.0	37.0		13.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	27.3		5.4	16.9		24.6	49.1		10.1	34.6	39.1
Actuated g/C Ratio	0.05	0.25		0.05	0.15		0.22	0.45		0.09	0.31	0.36
v/c Ratio	0.67	0.57		0.14	0.47		0.56	0.62		0.53	1.18	0.04
Control Delay	72.1	10.8		54.2	29.9		44.0	27.7		61.8	125.2	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.1	10.8		54.2	29.9		44.0	27.7		61.8	125.2	0.1
LOS	E	B		D	C		D	C		E	F	A
Approach Delay		26.0			31.8			32.7			119.4	
Approach LOS		C			C			C			F	
Queue Length 50th (m)	12.0	10.1		2.5	18.2		39.8	72.7		16.1	~154.8	0.0
Queue Length 95th (m)	#24.1	29.8		8.8	26.8		#101.4	#148.1		#43.3	#227.0	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	161	717		83	613		732	1505		149	1064	599
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.67	0.46		0.14	0.22		0.56	0.62		0.53	1.18	0.04

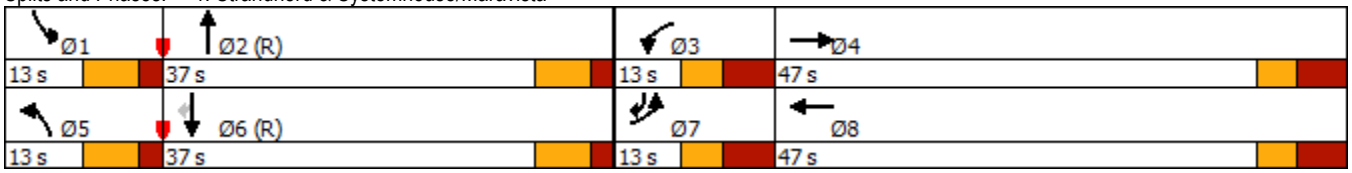
Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 67.7 — Intersection LOS: E
Intersection Capacity Utilization 100.7% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

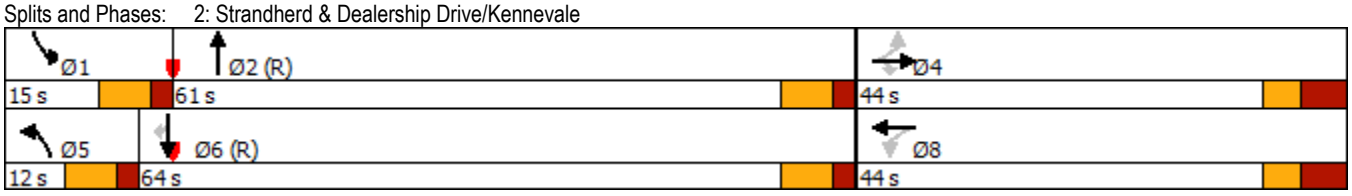


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	8	24	115	5	87	35	1213	129	95	1443	43
Future Volume (vph)	64	8	24	115	5	87	35	1213	129	95	1443	43
Satd. Flow (prot)	1691	1780	1513	1691	1493	0	3281	3298	0	1674	3382	1513
Flt Permitted	0.697			0.752			0.950			0.950		
Satd. Flow (perm)	1240	1780	1493	1337	1493	0	3281	3298	0	1674	3382	1492
Satd. Flow (RTOR)			94		87			12				102
Lane Group Flow (vph)	64	8	24	115	92	0	35	1342	0	95	1443	43
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	61.0		15.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	18.6	18.6	18.6	18.6	18.6		6.3	69.1		11.4	79.2	79.2
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16		0.05	0.58		0.10	0.66	0.66
v/c Ratio	0.33	0.03	0.08	0.56	0.30		0.20	0.70		0.60	0.65	0.04
Control Delay	46.5	36.6	0.5	54.9	11.0		57.3	22.5		68.3	17.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	46.5	36.6	0.5	54.9	11.0		57.3	22.5		68.3	17.2	0.1
LOS	D	D	A	D	B		E	C		E	B	A
Approach Delay		34.2			35.4			23.4			19.8	
Approach LOS		C			D			C			B	
Queue Length 50th (m)	14.0	1.7	0.0	26.1	1.1		4.1	109.3		21.4	104.4	0.0
Queue Length 95th (m)	22.3	5.0	0.0	36.7	12.7		9.5	#183.6		#50.8	192.9	0.0
Internal Link Dist (m)		459.3			162.4			334.0			761.8	
Turn Bay Length (m)	75.0		100.0	40.0			60.0			50.0		110.0
Base Capacity (vph)	376	539	518	405	513		171	1904		158	2230	1018
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.17	0.01	0.05	0.28	0.18		0.20	0.70		0.60	0.65	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 22.7 — Intersection LOS: C
Intersection Capacity Utilization 77.6% — ICU Level of Service D
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

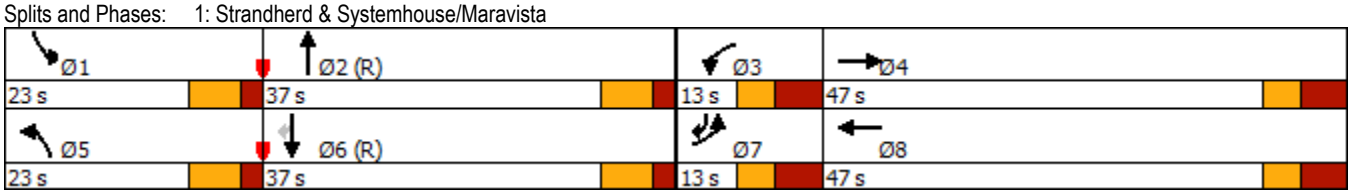


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	52	276	12	70	67	410	908	18	79	1255	22
Future Volume (vph)	108	52	276	12	70	67	410	908	18	79	1255	22
Satd. Flow (prot)	3281	1519	0	1691	1624	0	3281	3370	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1519	0	1691	1624	0	3281	3370	0	1626	3382	1479
Satd. Flow (RTOR)		237			43			2				102
Lane Group Flow (vph)	108	328	0	12	137	0	410	926	0	79	1255	22
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		23.0	37.0		23.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		19.5	59.6		11.1	48.6	53.1
Actuated g/C Ratio	0.04	0.22		0.04	0.15		0.16	0.50		0.09	0.40	0.44
v/c Ratio	0.73	0.64		0.16	0.49		0.77	0.55		0.52	0.92	0.03
Control Delay	84.5	17.8		60.0	35.1		50.9	35.8		63.5	46.3	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	84.5	17.8		60.0	35.1		50.9	35.8		63.5	46.3	0.1
LOS	F	B		E	D		D	D		E	D	A
Approach Delay		34.3			37.1			40.5			46.5	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	13.1	18.1		2.8	21.4		50.4	73.7		18.0	137.3	0.0
Queue Length 95th (m)	#27.3	41.6		9.2	31.4		#79.1	#169.6		32.6	#255.3	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	147	657		76	562		532	1673		222	1369	712
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.73	0.50		0.16	0.24		0.77	0.55		0.36	0.92	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 42.0 — Intersection LOS: D
Intersection Capacity Utilization 100.7% — ICU Level of Service G
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

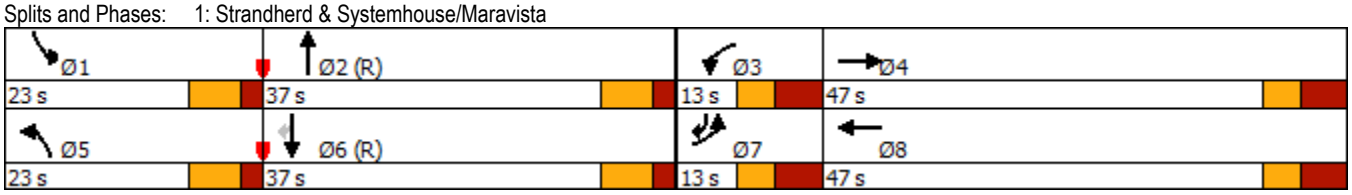


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	52	276	12	70	67	410	908	18	79	1238	22
Future Volume (vph)	108	52	276	12	70	67	410	908	18	79	1238	22
Satd. Flow (prot)	3281	1519	0	1691	1624	0	3281	3370	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1519	0	1691	1624	0	3281	3370	0	1626	3382	1479
Satd. Flow (RTOR)		237			43			2				102
Lane Group Flow (vph)	108	328	0	12	137	0	410	926	0	79	1238	22
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		23.0	37.0		23.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		19.5	59.6		11.1	48.6	53.1
Actuated g/C Ratio	0.04	0.22		0.04	0.15		0.16	0.50		0.09	0.40	0.44
v/c Ratio	0.73	0.64		0.16	0.49		0.77	0.55		0.52	0.90	0.03
Control Delay	84.5	17.8		60.0	35.1		50.9	35.8		63.5	45.0	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	84.5	17.8		60.0	35.1		50.9	35.8		63.5	45.0	0.1
LOS	F	B		E	D		D	D		E	D	A
Approach Delay		34.3			37.1			40.4			45.4	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	13.1	18.1		2.8	21.4		50.4	73.4		18.0	134.4	0.0
Queue Length 95th (m)	#27.3	41.6		9.2	31.4		#79.1	#169.6		32.6	#250.9	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	147	657		76	562		532	1673		222	1369	712
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.73	0.50		0.16	0.24		0.77	0.55		0.36	0.90	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 41.5 — Intersection LOS: D
Intersection Capacity Utilization 100.2% — ICU Level of Service G
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

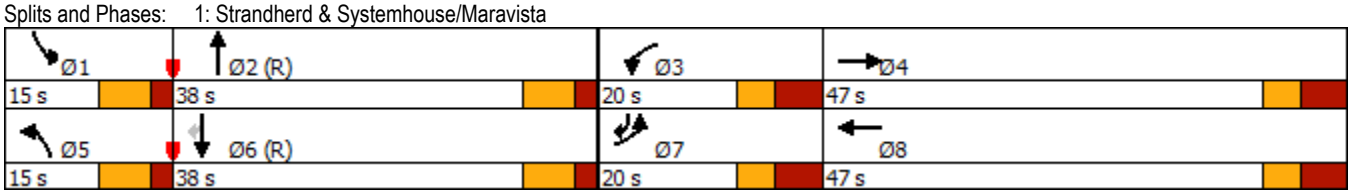


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	8	43	13	27	116	106	1435	14	26	797	6
Future Volume (vph)	61	8	43	13	27	116	106	1435	14	26	797	6
Satd. Flow (prot)	3216	1507	0	1658	1516	0	3216	3312	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1507	0	1658	1516	0	3216	3312	0	1658	3316	1450
Satd. Flow (RTOR)		43			116			1				102
Lane Group Flow (vph)	61	51	0	13	143	0	106	1449	0	26	797	6
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	20.0	47.0		20.0	47.0		15.0	38.0		15.0	38.0	20.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.7	22.5		6.6	15.9		9.2	68.1		7.4	61.3	68.1
Actuated g/C Ratio	0.06	0.19		0.06	0.13		0.08	0.57		0.06	0.51	0.57
v/c Ratio	0.30	0.16		0.14	0.48		0.43	0.77		0.25	0.47	0.01
Control Delay	56.8	14.1		57.1	16.3		72.6	18.9		59.1	23.9	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	56.8	14.1		57.1	16.3		72.6	18.9		59.1	23.9	0.0
LOS	E	B		E	B		E	B		E	C	A
Approach Delay		37.4			19.7			22.6			24.8	
Approach LOS		D			B			C			C	
Queue Length 50th (m)	7.2	1.5		3.0	6.0		12.8	140.5		6.0	57.6	0.0
Queue Length 95th (m)	13.9	9.9		9.4	18.8		m16.2	#295.3		14.9	#132.4	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	332	526		171	575		257	1879		120	1694	923
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.18	0.10		0.08	0.25		0.41	0.77		0.22	0.47	0.01

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 23.7 — Intersection LOS: C
Intersection Capacity Utilization 80.2% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

