



**2140 Baseline Road
Transportation Impact Assessment**

163601192

November 21, 2019

Prepared for:

Baseline Constellation Partnership Inc.

Prepared by:

Stantec Consulting Ltd.



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November 21, 2019
File: 163601192

Attention: Mike Giampa, P.Eng.
City of Ottawa
110 Laurier Avenue West, 4th Floor
Tel: 613-580-2424 ext. 23657

Dear Mr. Giampa,

Reference: 2140 Baseline Road Transportation Impact Assessment

Please find the attached Transportation Impact Assessment (TIA) in support of the proposed mixed-use student residence at 2140 Baseline Road. This TIA report serves as an update to the original submission made on June 6, 2018 and subsequent resubmissions made on January 9, 2019 and March 29, 2019.

The updated report addresses City staff comments received on March 1, 2019. The updated report also includes a revised site plan with minor changes, notably an increase in the number of proposed residences (increased from 144 units to 271 units) and a reduction in the ground floor retail (reduced from 14,488 ft² to 4,710 ft²). The revised site plan also includes an increase in the number of parking stalls (increased from 75 to 127).

The revised site plan is estimated to generate approximately 45 to 50 fewer person trips during peak periods than originally forecasted in the June 2018 TIA. Based on our review, the findings and recommendations identified in the original June 6, 2018 report remain valid and therefore the analyses contained within *Section 3 (Forecasting)* and *Section 4 (Strategy)* of the TIA report were not revised. This approach provides a conservative assessment of the trip generation potential of the proposed development.

Please contact the undersigned should you have any questions or require any additional information.

Regards,

Stantec Consulting Ltd.

A handwritten signature in black ink, reading "O'Grady", with a stylized flourish.

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Certification

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed¹ or registered¹ professional in good standing, whose field of expertise is either transportation engineering or transportation planning.

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



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

Table of Contents

1.0	SCREENING	1
1.1	SUMMARY OF DEVELOPMENT	1
1.2	TRIP GENERATION TRIGGER.....	1
1.3	LOCATION TRIGGERS.....	2
1.4	SAFETY TRIGGERS	2
1.5	SUMMARY	2
2.0	SCOPING	3
2.1	EXISTING AND PLANNED CONDITIONS	3
2.2	STUDY AREA AND TIME PERIODS.....	15
2.3	EXEMPTIONS REVIEW	16
3.0	FORECASTING.....	17
3.1	DEVELOPMENT GENERATED TRAVEL DEMAND	17
3.2	BACKGROUND NETWORK TRAVEL DEMAND	27
3.3	DEMAND RATIONALIZATION	28
4.0	STRATEGY	31
4.1	DEVELOPMENT DESIGN	31
4.2	PARKING.....	31
4.3	BOUNDARY STREET DESIGN.....	32
4.4	ACCESS INTERSECTIONS DESIGN	35
4.5	TRANSPORTATION DEMAND MANAGEMENT.....	36
4.6	NEIGHBOURHOOD TRAFFIC MANAGEMENT.....	36
4.7	TRANSIT	36
4.8	REVIEW OF NETWORK CONCEPT	37
4.9	INTERSECTION DESIGN	37
5.0	CONCLUSION.....	55

List of Tables

Table 1 - Assumed Land Uses	4
Table 2 - City of Ottawa Transportation Master Plan Projects	13
Table 3 - Exemptions Review	16
Table 4 - Vehicle Trip Generation Rates	17
Table 5 - Person Trips Generated by Land Use	17
Table 6 - Future Mode Share Targets (Residential Component)	18
Table 7 - Future Mode Share Targets (Mixed-Use Retail Component)	19
Table 8 - Trips Generated by Travel Mode	20
Table 9 - Pass-By and Internal Capture Trips	21
Table 10 - Trip Distribution	23
Table 10 - MMLOS Conditions (Segments)	33
Table 12 - 2025 Ultimate Access Intersection Operations (Synchro)	35
Table 13 - 2018 Existing Intersection Operations (Synchro)	38
Table 14 - 2018 Existing MMLOS (Baseline Road / Centrepointhe Drive)	41
Table 15 - 2018 Existing MMLOS (Baseline Road / Constellation Drive)	42
Table 16 - 2020 Future Background Intersection Operations (Synchro)	43
Table 17 - 2020 Future Background MMLOS (Baseline Road / Centrepointhe Drive)	45
Table 18 - 2020 Future Background MMLOS (Baseline Road / Constellation Drive)	46
Table 19 - 2020 Total Future Intersection Operations (Synchro)	47
Table 20 - 2020 Total Future MMLOS (Baseline Road / Centrepointhe Drive)	49
Table 21 - 2020 Total Future MMLOS (Baseline Road / Constellation Drive)	50
Table 22 - 2025 Ultimate Intersection Operations (Synchro)	51
Table 23 - 2025 Ultimate MMLOS (Baseline Road at Centrepointhe)	53
Table 24 - 2025 Ultimate MMLOS (Baseline Road at Constellation Drive)	54

List of Figures

Figure 1 - Site Location	4
Figure 2 - Proposed Site Plan	5
Figure 3 - Existing Lane Configuration and Traffic Control	7
Figure 4 - Existing Pedestrian and Cycling Network	8
Figure 5 - Study Area Transit Routes and Stops	9
Figure 6 - Study Area Transit Routes and Stops	10
Figure 7 - 2018 Existing Volumes (AM Peak)	12
Figure 8 - 2018 Existing Volumes (PM Peak)	12
Figure 9 - Planned Road Network Modifications	14
Figure 10 - 2020 Pass-By Volumes (AM Peak)	22
Figure 11 - 2020 Pass-By Volumes (PM Peak)	22
Figure 12 - Site Traffic Assignment Assumptions	24
Figure 13 - New Site Generated Volumes (AM Peak)	25
Figure 14 - New Site Generated Volumes (PM Peak)	25
Figure 15 - Net Site Generated Volumes (AM Peak)	26
Figure 16 - Net Site Generated Volumes (PM Peak)	26
Figure 17 - 2020 Future Background Volumes (AM Peak)	28
Figure 18 - 2020 Future Background Volumes (PM Peak)	28
Figure 19 - 2020 Total Future Volumes (AM Peak)	29
Figure 20 - 2020 Total Future Traffic Volumes (PM Peak)	29
Figure 21 - 2025 Ultimate Traffic Volumes (AM Peak)	30
Figure 22 - 2020 Ultimate Traffic Volumes (PM Peak)	30

Appendices

APPENDIX A - Turning Movement Counts

APPENDIX B - Collision Detailed Summary

APPENDIX C - Intersection Performance Worksheets

APPENDIX D - TDM Checklists

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Screening

1.0 SCREENING

1.1 SUMMARY OF DEVELOPMENT

Municipal Address	
Description of Location	Nepean, southwest quadrant of Baseline Road and Constellation Drive
Land Use Classification	Mixed-use (Residence + Ground Level Retail)
Development Size (units)	1 Building: 271 units (412 beds), 4,710 ft ² ground level retail
Development Size (m ²)	13,550 m ² GFA (145,851 ft ² GFA)
Number of Accesses and Locations	1 full access at Gemini Way
Phase of Development	1
Buildout Year	Fall 2020

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

1.2 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	Triggered
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.

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Screening

1.3 LOCATION TRIGGERS

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

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

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

1.4 SAFETY TRIGGERS

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

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

1.5 SUMMARY

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

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

2.0 SCOPING

2.1 EXISTING AND PLANNED CONDITIONS

2.1.1 Proposed Development

The proposed mixed-use college student residence and commercial retail development is located in the CentrepoinTE community of Ottawa, Ontario. The subject site is located at the southwest quadrant of the intersection of Baseline Road and Constellation Drive and is bound by Baseline Road to the north, Constellation Drive to the east, Gemini Way to the south, and the Nepean Medical Centre building to the west.

Figure 1 illustrates the site location. The subject site is currently zoned as MC F(2.0) H(34); the purpose of the MC – Mixed-Use Centre Zone, according to the City of Ottawa Official Plan, is to:

- Ensure that the areas designated Mixed-Use Centres in the Official Plan, or a similar designation in a Secondary Plan, accommodate a combination of transit-supportive uses such as offices, secondary and post secondary schools, hotels, hospitals, large institutional buildings, community recreation and leisure centres, day care centres, retail uses, entertainment uses, service uses such as restaurants and personal service businesses, and high- and medium-density residential uses;
- Allow the permitted uses in a compact and pedestrian-oriented built form in mixed-use buildings or side by side in separate buildings;
- Impose development standards that ensure medium to high profile development while minimizing its impact on surrounding residential areas

The proposed development consists of a single, 14 storey mixed-use student residence and retail building. The ground floor consists of 4,710 ft² of commercial retail. Floors 2 to 14 consist of 271 student rooming units with a total of 412 beds. The building has a combined gross-floor-area (GFA) of 13,550 m² (i.e. 145,851 ft²).

A single, full-movement vehicular access is proposed on Gemini Way. Pedestrian access to the building is facilitated through two entrances: a main entrance along the south of the building facing Gemini Way, and a secondary entrance along Baseline Road. Ground level retail units will be accessible along the frontage of the building.

A total of 124 vehicle parking spaces (7 surface level parking spaces, 117 underground parking spaces) and 244 bicycle parking spaces are proposed as part of the development.

Buildout and occupancy of the building is anticipated to occur in Fall 2020.

Table 1 outlines the proposed Institute of Transportation (ITE) land uses assumed for the analysis.

Figure 2 illustrates the proposed site plan.

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Scoping

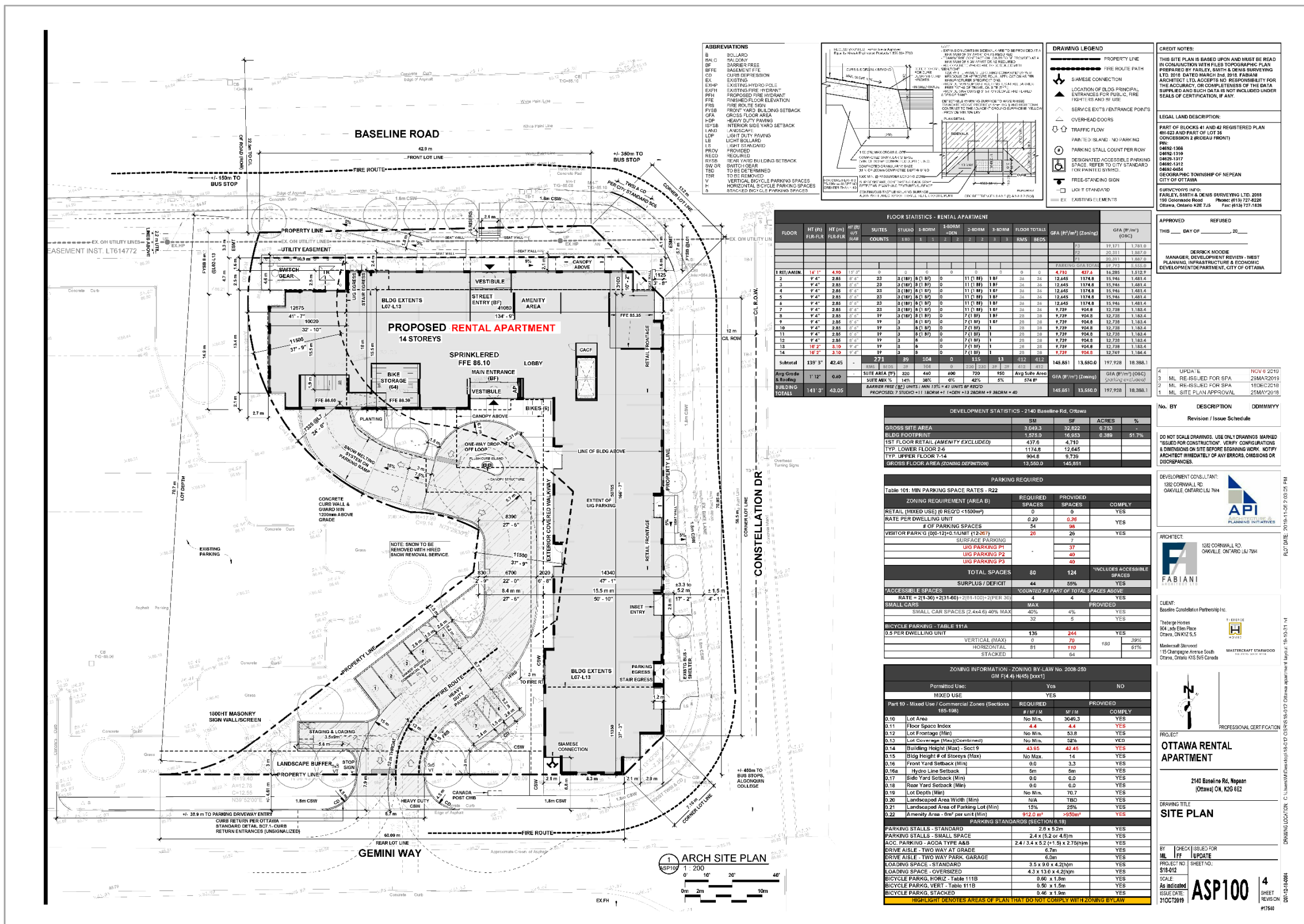
Figure 1 - Site Location



Table 1 - Assumed Land Uses

Floor	Size	Assumed ITE Land Use
L1	4,710 ft ² (GFA)	LUC 820: Shopping Centre LUC 936: Coffee / Donut Shop without Drive-Through Window
L2 - L14	271 units	LUC 222: High-rise apartments (13 floors) Amenities Space

Figure 2 - Proposed Site Plan



Scoping

2.1.2 Existing Conditions

2.1.2.1 Roads and Traffic Control

The roadways under consideration in the study area are described as follows:

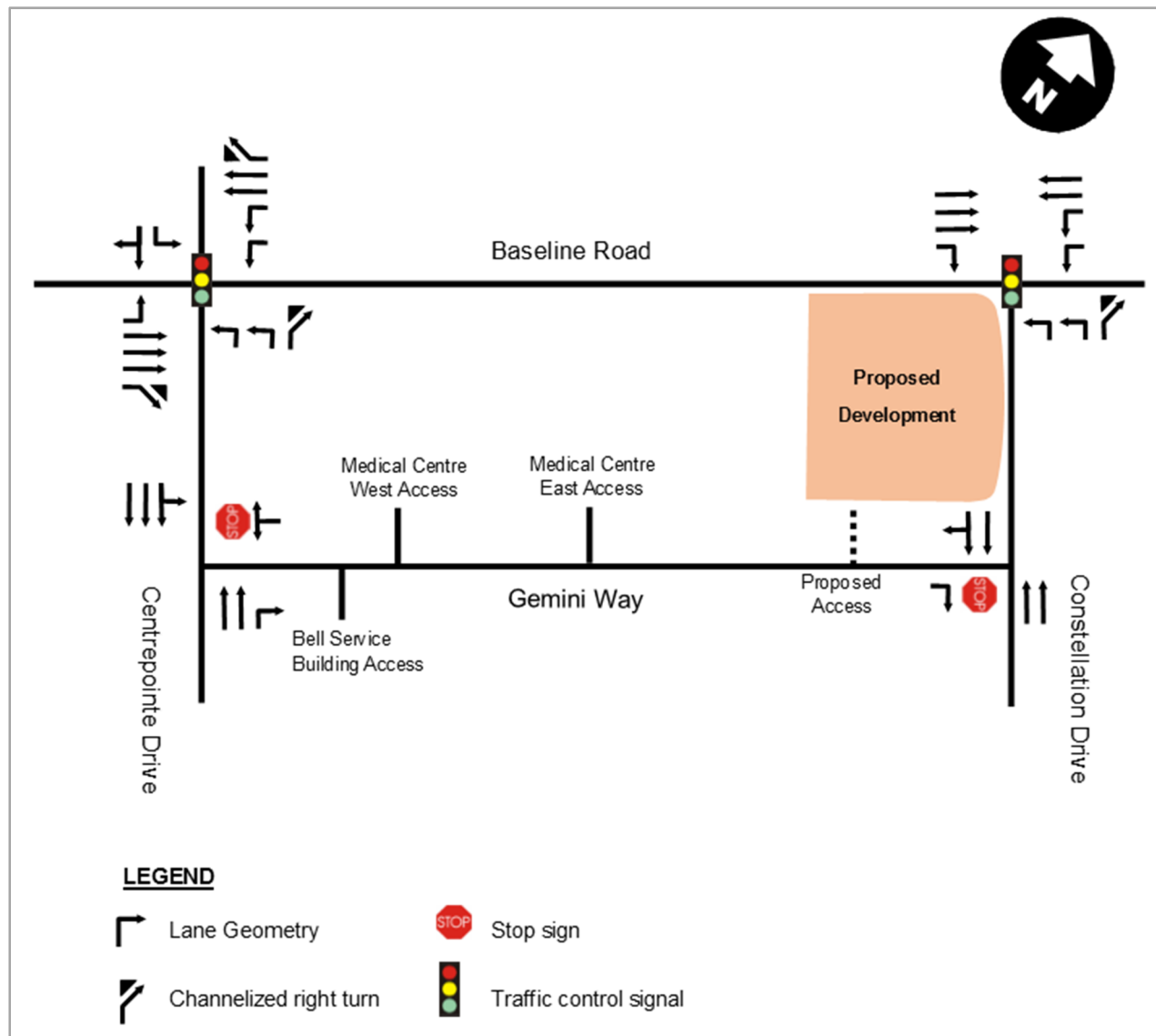
Baseline Road	Baseline Road is a municipally-owned, four-lane divided arterial roadway with a posted speed limit of 60 kph across the frontage of the proposed site.
Centrepointhe Drive	Centrepointhe Drive is a municipally-owned, four-lane undivided major-collector roadway with a posted speed limit of 40 kph in the vicinity of the proposed site.
Constellation Drive	Constellation Drive is a municipally-owned, four-lane collector roadway with a default speed limit of 50 kph across the frontage of the proposed site. South of Baseline Road, Constellation Drive is divided by a median for 130 m after which the median tapers off and the roadway becomes undivided.
Gemini Way	Gemini Way is a municipally-owned, two-lane undivided collector roadway with a default speed limit of 50 kph in the vicinity of the proposed site. On-street pay-and-display parking is provided along the north side of the road near the Nepean Medical Centre.

Two access driveways to a medical office building are provided on the north side of Gemini Way. A single access to a Bell service building is currently provided on the south side of Gemini Way. Two accesses to an office building are provided on the east side of Constellation Drive south of Baseline Road.

Figure 3 illustrates the existing lane configuration and traffic control.

Scoping

Figure 3 - Existing Lane Configuration and Traffic Control



Scoping

2.1.2.2 Walking and Cycling

Figure 4 illustrates the existing pedestrian and cycling facilities.

Figure 4 - Existing Pedestrian and Cycling Network



Source: geoOttawa, accessed March 2018

Scoping

2.1.2.3 Transit

The subject site is currently well serviced by transit through the following routes:

- | | |
|------------------|--|
| Route 88 | Is a <i>Frequent</i> route providing high frequency bus service along major roads including Baseline Road and Constellation Drive. This route provides service between Terry Fox Station and the Hurdman Station. |
| Baseline Station | Baseline Station is a Transitway Station located along the Southwest Transitway corridor. This key station currently accommodates upwards of 20 bus routes including <i>Rapid</i> Transitway routes such as 91, 94 and 95. |

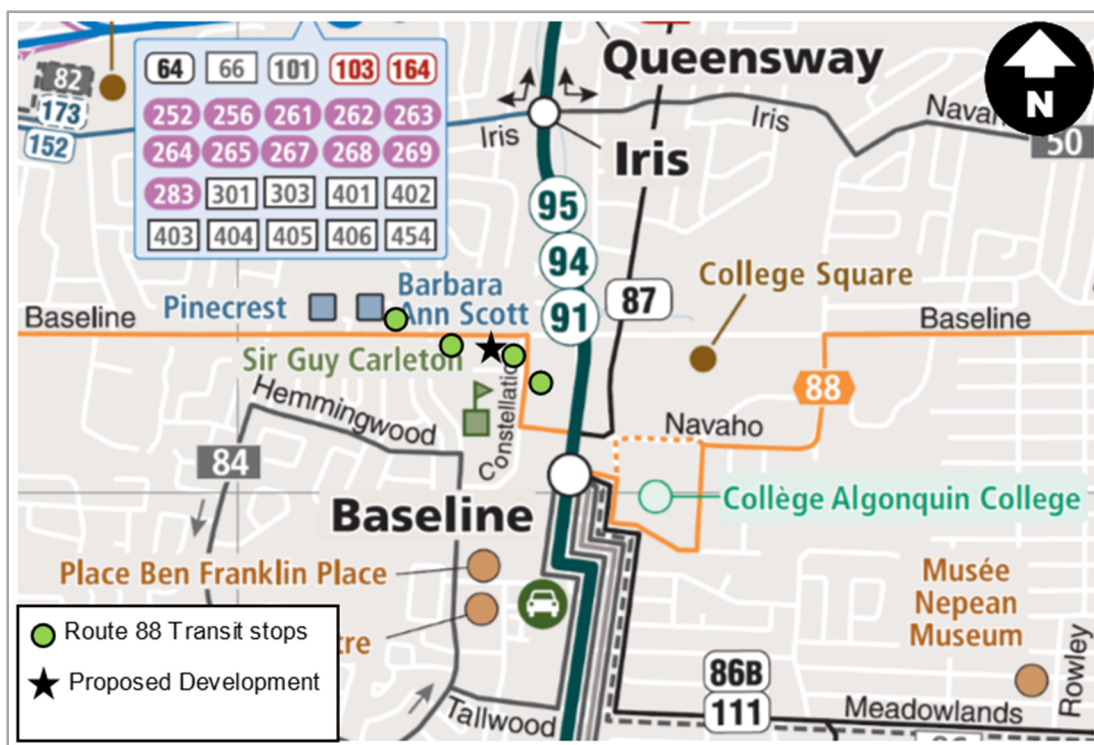
The subject site is located within 200 m of two existing on-street bus stops servicing Route 88: one bus stop and shelter is located at the southeast corner of the intersection of Baseline Road and Centrepointhe Drive, and another is located at the northwest corner of Constellation Drive and Gemini Way.

Figure 5 illustrates nearby transit routes and bus stop shelter locations.

The subject site is also located within 600 m of Baseline Station and is therefore within the Transitway Station catchment area.

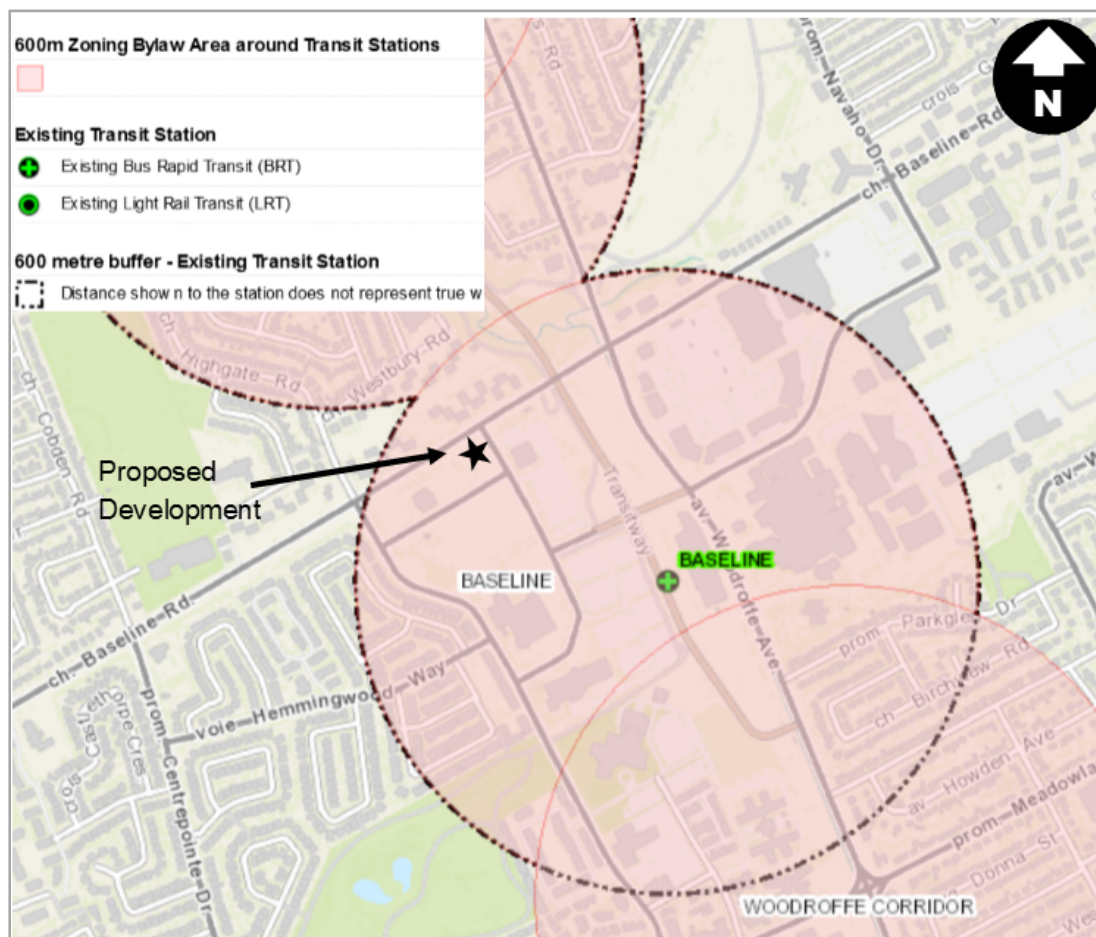
Figure 6 illustrates the location of the proposed development within the 600-meter catchment area near Baseline Station.

Figure 5 - Study Area Transit Routes and Stops



Source: OC Transpo System Map, accessed March 2018

Figure 6 - Study Area Transit Routes and Stops



2.1.2.4 Traffic Management Measures

The following traffic management measures were identified in the vicinity of the proposed development:

1. The restriction of the northbound and southbound through movements at the intersection of Baseline Road at Centrepointe Drive / Highgate Road;
2. The restriction of the eastbound left-turning movement and the westbound right-turning movement at the intersection of Baseline Road at Centrepointe Drive / Highgate Road during the AM peak period (7:00 am to 9:00 am); and
3. The restriction of the eastbound left-turn movement at the intersection of Constellation Drive at Gemini Way imposed by the existing median provided along Constellation Drive.

Scoping

2.1.2.5 Traffic Volumes

Traffic counts, conducted in 2018, were obtained from the City of Ottawa for the following intersections:

1. Baseline Road at Constellation Drive;
2. Baseline Road at Centrepointe Drive/ Highgate Road;
3. Constellation Drive at Gemini Way; and
4. Centrepointe Drive at Gemini Way.

Figure 7 and **Figure 8** illustrate existing 2018 traffic volumes during the AM and PM peak hours, respectively.

Appendix A contains existing turning movement count data.

2.1.2.6 Collision History

Baseline Road at Centrepointe Drive / Highgate Road experienced 44 collisions over a five-year period between 2012 and 2016. Out of the 39 recorded collisions, 24 were classified as rear-end (55%), 8 were classified as turning collisions (18%), and 5 were classified as a 'SMV Other' (11%). The remaining collisions were classified as angle, sideswipe or approaching collisions. None of the recorded collisions involved pedestrians or cyclists.

