



**2140 Baseline Road  
Transportation Impact Assessment**

June 5, 2018

Prepared for:

Baseline Constellation Partnership Inc.

Prepared by:

Stantec Consulting Ltd.

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## 1.0 SCREENING

### 1.1 SUMMARY OF DEVELOPMENT

| Municipal Address                       |                                                                              |
|-----------------------------------------|------------------------------------------------------------------------------|
| <b>Description of Location</b>          | Nepean, southwest quadrant of Baseline Road and Constellation Drive          |
| <b>Land Use Classification</b>          | Mixed-use (Residence + Ground Level Retail)                                  |
| <b>Development Size (units)</b>         | 1 Building: 144 units (484 beds), 14,488 ft <sup>2</sup> ground level retail |
| <b>Development Size (m<sup>2</sup>)</b> | 14,806.00 m <sup>2</sup> GFA (159,370 ft <sup>2</sup> GFA)                   |
| <b>Number of Accesses and Locations</b> | 1 full access at Gemini Way                                                  |
| <b>Phase of Development</b>             | 1                                                                            |
| <b>Buildout Year</b>                    | 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 <sup>2</sup>     | ✘         |
| Industrial                          | 5,000 m <sup>2</sup>     | ✘         |
| Fast-food restaurant or coffee shop | 100 m <sup>2</sup>       | ✓         |
| Destination retail                  | 1,000 m <sup>2</sup>     | ✓         |
| Gas station or convenience market   | 75 m <sup>2</sup>        | ✘         |

*\* 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 Report

### 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? |     | x  |
| 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?                                                                                                                                                     |     | x  |
| Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?                                                                                                              |     | x  |
| Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)? |     | x  |
| Is the proposed driveway within auxiliary lanes of an intersection?                                                                                                                                                       |     | x  |
| Does the proposed driveway make use of an existing median break that serves an existing site?                                                                                                                             |     | x  |
| Is there a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?                                                                                           |     | x  |
| Does the development include a drive-thru facility?                                                                                                                                                                       |     | x  |

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

### 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?          |     | x  |

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

## 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, 11 storey mixed-use student residence and retail building. The ground floor consists of 14,806 ft<sup>2</sup> of commercial retail and ancillary residential uses (i.e. leasing office, mailroom, lobby). Floors 2 to 11 consist of 144 student rooming units with a total of 484 beds. The building has a combined gross-floor-area (GFA) of 14,806.00 m<sup>2</sup> (i.e. 159,370 ft<sup>2</sup>).

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 75 vehicle parking spaces (8 surface level parking spaces, 67 underground parking spaces) and 200 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.

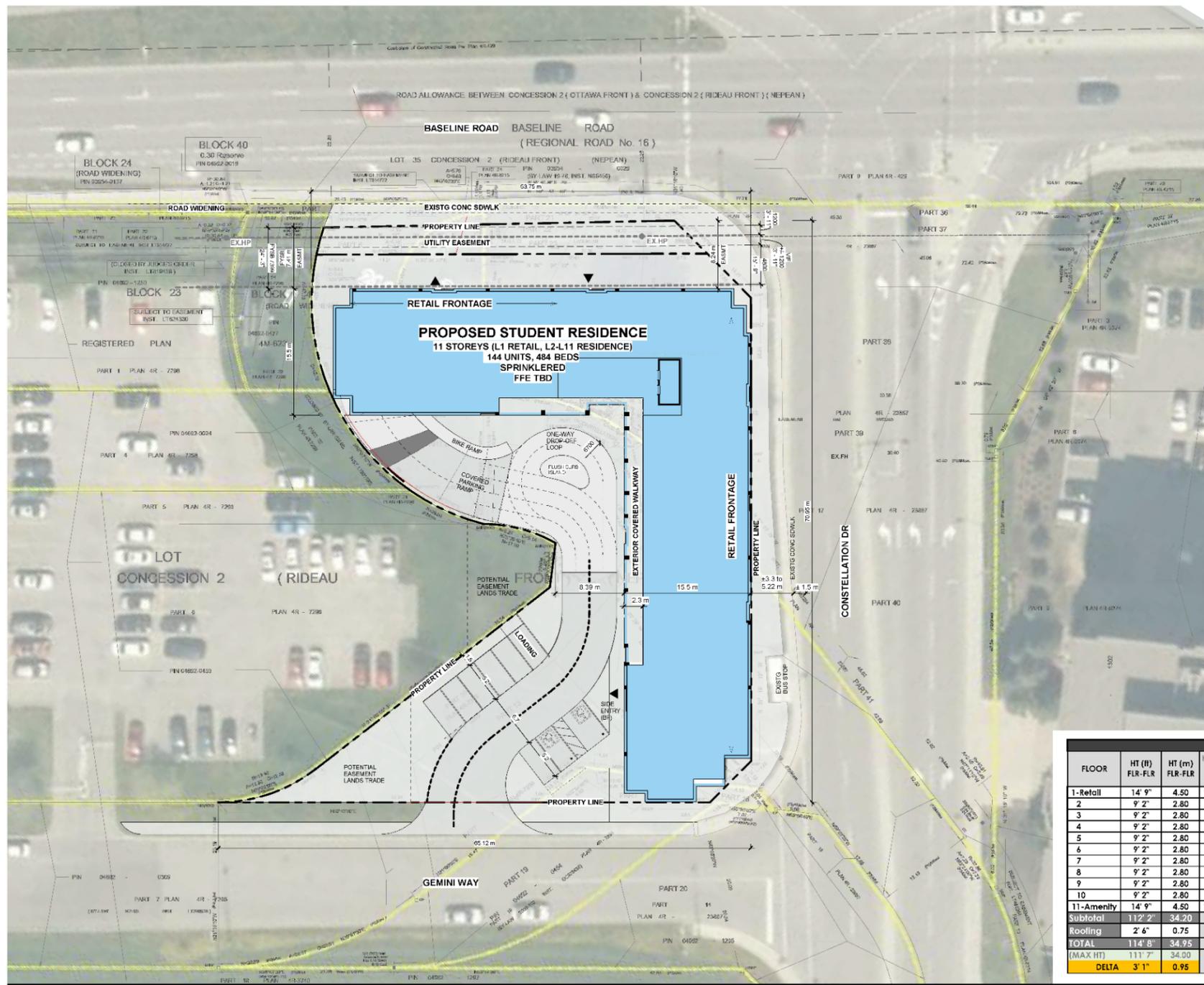
Figure 1 - Site Location



Table 1 - Assumed Land Uses

| Floor    | Size                         | Assumed ITE Land Use                                                                                                                                                                                        |
|----------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| L1       | 14,488 ft <sup>2</sup> (GFA) | LUC 820: Shopping Centre<br>LUC 932: High-Turnover (Sit-Down) Restaurant<br>LUC 936: Coffee / Donut Shop without Drive-Through Window<br>N/A: Ancillary Residential Space (Leasing Office, Mailroom, Lobby) |
| L2 - L11 | 144 units                    | LUC 222: High-rise apartments (10 floors)                                                                                                                                                                   |

Figure 2 - Proposed Site Plan



| DEVELOPMENT STATISTICS - 2140 Baseline Rd, Ottawa |          |         |       |       |
|---------------------------------------------------|----------|---------|-------|-------|
|                                                   | SM       | SF      | ACRES | %     |
| GROSS SITE AREA                                   | 3,049.3  | 32,822  | 0.753 | -     |
| BLDG FOOTPRINT                                    | 1,346.0  | 14,488  | 0.333 | 44.1% |
| 1ST FLOOR- RETAIL                                 | 1,346.0  | 14,488  |       |       |
| 2nd - 10th FLOOR (TYPICAL)                        | 1,346.0  | 14,488  |       |       |
| 11th FLOOR- AMENITIES                             | 1,346.0  | 14,488  |       |       |
| GROSS FLOOR AREA (GFA)                            | 14,806.0 | 169,370 |       |       |

| PARKING REQUIRED (By-Law No. ...)          |                 |                 |                                    |
|--------------------------------------------|-----------------|-----------------|------------------------------------|
| Table 101: MIN PARKING SPACE RATES - R22   |                 |                 |                                    |
| ZONING REQUIREMENT (AREA C)                | REQUIRED SPACES | PROVIDED SPACES | COMPLY                             |
| RETAIL (MIXED USE) (0 REQ'D <1500m²)       | 0               | 0               | TBD                                |
| RESIDENCE APMT (0.25 PER UNIT)             | 104             | 75              | TBD                                |
| SURFACE PARKING                            | -               | 8               |                                    |
| UG PARKING                                 | -               | 67              |                                    |
| <b>TOTAL SPACES</b>                        | <b>104</b>      | <b>75</b>       | <b>*INCLUDES ACCESSIBLE SPACES</b> |
| <b>SURPLUS / DEFICIT</b>                   | <b>-29</b>      | <b>72%</b>      | <b>TBD</b>                         |
| <b>RATE ACHIEVED (PER UNIT)</b>            |                 | <b>0.18</b>     |                                    |
| <b>(PER SUITE)</b>                         |                 | <b>0.62</b>     |                                    |
| <b>*ACCESSIBLE SPACES</b>                  |                 |                 |                                    |
| 2(1-30) + 2(31-60) + 2(61-100) + 2(PER 30) | 6               | 6               | YES                                |
| SMALL CARS                                 | MAX             | 36%             | PROVIDED                           |
| SMALL CAR (2.4x4.6) 40% MAX                | 40%             | 36%             | YES                                |
| BICYCLE PARKING - TABLE 111A               | 30              | 27              | YES                                |
| 1.0 PER DWELLING UNIT                      | 144             | 200             | YES                                |

| ZONING INFORMATION - ZONING BY-LAW ...                    |                                   |          |        |
|-----------------------------------------------------------|-----------------------------------|----------|--------|
| Official Plan                                             |                                   |          |        |
| Permitted Use:                                            | Yes                               | NO       |        |
| MIXED USE                                                 | YES                               |          |        |
| Part 10 - Mixed Use / Commercial Zones (Sections 185-198) | REQUIRED                          | PROVIDED | COMPLY |
| 0.10 Lot Area                                             | N/A                               | -        | YES    |
| 0.11 Floor Space Index                                    | 2.0                               | 4.86     | NO     |
| 0.12 Lot Frontage (Min)                                   | N/A                               | 53.8     | YES    |
| 0.13 Lot Coverage (Max)(Combined)                         | N/A                               | 44%      | YES    |
| 0.14 Building Height (Max) - Sect 9                       | 34m                               | 34.95    | NO     |
| 0.15 Bldg Height # of Storeys (Max)                       | N/A                               | 11       | YES    |
| 0.16 Front Yard Setback (Min)                             | N/A                               | 3.3      | YES    |
| 0.16a Hydro Line Setback                                  | 5m                                | 5m       | YES    |
| 0.17 Side Yard Setback (Min)                              | N/A                               | 0.0      | YES    |
| 0.18 Rear Yard Setback (Min)                              | N/A                               | 0.0      | YES    |
| 0.19 Lot Depth (Min)                                      | -                                 | 70.7     | YES    |
| 0.20 Landscaped Area Width (Min)                          | N/A                               | TBD      | YES    |
| PARKING STANDARDS (SECTION 6.18)                          |                                   |          |        |
| PARKING STALLS - STANDARD                                 | 2.6 x 5.2                         |          | YES    |
| PARKING STALLS - SMALL SPACE                              | 2.4 x (5.2 or 4.6)                |          | YES    |
| ACC. PARKING - AODA TYPE A&B                              | 2.4 / 3.4 x 5.2 (1+1.5) x 2.75(h) |          | YES    |
| DRIVE AISLE - TWO WAY AT GRADE                            | 6.7m                              |          | YES    |
| DRIVE AISLE - TWO WAY PARK GARAGE                         | 6.0m                              |          | YES    |
| LOADING SPACE - STANDARD                                  | 3.6 x 9.0 x 4.2(h)                |          | YES    |
| LOADING SPACE - OVERSIZED                                 | 4.3 x 13.0 x 4.2(h)               |          | YES    |
| BICYCLE PARKG. HORIZ - Table 111B                         | 0.60 x 1.8                        |          | YES    |
| AREAS OF PLAN THAT DO NOT COMPLY WITH ZONING BYLAW        |                                   |          |        |

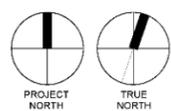
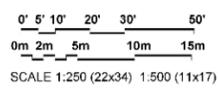
| FLOOR STATISTICS - STUDENT RESIDENCE |                 |                |                  |        |      |      |      |              |      |      |         |           |          |         |
|--------------------------------------|-----------------|----------------|------------------|--------|------|------|------|--------------|------|------|---------|-----------|----------|---------|
| FLOOR                                | HT (ft) FLR-FLR | HT (m) FLR-FLR | HT (ft) U/S SLAB | SUITES |      |      |      | FLOOR TOTALS |      |      |         | GFA (ft²) | GFA (m²) |         |
|                                      |                 |                |                  | COUNTS | 1 BD | 2 RM | 2 BD | 3 RM         | 3 BD | 4 RM | 4 BD    |           |          | RMS     |
| 1-Retail                             | 14' 9"          | 4.50           | 14' 1"           | 0      | 0    | 0    | 0    | 0            | 0    | 0    | 0       | 0         | 14,488   | 1,346.0 |
| 2                                    | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 3                                    | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 4                                    | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 5                                    | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 6                                    | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 7                                    | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 8                                    | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 9                                    | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 10                                   | 9' 2"           | 2.80           | 8' 8"            | 16     | 1    | 3    | 1    | 11           | 54   | 54   | 14,488  | 1,346.0   | 14,488   | 1,346.0 |
| 11-Amenity                           | 14' 9"          | 4.50           | 14' 1"           | 0      | 0    | 0    | 0    | 0            | 0    | 0    | 0       | 0         | 14,488   | 1,346.0 |
| Subtotal                             | 112' 2"         | 34.20          | -                | 144    | 9    | 27   | 9    | 99           | 486  | 486  | 169,370 | 14,806.0  |          |         |
| Roofing                              | 2' 6"           | 0.75           | -                |        |      |      |      |              |      |      |         |           |          |         |
| TOTAL                                | 114' 8"         | 34.95          | -                |        |      |      |      |              |      |      |         |           |          |         |
| (MAX HT)                             | 111' 7"         | 34.00          | -                |        |      |      |      |              |      |      |         |           |          |         |
| DELTA                                | 3' 1"           | 0.95           | -                |        |      |      |      |              |      |      |         |           |          |         |

C:\Users\MD\Desktop\18-012\18-012 OttawaSR rv17 ML 180404.rvt

2018-04-06 2:16:03 PM  
 ISSUED FOR: PLANS UPDATE  
 ISSUE DATE: 06 APR 2018  
 PROJECT No.: 18-012

**3.0**  
 REVISION

**SITE PLAN CONCEPT**  
**ASP 100**



**OTTAWA STUDENT RESIDENCE**  
 2140 Baseline Rd, Nepean  
 (Ottawa) ON, K2G 6E2

CLIENT: Baseline Constellation  
 Partnership Inc.