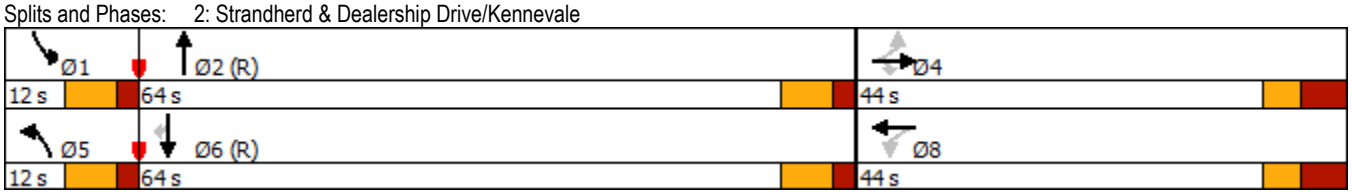


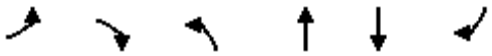
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	5	24	100	19	109	91	1380	86	51	688	68
Future Volume (vph)	56	5	24	100	19	109	91	1380	86	51	688	68
Satd. Flow (prot)	1658	1745	1483	1658	1504	0	3216	3282	0	1658	3316	1483
Flt Permitted	0.667			0.754			0.950			0.950		
Satd. Flow (perm)	1163	1745	1464	1314	1504	0	3216	3282	0	1658	3316	1463
Satd. Flow (RTOR)			94		109			7				102
Lane Group Flow (vph)	56	5	24	100	128	0	91	1466	0	51	688	68
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	64.0		12.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	17.9	17.9	17.9	17.9	17.9		7.8	75.6		8.1	73.4	73.4
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15		0.06	0.63		0.07	0.61	0.61
v/c Ratio	0.32	0.02	0.08	0.51	0.40		0.44	0.71		0.46	0.34	0.07
Control Delay	47.0	36.4	0.5	53.7	13.8		60.9	20.1		51.0	25.7	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	47.0	36.4	0.5	53.7	13.8		60.9	20.1		51.0	25.7	11.6
LOS	D	D	A	D	B		E	C		D	C	B
Approach Delay		33.3			31.3			22.5			26.1	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	12.4	1.1	0.0	22.7	4.1		10.7	114.2		11.7	78.6	4.4
Queue Length 95th (m)	20.2	3.9	0.0	32.4	17.3		#20.5	#217.5		#29.2	106.4	23.2
Internal Link Dist (m)		89.0			162.4			334.0			95.1	
Turn Bay Length (m)	75.0			40.0			60.0			50.0		
Base Capacity (vph)	352	529	509	398	532		209	2069		112	2027	934
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.16	0.01	0.05	0.25	0.24		0.44	0.71		0.46	0.34	0.07

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 29 (24%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 24.7 — Intersection LOS: C
Intersection Capacity Utilization 80.4% — ICU Level of Service D
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

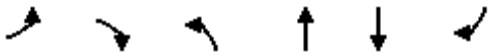




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	5	0	1545	822	54
Future Volume (Veh/h)	0	5	0	1545	822	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	5	0	1545	822	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				271		
pX, platoon unblocked	0.69					
vC, conflicting volume	1622	438	876			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1012	438	876			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	163	567	766			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	5	772	772	548	328
Volume Left	0	0	0	0	0
Volume Right	5	0	0	0	54
cSH	567	1700	1700	1700	1700
Volume to Capacity	0.01	0.45	0.45	0.32	0.19
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0
Control Delay (s)	11.4	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	11.4	0.0		0.0	
Approach LOS	B				

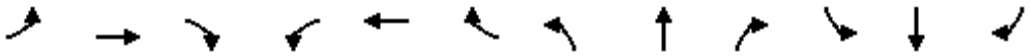
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	48.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1545	807	20
Future Volume (Veh/h)	0	0	0	1545	807	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	1545	807	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				119		
pX, platoon unblocked	0.69					
vC, conflicting volume	1590	279	827			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	965	279	827			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	175	718	800			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	772	772	323	323	181
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	20
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.45	0.45	0.19	0.19	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

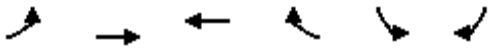
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	50	0	40	103	33	0	0	15	19	0	0
Future Volume (Veh/h)	0	50	0	40	103	33	0	0	15	19	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	50	0	40	103	33	0	0	15	19	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					113							
pX, platoon unblocked												
vC, conflicting volume	136			50			233	266	25	223	233	103
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136			50			233	266	25	223	233	103
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	99	97	100	100
cM capacity (veh/h)	1446			1555			688	622	1045	689	649	932

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	25	25	143	33	15	19
Volume Left	0	0	40	0	0	19
Volume Right	0	0	0	33	15	0
cSH	1446	1700	1555	1700	1045	689
Volume to Capacity	0.00	0.01	0.03	0.02	0.01	0.03
Queue Length 95th (m)	0.0	0.0	0.6	0.0	0.3	0.6
Control Delay (s)	0.0	0.0	2.2	0.0	8.5	10.4
Lane LOS			A		A	B
Approach Delay (s)	0.0		1.8		8.5	10.4
Approach LOS					A	B

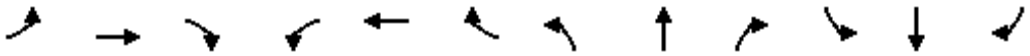
Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	29.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	23	54	49	27	0
Future Volume (Veh/h)	0	23	54	49	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	23	54	49	27	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			192			
pX, platoon unblocked						
vC, conflicting volume	103				102	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	103				102	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1489				897	982

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	23	103	27
Volume Left	0	0	27
Volume Right	0	49	0
cSH	1489	1700	897
Volume to Capacity	0.00	0.06	0.03
Queue Length 95th (m)	0.0	0.0	0.7
Control Delay (s)	0.0	0.0	9.1
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	16.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	13	0	9	38	7	0	0	5	5	0	0
Future Volume (Veh/h)	0	13	0	9	38	7	0	0	5	5	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	13	0	9	38	7	0	0	5	5	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					269							
pX, platoon unblocked												
vC, conflicting volume	45			13			72	76	13	78	72	42
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			13			72	76	13	78	72	42
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	99	100	100
cM capacity (veh/h)	1563			1606			914	810	1067	903	813	1029

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	54	5	5
Volume Left	0	9	0	5
Volume Right	0	7	5	0
cSH	1563	1606	1067	903
Volume to Capacity	0.00	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.1	0.1
Control Delay (s)	0.0	1.2	8.4	9.0
Lane LOS		A	A	A
Approach Delay (s)	0.0	1.2	8.4	9.0
Approach LOS			A	A

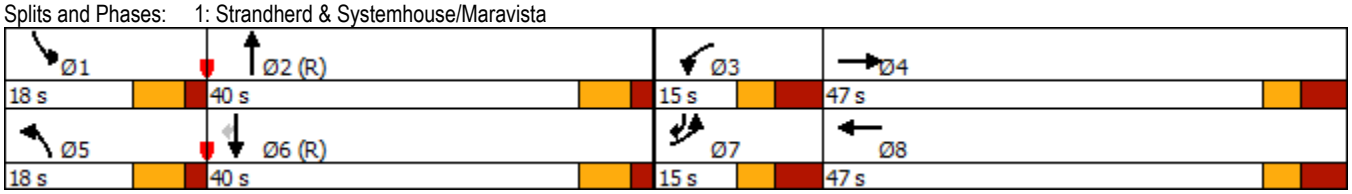
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	20.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	58	196	13	49	43	235	993	21	123	1256	26
Future Volume (vph)	69	58	196	13	49	43	235	993	21	123	1256	26
Satd. Flow (prot)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1450
Satd. Flow (RTOR)		151			39			2				102
Lane Group Flow (vph)	69	254	0	13	92	0	235	1014	0	123	1256	26
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	15.0	47.0		15.0	47.0		18.0	40.0		18.0	40.0	15.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.0	23.4		6.4	17.4		13.0	56.4		13.3	56.7	62.8
Actuated g/C Ratio	0.06	0.20		0.05	0.14		0.11	0.47		0.11	0.47	0.52
v/c Ratio	0.37	0.61		0.15	0.34		0.67	0.65		0.67	0.80	0.03
Control Delay	59.9	22.6		57.5	28.0		51.7	38.0		69.3	34.3	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	59.9	22.6		57.5	28.0		51.7	38.0		69.3	34.3	0.1
LOS	E	C		E	C		D	D		E	C	A
Approach Delay		30.6			31.7			40.6			36.8	
Approach LOS		C			C			D			D	
Queue Length 50th (m)	8.1	21.0		3.0	12.1		28.0	124.8		27.8	121.8	0.0
Queue Length 95th (m)	15.7	40.4		9.5	20.8		#45.9	#189.2		#58.5	#247.0	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	198	601		102	555		355	1554		188	1566	813
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.42		0.13	0.17		0.66	0.65		0.65	0.80	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 37.5 — Intersection LOS: D
Intersection Capacity Utilization 79.5% — ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

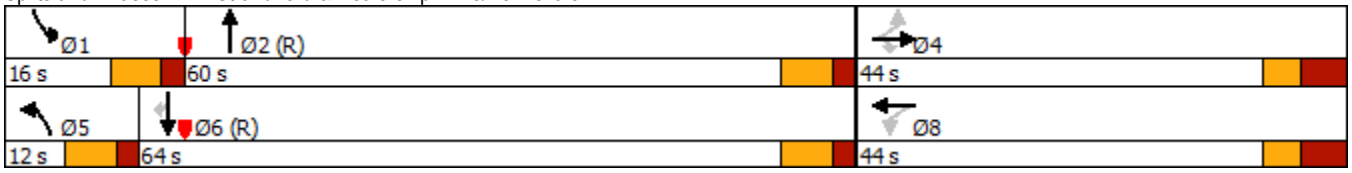


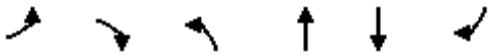
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	19	62	130	11	80	54	974	132	79	1360	56
Future Volume (vph)	187	19	62	130	11	80	54	974	132	79	1360	56
Satd. Flow (prot)	1658	1745	1483	1658	1496	0	3216	3247	0	1658	3316	1483
Flt Permitted	0.698			0.745			0.950			0.950		
Satd. Flow (perm)	1217	1745	1462	1297	1496	0	3216	3247	0	1658	3316	1463
Satd. Flow (RTOR)			94		80			16				102
Lane Group Flow (vph)	187	19	62	130	91	0	54	1106	0	79	1360	56
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	60.0		16.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	24.4	24.4	24.4	24.4	24.4		6.7	67.3		10.1	70.4	70.4
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20		0.06	0.56		0.08	0.59	0.59
v/c Ratio	0.76	0.05	0.17	0.49	0.25		0.30	0.60		0.57	0.70	0.06
Control Delay	63.0	34.5	3.2	47.0	10.9		58.9	21.7		74.9	12.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	63.0	34.5	3.2	47.0	10.9		58.9	21.7		74.9	12.9	0.1
LOS	E	C	A	D	B		E	C		E	B	A
Approach Delay		47.1			32.1			23.4			15.7	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	42.0	3.7	0.0	27.5	2.1		6.3	91.7		19.8	31.7	0.0
Queue Length 95th (m)	59.6	8.8	4.4	41.3	13.8		13.1	137.8		m26.6	73.1	m0.0
Internal Link Dist (m)		89.0			162.4			334.0			95.1	
Turn Bay Length (m)	75.0			40.0			60.0			50.0		
Base Capacity (vph)	369	529	508	393	509		180	1829		145	1945	900
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.51	0.04	0.12	0.33	0.18		0.30	0.60		0.54	0.70	0.06

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 22.4 — Intersection LOS: C
Intersection Capacity Utilization 79.5% — ICU Level of Service D
Analysis Period (min) 15
Description: Timing 13
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

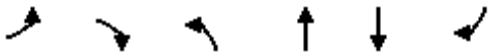




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	27	0	1241	1482	17
Future Volume (Veh/h)	0	27	0	1241	1482	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	27	0	1241	1482	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				271		
pX, platoon unblocked	0.79					
vC, conflicting volume	2111	750	1499			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1868	750	1499			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	100			
cM capacity (veh/h)	50	354	443			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	27	620	620	988	511
Volume Left	0	0	0	0	0
Volume Right	27	0	0	0	17
cSH	354	1700	1700	1700	1700
Volume to Capacity	0.08	0.36	0.36	0.58	0.30
Queue Length 95th (m)	1.9	0.0	0.0	0.0	0.0
Control Delay (s)	16.0	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	16.0	0.0		0.0	
Approach LOS	C				

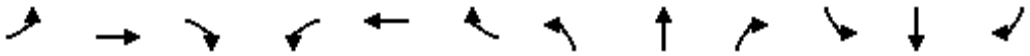
Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1241	1495	14
Future Volume (Veh/h)	0	0	0	1241	1495	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	1241	1495	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				119		
pX, platoon unblocked	0.78					
vC, conflicting volume	2122	505	1509			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1870	505	1509			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	50	512	439			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	620	620	598	598	313
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	14
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.36	0.36	0.35	0.35	0.18
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