The recorded collisions involved 34 property damage only (77%) and 10 non-fatal injury (23%), indicating low impact speeds.

Baseline Road at Constellation Drive experienced 21 collisions over a five-year period between 2012 and 2016. Out of the 21 recorded collisions, 12 were classified as rear-end (57%), 4 were classified as sideswipe collisions (19%), and 3 were classified as angle collisions (14%). The remaining collisions were classified as turning and single vehicle collisions. None of the recorded collisions involved pedestrians or cyclists.

The recorded collisions involved 20 property damage only (83%) and 1 non-fatal injury (4%), indicating low impact speeds.

Centrepointe Drive at Gemini Way experienced 3 collisions over a five-year period between 2012 and 2016. Out of the 3 recorded collisions, one was classified as a rear-end collision (33%), one was classified as a turning collision (33%), and one was classified as an angle collision (33%). None of the recorded collisions involved pedestrians or cyclists.

The recorded collisions only involved property damage, indicating low impact speeds.

Constellation Drive at Gemini Way did not experience any collisions between 2012 and 2016.

Based on the available data, there does not appear to be any prevailing safety issues at study area intersections.

Appendix B contains detailed collision summary reports.

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Scoping

Figure 7 - 2018 Existing Volumes (AM Peak)

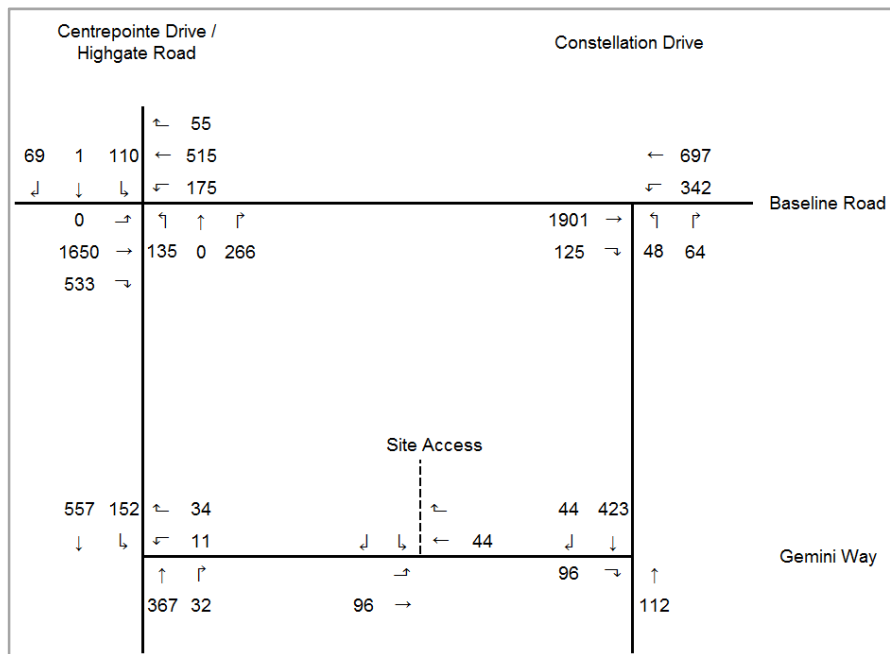
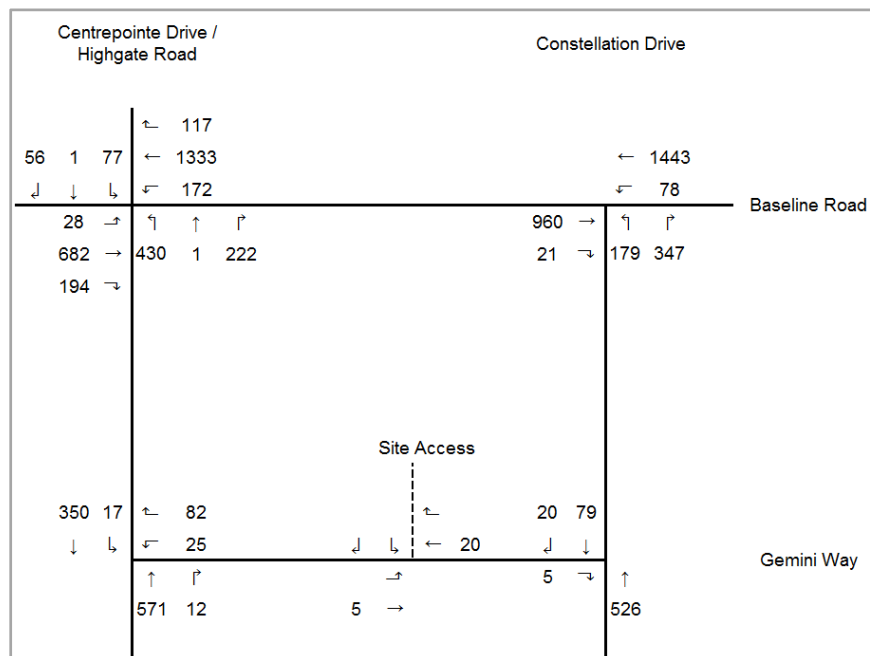


Figure 8 - 2018 Existing Volumes (PM Peak)



Scoping

2.1.3 Planned Conditions

2.1.3.1 Road Network Modifications

Table 2 identifies the City of Ottawa Transportation Master Plan (TMP) projects located near of the study area.

Table 2 - City of Ottawa Transportation Master Plan Projects

Project	Description	TMP Phase
Stage 2 LRT Confederation Line West Extension	Conversion of the West Transitway to LRT between Tunney's Pasture Station and Baseline Station. Construction of new LRT right-of-way between the existing West Transitway and Pinecrest, and conversion of West Transitway to LRT from Pinecrest to Moodie Station.	2023 Horizon
Baseline / Heron / Walkley / St. Laurent	At-grade BRT connecting Baseline Station to Heron Station. At-grade BRT connecting Bayshore Station to St. Laurent Station.	Network Concept (i.e. Beyond 2031 horizon)
Southwest Transitway Extension	Fully exclusive BRT between Baseline Station and Hunt Club Road.	Network Concept (i.e. Beyond 2031 horizon)
Baseline Road	Transit signal priority and queue jump lanes between Baseline Station and Richmond Road.	Affordable Network (i.e. within 2031 horizon)

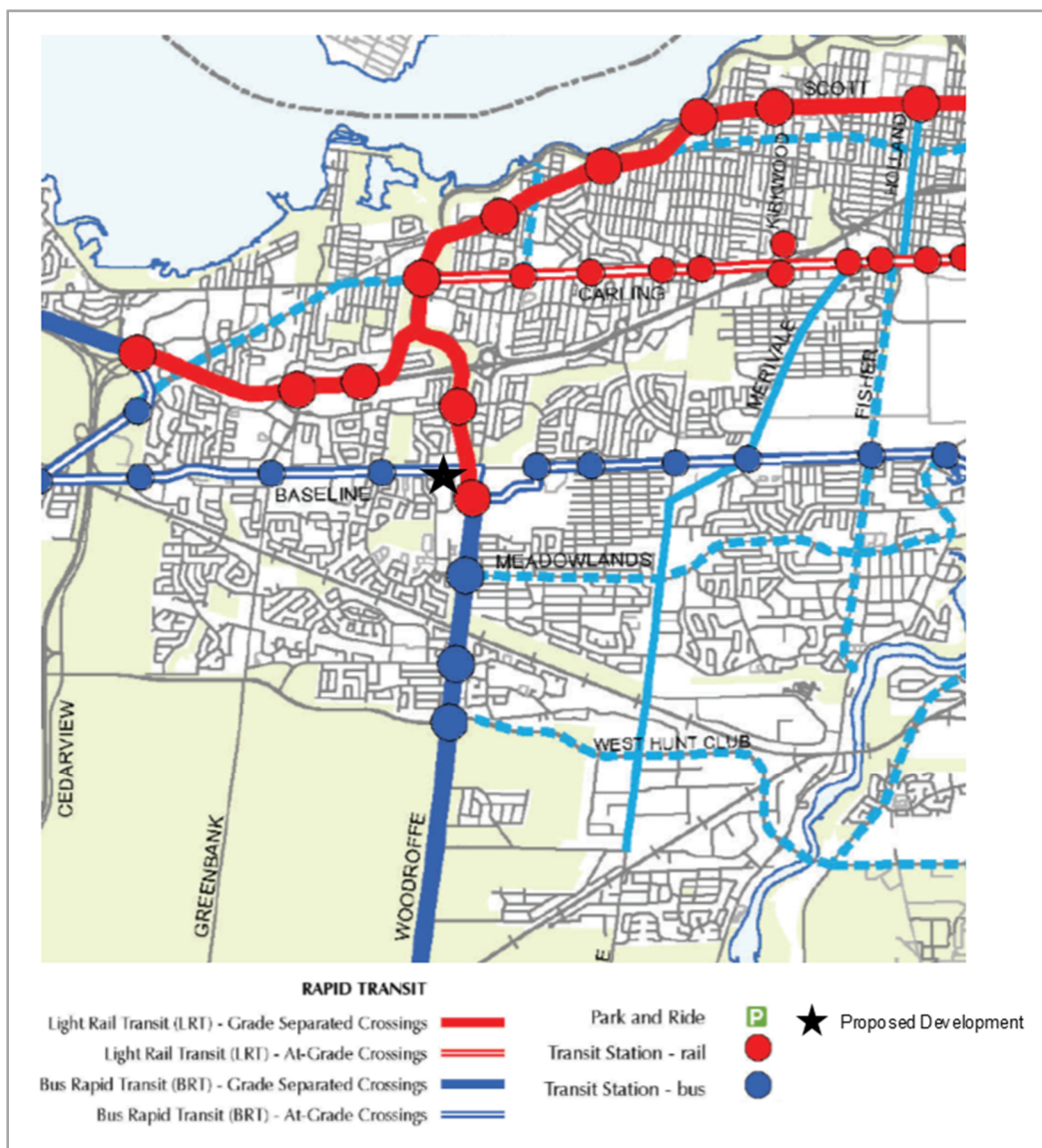
As outlined in **Table 2**, a number of transit improvements are expected to occur near the proposed development.

Under the TMP Affordable Network, the West Transitway will be converted from a BRT system to LRT between Tunney's Pasture Station and Baseline Station. This will occur as part of Stage 2 of the Confederation Line O-Train extension which is expected to go into revenue service in 2023.

In addition to the LRT extension to Baseline Station, an at-grade BRT system is currently planned on Baseline Road between Bayshore Station and Heron Station. The new at-grade BRT system will operate along the centre median of Baseline Road with a number of at-grade stations. The implementation of the new BRT system is expected take place beyond the 2031 horizon.

Figure 9 illustrates planned network modifications near the proposed development.

Figure 9 - Planned Road Network Modifications



Source: City of Ottawa TMP

2.1.3.2 Future Background Developments

The built out and occupancy of the proposed development is anticipated to occur in the Fall 2020.

There are currently no other known developments in the area.

As the area is located within a Design Priority Zone, it is anticipated that additional development and intensification, which is supported by the Baseline and Woodroffe Secondary Plans and CentrepoinTE Town Centre Concept Plan (CTC), will occur in the near future. At this time, no additional developments are anticipated to take place within the study time horizon.

Scoping

2.2 STUDY AREA AND TIME PERIODS

2.2.1 Study Area

The study area was limited to the following intersections:

1. Baseline Road at Centrepointe Drive / Highgate Road;
2. Baseline Road at Constellation Drive;
3. Gemini Way at Centrepointe;
4. Gemini Way at Constellation Drive; and
5. Gemini Way at Site Access.

2.2.2 Time Periods

The scope of the transportation assessment includes the following analysis time periods:

- Weekday AM peak hour of roadway; and
- Weekday PM peak hour of roadway.

2.2.3 Horizon Years

The scope of the transportation assessment includes the following horizon years:

- 2018 existing conditions;
- 2020 future background conditions;
- 2020 total future conditions (site build-out); and
- 2025 total future conditions (5 years beyond build-out).

Scoping

2.3 EXEMPTIONS REVIEW

Table 3 summarizes the Exemptions Review table from the City of Ottawa's *2017 Transportation Impact Assessment Guidelines*.

Table 3 - Exemptions Review

Module	Element	Exemption Considerations	Exempted?
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	No
	4.1.3 New Street Networks	Only required for plans of subdivision	Yes
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	No
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Yes
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	No
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	Yes
4.8 Network Concept		Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning	Yes
4.9 Intersection Design	All Elements	Not required if site generation trigger is not met.	No

3.0 FORECASTING

3.1 DEVELOPMENT GENERATED TRAVEL DEMAND

3.1.1 Trip Generation and Mode Shares

The *TRANS Residential Trip Generation Residential Trip Rates Study Report* and the *ITE Trip Generation Manual*, 9th edition, were used to forecast auto trip generation for the residential and retail portions of the development, respectively.

Table 4 outlines the assumed land uses and the vehicle trip generation rates for each land use.

As per the City of Ottawa TIA Guidelines, the auto trip generation rates of the residential portion of the proposed development were converted to person trips using the auto mode share rates for the Apartment Land Use in Table 3.13 in the *TRANS Residential Trip Generation Residential Trip Rates Study Report*. The auto trip generation rates of the retail portion of the proposed development were converted to person trip generation rates using a factor of 1.28 representing auto occupancy and transit modal shares.

Table 5 shows development-generated person trips for each land use.

Table 4 - Vehicle Trip Generation Rates

LUC	Land Use	Size	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Rate	In	Out	Rate
222	High Rise Apartments	144 Units	24%	76%	0.24	61%	61%	0.27
820	Shopping Centre	8.69 (1000 sq.ft. GFA)	62%	38%	4.04	48%	48%	13.42
932	High Turn-Over Restaurant	2.90 (1000 sq.ft. GFA)	55%	45%	10.81	60%	60%	9.85
936	Coffee Shop without Drive-Thru	1.45 (1000 sq.ft. GFA)	51%	49%	108.38	50%	50%	40.75

Table 5 - Person Trips Generated by Land Use

LUC	Land Use	Trip Conversion	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
222	High Rise Apartments	Auto Trips	8	26	35	24	15	39
		Auto Mode Share	37%	37%	37%	40%	40%	40%
		Person Trips	22	71	93	59	38	97
820	Shopping Centre	Auto Trips	22	13	35	56	61	117
		Conversion Factor	1.28	1.28	1.28	1.28	1.28	1.28
		Person Trips	28	17	45	72	78	149
932	High Turn-Over Restaurant	Auto Trips	17	14	31	17	11	29
		Conversion Factor	1.28	1.28	1.28	1.28	1.28	1.28
		Person Trips	22	18	40	22	15	37
936	Coffee Shop without Drive-Thru	Auto Trips	80	77	157	30	30	59
		Conversion Factor	1.28	1.28	1.28	1.28	1.28	1.28
		Person Trips	103	98	201	38	38	76
Total		Auto Trips	127	131	258	126	117	243
		Person Trips	175	205	379	191	168	359

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Forecasting

The *TRANS Committee's 2011 Origin-Destination (O-D) Survey* was reviewed to identify existing travel mode shares for the Bayshore/Cedarview district. New travel mode shares were set for the residential and retail portions of the proposed development based on the development build-out year, future transportation network projects, policy directions and objectives of the City of Ottawa, and development type and location.

Table 6 and **Table 7** list the existing and future travel mode share targets for residential and retail components of the proposed development, respectively.

Table 8 outlines the anticipated trip generation potential of the proposed development by travel mode based on assumed mode shares.

Table 6 - Future Mode Share Targets (Residential Component)

Travel Mode	Existing OD Survey Mode Share	Future		
		Mode Share Target	+/-	Rationale
Transit	10%	40%	+30%	Proximity to Baseline Transitway Station. Conversion of the West Transitway to LRT as part of Stage 2 of the Confederation Line O-Train extension. High transit utilization by Algonquin College students.
Walking and Cycling	3%	40%	+37%	Type of development (i.e. student residence) Location of development (i.e. proximity to Algonquin College)
Auto Passenger	12%	0%	-12%	Low auto-ownership of students residing near campus. Reduction to allow for other mode increases in line with mode share targets.
Auto Driver	70%	20%	-50%	Low auto-ownership of students residing near campus. Reduction to allow for other mode increases in line with mode share targets.
Other	5%	N/A	N/A	N/A
TOTAL	100%	100%	-	-

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Forecasting

Table 7 - Future Mode Share Targets (Mixed-Use Retail Component)

Travel Mode	Existing OD Survey Mode Share	Future		
		Mode Share Target	+/-	Rationale
Transit	10%	30%	+20%	Proximity to Baseline Transitway Station. Conversion of the West Transitway to LRT as part of Stage 2 of the Confederation Line O-Train extension.
Walking and Cycling	3%	25%	+22%	Location of development (i.e. proximity to Algonquin College and nearby office land uses)
Auto Passenger	12%	0%	-12%	Reduction to allow for other mode increases in line with mode share targets.
Auto Driver	70%	45%	-25%	Reduction to allow for other mode increases in line with mode share targets.
Other	5%	N/A	N/A	N/A
TOTAL	100%	100%	-	-

Table 8 - Trips Generated by Travel Mode

LUC	Land Use	Trip Conversion		Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
222	High Rise Apartments	Auto	20%	4	14	18	12	8	20
		Walk / Bike	40%	9	28	37	24	15	39
		Transit	40%	9	28	37	24	15	39
Residential Total Person Trips				22	70	92	60	38	98
820	Shopping Centre	Auto	45%	13	8	21	32	35	67
		Walk / Bike	25%	7	4	11	18	19	37
		Transit	30%	8	5	13	21	23	44
932	High Turn-Over Restaurant	Auto	45%	10	8	18	10	7	17
		Walk / Bike	25%	6	5	11	5	4	9
		Transit	30%	7	5	12	7	4	11
936	Coffee Shop without Drive-Thru	Auto	45%	46	44	90	17	17	34
		Walk / Bike	25%	26	25	51	9	9	18
		Transit	30%	31	30	61	11	11	22
Retail Total Person Trips				154	134	288	130	129	259
Total		Auto Trips		73	74	147	71	67	138
		Walk / Bike Trips		48	62	110	56	47	103
		Transit Trips		55	68	123	63	53	116

A portion of the auto trips generated by the mixed-use retail component will be 'pass-by' in nature. Pass-by trips represent intermediate stops between trip origins and destinations that are drawn from existing traffic already on the roadway. While the total number of auto trips generated by a given development remains the same, the turning volumes at site accesses require adjustments to reflect the turning movements of pass-by traffic.

Pass-by rates of 34% and 43% were obtained from the *ITE Trip Generation Manual* for the Shopping Centre (LUC 820) and High Turn-Over Restaurant (LUC 932), respectively. No pass-by rates are defined in the *ITE Trip Generation Manual* for the coffee shop land use. As a result, a pass-by rate of 30% was assumed for the Coffee Shop without Drive-Thru land use (LUC 936).

Due to the mixed-use nature of the proposed development, a portion of the trips generated are also anticipated to be captured internally. Internal capture accounts for synergies developed within a mixed-use development, this is particularly prevalent in developments that consist of residential, office, commercial retail and restaurant land uses. An internal capture rate of 25% was assumed for the retail portion of the development to account for the anticipated synergy developed between the residential and ground floor retail land uses.

Table 9 outlines the pass-by, internal capture, and new auto trips anticipated for the proposed development.

Figure 10 and **Figure 11** illustrate the pass-by trips the proposed development is anticipated to generate.

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Forecasting

Table 9 - Pass-By and Internal Capture Trips

LUC	Land Use	Trip Conversion		Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
222	High Rise Apartments	Auto Trips		4	14	18	12	8	20
		Pass-By	0%	0	0	0	0	0	0
		Internal Capture	0%	0	0	0	0	0	0
		New Auto Trips		4	14	18	12	8	20
820	Shopping Centre	Auto Trips		13	8	21	32	35	67
		Pass-By	34%	3	3	6	11	11	22
		Internal Capture	25%	3	2	5	8	9	17
		New Auto Trips		6	2	8	13	15	28
932	High Turn-Over Restaurant	Auto Trips		10	8	18	10	7	17
		Pass-By	43%	4	4	8	4	4	8
		Internal Capture	25%	2	2	4	2	2	4
		New Auto Trips		4	2	6	4	1	5
936	Coffee Shop without Drive-Thru	Auto Trips		46	44	90	17	17	34
		Pass-By	30%	14	14	28	5	5	10
		Internal Capture	25%	12	11	23	4	4	8
		New Auto Trips		21	20	41	8	8	16
Total		Auto Trips		73	74	147	71	67	138
		Pass-By		21	21	42	20	20	40
		Internal Capture		17	15	32	15	15	30
		New Auto Trips		35	38	73	36	31	67

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Forecasting

Figure 10 - 2020 Pass-By Volumes (AM Peak)

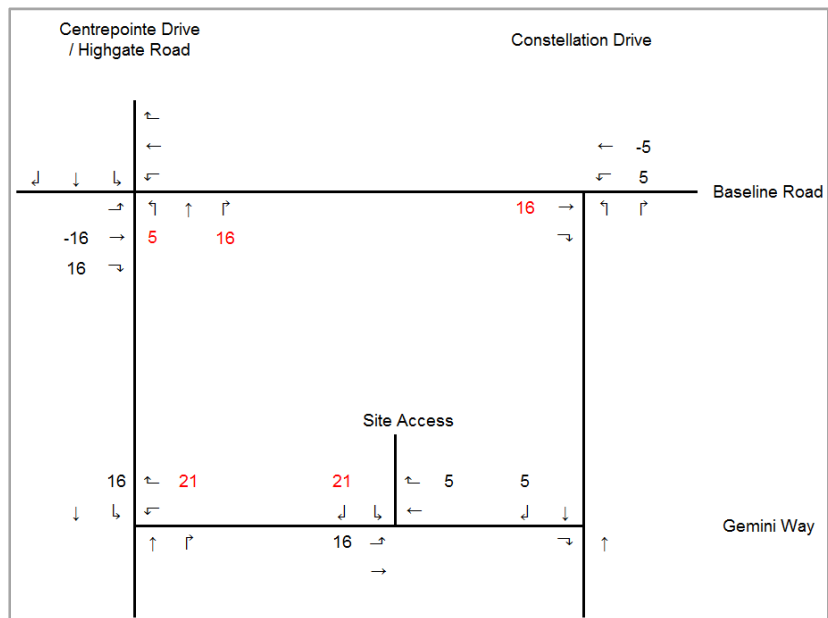
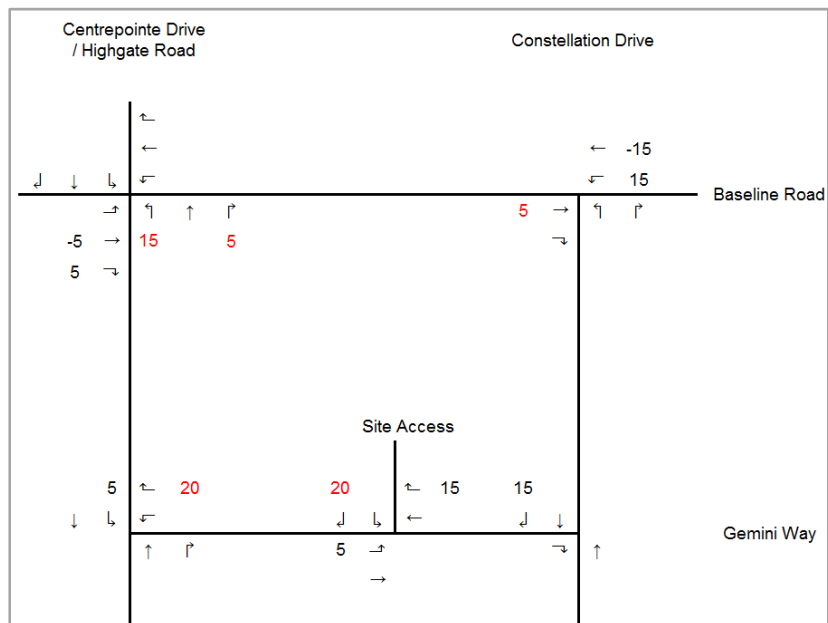


Figure 11 - 2020 Pass-By Volumes (PM Peak)



Forecasting

3.1.2 Trip Distribution

The distribution of traffic to / from the proposed is consistent with the *TRANS Committee's 2011 Origin-Destination Summary* for the Bayshore/Cedarview district.

Table 10 summarizes the assumed trip distribution for the proposed development.

Table 10 - Trip Distribution

Direction		Via (to/from)			
		Baseline Rd (East)	Baseline Rd (West)	Woodroffe Ave (North)	Woodroffe Ave (South)
North / East	30%	15%		15%	
South	15%		7.5%		7.5%
West	15%		7.5%	7.5%	
Internal *	40%		15%	17.5%	7.5%
Total	100%	15%	30%	40%	15%

* Refers to trip origins/destinations within the same O-D Ward (Bayshore/Cedarview).

3.1.3 Trip Assignment

Site generated trips were assigned to the study area road network based on the trip distribution assumptions outlined in **Table 10**. New site trips are assigned to the road network, pass-by trips (as outlined in **Figure 10** and **Figure 11**), were then added to develop the net site trips generated by the proposed development.

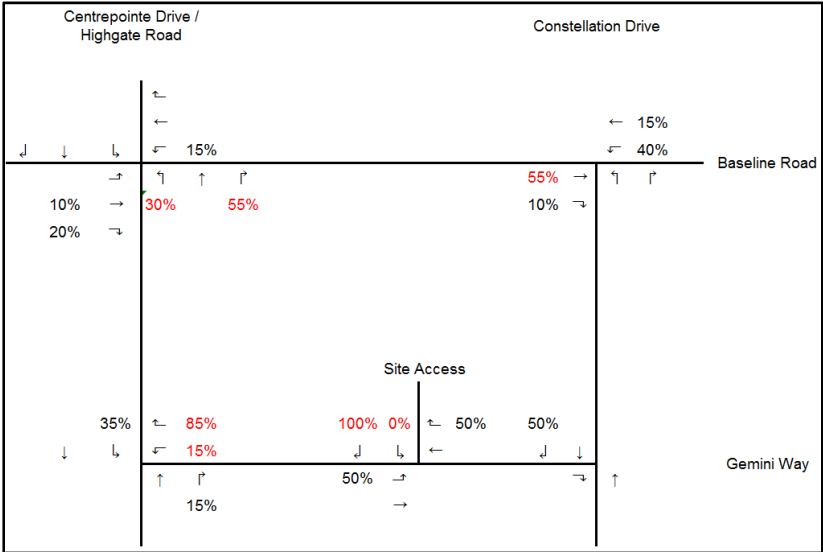
Figure 12 outlines site assignment assumptions.

Figure 13 and **Figure 14** illustrate new site generated trips, prior to accounting for pass-by, during the AM and PM peak hours, respectively.

Figure 15 and **Figure 16** illustrate the net site generated trips for the proposed development after accounting for pass-by trips, during the AM and PM peak hours, respectively.