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:

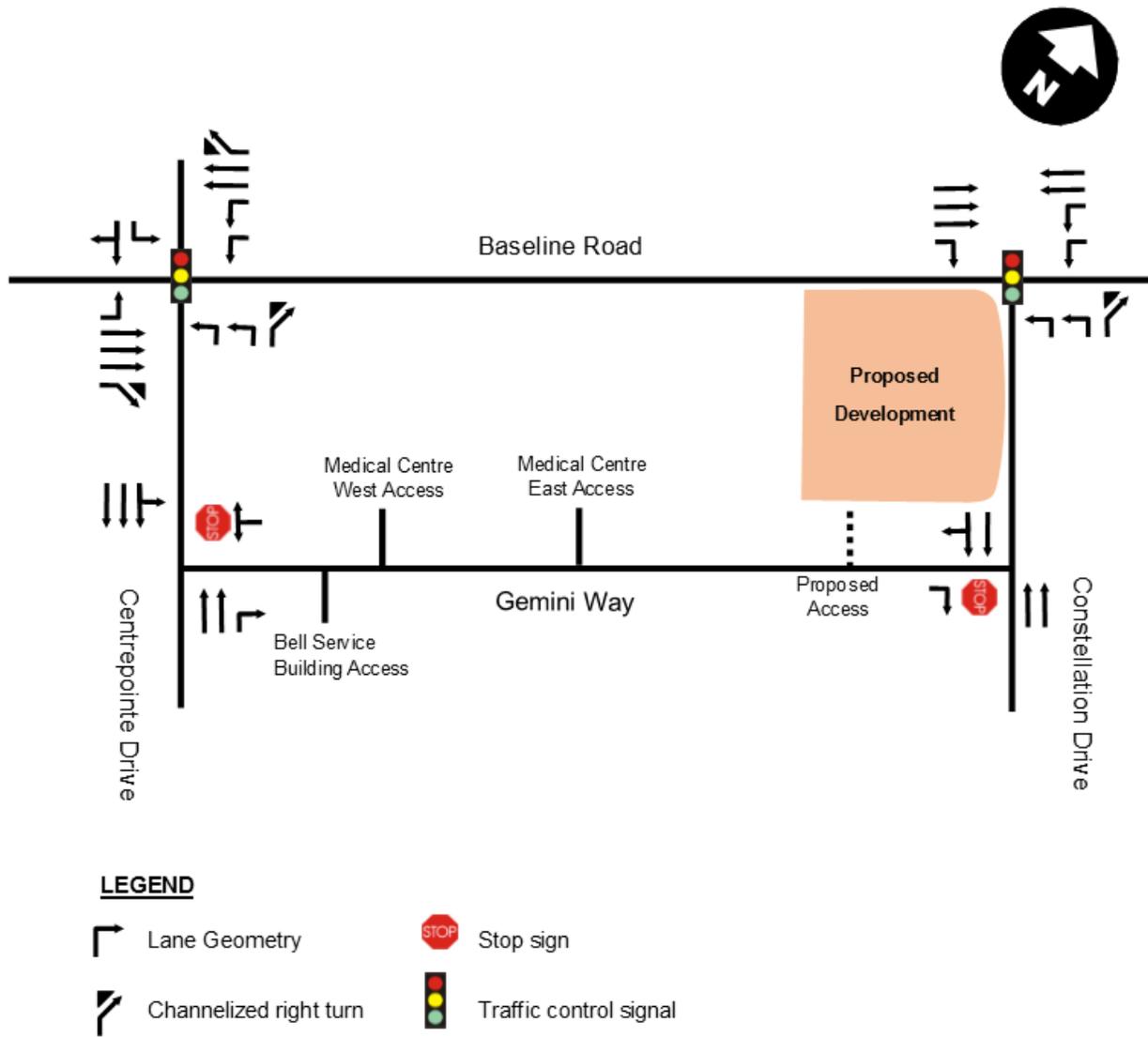
|                            |                                                                                                                                                                                                                                                                                                          |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Baseline Road</b>       | 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.                                                                                                                                                   |
| <b>Centrepointe Drive</b>  | Centrepointe 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.                                                                                                                                         |
| <b>Constellation Drive</b> | 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. |
| <b>Gemini Way</b>          | 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 *Frequent* 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 *Rapid* Transitway routes such as 91, 94 and 95.

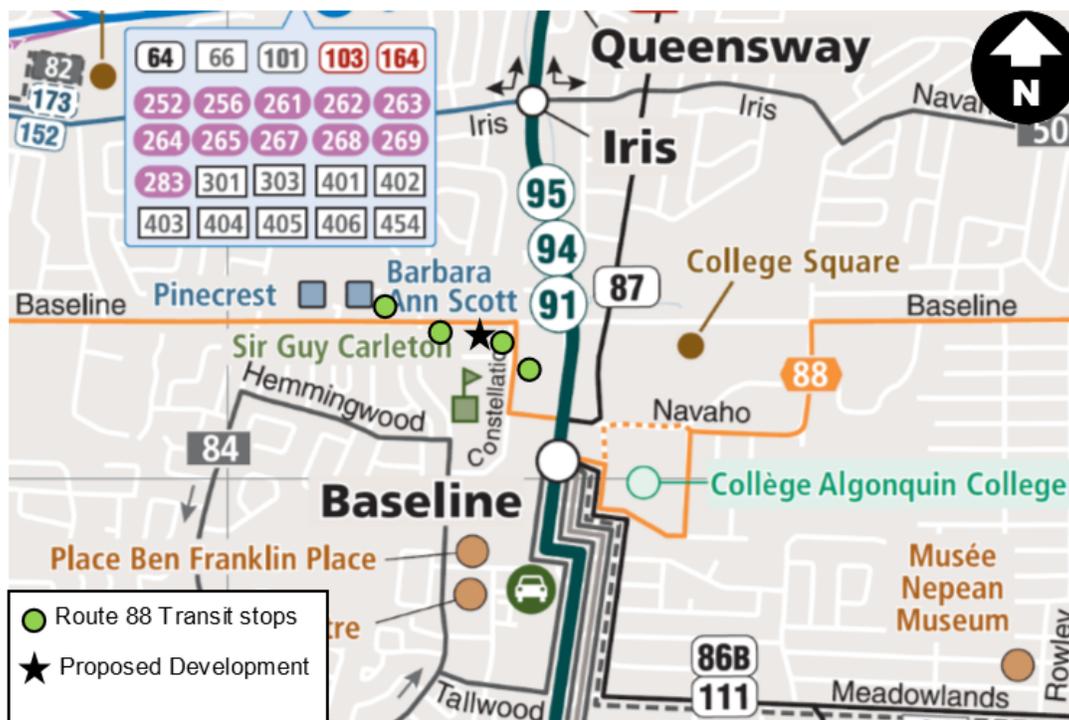
The subject site is located within 200 m of two existing on-street bus stops servicing Route 88: one bus stop and shelter is located at the southeast corner of the intersection of Baseline Road and Centrepointe Drive, and another is located at the northwest corner of Constellation Drive and Gemini Way.

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.

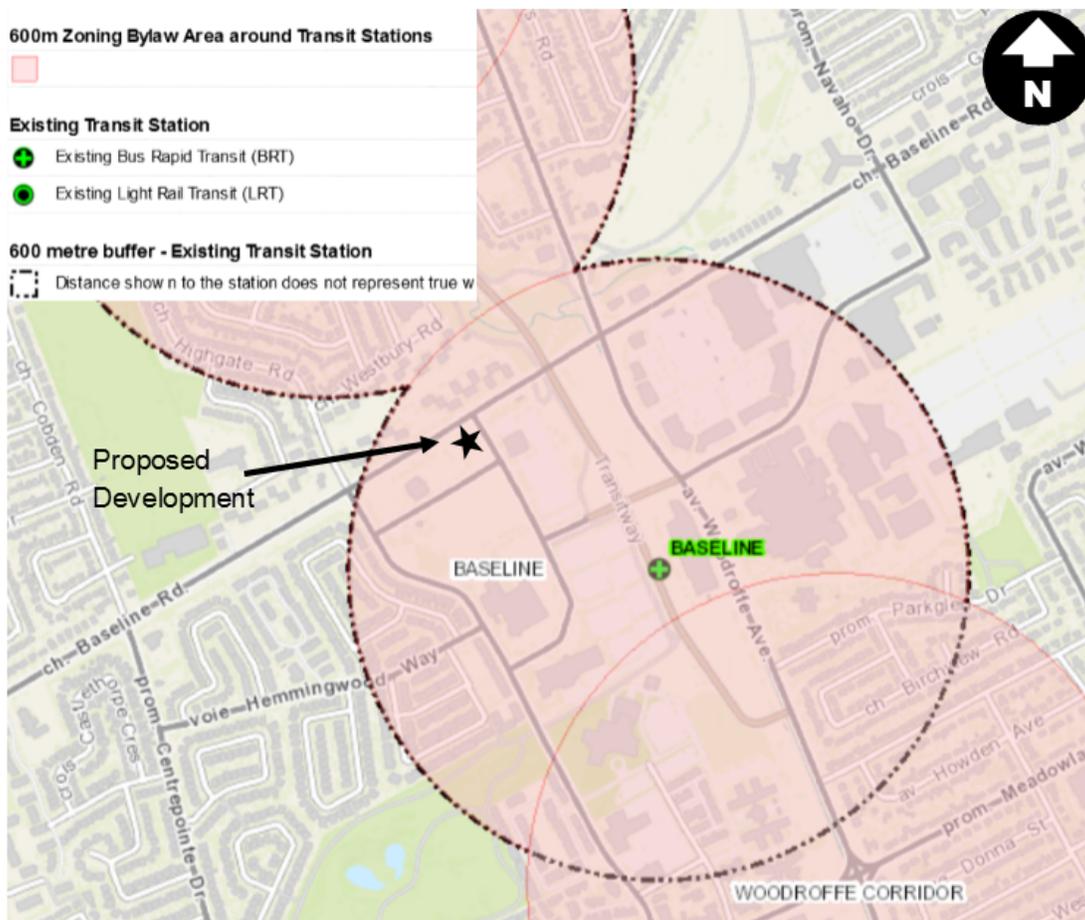
Figure 5 - Study Area Transit Routes and Stops



Source: OC Transpo System Map, accessed March 2018

Scoping

Figure 6 - Study Area Transit Routes and Stops



Source: geoOttawa, accessed March 2018

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.

## 2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

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 '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.

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Scoping

Figure 7 - 2018 Existing Volumes (AM Peak)

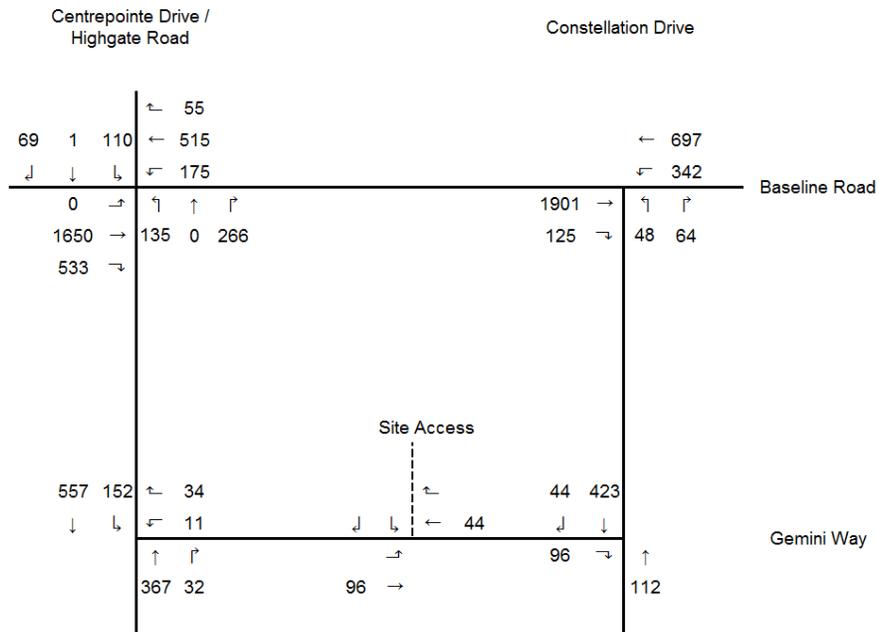
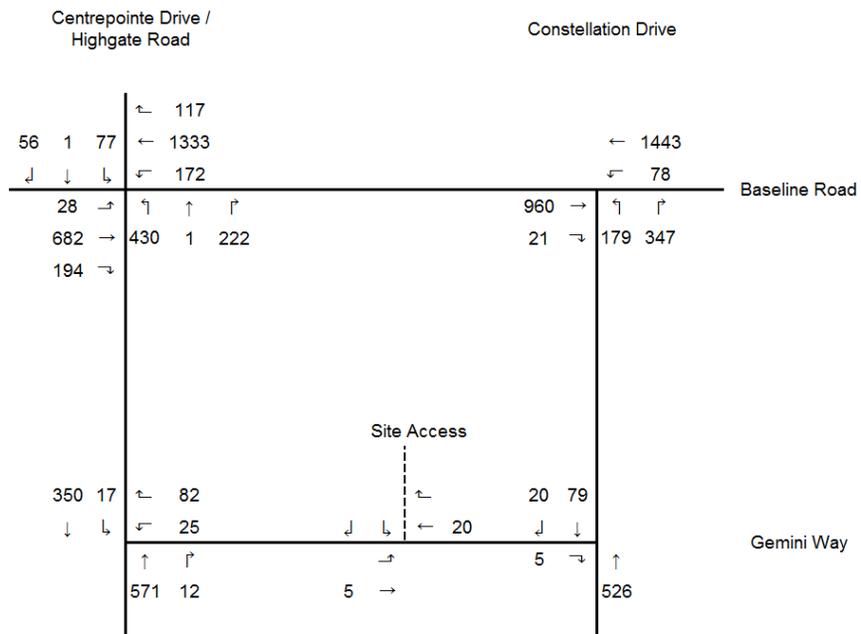


Figure 8 - 2018 Existing Volumes (PM Peak)



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.<br>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.<br>At-grade BRT connecting Bayshore Station to St. Laurent Station.                                                                                                                                         | Affordable Network (i.e. within 2031 horizon)<br>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)                                               |

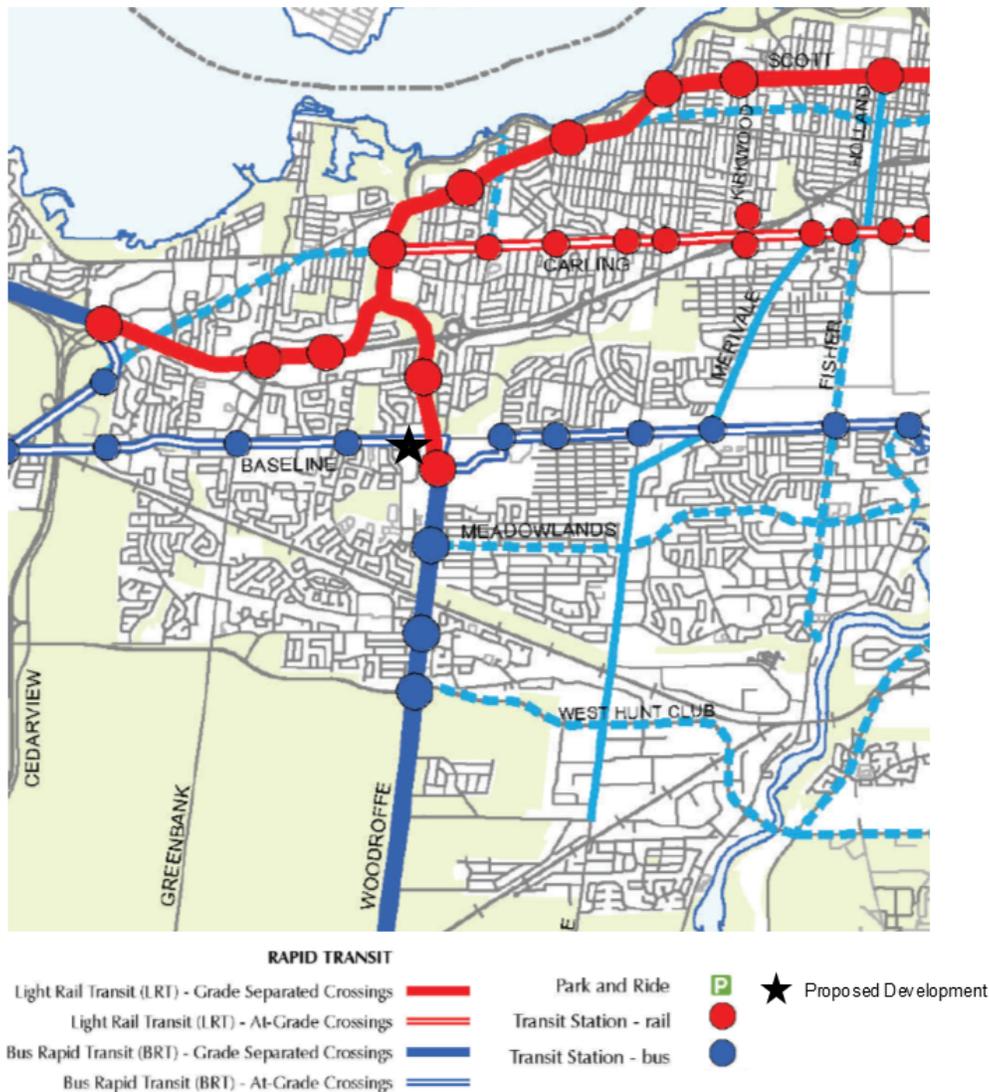
As outlined in **Table 2**, a number of transit improvements are expected to occur near the proposed development.

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. Construction of the new BRT system is planned to start in 2020.

