

Memorandum

To: Les Ranta, JL Richards Associates
Cc:
From: Stephen Keen, HDR
Date: May 30, 2012
Re: **DRAFT - Seymour Street Traffic Operations Report,
Seymour Street EA, City of North Bay**

This report has been prepared in support of the Municipal Class EA study for the reconstruction of Seymour Street between (east of) Station Road and Wallace Road. The study area is illustrated in **Exhibit 1** below.

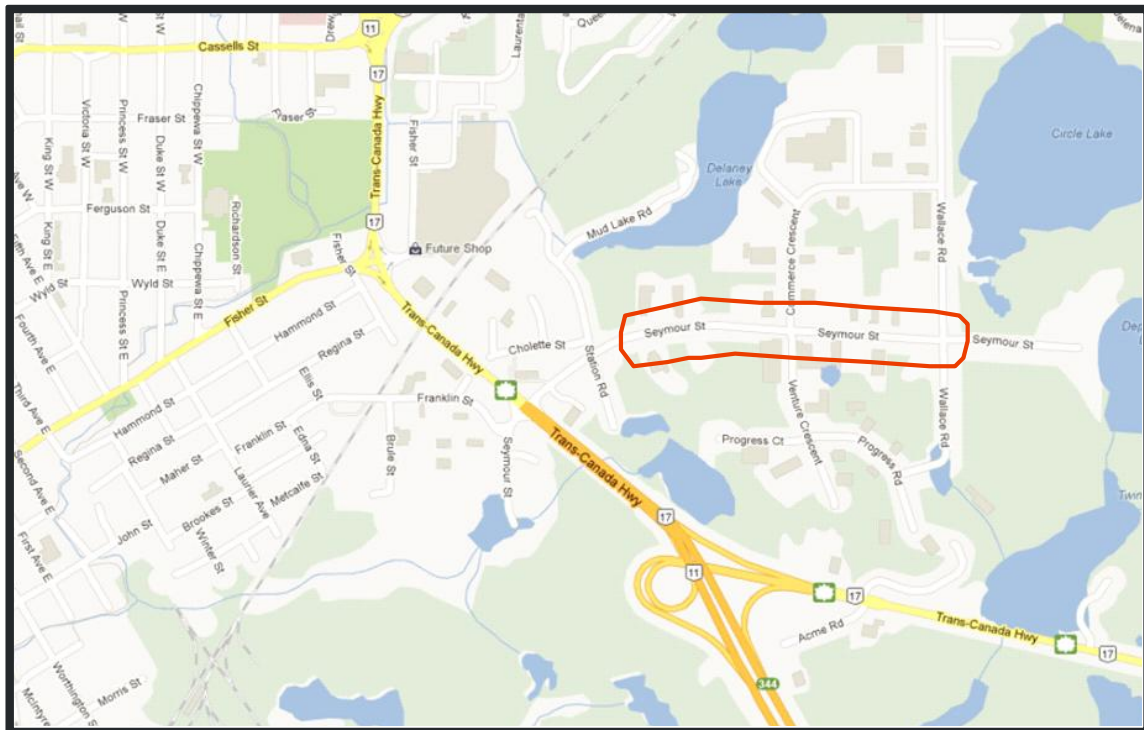


Exhibit 1: Study Area

1. EXISTING CONDITIONS

1.1 Roadway Conditions

The existing lane configuration along Seymour Street between Station Road and Wallace Road is illustrated in **Exhibit 2** below. The intersections of Station Road, Commerce Crescent / Venture Crescent, and Wallace Road with Seymour Street are two-way stop control. Seymour Street is four lanes from Highway 11/17 to east of Station Road where it drops down to a two-lane road. There are currently no sidewalks and no cycling facilities along Seymour Street. The posted speed along this section of Seymour Street is 50 km/h. The land use adjacent to Seymour Street consists mainly of employment type land uses (commercial and industrial). There are a significant number of commercial / industrial driveways onto Seymour Street east of Station Road.

The Annual Average Daily Traffic (AADT) on Seymour Street is around 17,710 (two-way) vehicles per day east of Highway 11/17, 13,360 (two-way) vehicles per day west of Commerce Crescent / Venture Crescent and 7,580 (two-way) vehicles per day east of Commerce Crescent / Venture Crescent.