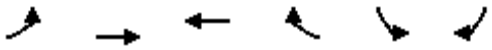
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	155	0	29	68	23	0	0	57	56	0	0
Future Volume (Veh/h)	0	155	0	29	68	23	0	0	57	56	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	155	0	29	68	23	0	0	57	56	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					113							
pX, platoon unblocked												
vC, conflicting volume	91			155			281	304	78	260	281	68
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	91			155			281	304	78	260	281	68
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	94	91	100	100
cM capacity (veh/h)	1502			1423			639	596	968	622	613	981

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	78	78	97	23	57	56
Volume Left	0	0	29	0	0	56
Volume Right	0	0	0	23	57	0
cSH	1502	1700	1423	1700	968	622
Volume to Capacity	0.00	0.05	0.02	0.01	0.06	0.09
Queue Length 95th (m)	0.0	0.0	0.5	0.0	1.4	2.2
Control Delay (s)	0.0	0.0	2.4	0.0	9.0	11.4
Lane LOS			A		A	B
Approach Delay (s)	0.0		1.9		9.0	11.4
Approach LOS					A	B

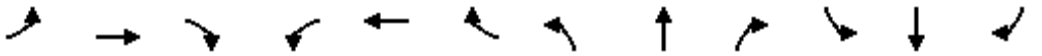
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	29.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	87	43	25	68	0
Future Volume (Veh/h)	0	87	43	25	68	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	87	43	25	68	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			192			
pX, platoon unblocked						
vC, conflicting volume	68				142	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	68				142	56
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				92	100
cM capacity (veh/h)	1533				850	1011

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	87	68	68
Volume Left	0	0	68
Volume Right	0	25	0
cSH	1533	1700	850
Volume to Capacity	0.00	0.04	0.08
Queue Length 95th (m)	0.0	0.0	2.0
Control Delay (s)	0.0	0.0	9.6
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.6
Approach LOS			A

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	41	0	9	27	7	0	0	39	7	0	0
Future Volume (Veh/h)	0	41	0	9	27	7	0	0	39	7	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	41	0	9	27	7	0	0	39	7	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					269							
pX, platoon unblocked												
vC, conflicting volume	34			41			90	93	41	128	90	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	34			41			90	93	41	128	90	30
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	96	99	100	100
cM capacity (veh/h)	1578			1568			891	792	1030	809	796	1044

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	41	43	39	7
Volume Left	0	9	0	7
Volume Right	0	7	39	0
cSH	1578	1568	1030	809
Volume to Capacity	0.00	0.01	0.04	0.01
Queue Length 95th (m)	0.0	0.1	0.9	0.2
Control Delay (s)	0.0	1.6	8.6	9.5
Lane LOS		A	A	A
Approach Delay (s)	0.0	1.6	8.6	9.5
Approach LOS			A	A

Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	21.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	52	276	12	70	67	410	973	18	79	1340	22
Future Volume (vph)	108	52	276	12	70	67	410	973	18	79	1340	22
Satd. Flow (prot)	3281	1520	0	1691	1624	0	3281	3370	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1520	0	1691	1624	0	3281	3370	0	1626	3382	1481
Satd. Flow (RTOR)		269			49			2				111
Lane Group Flow (vph)	108	328	0	12	137	0	410	991	0	79	1340	22
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		13.0	37.0		13.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	27.3		5.4	16.9		24.6	49.1		10.1	34.6	39.1
Actuated g/C Ratio	0.05	0.25		0.05	0.15		0.22	0.45		0.09	0.31	0.36
v/c Ratio	0.67	0.57		0.14	0.47		0.56	0.66		0.53	1.26	0.04
Control Delay	72.1	10.9		54.2	29.9		44.0	28.7		61.8	157.7	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	72.1	10.9		54.2	29.9		44.0	28.7		61.8	157.7	0.1
LOS	E	B		D	C		D	C		E	F	A
Approach Delay		26.0			31.8			33.2			150.0	
Approach LOS		C			C			C			F	
Queue Length 50th (m)	12.0	10.3		2.5	18.2		39.8	80.0		16.1	~174.8	0.0
Queue Length 95th (m)	#24.1	30.0		8.8	26.8		#101.4	#164.1		#43.3	#247.5	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	161	717		83	613		732	1505		149	1064	599
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.67	0.46		0.14	0.22		0.56	0.66		0.53	1.26	0.04

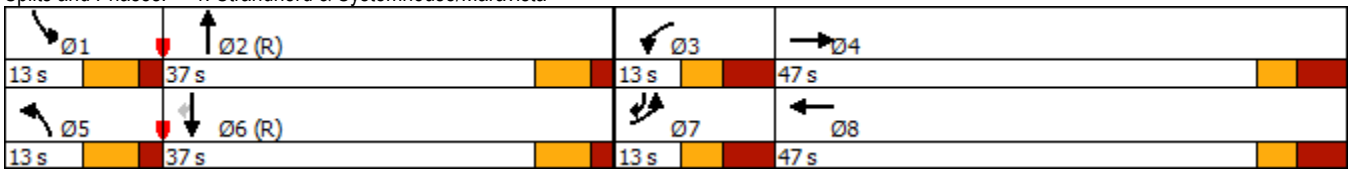
Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 81.3 — Intersection LOS: F
Intersection Capacity Utilization 103.1% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

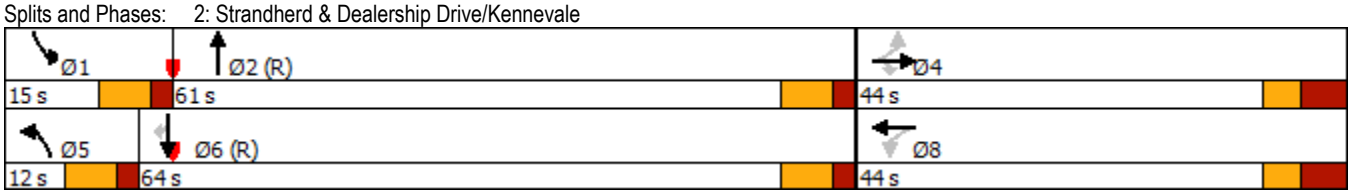


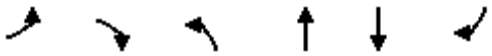
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	129	12	48	115	13	87	76	1213	129	97	1448	79
Future Volume (vph)	129	12	48	115	13	87	76	1213	129	97	1448	79
Satd. Flow (prot)	1691	1780	1513	1691	1515	0	3281	3298	0	1674	3382	1513
Flt Permitted	0.692			0.750			0.950			0.950		
Satd. Flow (perm)	1231	1780	1493	1334	1515	0	3281	3298	0	1674	3382	1492
Satd. Flow (RTOR)			94		87			12				102
Lane Group Flow (vph)	129	12	48	115	100	0	76	1342	0	97	1448	79
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	61.0		15.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	20.0	20.0	20.0	20.0	20.0		7.3	67.5		11.6	74.4	74.4
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.06	0.56		0.10	0.62	0.62
v/c Ratio	0.63	0.04	0.15	0.52	0.31		0.38	0.72		0.60	0.69	0.08
Control Delay	58.2	36.4	1.3	51.6	12.3		60.1	23.9		68.2	20.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	58.2	36.4	1.3	51.6	12.3		60.1	23.9		68.2	20.2	1.9
LOS	E	D	A	D	B		E	C		E	C	A
Approach Delay		42.4			33.3			25.8			22.2	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	29.2	2.5	0.0	25.5	2.7		8.9	115.6		21.8	115.7	0.0
Queue Length 95th (m)	41.2	6.6	0.8	36.7	14.6		17.2	#183.6		#51.8	194.2	5.1
Internal Link Dist (m)		89.0			162.4			334.0			95.1	
Turn Bay Length (m)	75.0			40.0			60.0			50.0		
Base Capacity (vph)	373	539	518	404	520		198	1861		161	2095	963
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.35	0.02	0.09	0.28	0.19		0.38	0.72		0.60	0.69	0.08

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 25.5 — Intersection LOS: C
Intersection Capacity Utilization 78.5% — ICU Level of Service D
Analysis Period (min) 15
Description: Timing 13
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

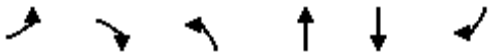




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	7	0	1429	1640	26
Future Volume (Veh/h)	0	7	0	1429	1640	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	7	0	1429	1640	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				271		
pX, platoon unblocked	0.71					
vC, conflicting volume	2368	833	1666			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2108	833	1666			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	31	312	382			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	7	714	714	1093	573
Volume Left	0	0	0	0	0
Volume Right	7	0	0	0	26
cSH	312	1700	1700	1700	1700
Volume to Capacity	0.02	0.42	0.42	0.64	0.34
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.0
Control Delay (s)	16.8	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	16.8	0.0		0.0	
Approach LOS	C				

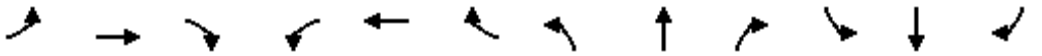
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	58.7%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1429	1624	22
Future Volume (Veh/h)	0	0	0	1429	1624	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	1429	1624	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				119		
pX, platoon unblocked	0.70					
vC, conflicting volume	2350	552	1646			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2077	552	1646			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	33	477	389			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	714	714	650	650	347
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	22
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.42	0.42	0.38	0.38	0.20
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

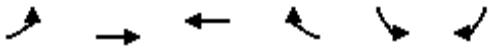
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	45.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	108	0	27	103	37	0	0	41	41	0	0
Future Volume (Veh/h)	0	108	0	27	103	37	0	0	41	41	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	108	0	27	103	37	0	0	41	41	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					113							
pX, platoon unblocked												
vC, conflicting volume	140			108			265	302	54	252	265	103
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	140			108			265	302	54	252	265	103
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	96	94	100	100
cM capacity (veh/h)	1441			1480			657	598	1002	644	628	932

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	54	54	130	37	41	41
Volume Left	0	0	27	0	0	41
Volume Right	0	0	0	37	41	0
cSH	1441	1700	1480	1700	1002	644
Volume to Capacity	0.00	0.03	0.02	0.02	0.04	0.06
Queue Length 95th (m)	0.0	0.0	0.4	0.0	1.0	1.5
Control Delay (s)	0.0	0.0	1.7	0.0	8.7	11.0
Lane LOS			A		A	B
Approach Delay (s)	0.0		1.3		8.7	11.0
Approach LOS					A	B

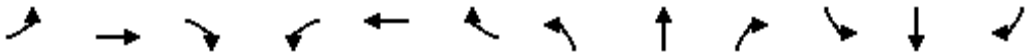
Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	29.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	63	65	38	45	0
Future Volume (Veh/h)	0	63	65	38	45	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	63	65	38	45	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			192			
pX, platoon unblocked						
vC, conflicting volume	103				147	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	103				147	84
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				95	100
cM capacity (veh/h)	1489				845	975

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	63	103	45
Volume Left	0	0	45
Volume Right	0	38	0
cSH	1489	1700	845
Volume to Capacity	0.00	0.06	0.05
Queue Length 95th (m)	0.0	0.0	1.3
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	27	0	14	40	11	0	0	28	8	0	0
Future Volume (Veh/h)	0	27	0	14	40	11	0	0	28	8	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	27	0	14	40	11	0	0	28	8	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					269							
pX, platoon unblocked												
vC, conflicting volume	51			27			100	106	27	128	100	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	51			27			100	106	27	128	100	46
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	97	99	100	100
cM capacity (veh/h)	1555			1587			875	777	1048	816	783	1024

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	27	65	28	8
Volume Left	0	14	0	8
Volume Right	0	11	28	0
cSH	1555	1587	1048	816
Volume to Capacity	0.00	0.01	0.03	0.01
Queue Length 95th (m)	0.0	0.2	0.6	0.2
Control Delay (s)	0.0	1.6	8.5	9.5
Lane LOS		A	A	A
Approach Delay (s)	0.0	1.6	8.5	9.5
Approach LOS			A	A