Forecasting

Figure 12 - Site Traffic Assignment Assumptions



Forecasting

Figure 13 - New Site Generated Volumes (AM Peak)

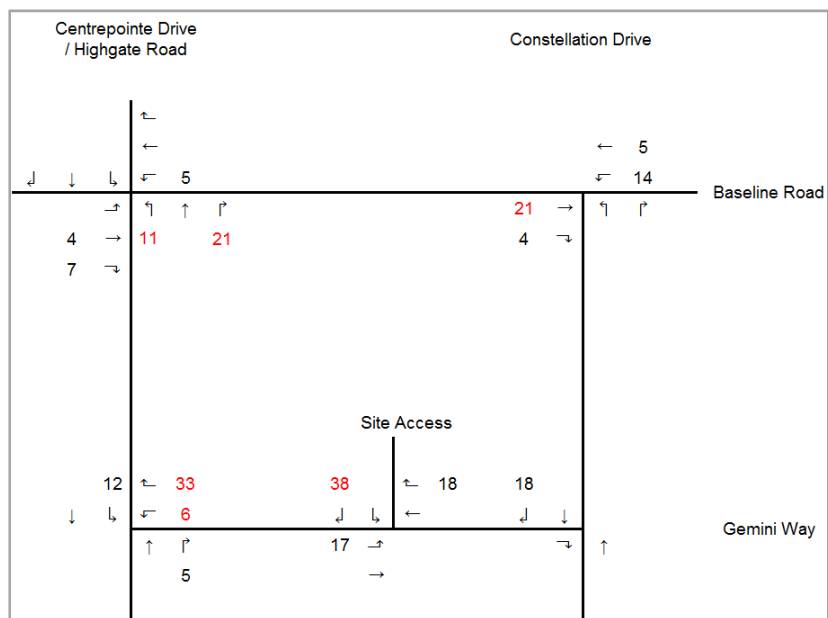
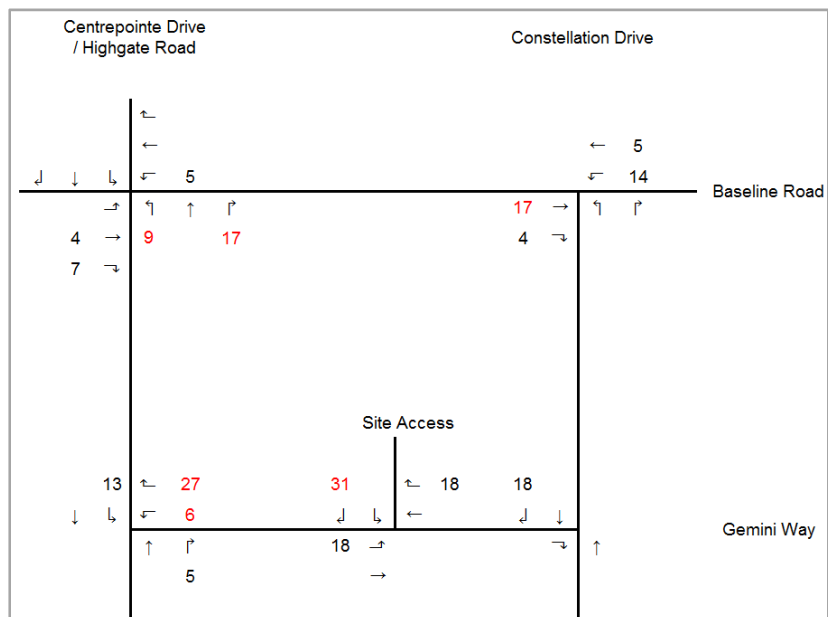


Figure 14 - New Site Generated Volumes (PM Peak)



Forecasting

Figure 15 - Net Site Generated Volumes (AM Peak)

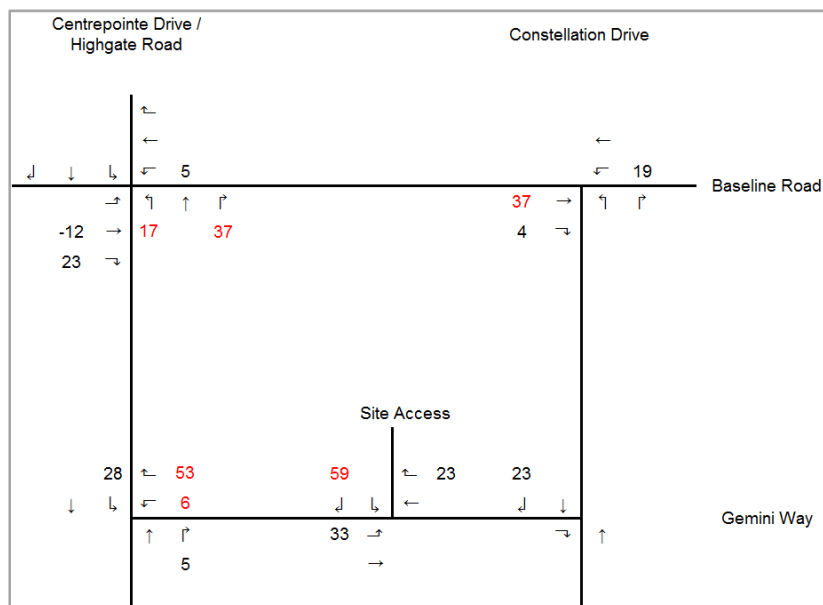
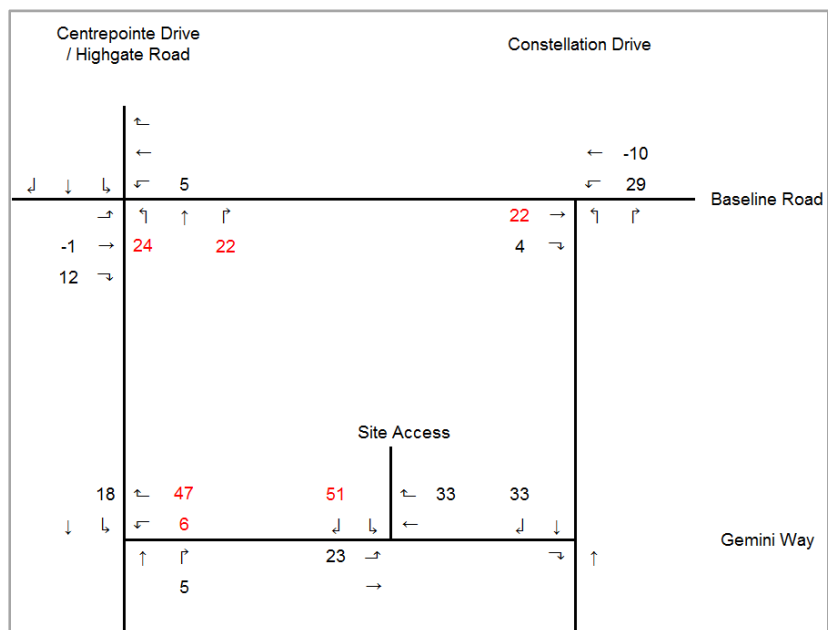


Figure 16 - Net Site Generated Volumes (PM Peak)



3.2 BACKGROUND NETWORK TRAVEL DEMAND

3.2.1 Transportation Network Plans

As outlined in **Table 2** in **section 2.1.3.1**, a number of transit improvements are expected to occur near the proposed development.

Under the TMP Affordable Network, the West Transitway will be converted from a BRT system to LRT between Tunney's Pasture Station and Baseline Station. This will occur as part of Stage 2 of the Confederation Line O-Train extension which is expected to go into revenue service in 2023.

In addition to the LRT extension to Baseline Station, an at-grade BRT system is currently planned on Baseline Road between Bayshore Station and Heron Station. The new at-grade BRT system will operate along the centre median of Baseline Road with a number of at-grade stations. The implementation of the new BRT system is expected take place beyond the 2031 horizon, and therefore was not considered as part of this transportation assessment.

3.2.2 Background Growth

The existing traffic counts were grown at a rate of 2% annually, non-compounding, to represent 2020 background traffic volumes.

3.2.3 Other Developments

The built out and occupancy of the proposed development is anticipated to occur in the Fall 2020.

There are currently no other known developments in the area.

As the area is located within a Design Priority Zone, it is anticipated that additional development and intensification, which is supported by the Baseline and Woodroffe Secondary Plans and CentrepoinTE Town Centre Concept Plan (CTC), will occur in the near future. At this time, no additional developments are anticipated to take place within the study time horizon.

3.3.1 2020 Future Background Traffic

The future background traffic demands are not expected to exceed capacity and therefore demand rationalization was not required.

Diagram illustrating the traffic flow and vehicle counts at the intersection of Gemini Way and Baseline Road, showing the proposed access point for the Site.

Centrepointhe Drive / Highgate Road (Left Side):

- Top Left: 72 (Left), 1 (Down), 114 (Right)
- Top Center: 57 (Up), 536 (Left), 182 (Left)
- Bottom Left: 0 (Right), 1716 (Right), 554 (Right)
- Bottom Center: 579 (Left), 158 (Left), 35 (Left), 11 (Left)
- Bottom Right: 382 (Up), 33 (Up), 100 (Right)

Constellation Drive (Right Side):

- Top Right: 725 (Left), 356 (Left)
- Bottom Right: 1977 (Right), 130 (Right), 50 (Right), 67 (Right), 46 (Right), 440 (Right), 100 (Right), 116 (Right)

Baseline Road (Horizontal Line):

- Center: 140 (Left), 0 (Left), 277 (Left)

Gemini Way (Bottom Section):

- Center: 46 (Left), 46 (Left)

Site Access (Vertical Dashed Line):

- Center: 46 (Left)

The diagram illustrates the traffic flow and vehicle counts at the Gemini Way intersection. The intersection is bounded by Centrepoint Drive / Highgate Road to the north and Constellation Drive to the south. Gemini Way runs east-west through the center of the intersection.

North Side (Centrepoint Drive / Highgate Road):

- Left Lane:** Vehicle counts are 58 (down), 1 (down), and 80 (down). A right-turn lane is indicated by a right-turn arrow.
- Through Lane:** Vehicle counts are 122 (up), 1386 (up), and 179 (up). A left-turn lane is indicated by a left-turn arrow.

South Side (Constellation Drive):

- Left Lane:** Vehicle counts are 1501 (up) and 81 (up). A right-turn lane is indicated by a right-turn arrow.
- Through Lane:** Vehicle counts are 998 (right) and 22 (right). A left-turn lane is indicated by a left-turn arrow.

East Side (Baseline Road):

- Left Lane:** Vehicle counts are 29 (right), 709 (right), and 202 (right). A right-turn lane is indicated by a right-turn arrow.
- Through Lane:** Vehicle counts are 447 (up), 1 (up), and 231 (up). A left-turn lane is indicated by a left-turn arrow.

West Side (Gemini Way):

- Left Lane:** Vehicle counts are 364 (down), 18 (down), and 594 (up). A right-turn lane is indicated by a right-turn arrow.
- Through Lane:** Vehicle counts are 85 (up), 26 (up), and 12 (up). A left-turn lane is indicated by a left-turn arrow.

Intersection Details:

- Site Access:** A dashed line indicates a site access point on the west side of the intersection, between the left and through lanes.
- Vehicle Counts:** The diagram shows vehicle counts for each lane in both directions. For example, on the north side, the left lane has 122 vehicles going up, 1386 vehicles going up, and 179 vehicles going up. On the south side, the left lane has 1501 vehicles going up and 81 vehicles going up.

Forecasting

Figure 19 and **Figure 20** illustrate the 2020 total future traffic volumes during the AM and PM peak hours, respectively.

The future background traffic demands are not expected to exceed capacity and therefore demand rationalization was not required.

Centrepointe Drive / Highgate Road				Constellation Drive			
72	1	114					
↓	↓	↓	↖ 57	↖ 536		↖ 725	
			↖ 187			↖ 375	
0	→		↑	↑	↑	2014	→
1704	→		157	0	313	134	→
577	↘					50	67
Site Access							
579	186		↖ 89	59 Neg.	↖ 23	69	440
↓	↓		↖ 17	↓	↓	46	↓
			↑	↑	↑	100	↘
			382	39	33	→	116
					100	→	

Centrepoin t Drive / Highgate Road						Constellation Drive					
			←	122					←	1491	
58	1	80	←	1386					←	111	
J	↓	L	↖	184					↖		
29	→		↑	↑	↑	1021	→		↑	↑	
708	→		472	1	253	25	↘		186	361	
214	↘										
Site Access											
364	35		←	132		51	Neg.	←	33	54	82
↓	L		↖	32		↓	L	←	21	↓	↓
			↑	↑		23	→		5	↘	
594	18					5	→				
										↑	547
Gemini Way											

Forecasting

Figure 21 and **Figure 22** illustrate the 2025 ultimate traffic volumes during the AM and PM peak hours, respectively.

The future background traffic demands are not expected to exceed capacity and therefore demand rationalization was not required.

Centrepointhe Drive / Highgate Road				Constellation Drive			
79	1	125					
↓	↓	↓					
			↖ 63				
			↖ 587				← 795
			↖ 205				↖ 409
0	→		↖ ↗ ↗		2204 →	↖ ↗	Baseline Road
1869	→		171 0 340		146 →	55 73	
630	→						
Site Access							
635	201		↖ 92	59 Neg.	↖ 23	73 482	
↓	↓		↖ 18	↓ ↓	← 50	↓ ↓	
			↑ ↗	33 →		109 →	↑
			418 42	109 →			128
				Gemini Way			

Centrepointe Drive / Highgate Road						Constellation Drive					
64	Neg.	88	↖	133							
			←	1520						←	1635
↓	↓	↳	↙	202						↙	118
<hr/>											
32	→		↑	↑	↑		1117	→		↑	↑
776	→		515 Neg.	275			28	↘		204	396
233	↘										
<hr/>											
Site Access											
399	37		↖	140		51 Neg.	↖	33		56	90
	↓	↳	↙	34		↓	↳	←	23	↓	↓
<hr/>											
			↑	↑		23	→			6	↘
			651	19		6	→				600
<hr/>											
Gemini Way											

Strategy

4.0 STRATEGY

4.1 DEVELOPMENT DESIGN

4.1.1 Design for Sustainable Modes

Bicycle facilities: A total of 244 bicycle parking spaces are provided on-site (70 vertical, 110 horizontal, and 64 stacked). The underground parking ramp includes a designated bike ramp to provide convenient access to the secure underground bike racks. The location of surface level bike racks provides convenient access to Baseline Road, Constellation Drive and Constellation Drive.

Parking areas: A total of 124 parking spaces are provided. This consists of 7 surface level parking spaces and 117 underground parking spaces. Accessible parking spaces are adjacent to pedestrian paths, including an exterior covered walkway, that provide access to building entrances.

Transit facilities: Transit stops for OC Transpo Route 88 are currently provided at the intersection of Baseline Road and Centrepoin Drive / Highgate Road and at the intersection of Gemini Way at Constellation Drive. Pedestrian sidewalks and intersection crossings within the proposed development provide convenient access to transit stops.

4.1.2 Circulation and Access

A single, full-movement vehicular access is proposed on Gemini Way. Pedestrian access to the building is facilitated through two entrances: a main entrance along the south of the building facing Gemini Way, and a secondary entrance along Baseline Road. Ground level retail units will be accessible along the frontage of the building. As part of the proposed development, a new sidewalk is proposed on the north side of Gemini Way between Constellation Drive and the existing surface parking access to the adjacent medical centre.

4.1.3 New Street Networks

Not applicable; exempted during screening and scoping.

4.2 PARKING

4.2.1 Parking Supply

Auto Parking - As per City of Ottawa Zoning By-law 2016-249 (Sections 101 and 102), no minimum parking, other than visitor parking, is required. The minimum visitor parking space rate of 0.1 parking spaces per dwelling unit in excess of 12 dwelling units applies. This results in a minimum requirement of 26 visitor parking spaces. As per Section 103 of the By-Law, the proposed development is within 600 m from a rapid transit station and therefore is subject to a parking maximum of 1.5 spaces per dwelling unit. The maximum number of parking spaces permitted on site is 406 spaces. The proposed development provides 124 vehicle parking spaces (7 surface level parking spaces, 117 underground parking spaces).

Strategy

Bicycle Parking – As per City of Ottawa Zoning By-law 2016-249 (Section 111), the minimum bicycle parking rate is 0.50 bicycle parking spaces per dwelling unit. The proposed development has 271 units and therefore 136 bicycle parking spaces are required. The proposed development provides 244 bicycle parking spaces.

4.2.2 Spillover Parking

Not applicable; exempted during screening and scoping.

4.3 BOUNDARY STREET DESIGN

4.3.1 Design Concept

The roadway segment multi-modal level of service (MMLOS) was evaluated for Baseline Road, Constellation Drive, CentrepoinTE Drive, and Gemini Way to assist with developing a design concept that maximizes the achievement of the MMLOS objectives. The MMLOS targets for the “Within 600m of a rapid transit station” policy area was adopted for the study area roadways.

Baseline Road, Constellation Drive, and CentrepoinTE Drive are subject to a Pedestrian LOS (PLOS) target of A.

The Ultimate Cycling Network from the City of Ottawa *Cycling Plan* (2013) designates Baseline Road as a Spine Cycling Route and CentrepoinTE Drive and Constellation Drive as Local Cycling Routes. These roads are therefore subject to Bicycle Level of Service (BLOS) targets of C and B, respectively. Gemini Way does not have a cycling route designation and is therefore subject to a BLOS target of D.

Within the study area limits, Baseline Road, Constellation Drive, and CentrepoinTE Drive do not currently feature any rapid transit or continuous transit priority measures and are therefore subject to a Transit LOS (TLOS) target of D.

Baseline Road is designated as a truck route and is therefore subject to Truck LOS (TrLOS) target of D. None of the other boundary roads are truck routes and are therefore not subject to TrLOS targets.

Table 11 presents the MMLOS conditions for roadway segments.

All boundary roads currently have a Pedestrian LOS (PLOS) below the PLOS target of A identified for developments within 600 m of a rapid transit station. Based on the MMLOS guidelines, roadway segment PLOS is largely influenced by motor vehicle traffic volumes (AADT) and operating speeds. Baseline Road, Constellation Drive and CentrepoinTE Drive currently operate with traffic volumes and operating speeds above 3,000 AADT and 30 km/hr, respectively, which results in PLOS below target. Gemini Way currently operates with a poor PLOS due to the lack of pedestrian sidewalks.

All boundary roads currently operate with a Bicycle LOS (BLOS) below their respective targets. Based on the MMLOS guidelines, road segment BLOS is influenced by the number of travel lanes, the availability and width of dedicated cycling facilities, and roadway operating speeds.

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Strategy

Table 11 - MMLOS Conditions (Segments)

Segment		Baseline Road (arterial, spine cycling route)		Centrepointhe Drive (Major-Collector, local cycling route)		Constellation Drive (Collector, no cycling designation)		Gemini Way (Local, no cycling designation)		Target
		Existing	Build-out	Existing	Build-out	Existing	Build-out	Existing	Build-out	
Pedestrian	Sidewalk width (m)	2	**	2	**	2	**	None	2	A
	Boulevard width (m)	4.5	**	None	**	None	**	None	**	
	AADT > 3000?	Yes	**	Yes	**	Yes	**	No	**	
	On-Street parking	No	**	Yes	**	Yes	**	Yes	**	
	Operating speed (kph)	60	**	40	**	50	**	30 - 50	**	
	Level of Service	C	**	B	**	B	**	F	**	
Bicycle	Type of facility	Mixed	**	Mixed	**	Mixed	**	Mixed	**	C/B/B/D
	Number of travel lanes	5	**	4	**	4	**	2	**	
	Bike lane width (m)	N/A	**	N/A	**	N/A	**	N/A	**	
	Operating speed (kph)	60	**	40	**	50	**	30 - 50	**	
	Centreline (yes/no)	Yes	**	Yes	**	Yes	**	No	**	
	Bike lane blockage freq.	N/A	**	N/A	**	N/A	**	N/A	**	
	Level of Service	F	**	D	**	E	**	A	**	
Transit	Type of facility	Mixed	**	Mixed	**	Mixed	**	N/A	**	D/D/D
	Parking/driveway friction	Low	**	Low	**	Low	**	N/A	**	
	Level of Service	B	**	D	**	D	**	N/A	**	
Truck	Curb lane width (m)	3.5m	**	Not applicable		Not applicable		Not applicable		D*
	Number of travel lanes	5	**							
	Level of Service	A	**							

Notes:

Auto LOS is not considered for segments in the MMLOS Guidelines.

"Mixed" means either cyclists or transit operate in a shared lane with general traffic, i.e. they do not have their own dedicated facilities.

The number of travel lanes is two-way, i.e. in both directions.

Bike lane blockage frequency is only applicable when cycling is in mixed traffic and in a commercial area.

The Bicycle LOS target C/B/B/D indicates that the target is C for Baseline Road, B for Centrepointhe Drive, B for Constellation Drive, D for Gemini Way.

The Transit LOS target D/D/D indicates that the target is D for Baseline Road, D for Centrepointhe Drive, and D for Constellation Drive.

* Truck LOS TARGET D is applicable to Baseline Road only.

** Indicates that are no change between horizons or scenarios.

2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

Strategy

It is anticipated that additional development within the CentrepoinTE Town Centre, as outlined in the CentrepoinTE Town Centre Secondary Plan, will provide future opportunities to implement some of these road design concept elements to improve pedestrian and cycling amenities on CentrepoinTE Drive, Constellation Drive, and Gemini Way.

To improve the BLOS and PLOS on boundary street segments, namely CentrepoinTE Drive, Constellation Drive and Gemini Way, the following road design concepts are contemplated:

CentrepoinTE Drive: In order to improve the PLOS and meet the PLOS target of A, a boulevard width of 0.5m or more will be required on both sides of CentrepoinTE Drive. In addition, traffic calming measures aimed at reducing vehicle operating speeds to 30 km/h will be required.

In order to meet the BLOS target of B on CentrepoinTE Drive, 1.5m bike lanes could potentially be installed on both sides of road. However, this would require the removal of on-street parking on the west side of CentrepoinTE Drive and the extension of the median separation along the roadway. Alternatively, the implementation of segregated cycling facilities, such as a multi-use pathway, on the east side of CentrepoinTE Drive would result in an improved BLOS.

Constellation Drive: In order to improve the PLOS and meet the PLOS target of A, a boulevard width of 0.5m or more will be required on both side of Constellation Drive. In addition, traffic calming measures aimed at reducing vehicle operating speeds to 30 km/h will be required.

In order to meet the BLOS target of B on Constellation Drive, 1.5m bike lanes could potentially be installed on both sides of road.

Gemini Way: In order to improve the PLOS, sidewalk facilities are recommended on both sides of Gemini Way. The roadway currently has a right-of-way width of 20m which can support 1.8 – 2.0m sidewalks on both sides of the roadway.

It is anticipated that additional development within the CentrepoinTE Town Centre, as outlined in the CentrepoinTE Town Centre Secondary Plan, will provide future opportunities to implement some of these road design concept elements to improve pedestrian and cycling amenities on CentrepoinTE Drive, Constellation Drive, and Gemini Way.

4.4 ACCESS INTERSECTIONS DESIGN

4.4.1 Location and Design of Access

The site access is located on a Gemini Way and is located approximately 35 m west of the intersection of Constellation Drive at Gemini Way, and 235 m east of the intersection of Centrepointhe Drive at Gemini Way. This exceeds the City requirement of 18 m between the private approach and the nearest intersecting street line, as required by the Private Approach By-law No. 2003-447, S.25, L.

The site access has a width of 6.7 m which is above the minimum of 2.4 m and below the maximum width of 9.0 m.

The proposed access driveway has a clear throat length of 12 m between Gemini Way and the on-site surface parking area. As per Table 8.9.3 of the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, the minimum clear throat distance suggested for a major driveway access on a collector roadway ranges between 8 m and 15 m for an apartment building land use with 100 and 200 residential units, respectively.

4.4.2 Intersection Control

The site access is a low-volume driveway located on a low-volume local roadway and therefore a stop control on the minor site access approach is appropriate.

4.4.3 Intersection Design

Table 12 summarizes the Synchro intersection analysis results for the site access intersection under 2025 Ultimate Traffic conditions. The analysis indicates that the access intersection will operate acceptably with a stop-control on the minor approach.

Appendix C contains the intersection performance worksheets.

Table 12 - 2025 Ultimate Access Intersection Operations (Synchro)

Intersection	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95 th (veh)
Gemini Way at Site Access	Minor Approach Stop-Control	EB	Left / Through	A (A)	0.02	7.4 (7.4)	0.1 (0)
		WB	Through / Right	A (A)	0	0 (0)	0 (0)
		SB	Left / Through	A (A)	0.07	9.0 (8.7)	0.2 (0.2)
		Overall Intersection		A (A)	-	2.9 (4.6)	-

4.5 TRANSPORTATION DEMAND MANAGEMENT

4.5.1 Context for TDM

The proposed development is owned by Baseline Constellation Partnership Inc. and is located within a Design Priority Area (DPA) and Transit Oriented Development (TOD) zone. Property management arrangements and tenants are not known at this time. Residential tenants will comprise of post-secondary students attending the nearby Algonquin College campus. It is anticipated that students residing in the building will primarily travel by transit and active modes, particularly during the AM and PM peak periods.

The land uses proposed as part of the ground level mixed-use retail, which include a restaurant and coffee shop, are expected to accommodate students residing in the building as well as students and employees from the nearby Algonquin College campus, the medical centre and office buildings within CentrepoinTE. As outlined in **Table 8**, an internal capture rate of 25% was assumed for the ground level retail component to reflect the anticipated synergy between the retail, residential and nearby office land uses.

4.5.2 Need and Opportunity

In order to support the transit and active modal share targets outlined in **Table 6** (residential component) and **Table 7** (commercial component), cycling and transit modes will need to be promoted. This includes promotion of proposed cycling amenities (i.e. underground secure bicycle parking) and convenient nearby transit service to both residential and commercial tenants.

4.5.3 TDM Program

The City of Ottawa TDM Checklists were used to determine what TDM measures could be implemented based on the available information.

The TDM checklists are contained in **Appendix D**.

4.6 NEIGHBOURHOOD TRAFFIC MANAGEMENT

Not applicable; exempted during screening and scoping.

4.7 TRANSIT

4.7.1 Route Capacity

Assumed transit modal shares of 40% and 30% were adopted for the residential and retail components of the development, respectively. The forecasted transit trips generation for the residential component is 37 and 39 transit trips during the AM or PM peak hours, respectively. The forecasted transit trips generation for the retail component is 86 and 77 transit trips during the AM or PM peak hour, respectively. In the short term, transit service headways for OC Transpo Route 88 are anticipated to remain at 15-minutes during the morning and afternoon peak periods. Articulated buses and double-decker buses have seated capacities of 60 and 80 people; respectively, and therefore the hourly transit capacity will be 240 - 320 people per hour.

In addition to transit service provided on Baseline Road and Constellation Drive, the subject site is also located within 600 m of Baseline Station and is therefore within the Transitway Station catchment area. Baseline Station is a Transitway Station located along the Southwest Transitway corridor. This key station currently accommodates upwards of 20 bus routes including Rapid Transitway routes such as 91, 94 and 95. This station is identified as an LRT-BRT station in the future. It is, therefore, expected that the planned transit services will be able to adequately accommodate development-generated transit trips.

In addition, transit service and coverage on Baseline Road is anticipated to increase with the completion of the Baseline Transitway.

4.7.2 Transit Priority

The proposed development will be utilizing existing transit stops abutting the subject site and is therefore not expected to impact the transit travel times or trigger the need for transit priority measures.

4.8 REVIEW OF NETWORK CONCEPT

Not applicable; exempted during screening and scoping.