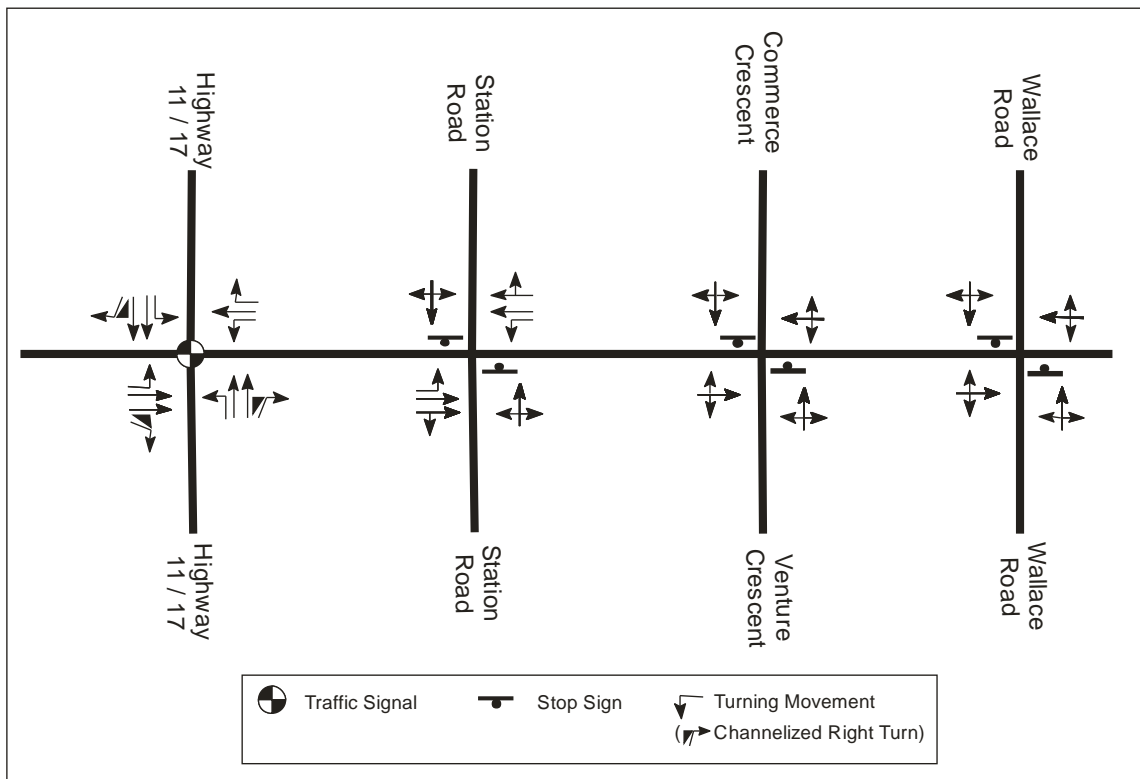


Exhibit 2: Road Network Configuration

1.2 Traffic Volumes

The existing weekday AM and PM peak hour traffic volumes for Seymour Street were obtained from the City of North Bay for the intersection of Seymour Street at Commerce Crescent / Venture Crescent. The traffic volumes were collected late 2011 and early 2012. The existing weekday AM and PM traffic volumes are shown in **Exhibit 3** below.