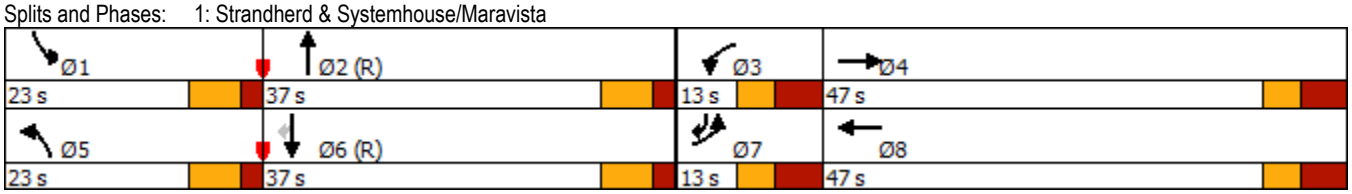
Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	52	276	12	70	67	410	973	18	79	1340	22
Future Volume (vph)	108	52	276	12	70	67	410	973	18	79	1340	22
Satd. Flow (prot)	3281	1519	0	1691	1624	0	3281	3370	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1519	0	1691	1624	0	3281	3370	0	1626	3382	1479
Satd. Flow (RTOR)		237			43			1				102
Lane Group Flow (vph)	108	328	0	12	137	0	410	991	0	79	1340	22
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		23.0	37.0		23.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		19.5	59.6		11.1	48.6	53.1
Actuated g/C Ratio	0.04	0.22		0.04	0.15		0.16	0.50		0.09	0.40	0.44
v/c Ratio	0.73	0.64		0.16	0.49		0.77	0.59		0.52	0.98	0.03
Control Delay	84.5	17.8		60.0	35.1		50.2	36.7		63.5	55.8	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	84.5	17.8		60.0	35.1		50.2	36.7		63.5	55.8	0.1
LOS	F	B		E	D		D	D		E	E	A
Approach Delay		34.3			37.1			40.7			55.4	
Approach LOS		C			D			D			E	
Queue Length 50th (m)	13.1	18.1		2.8	21.4		50.3	91.4		18.0	152.6	0.0
Queue Length 95th (m)	#27.3	41.6		9.2	31.4		#77.7	#188.0		32.6	#277.4	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	147	657		76	562		532	1673		222	1369	712
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.73	0.50		0.16	0.24		0.77	0.59		0.36	0.98	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 45.9 — Intersection LOS: D
Intersection Capacity Utilization 103.1% — ICU Level of Service G
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

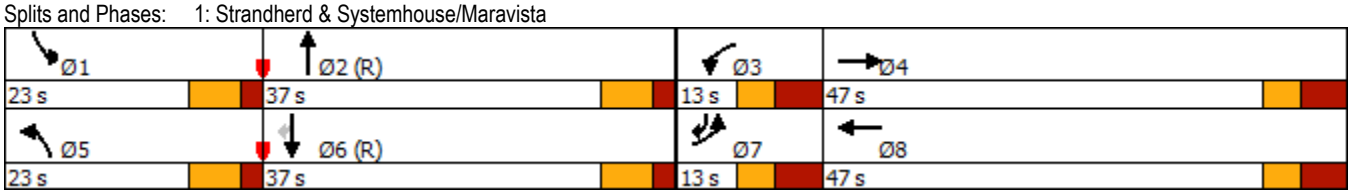


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	52	276	12	70	67	410	973	18	79	1238	22
Future Volume (vph)	108	52	276	12	70	67	410	973	18	79	1238	22
Satd. Flow (prot)	3281	1519	0	1691	1624	0	3281	3370	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1519	0	1691	1624	0	3281	3370	0	1626	3382	1479
Satd. Flow (RTOR)		237			43			1				102
Lane Group Flow (vph)	108	328	0	12	137	0	410	991	0	79	1238	22
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		23.0	37.0		23.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		19.5	59.6		11.1	48.6	53.1
Actuated g/C Ratio	0.04	0.22		0.04	0.15		0.16	0.50		0.09	0.40	0.44
v/c Ratio	0.73	0.64		0.16	0.49		0.77	0.59		0.52	0.90	0.03
Control Delay	84.5	17.8		60.0	35.1		50.2	36.7		63.5	45.0	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	84.5	17.8		60.0	35.1		50.2	36.7		63.5	45.0	0.1
LOS	F	B		E	D		D	D		E	D	A
Approach Delay		34.3			37.1			40.7			45.4	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	13.1	18.1		2.8	21.4		50.3	91.4		18.0	134.4	0.0
Queue Length 95th (m)	#27.3	41.6		9.2	31.4		#77.7	#188.0		32.6	#250.9	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	147	657		76	562		532	1673		222	1369	712
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.73	0.50		0.16	0.24		0.77	0.59		0.36	0.90	0.03

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 41.6 — Intersection LOS: D
Intersection Capacity Utilization 100.2% — ICU Level of Service G
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

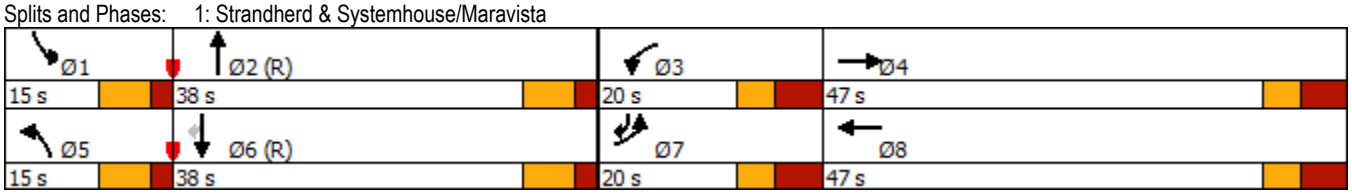


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	9	46	13	32	116	129	1580	14	26	817	70
Future Volume (vph)	69	9	46	13	32	116	129	1580	14	26	817	70
Satd. Flow (prot)	3216	1509	0	1658	1524	0	3216	3312	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1509	0	1658	1524	0	3216	3312	0	1658	3316	1450
Satd. Flow (RTOR)		46			116			1				102
Lane Group Flow (vph)	69	55	0	13	148	0	129	1594	0	26	817	70
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	20.0	47.0		20.0	47.0		15.0	38.0		15.0	38.0	20.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	8.0	25.5		6.6	16.0		9.7	65.1		7.4	57.8	64.9
Actuated g/C Ratio	0.07	0.21		0.06	0.13		0.08	0.54		0.06	0.48	0.54
v/c Ratio	0.32	0.15		0.14	0.49		0.50	0.89		0.25	0.51	0.08
Control Delay	57.0	13.5		57.1	17.1		76.2	20.1		59.1	25.7	1.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	57.0	13.5		57.1	17.1		76.2	20.1		59.1	25.7	1.9
LOS	E	B		E	B		E	C		E	C	A
Approach Delay		37.7			20.4			24.3			24.9	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	8.1	1.7		3.0	7.2		16.7	85.6		6.0	61.0	0.0
Queue Length 95th (m)	15.3	10.3		9.4	19.9		m17.3	#334.1		14.9	#138.1	4.1
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	332	530		171	578		266	1796		120	1596	883
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.21	0.10		0.08	0.26		0.48	0.89		0.22	0.51	0.08

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 24.8 — Intersection LOS: C
Intersection Capacity Utilization 88.8% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

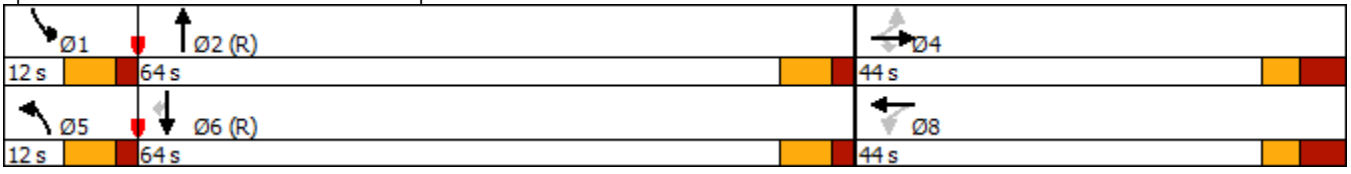


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	4	15	100	8	109	50	1574	86	50	776	74
Future Volume (vph)	30	4	15	100	8	109	50	1574	86	50	776	74
Satd. Flow (prot)	1658	1745	1483	1658	1482	0	3216	3285	0	1658	3316	1483
Flt Permitted	0.682			0.755			0.950			0.950		
Satd. Flow (perm)	1189	1745	1464	1316	1482	0	3216	3285	0	1658	3316	1463
Satd. Flow (RTOR)			94		105			6				102
Lane Group Flow (vph)	30	4	15	100	117	0	50	1660	0	50	776	74
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	64.0		12.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	17.9	17.9	17.9	17.9	17.9		6.6	75.7		8.1	77.0	77.0
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15		0.06	0.63		0.07	0.64	0.64
v/c Ratio	0.17	0.02	0.05	0.51	0.38		0.28	0.80		0.45	0.36	0.08
Control Delay	42.2	36.5	0.3	53.7	12.5		58.6	23.1		50.0	28.1	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	42.2	36.5	0.3	53.7	12.5		58.6	23.1		50.0	28.1	12.1
LOS	D	D	A	D	B		E	C		D	C	B
Approach Delay		28.9			31.5			24.1			28.0	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	6.5	0.8	0.0	22.7	2.6		5.8	144.5		11.3	97.7	5.3
Queue Length 95th (m)	12.4	3.3	0.0	32.4	15.4		12.5	#268.4		m#26.6	120.8	25.4
Internal Link Dist (m)		459.3			162.4			334.0			761.8	
Turn Bay Length (m)	75.0		100.0	40.0			60.0			50.0		110.0
Base Capacity (vph)	360	529	509	399	522		177	2073		111	2127	975
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.08	0.01	0.03	0.25	0.22		0.28	0.80		0.45	0.36	0.08

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 29 (24%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 26.0 — Intersection LOS: C
Intersection Capacity Utilization 73.8% — ICU Level of Service D
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

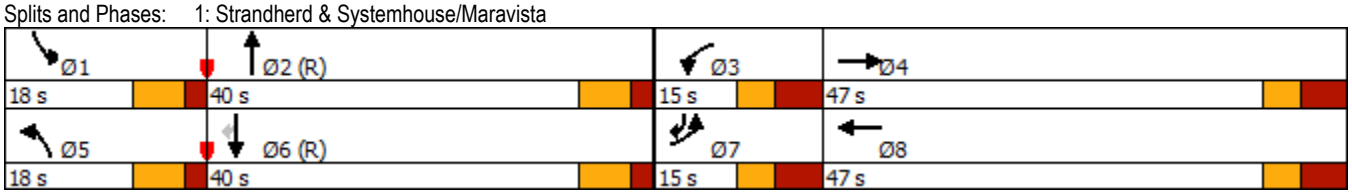


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	62	214	13	49	43	236	1031	21	123	1362	30
Future Volume (vph)	119	62	214	13	49	43	236	1031	21	123	1362	30
Satd. Flow (prot)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1450
Satd. Flow (RTOR)		154			39			2				102
Lane Group Flow (vph)	119	276	0	13	92	0	236	1052	0	123	1362	30
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	15.0	47.0		15.0	47.0		18.0	40.0		18.0	40.0	15.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.3	26.8		6.4	17.8		13.1	53.1		13.3	53.3	59.7
Actuated g/C Ratio	0.06	0.22		0.05	0.15		0.11	0.44		0.11	0.44	0.50
v/c Ratio	0.61	0.60		0.15	0.34		0.67	0.72		0.67	0.93	0.04
Control Delay	68.7	23.2		57.5	27.6		50.5	41.1		69.3	44.2	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.7	23.2		57.5	27.6		50.5	41.1		69.3	44.2	0.1
LOS	E	C		E	C		D	D		E	D	A
Approach Delay		36.9			31.3			42.9			45.3	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	14.3	25.6		3.0	12.1		27.8	130.3		27.8	139.4	0.0
Queue Length 95th (m)	24.0	45.8		9.5	20.8		#46.3	#200.0		#58.5	#274.8	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	198	603		102	555		355	1462		188	1472	775
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.60	0.46		0.13	0.17		0.66	0.72		0.65	0.93	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 42.9 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