4.9 INTERSECTION DESIGN

4.9.1 Intersection Control

The existing intersection control will be maintained as the default control for the Baseline Road at the CentrepoinTE Drive / Highgate Road, Baseline Road at Constellation Drive, Gemini Way at CentrepoinTE Drive, and Gemini Way at Constellation Drive intersections. Any intersection improvements triggered through the intersection level of service analysis will be highlighted and adopted accordingly.

4.9.2 Intersection Design

An assessment of the study area intersections was undertaken to determine the operational characteristics of the study area intersections under the different horizons identified in the Screening and Scoping report. Intersection operational analysis was facilitated by Synchro 9.0™ software package and the MMLOS analysis was completed for all modes and compared against the City of Ottawa's MMLOS targets.

4.9.2.1 2018 Existing Conditions

Figure 7 and **Figure 8** illustrate 2018 Existing AM and PM peak hour traffic volumes at the study area intersections.

Table 13 summarizes the results of the Synchro analysis under 2018 existing conditions.

All study area intersections are currently operating satisfactorily.

Appendix C contains detailed intersection performance worksheets.

Table 13 - 2018 Existing Intersection Operations (Synchro)

Scenario	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95 th (veh)
Baseline Road at Centrepointe Drive / Highgate Road	Traffic Signals	EB	Left	A (A)	0 (0.29)	0 (65.6)	0 (17.4)
			Through	B (A)	0.67 (0.32)	25.1 (25.3)	157.6 (64.2)
			Right	A (A)	0.52 (0.25)	3.4 (4.4)	19.3 (16.1)
		WB	Left	A (A)	0.57 (0.57)	66.7 (73.5)	30.4 (35.9)
			Through	A (C)	0.23 (0.78)	8.0 (27.0)	30.2 (#248.5)
			Right	A (A)	0.05 (0.14)	0.6 (1.3)	1.3 (2.3)
		NB	Left	A (C)	0.46 (0.76)	60.3 (58.8)	28.3 (73.4)
			Right	C (A)	0.71 (0.50)	16.0 (8.9)	26.1 (20.8)
		SB	Left	B (A)	0.69 (0.52)	77.4 (67.4)	#53.1 (37.0)
			Right	A (A)	0.27 (0.19)	2.6 (1.4)	0.7 (0)
Overall Intersection			C (C)	0.71 (0.78)	22.9 (30.6)	-	
Baseline Road at Constellation Drive	Traffic Signals	EB	Through	B (A)	0.63 (0.31)	4.5 (6.6)	30.4 (28.9)
			Right	A (A)	0.11 (0.02)	0.2 (0.1)	m0.4 (m0.3)
		WB	Left	C (A)	0.73 (0.37)	61.5 (62.4)	61.4 (19.1)
			Through	A (A)	0.25 (0.57)	2.4 (8.3)	23.2 (132.9)
		NB	Left	A (A)	0.26 (0.43)	61.0 (53.4)	13.1 (32.1)
			Right	A (D)	0.44 (0.84)	21.7 (31.8)	14.5 (57.8)
		Overall Intersection			C (D)	0.73 (0.84)	11.2 (14.5)
Gemini Way at Centrepointe Drive	Minor Stop Control	WB	Left / Right	B (B)	0.10 (0.21)	13.1 (13.2)	0.3* (0.8*)
		NB	Through	A (A)	0 (0)	0 (0)	0* (0*)
			Right	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Left / Through	A (A)	0.14 (0.02)	2.1 (0.5)	0.5* (0.1*)
		Overall Intersection			A (A)	-	1.8 (1.5)
Gemini Way at Constellation Drive	Minor Stop Control	EB	Right	B (A)	0.14 (0.01)	10.6 (8.6)	0.5* (0*)
		NB	Through	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Through / Right	A (A)	0 (0)	0 (0)	0* (0*)
		Overall Intersection			A (A)	-	1.5 (0.1)
Notes:							
1. Table format: AM (PM)							
2. v/c – represents the anticipated volume divided by the predicted capacity							
3. # - 95 th percentile volume exceeds capacity, queue may be longer							
4. * - Queue lengths for these movements are in vehicles							
5. m – Volume for 95 th percentile queue is metered by upstream signal							

The signalized intersection MMLOS assessment was undertaken for the intersections of Baseline Road at Centrepointhe Drive / Highgate Road, and the Baseline Road at Constellation Drive intersection under 2018 Existing conditions. Intersection operations under the AM and PM peak hours were considered in the assessment. MMLOS targets for areas “Within 600m of a rapid transit station” were applied.

MMLOS - Baseline Road at Centrepointhe Drive/ Highgate Road intersection (2018 Existing):

Under the current intersection configuration, pedestrian crossings are provided on the north, east, and south legs of the intersection. A pedestrian crossing is not provided on the west leg of the intersection due to the northbound left-turn signal phasing. As the intersection is within 600m of a rapid transit station, a PLOS target of A was selected for the intersection.

The Ultimate Cycling Network from the City of Ottawa *Cycling Plan* (2013) designates Baseline Road as a spine cycling route and Centrepointhe Drive as a local cycling route. These roads are therefore subject to a BLOS target of C and B, respectively. A BLOS target of B was selected for the intersection.

Westbound transit service travelling on Baseline Road currently operates within a short section of dedicated transit lane. Transit service in the eastbound direction on Baseline Road and on Centrepointhe currently operate within mixed traffic. Based on the MMLOS targets, a TLOS target of C was selected for the intersection.

Baseline Road is designated as a truck route, therefore the intersection is subject to TrLOS target of D.

Table 14 presents the MMLOS conditions for the signalized intersection of Baseline Road at Centrepointhe Drive / Highgate Road.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Centrepointhe Drive is currently operating with a PLOS of F. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross, the intersection cycle length and subsequent delay to pedestrians, pedestrian crossing time, and the treatment of right-turn movements at intersections.

The cycling level of service at the intersection is currently operating with a BLOS of F. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds.

As the intersection of Baseline Road at Centrepointhe Drive is an arterial-major collector intersection, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified to improve the pedestrian and cycling LOS at the intersection.

It is anticipated that the pedestrian, cycling and transit level of service will improve with the completion of the Baseline Transitway. Under the recommended plan, the Baseline Transitway maintains two general traffic lanes in each direction, and features 23 km of new sidewalks, 22 km of cycle tracks, a 4 km multi-use pathway, and 1.5 km of on-road/shoulder bike lanes. These improvements are currently identified under the TMP Network Concept and therefore are anticipated to be in place beyond the 2031 horizon.

MMLOS - Baseline Road at Constellation Drive intersection (2018 Existing):

Under the current intersection configuration, pedestrian crossings are provided on the east, and south legs of the intersection. A pedestrian crossing is not provided on the west leg of the intersection due to the northbound left-turn signal phasing. As the intersection is within 600m of a rapid transit station, a PLOS target of A was selected for the intersection.

The Ultimate Cycling Network from the City of Ottawa *Cycling Plan* (2013) designates Baseline Road as a spine cycling route and Constellation Drive as a local cycling route. These roads are therefore subject to a BLOS target of C and B, respectively. A BLOS target of B was selected for the intersection.

Transit service at the intersection of Baseline Road and Constellation Drive currently operates within mixed traffic. Based on the MMLOS targets, a TLOS target of C was selected for the intersection.

Baseline Road is designated as a truck route, therefore the intersection is subject to TrLOS target of D.

Table 15 presents the MMLOS conditions for the signalized intersection of Baseline Road at Constellation Drive.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Constellation Drive is currently operating with a PLOS of F. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross, the intersection cycle length and subsequent delay to pedestrians, pedestrian crossing time, and the treatment of right-turn movements at intersections.

The cycling level of service at the intersection is currently operating with a BLOS of F. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds.

As the intersection of Baseline Road at Constellation Drive is an arterial-collector intersection, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified to improve the pedestrian and cycling LOS at the intersection.

It is anticipated that the pedestrian, cycling and transit level of service will improve with the completion of the Baseline Transitway. Under the recommended plan, the Baseline Transitway maintains two general traffic lanes in each direction, and features 23 km of new sidewalks, 22 km of cycle tracks, a 4 km multi-use pathway, and 1.5 km of on-road/shoulder bike lanes. These improvements are currently identified under the TMP Network Concept and therefore are anticipated to be in place beyond the 2031 horizon.

Table 14 - 2018 Existing MMLOS (Baseline Road / Centrepointhe Drive)

Segment		2018 Existing Traffic				Target
		EB	WB	NB	SB	
PLOS	Lanes crossed	6	4	10	NA	A
	Median (yes/no)	No	No	No	NA	
	Island refuge >=2.4m (yes/no)	Yes	Yes	Yes	NA	
	Left turn phasing	Protected	Protected	Protected	NA	
	Right turn conflict	Yield Control	Yield Control	Yield Control	NA	
	RTOR (yes/no)	Yes	Yes	Yes	NA	
	Leading ped interval (yes/no)	No	No	No	NA	
	Right turn corner radius (m)	Right-turn Channel	Right-turn Channel	Right-turn Channel	NA	
	Crosswalk treatment	Standard	Standard	Standard	NA	
	Cycle length (s)	130	130	130	NA	
	Effective walk time (s)	49	58	39	NA	
	PETSI Points	35	68	-30	NA	
	PETSI Points LOS	E	C	F	NA	
	Average Pedestrian Delay (s)	25.2	19.9	31.9	NA	
	Ped Delay LOS	C	B	D	NA	
	Level of Service	E	C	F	NA	
	Level of Service	F				
BLOS	Type of bike lane	Mixed	Mixed	Mixed	Mixed	B
	Left-turn - lanes crossed	3	3	0	1	
	Left-turn - vehicle operating speed (km/hr)	60	60	40	40	
	Right-turn - number of turn lanes	1	1	1	0	
	Right-turn - turn lane length (m)	140	100	110	NA (Shared)	
	Right-turn - turning speed (km/hr)	15	15	15	15	
	Right-turn - location of bike lane	NA	NA	NA	NA	
	Level of Service	F	F	F	B	
	Level of Service	F				
TLOS	Intersection Average Delay (s)	14.5				C
	Level of Service	C				
TkLOS	Effective corner radius (m)	>15	>15	NA	NA	D
	Number of receiving lanes	>1	>1	NA	NA	
	Level of Service	A	A	NA	NA	
	Level of Service	A				
VLOS	Maximum Volume-to-capacity (v/c)	0.67	0.78	0.76	0.69	D
	Level of Service	B	C	C	B	
	Level of Service	C				

Table 15 - 2018 Existing MMLOS (Baseline Road / Constellation Drive)

Segment		2018 Existing Traffic			Target
		EB	WB	NB	
PLOS	Lanes crossed	5	NA	8	A
	Median (yes/no)	No	NA	No	
	Island refuge >=2.4m (yes/no)	Yes	NA	Yes	
	Left turn phasing	Protected	NA	NA	
	Right turn conflict	Protected / Permissive	NA	Yield Control	
	RTOR (yes/no)	Yes	NA	Yes	
	Leading ped interval (yes/no)	No	NA	No	
	Right turn corner radius (m)	> 5 to 10	NA	Smart Channel	
	Crosswalk treatment	Standard	NA	Standard	
	Cycle length (s)	130	NA	130	
	Effective walk time (s)	66	NA	34	
	PETSI Points	50	NA	8	
	PETSI Points LOS	D	NA	F	
	Average Pedestrian Delay (s)	15.8	NA	35.4	
	Ped Delay LOS	B	NA	D	
	Level of Service	D	NA	F	
	Level of Service	F			
BLOS	Type of bike lane	Pocket Bike Lane	Mixed	Mixed	B
	Left-turn - lanes crossed	NA	2	0	
	Left-turn - vehicle operating speed (km/hr)	NA	60	50	
	Right-turn - number of turn lanes	50	NA	1	
	Right-turn - turn lane length (m)	140	NA	> 50	
	Right-turn - turning speed (km/hr)	15	NA	15	
	Right-turn - location of bike lane	Left	NA	NA	
	Level of Service	B	F	F	
Level of Service	F				
TLOS	Intersection Average Delay (s)	30.6			C
	Level of Service	E			
TkLOS	Effective corner radius (m)	>15	>15	NA	D
	Number of receiving lanes	>1	>1	NA	
	Level of Service	A	A	NA	
	Level of Service	A			
VLOS	Maximum Volume-to-capacity (v/c)	0.63	0.73	0.84	D
	Level of Service	B	C	D	
	Level of Service	D			

4.9.2.2 2020 Future Background Conditions

Figure 17 and Figure 18 illustrate 2020 Future Background AM and PM peak hour traffic volumes at the study area intersections.

All study area intersections are anticipated to operate satisfactorily.

Table 16 summarizes the results of the Synchro analysis for 2020 Future Background conditions.

Appendix C contains detailed intersection performance worksheets.

Table 16 - 2020 Future Background Intersection Operations (Synchro)

Scenario	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95 th (veh)
Baseline Road at Centrepointe Drive / Highgate Road	Traffic Signals	EB	Left	A (A)	0 (0.22)	0 (31.3)	0 (14.3)
			Through	B (A)	0.63 (0.30)	23.9 (24.1)	146.4 (59.4)
			Right	A (A)	0.50 (0.24)	3.3 (4.2)	19.0 (15.5)
		WB	Left	A (A)	0.56 (0.56)	67.7 (71.0)	29.7 (33.0)
			Through	A (B)	0.22 (0.65)	7.9 (17.0)	29.1 (163.2)
			Right	A (A)	0.05 (0.12)	0.5 (1.5)	1.0 (3.1)
		NB	Left	A (C)	0.45 (0.75)	60.2 (59.1)	27.2 (70.7)
			Right	B (A)	0.70 (0.50)	16.1 (9.2)	25.8 (20.8)
		SB	Left	B (A)	0.67 (0.51)	75.5 (67.6)	48.1 (35.7)
			Right	A (A)	0.26 (0.22)	2.4 (1.9)	0 (0)
Overall Intersection			B (C)	0.70 (0.75)	22.2 (26.0)	-	
Baseline Road at Constellation Drive	Traffic Signals	EB	Through	A (A)	0.59 (0.29)	4.4 (5.2)	29.1 (24.4)
			Right	A (A)	0.11 (0.02)	0.2 (0.3)	m0.3 (m0.1)
		WB	Left	C (A)	0.72 (0.36)	61.7 (62.3)	59.2 (18.4)
			Through	A (A)	0.24 (0.53)	2.4 (5.9)	22.0 (95.1)
		NB	Left	A (A)	0.25 (0.53)	61.0 (60.1)	12.7 (33.5)
			Right	A (C)	0.43 (0.76)	22.0 (16.7)	14.2 (31.6)
		Overall Intersection			C (C)	0.72 (0.76)	11.2 (11.5)
Gemini Way at Centrepointe Drive	Minor Stop Control	WB	Left / Right	B (B)	0.09 (0.19)	12.6 (12.8)	0.3* (0.7*)
		NB	Through	A (A)	0 (0)	0 (0)	0* (0*)
			Right	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Left / Through	A (A)	0.14 (0.02)	2.1 (0.5)	0.5* (0.1*)
		Overall Intersection			A (A)	-	1.8 (1.5)
Gemini Way at Constellation Drive	Minor Stop Control	EB	Right	B (A)	0.13 (0.01)	10.5 (8.6)	0.5* (0*)
		NB	Through	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Through / Right	A (A)	0 (0)	0 (0)	0* (0*)
		Overall Intersection			A (A)	-	1.5 (0.1)

Notes:

1. Table format: AM (PM)

2. v/c – represents the anticipated volume divided by the predicted capacity

3. # - 95th percentile volume exceeds capacity, queue may be longer

4. * - Queue lengths for these movements are in vehicles

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

The signalized intersection MMLOS assessment was undertaken for the intersections of Baseline Road at Centrepointhe Drive / Highgate Road, and the Baseline Road at Constellation Drive intersection under 2020 Future Background conditions. Intersection operations under the AM and PM peak hours were considered in the assessment. MMLOS targets for areas “Within 600m of a rapid transit station” were applied.

MMLOS - Baseline Road at Centrepointhe Drive/ Highgate Road (2020 Future Background):

Table 17 outlines 2020 Future Background MMLOS conditions for the signalized intersection of Baseline Road at Centrepointhe Drive / Highgate Road.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Centrepointhe Drive is expected to continue to operate with a PLOS of F. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross, the intersection cycle length and subsequent delay to pedestrians, pedestrian crossing time, and the treatment of right-turn movements at intersections.

The cycling level of service at the intersection is expected to continue to operate with a BLOS of F. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds.

As the intersection of Baseline Road at Centrepointhe Drive is an arterial-major collector intersection, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified to improve the pedestrian and cycling LOS at the intersection.

It is anticipated that the pedestrian, cycling and transit level of service will improve with the completion of the Baseline Transitway. Under the recommended plan, the Baseline Transitway maintains two general traffic lanes in each direction, and features 23 km of new sidewalks, 22 km of cycle tracks, a 4 km multi-use pathway, and 1.5 km of on-road/shoulder bike lanes.

MMLOS - Baseline Road at Constellation Drive (2020 Future Background):

Table 18 outlines 2020 Future Background MMLOS conditions for the signalized intersection of Baseline Road at Constellation Drive.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Constellation Drive is expected to continue to operate with a PLOS of F. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross, the intersection cycle length and subsequent delay to pedestrians, pedestrian crossing time, and the treatment of right-turn movements at intersections.

The cycling level of service at the intersection is expected to continue to operate with a BLOS of F. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds.

As the intersection of Baseline Road at Constellation Drive is an arterial-collector intersection, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified to improve the pedestrian and cycling LOS at the intersection.

Table 17 - 2020 Future Background MMLOS (Baseline Road / Centrepointhe Drive)

Segment		2018 Existing Traffic				Target
		EB	WB	NB	SB	
PLOS	Lanes crossed	6	4	10	NA	A
	Median (yes/no)	No	No	No	NA	
	Island refuge >=2.4m (yes/no)	Yes	Yes	Yes	NA	
	Left turn phasing	Protected	Protected	Protected	NA	
	Right turn conflict	Yield Control	Yield Control	Yield Control	NA	
	RTOR (yes/no)	Yes	Yes	Yes	NA	
	Leading ped interval (yes/no)	No	No	No	NA	
	Right turn corner radius (m)	Right-turn Channel	Right-turn Channel	Right-turn Channel	NA	
	Crosswalk treatment	Standard	Standard	Standard	NA	
	Cycle length (s)	130	130	130	NA	
	Effective walk time (s)	49	58	39	NA	
	PETSI Points	35	68	-30	NA	
	PETSI Points LOS	E	C	F	NA	
	Average Pedestrian Delay (s)	25.2	19.9	31.9	NA	
	Ped Delay LOS	C	B	D	NA	
	Level of Service	E	C	F	NA	
	Level of Service	F				
BLOS	Type of bike lane	Mixed	Mixed	Mixed	Mixed	B
	Left-turn - lanes crossed	3	3	0	1	
	Left-turn - vehicle operating speed (km/hr)	60	60	40	40	
	Right-turn - number of turn lanes	1	1	1	0	
	Right-turn - turn lane length (m)	140	100	110	NA (Shared)	
	Right-turn - turning speed (km/hr)	15	15	15	15	
	Right-turn - location of bike lane	NA	NA	NA	NA	
	Level of Service	F	F	F	B	
	Level of Service	F				
TLOS	Intersection Average Delay (s)	26.0				C
	Level of Service	D				
TkLOS	Effective corner radius (m)	>15	>15	NA	NA	D
	Number of receiving lanes	>1	>1	NA	NA	
	Level of Service	A	A	NA	NA	
	Level of Service	A				
VLOS	Maximum Volume-to-capacity (v/c)	0.63	0.65	0.70	0.67	D
	Level of Service	B	B	B	B	
	Level of Service	B				

Table 18 - 2020 Future Background MMLOS (Baseline Road / Constellation Drive)

Segment		2018 Existing Traffic			Target
		EB	WB	NB	
PLOS	Lanes crossed	5	NA	8	A
	Median (yes/no)	No	NA	No	
	Island refuge >=2.4m (yes/no)	Yes	NA	Yes	
	Left turn phasing	Protected	NA	NA	
	Right turn conflict	Protected / Permissive	NA	Yield Control	
	RTOR (yes/no)	Yes	NA	Yes	
	Leading ped interval (yes/no)	No	NA	No	
	Right turn corner radius (m)	> 5 to 10	NA	Smart Channel	
	Crosswalk treatment	Standard	NA	Standard	
	Cycle length (s)	130	NA	130	
	Effective walk time (s)	66	NA	34	
	PETSI Points	50	NA	8	
	PETSI Points LOS	D	NA	F	
	Average Pedestrian Delay (s)	15.8	NA	35.4	
	Ped Delay LOS	B	NA	D	
	Level of Service	D	NA	F	
	Level of Service	F			
BLOS	Type of bike lane	Pocket Bike Lane	Mixed	Mixed	B
	Left-turn - lanes crossed	NA	2	0	
	Left-turn - vehicle operating speed (km/hr)	NA	60	50	
	Right-turn - number of turn lanes	50	NA	1	
	Right-turn - turn lane length (m)	140	NA	> 50	
	Right-turn - turning speed (km/hr)	15	NA	15	
	Right-turn - location of bike lane	Left	NA	NA	
	Level of Service	B	F	F	
	Level of Service	F			
TLOS	Intersection Average Delay (s)	11.5			C
	Level of Service	C			
TkLOS	Effective corner radius (m)	>15	>15	NA	D
	Number of receiving lanes	>1	>1	NA	
	Level of Service	A	A	NA	
	Level of Service	A			
VLOS	Maximum Volume-to-capacity (v/c)	0.59	0.72	0.76	D
	Level of Service	A	C	C	
	Level of Service	C			

4.9.2.3 2020 Total Future Conditions

Figure 19 and Figure 20 illustrate 2020 Total Future AM and PM peak hour traffic volumes at the study area intersections.

All study area intersections are anticipated to operate satisfactorily.

Table 19 summarizes the results of the Synchro analysis for 2020 Total Future conditions.

Appendix C contains detailed intersection performance worksheets.

Table 19 - 2020 Total Future Intersection Operations (Synchro)

Scenario	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95 th (veh)
Baseline Road at Centrepointe Drive / Highgate Road	Traffic Signals	EB	Left	A (A)	0 (0.23)	0 (32.6)	0 (14.6)
			Through	B (A)	0.63 (0.31)	24.4 (25.0)	147.5 (60.4)
			Right	A (A)	0.52 (0.26)	3.4 (4.3)	19.6 (16.1)
		WB	Left	A (A)	0.57 (0.57)	66.4 (69.6)	30.1 (32.9)
			Through	A (B)	0.23 (0.66)	8.0 (17.9)	29.1 (176.4)
			Right	A (A)	0.05 (0.12)	0.5 (1.6)	1.0 (3.2)
		NB	Left	A (C)	0.48 (0.76)	60.4 (58.4)	29.8 (74.0)
			Right	C (A)	0.72 (0.51)	15.8 (8.8)	27.0 (21.4)
		SB	Left	B (A)	0.67 (0.51)	75.5 (67.6)	48.1 (35.7)
			Right	A (A)	0.26 (0.22)	2.4 (1.9)	0 (0)
Overall Intersection			C (C)	0.72 (0.76)	22.5 (26.4)	-	
Baseline Road at Constellation Drive	Traffic Signals	EB	Through	B (A)	0.61 (0.33)	4.7 (6.2)	31.9 (29.4)
			Right	A (A)	0.11 (0.02)	0.3 (0.1)	0.6 (m0.3)
		WB	Left	C (A)	0.73 (0.45)	61.5 (62.7)	61.9 (24.5)
			Through	A (A)	0.24 (0.59)	2.4 (7.7)	22.0 (131.3)
		NB	Left	A (A)	0.25 (0.49)	61.0 (56.5)	12.7 (34.4)
			Right	A (C)	0.43 (0.81)	22.0 (23.2)	14.2 (46.5)
		Overall Intersection			C (D)	0.73 (0.81)	11.5 (13.6)
Gemini Way at Centrepointe Drive	Minor Stop Control	WB	Left / Right	B (B)	0.19 (0.32)	12.9 (14.8)	0.7* (1.4*)
		NB	Through	A (A)	0 (0)	0 (0)	0* (0*)
			Right	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Left / Through	A (A)	0.16 (0.04)	2.3 (0.9)	0.6* (0.1*)
		Overall Intersection			A (A)	-	2.4 (2.2)
Gemini Way at Constellation Drive	Minor Stop Control	EB	Right	B (A)	0.13 (0.01)	10.6 (8.7)	0.5* (0*)
		NB	Through	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Through / Right	A (A)	0 (0)	0 (0)	0* (0*)
		Overall Intersection			A (A)	-	1.5 (0.1)
Gemini Way at Site Access	Minor Stop Control	EB	Left / Through	A (A)	0.02 (0.02)	1.8 (6.0)	0.1* (0*)
		WB	Through / Right	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Left/ Right	A (A)	0.07 (0.06)	8.9 (8.7)	0.2* (0.2*)
		Overall Intersection			A (A)	-	3.0 (4.7)
Notes:							
1. Table format: AM (PM)							
2. v/c – represents the anticipated volume divided by the predicted capacity							
3. # - 95 th percentile volume exceeds capacity, queue may be longer							
4. * - Queue lengths for these movements are in vehicles							
5. m – Volume for 95 th percentile queue is metered by upstream signal							

The signalized intersection MMLOS assessment was undertaken for the intersections of Baseline Road at Centrepointhe Drive / Highgate Road, and the Baseline Road at Constellation Drive intersection under 2020 Total Future conditions. Intersection operations under the AM and PM peak hours were considered in the assessment. MMLOS targets for areas “Within 600m of a rapid transit station” were applied.

MMLOS - Baseline Road at Centrepointhe Drive/ Highgate Road (2020 Total Future):

Table 20 outlines 2020 Total Future MMLOS conditions for the signalized intersection of Baseline Road at Centrepointhe Drive.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Centrepointhe Drive is expected to continue to operate with a PLOS of F. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross, the intersection cycle length and subsequent delay to pedestrians, pedestrian crossing time, and the treatment of right-turn movements at intersections.

The cycling level of service at the intersection is expected to continue to operate with a BLOS of F. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds.

As the intersection of Baseline Road at Centrepointhe Drive is an arterial-major collector intersection, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified to improve the pedestrian and cycling LOS at the intersection.

It is anticipated that the pedestrian, cycling and transit level of service will improve with the completion of the Baseline Transitway. Under the recommended plan, the Baseline Transitway maintains two general traffic lanes in each direction, and features 23 km of new sidewalks, 22 km of cycle tracks, a 4 km multi-use pathway, and 1.5 km of on-road/shoulder bike lanes.

MMLOS - Baseline Road at Constellation Drive (2020 Total Future):

Table 21 outlines 2020 Total Future MMLOS conditions for the signalized intersection of Baseline Road at Constellation Drive.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Constellation Drive is expected to continue to operate with a PLOS of F. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross, the intersection cycle length and subsequent delay to pedestrians, pedestrian crossing time, and the treatment of right-turn movements at intersections.

The cycling level of service at the intersection is expected to continue to operate with a BLOS of F. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds.

As the intersection of Baseline Road at Constellation Drive is an arterial-collector intersection, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified to improve the pedestrian and cycling LOS at the intersection.