**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        |

Forecasting

## 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, 9<sup>th</sup> 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%        |
|              |                                | <b>Person Trips</b> | <b>22</b>            | <b>71</b>  | <b>93</b>  | <b>59</b>            | <b>38</b>  | <b>97</b>  |
| 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       |
|              |                                | <b>Person Trips</b> | <b>28</b>            | <b>17</b>  | <b>45</b>  | <b>72</b>            | <b>78</b>  | <b>149</b> |
| 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       |
|              |                                | <b>Person Trips</b> | <b>22</b>            | <b>18</b>  | <b>40</b>  | <b>22</b>            | <b>15</b>  | <b>37</b>  |
| 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       |
|              |                                | <b>Person Trips</b> | <b>103</b>           | <b>98</b>  | <b>201</b> | <b>38</b>            | <b>38</b>  | <b>76</b>  |
| <b>Total</b> |                                | Auto Trips          | 127                  | 131        | 258        | 126                  | 117        | 243        |
|              |                                | <b>Person Trips</b> | <b>175</b>           | <b>205</b> | <b>379</b> | <b>191</b>           | <b>168</b> | <b>359</b> |

## 2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

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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.<br>Conversion of the West Transitway to LRT as part of Stage 2 of the Confederation Line O-Train extension.<br>Implementation of the Baseline-Heron BRT system.<br>High transit utilization by Algonquin College students. |
| Walking and Cycling | 3%                            | 40%               | +37%     | Type of development (i.e. student residence)<br>Location of development (i.e. proximity to Algonquin College)                                                                                                                                                        |
| Auto Passenger      | 12%                           | 0%                | -12%     | Low auto-ownership of students residing near campus.<br>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.<br>Reduction to allow for other mode increases in line with mode share targets.                                                                                                                                 |
| Other               | 5%                            | N/A               | N/A      | N/A                                                                                                                                                                                                                                                                  |
| <b>TOTAL</b>        | <b>100%</b>                   | <b>100%</b>       | <b>-</b> | <b>-</b>                                                                                                                                                                                                                                                             |

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.<br>Conversion of the West Transitway to LRT as part of Stage 2 of the Confederation Line O-Train extension.<br>Implementation of the Baseline-Heron BRT system. |
| 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                                                                                                                                                                                                       |
| <b>TOTAL</b>        | <b>100%</b>                   | <b>100%</b>       | <b>-</b> | <b>-</b>                                                                                                                                                                                                  |

Forecasting

**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         |
| <b>Residential Total Person Trips</b> |                                |                          |     | <b>22</b>            | <b>70</b>  | <b>92</b>  | <b>60</b>            | <b>38</b>  | <b>98</b>  |
| 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         |
| <b>Retail Total Person Trips</b>      |                                |                          |     | <b>154</b>           | <b>134</b> | <b>288</b> | <b>130</b>           | <b>129</b> | <b>259</b> |
| <b>Total</b>                          |                                | <b>Auto Trips</b>        |     | 73                   | 74         | 147        | 71                   | 67         | 138        |
|                                       |                                | <b>Walk / Bike Trips</b> |     | 48                   | 62         | 110        | 56                   | 47         | 103        |
|                                       |                                | <b>Transit Trips</b>     |     | 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.

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**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         |
|              |                                | <b>New Auto Trips</b> |     | 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        |
|              |                                | <b>New Auto Trips</b> |     | 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         |
|              |                                | <b>New Auto Trips</b> |     | 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         |
|              |                                | <b>New Auto Trips</b> |     | 21                   | 20        | 41        | 8                    | 8         | 16        |
| <b>Total</b> |                                | Auto Trips            |     | 73                   | 74        | 147       | 71                   | 67        | 138       |
|              |                                | Pass-By               |     | 21                   | 21        | 42        | 20                   | 20        | 40        |
|              |                                | Internal Capture      |     | 17                   | 15        | 32        | 15                   | 15        | 30        |
|              |                                | <b>New Auto Trips</b> |     | <b>35</b>            | <b>38</b> | <b>73</b> | <b>36</b>            | <b>31</b> | <b>67</b> |

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Forecasting

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

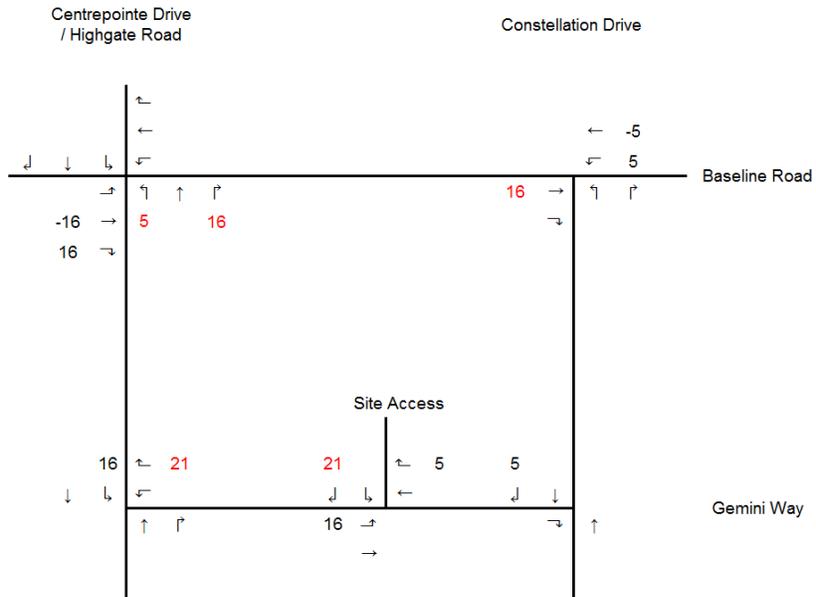
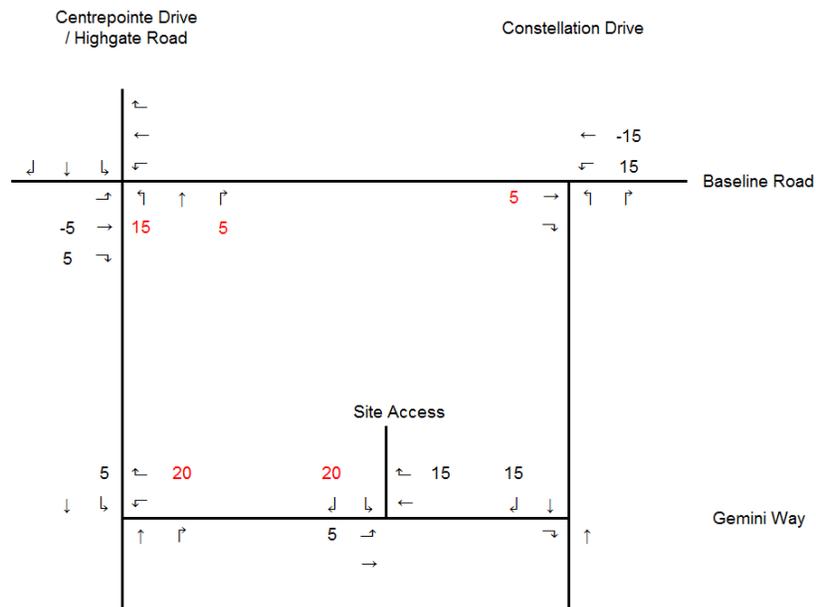


Figure 11 - 2020 Pass-By Volumes (PM Peak)



Forecasting

### 3.1.2

### 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%                  |
| <b>Total</b> | <b>100%</b> | <b>15%</b>         | <b>30%</b>         | <b>40%</b>            | <b>15%</b>            |

\* 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.

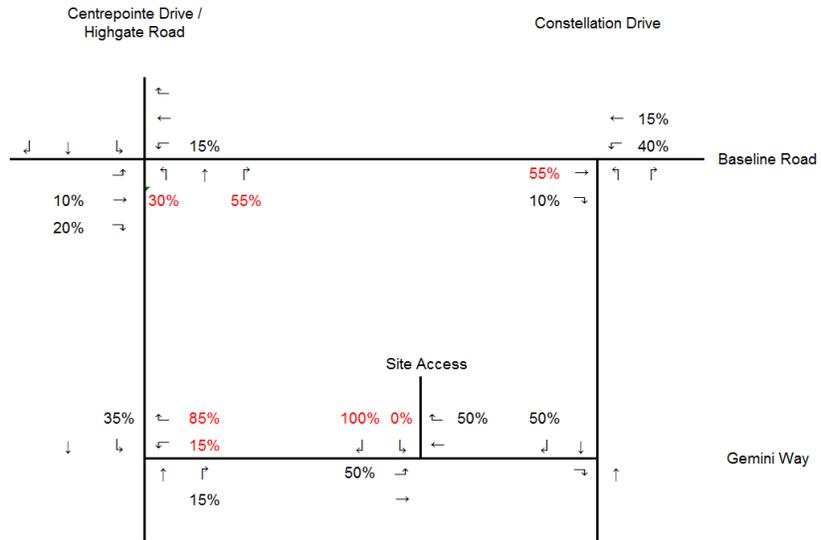
**Figure 13** and **Figure 14** illustrate new site generated trips, prior to accounting for pass-by, during the AM and PM peak hours, respectively.

**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.

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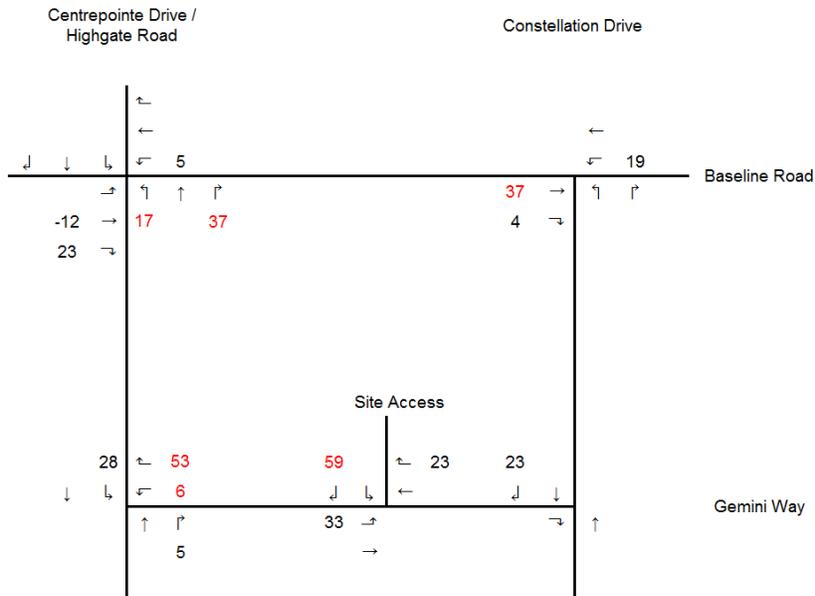
Figure 12 - Site Traffic Assignment Assumptions



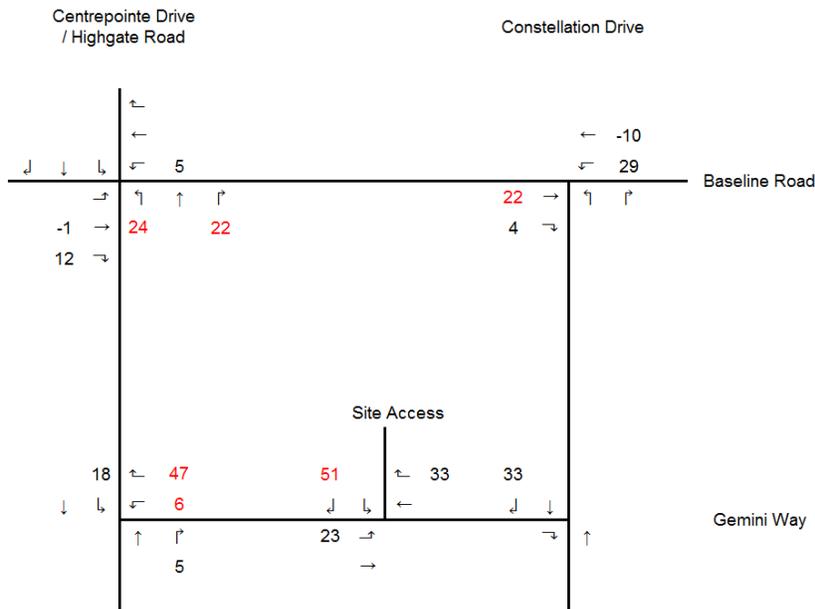


Forecasting

**Figure 15 - Net Site Generated Volumes (AM Peak)**



**Figure 16 - Net Site Generated Volumes (PM Peak)**



Forecasting

## 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. Construction of the new BRT system is planned to start in 2020.

### 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.

Forecasting

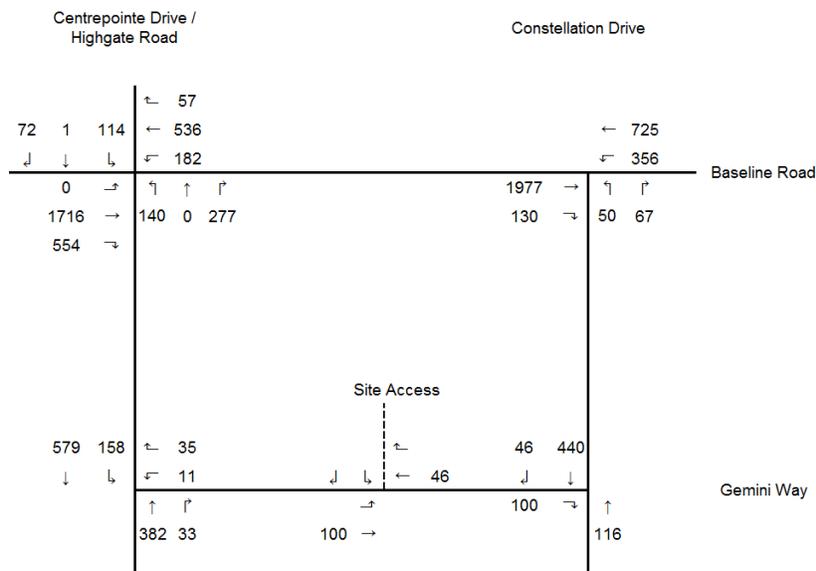
### 3.3 DEMAND RATIONALIZATION

#### 3.3.1 2020 Future Background Traffic

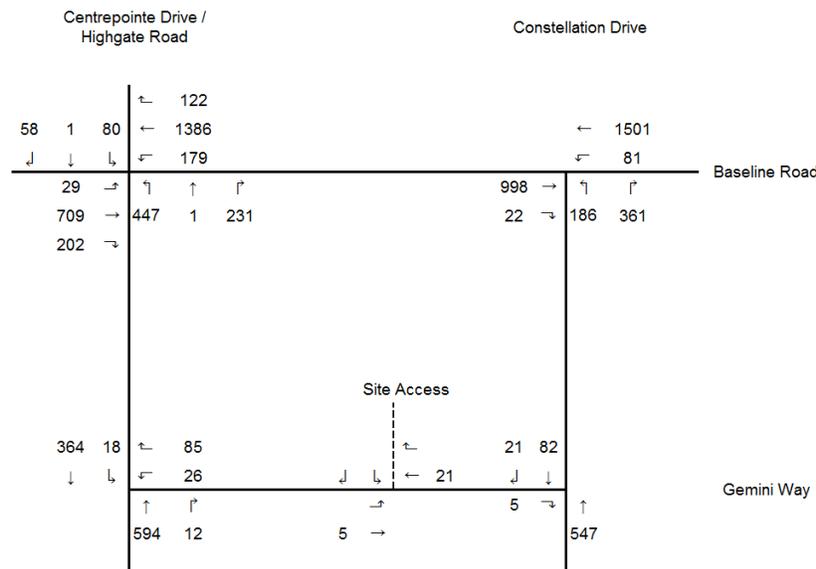
Figure 17 and Figure 18 illustrate the 2020 future background traffic volumes during the AM and PM peak hours, respectively.

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

**Figure 17 - 2020 Future Background Volumes (AM Peak)**



**Figure 18 - 2020 Future Background Volumes (PM Peak)**



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Forecasting

3.3.2 2020 Total Future Traffic

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.