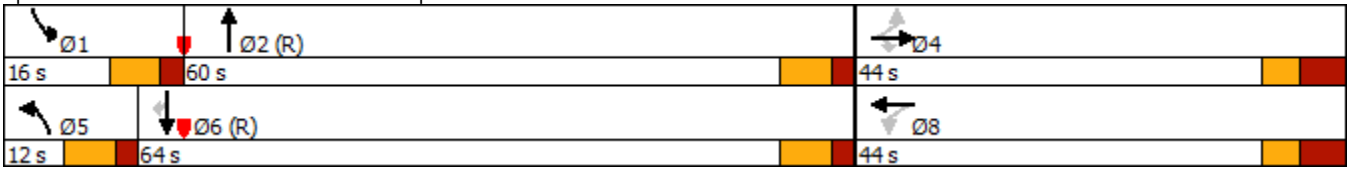


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	15	43	130	8	80	36	1088	132	72	1513	52
Future Volume (vph)	124	15	43	130	8	80	36	1088	132	72	1513	52
Satd. Flow (prot)	1658	1745	1483	1658	1489	0	3216	3255	0	1658	3316	1483
Flt Permitted	0.700			0.748			0.950			0.950		
Satd. Flow (perm)	1220	1745	1462	1302	1489	0	3216	3255	0	1658	3316	1463
Satd. Flow (RTOR)			94		80			14				102
Lane Group Flow (vph)	124	15	43	130	88	0	36	1220	0	72	1513	52
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	60.0		16.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	19.8	19.8	19.8	19.8	19.8		6.3	72.3		9.6	78.0	78.0
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16		0.05	0.60		0.08	0.65	0.65
v/c Ratio	0.62	0.05	0.13	0.61	0.28		0.21	0.62		0.55	0.70	0.05
Control Delay	57.9	37.1	0.9	56.5	11.6		57.5	19.8		69.2	12.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	57.9	37.1	0.9	56.5	11.6		57.5	19.8		69.2	12.0	0.1
LOS	E	D	A	E	B		E	B		E	B	A
Approach Delay		42.7			38.4			20.8			14.2	
Approach LOS		D			D			C			B	
Queue Length 50th (m)	28.1	3.1	0.0	29.4	1.7		4.2	92.1		18.0	23.8	0.0
Queue Length 95th (m)	39.9	7.6	0.0	41.3	13.2		9.7	160.2		m21.6	m#97.3	m0.0
Internal Link Dist (m)		459.3			162.4			334.0			761.8	
Turn Bay Length (m)	75.0		100.0	40.0			60.0			50.0		110.0
Base Capacity (vph)	370	529	508	394	507		169	1967		142	2154	986
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.34	0.03	0.08	0.33	0.17		0.21	0.62		0.51	0.70	0.05

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 19.9 — Intersection LOS: B
Intersection Capacity Utilization 80.5% — ICU Level of Service D
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

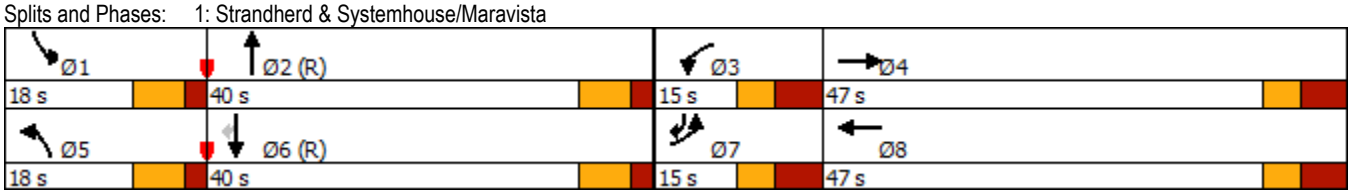


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	62	214	13	49	43	236	1031	21	123	1332	30
Future Volume (vph)	119	62	214	13	49	43	236	1031	21	123	1332	30
Satd. Flow (prot)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1450
Satd. Flow (RTOR)		154			39			2				102
Lane Group Flow (vph)	119	276	0	13	92	0	236	1052	0	123	1332	30
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	15.0	47.0		15.0	47.0		18.0	40.0		18.0	40.0	15.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.3	26.8		6.4	17.8		13.1	53.1		13.3	53.3	59.7
Actuated g/C Ratio	0.06	0.22		0.05	0.15		0.11	0.44		0.11	0.44	0.50
v/c Ratio	0.61	0.60		0.15	0.34		0.67	0.72		0.67	0.90	0.04
Control Delay	68.7	23.2		57.5	27.6		50.5	41.1		69.3	42.1	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.7	23.2		57.5	27.6		50.5	41.1		69.3	42.1	0.1
LOS	E	C		E	C		D	D		E	D	A
Approach Delay		36.9			31.3			42.9			43.5	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	14.3	25.6		3.0	12.1		27.8	130.3		27.8	134.3	0.0
Queue Length 95th (m)	24.0	45.8		9.5	20.8		#46.3	#200.0		#58.5	#266.8	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	198	603		102	555		355	1462		188	1472	775
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.60	0.46		0.13	0.17		0.66	0.72		0.65	0.90	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 42.0 — Intersection LOS: D
Intersection Capacity Utilization 82.9% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista



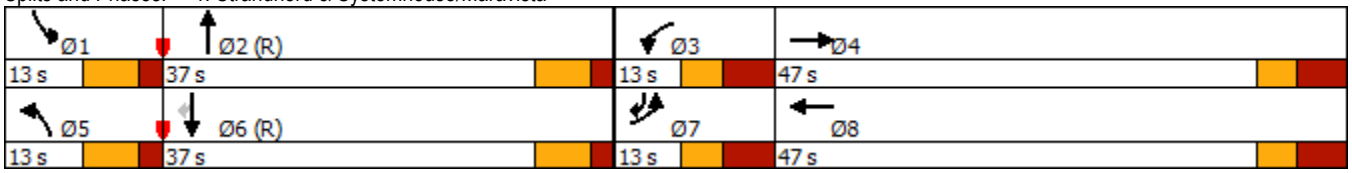
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	52	277	12	70	67	412	1050	18	79	1431	28
Future Volume (vph)	110	52	277	12	70	67	412	1050	18	79	1431	28
Satd. Flow (prot)	3281	1520	0	1691	1624	0	3281	3371	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1520	0	1691	1624	0	3281	3371	0	1626	3382	1481
Satd. Flow (RTOR)		269			49			1				111
Lane Group Flow (vph)	110	329	0	12	137	0	412	1068	0	79	1431	28
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		13.0	37.0		13.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	27.3		5.4	16.9		24.6	49.1		10.1	34.6	39.1
Actuated g/C Ratio	0.05	0.25		0.05	0.15		0.22	0.45		0.09	0.31	0.36
v/c Ratio	0.68	0.57		0.14	0.47		0.56	0.71		0.53	1.35	0.05
Control Delay	73.1	11.0		54.2	29.9		43.9	30.0		61.8	194.5	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	73.1	11.0		54.2	29.9		43.9	30.0		61.8	194.5	0.1
LOS	E	B		D	C		D	C		E	F	A
Approach Delay		26.5			31.8			33.9			184.1	
Approach LOS		C			C			C			F	
Queue Length 50th (m)	12.2	10.5		2.5	18.2		40.1	89.2		16.1	~196.6	0.0
Queue Length 95th (m)	#24.7	30.5		8.8	26.8		#101.9	#183.5		#43.3	#269.1	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	161	717		83	613		734	1505		149	1063	599
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.68	0.46		0.14	0.22		0.56	0.71		0.53	1.35	0.05

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 97.0 — Intersection LOS: F
Intersection Capacity Utilization 105.9% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

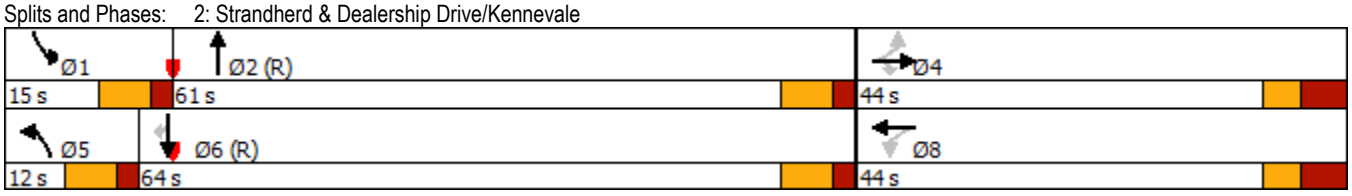


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	11	40	115	8	87	51	1342	129	95	1593	89
Future Volume (vph)	110	11	40	115	8	87	51	1342	129	95	1593	89
Satd. Flow (prot)	1691	1780	1513	1691	1503	0	3281	3301	0	1674	3382	1513
Flt Permitted	0.695			0.750			0.950			0.950		
Satd. Flow (perm)	1236	1780	1493	1334	1503	0	3281	3301	0	1674	3382	1492
Satd. Flow (RTOR)			94		87			11				102
Lane Group Flow (vph)	110	11	40	115	95	0	51	1471	0	95	1593	89
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	61.0		15.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	18.8	18.8	18.8	18.8	18.8		6.6	68.9		11.4	76.1	76.1
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16		0.06	0.57		0.10	0.63	0.63
v/c Ratio	0.57	0.04	0.13	0.55	0.31		0.28	0.77		0.60	0.74	0.09
Control Delay	56.0	37.1	0.8	54.4	11.6		58.5	24.9		68.3	20.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	56.0	37.1	0.8	54.4	11.6		58.5	24.9		68.3	20.8	2.5
LOS	E	D	A	D	B		E	C		E	C	A
Approach Delay		41.0			35.0			26.1			22.4	
Approach LOS		D			D			C			C	
Queue Length 50th (m)	25.0	2.3	0.0	26.0	1.7		6.0	129.5		21.4	128.2	0.0
Queue Length 95th (m)	35.6	6.2	0.0	36.7	13.6		12.6	#228.0		#50.8	#245.1	6.8
Internal Link Dist (m)		459.3			162.4			334.0			761.8	
Turn Bay Length (m)	75.0		100.0	40.0			60.0			50.0		110.0
Base Capacity (vph)	374	539	518	404	516		180	1899		158	2143	982
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.29	0.02	0.08	0.28	0.18		0.28	0.77		0.60	0.74	0.09

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 25.5 — Intersection LOS: C
Intersection Capacity Utilization 82.0% — ICU Level of Service E
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	52	277	12	70	67	412	1050	18	79	1431	28
Future Volume (vph)	110	52	277	12	70	67	412	1050	18	79	1431	28
Satd. Flow (prot)	3281	1519	0	1691	1624	0	3281	3371	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1519	0	1691	1624	0	3281	3371	0	1626	3382	1479
Satd. Flow (RTOR)		238			43			1				102
Lane Group Flow (vph)	110	329	0	12	137	0	412	1068	0	79	1431	28
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		23.0	37.0		23.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		19.6	59.6		11.1	48.5	53.0
Actuated g/C Ratio	0.04	0.22		0.04	0.15		0.16	0.50		0.09	0.40	0.44
v/c Ratio	0.75	0.64		0.16	0.49		0.77	0.64		0.52	1.05	0.04
Control Delay	86.0	17.7		60.0	35.1		47.1	39.7		63.5	73.2	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	86.0	17.7		60.0	35.1		47.1	39.7		63.5	73.2	0.1
LOS	F	B		E	D		D	D		E	E	A
Approach Delay		34.8			37.1			41.7			71.4	
Approach LOS		C			D			D			E	
Queue Length 50th (m)	13.4	18.1		2.8	21.4		48.9	115.9		18.0	170.8	0.0
Queue Length 95th (m)	#27.8	41.7		9.2	31.4		m#78.3	#208.7		32.6	#301.2	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	147	658		76	562		534	1673		222	1366	711
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.75	0.50		0.16	0.24		0.77	0.64		0.36	1.05	0.04

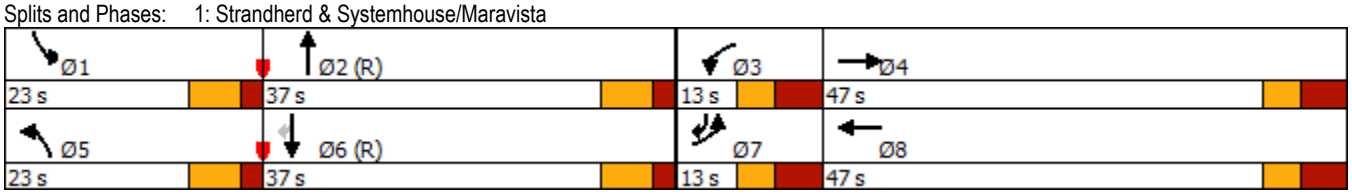
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 53.4 — Intersection LOS: D
Intersection Capacity Utilization 105.9% — ICU Level of Service G
Analysis Period (min) 15