Table 20 - 2020 Total Future MMLOS (Baseline Road / Centrepointhe Drive)

Segment		2018 Existing Traffic				Target
		EB	WB	NB	SB	
PLOS	Lanes crossed	6	4	10	NA	A
	Median (yes/no)	No	No	No	NA	
	Island refuge >=2.4m (yes/no)	Yes	Yes	Yes	NA	
	Left turn phasing	Protected	Protected	Protected	NA	
	Right turn conflict	Yield Control	Yield Control	Yield Control	NA	
	RTOR (yes/no)	Yes	Yes	Yes	NA	
	Leading ped interval (yes/no)	No	No	No	NA	
	Right turn corner radius (m)	Right-turn Channel	Right-turn Channel	Right-turn Channel	NA	
	Crosswalk treatment	Standard	Standard	Standard	NA	
	Cycle length (s)	130	130	130	NA	
	Effective walk time (s)	49	58	39	NA	
	PETSI Points	35	68	-30	NA	
	PETSI Points LOS	E	C	F	NA	
	Average Pedestrian Delay (s)	25.2	19.9	31.9	NA	
	Ped Delay LOS	C	B	D	NA	
	Level of Service	E	C	F	NA	
	Level of Service	F				
BLOS	Type of bike lane	Mixed	Mixed	Mixed	Mixed	B
	Left-turn - lanes crossed	3	3	0	1	
	Left-turn - vehicle operating speed (km/hr)	60	60	40	40	
	Right-turn - number of turn lanes	1	1	1	0	
	Right-turn - turn lane length (m)	140	100	110	NA (Shared)	
	Right-turn - turning speed (km/hr)	15	15	15	15	
	Right-turn - location of bike lane	NA	NA	NA	NA	
	Level of Service	F	F	F	B	
	Level of Service	F				
TLOS	Intersection Average Delay (s)	26.4				C
	Level of Service	D				
TkLOS	Effective corner radius (m)	>15	>15	NA	NA	D
	Number of receiving lanes	>1	>1	NA	NA	
	Level of Service	A	A	NA	NA	
	Level of Service	A				
VLOS	Maximum Volume-to-capacity (v/c)	0.63	0.66	0.76	0.67	D
	Level of Service	B	B	C	B	
	Level of Service	C				

Table 21 - 2020 Total Future MMLOS (Baseline Road / Constellation Drive)

Segment		2018 Existing Traffic			Target
		EB	WB	NB	
PLOS	Lanes crossed	5	NA	8	A
	Median (yes/no)	No	NA	No	
	Island refuge >=2.4m (yes/no)	Yes	NA	Yes	
	Left turn phasing	Protected	NA	NA	
	Right turn conflict	Protected / Permissive	NA	Yield Control	
	RTOR (yes/no)	Yes	NA	Yes	
	Leading ped interval (yes/no)	No	NA	No	
	Right turn corner radius (m)	> 5 to 10	NA	Smart Channel	
	Crosswalk treatment	Standard	NA	Standard	
	Cycle length (s)	130	NA	130	
	Effective walk time (s)	66	NA	34	
	PETSI Points	50	NA	8	
	PETSI Points LOS	D	NA	F	
	Average Pedestrian Delay (s)	15.8	NA	35.4	
	Ped Delay LOS	B	NA	D	
	Level of Service	D	NA	F	
	Level of Service	F			
BLOS	Type of bike lane	Pocket Bike Lane	Mixed	Mixed	B
	Left-turn - lanes crossed	NA	2	0	
	Left-turn - vehicle operating speed (km/hr)	NA	60	50	
	Right-turn - number of turn lanes	50	NA	1	
	Right-turn - turn lane length (m)	140	NA	> 50	
	Right-turn - turning speed (km/hr)	15	NA	15	
	Right-turn - location of bike lane	Left	NA	NA	
	Level of Service	B	F	F	
	Level of Service	F			
TLOS	Intersection Average Delay (s)	12.1			C
	Level of Service	C			
TkLOS	Effective corner radius (m)	>15	>15	NA	D
	Number of receiving lanes	>1	>1	NA	
	Level of Service	A	A	NA	
	Level of Service	A			
VLOS	Maximum Volume-to-capacity (v/c)	0.61	0.73	0.76	D
	Level of Service	B	C	C	
	Level of Service	C			

4.9.2.4 2025 Ultimate Conditions

Figure 21 and Figure 22 illustrate 2025 Ultimate AM and PM peak hour traffic volumes at the study area intersections.

All study area intersections are anticipated to operate satisfactorily under existing intersection geometry.

Table 22 summarizes the results of the Synchro analysis for 2025 Ultimate conditions.

Appendix C contains detailed intersection performance worksheets.

Table 22 - 2025 Ultimate Intersection Operations (Synchro)

Scenario	Intersection Control	Approach / Movement		LOS	V/C	Delay (s)	Queue 95 th (veh)
Baseline Road at Centrepoin ^t e Drive / Highgate Road	Traffic Signals	EB	Left	A (A)	0 (0.37)	0 (46.3)	0 (#20.7)
			Through	C (A)	0.72 (0.36)	28.1 (27.3)	182.4 (69.3)
			Right	A (A)	0.56 (0.29)	3.9 (4.6)	22.6 (17.4)
		WB	Left	A (A)	0.59 (0.59)	64.9 (71.4)	30.7 (37.2)
			Through	A (C)	0.25 (0.74)	8.9 (20.2)	31.5 (170.2)
			Right	A (A)	0.06 (0.14)	0.8 (1.8)	1.6 (3.7)
		NB	Left	A (C)	0.47 (0.77)	58.5 (57.4)	30.7 (79.0)
			Right	C (A)	0.77 (0.52)	20.2 (8.3)	36.6 (21.6)
		SB	Left	C (A)	0.72 (0.54)	79.5 (69.1)	#56.3 (38.7)
			Right	A (A)	0.29 (0.24)	3.6 (2.2)	1.9 (0)
Overall Intersection				C (C)	0.77 (0.77)	24.7 (27.9)	-
Baseline Road at Constellation Drive	Traffic Signals	EB	Through	B (A)	0.68 (0.33)	5.4 (6.2)	37.6 (29.4)
			Right	A (A)	0.12 (0.02)	0.5 (0.1)	m1.1 (m0.3)
		WB	Left	C (A)	0.75 (0.45)	61.1 (62.7)	66.5 (24.5)
			Through	A (A)	0.27 (0.59)	2.5 (7.7)	24.8 (131.3)
		NB	Left	A (A)	0.27 (0.49)	61.1 (56.5)	13.6 (34.4)
			Right	A (C)	0.45 (0.81)	21.6 (23.2)	14.7 (46.5)
		Overall Intersection				C (C)	0.75 (0.76)
Gemini Way at Centrepoin ^t e Drive	Minor Stop Control	WB	Left / Right	B (B)	0.22 (0.32)	14.0 (14.8)	0.8* (1.4*)
		NB	Through	A (A)	0 (0)	0 (0)	0* (0*)
			Right	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Left / Through	A (A)	0.18 (0.04)	2.4 (0.9)	0.6* (0.1*)
		Overall Intersection				A (A)	-
Gemini Way at Constellation Drive	Minor Stop Control	EB	Right	B (A)	0.15 (0.01)	10.9 (8.7)	0.5* (0*)
		NB	Through	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Through / Right	A (A)	0 (0)	0 (0)	0* (0*)
		Overall Intersection				A (A)	-
Gemini Way at Site Access	Minor Stop Control	EB	Left / Through	A (A)	0.02 (0.02)	1.7 (5.8)	0.1* (0*)
		WB	Through / Right	A (A)	0 (0)	0 (0)	0* (0*)
		SB	Left/ Right	A (A)	0.07 (0.06)	9.0 (8.7)	0.2* (0.2*)
		Overall Intersection				A (A)	-
Notes:							
1. Table format: AM (PM)							
2. v/c – represents the anticipated volume divided by the predicted capacity							
3. # - 95 th percentile volume exceeds capacity, queue may be longer							
4. * - Queue lengths for these movements are in vehicles							
5. m – Volume for 95 th percentile queue is metered by upstream signal							

The signalized intersection MMLOS assessment was undertaken for the intersections of Baseline Road at Centrepointhe Drive / Highgate Road, and the Baseline Road at Constellation Drive intersection under 2025 Ultimate conditions. Intersection operations under the AM and PM peak hours were considered in the assessment. MMLOS targets for areas “Within 600m of a rapid transit station” were applied.

MMLOS - Baseline Road at Centrepointhe Drive/ Highgate Road (2025 Ultimate):

Table 23 outlines 2025 Ultimate MMLOS conditions for the signalized intersection of Baseline Road at Centrepointhe Drive.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Centrepointhe Drive is expected to continue to operate with a PLOS of F. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross, the intersection cycle length and subsequent delay to pedestrians, pedestrian crossing time, and the treatment of right-turn movements at intersections.

The cycling level of service at the intersection is expected to continue to operate with a BLOS of F. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds.

As the intersection of Baseline Road at Centrepointhe Drive is an arterial-major collector intersection, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified to improve the pedestrian and cycling LOS at the intersection.

It is anticipated that the pedestrian, cycling and transit level of service will improve with the completion of the Baseline Transitway. Under the recommended plan, the Baseline Transitway maintains two general traffic lanes in each direction, and features 23 km of new sidewalks, 22 km of cycle tracks, a 4 km multi-use pathway, and 1.5 km of on-road/shoulder bike lanes.

MMLOS - Baseline Road at Constellation Drive intersection (2025 Ultimate):

Table 24 outlines 2025 Ultimate MMLOS conditions for the signalized intersection of Baseline Road at Constellation Drive.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Constellation Drive is expected to continue to operate with a PLOS of F. Based on the MMLOS guidelines, intersection PLOS is largely influenced by the number of lanes pedestrians cross, the intersection cycle length and subsequent delay to pedestrians, pedestrian crossing time, and the treatment of right-turn movements at intersections.

The cycling level of service at the intersection is expected to continue to operate with a BLOS of F. Based on the MMLOS guidelines, intersection BLOS is influenced by the availability of dedicated cycling amenities, number of lanes cyclists must cross to negotiate a turn at intersections, and roadway operating speeds.

As the intersection of Baseline Road at Constellation Drive is an arterial-collector intersection, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified to improve the pedestrian and cycling LOS at the intersection.

Table 23 - 2025 Ultimate MMLOS (Baseline Road at CentrepoinTE)

Segment		2018 Existing Traffic				Target
		EB	WB	NB	SB	
PLOS	Lanes crossed	6	4	10	NA	A
	Median (yes/no)	No	No	No	NA	
	Island refuge >=2.4m (yes/no)	Yes	Yes	Yes	NA	
	Left turn phasing	Protected	Protected	Protected	NA	
	Right turn conflict	Yield Control	Yield Control	Yield Control	NA	
	RTOR (yes/no)	Yes	Yes	Yes	NA	
	Leading ped interval (yes/no)	No	No	No	NA	
	Right turn corner radius (m)	Right-turn Channel	Right-turn Channel	Right-turn Channel	NA	
	Crosswalk treatment	Standard	Standard	Standard	NA	
	Cycle length (s)	130	130	130	NA	
	Effective walk time (s)	49	58	39	NA	
	PETSI Points	35	68	-30	NA	
	PETSI Points LOS	E	C	F	NA	
	Average Pedestrian Delay (s)	25.2	19.9	31.9	NA	
	Ped Delay LOS	C	B	D	NA	
	Level of Service	E	C	F	NA	
	Level of Service	F				
BLOS	Type of bike lane	Mixed	Mixed	Mixed	Mixed	B
	Left-turn - lanes crossed	3	3	0	1	
	Left-turn - vehicle operating speed (km/hr)	60	60	40	40	
	Right-turn - number of turn lanes	1	1	1	0	
	Right-turn - turn lane length (m)	140	100	110	NA (Shared)	
	Right-turn - turning speed (km/hr)	15	15	15	15	
	Right-turn - location of bike lane	NA	NA	NA	NA	
	Level of Service	F	F	F	B	
	Level of Service	F				
TLOS	Intersection Average Delay (s)	27.9				C
	Level of Service	D				
TkLOS	Effective corner radius (m)	>15	>15	NA	NA	D
	Number of receiving lanes	>1	>1	NA	NA	
	Level of Service	A	A	NA	NA	
	Level of Service	A				
VLOS	Maximum Volume-to-capacity (v/c)	0.72	0.74	0.77	0.72	D
	Level of Service	C	C	C	C	
	Level of Service	C				

Table 24 - 2025 Ultimate MMLOS (Baseline Road at Constellation Drive)

Segment		2018 Existing Traffic			Target
		EB	WB	NB	
PLOS	Lanes crossed	5	NA	8	A
	Median (yes/no)	No	NA	No	
	Island refuge >=2.4m (yes/no)	Yes	NA	Yes	
	Left turn phasing	Protected	NA	NA	
	Right turn conflict	Protected / Permissive	NA	Yield Control	
	RTOR (yes/no)	Yes	NA	Yes	
	Leading ped interval (yes/no)	No	NA	No	
	Right turn corner radius (m)	> 5 to 10	NA	Smart Channel	
	Crosswalk treatment	Standard	NA	Standard	
	Cycle length (s)	130	NA	130	
	Effective walk time (s)	66	NA	34	
	PETSI Points	50	NA	8	
	PETSI Points LOS	D	NA	F	
	Average Pedestrian Delay (s)	15.8	NA	35.4	
	Ped Delay LOS	B	NA	D	
	Level of Service	D	NA	F	
	Level of Service	F			
BLOS	Type of bike lane	Pocket Bike Lane	Mixed	Mixed	B
	Left-turn - lanes crossed	NA	2	0	
	Left-turn - vehicle operating speed (km/hr)	NA	60	50	
	Right-turn - number of turn lanes	50	NA	1	
	Right-turn - turn lane length (m)	140	NA	> 50	
	Right-turn - turning speed (km/hr)	15	NA	15	
	Right-turn - location of bike lane	Left	NA	NA	
	Level of Service	B	F	F	
Level of Service	F				
TLOS	Intersection Average Delay (s)	13.6			C
	Level of Service	C			
TkLOS	Effective corner radius (m)	>15	>15	NA	D
	Number of receiving lanes	>1	>1	NA	
	Level of Service	A	A	NA	
	Level of Service	A			
VLOS	Maximum Volume-to-capacity (v/c)	0.68	0.75	0.81	D
	Level of Service	B	C	D	
	Level of Service	D			

5.0 CONCLUSION

The development-generated trips are not anticipated to adversely impact traffic operations at study area intersections.

The Multi-Modal Level of Service (MMLOS) assessment identified poor pedestrian and cycling levels of service under existing conditions. As Baseline Road is an arterial roadway, significant capacity is allocated to vehicular demands. Based on a review of the signal timing plans, vehicular demands, and intersection geometry, no short-term improvements were identified at study area intersections.

Additional development within the CentrepoinTE Town Centre, as outlined in the CentrepoinTE Town Centre Secondary Plan, will provide future opportunities to improve pedestrian and cycling amenities on CentrepoinTE Drive, Constellation Drive, and Gemini Way.

It is anticipated that the pedestrian, cycling and transit levels of service will improve on Baseline Road with the completion of the Baseline Transitway. Under the recommended plan, the Baseline Transitway would maintain two general traffic lanes in each direction and would include 23 km of new sidewalks, 22 km of cycle tracks, a 4 km multi-use pathway, and 1.5 km of on-road/shoulder bike lanes. These improvements are currently identified under the TMP Network Concept and therefore are anticipated to be in place beyond the 2031 horizon.

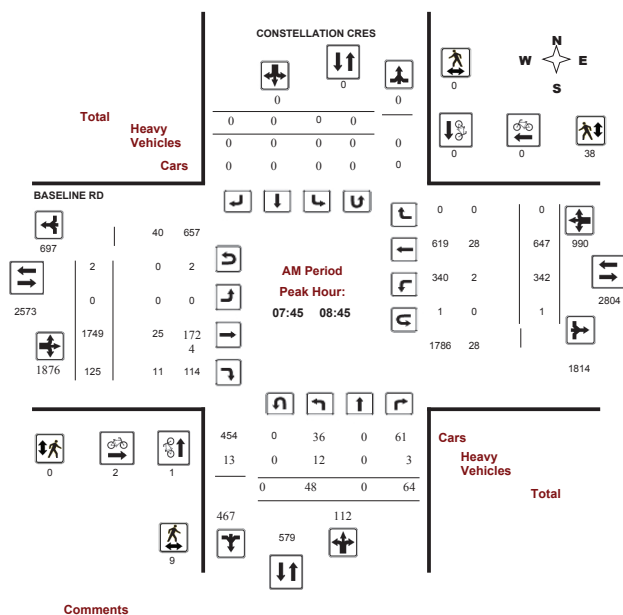
Based on the transportation evaluation presented in this study, no roadway modification application (RMA) or a monitoring report is required for the proposed development. The proposed mixed-use development at 2140 Baseline Road within the CentrepoinTE community of Ottawa should be permitted to proceed from a transportation impact perspective.

Appendix A **TURNING MOVEMENT COUNTS**

Turning Movement Count - Full Study Peak Hour Diagram

Survey Date: Wednesday, February 14, 2018
Start Time: 07:00

WO No: 37532
Device: Miovision



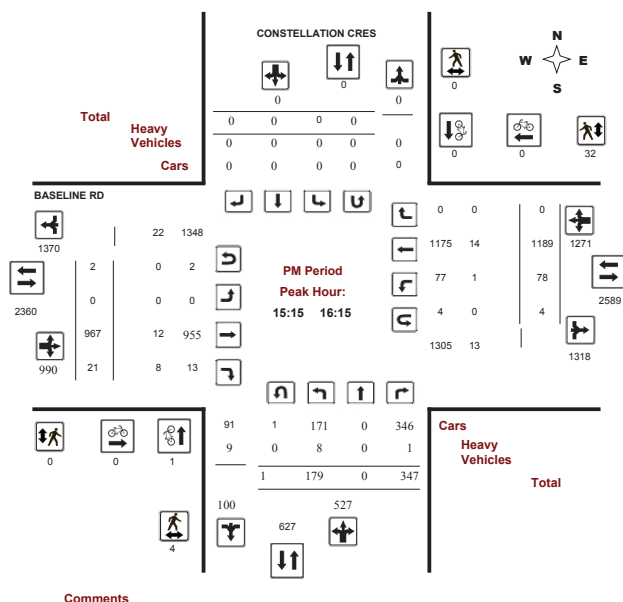
2018-Mar-27

Page 1 of 4

Turning Movement Count - Full Study Peak Hour Diagram
CONSTELLATION CRES @ BASELINE RD

Survey Date: Wednesday, February 14, 2018
Start Time: 07:00

WO No: 37532
Device: Miovision



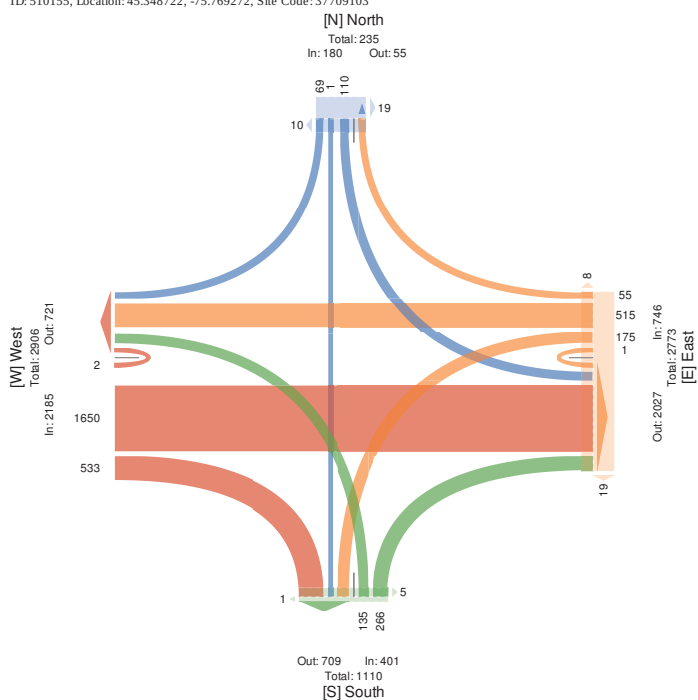
2018-Mar-27

Page 4 of 4

5363812 - Baseline and Centrepoint E/Highgate - Apr 10th - TMC

Tue Apr 10, 2018
AM Peak (7:45AM - 8:45AM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 510155, Location: 45.348722, -75.769272, Site Code: 37709103

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

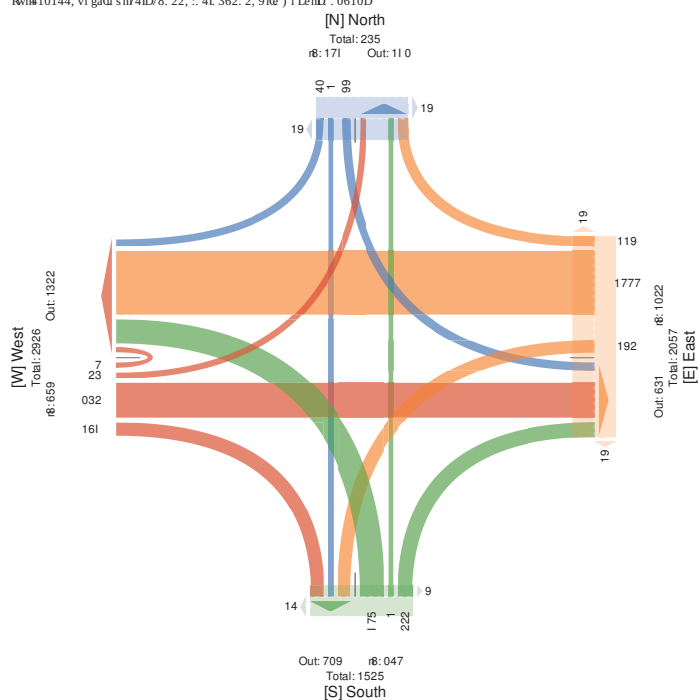


4 of 6

5363812 - Baseline and Centrepont E/Highgate - Apr 10th - TMC

Tue Apr 10, 2018
MP: Mnak (7MP : 4MP 5
A-P: nQOQvHhOasLP iGrghgQ t eanh, MLeOElas Q dlghgeOi s c i al, dlghgeO
i s) i i QYak5
A-P i neBes O
Rwn10144, vi gaU sn74fD8.22, i: 4L 362.2, 946 i) LenD. 0610D

Mi nLeL Shn) lK i bf Cāy a
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Nepeas, f N, K2G 4J6,) A

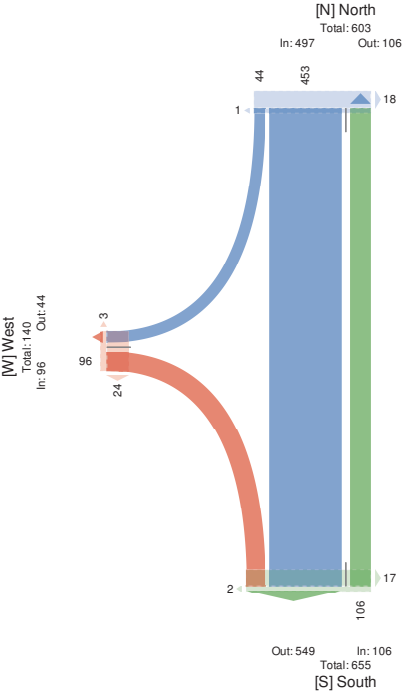


6 of 6

5363812 - Constellation and Gemini - Apr 10th - TMC

Tue Apr 10, 2018
AM Peak (7:40AM-5:40AM) - Overall Peak Hour
Awo vGrC(s)l glCat n MHHdcC, l eaC, PeneCrlat C yldcdeCH BHn, yldcdeC
H orHCRak-
AwMHCRwet hC
n: DI01.1, sHahH: 3D63949, 5D7. DB. 2, Sll e o Hne: 47710104

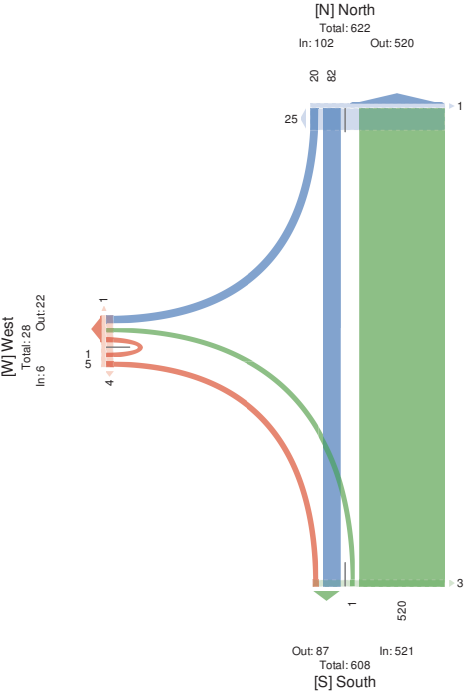
PrHCRen be: o lre: H) llnRa
100 o H CRewHl l r,
Nepeat,) N, K2G D9, o A



5363812 - Constellation and Gemini - Apr 10th - TMC

Tue Apr 10, 2018
MP Peak (7:14MP - 5:14MP)
AOW l l e l (HCs ll aig P hlrrnt l, deacn, Nge l lra l, yant l hi Bhag, yant l
hi vrhl l Ra l
AOP hcewei l
n: 4101DI, Hht al dhi: -4.7-373D, 54.6D4- D, 9de v hge: 76610107

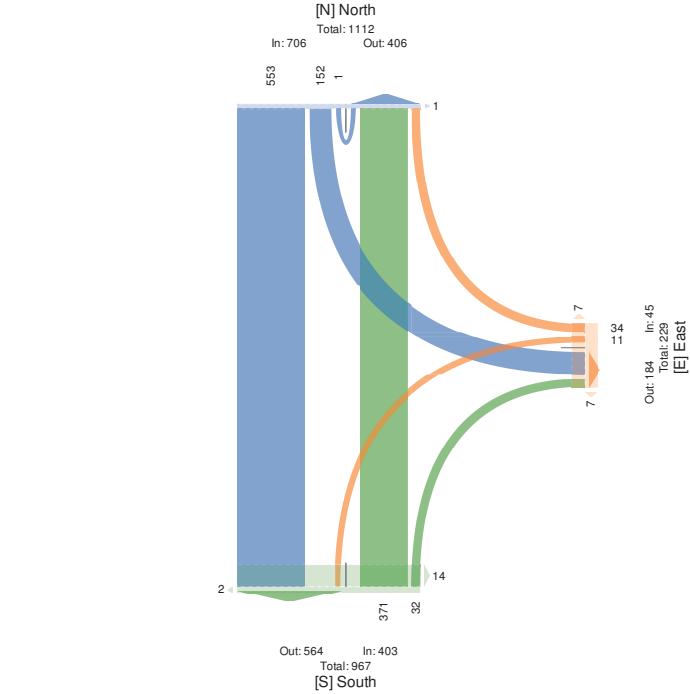
Mhcgeg Sn: v da hbf llaRa
100 v hl l le l l r,
Nepei, f N, K2G 4I3, v A



5363812 - Centreponte and Gemini - Apr 10th - TMC

Tue Apr 10, 2018
AM Peak (7:45AM-8:45AM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 510171, Location: 45.348023, -75.768676, Site Code: 37711103