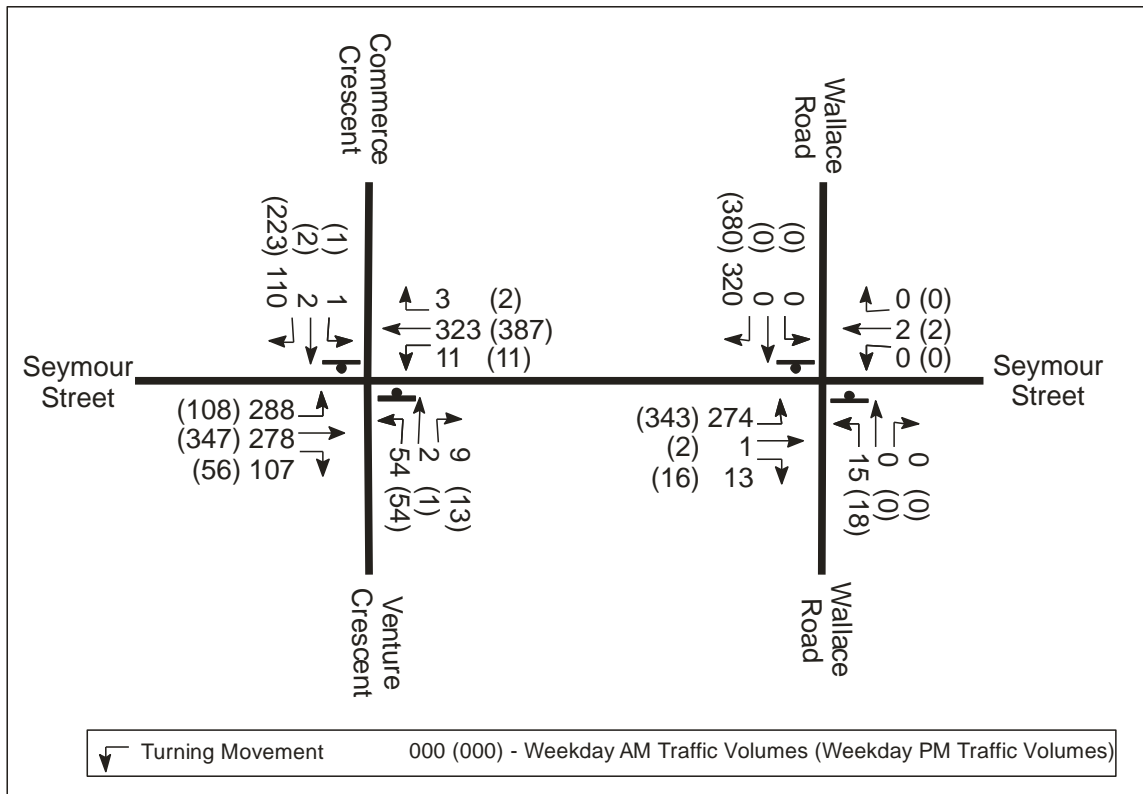


Exhibit 3: Existing Traffic Volumes

It should be noted that no traffic data was obtained for the intersection of Seymour Street and Wallace Road. Based on discussions with local employees, it was determined that majority of traffic (approximately 95% - if not greater) moves between Seymour Street and the north leg of Wallace Road.

1.3 Traffic Operations

Analysis of the intersections were conducted using Synchro 7 which employs methodology from the Highway Capacity Manual (HCM 2000) published by the Transportation Research Board National Research Council. Synchro 7 can analyze both signalized and unsignalized intersections in a road corridor or network taking into account the spacing, interaction, queues and operations between intersections.

In order to test future roundabout alternatives, roundabout analysis was undertaken using SIDRA software which is recognized by the Highway Capacity Manual, TRB-FHWA Roundabout Guide, and many other jurisdictions around the world. SIDRA bases the roundabout calculations from the Highway Capacity Manual (which makes it comparable to Synchro results) for roundabout analysis.

For this report, Commerce Crescent / Venture Crescent will be documented with a north south orientation while Seymour Street will be documented with an east-west orientation.

1.3.1 Existing Traffic Operations

The existing traffic operations for the unsignalized intersection of Seymour Street at Commerce Crescent / Venture Crescent were analyzed based on the existing traffic volumes and the existing road lane configurations. The weekday AM and PM peak hour traffic operations are summarized in **Table 1** below.

Table 1: Existing Intersection Operations

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|-------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (unsignalized) | | | | | | |
| Overall | D | | | D | | |
| Eastbound left-through-right | A | 0.26 | 5.6 | A | 0.10 | 2.7 |
| Westbound left-through-right | A | 0.01 | 0.4 | A | 0.001 | 0.3 |
| Northbound left-through-right | F | 0.92 | 173.0 | F | 0.83 | 135.1 |
| Southbound left-through-right | B | 0.21 | 12.6 | B | 0.40 | 14.8 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – control delay in seconds

The unsignalized intersection of Seymour Street at Commerce Crescent / Venture Crescent operates with an overall level of service ‘D’ during both the weekday AM and PM peak hours under existing traffic conditions. The shared northbound left-through-right turn movement is show a higher delay than acceptable thresholds during both the weekday AM and PM peak hours.