Figure 19 - 2020 Total Future Volumes (AM Peak)

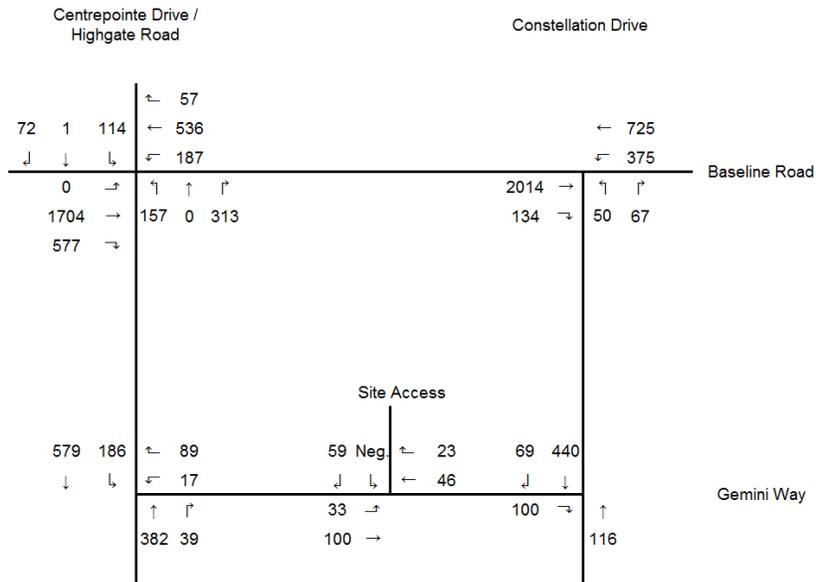
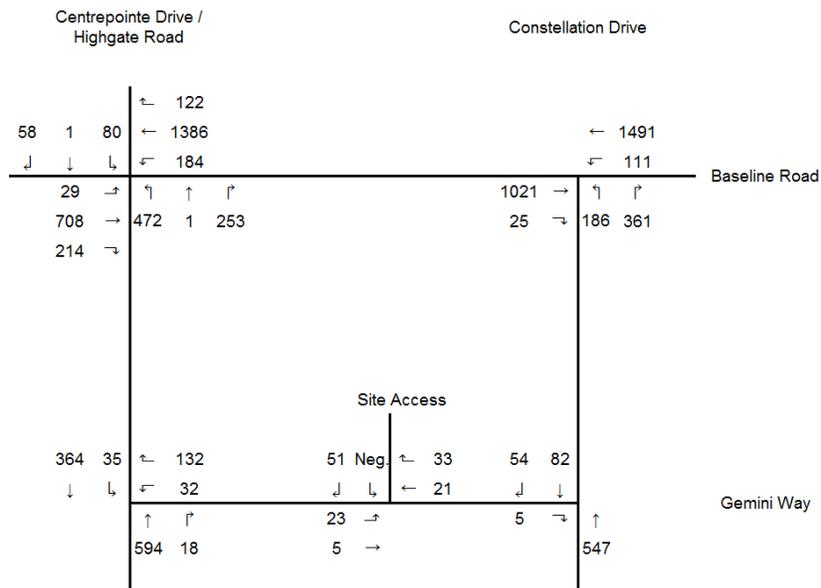


Figure 20 - 2020 Total Future Traffic Volumes (PM Peak)



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3.3.3 2025 Ultimate Traffic

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.

Figure 21 - 2025 Ultimate Traffic Volumes (AM Peak)

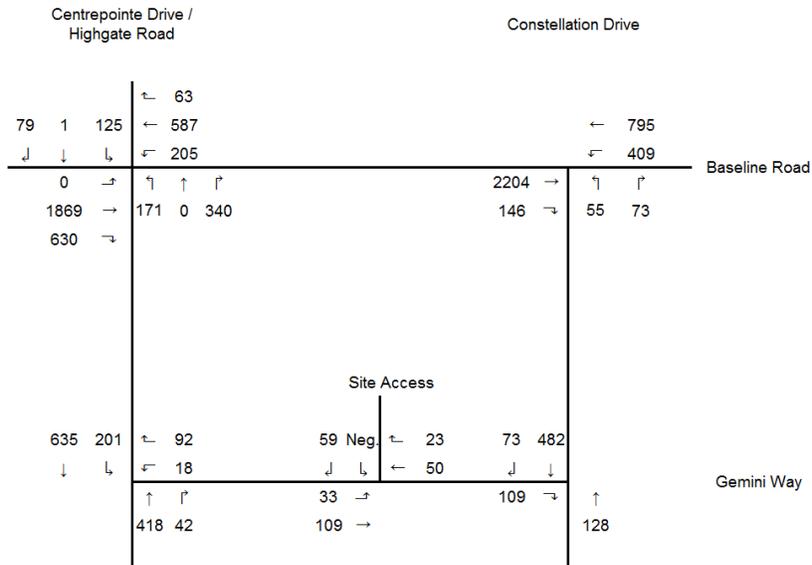
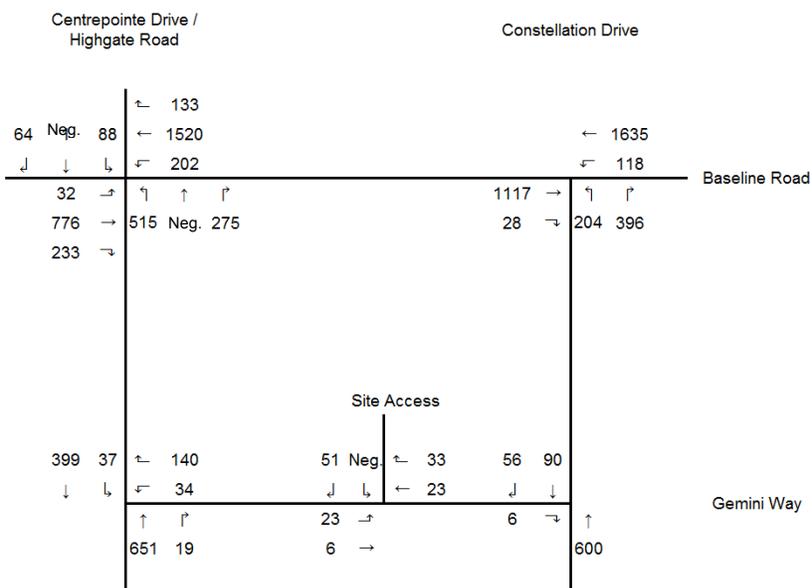


Figure 22 - 2020 Ultimate Traffic Volumes (PM Peak)



## 4.0 STRATEGY REPORT

### 4.1 DEVELOPMENT DESIGN

#### 4.1.1 Design for Sustainable Modes

**Bicycle facilities:** A total of 200 bicycle parking spaces are provided on-site. 36 parking spaces are provided on the surface. The remaining 164 bicycle spaces are provided in the underground parking facility. 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 75 parking spaces are provided. This consists of 8 surface level parking spaces and 67 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 Centrepointe 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 14 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 216 spaces. The proposed development provides 75 vehicle parking spaces (8 surface level parking spaces, 67 underground parking spaces).

**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 144 units and therefore 72 bicycle parking spaces are required. The proposed development provides 200 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 10** 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 a poor PLOS. 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.

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Table 11 - MMLOS Conditions (Segments)

| Segment                 |                           | Baseline Road<br>(arterial, spine cycling route) |           | Centrepointe Drive<br>(Major-Collector, local cycling route) |           | Constellation Drive<br>(Collector, no cycling designation) |           | Gemini Way<br>(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         | <b>A</b>       |
|                         | 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                                                         | **        | 50                                            | **        |                |
|                         | <b>Level of Service</b>   | <b>C</b>                                         | **        | <b>B</b>                                                     | **        | <b>B</b>                                                   | **        | <b>F</b>                                      | <b>B</b>  |                |
| Bicycle                 | Type of facility          | Mixed                                            | **        | Mixed                                                        | **        | Mixed                                                      | **        | Mixed                                         | **        | <b>C/B/B/D</b> |
|                         | 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                                                         | **        | 50                                            | **        |                |
|                         | Centreline (yes/no)       | Yes                                              | **        | Yes                                                          | **        | Yes                                                        | **        | No                                            | **        |                |
|                         | Bike lane blockage freq.  | Rare                                             | **        | N/A                                                          | **        | N/A                                                        | **        | N/A                                           | **        |                |
| <b>Level of Service</b> | <b>E</b>                  | **                                               | <b>D</b>  | **                                                           | <b>E</b>  | **                                                         | <b>B</b>  | **                                            |           |                |
| Transit                 | Type of facility          | Mixed                                            | **        | Mixed                                                        | **        | Mixed                                                      | **        | N/A                                           | **        | <b>D/D/D</b>   |
|                         | Parking/driveway friction | Low                                              | **        | Low                                                          | **        | Low                                                        | **        | N/A                                           | **        |                |
|                         | <b>Level of Service</b>   | <b>B</b>                                         | **        | <b>D</b>                                                     | **        | <b>D</b>                                                   | **        | <b>N/A</b>                                    | **        |                |
| Truck                   | Curb lane width (m)       | 3.5m                                             | **        |                                                              |           |                                                            |           |                                               |           | <b>D*</b>      |
|                         | Number of travel lanes    | 5                                                | **        | Not applicable                                               |           | Not applicable                                             |           | Not applicable                                |           |                |
|                         | <b>Level of Service</b>   | <b>A</b>                                         | **        |                                                              |           |                                                            |           |                                               |           |                |

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 Centrepointe 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 Centrepointe 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.

## 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 Centrepointe 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.

### 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 intersections will operate acceptably under two-way stop-control.

**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 <sup>th</sup> (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 <sup>th</sup> (veh) |                    |
|------------------------------------------------------------|----------------------|-----------------------------|-----------------|--------------------|--------------------|------------------------------|--------------------|
| <b>Baseline Road at Centrepointe Drive / Highgate Road</b> | 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)            |
| <b>Overall Intersection</b>                                |                      |                             | <b>C (C)</b>    | <b>0.71 (0.78)</b> | <b>22.9 (30.6)</b> | <b>-</b>                     |                    |
| <b>Baseline Road at Constellation Drive</b>                | 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)        |
|                                                            |                      | <b>Overall Intersection</b> |                 |                    | <b>C (D)</b>       | <b>0.73 (0.84)</b>           | <b>11.2 (14.5)</b> |
| <b>Gemini Way at Centrepointe Drive</b>                    | 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*)        |
|                                                            |                      | <b>Overall Intersection</b> |                 |                    | <b>A (A)</b>       | <b>-</b>                     | <b>1.8 (1.5)</b>   |
| <b>Gemini Way at Constellation Drive</b>                   | 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*)            |
|                                                            |                      | <b>Overall Intersection</b> |                 |                    | <b>A (A)</b>       | <b>-</b>                     | <b>1.5 (0.1)</b>   |

Notes:

1. Table format: AM (PM)
2. v/c – represents the anticipated volume divided by the predicted capacity
3. # - 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer
4. \* - Queue lengths for these movements are in vehicles
5. m – Volume for 95<sup>th</sup> percentile queue is metered by upstream signal

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The signalized intersection MMLOS assessment was undertaken for the intersections of Baseline Road at Centrepointe 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 Centrepointe 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 Centrepointe 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 Centrepointe 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 Centrepointe Drive / Highgate Road.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Centrepointe 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 Centrepointe 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 (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.

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**Table 14 - 2018 Existing MMLOS (Baseline Road / Centrepointe 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          |        |
|                         | <b>Level of Service</b>                     | <b>E</b>              | <b>C</b>           | <b>F</b>           | NA          |        |
| <b>Level of Service</b> | <b>F</b>                                    |                       |                    |                    |             |        |
| 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          |        |
|                         | <b>Level of Service</b>                     | <b>F</b>              | <b>F</b>           | <b>F</b>           | B           |        |
| <b>Level of Service</b> | <b>F</b>                                    |                       |                    |                    |             |        |
| TLOS                    | Intersection Average Delay (s)              | 14.5                  |                    |                    |             | C      |
|                         | <b>Level of Service</b>                     | <b>C</b>              |                    |                    |             |        |
| TKLOS                   | Effective corner radius (m)                 | >15                   | >15                | NA                 | NA          | D      |
|                         | Number of receiving lanes                   | >1                    | >1                 | NA                 | NA          |        |
|                         | <b>Level of Service</b>                     | A                     | A                  | NA                 | NA          |        |
|                         | <b>Level of Service</b>                     | <b>A</b>              |                    |                    |             |        |
| VLOS                    | Maximum Volume-to-capacity (v/c)            | 0.67                  | 0.78               | 0.76               | 0.69        | D      |
|                         | <b>Level of Service</b>                     | B                     | C                  | C                  | B           |        |
|                         | <b>Level of Service</b>                     | <b>C</b>              |                    |                    |             |        |

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**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             |        |
|                         | <b>Level of Service</b>                     | <b>D</b>               | <b>NA</b> | <b>F</b>      |        |
| <b>Level of Service</b> | <b>F</b>                                    |                        |           |               |        |
| 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            |        |
|                         | <b>Level of Service</b>                     | <b>B</b>               | <b>F</b>  | <b>F</b>      |        |
| <b>Level of Service</b> | <b>F</b>                                    |                        |           |               |        |
| TLOS                    | Intersection Average Delay (s)              | 30.6                   |           |               | C      |
|                         | <b>Level of Service</b>                     | <b>E</b>               |           |               |        |
| TKLOS                   | Effective corner radius (m)                 | >15                    | >15       | NA            | D      |
|                         | Number of receiving lanes                   | >1                     | >1        | NA            |        |
|                         | <b>Level of Service</b>                     | <b>A</b>               | <b>A</b>  | <b>NA</b>     |        |
| <b>Level of Service</b> | <b>A</b>                                    |                        |           |               |        |
| VLOS                    | Maximum Volume-to-capacity (v/c)            | 0.63                   | 0.73      | 0.84          | D      |
|                         | <b>Level of Service</b>                     | <b>B</b>               | <b>C</b>  | <b>D</b>      |        |
|                         | <b>Level of Service</b>                     | <b>D</b>               |           |               |        |

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 <sup>th</sup> (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)              |
| <b>Overall Intersection</b>                         |                      |                             | <b>B (C)</b>    | <b>0.70 (0.75)</b> | <b>22.2 (26.0)</b> | <b>-</b>                     |                    |
| 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)        |
|                                                     |                      | <b>Overall Intersection</b> |                 |                    | <b>C (C)</b>       | <b>0.72 (0.76)</b>           | <b>11.2 (11.5)</b> |
| 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*)        |
|                                                     |                      | <b>Overall Intersection</b> |                 |                    | <b>A (A)</b>       | <b>-</b>                     | <b>1.8 (1.5)</b>   |
| 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*)            |
|                                                     |                      | <b>Overall Intersection</b> |                 |                    | <b>A (A)</b>       | <b>-</b>                     | <b>1.5 (0.1)</b>   |

Notes:

1. Table format: AM (PM)
2. v/c – represents the anticipated volume divided by the predicted capacity
3. # - 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer
4. \* - Queue lengths for these movements are in vehicles
5. m – Volume for 95<sup>th</sup> percentile queue is metered by upstream signal

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The signalized intersection MMLOS assessment was undertaken for the intersections of Baseline Road at Centrepointe 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 Centrepointe Drive/ Highgate Road (2020 Future Background):**

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

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Centrepointe 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 Centrepointe 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.

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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.