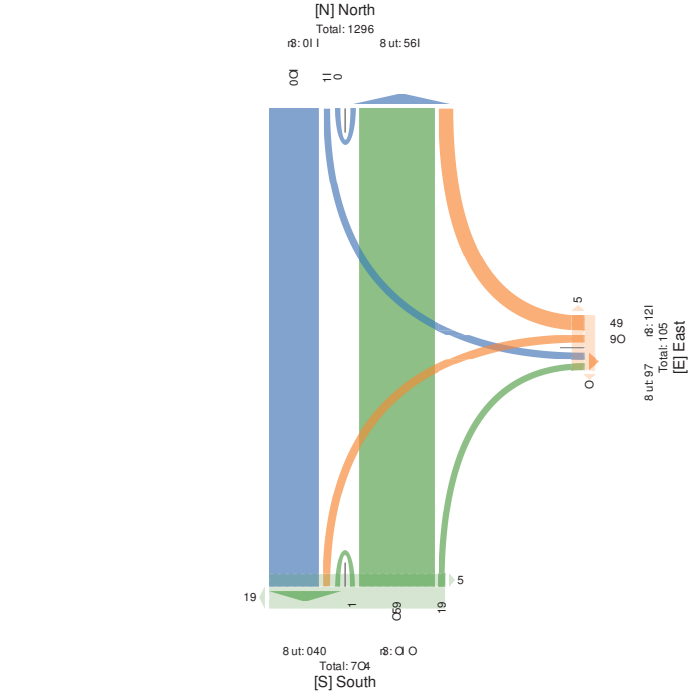
Provided by: City of Ottawa
100 Constellation Dr,
f epean, Of, N2K 5G, CA



5363812 - Centreponte and Gemini - Apr 10th - TMC

Tue Apr 10, 2018
MP Peak (7:45MP - 4:45MP)
AOW l l e l (HCs ll aig P hlrrnt l, deacn, Nge l lra l, yant l hi Bhag, yant l
hi vrhl l Ra l
AOP hcewei l
n: 5101DI, Hht al dhi: 45.748027, -75.768676, Site Code: 37711103

Mhcgeg Sn: v da hbf llaRa
100 v hl l le l l r,
f epei, b f, N2K 5G, v A



Appendix B **COLLISION DETAILED SUMMARY**

Collision Main Detail Summary
OnTRAC Reporting System

FROM: 2012-01-01 TO: 2013-01-01

BASELINE RD & CENTREPOINTE DR E
Former Municipality: Ottawa

Former Municipality	Ottawa	Traffic Control: Traffic signal						Number of Collisions: 13						
	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED	
1	2012-01-04	We	17:20	Snow	Dusk	Rear end	P.D. only	V1 N V2 N	Wet Wet	Going ahead Stopped	Automobile, station Pick-up truck Other motor vehicle		0	
2	2012-01-20	Fri	14:35	Clear	Daylight	Rear end	P.D. only	V1 U V2 U	Wet Wet	Going ahead Stopped	Pick-up truck Automobile, station Other motor vehicle		0	
3	2012-01-23	Mo	19:01	Freezin	Dark	Turning	Non-fatal	V1 E V2 W	Slush Slush	Going ahead Turning left	Automobile, station Automobile, station Other motor vehicle		0	
4	2012-02-03	Fri	17:58	Clear	Dark	Rear end	P.D. only	V1 W V2 W V3 W	Wet Wet Wet	Slowing or Stopped Stopped	Automobile, station Automobile, station Other motor vehicle		0	
5	2012-02-26	Sun	18:35	Clear	Dark	Approaching	Non-fatal	V1 N V2 S V3 W V4 W	Dry Dry Dry Dry	Turning left Going ahead Turning left Turning left	Pick-up truck Pick-up truck Automobile, station Passenger van Other motor vehicle		0	
6	2012-03-10	Sat	10:40	Clear	Daylight	Rear end	P.D. only	V1 E V2 E	Wet Wet	Changing lanes Slowing or Slowing or	Automobile, station Automobile, station Automobile, station Other motor vehicle		0	
7	2012-03-16	Fri	13:47	Clear	Daylight	Rear end	P.D. only	V1 W V2 W	Wet Wet	Slowing or Slowing or	Automobile, station Automobile, station Other motor vehicle		0	
8	2012-05-03	Thu	10:00	Rain	Daylight	Rear end	P.D. only	V1 W V2 W	Wet Wet	Slowing or Stopped	Automobile, station Automobile, station Other motor vehicle		0	
9	2012-05-06	Sun	18:39	Clear	Daylight	Rear end	P.D. only	V1 W V2 W	Dry Dry	Going ahead Slowing or	Automobile, station Automobile, station Other motor vehicle		0	
10	2012-06-01	Fri	22:40	Rain	Dark	Rear end	P.D. only	V1 W V2 W	Wet Wet	Going ahead Stopped	Automobile, station Automobile, station Other motor vehicle		0	

(Note: Time of Day = "00:00" represents unknown collision time
Wednesday, April 25, 2018

Page 1 of 2

Collision Main Detail Summary
OnTRAC Reporting System

FROM: 2012-01-01 TO: 2013-01-01

11	2012-07-14	Sat	16:21	Clear	Daylight	Rear end	P.D. only	V1 W V2 W	Dry	Dry	Going ahead Stopped	Municipal transit bus Automobile, station Other motor vehicle	0
12	2012-09-04	Tue	19:07	Rain	Dusk	Rear end	P.D. only	V1 W V2 W	Wet	Wet	Slowing or Stopped	Passenger van Automobile, station Other motor vehicle	0
13	2012-09-13	Thu	14:07	Clear	Daylight	Rear end	P.D. only	V1 W V2 W	Wet	Wet	Going ahead Stopped	Automobile, station Pick-up truck Other motor vehicle	0

BASELINE RD & CONSTELLATION CRE
Former Municipality: Ottawa

Former Municipality Ottawa				Traffic Control: Traffic signal				Number of Collisions: 3					
	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
14	2012-02-29	We	07:49	Clear	Daylight	Rear end	P.D. only	V1 E V2 E V3 E	Dry	Going ahead Going ahead Going ahead	Automobile, station Automobile, station Automobile, station Other motor vehicle	Other motor vehicle	0
15	2012-05-09	We	21:14	Rain	Dark	Single vehicle	P.D. only	V1 W	Wet	Unknown	Pick-up truck	Skidding/Sliding	0
16	2012-05-15	Tue	17:15	Clear	Daylight	Angle	P.D. only	V1 E V2 N	Dry	Going ahead Turning left	Pick-up truck Automobile, station Automobile, station Other motor vehicle	Other motor vehicle	0

CENTREPOINTE DR & GEMINI WAY
Former Municipality: Nepean

Former Municipality: Nepean				Traffic Control: Stop sign				Number of Collisions: 1					
	DATE	DAY	TIME	ENV	LIGHT	IMPACT TYPE	CLASS	DIR	SURFACE COND'N	VEHICLE MANOEUVRE	VEHICLE TYPE	FIRST EVENT	No. PED
17	2012-08-24	Fri	17:10	Clear	Daylight	Rear end	P.D. only	V1 N V2 N	Dry Dry	Going ahead Stopped	Automobile, station Automobile, station	Other motor vehicle Other motor vehicle	0

(Note: Time of Day = "00:00" represents unknown collision time
Wednesday, April 25, 2018

Page 2 of 2



City Operations - Transportation Services
Collision Details Report - Public Version

From: January 1, 2013 To: December 31, 2016

Location: CONSTELLATION CRES @ BASELINE RD

Traffic Control: Traffic signal

Total Collisions: 18

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2016-May-13, Fri,09:15	Rain	Rear end	Non-fatal injury	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2016-Apr-06, Wed,19:00	Snow	Angle	P.D. only	Slush	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2016-Mar-29, Tue,13:51	Clear	Sideswipe	P.D. only	Dry	West	Turning left	Pick-up truck	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Oct-28, Wed,19:20	Rain	Sideswipe	P.D. only	Wet	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2015-Jul-30, Thu,15:15	Clear	Rear end	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	
					North	Turning right	Automobile, station wagon	Other motor vehicle	

Wednesday, April 25, 2018

Page 1 of 3

2015-Jun-26, Fri,15:31	Clear	Rear end	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Pick-up truck	Other motor vehicle	
2014-Nov-19, Wed,08:52	Clear	Sideswipe	P.D. only	Wet	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-May-14, Wed,16:00	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Pick-up truck	Other motor vehicle	
2014-Apr-09, Wed,13:20	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2014-Mar-07, Fri,15:55	Clear	Rear end	P.D. only	Wet	West	Unknown	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Feb-14, Fri,10:00	Snow	Rear end	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2014-Feb-05, Wed,07:10	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	

Wednesday, April 25, 2018

Page 2 of 3

2014-Feb-03, Mon,08:46	Clear	Rear end	P.D. only	Slush	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2013-Dec-08, Mon,06:49	Snow	Rear end	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2013-Sep-04, Wed,09:38	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					North	Turning left	Municipal transit bus	Other motor vehicle
2013-Aug-28, Wed,11:30	Clear	Turning movement	P.D. only	Dry	East	Turning right	Pick-up truck	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2013-Jul-18, Thu,12:00	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Unknown	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2013-Jan-24, Thu,08:00	Clear	Rear end	P.D. only	Ice	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle

Wednesday, April 25, 2018

Page 3 of 3

2016-Mar-11, Fri,15:30	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
					West	Stopped	Automobile, station wagon	Other motor vehicle
2016-Jan-29, Fri,07:26	Snow	Angle	P.D. only	Loose snow	North	Turning left	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Municipal transit bus	Other motor vehicle
2015-Nov-23, Mon,07:47	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					East	Turning right	Automobile, station wagon	Other motor vehicle
2015-Oct-31, Thu,12:09	Clear	Turning movement	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Turning left	Automobile, station wagon	Other motor vehicle
2015-Oct-18, Sun,08:06	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
2015-Oct-13, Tue,07:59	Rain	Rear end	P.D. only	Wet	East	Going ahead	Pick-up truck	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Pick-up truck	Other motor vehicle

Wednesday, April 25, 2018

Page 2 of 5



City Operations - Transportation Services Collision Details Report - Public Version

From: January 1, 2013 To: December 31, 2016

Location: BASELINE RD @ CENTREPOINTE DR E/HIGHGATE RD									
Traffic Control: Traffic signal									
								Total Collisions: 31	
Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2016-Dec-22, Thu,09:00	Snow	SMV other	P.D. only	Loose snow	West	Turning right	Automobile, station wagon	Skidding/sliding	
2016-Dec-15, Thu,19:52	Clear	Sideswipe	P.D. only	Ice	West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2016-Dec-04, Sun,21:16	Clear	Turning movement	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Pick-up truck	Other motor vehicle	
2016-Oct-16, Sun,09:10	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	
					North	Turning left	Pick-up truck	Other motor vehicle	
2016-Sep-07, Wed,15:03	Fog, mist, smoke, dust	Rear end	Non-fatal injury	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2016-Aug-17, Wed,06:00	Rain	SMV other	P.D. only	Wet	North	Turning left	Automobile, station wagon	Curb	

Wednesday, April 25, 2018

Page 1 of 5

2015-Aug-01, Sat,21:04	Clear	Turning movement	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2015-Jun-16, Tue,11:50	Rain	Rear end	Non-fatal injury	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2015-Jan-27, Tue,08:19	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Passenger van	Other motor vehicle	
					West	Slowing or stopping	Pick-up truck	Other motor vehicle	
					West	Slowing or stopping	Pick-up truck	Other motor vehicle	
2014-Oct-16, Thu,12:33	Rain	Turning movement	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Turning left	Passenger van	Other motor vehicle	
2014-Oct-06, Mon,13:15	Rain	Sideswipe	P.D. only	Wet	West	Changing lanes	Pick-up truck	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Oct-03, Fri,21:53	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	

Wednesday, April 25, 2018

Page 3 of 5

2014-Jul-30, Wed, 10:31	Clear	Rear end	P.D. only	Dry	West West	Going ahead Stopped	Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle	
2014-May-26, Mon, 18:27	Clear	Turning movement	P.D. only	Dry	West West	Turning left Turning left	Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle	
2014-May-18, Sun, 12:38	Clear	Rear end	Non-fatal injury	Dry	North North	Turning right Turning right	Automobile, station wagon Passenger van	Other motor vehicle Other motor vehicle	
2014-May-01, Thu, 20:35	Clear	Turning movement	P.D. only	Dry	West West	Turning left Turning left	Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle	
2014-Apr-22, Tue, 15:33	Rain	Turning movement	Non-fatal injury	Wet	East West	Turning left Going ahead	Automobile, station wagon Passenger van	Other motor vehicle Other motor vehicle	
2014-Feb-14, Fri, 09:00	Snow	Sideswipe	P.D. only	Loose snow	West West West West West	Going ahead Turning left Turning left Turning left Turning left	Automobile, station wagon Passenger van Automobile, station wagon Automobile, station wagon Passenger van	Other motor vehicle Other motor vehicle Other motor vehicle Other motor vehicle	

Wednesday, April 25, 2018

Page 4 of 5

2014-Jan-06, Mon, 02:42	Freezing Rain	SMV other	P.D. only	Ice	North	Going ahead	Automobile, station wagon	Ran off road	
2013-Nov-27, Wed, 08:58	Snow	SMV other	P.D. only	Slush	West	Going ahead	Automobile, station wagon	Skidding/sliding	
2013-Nov-26, Tue, 17:36	Snow	SMV other	P.D. only	Slush	East	Turning left	Pick-up truck	Pole (utility, power)	
2013-Aug-31, Sat, 13:00	Clear	Rear end	P.D. only	Dry	North North	Turning right Turning right	Automobile, station wagon Pick-up truck	Other motor vehicle Other motor vehicle	
2013-May-23, Thu, 13:42	Rain	Rear end	P.D. only	Wet	West West	Turning left Turning left	Pick-up truck Pick-up truck	Other motor vehicle Other motor vehicle	
2013-May-08, Wed, 18:10	Clear	Angle	P.D. only	Dry	East North	Going ahead Turning left	Bicycle Automobile, station wagon	Other motor vehicle Cyclist	
2013-Feb-22, Fri, 08:48	Clear	Rear end	P.D. only	Dry	West West	Going ahead Slowing or stopping	Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle	

Wednesday, April 25, 2018

Page 5 of 5



City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2013 To: December 31, 2016

Location: CENTREPOINTE DR @ GEMINI WAY

Traffic Control: Stop sign

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2016-Feb-04, Thu, 09:10	Clear	Angle	P.D. only	Wet	West North	Turning left Going ahead	Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle	
2013-May-04, Sat, 07:49	Clear	Turning movement	P.D. only	Dry	North North	Turning right Going ahead	Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle	

Wednesday, April 25, 2018

Page 1 of 1

Appendix C INTERSECTION PERFORMANCE WORKSHEET

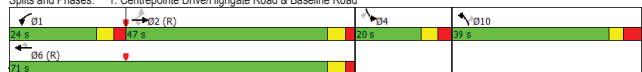
Lanes, Volumes, Timings
1: Centrepointe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2018 Existing AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	0	1650	533	175	515	55	135	0	266	110	0	69
Future Volume (vph)	0	1650	533	175	515	55	135	0	266	110	0	69
Satd. Flow (prot)	1883	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Satd. Flow (RTOR)				579			85			289		132
Lane Group Flow (vph)	0	1793	579	190	560	60	147	0	289	120	0	75
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases		2		1	6		10			4		
Permitted Phases	2		2		6			10			4	
Detector Phase	2	2	2	1	6	6	10	10	10	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	11.2	25.7	25.7	38.8	38.8	38.8	16.3	16.3	16.3
Total Split (s)	47.0	47.0	47.0	24.0	71.0	71.0	39.0	39.0	39.0	20.0	20.0	20.0
Total Split (%)	36.2%	36.2%	36.2%	18.5%	54.6%	54.6%	30.0%	30.0%	15.4%	15.4%	15.4%	15.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	3.8	3.8	3.8	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	6.2	5.7	5.7	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	68.0	68.0	12.4	86.6	86.6	11.9	11.9	12.6	12.6	12.6	12.6	12.6
Actuated g/C Ratio	0.52	0.52	0.10	0.67	0.67	0.09	0.09	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.67	0.52	0.57	0.23	0.05	0.46	0.71	0.69	0.27	0.27	0.27	0.27
Control Delay	25.1	3.4	66.7	8.0	0.6	60.3	16.0	77.4	2.6	2.6	2.6	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	3.4	66.7	8.0	0.6	60.3	16.0	77.4	2.6	2.6	2.6	2.6
LOS	C	A	E	A	A	E	B	E	A	A	A	A
Approach Delay	19.8			21.2			30.9			48.6		
Approach LOS	B			C			C			D		

Intersection Summary												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 76 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.71												
Intersection Signal Delay: 22.9												
Intersection Capacity Utilization 68.2%												
ICU Level of Service C												
Analysis Period (min) 15												

Splits and Phases: 1: Centrepointe Drive/Highgate Road & Baseline Road



06/01/2018

Synchro 9 Report
Page 1

Queues
1: Centrepointe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2018 Existing AM Peak

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
Lane Group Flow (vph)	1793	579	190	560	60	147	289	120	75
v/c Ratio	0.67	0.52	0.57	0.23	0.05	0.46	0.71	0.69	0.27
Control Delay	25.1	3.4	66.7	8.0	0.6	60.3	16.0	77.4	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.1	3.4	66.7	8.0	0.6	60.3	16.0	77.4	2.6
Queue Length 50th (m)	119.1	0.0	25.1	24.4	0.0	18.9	0.0	30.0	0.0
Queue Length 95th (m)	157.6	19.3	30.4	30.2	1.3	28.3	26.1	#53.1	0.7
Internal Link Dist (m)	158.7			258.8					
Turn Bay Length (m)		135.0	110.0		95.0			37.5	
Base Capacity (vph)	2691	1114	475	2385	1095	859	613	188	286
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	0.52	0.40	0.23	0.05	0.17	0.47	0.64	0.26

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

06/01/2018

Synchro 9 Report
Page 2

Lanes, Volumes, Timings
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2018 Existing AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	←	←	←	←	←	←
Traffic Volume (vph)	1901	125	342	697	48	64
Future Volume (vph)	1901	125	342	697	48	64
Satd. Flow (prot)	5142	1601	3471	3579	3471	1601
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	5142	1601	3471	3579	3471	1601
Satd. Flow (RTOR)			70		70	
Lane Group Flow (vph)	2066	136	372	758	52	70
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	4	1	6	4	
Permitted Phases	2		2		4	
Detector Phase	2	4	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	32.5	33.9	11.5	16.5	33.9	33.9
Total Split (s)	66.0	34.0	30.0	96.0	34.0	34.0
Total Split (%)	50.8%	26.2%	23.1%	73.8%	26.2%	26.2%
Yellow Time (s)	3.7	3.0	3.7	3.7	3.0	3.0
All-Red Time (s)	2.8	3.9	2.8	2.8	3.9	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.9	6.5	6.5	6.9	6.9
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	None	None	C-Max	None	None
Act Effct Green (s)	83.4	97.5	19.1	109.0	7.6	7.6
Actuated g/C Ratio	0.64	0.75	0.15	0.84	0.06	0.06
v/c Ratio	0.63	0.11	0.73	0.25	0.26	0.44
Control Delay	4.5	0.2	61.5	2.4	61.0	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	0.2	61.5	2.4	61.0	21.7
LOS	A	A	E	A	E	C
Approach Delay	4.3			21.9	38.5	
Approach LOS	A			C	D	

Intersection Summary						
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 74 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green						
Natural Cycle: 90						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.73						
Intersection Signal Delay: 11.2						
Intersection Capacity Utilization 67.2%						
ICU Level of Service C						
Analysis Period (min) 15						

Splits and Phases: 2: Constellation Drive & Baseline Road



06/01/2018

Synchro 9 Report
Page 3

Queues
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2018 Existing AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2066	136	372	758	52	70
v/c Ratio	0.63	0.11	0.73	0.25	0.26	0.44
Control Delay	4.5	0.2	61.5	2.4	61.0	21.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	0.2	61.5	2.4	61.0	21.7
Queue Length 50th (m)	22.0	0.1	47.5	15.7	6.7	0.0
Queue Length 95th (m)	30.4	m0.4	61.4	23.2	13.1	14.5
Internal Link Dist (m)	258.8			131.8	77.4	
Turn Bay Length (m)		55.0	115.0		60.0	
Base Capacity (vph)	3300	1448	629	3002	723	389
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.09	0.59	0.25	0.07	0.18

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

06/01/2018

Synchro 9 Report
Page 4

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	11	34	367	32	152	557
Future Vol, veh/h	11	34	367	32	152	557
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	450	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	37	399	35	165	605

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	972	199	0
Stage 1	399	-	-
Stage 2	573	-	-
Critical Hdwy	6.29	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	-
Pot Cap-1 Maneuver	283	809	-
Stage 1	625	-	-
Stage 2	495	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	222	809	-
Mov Cap-2 Maneuver	222	-	-
Stage 1	625	-	-
Stage 2	389	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	491	1156	-
HCM Lane V/C Ratio	-	-	0.1	0.143	-
HCM Control Delay (s)	-	-	13.1	8.6	0.3
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.5	-

06/01/2018

Synchro 9 Report
Page 6

Lanes, Volumes, Timings
1: Centrepointhe Drive/Highgate Road & Baseline Road
2018 Existing PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	28	682	194	172	1333	117	430	0	222	77	0	56
Future Volume (vph)	28	682	194	172	1333	117	430	0	222	77	0	56
Satd. Flow (prot)	1789	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1789	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Satd. Flow (RTOR)				211			137			241		184
Lane Group Flow (vph)	30	741	211	187	1449	127	467	0	241	84	0	61
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		10			4		
Permitted Phases												
Detector Phase	5	2	2	1	6	6	10	10	4			4
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0		10.0
Minimum Split (s)	11.2	25.7	25.7	11.2	25.7	25.7	38.8	38.8	16.3			16.3
Total Split (s)	12.0	49.0	49.0	21.0	58.0	58.0	39.0	39.0	21.0			21.0
Total Split (%)	9.2%	37.7%	37.7%	16.2%	44.6%	44.6%	30.0%	30.0%	16.2%			16.2%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.3			3.3
All-Red Time (s)	2.5	2.0	2.0	2.5	2.0	2.0	3.8	3.8	3.0			3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
Total Lost Time (s)	6.2	5.7	5.7	6.2	5.7	5.7	6.8	6.8	6.3			6.3
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None		None
Act Effct Green (s)	7.5	57.7	57.7	12.3	67.5	67.5	23.1	23.1	11.9			11.9
Actualized g/C Ratio	0.06	0.44	0.44	0.09	0.52	0.52	0.18	0.18	0.09			0.09
v/c Ratio	0.29	0.32	0.25	0.57	0.78	0.14	0.76	0.50	0.52			0.19
Control Delay	65.6	25.3	4.4	73.5	27.0	1.3	58.8	8.9	67.4			1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
Total Delay	65.6	25.3	4.4	73.5	27.0	1.3	58.8	8.9	67.4			1.4
LOS	E	C	A	E	C	A	E	A	E			A
Approach Delay	22.0			30.1			41.8			39.6		
Approach LOS	C			C			D			D		

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 71 (55%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 30.6	Intersection LOS: C
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Centrepointhe Drive/Highgate Road & Baseline Road

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06/01/2018

Synchro 9 Report
Page 1

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↔		↔	↔	
Traffic Vol, veh/h	0	96	0	112	423	44
Future Vol, veh/h	0	96	0	112	423	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length		0		-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	104	0	122	460	48

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	254	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	745	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	745	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-












Approach	EB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	745	-	-
HCM Lane V/C Ratio	-	0.14	-	-
HCM Control Delay (s)	-	10.6	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

06/01/2018

Synchro 9 Report
Page 8

Queues
1: Centrepointhe Drive/Highgate Road & Baseline Road
2018 Existing PM Peak

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	
Lane Group Flow (vph)	30	741	211	187	1449	127	467	241	84	61	
v/c Ratio	0.29	0.32	0.25	0.57	0.78	0.14	0.76	0.50	0.52	0.19	
Control Delay	65.6	25.3	4.4	73.5	27.0	1.3	58.8	8.9	67.4	1.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	65.6	25.3	4.4	73.5	27.0	1.3	58.8	8.9	67.4	1.4	
Queue Length 50th (m)	7.5	43.8	0.0	23.8	172.3	0.6	59.4	0.0	21.0	0.0	
Queue Length 95th (m)	17.4	64.2	16.1	35.9	#248.5	2.3	73.4	20.8	37.0	0.0	
Internal Link Dist (m)	158.7			258.8							
Turn Bay Length (m)	55.0			135.0			110.0			95.0	
Base Capacity (vph)	103	2283	828	400	1857	896	859	577	202	344	
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	0.32	0.25	0.47	0.78	0.14	0.54	0.42	0.42	0.18	

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

06/01/2018

Synchro 9 Report
Page 2

Lanes, Volumes, Timings

2: Constellation Drive & Baseline Road

2140 Baseline Road TIA

2018 Existing PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔↔	↔	↔↔	↔↔	↔↔	↔
Traffic Volume (vph)	960	21	78	1443	179	347
Future Volume (vph)	960	21	78	1443	179	347
Satd. Flow (prot)	5142	1601	3471	3579	3471	1601
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	5142	1601	3471	3579	3471	1601
Satd. Flow (RTOR)		23				275
Lane Group Flow (vph)	1043	23	85	1568	195	377
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	4	1	6	4	
Permitted Phases	2	4	1	6	4	4
Detector Phase	2	4	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	32.5	33.9	11.5	16.5	33.9	33.9
Total Split (s)	70.0	37.0	23.0	93.0	37.0	37.0
Total Split (%)	53.8%	28.5%	17.7%	71.5%	28.5%	28.5%
Yellow Time (s)	3.7	3.0	3.7	3.7	3.0	3.0
All-Red Time (s)	2.8	3.9	2.8	2.8	3.9	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.9	6.5	6.5	6.9	6.9
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	None	None	C-Max	None	None
Act Effct Green (s)	84.5	108.0	8.6	99.6	17.0	17.0
Actuated g/C Ratio	0.65	0.83	0.07	0.77	0.13	0.13
v/c Ratio	0.31	0.02	0.37	0.57	0.43	0.84
Control Delay	6.6	0.1	62.4	8.3	53.4	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	0.1	62.4	8.3	53.4	31.8
LOS	A	A	E	A	D	C
Approach Delay	6.5			11.1	39.2	
Approach LOS	A			B	D	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 64 (49%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 14.5

Intersection LOS: B

Intersection Capacity Utilization 56.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Constellation Drive & Baseline Road



06/01/2018

Synchro 9 Report
Page 3

HCM 2010 TWSC

3: Centrepointe Drive & Gemini Way

2140 Baseline Road TIA

2018 Existing PM Peak

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔↔	↔	↔↔	↔↔
Traffic Vol, veh/h	25	82	571	12	17	350
Future Vol, veh/h	25	82	571	12	17	350
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	450	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	89	621	13	18	380

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	810	310	0
Stage 1	621	-	-
Stage 2	189	-	-
Critical Hdwy	6.29	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	-
Pot Cap-1 Maneuver	350	686	-
Stage 1	483	-	-
Stage 2	785	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	342	686	-
Mov Cap-2 Maneuver	342	-	-
Stage 1	483	-	-
Stage 2	766	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	555	956
HCM Lane V/C Ratio	-	-	0.21	0.019
HCM Control Delay (s)	-	-	13.2	8.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1