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

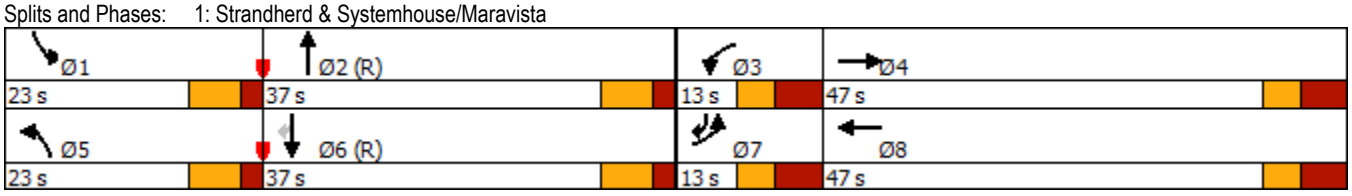


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	52	277	12	70	67	412	1050	18	79	1236	28
Future Volume (vph)	110	52	277	12	70	67	412	1050	18	79	1236	28
Satd. Flow (prot)	3281	1519	0	1691	1624	0	3281	3371	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1519	0	1691	1624	0	3281	3371	0	1626	3382	1479
Satd. Flow (RTOR)		238			43			1				102
Lane Group Flow (vph)	110	329	0	12	137	0	412	1068	0	79	1236	28
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		23.0	37.0		23.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		19.6	59.6		11.1	48.5	53.0
Actuated g/C Ratio	0.04	0.22		0.04	0.15		0.16	0.50		0.09	0.40	0.44
v/c Ratio	0.75	0.64		0.16	0.49		0.77	0.64		0.52	0.90	0.04
Control Delay	86.0	17.7		60.0	35.1		47.1	39.7		63.5	45.1	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	86.0	17.7		60.0	35.1		47.1	39.7		63.5	45.1	0.1
LOS	F	B		E	D		D	D		E	D	A
Approach Delay		34.8			37.1			41.7			45.3	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	13.4	18.1		2.8	21.4		48.9	115.9		18.0	134.2	0.0
Queue Length 95th (m)	#27.8	41.7		9.2	31.4		m#78.3	#208.7		32.6	#250.4	0.0
Internal Link Dist (m)		194.3			175.3			761.8			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	147	658		76	562		534	1673		222	1366	711
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.75	0.50		0.16	0.24		0.77	0.64		0.36	0.90	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 42.0 — Intersection LOS: D
Intersection Capacity Utilization 100.2% — ICU Level of Service G
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

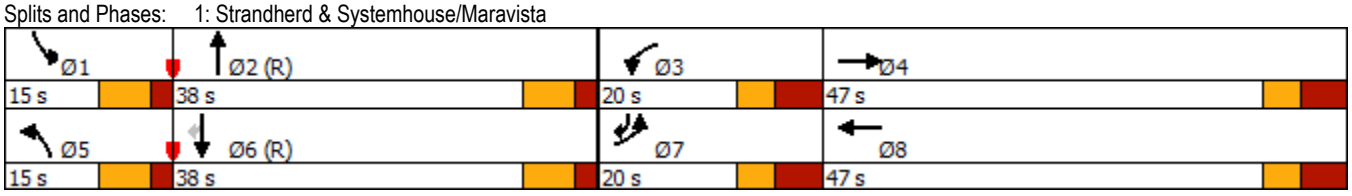


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	9	46	13	32	116	129	1617	14	26	916	70
Future Volume (vph)	69	9	46	13	32	116	129	1617	14	26	916	70
Satd. Flow (prot)	3216	1509	0	1658	1524	0	3216	3312	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1509	0	1658	1524	0	3216	3312	0	1658	3316	1450
Satd. Flow (RTOR)		46			116			1				102
Lane Group Flow (vph)	69	55	0	13	148	0	129	1631	0	26	916	70
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	20.0	47.0		20.0	47.0		15.0	38.0		15.0	38.0	20.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	8.0	25.5		6.6	16.0		9.7	65.1		7.4	57.8	64.9
Actuated g/C Ratio	0.07	0.21		0.06	0.13		0.08	0.54		0.06	0.48	0.54
v/c Ratio	0.32	0.15		0.14	0.49		0.50	0.91		0.25	0.57	0.08
Control Delay	57.0	13.5		57.1	17.1		75.1	22.7		59.1	26.8	1.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	57.0	13.5		57.1	17.1		75.1	22.7		59.1	26.8	1.9
LOS	E	B		E	B		E	C		E	C	A
Approach Delay		37.7			20.4			26.5			25.9	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	8.1	1.7		3.0	7.2		16.7	135.1		6.0	71.2	0.0
Queue Length 95th (m)	15.3	10.3		9.4	19.9		m17.6	#344.1		14.9	#164.4	4.1
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	332	530		171	578		266	1796		120	1596	883
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.21	0.10		0.08	0.26		0.48	0.91		0.22	0.57	0.08

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 83 (69%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 26.4 — Intersection LOS: C
Intersection Capacity Utilization 89.9% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

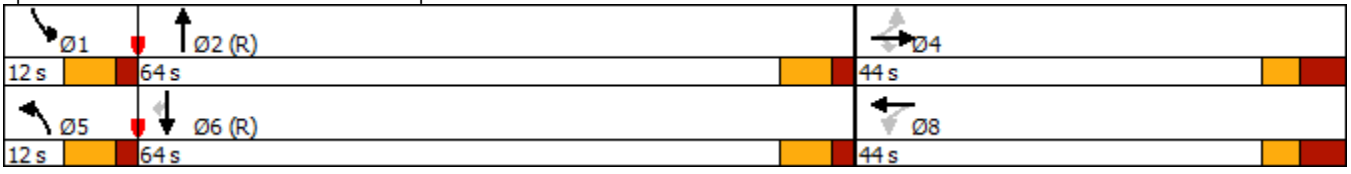


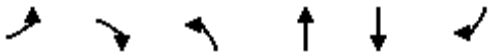
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	6	28	100	21	109	102	1574	86	51	780	99
Future Volume (vph)	67	6	28	100	21	109	102	1574	86	51	780	99
Satd. Flow (prot)	1658	1745	1483	1658	1508	0	3216	3285	0	1658	3316	1483
Flt Permitted	0.661			0.754			0.950			0.950		
Satd. Flow (perm)	1153	1745	1464	1314	1508	0	3216	3285	0	1658	3316	1463
Satd. Flow (RTOR)			94		105			6				102
Lane Group Flow (vph)	67	6	28	100	130	0	102	1660	0	51	780	99
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	64.0		12.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	17.9	17.9	17.9	17.9	17.9		8.2	75.6		8.1	73.0	73.0
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15		0.07	0.63		0.07	0.61	0.61
v/c Ratio	0.39	0.02	0.09	0.51	0.41		0.47	0.80		0.46	0.39	0.11
Control Delay	49.6	36.8	0.6	53.7	15.0		61.2	23.2		49.5	30.4	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	49.6	36.8	0.6	53.7	15.0		61.2	23.2		49.5	30.4	14.3
LOS	D	D	A	D	B		E	C		D	C	B
Approach Delay		35.2			31.8			25.4			29.7	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	15.0	1.3	0.0	22.7	5.3		12.0	144.9		11.6	98.3	8.9
Queue Length 95th (m)	23.5	4.2	0.0	32.4	18.6		#24.3	#268.4		m#23.3	121.2	32.9
Internal Link Dist (m)		89.0			162.4			334.0			95.1	
Turn Bay Length (m)	75.0			40.0			60.0			50.0		
Base Capacity (vph)	349	529	509	398	530		219	2071		112	2017	929
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.19	0.01	0.06	0.25	0.25		0.47	0.80		0.46	0.39	0.11

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 29 (24%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 27.5 — Intersection LOS: C
Intersection Capacity Utilization 84.5% — ICU Level of Service E
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

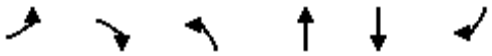




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	5	0	1776	960	54
Future Volume (Veh/h)	0	5	0	1776	960	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	5	0	1776	960	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				271		
pX, platoon unblocked	0.60					
vC, conflicting volume	1875	507	1014			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1135	507	1014			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	118	511	680			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	5	888	888	640	374
Volume Left	0	0	0	0	0
Volume Right	5	0	0	0	54
cSH	511	1700	1700	1700	1700
Volume to Capacity	0.01	0.52	0.52	0.38	0.22
Queue Length 95th (m)	0.2	0.0	0.0	0.0	0.0
Control Delay (s)	12.1	0.0	0.0	0.0	0.0
Lane LOS	B				
Approach Delay (s)	12.1	0.0		0.0	
Approach LOS	B				

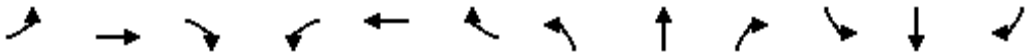
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	55.2%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1776	945	20
Future Volume (Veh/h)	0	0	0	1776	945	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	1776	945	20
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				119		
pX, platoon unblocked	0.61					
vC, conflicting volume	1843	325	965			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1094	325	965			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	127	671	709			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	888	888	378	378	209
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	20
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.52	0.22	0.22	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

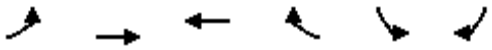
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	66	0	40	147	33	0	0	15	19	0	0
Future Volume (Veh/h)	0	66	0	40	147	33	0	0	15	19	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	66	0	40	147	33	0	0	15	19	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					113							
pX, platoon unblocked												
vC, conflicting volume	180			66			293	326	33	275	293	147
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	180			66			293	326	33	275	293	147
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	99	97	100	100
cM capacity (veh/h)	1393			1534			624	576	1033	633	601	873

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	33	33	187	33	15	19
Volume Left	0	0	40	0	0	19
Volume Right	0	0	0	33	15	0
cSH	1393	1700	1534	1700	1033	633
Volume to Capacity	0.00	0.02	0.03	0.02	0.01	0.03
Queue Length 95th (m)	0.0	0.0	0.6	0.0	0.3	0.7
Control Delay (s)	0.0	0.0	1.8	0.0	8.5	10.9
Lane LOS			A		A	B
Approach Delay (s)	0.0		1.5		8.5	10.9
Approach LOS					A	B

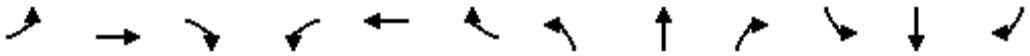
Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	31.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	39	98	49	27	0
Future Volume (Veh/h)	0	39	98	49	27	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	39	98	49	27	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			192			
pX, platoon unblocked						
vC, conflicting volume	147				162	122
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	147				162	122
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	100
cM capacity (veh/h)	1435				829	929

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	39	147	27
Volume Left	0	0	27
Volume Right	0	49	0
cSH	1435	1700	829
Volume to Capacity	0.00	0.09	0.03
Queue Length 95th (m)	0.0	0.0	0.8
Control Delay (s)	0.0	0.0	9.5
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	29	0	9	82	7	0	0	5	5	0	0
Future Volume (Veh/h)	0	29	0	9	82	7	0	0	5	5	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	29	0	9	82	7	0	0	5	5	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					269							
pX, platoon unblocked												
vC, conflicting volume	89			29			132	136	29	138	132	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			29			132	136	29	138	132	86
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	99	100	100
cM capacity (veh/h)	1506			1584			836	751	1046	826	754	973

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	98	5	5
Volume Left	0	9	0	5
Volume Right	0	7	5	0
cSH	1506	1584	1046	826
Volume to Capacity	0.00	0.01	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.1	0.1
Control Delay (s)	0.0	0.7	8.5	9.4
Lane LOS		A	A	A
Approach Delay (s)	0.0	0.7	8.5	9.4
Approach LOS			A	A

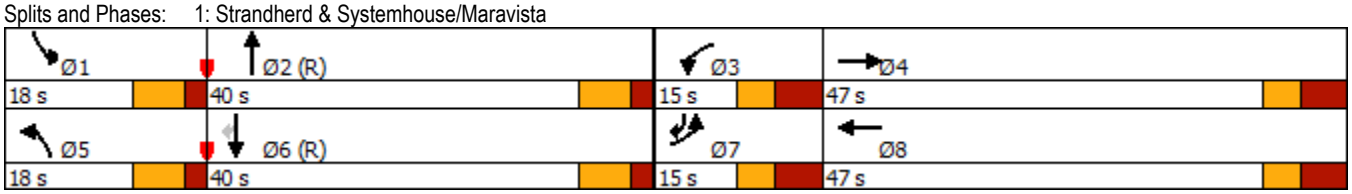
Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	23.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	62	214	13	49	43	236	1126	21	123	1418	30
Future Volume (vph)	119	62	214	13	49	43	236	1126	21	123	1418	30
Satd. Flow (prot)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1450
Satd. Flow (RTOR)		154			39			1				102
Lane Group Flow (vph)	119	276	0	13	92	0	236	1147	0	123	1418	30
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	15.0	47.0		15.0	47.0		18.0	40.0		18.0	40.0	15.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.3	26.8		6.4	17.8		13.1	53.1		13.3	53.3	59.7
Actuated g/C Ratio	0.06	0.22		0.05	0.15		0.11	0.44		0.11	0.44	0.50
v/c Ratio	0.61	0.60		0.15	0.34		0.67	0.79		0.67	0.96	0.04
Control Delay	68.7	23.2		57.5	27.6		48.2	41.9		69.3	49.6	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.7	23.2		57.5	27.6		48.2	41.9		69.3	49.6	0.1
LOS	E	C		E	C		D	D		E	D	A
Approach Delay		36.9			31.3			43.0			50.2	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	14.3	25.6		3.0	12.1		26.1	142.9		27.8	149.4	0.0
Queue Length 95th (m)	24.0	45.8		9.5	20.8		#46.4	#226.0		#58.5	#289.0	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	198	603		102	555		355	1461		188	1472	775
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.60	0.46		0.13	0.17		0.66	0.79		0.65	0.96	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 45.2 — Intersection LOS: D
Intersection Capacity Utilization 85.4% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