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**Table 17 - 2020 Future Background MMLoS (Baseline Road / Centrepointe 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          |        |
|                         | <b>Level of Service</b>                     | <b>E</b>              | <b>C</b>           | <b>F</b>           | NA          |        |
| <b>Level of Service</b> | <b>F</b>                                    |                       |                    |                    |             |        |
| 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          |        |
|                         | <b>Level of Service</b>                     | <b>F</b>              | <b>F</b>           | <b>F</b>           | B           |        |
| <b>Level of Service</b> | <b>F</b>                                    |                       |                    |                    |             |        |
| TLOS                    | Intersection Average Delay (s)              | 26.0                  |                    |                    |             | C      |
|                         | <b>Level of Service</b>                     | <b>D</b>              |                    |                    |             |        |
| TKLOS                   | Effective corner radius (m)                 | >15                   | >15                | NA                 | NA          | D      |
|                         | Number of receiving lanes                   | >1                    | >1                 | NA                 | NA          |        |
|                         | <b>Level of Service</b>                     | A                     | A                  | NA                 | NA          |        |
|                         | <b>Level of Service</b>                     | <b>A</b>              |                    |                    |             |        |
| VLOS                    | Maximum Volume-to-capacity (v/c)            | 0.63                  | 0.65               | 0.70               | 0.67        | D      |
|                         | <b>Level of Service</b>                     | B                     | B                  | B                  | B           |        |
|                         | <b>Level of Service</b>                     | <b>B</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             |        |
|                         | <b>Level of Service</b>                     | <b>D</b>               | <b>NA</b> | <b>F</b>      |        |
| <b>Level of Service</b> | <b>F</b>                                    |                        |           |               |        |
| 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            |        |
|                         | <b>Level of Service</b>                     | <b>B</b>               | <b>F</b>  | <b>F</b>      |        |
| <b>Level of Service</b> | <b>F</b>                                    |                        |           |               |        |
| TLOS                    | Intersection Average Delay (s)              | 11.5                   |           |               | C      |
|                         | <b>Level of Service</b>                     | <b>C</b>               |           |               |        |
| TKLOS                   | Effective corner radius (m)                 | >15                    | >15       | NA            | D      |
|                         | Number of receiving lanes                   | >1                     | >1        | NA            |        |
|                         | <b>Level of Service</b>                     | <b>A</b>               | <b>A</b>  | <b>NA</b>     |        |
|                         | <b>Level of Service</b>                     | <b>A</b>               |           |               |        |
| VLOS                    | Maximum Volume-to-capacity (v/c)            | 0.59                   | 0.72      | 0.76          | D      |
|                         | <b>Level of Service</b>                     | <b>A</b>               | <b>C</b>  | <b>C</b>      |        |
|                         | <b>Level of Service</b>                     | <b>C</b>               |           |               |        |

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 <sup>th</sup> (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)              |
| <b>Overall Intersection</b>                         |                      |                             | <b>C (C)</b>    | <b>0.72 (0.76)</b> | <b>22.5 (26.4)</b> | <b>-</b>                     |                    |
| 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)        |
|                                                     |                      | <b>Overall Intersection</b> |                 |                    | <b>C (D)</b>       | <b>0.73 (0.81)</b>           | <b>11.5 (13.6)</b> |
| 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*)        |
|                                                     |                      | <b>Overall Intersection</b> |                 |                    | <b>A (A)</b>       | <b>-</b>                     | <b>2.4 (2.2)</b>   |
| 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*)            |
|                                                     |                      | <b>Overall Intersection</b> |                 |                    | <b>A (A)</b>       | <b>-</b>                     | <b>1.5 (0.1)</b>   |
| 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*)        |
|                                                     |                      | <b>Overall Intersection</b> |                 |                    | <b>A (A)</b>       | <b>-</b>                     | <b>3.0 (4.7)</b>   |

Notes:

1. Table format: AM (PM)
2. v/c – represents the anticipated volume divided by the predicted capacity
3. # - 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer
4. \* - Queue lengths for these movements are in vehicles
5. m – Volume for 95<sup>th</sup> percentile queue is metered by upstream signal

## 2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

### Strategy Report

The signalized intersection MMLoS assessment was undertaken for the intersections of Baseline Road at Centrepointe 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 Centrepointe Drive/ Highgate Road (2020 Total Future):**

**Table 20** outlines 2020 Total Future MMLoS conditions for the signalized intersection of Baseline Road at Centrepointe Drive.

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Centrepointe 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 Centrepointe 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.

## 2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

### Strategy Report

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.

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Table 20 - 2020 Total Future MMLOS (Baseline Road / Centrepointe 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          |        |
|                         | <b>Level of Service</b>                     | <b>E</b>              | <b>C</b>           | <b>F</b>           | NA          |        |
| <b>Level of Service</b> | <b>F</b>                                    |                       |                    |                    |             |        |
| 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          |        |
|                         | <b>Level of Service</b>                     | <b>F</b>              | <b>F</b>           | <b>F</b>           | B           |        |
| <b>Level of Service</b> | <b>F</b>                                    |                       |                    |                    |             |        |
| TLOS                    | Intersection Average Delay (s)              | 26.4                  |                    |                    |             | C      |
|                         | <b>Level of Service</b>                     | <b>D</b>              |                    |                    |             |        |
| TKLOS                   | Effective corner radius (m)                 | >15                   | >15                | NA                 | NA          | D      |
|                         | Number of receiving lanes                   | >1                    | >1                 | NA                 | NA          |        |
|                         | <b>Level of Service</b>                     | A                     | A                  | NA                 | NA          |        |
|                         | <b>Level of Service</b>                     | <b>A</b>              |                    |                    |             |        |
| VLOS                    | Maximum Volume-to-capacity (v/c)            | 0.63                  | 0.66               | 0.76               | 0.67        | D      |
|                         | <b>Level of Service</b>                     | B                     | B                  | C                  | B           |        |
|                         | <b>Level of Service</b>                     | <b>C</b>              |                    |                    |             |        |

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Strategy Report

**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             |        |
|                         | <b>Level of Service</b>                     | <b>D</b>               | <b>NA</b> | <b>F</b>      |        |
| <b>Level of Service</b> | <b>F</b>                                    |                        |           |               |        |
| 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            |        |
|                         | <b>Level of Service</b>                     | <b>B</b>               | <b>F</b>  | <b>F</b>      |        |
| <b>Level of Service</b> | <b>F</b>                                    |                        |           |               |        |
| TLOS                    | Intersection Average Delay (s)              | 12.1                   |           |               | C      |
|                         | <b>Level of Service</b>                     | <b>C</b>               |           |               |        |
| TKLOS                   | Effective corner radius (m)                 | >15                    | >15       | NA            | D      |
|                         | Number of receiving lanes                   | >1                     | >1        | NA            |        |
|                         | <b>Level of Service</b>                     | <b>A</b>               | <b>A</b>  | <b>NA</b>     |        |
| <b>Level of Service</b> | <b>A</b>                                    |                        |           |               |        |
| VLOS                    | Maximum Volume-to-capacity (v/c)            | 0.61                   | 0.73      | 0.76          | D      |
|                         | <b>Level of Service</b>                     | <b>B</b>               | <b>C</b>  | <b>C</b>      |        |
|                         | <b>Level of Service</b>                     | <b>C</b>               |           |               |        |

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 <sup>th</sup> (veh) |                    |
|-----------------------------------------------------|----------------------|-----------------------------|-----------------------------|--------------------|--------------------|------------------------------|--------------------|
| Baseline Road at Centrepointe 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)            |
| <b>Overall Intersection</b>                         |                      |                             | <b>C (C)</b>                | <b>0.77 (0.77)</b> | <b>24.7 (27.9)</b> | <b>-</b>                     |                    |
| 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)        |
|                                                     |                      | <b>Overall Intersection</b> |                             |                    | <b>C (C)</b>       | <b>0.75 (0.76)</b>           | <b>11.9 (13.6)</b> |
| Gemini Way at Centrepointe Drive                    | Minor Stop Control   | WB                          | Left / Right                | B (B)              | 0.22 (0.32)        | 14.0 (14.8)                  | 0.8* (1.4*)        |
|                                                     |                      |                             | Through                     | A (A)              | 0 (0)              | 0 (0)                        | 0* (0*)            |
|                                                     |                      | NB                          | Right                       | A (A)              | 0 (0)              | 0 (0)                        | 0* (0*)            |
|                                                     |                      |                             | Left / Through              | A (A)              | 0.18 (0.04)        | 2.4 (0.9)                    | 0.6* (0.1*)        |
|                                                     |                      | <b>Overall Intersection</b> |                             |                    | <b>A (A)</b>       | <b>-</b>                     | <b>2.5 (2.3)</b>   |
| Gemini Way at Constellation Drive                   | Minor Stop Control   | EB                          | Right                       | B (A)              | 0.15 (0.01)        | 10.9 (8.7)                   | 0.5* (0*)          |
|                                                     |                      |                             | Through                     | A (A)              | 0 (0)              | 0 (0)                        | 0* (0*)            |
|                                                     |                      | SB                          | Through / Right             | A (A)              | 0 (0)              | 0 (0)                        | 0* (0*)            |
|                                                     |                      |                             | <b>Overall Intersection</b> |                    |                    | <b>A (A)</b>                 | <b>-</b>           |
| 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)              |
|                                                     |                      | SB                          |                             | Left/ Right        | A (A)              | 0.07 (0.06)                  | 9.0 (8.7)          |
|                                                     |                      |                             | <b>Overall Intersection</b> |                    |                    | <b>A (A)</b>                 | <b>-</b>           |

Notes:

1. Table format: AM (PM)
2. v/c – represents the anticipated volume divided by the predicted capacity
3. # - 95<sup>th</sup> percentile volume exceeds capacity, queue may be longer
4. \* - Queue lengths for these movements are in vehicles
5. m – Volume for 95<sup>th</sup> percentile queue is metered by upstream signal

## 2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

### Strategy Report

The signalized intersection MMLOS assessment was undertaken for the intersections of Baseline Road at Centrepointe 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 Centrepointe Drive/ Highgate Road (2025 Ultimate):**

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

As outlined in the summary analysis, the pedestrian level of service at the intersection of Baseline Road / Centrepointe 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 Centrepointe 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.

## 2140 BASELINE ROAD TRANSPORTATION IMPACT ASSESSMENT

### Strategy Report

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.

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**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          |        |
|                         | <b>Level of Service</b>                     | <b>E</b>              | <b>C</b>           | <b>F</b>           | NA          |        |
| <b>Level of Service</b> | <b>F</b>                                    |                       |                    |                    |             |        |
| 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          |        |
|                         | <b>Level of Service</b>                     | <b>F</b>              | <b>F</b>           | <b>F</b>           | B           |        |
| <b>Level of Service</b> | <b>F</b>                                    |                       |                    |                    |             |        |
| TLOS                    | Intersection Average Delay (s)              | 27.9                  |                    |                    |             | C      |
|                         | <b>Level of Service</b>                     | <b>D</b>              |                    |                    |             |        |
| TKLOS                   | Effective corner radius (m)                 | >15                   | >15                | NA                 | NA          | D      |
|                         | Number of receiving lanes                   | >1                    | >1                 | NA                 | NA          |        |
|                         | <b>Level of Service</b>                     | A                     | A                  | NA                 | NA          |        |
|                         | <b>Level of Service</b>                     | <b>A</b>              |                    |                    |             |        |
| VLOS                    | Maximum Volume-to-capacity (v/c)            | 0.72                  | 0.74               | 0.77               | 0.72        | D      |
|                         | <b>Level of Service</b>                     | C                     | C                  | C                  | C           |        |
|                         | <b>Level of Service</b>                     | C                     |                    |                    |             |        |

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**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             |        |
|                         | <b>Level of Service</b>                     | <b>D</b>               | <b>NA</b> | <b>F</b>      |        |
| <b>Level of Service</b> | <b>F</b>                                    |                        |           |               |        |
| 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            |        |
|                         | <b>Level of Service</b>                     | <b>B</b>               | <b>F</b>  | <b>F</b>      |        |
| <b>Level of Service</b> | <b>F</b>                                    |                        |           |               |        |
| TLOS                    | Intersection Average Delay (s)              | 13.6                   |           |               | C      |
|                         | <b>Level of Service</b>                     | <b>C</b>               |           |               |        |
| TKLOS                   | Effective corner radius (m)                 | >15                    | >15       | NA            | D      |
|                         | Number of receiving lanes                   | >1                     | >1        | NA            |        |
|                         | <b>Level of Service</b>                     | <b>A</b>               | <b>A</b>  | <b>NA</b>     |        |
| <b>Level of Service</b> | <b>A</b>                                    |                        |           |               |        |
| VLOS                    | Maximum Volume-to-capacity (v/c)            | 0.68                   | 0.75      | 0.81          | D      |
|                         | <b>Level of Service</b>                     | <b>B</b>               | <b>C</b>  | <b>D</b>      |        |
|                         | <b>Level of Service</b>                     | <b>D</b>               |           |               |        |

Conclusion

### 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.

It is anticipated that the pedestrian, cycling and transit levels 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.

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 and Constellation Drive.

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.

Conclusion

## Appendix A **TURNING MOVEMENT COUNTS**

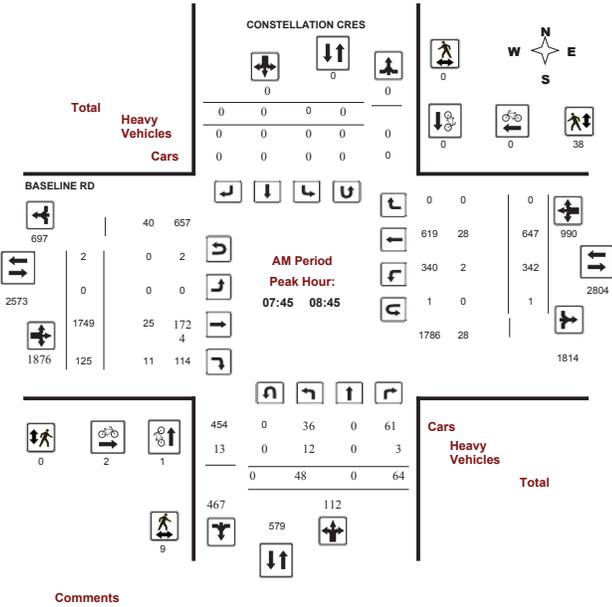


### Transportation Services - Traffic Services

#### 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

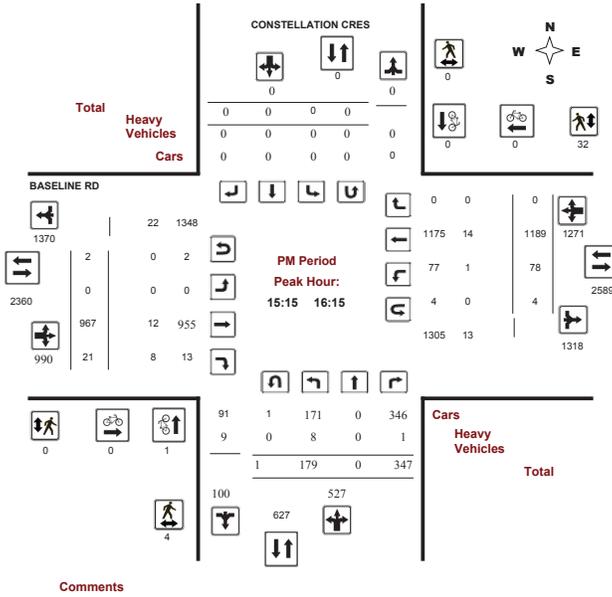


### Transportation Services - Traffic Services

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

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

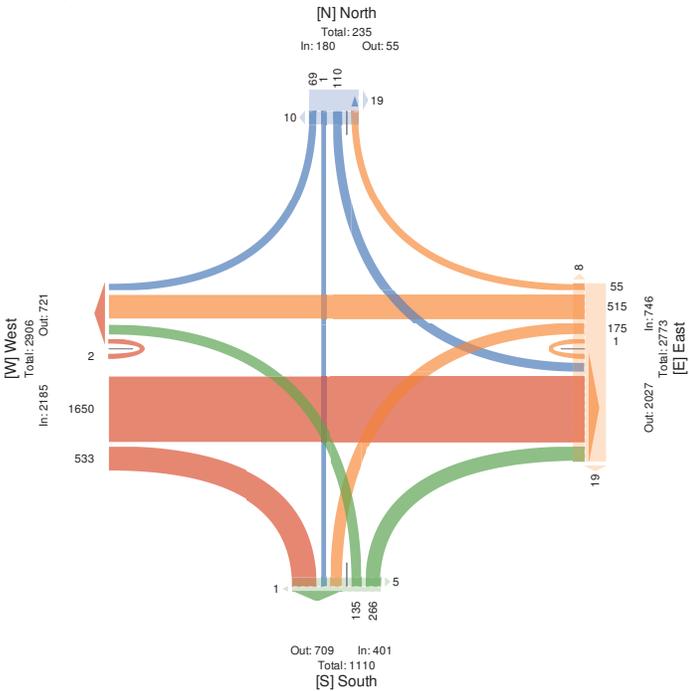
WO No: 37532  
Device: Miovision



#### 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

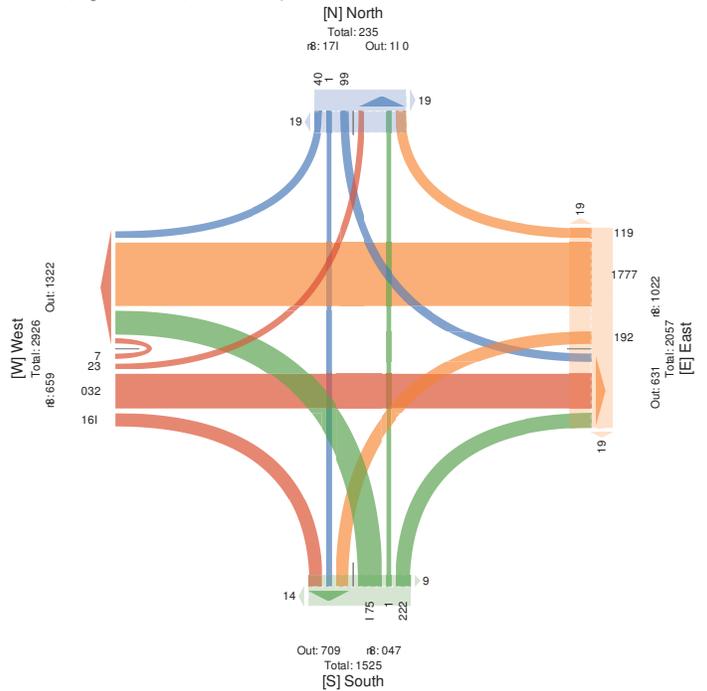
Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA



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

Tue Apr 10, 2018  
PM Peak (7PM - 4PM)  
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)  
All Movements  
ID: 510144, Location: 45.348722, -75.769272, Site Code: 37709103

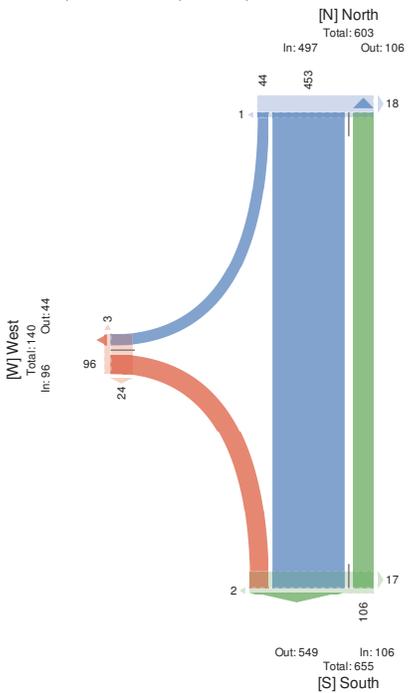
Provided by: City of Ottawa  
100 Constellation Dr,  
Nepean, ON, K2G 5J9, CA



**5363812 - Constellation and Gemini - Apr 10th - TMC**

Tue Apr 10, 2018  
 AM Peak (7:40AM-5:45AM) - 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

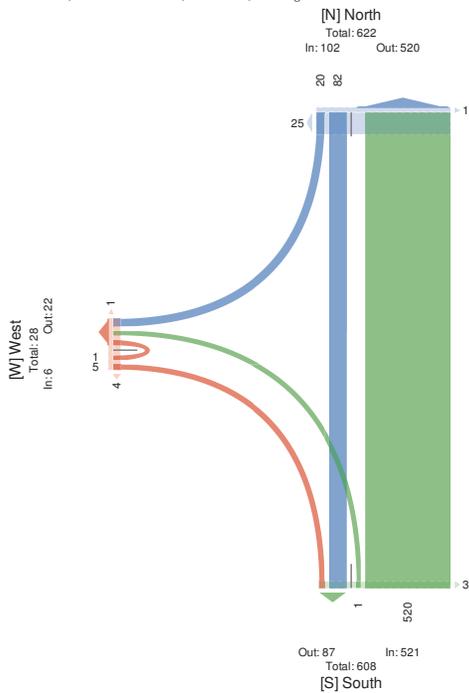
Provided by: City of Ottawa  
 100 Constellation Dr,  
 Nepean, ON, N2K 5G, CA



**5363812 - Constellation and Gemini - Apr 10th - TMC**

Tue Apr 10, 2018  
 PM Peak (7:14PM-5:14PM)  
 All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)  
 All Movements  
 ID: 4101DI, Htt al dhi: -4.7-373D, 54.6D4-1D, 9de v hge: 76610107

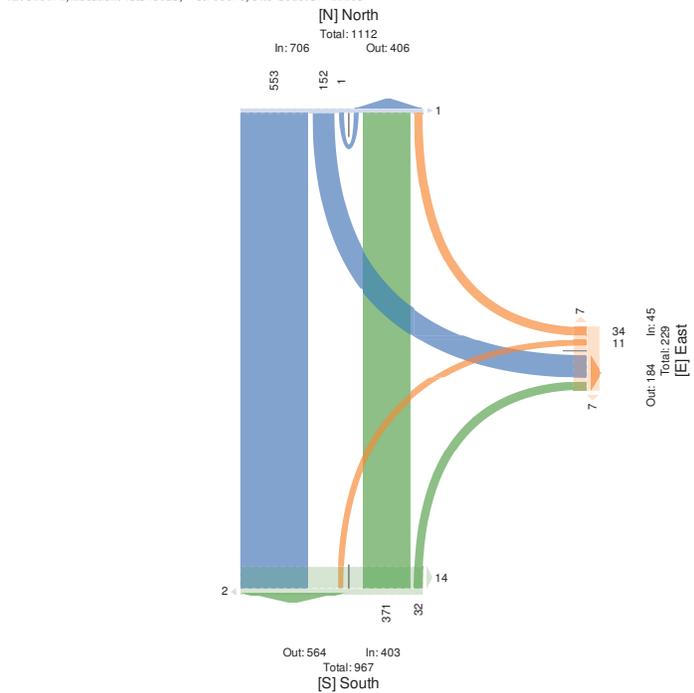
Mhcegeg Sn: v da hSb llaRa  
 100 v h i l e @ l d h i l r,  
 Nepean, f N, K2G 4I3, v A



**5363812 - Centrepointe 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

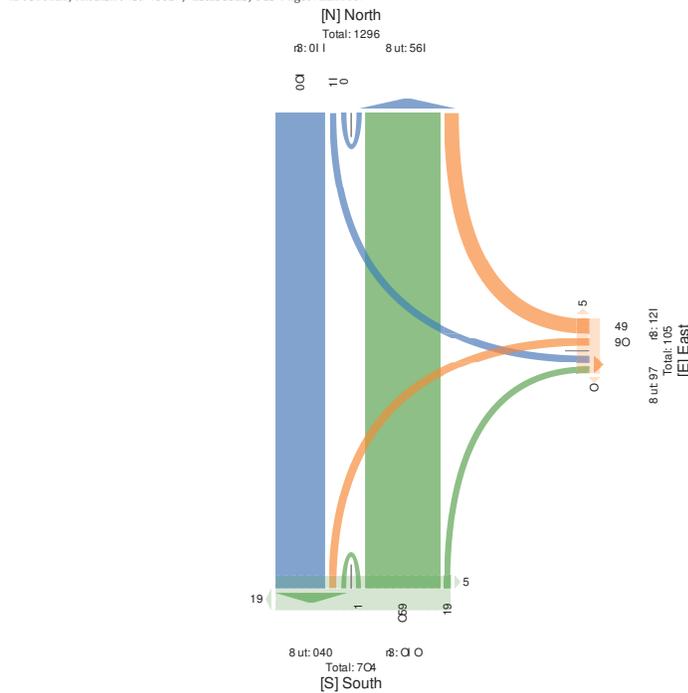
Provided by: City of Ottawa  
 100 Constellation Dr,  
 Nepean, ON, N2K 5G, CA



**5363812 - Centrepointe and Gemini - Apr 10th - TMC**

Tue Apr 10, 2018  
 PM Peak (7:45PM-4:45PM)  
 All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)  
 All Movements  
 ID: 5101DI, Htt al dhi: 45.748027, -75.768676, Site Code: 37711103

Mhcegeg Sn: v da hSb llaRa  
 100 v h i l e @ l d h i l r,  
 Nepean, f N, K2K 5G, v A



Conclusion

## 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

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<br>V2 N                         | Wet<br>Wet                      | Going ahead<br>Stopped                                                 | Automobile, station<br>Pick-up truck                                                    | Other motor vehicle<br>Other motor vehicle                                                                      | 0       |
| 2  | 2012-01-20 | Fri | 14:35 | Clear   | Daylight | Rear end    | P.D. only | V1 U<br>V2 U                         | Wet<br>Wet                      | Going ahead<br>Stopped                                                 | Pick-up truck<br>Automobile, station                                                    | Other motor vehicle<br>Other motor vehicle                                                                      | 0       |
| 3  | 2012-01-23 | Mo  | 19:01 | Freezin | Dark     | Turning     | Non-fatal | V1 E<br>V2 W                         | Slush<br>Slush                  | Going ahead<br>Turning left                                            | Automobile, station<br>Automobile, station                                              | Other motor vehicle<br>Other motor vehicle                                                                      | 0       |
| 4  | 2012-02-03 | Fri | 17:58 | Clear   | Dark     | Rear end    | P.D. only | V1 W<br>V2 W<br>V3 W                 | Wet<br>Wet<br>Wet               | Slowing or<br>Stopped<br>Stopped                                       | Automobile, station<br>Automobile, station<br>Automobile, station                       | Other motor vehicle<br>Other motor vehicle<br>Other motor vehicle                                               | 0       |
| 5  | 2012-02-26 | Sun | 18:35 | Clear   | Dark     | Approaching | Non-fatal | V5 W<br>V1 N<br>V2 S<br>V3 W<br>V4 W | Dry<br>Dry<br>Dry<br>Dry<br>Dry | Stopped<br>Turning left<br>Going ahead<br>Turning left<br>Turning left | Pick-up truck<br>Pick-up truck<br>Pick-up truck<br>Automobile, station<br>Passenger van | Other motor vehicle<br>Other motor vehicle<br>Other motor vehicle<br>Other motor vehicle<br>Other motor vehicle | 0       |
| 6  | 2012-03-10 | Sat | 10:40 | Clear   | Daylight | Rear end    | P.D. only | V1 E<br>V2 E                         | Wet<br>Wet                      | Changing lanes<br>Slowing or                                           | Automobile, station<br>Automobile, station                                              | Other motor vehicle<br>Other motor vehicle                                                                      | 0       |
| 7  | 2012-03-16 | Fri | 13:47 | Clear   | Daylight | Rear end    | P.D. only | V1 W<br>V2 W                         | Wet<br>Wet                      | Slowing or<br>Slowing or                                               | Automobile, station<br>Automobile, station                                              | Other motor vehicle<br>Other motor vehicle                                                                      | 0       |
| 8  | 2012-05-03 | Thu | 10:00 | Rain    | Daylight | Rear end    | P.D. only | V1 W<br>V2 W                         | Wet<br>Wet                      | Slowing or<br>Stopped                                                  | Automobile, station<br>Automobile, station                                              | Other motor vehicle<br>Other motor vehicle                                                                      | 0       |
| 9  | 2012-05-06 | Sun | 18:39 | Clear   | Daylight | Rear end    | P.D. only | V1 W<br>V2 W                         | Dry<br>Dry                      | Going ahead<br>Slowing or                                              | Automobile, station<br>Automobile, station                                              | Other motor vehicle<br>Other motor vehicle                                                                      | 0       |
| 10 | 2012-06-01 | Fri | 22:40 | Rain    | Dark     | Rear end    | P.D. only | V1 W<br>V2 W                         | Wet<br>Wet                      | Going ahead<br>Stopped                                                 | Automobile, station<br>Automobile, station                                              | Other motor vehicle<br>Other motor vehicle                                                                      | 0       |

(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, April 25, 2018

## Collision Main Detail Summary

OnTRAC Reporting System

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

| ID | DATE       | DAY | TIME  | ENV   | LIGHT    | IMPACT TYPE | CLASS     | DIR          | SURFACE COND'N | VEHICLE MANOEUVRE      | VEHICLE TYPE                                 | FIRST EVENT                                | No. PED |
|----|------------|-----|-------|-------|----------|-------------|-----------|--------------|----------------|------------------------|----------------------------------------------|--------------------------------------------|---------|
| 11 | 2012-07-14 | Sat | 16:21 | Clear | Daylight | Rear end    | P.D. only | V1 W<br>V2 W | Dry<br>Dry     | Going ahead<br>Stopped | Municipal transit bus<br>Automobile, station | Other motor vehicle<br>Other motor vehicle | 0       |
| 12 | 2012-09-04 | Tue | 19:07 | Rain  | Dusk     | Rear end    | P.D. only | V1 W<br>V2 W | Wet<br>Wet     | Slowing or<br>Stopped  | Passenger van<br>Automobile, station         | Other motor vehicle<br>Other motor vehicle | 0       |
| 13 | 2012-09-13 | Thu | 14:07 | Clear | Daylight | Rear end    | P.D. only | V1 W<br>V2 W | Dry<br>Dry     | Going ahead<br>Stopped | Automobile, station<br>Pick-up truck         | Other motor vehicle<br>Other motor vehicle | 0       |

### BASELINE RD & CONSTELLATION CRE

Former Municipality: Ottawa

Traffic Control: Traffic signal

Number of Collisions: 3

| ID | 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<br>V2 E<br>V3 E | Dry<br>Dry<br>Dry | Going ahead<br>Going ahead<br>Going ahead | Automobile, station<br>Automobile, station<br>Automobile, station | Other motor vehicle<br>Other motor vehicle<br>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<br>V2 N         | Dry<br>Dry        | Going ahead<br>Turning left               | Pick-up truck<br>Automobile, station                              | Other motor vehicle<br>Other motor vehicle                        | 0       |

### CENTREPOINTE DR & GEMINI WAY

Former Municipality: Nepean

Traffic Control: Stop sign

Number of Collisions: 1

| ID | 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<br>V2 N | Dry<br>Dry     | Going ahead<br>Stopped | Automobile, station<br>Automobile, station | Other motor vehicle<br>Other motor vehicle | 0       |

(Note: Time of Day = "00:00" represents unknown collision time)

Wednesday, April 25, 2018



# 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 |         |

|                        |       |           |           |            |       |                     |                           |                     |
|------------------------|-------|-----------|-----------|------------|-------|---------------------|---------------------------|---------------------|
| 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 |

|                        |       |          |           |       |      |                     |                           |                     |
|------------------------|-------|----------|-----------|-------|------|---------------------|---------------------------|---------------------|
| 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 |

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|                        |      |          |           |            |      |             |                           |                     |
|------------------------|------|----------|-----------|------------|------|-------------|---------------------------|---------------------|
| 2013-Dec-09, 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 |

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|                        |       |       |           |     |       |              |                           |                     |
|------------------------|-------|-------|-----------|-----|-------|--------------|---------------------------|---------------------|
| 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 |

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|                        |       |                  |           |     |      |               |                           |                     |
|------------------------|-------|------------------|-----------|-----|------|---------------|---------------------------|---------------------|
| 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 |

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|                        |       |          |           |     |      |                     |                           |                     |
|------------------------|-------|----------|-----------|-----|------|---------------------|---------------------------|---------------------|
| 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 |

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|                        |       |          |           |     |      |                     |                           |                     |
|------------------------|-------|----------|-----------|-----|------|---------------------|---------------------------|---------------------|
| 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 |

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# 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                |         |

|                        |       |                  |                  |            |       |               |                           |                     |
|------------------------|-------|------------------|------------------|------------|-------|---------------|---------------------------|---------------------|
| 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, Sat,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 |

|                        |       |                  |                  |     |      |                     |                           |                     |
|------------------------|-------|------------------|------------------|-----|------|---------------------|---------------------------|---------------------|
| 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 |

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

|                        |               |           |           |       |       |                     |                           |                       |
|------------------------|---------------|-----------|-----------|-------|-------|---------------------|---------------------------|-----------------------|
| 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 | Turning right       | Automobile, station wagon | Other motor vehicle   |
|                        |               |           |           |       | North | Turning right       | Pick-up truck             | Other motor vehicle   |
| 2013-May-23, Thu,13:42 | Rain          | Rear end  | P.D. only | Wet   | West  | Turning left        | Pick-up truck             | Other motor vehicle   |
|                        |               |           |           |       | West  | Turning left        | Pick-up truck             | Other motor vehicle   |
| 2013-May-08, Wed,18:10 | Clear         | Angle     | P.D. only | Dry   | East  | Going ahead         | Bicycle                   | Other motor vehicle   |
|                        |               |           |           |       | North | Turning left        | Automobile, station wagon | Cyclist               |
| 2013-Feb-22, Fri,08:48 | Clear         | Rear end  | P.D. only | Dry   | West  | Going ahead         | Automobile, station wagon | Other motor vehicle   |
|                        |               |           |           |       | West  | Slowing or stopping | Automobile, station wagon | Other motor vehicle   |



# 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     | Turning left      | Automobile, station wagon | Other motor vehicle |         |
|                        |             |                  |                |                | North    | Going ahead       | Automobile, station wagon | Other motor vehicle |         |
| 2013-May-04, Sat,07:49 | Clear       | Turning movement | P.D. only      | Dry            | North    | Turning right     | Automobile, station wagon | Other motor vehicle |         |
|                        |             |                  |                |                | North    | Going ahead       | Automobile, station wagon | Other motor vehicle |         |

Conclusion

## Appendix C INTERSECTION PERFORMANCE WORKSHEET

Lanes, Volumes, Timings  
1: Centrepointe Drive/Highgate Road & Baseline Road  
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     | 2     | 2     | 1     | 6     | 6     | 10    |      |      | 4     |      | 4     |
| Permitted Phases      | 2     | 2     | 2     | 1     | 6     | 6     | 10    |      |      | 4     |      | 4     |
| Detector Phase        | 2     | 2     | 2     | 1     | 6     | 6     | 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  |
| Minimum Split (s)     | 25.7  | 25.7  | 25.7  | 11.2  | 25.7  | 25.7  | 38.8  |      |      | 38.8  |      | 16.3  |
| Total Split (s)       | 47.0  | 47.0  | 47.0  | 24.0  | 71.0  | 71.0  | 39.0  |      |      | 39.0  |      | 20.0  |
| Total Split (%)       | 36.2% | 36.2% | 36.2% | 18.5% | 54.6% | 54.6% | 30.0% |      |      | 30.0% |      | 15.4% |
| Yellow Time (s)       | 3.7   | 3.7   | 3.7   | 3.7   | 3.7   | 3.7   | 3.0   |      |      | 3.0   |      | 3.3   |
| All-Red Time (s)      | 2.0   | 2.0   | 2.0   | 2.5   | 2.0   | 2.0   | 3.8   |      |      | 3.8   |      | 3.0   |
| Lost Time Adjust (s)  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      |      | 0.0   |      | 0.0   |
| Total Lost Time (s)   | 5.7   | 5.7   | 5.7   | 6.2   | 5.7   | 5.7   | 6.8   |      |      | 6.8   |      | 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  |
| Act Effct Green (s)   | 68.0  | 68.0  | 12.4  | 86.6  | 86.6  | 11.9  | 11.9  |      |      | 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  |
| 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   |
| LOS                   | C     | A     | E     | A     | A     | E     | B     |      |      | E     |      | A     |
| Approach Delay        | 19.6  |       |       | 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:EBT 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%  
 Analysis Period (min) 15  
 ICU Level of Service C



Synchro 9 Report Page 1

Queues  
1: Centrepointe Drive/Highgate Road & Baseline Road  
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 |

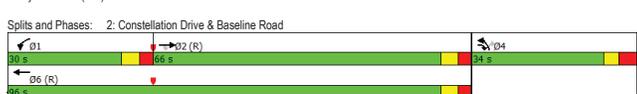
**Intersection Summary**  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Synchro 9 Report Page 2

Lanes, Volumes, Timings  
2: Constellation Drive & Baseline Road  
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     | 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)   | 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%  
 Analysis Period (min) 15  
 ICU Level of Service C



Synchro 9 Report Page 3

Queues  
2: Constellation Drive & Baseline Road  
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.