06/01/2018

Synchro 9 Report
Page 6

Queues

2: Constellation Drive & Baseline Road

2140 Baseline Road TIA

2018 Existing PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1043	23	85	1568	195	377
v/c Ratio	0.31	0.02	0.37	0.57	0.43	0.84
Control Delay	6.6	0.1	62.4	8.3	53.4	31.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	0.1	62.4	8.3	53.4	31.8
Queue Length 50th (m)	18.1	0.0	10.9	70.4	24.4	26.1
Queue Length 95th (m)	28.9	m0.3	19.1	132.9	32.1	57.8
Internal Link Dist (m)	258.8			131.8	77.4	
Turn Bay Length (m)		55.0	115.0			60.0
Base Capacity (vph)	3343	1490	440	2741	803	582
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.02	0.19	0.57	0.24	0.65

Intersection Summary

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

06/01/2018

Synchro 9 Report
Page 4

HCM 2010 TWSC

4: Constellation Drive & Gemini Way

2140 Baseline Road TIA

2018 Existing PM Peak

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔↔	↔↔	↔
Traffic Vol, veh/h	0	5	0	526	79	20
Future Vol, veh/h	0	5	0	526	79	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	0	572	86	22

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	54	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	1002	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1002	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBL/N1	SBT	SBR
Capacity (veh/h)	-	1002	-	-
HCM Lane V/C Ratio	-	0.005	-	-
HCM Control Delay (s)	-	8.6	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

06/01/2018

Synchro 9 Report
Page 8

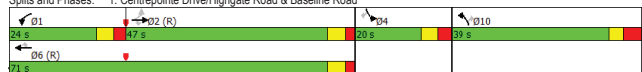
Lanes, Volumes, Timings
1: Centrepointe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2020 FBG AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	0	1716	554	182	536	57	140	0	277	114	0	72
Future Volume (vph)	0	1716	554	182	536	57	140	0	277	114	0	72
Satd. Flow (prot)	1883	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Satd. Flow (RTOR)				554			85			277		132
Lane Group Flow (vph)	0	1716	554	182	536	57	140	0	277	114	0	72
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases		2		1	6		10			4		
Permitted Phases	2		2		6		10			4		4
Detector Phase	2	2	2	1	6	6	10	10	4			4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	11.2	25.7	25.7	38.8	38.8	16.3	16.3	16.3	16.3
Total Split (s)	47.0	47.0	47.0	24.0	71.0	71.0	39.0	39.0	20.0	20.0	20.0	20.0
Total Split (%)	36.2%	36.2%	36.2%	18.5%	54.6%	54.6%	30.0%	30.0%	15.4%	15.4%	15.4%	15.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	3.8	3.8	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	6.2	5.7	5.7	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	68.6	68.6	12.1	87.0	87.0	11.7	11.7	12.5	12.5	12.5	12.5	12.5
Actuated g/C Ratio	0.53	0.53	0.09	0.67	0.67	0.09	0.09	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.63	0.50	0.56	0.22	0.05	0.45	0.70	0.67	0.26	0.26	0.26	0.26
Control Delay	23.9	3.3	67.7	7.9	0.5	60.2	16.1	75.5	2.4	2.4	2.4	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	3.3	67.7	7.9	0.5	60.2	16.1	75.5	2.4	2.4	2.4	2.4
LOS	C	A	E	A	A	E	B	E	A	A	A	A
Approach Delay	18.9			21.4			30.9			47.2		
Approach LOS	B			C			C			D		

Intersection Summary												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 76 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 105												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.70												
Intersection Signal Delay: 22.2												
Intersection Capacity Utilization 70.4%												
ICU Level of Service C												
Analysis Period (min) 15												

Splits and Phases: 1: Centrepointe Drive/Highgate Road & Baseline Road



06/01/2018

Synchro 9 Report
Page 1

Queues
1: Centrepointe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2020 FBG AM Peak

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
Lane Group Flow (vph)	1716	554	182	536	57	140	277	114	72
v/c Ratio	0.63	0.50	0.56	0.22	0.05	0.45	0.70	0.67	0.26
Control Delay	23.9	3.3	67.7	7.9	0.5	60.2	16.1	75.5	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	3.3	67.7	7.9	0.5	60.2	16.1	75.5	2.4
Queue Length 50th (m)	109.9	0.0	24.7	23.4	0.0	18.0	0.0	28.4	0.0
Queue Length 95th (m)	146.4	19.0	29.7	29.1	1.0	27.2	25.8	48.1	0.0
Internal Link Dist (m)	158.7			258.8					
Turn Bay Length (m)		135.0	110.0		95.0		37.5		
Base Capacity (vph)	2715	1106	475	2394	1099	859	604	188	286
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	0.63	0.50	0.38	0.22	0.05	0.16	0.46	0.61	0.25
Intersection Summary									

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

06/01/2018

Synchro 9 Report
Page 2

Lanes, Volumes, Timings
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2020 FBG AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰	↰	↰	↰	↰	↰
Traffic Volume (vph)	1977	130	356	725	50	67
Future Volume (vph)	1977	130	356	725	50	67
Satd. Flow (prot)	5142	1601	3471	3579	1601	3471
Flt Permitted			0.950			0.950
Satd. Flow (perm)	5142	1601	3471	3579	1601	3471
Satd. Flow (RTOR)			79			67
Lane Group Flow (vph)	1977	130	356	725	50	67
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	4	1	6	4	
Permitted Phases	2		2		4	4
Detector Phase	2	4	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	32.5	33.9	11.5	16.5	33.9	33.9
Total Split (s)	66.0	34.0	30.0	96.0	34.0	34.0
Total Split (%)	50.8%	26.2%	23.1%	73.8%	26.2%	26.2%
Yellow Time (s)	3.7	3.0	3.7	3.7	3.0	3.0
All-Red Time (s)	2.8	3.9	2.8	2.8	3.9	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.9	6.5	6.5	6.9	6.9
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	None	None	C-Max	None	None
Act Effct Green (s)	84.1	98.1	18.5	109.1	7.5	7.5
Actuated g/C Ratio	0.65	0.75	0.14	0.84	0.06	0.06
v/c Ratio	0.59	0.11	0.72	0.24	0.25	0.43
Control Delay	4.4	0.2	61.7	2.4	61.0	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	0.2	61.7	2.4	61.0	22.0
LOS	A	A	E	A	E	C
Approach Delay	4.1			21.9	38.7	
Approach LOS	A			C	D	

Intersection Summary						
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 74 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green						
Natural Cycle: 90						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.72						
Intersection Signal Delay: 11.2						
Intersection Capacity Utilization 69.1%						
ICU Level of Service C						
Analysis Period (min) 15						

Splits and Phases: 2: Constellation Drive & Baseline Road



06/01/2018

Synchro 9 Report
Page 3

Queues
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2020 FBG AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1977	130	356	725	50	67
v/c Ratio	0.59	0.11	0.72	0.24	0.25	0.43
Control Delay	4.4	0.2	61.7	2.4	61.0	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	0.2	61.7	2.4	61.0	22.0
Queue Length 50th (m)	20.8	0.1	45.5	14.8	6.4	0.0
Queue Length 95th (m)	29.1	m0.3	59.2	22.0	12.7	14.2
Internal Link Dist (m)	258.8			131.8	77.4	
Turn Bay Length (m)		55.0	115.0		60.0	
Base Capacity (vph)	3328	1457	627	3004	723	386
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.09	0.57	0.24	0.07	0.17
Intersection Summary						

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

06/01/2018

Synchro 9 Report
Page 4

Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	11	35	382	33	158	579
Future Vol, veh/h	11	35	382	33	158	579
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	450	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	35	382	33	158	579

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	930	191	0
Stage 1	382	-	-
Stage 2	548	-	-
Critical Hdwy	6.29	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	-
Pot Cap-1 Maneuver	299	818	-
Stage 1	637	-	-
Stage 2	511	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	239	818	-
Mov Cap-2 Maneuver	239	-	-
Stage 1	637	-	-
Stage 2	409	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBL	SBL	SBT
Capacity (veh/h)	-	-	518	1173	-
HCM Lane V/C Ratio	-	-	0.089	0.135	-
HCM Control Delay (s)	-	-	12.6	8.5	0.3
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.5	-

06/01/2018

Synchro 9 Report
Page 6

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	0	100	0	116	440	46
Future Vol, veh/h	0	100	0	116	440	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	100	0	116	440	46

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	243	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	758	0
Stage 1	0	-	-
Stage 2	0	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	758	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBL	NBT	SBT	SBR
Capacity (veh/h)	-	758	-	-	-
HCM Lane V/C Ratio	-	0.132	-	-	-
HCM Control Delay (s)	-	10.5	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-	-

06/01/2018

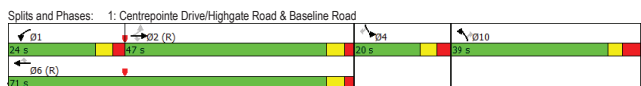
Synchro 9 Report
Page 8

Lanes, Volumes, Timings
1: Centrepointe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2020 FBG PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	29	709	202	179	1386	122	447	0	231	80	0	58
Future Volume (vph)	29	709	202	179	1386	122	447	0	231	80	0	58
Satd. Flow (prot)	1789	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Flt Permitted	0.155			0.950			0.950			0.950		
Satd. Flow (perm)	292	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Satd. Flow (RTOR)				202			122			231		132
Lane Group Flow (vph)	29	709	202	179	1386	122	447	0	231	80	0	58
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases		2		1	6		10			4		
Permitted Phases	2		2	1	6	6		10		4		4
Detector Phase	2	2	2	1	6	6	10	10	4			4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	11.2	25.7	25.7	38.8	38.8	16.3	16.3		
Total Split (s)	47.0	47.0	47.0	24.0	71.0	71.0	39.0	39.0	20.0	20.0		
Total Split (%)	36.2%	36.2%	36.2%	18.5%	54.6%	54.6%	30.0%	30.0%	15.4%	15.4%		
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.3	3.3		
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	3.8	3.8	3.0	3.0		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	5.7	5.7	5.7	6.2	5.7	5.7	6.8	6.8	6.3	6.3		
Lead/Lag	Lag	Lag	Lag	Lag	Lead							
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None		
Act Effct Green (s)	59.1	59.1	59.1	12.0	77.3	77.3	22.3	22.3	11.5	11.5		
Actualized g/C Ratio	0.45	0.45	0.45	0.09	0.59	0.59	0.17	0.17	0.09	0.09		
v/c Ratio	0.22	0.30	0.24	0.56	0.65	0.12	0.75	0.50	0.51	0.22		
Control Delay	31.3	24.1	4.2	71.0	17.0	1.5	59.1	9.2	67.6	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	31.3	24.1	4.2	71.0	17.0	1.5	59.1	9.2	67.6	1.9		
LOS	C	C	A	E	B	A	E	A	E	A		
Approach Delay	20.1			21.6			42.1			40.0		
Approach LOS	C			C			D			D		

Intersection Summary												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 76 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.75												
Intersection Signal Delay: 26.0												
Intersection Capacity Utilization 74.6%												
Analysis Period (min) 15												



06/01/2018

Synchro 9 Report
Page 1

Queues
1: Centrepointe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2020 FBG PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	29	709	202	179	1386	122	447	0	231	80	0	58
v/c Ratio	0.22	0.30	0.24	0.56	0.65	0.12	0.75	0.50	0.51	0.22		
Control Delay	31.3	24.1	4.2	71.0	17.0	1.5	59.1	9.2	67.6	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	31.3	24.1	4.2	71.0	17.0	1.5	59.1	9.2	67.6	1.9		
Queue Length 50th (m)	4.4	40.7	0.0	23.2	129.7	0.2	56.9	0.0	20.0	0.0		
Queue Length 95th (m)	14.3	59.4	15.5	33.0	163.2	3.1	70.7	20.8	35.7	0.0		
Internal Link Dist (m)	158.7			258.8								
Turn Bay Length (m)	55.0			135.0			110.0			95.0		
Base Capacity (vph)	132	2337	838	475	2128	1001	859	570	188	286		
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	0.22	0.30	0.24	0.38	0.65	0.12	0.52	0.41	0.43	0.20		

Intersection Summary												
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06/01/2018

Synchro 9 Report
Page 2

Lanes, Volumes, Timings

2: Constellation Drive & Baseline Road

2140 Baseline Road TIA

2020 FBG PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔↔	↔	↔↔	↔↔	↔↔	↔
Traffic Volume (vph)	998	22	81	1501	186	361
Future Volume (vph)	998	22	81	1501	186	361
Satd. Flow (prot)	5142	1601	3471	3579	3471	1601
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	5142	1601	3471	3579	3471	1601
Satd. Flow (RTOR)		22				351
Lane Group Flow (vph)	998	22	81	1501	186	361
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	4	1	6	4	
Permitted Phases	2	4	1	6	4	4
Detector Phase	2	4	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	32.5	33.9	11.5	16.5	33.9	33.9
Total Split (s)	66.0	34.0	30.0	96.0	34.0	34.0
Total Split (%)	50.8%	26.2%	23.1%	73.8%	26.2%	26.2%
Yellow Time (s)	3.7	3.0	3.7	3.7	3.0	3.0
All-Red Time (s)	2.8	3.9	2.8	2.8	3.9	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.9	6.5	6.5	6.9	6.9
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	None	None	C-Max	None	None
Act Effct Green (s)	88.4	108.2	8.4	103.3	13.3	13.3
Actuated g/C Ratio	0.68	0.83	0.06	0.79	0.10	0.10
v/c Ratio	0.29	0.02	0.36	0.53	0.53	0.76
Control Delay	5.2	0.3	62.3	5.9	60.1	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	0.3	62.3	5.9	60.1	16.7
LOS	A	A	E	A	E	B
Approach Delay	5.1			8.8	31.5	
Approach LOS	A			A	C	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 74 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 11.5

Intersection LOS: B

Intersection Capacity Utilization 58.0%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Constellation Drive & Baseline Road



06/01/2018

Synchro 9 Report
Page 3

Queues

2: Constellation Drive & Baseline Road

2140 Baseline Road TIA

2020 FBG PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	998	22	81	1501	186	361
v/c Ratio	0.29	0.02	0.36	0.53	0.53	0.76
Control Delay	5.2	0.3	62.3	5.9	60.1	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.2	0.3	62.3	5.9	60.1	16.7
Queue Length 50th (m)	15.0	0.0	10.4	56.6	23.9	2.4
Queue Length 95th (m)	24.4	m0.1	18.4	95.1	33.5	31.6
Internal Link Dist (m)	258.8			131.8	77.4	
Turn Bay Length (m)		55.0	115.0		60.0	
Base Capacity (vph)	3497	1503	627	2845	723	611
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.01	0.13	0.53	0.26	0.59

Intersection Summary

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

06/01/2018

Synchro 9 Report
Page 4

HCM 2010 TWSC

3: Centrepointe Drive & Gemini Way

2140 Baseline Road TIA

2020 FBG PM Peak

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔↔	↔	↔↔	↔↔
Traffic Vol, veh/h	26	85	594	12	18	364
Future Vol, veh/h	26	85	594	12	18	364
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	450	-	-
Veh in Median Storage, #	0	-	0	-	0	-
Grade, %	0	-	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	26	85	594	12	18	364

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	776	297	0
Stage 1	594	-	-
Stage 2	182	-	-
Critical Hdwy	6.29	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	-
Pot Cap-1 Maneuver	366	699	-
Stage 1	499	-	-
Stage 2	792	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	358	699	-
Mov Cap-2 Maneuver	358	-	-
Stage 1	499	-	-
Stage 2	774	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	571	978
HCM Lane V/C Ratio	-	-	0.194	0.018
HCM Control Delay (s)	-	-	12.8	8.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1

06/01/2018

Synchro 9 Report
Page 6

HCM 2010 TWSC

4: Constellation Drive & Gemini Way

2140 Baseline Road TIA

2020 FBG PM Peak

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	0	5	0	547	82	21
Future Vol, veh/h	0	5	0	547	82	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	0	547	82	21

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	52	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	1005	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1005	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1005	-	-
HCM Lane V/C Ratio	-	0.005	-	-
HCM Control Delay (s)	-	8.6	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0	-	-

06/01/2018

Synchro 9 Report
Page 8

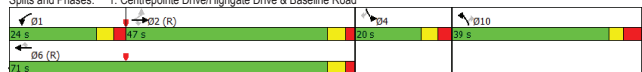
Lanes, Volumes, Timings
1: Centrepointe Drive/Highgate Drive & Baseline Road

2140 Baseline Road TIA
2020 Total Future AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	0	1704	577	187	536	57	157	0	313	114	0	72
Future Volume (vph)	0	1704	577	187	536	57	157	0	313	114	0	72
Satd. Flow (prot)	1883	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Satd. Flow (RTOR)				577			85			313		132
Lane Group Flow (vph)	0	1704	577	187	536	57	157	0	313	114	0	72
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	0	Perm	Prot	0	Perm
Protected Phases		2		1	6		10			4		
Permitted Phases	2		2		6		10			4		4
Detector Phase	2	2	2	1	6	6	10	10	4			4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	11.2	25.7	25.7	38.8	38.8	16.3	16.3	20.0	20.0
Total Split (s)	47.0	47.0	47.0	24.0	71.0	71.0	39.0	39.0	20.0	20.0	20.0	20.0
Total Split (%)	36.2%	36.2%	36.2%	18.5%	54.6%	54.6%	30.0%	30.0%	15.4%	15.4%	15.4%	15.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	3.8	3.8	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	6.2	5.7	5.7	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	68.0	68.0	12.3	86.5	86.5	12.2	12.2	12.5	12.5	12.5	12.5	12.5
Actuated g/C Ratio	0.52	0.52	0.09	0.67	0.67	0.09	0.09	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.63	0.52	0.57	0.23	0.05	0.48	0.72	0.67	0.26	0.26	0.26	0.26
Control Delay	24.4	3.4	66.4	8.0	0.5	60.4	15.8	75.5	2.4	2.4	2.4	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	3.4	66.4	8.0	0.5	60.4	15.8	75.5	2.4	2.4	2.4	2.4
LOS	C	A	E	A	A	E	B	E	A	A	A	A
Approach Delay	19.1			21.5			30.7			47.2		
Approach LOS	B			C			C			D		

Intersection Summary												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 76 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 105												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.72												
Intersection Signal Delay: 22.5												
Intersection Capacity Utilization 72.4%												
ICU Level of Service C												
Analysis Period (min) 15												

Splits and Phases: 1: Centrepointe Drive/Highgate Drive & Baseline Road



06/01/2018

Synchro 9 Report
Page 1

Queues
1: Centrepointe Drive/Highgate Drive & Baseline Road

2140 Baseline Road TIA
2020 Total Future AM Peak

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
Lane Group Flow (vph)	1704	577	187	536	57	157	313	114	72
v/c Ratio	0.63	0.52	0.57	0.23	0.05	0.48	0.72	0.67	0.26
Control Delay	24.4	3.4	66.4	8.0	0.5	60.4	15.8	75.5	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.4	3.4	66.4	8.0	0.5	60.4	15.8	75.5	2.4
Queue Length 50th (m)	110.3	0.0	24.5	23.4	0.0	20.2	0.0	28.4	0.0
Queue Length 95th (m)	147.5	19.6	30.1	29.1	1.0	29.8	27.0	48.1	0.0
Internal Link Dist (m)	158.7			258.8					
Turn Bay Length (m)		135.0	110.0		95.0		37.5		
Base Capacity (vph)	2690	1112	475	2381	1094	859	632	188	286
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	0.63	0.52	0.39	0.23	0.05	0.18	0.50	0.61	0.25
Intersection Summary									

06/01/2018

Synchro 9 Report
Page 2

Lanes, Volumes, Timings
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2020 Total Future AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	2014	134	375	725	50	67
Future Volume (vph)	2014	134	375	725	50	67
Satd. Flow (prot)	5142	1601	3471	3579	3471	1601
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	5142	1601	3471	3579	3471	1601
Satd. Flow (RTOR)			68		67	
Lane Group Flow (vph)	2014	134	375	725	50	67
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	4	1	6	4	
Permitted Phases	2		2		4	4
Detector Phase	2	4	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	32.5	33.9	11.5	16.5	33.9	33.9
Total Split (s)	66.0	34.0	30.0	96.0	34.0	34.0
Total Split (%)	50.8%	26.2%	23.1%	73.8%	26.2%	26.2%
Yellow Time (s)	3.7	3.0	3.7	3.7	3.0	3.0
All-Red Time (s)	2.8	3.9	2.8	2.8	3.9	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.9	6.5	6.5	6.9	6.9
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	None	None	C-Max	None	None
Act Effct Green (s)	83.4	97.4	19.2	109.1	7.5	7.5
Actuated g/C Ratio	0.64	0.75	0.15	0.84	0.06	0.06
v/c Ratio	0.61	0.11	0.73	0.24	0.25	0.43
Control Delay	4.7	0.3	61.5	2.4	61.0	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	0.3	61.5	2.4	61.0	22.0
LOS	A	A	E	A	E	C
Approach Delay	4.4			22.5	38.7	
Approach LOS	A			C	D	

Intersection Summary						
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 74 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green						
Natural Cycle: 90						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.73						
Intersection Signal Delay: 11.5						
Intersection Capacity Utilization 70.4%						
ICU Level of Service C						
Analysis Period (min) 15						

Splits and Phases: 2: Constellation Drive & Baseline Road



06/01/2018

Synchro 9 Report
Page 3

Queues
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2020 Total Future AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2014	134	375	725	50	67
v/c Ratio	0.61	0.11	0.73	0.24	0.25	0.43
Control Delay	4.7	0.3	61.5	2.4	61.0	22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.7	0.3	61.5	2.4	61.0	22.0
Queue Length 50th (m)	22.8	0.1	47.9	14.8	6.4	0.0
Queue Length 95th (m)	31.9	0.6	61.9	22.0	12.7	14.2
Internal Link Dist (m)	258.8			131.8	77.4	
Turn Bay Length (m)		55.0	115.0		60.0	
Base Capacity (vph)	3300	1448	629	3004	723	386
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.09	0.60	0.24	0.07	0.17
Intersection Summary						

06/01/2018

Synchro 9 Report
Page 4

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↕	↕	↕	↕
Traffic Vol, veh/h	17	89	382	39	186	579
Future Vol, veh/h	17	89	382	39	186	579
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	450	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	89	382	39	186	579

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	986	191	0
Stage 1	382	-	-
Stage 2	604	-	-
Critical Hdwy	6.29	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	-
Pot Cap-1 Maneuver	278	818	-
Stage 1	637	-	-
Stage 2	477	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	213	818	-
Mov Cap-2 Maneuver	213	-	-
Stage 1	637	-	-
Stage 2	365	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.9	0	2.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	562	1173
HCM Lane V/C Ratio	-	-	0.189	0.159
HCM Control Delay (s)	-	-	12.9	8.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.7	0.6

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBT
Lane Configurations	↔	↕	↕		↕	↕
Traffic Vol, veh/h	33	100	46	23	5	59
Future Vol, veh/h	33	100	46	23	5	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	100	46	23	5	59

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	69	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1532	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1532	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1532	-	-	-	981
HCM Lane V/C Ratio	0.022	-	-	-	0.065
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↕		↕	↕	↕
Traffic Vol, veh/h	0	100	0	116	69	440
Future Vol, veh/h	0	100	0	116	69	440
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	0	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	100	0	116	69	440

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	255	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	744	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	744	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

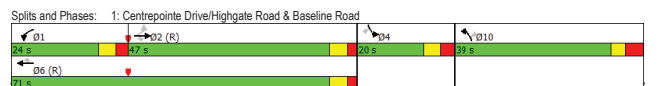
Approach	EB	NB	SB
HCM Control Delay, s	10.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	SBT	SBR
Capacity (veh/h)	-	744	-	-
HCM Lane V/C Ratio	-	0.134	-	-
HCM Control Delay (s)	-	10.6	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

1: Centrepointe Drive/Highgate Road & Baseline Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕	↕
Traffic Volume (vph)	29	708	214	184	1386	122	472	0	253	80	0	58
Future Volume (vph)	29	708	214	184	1386	122	472	0	253	80	0	58
Satd. Flow (prot)	1789	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Flt Permitted	0.153			0.950			0.950			0.950		
Satd. Flow (perm)	288	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Satd. Flow (RTOR)				214			122			253		132
Lane Group Flow (vph)	29	708	214	184	1386	122	472	0	253	80	0	58
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases		2		1	6		10			4		
Permitted Phases	2		2		6			10		4		4
Detector Phase	2	2	2	1	6	6	10		10	4		4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	11.2	25.7	25.7	38.8	38.8	16.3	16.3	16.3	16.3
Total Split (s)	47.0	47.0	47.0	24.0	71.0	71.0	39.0	39.0	20.0	20.0	20.0	20.0
Total Split (%)	36.2%	36.2%	36.2%	18.5%	54.6%	54.6%	30.0%	30.0%	15.4%	15.4%	15.4%	15.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	3.8	3.8	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	6.2	5.7	5.7	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	57.8	57.8	57.8	12.2	76.2	76.2	23.4	23.4	11.5	11.5	11.5	11.5
Actuated g/C Ratio	0.44	0.44	0.44	0.09	0.59	0.59	0.18	0.18	0.09	0.09	0.09	0.09
v/c Ratio	0.23	0.31	0.26	0.57	0.66	0.12	0.76	0.51	0.51	0.22	0.22	0.22
Control Delay	32.6	25.0	4.3	69.6	17.9	1.6	58.4	8.8	67.6	1.9	1.9	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	25.0	4.3	69.6	17.9	1.6	58.4	8.8	67.6	1.9	1.9	1.9
LOS	C	C	A	E	B	A	E	A	E	A	A	A
Approach Delay		20.6			22.4			41.1			40.0	
Approach LOS		C			C			D			D	

Intersection Summary												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 76 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.76												
Intersection Signal Delay: 26.4												
Intersection Capacity Utilization 75.3%												
ICU Level of Service D												
Analysis Period (min) 15												



Queues
1: Centrepointhe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2020 Total Future PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
Lane Group Flow (vph)	29	708	214	184	1386	122	472	253	80	58
v/c Ratio	0.23	0.31	0.26	0.57	0.66	0.12	0.76	0.51	0.51	0.22
Control Delay	32.6	25.0	4.3	69.6	17.9	1.6	58.4	8.8	67.6	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	32.6	25.0	4.3	69.6	17.9	1.6	58.4	8.8	67.6	1.9
Queue Length 50th (m)	4.5	42.0	0.0	23.0	133.3	0.2	59.5	0.0	20.0	0.0
Queue Length 95th (m)	14.6	60.4	16.1	32.9	176.4	3.2	74.0	21.4	35.7	0.0
Internal Link Dist (m)	158.7		135.0		110.0		258.8		37.5	
Turn Bay Length (m)	55.0		135.0		110.0		258.8		37.5	
Base Capacity (vph)	128	2287	831	475	2099	989	859	586	188	286
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	0.23	0.31	0.26	0.39	0.66	0.12	0.55	0.43	0.43	0.20