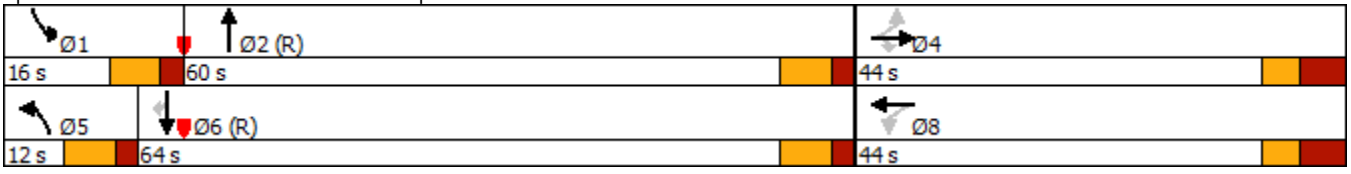


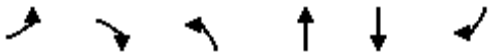
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	21	73	130	13	80	62	1088	132	79	1533	77
Future Volume (vph)	219	21	73	130	13	80	62	1088	132	79	1533	77
Satd. Flow (prot)	1658	1745	1483	1658	1502	0	3216	3255	0	1658	3316	1483
Flt Permitted	0.697			0.744			0.950			0.950		
Satd. Flow (perm)	1215	1745	1462	1296	1502	0	3216	3255	0	1658	3316	1463
Satd. Flow (RTOR)			94		80			14				102
Lane Group Flow (vph)	219	21	73	130	93	0	62	1220	0	79	1533	77
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	60.0		16.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	26.8	26.8	26.8	26.8	26.8		6.8	65.0		10.0	67.9	67.9
Actuated g/C Ratio	0.22	0.22	0.22	0.22	0.22		0.06	0.54		0.08	0.57	0.57
v/c Ratio	0.81	0.05	0.18	0.45	0.23		0.34	0.69		0.58	0.82	0.09
Control Delay	65.4	33.1	4.6	43.6	10.8		59.7	25.2		77.5	14.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	65.4	33.1	4.6	43.6	10.8		59.7	25.2		77.5	14.1	0.1
LOS	E	C	A	D	B		E	C		E	B	A
Approach Delay		49.0			29.9			26.9			16.4	
Approach LOS		D			C			C			B	
Queue Length 50th (m)	49.1	3.9	0.0	26.5	2.4		7.3	113.6		19.8	23.5	0.0
Queue Length 95th (m)	70.3	9.5	6.9	41.0	14.2		14.7	160.2		m23.7	m#89.2	m0.0
Internal Link Dist (m)		89.0			162.4			334.0			95.1	
Turn Bay Length (m)	75.0			40.0			60.0			50.0		
Base Capacity (vph)	368	529	508	393	511		183	1769		144	1876	872
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.60	0.04	0.14	0.33	0.18		0.34	0.69		0.55	0.82	0.09

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 24.0 — Intersection LOS: C
Intersection Capacity Utilization 86.3% — ICU Level of Service E
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

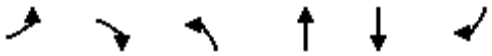




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	27	0	1411	1695	17
Future Volume (Veh/h)	0	27	0	1411	1695	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	27	0	1411	1695	17
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				271		
pX, platoon unblocked	0.73					
vC, conflicting volume	2409	856	1712			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2194	856	1712			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	91	100			
cM capacity (veh/h)	28	301	367			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	27	706	706	1130	582
Volume Left	0	0	0	0	0
Volume Right	27	0	0	0	17
cSH	301	1700	1700	1700	1700
Volume to Capacity	0.09	0.41	0.41	0.66	0.34
Queue Length 95th (m)	2.2	0.0	0.0	0.0	0.0
Control Delay (s)	18.1	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	18.1	0.0		0.0	
Approach LOS	C				

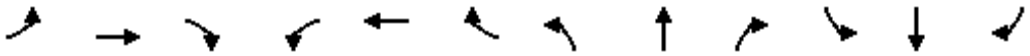
Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	60.0%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1411	1708	14
Future Volume (Veh/h)	0	0	0	1411	1708	14
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	1411	1708	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				119		
pX, platoon unblocked	0.73					
vC, conflicting volume	2420	576	1722			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2202	576	1722			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	28	460	363			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	706	706	683	683	356
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	14
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.41	0.40	0.40	0.21
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

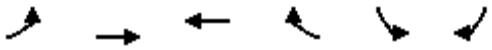
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	200	0	29	98	23	0	0	57	56	0	0
Future Volume (Veh/h)	0	200	0	29	98	23	0	0	57	56	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	200	0	29	98	23	0	0	57	56	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					113							
pX, platoon unblocked												
vC, conflicting volume	121			200			356	379	100	313	356	98
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	121			200			356	379	100	313	356	98
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	94	90	100	100
cM capacity (veh/h)	1464			1370			565	540	936	569	556	939

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	100	100	127	23	57	56
Volume Left	0	0	29	0	0	56
Volume Right	0	0	0	23	57	0
cSH	1464	1700	1370	1700	936	569
Volume to Capacity	0.00	0.06	0.02	0.01	0.06	0.10
Queue Length 95th (m)	0.0	0.0	0.5	0.0	1.5	2.5
Control Delay (s)	0.0	0.0	1.9	0.0	9.1	12.0
Lane LOS			A		A	B
Approach Delay (s)	0.0		1.6		9.1	12.0
Approach LOS					A	B

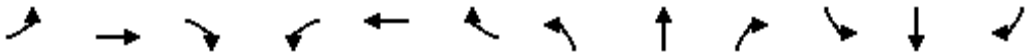
Intersection Summary				
Average Delay	3.1			
Intersection Capacity Utilization	32.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	132	73	25	68	0
Future Volume (Veh/h)	0	132	73	25	68	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	132	73	25	68	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			192			
pX, platoon unblocked						
vC, conflicting volume	98				218	86
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98				218	86
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				91	100
cM capacity (veh/h)	1495				771	973

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	132	98	68
Volume Left	0	0	68
Volume Right	0	25	0
cSH	1495	1700	771
Volume to Capacity	0.00	0.06	0.09
Queue Length 95th (m)	0.0	0.0	2.2
Control Delay (s)	0.0	0.0	10.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	18.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	86	0	9	57	7	0	0	39	7	0	0
Future Volume (Veh/h)	0	86	0	9	57	7	0	0	39	7	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	86	0	9	57	7	0	0	39	7	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					269							
pX, platoon unblocked												
vC, conflicting volume	64			86			164	168	86	204	164	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			86			164	168	86	204	164	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	96	99	100	100
cM capacity (veh/h)	1538			1510			796	721	973	721	724	1005

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	86	73	39	7
Volume Left	0	9	0	7
Volume Right	0	7	39	0
cSH	1538	1510	973	721
Volume to Capacity	0.00	0.01	0.04	0.01
Queue Length 95th (m)	0.0	0.1	1.0	0.2
Control Delay (s)	0.0	1.0	8.9	10.0
Lane LOS		A	A	B
Approach Delay (s)	0.0	1.0	8.9	10.0
Approach LOS			A	B

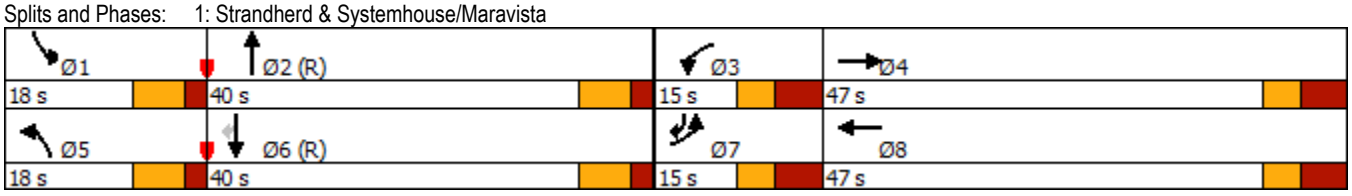
Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	23.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	62	214	13	49	43	236	1126	21	123	1332	30
Future Volume (vph)	119	62	214	13	49	43	236	1126	21	123	1332	30
Satd. Flow (prot)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1483
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3216	1524	0	1658	1613	0	3216	3304	0	1658	3316	1450
Satd. Flow (RTOR)		154			39			1				102
Lane Group Flow (vph)	119	276	0	13	92	0	236	1147	0	123	1332	30
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	15.0	47.0		15.0	47.0		18.0	40.0		18.0	40.0	15.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	7.3	26.8		6.4	17.8		13.1	53.1		13.3	53.3	59.7
Actuated g/C Ratio	0.06	0.22		0.05	0.15		0.11	0.44		0.11	0.44	0.50
v/c Ratio	0.61	0.60		0.15	0.34		0.67	0.79		0.67	0.90	0.04
Control Delay	68.7	23.2		57.5	27.6		47.5	41.1		69.3	42.1	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	68.7	23.2		57.5	27.6		47.5	41.1		69.3	42.1	0.1
LOS	E	C		E	C		D	D		E	D	A
Approach Delay		36.9			31.3			42.2			43.5	
Approach LOS		D			C			D			D	
Queue Length 50th (m)	14.3	25.6		3.0	12.1		25.6	141.4		27.8	134.3	0.0
Queue Length 95th (m)	24.0	45.8		9.5	20.8		m#44.8	#225.8		#58.5	#266.8	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	198	603		102	555		355	1461		188	1472	775
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.60	0.46		0.13	0.17		0.66	0.79		0.65	0.90	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 111 (93%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 41.8 — Intersection LOS: D
Intersection Capacity Utilization 82.9% — ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista



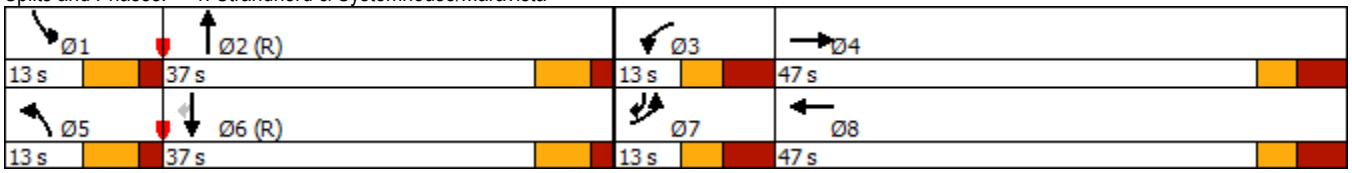
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	52	277	12	70	67	412	1115	18	79	1516	28
Future Volume (vph)	110	52	277	12	70	67	412	1115	18	79	1516	28
Satd. Flow (prot)	3281	1520	0	1691	1624	0	3281	3374	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1520	0	1691	1624	0	3281	3374	0	1626	3382	1481
Satd. Flow (RTOR)		269			49			1				111
Lane Group Flow (vph)	110	329	0	12	137	0	412	1133	0	79	1516	28
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		13.0	37.0		13.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	27.3		5.4	16.9		24.6	49.1		10.1	34.6	39.1
Actuated g/C Ratio	0.05	0.25		0.05	0.15		0.22	0.45		0.09	0.31	0.36
v/c Ratio	0.68	0.57		0.14	0.47		0.56	0.75		0.53	1.43	0.05
Control Delay	73.1	11.0		54.2	29.9		43.9	31.2		61.8	228.5	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	73.1	11.0		54.2	29.9		43.9	31.2		61.8	228.5	0.1
LOS	E	B		D	C		D	C		E	F	A
Approach Delay		26.5			31.8			34.6			216.4	
Approach LOS		C			C			C			F	
Queue Length 50th (m)	12.2	10.5		2.5	18.2		40.1	97.3		16.1	~216.6	0.0
Queue Length 95th (m)	#24.7	30.5		8.8	26.8		#101.9	#199.5		#43.3	#289.4	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	161	717		83	613		734	1506		149	1063	599
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.68	0.46		0.14	0.22		0.56	0.75		0.53	1.43	0.05