Synchro 9 Report Page 4

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.8  |      |      |      |      |      |
| Movement                 | WBL  | WBR  | NBT  | NBR  | SBL  | SBT  |
| Lane Configurations      | Y    |      | ↑↑   | ↑    | ↑↑   | ↑↑   |
| 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              | -      | -      | -      |
| 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   | -   |

| 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   | -   | -   |

Lanes, Volumes, Timings  
1: Centrepointe 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  |
| Fit 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  | Prot | Perm  |
| Protected Phases      | 5     | 2     |       | 1     | 6     |       | 10    |       |       | 4     |      |       |
| Permitted Phases      |       |       | 2     |       |       | 6     |       |       | 10    |       |      | 4     |
| Detector Phase        | 5     | 2     | 2     | 1     | 6     | 6     | 10    | 4     |       | 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 | 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  |      | 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  |      | 21.0  |
| Total Split (%)       | 9.2%  | 37.7% | 37.7% | 16.2% | 44.6% | 44.6% | 30.0% | 30.0% | 16.2% | 16.2% |      | 16.2% |
| 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   |
| All-Red Time (s)      | 2.5   | 2.0   | 2.0   | 2.5   | 2.0   | 2.0   | 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   |
| Total Lost Time (s)   | 6.2   | 5.7   | 5.7   | 6.2   | 5.7   | 5.7   | 6.8   | 6.8   | 6.3   | 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  |      | 11.9  |
| Actuated G/C Ratio    | 0.06  | 0.44  | 0.44  | 0.09  | 0.52  | 0.52  | 0.18  | 0.18  | 0.09  | 0.09  |      | 0.09  |
| v/c Ratio             | 0.29  | 0.32  | 0.25  | 0.57  | 0.78  | 0.78  | 0.14  | 0.14  | 0.09  | 0.09  |      | 0.19  |
| Control Delay         | 65.6  | 25.3  | 4.4   | 73.5  | 27.0  | 1.3   | 58.8  | 8.9   | 67.4  | 1.4   |      | 1.4   |
| Queue Delay           | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      | 0.0   |
| Total Delay           | 65.6  | 25.3  | 4.4   | 73.5  | 27.0  | 1.3   | 58.8  | 8.9   | 67.4  | 1.4   |      | 1.4   |
| LOS                   | E     | C     | A     | E     | C     | A     | E     | A     | E     | A     |      | 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



Queues  
1: Centrepointe 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   | 0.78 | 0.14 | 0.14 | 0.09 | 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 |      | 37.5 |      |
| 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   | 0.78 | 0.14 | 0.14 | 0.09 | 0.18 |

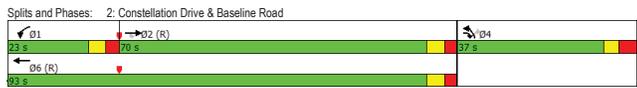
**Intersection Summary**  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

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     | 4     |
| Permitted Phases      |       | 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)       | 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



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  | 0.0  | 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.

HCM 2010 TWSC  
3: Centrepointhe 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              | 921    | -      | -      |
| 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/WBL1 | SBL   | SBT |
|-----------------------|-----|----------|-------|-----|
| Capacity (veh/h)      | -   | 555      | 956   | -   |
| HCM Lane V/C Ratio    | -   | 0.21     | 0.019 | -   |
| HCM Control Delay (s) | -   | 13.2     | 8.8   | 0.1 |
| HCM Lane LOS          | -   | B        | A     | A   |
| HCM 95th %tile Q(veh) | -   | 0.8      | 0.1   | -   |

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    | 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      | -      | -      |
| Stage 2              | 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 | EBL1  | 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     | -   | -   |

Lanes, Volumes, Timings  
1: Centrepointe Drive/Highgate Road & Baseline Road  
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 | Prot  | Perm | Perm  |
| Protected Phases      | 2     | 2     | 2     | 1     | 6     | 6     | 10    |      |      | 4     |      | 4     |
| Permitted Phases      | 2     | 2     | 2     | 1     | 6     | 6     | 10    |      |      | 4     |      | 4     |
| Detector Phase        | 2     | 2     | 2     | 1     | 6     | 6     | 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  |
| Minimum Split (s)     | 25.7  | 25.7  | 25.7  | 11.2  | 25.7  | 25.7  | 38.8  |      |      | 38.8  |      | 16.3  |
| Total Split (s)       | 47.0  | 47.0  | 47.0  | 24.0  | 71.0  | 71.0  | 39.0  |      |      | 39.0  |      | 20.0  |
| Total Split (%)       | 36.2% | 36.2% | 36.2% | 18.5% | 54.6% | 54.6% | 30.0% |      |      | 30.0% |      | 15.4% |
| Yellow Time (s)       | 3.7   | 3.7   | 3.7   | 3.7   | 3.7   | 3.7   | 3.0   |      |      | 3.0   |      | 3.3   |
| All-Red Time (s)      | 2.0   | 2.0   | 2.0   | 2.5   | 2.0   | 2.0   | 3.8   |      |      | 3.8   |      | 3.0   |
| Lost Time Adjust (s)  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      |      | 0.0   |      | 0.0   |
| Total Lost Time (s)   | 5.7   | 5.7   | 5.7   | 6.2   | 5.7   | 5.7   | 6.8   |      |      | 6.8   |      | 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  |
| Act Effct Green (s)   | 68.6  | 68.6  | 12.1  | 87.0  | 87.0  | 11.7  | 11.7  |      |      | 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  |
| 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   |
| LOS                   | C     | A     | E     | A     | A     | E     | B     |      |      | E     |      | 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%  
 Analysis Period (min) 15  
 ICU Level of Service C



Synchro 9 Report Page 1

Queues  
1: Centrepointe Drive/Highgate Road & Baseline Road  
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**

Synchro 9 Report Page 2

Lanes, Volumes, Timings  
2: Constellation Drive & Baseline Road  
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  | 3471  | 1601  |
| Flt Permitted         |       |       |       | 0.950 |       | 0.950 |
| Satd. Flow (perm)     | 5142  | 1601  | 3471  | 3579  | 3471  | 1601  |
| 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     | 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)   | 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%  
 Analysis Period (min) 15  
 ICU Level of Service C



Synchro 9 Report Page 3

Queues  
2: Constellation Drive & Baseline Road  
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.

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 | WBLn1 | 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   | -   |

| 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    | -      |
| 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 | EBLn1 | 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   | -   | -   |

Lanes, Volumes, Timings  
1: Centrepointe Drive/Highgate Road & Baseline Road  
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  | 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)   | 59.1  | 59.1  | 59.1  | 12.0  | 77.3  | 77.3  | 22.3  | 22.3  | 11.5  | 11.5  | 11.5  | 11.5  |
| Actuated g/C Ratio    | 0.45  | 0.45  | 0.45  | 0.09  | 0.59  | 0.59  | 0.17  | 0.17  | 0.09  | 0.09  | 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  | 0.22  | 0.22  |
| Control Delay         | 31.3  | 24.1  | 4.2   | 71.0  | 17.0  | 1.5   | 59.1  | 9.2   | 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           | 31.3  | 24.1  | 4.2   | 71.0  | 17.0  | 1.5   | 59.1  | 9.2   | 67.6  | 1.9   | 1.9   | 1.9   |
| LOS                   | C     | C     | A     | E     | B     | A     | E     | A     | E     | A     | A     | 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%                                                          |
| ICU Level of Service:              | D                                                              |
| Analysis Period (min):             | 15                                                             |



Queues  
1: Centrepointe Drive/Highgate Road & Baseline Road  
2020 FBG PM Peak

| Lane Group             | EBL  | EBT   | EBR   | WBL   | WBT   | WBR  | NBL  | NBR  | SBL  | SBR  |
|------------------------|------|-------|-------|-------|-------|------|------|------|------|------|
| Lane Group Flow (vph)  | 29   | 709   | 202   | 179   | 1386  | 122  | 447  | 0    | 231  | 80   |
| 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 | -    | 37.5 | -    | -    |
| 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 |

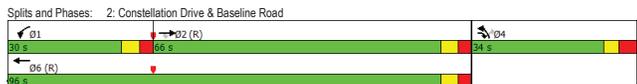
| Intersection Summary |     |
|----------------------|-----|
| Queue Length:        | 130 |

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     | 4     |
| Permitted Phases      |       | 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)   | 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



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.

HCM 2010 TWSC  
3: Centrepointhe 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              | -      | -      | -      |
| 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/WBL1 | SBL   | SBT |
|-----------------------|-----|----------|-------|-----|
| Capacity (veh/h)      | -   | 571      | 978   | -   |
| HCM Lane V/C Ratio    | -   | 0.194    | 0.018 | -   |
| HCM Control Delay (s) | -   | 12.8     | 8.8   | 0.1 |
| HCM Lane LOS          | -   | B        | A     | A   |
| HCM 95th %tile Q(veh) | -   | 0.7      | 0.1   | -   |

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      | -      | -      |
| Stage 2              | 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 | EBL1  | 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     | -   | -   |

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  | Perm | Prot | Prot  | Perm | Perm  |
| Protected Phases      | 2     | 2     | 2     | 1     | 6     | 6     | 10    |      |      | 4     |      | 4     |
| Permitted Phases      | 2     | 2     | 2     | 1     | 6     | 6     | 10    |      |      | 4     |      | 4     |
| Detector Phase        | 2     | 2     | 2     | 1     | 6     | 6     | 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  |
| Minimum Split (s)     | 25.7  | 25.7  | 25.7  | 11.2  | 25.7  | 25.7  | 38.8  |      |      | 38.8  |      | 16.3  |
| Total Split (s)       | 47.0  | 47.0  | 47.0  | 24.0  | 71.0  | 71.0  | 39.0  |      |      | 39.0  |      | 20.0  |
| Total Split (%)       | 36.2% | 36.2% | 36.2% | 18.5% | 54.6% | 54.6% | 30.0% |      |      | 30.0% |      | 15.4% |
| Yellow Time (s)       | 3.7   | 3.7   | 3.7   | 3.7   | 3.7   | 3.7   | 3.0   |      |      | 3.0   |      | 3.3   |
| All-Red Time (s)      | 2.0   | 2.0   | 2.0   | 2.5   | 2.0   | 2.0   | 3.8   |      |      | 3.8   |      | 3.0   |
| Lost Time Adjust (s)  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |      |      | 0.0   |      | 0.0   |
| Total Lost Time (s)   | 5.7   | 5.7   | 5.7   | 6.2   | 5.7   | 5.7   | 6.8   |      |      | 6.8   |      | 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  |
| Act Effct Green (s)   | 68.0  | 68.0  | 12.3  | 86.5  | 86.5  | 12.2  | 12.5  |      |      | 12.5  |      | 12.5  |
| Actuated g/C Ratio    | 0.52  | 0.52  | 0.09  | 0.67  | 0.67  | 0.09  | 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  |
| 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   |
| LOS                   | C     | A     | E     | A     | A     | E     | B     |      |      | E     |      | 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 LOS: C  
 Intersection Capacity Utilization 72.4%  
 ICU Level of Service C  
 Analysis Period (min) 15



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 |

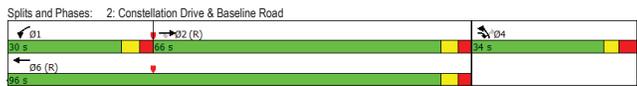
**Intersection Summary**

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 |       |       |
| 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     | 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)   | 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 LOS: B  
 Intersection Capacity Utilization 70.4%  
 ICU Level of Service C  
 Analysis Period (min) 15



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 | 966    | 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 | NBR | WBLn1 | SBL   | SBT |
|-----------------------|-----|-----|-------|-------|-----|
| Capacity (veh/h)      | -   | -   | 562   | 1173  | -   |
| HCM Lane V/C Ratio    | -   | -   | 0.189 | 0.159 | -   |
| HCM Control Delay (s) | -   | -   | 12.9  | 8.6   | 0.3 |
| HCM Lane LOS          | -   | -   | B     | A     | A   |
| HCM 95th %tile Q(veh) | -   | -   | 0.7   | 0.6   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 1.5  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      | ↔    | ↔    | ↔    | ↕    | ↕    | ↔    |
| Traffic Vol, veh/h       | 0    | 100  | 0    | 116  | 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 | EBLn1 | 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   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 3    |      |      |      |      |      |
| Movement                 | EBL  | EBT  | WBT  | WBR  | SBL  | SBR  |
| 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   |

| 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     | -     | 6     | -     | 10    | -     | 4     | -     |
| Detector Phase        | 2     | -     | 2     | -     | 6     | -     | 6     | -     | 10    | -     | 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 Effct 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  | 0.76  | 0.51  | 0.51  | 0.22  | 0.22  |
| Control Delay         | 32.6  | 25.0  | 4.3   | 69.6  | 17.9  | 1.6   | 58.4  | 58.4  | 8.8   | 67.6  | 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  | 58.4  | 8.8   | 67.6  | 1.9   | 1.9   |
| LOS                   | C     | C     | A     | E     | B     | A     | E     | E     | A     | E     | 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: Centrepointe Drive/Highgate Road & Baseline Road  
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 |       | 258.8 |      |       |      |      |      |      |      |
| Turn Bay Length (m)    | 55.0  | 135.0 | 110.0 | 95.0 |       |      |      |      |      |      |
| 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

2140 Baseline Road TIA  
2020 Total Future PM Peak

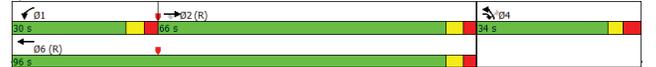
Lanes, Volumes, Timings  
2: Constellation Drive & Baseline Road  
2020 Total Future PM Peak

| 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    |       |       |       |       |       |
| 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     | 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)   | 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



Queues  
2: Constellation Drive & Baseline Road  
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.