Intersection Summary

06/01/2018

Synchro 9 Report
Page 2

Lanes, Volumes, Timings
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2020 Total Future PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (vph)	1021	25	111	1491	186	361
Future Volume (vph)	1021	25	111	1491	186	361
Satd. Flow (prot)	5142	1601	3471	3579	3471	1601
Flt Permitted			0.950			
Satd. Flow (perm)	5142	1601	3471	3579	3471	1601
Satd. Flow (RTOR)			25			348
Lane Group Flow (vph)	1021	25	111	1491	186	361
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	4	1	6	4	
Permitted Phases	2	2				4
Detector Phase	2	4	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	32.5	33.9	11.5	16.5	33.9	33.9
Total Split (s)	66.0	34.0	30.0	96.0	34.0	34.0
Total Split (%)	50.8%	26.2%	23.1%	73.8%	26.2%	26.2%
Yellow Time (s)	3.7	3.0	3.7	3.7	3.0	3.0
All-Red Time (s)	2.8	3.9	2.8	2.8	3.9	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.9	6.5	6.5	6.9	6.9
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	C-Max	None	None	C-Max	None	None
Act Effect Green (s)	87.3	107.1	9.5	103.3	13.3	13.3
Actuated g/C Ratio	0.67	0.82	0.07	0.79	0.10	0.10
v/c Ratio	0.30	0.02	0.44	0.52	0.52	0.76
Control Delay	5.5	0.3	62.7	5.9	60.0	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	0.3	62.7	5.9	60.0	17.2
LOS	A	A	E	A	E	B
Approach Delay	5.4			9.8	31.8	
Approach LOS	A			A	C	

Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 130
Offset: 74 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 12.1
Intersection LOS: B
Intersection Capacity Utilization 57.7%
ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Constellation Drive & Baseline Road



06/01/2018

Synchro 9 Report
Page 3

Queues
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2020 Total Future PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1021	25	111	1491	186	361
v/c Ratio	0.30	0.02	0.44	0.52	0.52	0.76
Control Delay	5.5	0.3	62.7	5.9	60.0	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.5	0.3	62.7	5.9	60.0	17.2
Queue Length 50th (m)	16.0	0.0	14.2	56.1	23.9	3.1
Queue Length 95th (m)	26.1	m0.2	23.4	95.0	33.4	32.5
Internal Link Dist (m)	258.8		131.8		77.4	
Turn Bay Length (m)	55.0		115.0		60.0	
Base Capacity (vph)	3452	1490	627	2844	723	609
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.02	0.16	0.52	0.26	0.59

Intersection Summary

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

06/01/2018

Synchro 9 Report
Page 4

HCM 2010 TWSC
3: Centrepointhe Drive & Gemini Way

2140 Baseline Road TIA
2020 Total Future PM Peak

Intersection						
Int Delay, s/veh	2.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↑	↑	↑↑	↑	↑↑	↑↑
Traffic Vol, veh/h	32	132	594	18	35	364
Future Vol, veh/h	32	132	594	18	35	364
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	0	0	None	None	None	None
Storage Length	0	0	450	0	0	0
Veh in Median Storage, #	0	0	0	0	0	0
Grade, %	0	0	0	0	0	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	132	594	18	35	364

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	810	297	0
Stage 1	594	-	-
Stage 2	216	-	-
Critical Hdwy Stg 1	6.29	6.94	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	6.04	-	-
Pot Cap-1 Maneuver	3.67	3.32	-
Stage 1	350	699	-
Stage 2	499	-	-
Platoon blocked, %	761	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	334	699	-
Stage 1	-	-	-
Stage 2	499	-	-
Stage 2	727	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.7	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR/WBLn1	SBL	SBT
Capacity (veh/h)	-	-	576	978
HCM Lane v/c Ratio	-	-	0.285	0.036
HCM Control Delay (s)	-	-	13.7	8.8
HCM Lane LOS	-	-	B	A
HCM 95th %ile Q(veh)	-	-	1.2	0.1

06/01/2018

Synchro 9 Report
Page 6

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗↗	↗↗	
Traffic Vol, veh/h	0	5	0	547	82	54
Future Vol, veh/h	0	5	0	547	82	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	0	547	82	54

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 68	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.94	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.32	- -	- -
Pot Cap-1 Maneuver	0 981	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %	- -	- -	- -
Mov Cap-1 Maneuver	- 981	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 981	- -	- -
HCM Lane V/C Ratio	- 0.005	- -	- -
HCM Control Delay (s)	- 8.7	- -	- -
HCM Lane LOS	- A	- -	- -
HCM 95th %tile Q(veh)	- 0	- -	- -

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↗	↗		↗	
Traffic Vol, veh/h	23	5	21	33	5	51
Future Vol, veh/h	23	5	21	33	5	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	5	21	33	5	51

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	54	0 -	0 89 38
Stage 1	- -	- -	- 38 -
Stage 2	- -	- -	- 51 -
Critical Hdwy	4.12	- -	- 6.42 6.22
Critical Hdwy Stg 1	- -	- -	- 5.42 -
Critical Hdwy Stg 2	- -	- -	- 5.42 -
Follow-up Hdwy	2.218	- -	- 3.518 3.318
Pot Cap-1 Maneuver	1551	- -	- 912 1034
Stage 1	- -	- -	- 984 -
Stage 2	- -	- -	- 971 -
Platoon blocked, %	- -	- -	- -
Mov Cap-1 Maneuver	1551	- -	- 898 1034
Mov Cap-2 Maneuver	- -	- -	- 898 -
Stage 1	- -	- -	- 984 -
Stage 2	- -	- -	- 956 -

Approach	EB	WB	SB
HCM Control Delay, s	6	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1551	- -	- -	- 1020	-
HCM Lane V/C Ratio	0.015	- -	- -	- 0.055	-
HCM Control Delay (s)	7.4	0 -	- -	- 8.7	-
HCM Lane LOS	A	A -	- -	- A	-
HCM 95th %tile Q(veh)	0	- -	- -	- 0.2	-

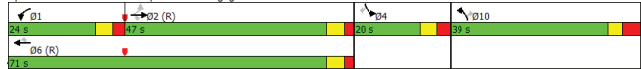
Lanes, Volumes, Timings
1: Centrepointe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2025 Ultimate AM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (vph)	0	1869	630	205	587	63	171	0	340	125	0	79
Future Volume (vph)	0	1869	630	205	587	63	171	0	340	125	0	79
Satd. Flow (prot)	1883	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Flt Permitted				0.950			0.950			0.950		
Satd. Flow (perm)	1883	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Satd. Flow (RTOR)				630			85			310		132
Lane Group Flow (vph)	0	1869	630	205	587	63	171	0	340	125	0	79
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases	2	2	2	1	6	6	10	10	4	4	4	4
Detector Phase	2	2	2	1	6	6	10	10	4	4	4	4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	11.2	25.7	25.7	38.8	38.8	16.3	16.3	16.3	16.3
Total Split (s)	47.0	47.0	47.0	24.0	71.0	71.0	39.0	39.0	20.0	20.0	20.0	20.0
Total Split (%)	36.2%	36.2%	36.2%	18.5%	54.6%	54.6%	30.0%	30.0%	15.4%	15.4%	15.4%	15.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.3	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	3.8	3.8	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	6.2	5.7	5.7	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effct Green (s)	65.9	65.9	13.0	85.0	85.0	13.5	13.5	12.7	12.7	12.7	12.7	12.7
Actuated g/C Ratio	0.51	0.51	0.10	0.65	0.65	0.10	0.10	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.72	0.56	0.59	0.25	0.06	0.47	0.77	0.72	0.29	0.29	0.29	0.29
Control Delay	28.1	3.9	64.9	8.9	0.8	58.5	20.2	79.5	3.6	3.6	3.6	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	3.9	64.9	8.9	0.8	58.5	20.2	79.5	3.6	3.6	3.6	3.6
LOS	C	A	E	A	A	E	C	E	A	A	A	A
Approach Delay	22.0			21.7			33.0		50.1			
Approach LOS	C			C			C		D			

Intersection Summary												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 76 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.77												
Intersection Signal Delay: 24.7												
Intersection Capacity Utilization 77.8%												
ICU Level of Service D												
Analysis Period (min) 15												

Splits and Phases: 1: Centrepointe Drive/Highgate Road & Baseline Road



06/01/2018

Synchro 9 Report
Page 1

Queues
1: Centrepointe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2025 Ultimate AM Peak

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
Lane Group Flow (vph)	1869	630	205	587	63	171	340	125	79
v/c Ratio	0.72	0.56	0.59	0.25	0.06	0.47	0.77	0.72	0.29
Control Delay	28.1	3.9	64.9	8.9	0.8	58.5	20.2	79.5	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	3.9	64.9	8.9	0.8	58.5	20.2	79.5	3.6
Queue Length 50th (m)	130.5	0.0	25.9	25.6	0.0	21.9	7.3	31.3	0.0
Queue Length 95th (m)	182.4	22.6	30.7	31.5	1.6	30.7	36.6	#56.3	1.9
Internal Link Dist (m)	158.7			258.8					
Turn Bay Length (m)		135.0	110.0		95.0		37.5		
Base Capacity (vph)	2605	1121	475	2341	1076	859	629	188	286
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	0.72	0.56	0.43	0.25	0.06	0.20	0.54	0.66	0.28

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

06/01/2018

Synchro 9 Report
Page 2

Lanes, Volumes, Timings
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2025 Ultimate AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	←	←	←	←	←	←
Traffic Volume (vph)	2204	146	409	795	55	73
Future Volume (vph)	2204	146	409	795	55	73
Satd. Flow (prot)	5142	1601	3471	3579	1601	1601
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	5142	1601	3471	3579	1601	1601
Satd. Flow (RTOR)			52		73	
Lane Group Flow (vph)	2204	146	409	795	55	73
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	4	1	6	4	4
Permitted Phases	2	2				
Detector Phase	2	4	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	32.5	33.9	11.5	16.5	33.9	33.9
Total Split (s)	66.0	34.0	30.0	96.0	34.0	34.0
Total Split (%)	50.8%	26.2%	23.1%	73.8%	26.2%	26.2%
Yellow Time (s)	3.7	3.0	3.7	3.7	3.0	3.0
All-Red Time (s)	2.8	3.9	2.8	2.8	3.9	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.9	6.5	6.5	6.9	6.9
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Recall Mode	C-Max	None	None	C-Max	None	None
Act Effct Green (s)	82.0	96.2	20.4	108.9	7.7	7.7
Actuated g/C Ratio	0.63	0.74	0.16	0.84	0.06	0.06
v/c Ratio	0.68	0.12	0.75	0.27	0.27	0.45
Control Delay	5.4	0.5	61.1	2.5	61.1	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	0.5	61.1	2.5	61.1	21.6
LOS	A	A	E	A	E	C
Approach Delay	5.1			22.4		38.6
Approach LOS	A			C		D

Intersection Summary						
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 74 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.75						
Intersection Signal Delay: 11.9						
Intersection Capacity Utilization 75.0%						
ICU Level of Service D						
Analysis Period (min) 15						

Splits and Phases: 2: Constellation Drive & Baseline Road



06/01/2018

Synchro 9 Report
Page 3

Queues
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2025 Ultimate AM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	2204	146	409	795	55	73
v/c Ratio	0.68	0.12	0.75	0.27	0.27	0.45
Control Delay	5.4	0.5	61.1	2.5	61.1	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	0.5	61.1	2.5	61.1	21.6
Queue Length 50th (m)	27.3	0.3	52.2	16.8	7.0	0.0
Queue Length 95th (m)	37.6	m1.1	66.5	24.8	13.6	14.7
Internal Link Dist (m)	258.8			131.8	77.4	
Turn Bay Length (m)		55.0	115.0		60.0	
Base Capacity (vph)	3243	1429	637	2999	723	391
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.10	0.64	0.27	0.08	0.19

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

06/01/2018

Synchro 9 Report
Page 4

Intersection						
Int Delay, s/veh	2.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖		↗	↗	↖	↖
Traffic Vol, veh/h	18	92	418	42	201	635
Future Vol, veh/h	18	92	418	42	201	635
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	450	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	92	418	42	201	635

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1074	209	0
Stage 1	418	-	-
Stage 2	656	-	-
Critical Hdwy	6.29	6.94	-
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	-
Pot Cap-1 Maneuver	247	797	-
Stage 1	612	-	-
Stage 2	448	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	180	797	-
Mov Cap-2 Maneuver	180	-	-
Stage 1	612	-	-
Stage 2	326	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14	0	2.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT
Capacity (veh/h)	-	-	511	1138
HCM Lane V/C Ratio	-	-	0.215	0.177
HCM Control Delay (s)	-	-	14	8.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.6

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖
Traffic Vol, veh/h	33	109	50	23	5	59
Future Vol, veh/h	33	109	50	23	5	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	109	50	23	5	59

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	73	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1527	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1527	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBT
Capacity (veh/h)	1527	-	-	-	975	-
HCM Lane V/C Ratio	0.022	-	-	-	0.066	-
HCM Control Delay (s)	7.4	0	-	-	-	-
HCM Lane LOS	A	A	-	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	-

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↖		↖	↖	↖
Traffic Vol, veh/h	0	109	0	128	482	73
Future Vol, veh/h	0	109	0	128	482	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	0	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	109	0	128	482	73

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	-	278	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	6.94	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.32	-
Pot Cap-1 Maneuver	0	719	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	719	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	SBL	SBT
Capacity (veh/h)	-	719	-	-
HCM Lane V/C Ratio	-	0.152	-	-
HCM Control Delay (s)	-	10.9	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

1: Centrepointhe Drive/Highgate Road & Baseline Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	32	776	233	202	1520	133	515	0	275	88	0	64
Future Volume (vph)	32	776	233	202	1520	133	515	0	275	88	0	64
Satd. Flow (prot)	1789	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Flt Permitted	0.109			0.950			0.950			0.950		
Satd. Flow (perm)	205	5142	1601	3471	3579	1601	3471	0	1601	1789	0	1601
Satd. Flow (RTOR)				233			125			275		132
Lane Group Flow (vph)	32	776	233	202	1520	133	515	0	275	88	0	64
Turn Type	Perm	NA	Perm	Prot	NA	Perm	Prot	Perm	Prot	Perm	Prot	Perm
Protected Phases		2		1	6		10			4		
Permitted Phases	2		2		6	6		10		4		4
Detector Phase	2	2	2	1	6	6	10		10	4		4
Switch Phase												
Minimum Initial (s)	10.0	10.0	10.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.7	25.7	25.7	11.2	25.7	25.7	38.8	38.8	16.3	16.3	16.3	16.3
Total Split (s)	47.0	47.0	47.0	24.0	71.0	71.0	39.0	39.0	20.0	20.0	20.0	20.0
Total Split (%)	36.2%	36.2%	36.2%	18.5%	54.6%	54.6%	30.0%	30.0%	15.4%	15.4%	15.4%	15.4%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.0	3.0	3.0	3.3	3.3	3.3
All-Red Time (s)	2.0	2.0	2.0	2.5	2.0	2.0	3.8	3.8	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	6.2	5.7	5.7	6.8	6.8	6.3	6.3	6.3	6.3
Lead/Lag	Lag	Lag	Lag	Lead								
Lead-Lag Optimize?	Yes	Yes	Yes	Yes								
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
Act Effect Green (s)	55.2	55.2	55.2	12.9	74.3	74.3	25.1	25.1	11.8	11.8	11.8	11.8
Actualized g/C Ratio	0.42	0.42	0.42	0.10	0.57	0.57	0.19	0.19	0.09	0.09	0.09	0.09
v/c Ratio	0.37	0.36	0.29	0.59	0.74	0.74	0.14	0.14	0.09	0.09	0.09	0.09
Control Delay	46.3	27.3	4.6	71.4	20.2	1.8	57.4	8.3	69.1	2.2	2.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	27.3	4.6	71.4	20.2	1.8	57.4	8.3	69.1	2.2	2.2	2.2
LOS	D	C	A	E	C	A	E	A	E	A	E	A
Approach Delay		22.8			24.5			40.3			40.9	
Approach LOS		C			C			D			D	

Intersection Summary												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 76 (58%), Referenced to phase 2:EBTL and 6:WBT, Start of Green												
Natural Cycle: 105												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.77												
Intersection Signal Delay: 27.9												
Intersection Capacity Utilization 80.2%												
ICU Level of Service D												
Analysis Period (min) 15												



Queues
1: Centrepointhe Drive/Highgate Road & Baseline Road

2140 Baseline Road TIA
2025 Ultimate PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR
Lane Group Flow (vph)	32	776	233	202	1520	133	515	275	88	64
v/c Ratio	0.37	0.36	0.29	0.59	0.74	0.14	0.77	0.52	0.54	0.24
Control Delay	46.3	27.3	4.6	71.4	20.2	1.8	57.4	8.3	69.1	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	27.3	4.6	71.4	20.2	1.8	57.4	8.3	69.1	2.2
Queue Length 50th (m)	5.5	48.8	0.0	24.6	159.8	0.4	64.9	0.0	22.0	0.0
Queue Length 95th (m)	#20.7	69.3	17.4	37.2	170.2	3.7	79.0	21.6	38.7	0.0
Internal Link Dist (m)	158.7		258.8							
Turn Bay Length (m)	55.0		135.0	110.0		95.0			37.5	
Base Capacity (vph)	87	2184	814	475	2045	968	859	603	188	286
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	0.37	0.36	0.29	0.43	0.74	0.14	0.60	0.46	0.47	0.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

06/01/2018

Synchro 9 Report
Page 2

Lanes, Volumes, Timings
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2025 Ultimate PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	1117	28	118	1635	204	396
Future Volume (vph)	1117	28	118	1635	204	396
Satd. Flow (prot)	5142	1601	3471	3579	3471	1601
Flt Permitted			0.950			
Satd. Flow (perm)	5142	1601	3471	3579	3471	1601
Satd. Flow (RTOR)			28			338
Lane Group Flow (vph)	1117	28	118	1635	204	396
Turn Type	NA	pm+ov	Prot	NA	Prot	Perm
Protected Phases	2	4	1	6	4	
Permitted Phases	2	2				4
Detector Phase	2	4	1	6	4	4
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	10.0	5.0	5.0
Minimum Split (s)	32.5	33.9	11.5	16.5	33.9	33.9
Total Split (s)	66.0	34.0	30.0	96.0	34.0	34.0
Total Split (%)	50.8%	26.2%	23.1%	73.8%	26.2%	26.2%
Yellow Time (s)	3.7	3.0	3.7	3.7	3.0	3.0
All-Red Time (s)	2.8	3.9	2.8	2.8	3.9	3.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.9	6.5	6.5	6.9	6.9
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?	Yes	Yes				
Recall Mode	C-Max	None	None	C-Max	None	None
Act Effect Green (s)	84.8	106.8	9.8	101.1	15.5	15.5
Actuated g/C Ratio	0.65	0.82	0.08	0.78	0.12	0.12
v/c Ratio	0.33	0.02	0.45	0.59	0.49	0.81
Control Delay	6.2	0.1	62.7	7.7	56.5	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	0.1	62.7	7.7	56.5	23.2
LOS	A	A	E	A	E	C
Approach Delay	6.0			11.4	34.5	
Approach LOS	A			B	C	

Intersection Summary

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 74 (57%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

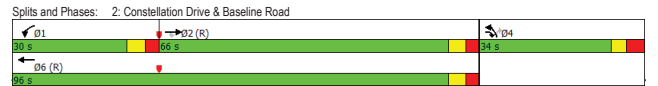
Intersection Signal Delay: 13.6

Intersection LOS: B

Intersection Capacity Utilization 62.2%

ICU Level of Service B

Analysis Period (min) 15



06/01/2018

Synchro 9 Report
Page 3

Queues
2: Constellation Drive & Baseline Road

2140 Baseline Road TIA
2025 Ultimate PM Peak

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1117	28	118	1635	204	396
v/c Ratio	0.33	0.02	0.45	0.59	0.49	0.81
Control Delay	6.2	0.1	62.7	7.7	56.5	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.2	0.1	62.7	7.7	56.5	23.2
Queue Length 50th (m)	17.9	0.0	15.2	68.4	26.1	14.1
Queue Length 95th (m)	29.4	m0.3	24.5	131.3	34.4	46.5
Internal Link Dist (m)	258.8		131.8	77.4		
Turn Bay Length (m)		55.0	115.0		60.0	
Base Capacity (vph)	3354	1460	627	2784	723	601
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.02	0.19	0.59	0.26	0.66

Intersection Summary

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

06/01/2018

Synchro 9 Report
Page 4

HCM 2010 TWSC
3: Centrepointhe Drive & Gemini Way

2140 Baseline Road TIA
2025 Ultimate PM Peak

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	34	140	651	19	37	399
Future Vol, veh/h	34	140	651	19	37	399
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	0	0	0	0	0	0
Storage Length	0	0	450	0	0	0
Veh in Median Storage, #	0	0	0	0	0	0
Grade, %	0	0	0	0	0	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	34	140	651	19	37	399
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	855	326	0	651	0	
Stage 1	651	-	-	-	-	
Stage 2	234	-	-	-	-	
Critical Hdwy Stg 1	6.29	6.94	-	4.14	-	
Critical Hdwy Stg 2	5.84	-	-	-	-	
Follow-up Hdwy	6.04	-	-	-	-	
Pot Cap-1 Maneuver	3.67	3.32	-	2.22	-	
Stage 1	317	670	-	931	-	
Stage 2	467	-	-	-	-	
Platoon blocked, %	745	-	-	-	-	
Mov Cap-1 Maneuver	301	670	-	931	-	
Mov Cap-2 Maneuver	301	-	-	-	-	
Stage 1	467	-	-	-	-	
Stage 2	707	-	-	-	-	
Approach	WB	NB	SB			
HCM Control Delay, s	14.8	0	0.9			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	541	931	-	
HCM Lane v/c Ratio	-	-	0.322	0.04	-	
HCM Control Delay (s)	-	-	14.8	9	0.1	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %ile Q(veh)	-	-	1.4	0.1	-	

06/01/2018

Synchro 9 Report
Page 6

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗↗	↗↗	
Traffic Vol, veh/h	0	6	0	600	90	56
Future Vol, veh/h	0	6	0	600	90	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	6	0	600	90	56

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 73	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.94	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.32	- -	- -
Pot Cap-1 Maneuver	0 974	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %	- -	- -	- -
Mov Cap-1 Maneuver	- 974	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	8.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 974	- -	- -
HCM Lane V/C Ratio	- 0.006	- -	- -
HCM Control Delay (s)	- 8.7	- -	- -
HCM Lane LOS	- A	- -	- -
HCM 95th %tile Q(veh)	- 0	- -	- -

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↗	↗		↗	
Traffic Vol, veh/h	23	6	23	33	5	51
Future Vol, veh/h	23	6	23	33	5	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	6	23	33	5	51

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	56	0 -	0 92 40
Stage 1	- -	- -	- 40 -
Stage 2	- -	- -	- 52 -
Critical Hdwy	4.12	- -	- 6.42 6.22
Critical Hdwy Stg 1	- -	- -	- 5.42 -
Critical Hdwy Stg 2	- -	- -	- 5.42 -
Follow-up Hdwy	2.218	- -	- 3.518 3.318
Pot Cap-1 Maneuver	1549	- -	- 908 1031
Stage 1	- -	- -	- 982 -
Stage 2	- -	- -	- 970 -
Platoon blocked, %	- -	- -	- -
Mov Cap-1 Maneuver	1549	- -	- 894 1031
Mov Cap-2 Maneuver	- -	- -	- 894 -
Stage 1	- -	- -	- 982 -
Stage 2	- -	- -	- 955 -

Approach	EB	WB	SB
HCM Control Delay, s	5.8	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1549	- -	- -	- -	1017
HCM Lane V/C Ratio	0.015	- -	- -	- -	0.055
HCM Control Delay (s)	7.4	0 -	- -	- -	8.7
HCM Lane LOS	A	A -	- -	- -	A
HCM 95th %tile Q(veh)	0	- -	- -	- -	0.2

Appendix D TDM CHECKLISTS

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

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

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		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	<input checked="" type="checkbox"/>
BASIC	1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	<input checked="" type="checkbox"/>
BASIC	1.1.3 Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	<input checked="" type="checkbox"/>
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 (<i>see Official Plan policy 4.3.3</i>)	<input checked="" type="checkbox"/>
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 (<i>see Official Plan policy 4.3.12</i>)	<input checked="" type="checkbox"/>

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		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 (<i>see Official Plan policy 4.3.10</i>)	<input checked="" type="checkbox"/>
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 (<i>see Official Plan policy 4.3.10</i>)	<input checked="" type="checkbox"/>
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 (<i>see Official Plan policy 4.3.11</i>)	<input checked="" type="checkbox"/>
BASIC	1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	<input checked="" type="checkbox"/>
BASIC	1.2.7 Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	<input type="checkbox"/> N/A
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	<input type="checkbox"/> N/A
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	<input type="checkbox"/> N/A
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)	<input type="checkbox"/> N/A

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		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 <i>Official Plan policy 4.3.6</i>)	<input checked="" type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
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 <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
BASIC	2.1.4 Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	<input type="checkbox"/> N/A
2.2 Secure bicycle parking		
REQUIRED	2.2.1 Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers (see <i>Zoning By-law Section 111</i>)	<input checked="" type="checkbox"/>
BETTER	2.2.2 Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	<input type="checkbox"/> N/A
2.3 Bicycle repair station		
BETTER	2.3.1 Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	<input type="checkbox"/> N/A
3. TRANSIT		
3.1 Customer amenities		
BASIC	3.1.1 Provide shelters, lighting and benches at any on-site transit stops	<input type="checkbox"/>
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	<input type="checkbox"/> N/A
BETTER	3.1.3 Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	<input type="checkbox"/> N/A

TDM-supportive design & infrastructure measures: <i>Residential developments</i>		Check if completed & add descriptions, explanations or plan/drawing references
4. RIDESHARING		
4.1 Pick-up & drop-off facilities		
BASIC	4.1.1 Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	<input checked="" type="checkbox"/>
5. CARSHARING & BIKESHARING		
5.1 Carshare parking spaces		
BETTER	5.1.1 Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses (see <i>Zoning By-law Section 94</i>)	<input type="checkbox"/> N/A
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	<input type="checkbox"/> N/A
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	<input checked="" type="checkbox"/>
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	<input type="checkbox"/> N/A
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 <i>Zoning By-law Section 104</i>)	<input type="checkbox"/> N/A
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 <i>Zoning By-law Section 111</i>)	<input type="checkbox"/> N/A
6.2 Separate long-term & short-term parking areas		
BETTER	6.2.1 Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	<input type="checkbox"/> N/A

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

Legend	
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance
★	The measure is one of the most dependably effective tools to encourage the use of sustainable modes

TDM measures: Residential developments		Check if proposed & add descriptions
1. TDM PROGRAM MANAGEMENT		
1.1 Program coordinator		
BASIC ★	1.1.1 Designate an internal coordinator, or contract with an external coordinator	<input checked="" type="checkbox"/>
1.2 Travel surveys		
BETTER	1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	<input checked="" type="checkbox"/>
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 (<i>multi-family, condominium</i>)	<input checked="" type="checkbox"/>
2.2 Bicycle skills training		
BETTER	2.2.1 Offer on-site cycling courses for residents, or subsidize off-site courses	<input checked="" type="checkbox"/>

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

TDM measures: <i>Residential developments</i>			Check if proposed & add descriptions
6. TDM MARKETING & COMMUNICATIONS			
6.1 Multimodal travel information			
BASIC	★	6.1.1 Provide a multimodal travel option information package to new residents	<input checked="" type="checkbox"/>
6.2 Personalized trip planning			
BETTER	★	6.2.1 Offer personalized trip planning to new residents	<input checked="" type="checkbox"/>