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.43
Intersection Signal Delay: 112.1 — Intersection LOS: F
Intersection Capacity Utilization 108.4% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista

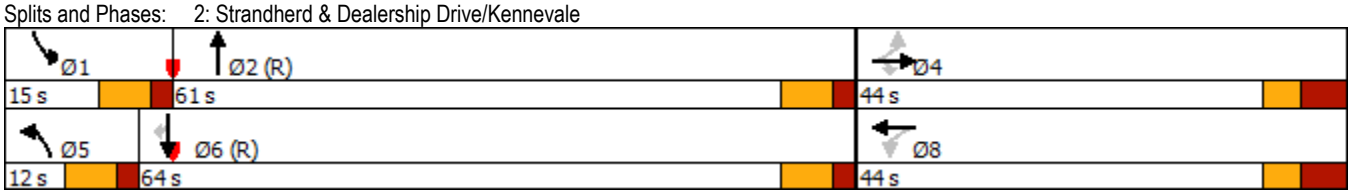


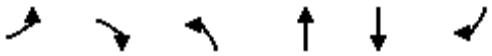
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	175	15	64	115	16	87	92	1342	129	97	1598	125
Future Volume (vph)	175	15	64	115	16	87	92	1342	129	97	1598	125
Satd. Flow (prot)	1691	1780	1513	1691	1523	0	3281	3301	0	1674	3382	1513
Flt Permitted	0.690			0.748			0.950			0.950		
Satd. Flow (perm)	1227	1780	1493	1330	1523	0	3281	3301	0	1674	3382	1492
Satd. Flow (RTOR)			94		87			11				102
Lane Group Flow (vph)	175	15	64	115	103	0	92	1471	0	97	1598	125
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Total Split (s)	44.0	44.0	44.0	44.0	44.0		12.0	61.0		15.0	64.0	64.0
Total Lost Time (s)	7.6	7.6	7.6	7.6	7.6		6.6	6.7		6.6	6.7	6.7
Act Effct Green (s)	23.4	23.4	23.4	23.4	23.4		7.7	64.2		11.6	68.0	68.0
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20		0.06	0.54		0.10	0.57	0.57
v/c Ratio	0.73	0.04	0.17	0.44	0.28		0.44	0.83		0.60	0.83	0.14
Control Delay	61.8	34.7	3.5	45.9	11.7		60.8	30.1		68.2	27.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	61.8	34.7	3.5	45.9	11.7		60.8	30.1		68.2	27.9	4.9
LOS	E	C	A	D	B		E	C		E	C	A
Approach Delay		45.5			29.8			31.9			28.5	
Approach LOS		D			C			C			C	
Queue Length 50th (m)	39.5	2.9	0.0	24.3	3.1		10.8	149.1		21.8	155.6	2.3
Queue Length 95th (m)	55.7	7.6	4.7	36.7	15.4		#20.0	#228.0		#51.8	#246.1	13.0
Internal Link Dist (m)		89.0			162.4			334.0			95.1	
Turn Bay Length (m)	75.0			40.0			60.0			50.0		
Base Capacity (vph)	372	539	518	403	522		211	1770		161	1915	889
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.47	0.03	0.12	0.29	0.20		0.44	0.83		0.60	0.83	0.14

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 31.1 — Intersection LOS: C
Intersection Capacity Utilization 85.4% — ICU Level of Service E
Analysis Period (min) 15
Description: Timing 13
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Strandherd & Dealership Drive/Kennevale

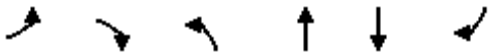




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	7	0	1627	1860	26
Future Volume (Veh/h)	0	7	0	1627	1860	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	7	0	1627	1860	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				271		
pX, platoon unblocked	0.63					
vC, conflicting volume	2686	943	1886			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2503	943	1886			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	97	100			
cM capacity (veh/h)	15	264	314			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	7	814	814	1240	646
Volume Left	0	0	0	0	0
Volume Right	7	0	0	0	26
cSH	264	1700	1700	1700	1700
Volume to Capacity	0.03	0.48	0.48	0.73	0.38
Queue Length 95th (m)	0.6	0.0	0.0	0.0	0.0
Control Delay (s)	19.0	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	19.0	0.0		0.0	
Approach LOS	C				

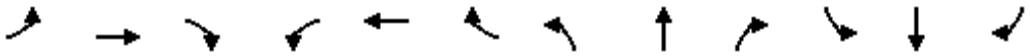
Intersection Summary				
Average Delay	0.0			
Intersection Capacity Utilization	65.1%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	1627	1844	22
Future Volume (Veh/h)	0	0	0	1627	1844	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	1627	1844	22
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				119		
pX, platoon unblocked	0.63					
vC, conflicting volume	2668	626	1866			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2472	626	1866			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	16	427	319			

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	814	814	738	738	391
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	22
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.48	0.48	0.43	0.43	0.23
Queue Length 95th (m)	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

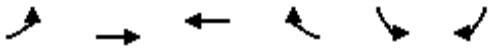
Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	173	0	27	168	37	0	0	41	41	0	0
Future Volume (Veh/h)	0	173	0	27	168	37	0	0	41	41	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	173	0	27	168	37	0	0	41	41	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					113							
pX, platoon unblocked												
vC, conflicting volume	205			173			395	432	86	350	395	168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	205			173			395	432	86	350	395	168
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	96	93	100	100
cM capacity (veh/h)	1364			1401			531	505	955	548	530	847

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	86	86	195	37	41	41
Volume Left	0	0	27	0	0	41
Volume Right	0	0	0	37	41	0
cSH	1364	1700	1401	1700	955	548
Volume to Capacity	0.00	0.05	0.02	0.02	0.04	0.07
Queue Length 95th (m)	0.0	0.0	0.4	0.0	1.0	1.8
Control Delay (s)	0.0	0.0	1.2	0.0	8.9	12.1
Lane LOS			A		A	B
Approach Delay (s)	0.0		1.0		8.9	12.1
Approach LOS					A	B

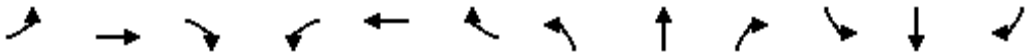
Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	35.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	128	130	38	45	0
Future Volume (Veh/h)	0	128	130	38	45	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	128	130	38	45	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)			192			
pX, platoon unblocked						
vC, conflicting volume	168				277	149
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168				277	149
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1410				713	898

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	128	168	45
Volume Left	0	0	45
Volume Right	0	38	0
cSH	1410	1700	713
Volume to Capacity	0.00	0.10	0.06
Queue Length 95th (m)	0.0	0.0	1.5
Control Delay (s)	0.0	0.0	10.4
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.4
Approach LOS			B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	19.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	92	0	9	105	11	0	0	28	8	0	0
Future Volume (Veh/h)	0	92	0	9	105	11	0	0	28	8	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	92	0	9	105	11	0	0	28	8	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)					269							
pX, platoon unblocked												
vC, conflicting volume	116			92			220	226	92	248	220	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	116			92			220	226	92	248	220	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	97	99	100	100
cM capacity (veh/h)	1473			1503			732	669	965	681	674	943

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	92	125	28	8
Volume Left	0	9	0	8
Volume Right	0	11	28	0
cSH	1473	1503	965	681
Volume to Capacity	0.00	0.01	0.03	0.01
Queue Length 95th (m)	0.0	0.1	0.7	0.3
Control Delay (s)	0.0	0.6	8.8	10.3
Lane LOS		A	A	B
Approach Delay (s)	0.0	0.6	8.8	10.3
Approach LOS			A	B

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	27.4%	ICU Level of Service	A	
Analysis Period (min)	15			

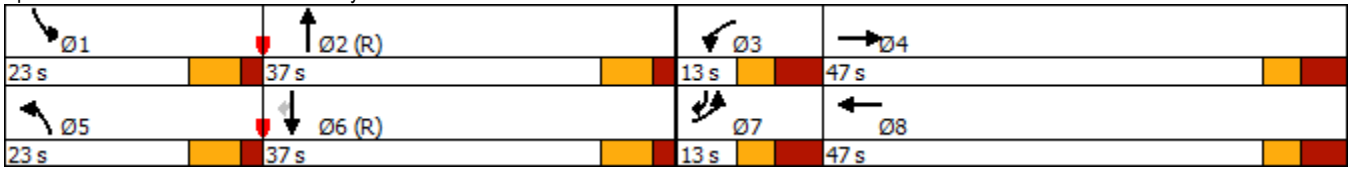
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	52	277	12	70	67	412	1115	18	79	1516	28
Future Volume (vph)	110	52	277	12	70	67	412	1115	18	79	1516	28
Satd. Flow (prot)	3281	1519	0	1691	1624	0	3281	3374	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1519	0	1691	1624	0	3281	3374	0	1626	3382	1479
Satd. Flow (RTOR)		238			43			1				102
Lane Group Flow (vph)	110	329	0	12	137	0	412	1133	0	79	1516	28
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		23.0	37.0		23.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		19.6	59.6		11.1	48.5	53.0
Actuated g/C Ratio	0.04	0.22		0.04	0.15		0.16	0.50		0.09	0.40	0.44
v/c Ratio	0.75	0.64		0.16	0.49		0.77	0.68		0.52	1.11	0.04
Control Delay	86.0	17.7		60.0	35.1		45.4	42.3		63.5	94.6	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	86.0	17.7		60.0	35.1		45.4	42.3		63.5	94.6	0.1
LOS	F	B		E	D		D	D		E	F	A
Approach Delay		34.8			37.1			43.1			91.4	
Approach LOS		C			D			D			F	
Queue Length 50th (m)	13.4	18.1		2.8	21.4		49.2	140.2		18.0	~202.0	0.0
Queue Length 95th (m)	#27.8	41.7		9.2	31.4		m#70.6	#226.3		32.6	#323.1	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	147	658		76	562		534	1675		222	1366	711
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.75	0.50		0.16	0.24		0.77	0.68		0.36	1.11	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 62.8 — Intersection LOS: E
Intersection Capacity Utilization 108.4% — ICU Level of Service G
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	52	277	12	70	67	412	1115	18	79	1236	28
Future Volume (vph)	110	52	277	12	70	67	412	1115	18	79	1236	28
Satd. Flow (prot)	3281	1519	0	1691	1624	0	3281	3374	0	1626	3382	1513
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3281	1519	0	1691	1624	0	3281	3374	0	1626	3382	1479
Satd. Flow (RTOR)		238			43			1				102
Lane Group Flow (vph)	110	329	0	12	137	0	412	1133	0	79	1236	28
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases												6
Total Split (s)	13.0	47.0		13.0	47.0		23.0	37.0		23.0	37.0	13.0
Total Lost Time (s)	7.6	7.6		7.6	7.6		6.6	6.7		6.6	6.7	7.6
Act Effct Green (s)	5.4	25.9		5.4	18.1		19.6	59.6		11.1	48.5	53.0
Actuated g/C Ratio	0.04	0.22		0.04	0.15		0.16	0.50		0.09	0.40	0.44
v/c Ratio	0.75	0.64		0.16	0.49		0.77	0.68		0.52	0.90	0.04
Control Delay	86.0	17.7		60.0	35.1		45.4	42.3		63.5	45.1	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	86.0	17.7		60.0	35.1		45.4	42.3		63.5	45.1	0.1
LOS	F	B		E	D		D	D		E	D	A
Approach Delay		34.8			37.1			43.1			45.3	
Approach LOS		C			D			D			D	
Queue Length 50th (m)	13.4	18.1		2.8	21.4		49.2	140.2		18.0	134.2	0.0
Queue Length 95th (m)	#27.8	41.7		9.2	31.4		m#70.6	#226.3		32.6	#250.4	0.0
Internal Link Dist (m)		194.3			175.3			490.7			174.9	
Turn Bay Length (m)	85.0			25.0			130.0			140.0		50.0
Base Capacity (vph)	147	658		76	562		534	1675		222	1366	711
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.75	0.50		0.16	0.24		0.77	0.68		0.36	0.90	0.04

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 42.6 — Intersection LOS: D
Intersection Capacity Utilization 100.2% — ICU Level of Service G
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Strandherd & Systemhouse/Maravista