2140 Baseline Road TIA  
2020 Total Future PM Peak

HCM 2010 TWSC  
3: Centrepointe Drive & Gemini Way  
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           | None   | None     | None   | 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                | 32     | 132      | 594    | 18    | 35   | 364  |
| Major/Minor              | Minor1 | Major1   | Major2 |       |      |      |
| Conflicting Flow All     | 810    | 297      | 0      | 594   | 0    |      |
| Stage 1                  | 594    | -        | -      | -     | -    |      |
| Stage 2                  | 216    | -        | -      | -     | -    |      |
| Critical Hdwy Stg 1      | 6.29   | 6.94     | -      | 4.14  | -    |      |
| Critical Hdwy Stg 2      | 5.84   | -        | -      | -     | -    |      |
| Follow-up Hdwy           | 3.67   | 3.32     | -      | 2.22  | -    |      |
| Pot Cap-1 Maneuver       | 350    | 699      | -      | 978   | -    |      |
| Stage 1                  | 499    | -        | -      | -     | -    |      |
| Stage 2                  | 761    | -        | -      | -     | -    |      |
| Platoon blocked, %       | -      | -        | -      | -     | -    |      |
| Mov Cap-1 Maneuver       | 334    | 699      | -      | 978   | -    |      |
| Mov Cap-2 Maneuver       | 334    | -        | -      | -     | -    |      |
| Stage 1                  | 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/WBL1 | SBL    | SBT   |      |      |
| Capacity (veh/h)         | -      | -        | 576    | 978   | -    |      |
| HCM Lane v/c Ratio       | -      | -        | 0.285  | 0.036 | -    |      |
| HCM Control Delay (s)    | -      | -        | 13.7   | 8.8   | 0.1  |      |
| HCM Lane LOS             | -      | -        | B      | A     | A    |      |
| HCM 95th %tile Q(veh)    | -      | -        | 1.2    | 0.1   | -    |      |

| 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  
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  | NA  | Perm | Prot  | NA  | Perm  |
| Protected Phases      | 2     | 2     | 2     | 1     | 6     | 6     | 10    |     |      | 4     |     | 4     |
| Permitted Phases      | 2     | 2     | 2     | 1     | 6     | 6     | 10    |     |      | 4     |     | 4     |
| Detector Phase        | 2     | 2     | 2     | 1     | 6     | 6     | 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  |
| Minimum Split (s)     | 25.7  | 25.7  | 25.7  | 11.2  | 25.7  | 25.7  | 38.8  |     |      | 38.8  |     | 16.3  |
| Total Split (s)       | 47.0  | 47.0  | 47.0  | 24.0  | 71.0  | 71.0  | 39.0  |     |      | 39.0  |     | 20.0  |
| Total Split (%)       | 36.2% | 36.2% | 36.2% | 18.5% | 54.6% | 54.6% | 30.0% |     |      | 30.0% |     | 15.4% |
| Yellow Time (s)       | 3.7   | 3.7   | 3.7   | 3.7   | 3.7   | 3.7   | 3.0   |     |      | 3.0   |     | 3.3   |
| All-Red Time (s)      | 2.0   | 2.0   | 2.0   | 2.5   | 2.0   | 2.0   | 3.8   |     |      | 3.8   |     | 3.0   |
| Lost Time Adjust (s)  | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |     |      | 0.0   |     | 0.0   |
| Total Lost Time (s)   | 5.7   | 5.7   | 5.7   | 6.2   | 5.7   | 5.7   | 6.8   |     |      | 6.8   |     | 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  |
| Act Effct Green (s)   | 65.9  | 65.9  | 13.0  | 85.0  | 85.0  | 13.5  | 13.5  |     |      | 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  |
| 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   |
| LOS                   | C     | A     | E     | A     | A     | E     | C     |     |      | E     |     | 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:EBT 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%  
 Analysis Period (min) 15  
 ICU Level of Service D



Queues  
1: Centrepointe Drive/Highgate Road & Baseline Road  
2025 Ultimate AM Peak

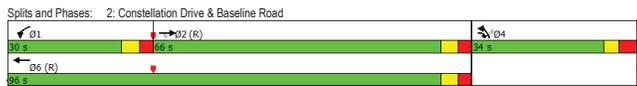
| Lane Group             | EBT   | EBR   | WBL   | WBT   | WBR  | NBL  | NBR  | SBL  | SBR  |
|------------------------|-------|-------|-------|-------|------|------|------|------|------|
| Lane Group Flow (vph)  | 1869  | 630   | 205   | 587   | 63   | 171  | 340  | 125  | 79   |
| v/c Ratio              | 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.

Lanes, Volumes, Timings  
2: Constellation Drive & Baseline Road  
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  | 3471  | 1601  |
| Flt Permitted         |       |       | 0.950 |       | 0.950 |       |
| Satd. Flow (perm)     | 5142  | 1601  | 3471  | 3579  | 3471  | 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     | 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)   | 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%  
 Analysis Period (min) 15  
 ICU Level of Service D



Queues  
2: Constellation Drive & Baseline Road  
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.

| 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 | WBLn1 | SBL   | SBT |
|-----------------------|-----|-----|-------|-------|-----|
| Capacity (veh/h)      | -   | -   | 511   | 1138  | -   |
| HCM Lane V/C Ratio    | -   | -   | 0.215 | 0.177 | -   |
| HCM Control Delay (s) | -   | -   | 14    | 8.8   | 0.4 |
| HCM Lane LOS          | -   | -   | B     | A     | A   |
| HCM 95th %tile Q(veh) | -   | -   | 0.8   | 0.6   | -   |

| 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      | -      | -      |
| Stage 2              | 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 | EBLn1 | SBT | SBR |
|-----------------------|-----|-------|-----|-----|
| 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   | -   | -   |

| 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    | -    | 0    |
| Grade, %                 | -    | 0    | 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      | -      |
| Stage 1              | -      | -      | 237    |
| Stage 2              | -      | -      | 62     |
| Critical Hdwy        | 4.12   | -      | -      |
| Critical Hdwy Stg 1  | -      | -      | 6.42   |
| Critical Hdwy Stg 2  | -      | -      | 5.42   |
| Follow-up Hdwy       | 2.218  | -      | -      |
| Pot Cap-1 Maneuver   | 1527   | -      | -      |
| Stage 1              | -      | -      | 751    |
| Stage 2              | -      | -      | 1003   |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | 1527   | -      | -      |
| Mov Cap-2 Maneuver   | -      | -      | -      |
| Stage 1              | -      | -      | 734    |
| Stage 2              | -      | -      | 1003   |

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

| Minor Lane/Major Mvmt | EBL   | EBT | WBT | WBR | SBLn1 |
|-----------------------|-------|-----|-----|-----|-------|
| Capacity (veh/h)      | 1527  | -   | -   | -   | 975   |
| HCM Lane V/C Ratio    | 0.022 | -   | -   | -   | 0.066 |
| HCM Control Delay (s) | 7.4   | 0   | -   | -   | 9     |
| HCM Lane LOS          | A     | A   | -   | -   | A     |
| HCM 95th %tile Q(veh) | 0.1   | -   | -   | -   | 0.2   |

| 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     | -     |
| Detector Phase        | 2     | -     | 2     | -     | 6     | -     | 6     | -     | 10    | -     | 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% | 30.0% | 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   | 6.8   | 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)   | 55.2  | 55.2  | 55.2  | 12.9  | 74.3  | 74.3  | 25.1  | 25.1  | 25.1  | 11.8  | 11.8  | 11.8  |
| Actuated g/C Ratio    | 0.42  | 0.42  | 0.42  | 0.10  | 0.57  | 0.57  | 0.19  | 0.19  | 0.19  | 0.09  | 0.09  | 0.09  |
| v/c Ratio             | 0.37  | 0.36  | 0.29  | 0.59  | 0.74  | 0.14  | 0.77  | 0.52  | 0.54  | 0.24  | 0.24  | 0.24  |
| 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: Centrepointe Drive/Highgate Road & Baseline Road  
2025 Ultimate PM Peak

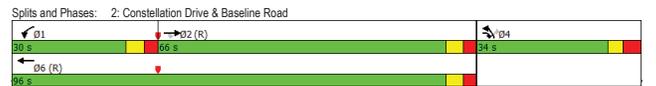
| Lane Group             | EBL   | EBT   | EBR   | WBL   | WBT   | WBR  | NBL  | NBR  | SBL  | SBR  |
|------------------------|-------|-------|-------|-------|-------|------|------|------|------|------|
| Lane Group Flow (vph)  | 32    | 776   | 233   | 202   | 1520  | 133  | 515  | 275  | 88   | 64   |
| 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.

Lanes, Volumes, Timings  
2: Constellation Drive & Baseline Road  
2025 Ultimate PM Peak

| Lane Group            | EBT   | EBR   | WBL   | WBT   | NBL   | NBR   |
|-----------------------|-------|-------|-------|-------|-------|-------|
| Lane Configurations   | ↑↑↑   | ↑     | ↑↑    | ↑↑    | ↑↑    | ↑     |
| 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 Effct 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



Queues  
2: Constellation Drive & Baseline Road  
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.

HCM 2010 TWSC  
3: Centrepointe Drive & Gemini Way  
2025 Ultimate PM Peak

| Intersection             | WB                            | NB | SB  |
|--------------------------|-------------------------------|----|-----|
| Int Delay, s/veh         | 2.3                           |    |     |
| Movement                 | WBL WBR NBT NBR SBL SBT       |    |     |
| Lane Configurations      | ↑↑                            | ↑↑ | ↑↑↑ |
| 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           | 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                | 34 140 651 19 37 399          |    |     |
| Major/Minor              | Minor1 Major1 Major2          |    |     |
| Conflicting Flow All     | 855 326 0 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           | 3.67 3.32 - - 2.22 -          |    |     |
| Pot Cap-1 Maneuver       | 317 670 - - 931 -             |    |     |
| Stage 1                  | 467 - - - - -                 |    |     |
| Stage 2                  | 745 - - - - -                 |    |     |
| Platoon blocked, %       | - - - - -                     |    |     |
| 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/WBL1 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 %tile Q(veh)    | - - 1.4 0.1 -                 |    |     |

| 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   |    | 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   |

Conclusion

## Appendix D TDM CHECKLISTS

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

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

| TDM-supportive design & infrastructure measures:<br><i>Residential developments</i> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Check if completed &<br>add descriptions, explanations<br>or plan/drawing references |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>1. WALKING &amp; CYCLING: ROUTES</b>                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                      |
| <b>1.1 Building location &amp; access points</b>                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                      |
| <b>BASIC</b>                                                                        | 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"/>                                                  |
| <b>BASIC</b>                                                                        | 1.1.2 Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <input checked="" type="checkbox"/>                                                  |
| <b>BASIC</b>                                                                        | 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"/>                                                  |
| <b>1.2 Facilities for walking &amp; cycling</b>                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                      |
| <b>REQUIRED</b>                                                                     | 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"/>                                                  |
| <b>REQUIRED</b>                                                                     | 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"/>                                                  |

| <b>TDM-supportive design &amp; infrastructure measures:<br/><i>Residential developments</i></b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Check if completed &amp;<br/>add descriptions, explanations<br/>or plan/drawing references</b> |
|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>REQUIRED</b>                                                                                 | 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"/>                                                               |
| <b>REQUIRED</b>                                                                                 | 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"/>                                                               |
| <b>REQUIRED</b>                                                                                 | 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"/>                                                               |
| <b>BASIC</b>                                                                                    | 1.2.6 Provide safe, direct and attractive walking routes from building entrances to nearby transit stops                                                                                                                                                                                                                                                                                                                                                       | <input checked="" type="checkbox"/>                                                               |
| <b>BASIC</b>                                                                                    | 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                                                                      |
| <b>BASIC</b>                                                                                    | 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                                                                      |
| <b>1.3 Amenities for walking &amp; cycling</b>                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                   |
| <b>BASIC</b>                                                                                    | 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                                                                      |
| <b>BASIC</b>                                                                                    | 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:<br><i>Residential developments</i> |                                                                                                                                                                                                                                                                                | Check if completed &<br>add descriptions, explanations<br>or plan/drawing references |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>2. WALKING &amp; CYCLING: END-OF-TRIP FACILITIES</b>                             |                                                                                                                                                                                                                                                                                |                                                                                      |
| <b>2.1 Bicycle parking</b>                                                          |                                                                                                                                                                                                                                                                                |                                                                                      |
| 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                                                         |
| <b>2.2 Secure bicycle parking</b>                                                   |                                                                                                                                                                                                                                                                                |                                                                                      |
| 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                                                         |
| <b>2.3 Bicycle repair station</b>                                                   |                                                                                                                                                                                                                                                                                |                                                                                      |
| 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                                                         |
| <b>3. TRANSIT</b>                                                                   |                                                                                                                                                                                                                                                                                |                                                                                      |
| <b>3.1 Customer amenities</b>                                                       |                                                                                                                                                                                                                                                                                |                                                                                      |
| 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:<br><i>Residential developments</i> |                                                                                                                                                                                                                                                                                                    | Check if completed &<br>add descriptions, explanations<br>or plan/drawing references |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>4. RIDESHARING</b>                                                               |                                                                                                                                                                                                                                                                                                    |                                                                                      |
| <b>4.1 Pick-up &amp; drop-off facilities</b>                                        |                                                                                                                                                                                                                                                                                                    |                                                                                      |
| 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"/>                                                  |
| <b>5. CARSHARING &amp; BIKESHARING</b>                                              |                                                                                                                                                                                                                                                                                                    |                                                                                      |
| <b>5.1 Carshare parking spaces</b>                                                  |                                                                                                                                                                                                                                                                                                    |                                                                                      |
| 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                                                         |
| <b>5.2 Bikeshare station location</b>                                               |                                                                                                                                                                                                                                                                                                    |                                                                                      |
| 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                                                         |
| <b>6. PARKING</b>                                                                   |                                                                                                                                                                                                                                                                                                    |                                                                                      |
| <b>6.1 Number of parking spaces</b>                                                 |                                                                                                                                                                                                                                                                                                    |                                                                                      |
| 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                                                         |
| <b>6.2 Separate long-term &amp; short-term parking areas</b>                        |                                                                                                                                                                                                                                                                                                    |                                                                                      |
| 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)*

| <b>Legend</b> |                                                                                                                |
|---------------|----------------------------------------------------------------------------------------------------------------|
| <b>BASIC</b>  | The measure is generally feasible and effective, and in most cases would benefit the development and its users |
| <b>BETTER</b> | 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: <i>Residential developments</i>                       |                                                                                                                                               | Check if proposed & add descriptions |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| <b>1. TDM PROGRAM MANAGEMENT</b>                                    |                                                                                                                                               |                                      |
| <b>1.1 Program coordinator</b>                                      |                                                                                                                                               |                                      |
| <b>BASIC</b>                                                        | ★ 1.1.1 Designate an internal coordinator, or contract with an external coordinator                                                           | <input checked="" type="checkbox"/>  |
| <b>1.2 Travel surveys</b>                                           |                                                                                                                                               |                                      |
| <b>BETTER</b>                                                       | 1.2.1 Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress              | <input checked="" type="checkbox"/>  |
| <b>2. WALKING AND CYCLING</b>                                       |                                                                                                                                               |                                      |
| <b>2.1 Information on walking/cycling routes &amp; destinations</b> |                                                                                                                                               |                                      |
| <b>BASIC</b>                                                        | 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"/>  |
| <b>2.2 Bicycle skills training</b>                                  |                                                                                                                                               |                                      |
| <b>BETTER</b>                                                       | 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 |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| <b>3. TRANSIT</b>                               |                                                                                                                                                  |                                      |
| <b>3.1 Transit information</b>                  |                                                                                                                                                  |                                      |
| 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"/>  |
| <b>3.2 Transit fare incentives</b>              |                                                                                                                                                  |                                      |
| 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"/>  |
| <b>3.3 Enhanced public transit service</b>      |                                                                                                                                                  |                                      |
| 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"/>  |
| <b>3.4 Private transit service</b>              |                                                                                                                                                  |                                      |
| BETTER                                          | 3.4.1 Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)                               | <input checked="" type="checkbox"/>  |
| <b>4. CARSHARING &amp; BIKESHARING</b>          |                                                                                                                                                  |                                      |
| <b>4.1 Bikeshare stations &amp; memberships</b> |                                                                                                                                                  |                                      |
| 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"/>  |
| <b>4.2 Carshare vehicles &amp; memberships</b>  |                                                                                                                                                  |                                      |
| 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"/>  |
| <b>5. PARKING</b>                               |                                                                                                                                                  |                                      |
| <b>5.1 Priced parking</b>                       |                                                                                                                                                  |                                      |
| 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 |
|-----------------------------------------------|-------------------------------------------------------------------------------|--------------------------------------|
| <b>6. TDM MARKETING &amp; COMMUNICATIONS</b>  |                                                                               |                                      |
| <b>6.1 Multimodal travel information</b>      |                                                                               |                                      |
| <b>BASIC</b> ★                                | 6.1.1 Provide a multimodal travel option information package to new residents | <input checked="" type="checkbox"/>  |
| <b>6.2 Personalized trip planning</b>         |                                                                               |                                      |
| <b>BETTER</b> ★                               | 6.2.1 Offer personalized trip planning to new residents                       | <input checked="" type="checkbox"/>  |