Based on the analysis, the northbound left turn from Venture Crescent is the main cause to the delay to the northbound movement. Adding an exclusive northbound left turn lane would not reduce the delay for the northbound left turn movement.

1.3.2 Left Turn Lane Warrant

A left turn lane warrant analysis based on MTO Geometric Design guidelines was undertaken for the eastbound movement at the intersection of Seymour Street and Commerce Crescent / Venture Crescent for existing conditions.

The left turn lane warrant analysis results show that a left turn lane with 40m of storage for the eastbound left turn movement in the weekday AM peak hour (the weekday PM peak hour warrants a left turn lane with a storage length of 25m). The left turn lane warrant analysis is attached to this report in Appendix B.

1.3.3 Signal Warrant

A traffic signal warrant analysis based on the latest OTM Book 12, Ministry of Transportation Ontario methodology was undertaken for the intersection of Seymour Street at Commerce Crescent / Venture Crescent.

The signal warrant analysis results show that the intersection is warranted under Justification 3 – combination of minor vehicular volume and delay to cross traffic under existing conditions. The signal warrant analysis is attached to this report in Appendix C.

1.3.4 Traffic Operations with Signals

Based on the results of the signal warrant analysis for the intersection of Seymour Street at Commerce Crescent / Venture Crescent, a traffic operations analysis was undertaken based on existing traffic volumes, traffic signals with a cycle length of 60 seconds, and an exclusive eastbound left turn lane. The results for the existing AM and PM peak hour conditions are shown in **Table 2** below.

Table 2: Seymour Street at Commerce / Venture Existing Operations with Signals

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (signalized) | | | | | | |
| Overall | A | | | A | | |
| Eastbound left | A | 0.54 | 9.1 | A | 0.25 | 6.3 |
| Eastbound through-right | A | 0.45 | 5.8 | A | 0.53 | 7.9 |
| Westbound left-through-right | A | 0.39 | 6.0 | A | 0.53 | 8.2 |
| Northbound left-through-right | B | 0.23 | 14.1 | A | 0.20 | 9.7 |
| Southbound left-through-right | A | 0.26 | 5.9 | A | 0.41 | 4.5 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – control delay in seconds

Under existing conditions with traffic signals, the intersection of Seymour Street at Commerce Crescent / Venture Crescent would operate with an overall level of service ‘A’ during both the weekday AM and PM peak hours.

1.3.5 Traffic Operations with Roundabout

As with most cases when an intersection requires traffic signal installation, a roundabout should also be considered due to the roundabouts safety, delay reduction and environmental benefits.

The existing traffic operations for the unsignalized intersection of Seymour Street at Commerce Crescent / Venture Crescent were analyzed based on the existing traffic volumes and a roundabout with an Inscribed Circle Diameter (ICD) of 40m (the default dimension for a signal lane roundabout). The existing weekday AM and PM peak hour roundabout operational results are summarized in **Table 3** below.

Table 3: Seymour Street at Commerce / Venture Existing Operations with Roundabout

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (roundabout) | | | | | | |
| Overall | A | | | A | | |
| Eastbound approach | A | 0.48 | 5.0 | A | 0.37 | 3.3 |
| Westbound approach | B | 0.43 | 5.1 | B | 0.41 | 3.2 |
| Northbound approach | B | 0.10 | 12.2 | B | 0.09 | 10.9 |
| Southbound approach | B | 0.16 | 6.2 | B | 0.33 | 7.2 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – average delay in seconds

Under existing traffic conditions, a single lane roundabout with an ICD of 40m would operate with an overall level of service ‘A’ during both the weekday AM and PM peak hours with less delay.

Depending on property and geometric constraints, a roundabout could be considered as an alternative form of traffic control for the intersection of Seymour Street and Commerce Crescent / Venture Crescent.

1.4 Safety Review

No collision records are available for this section of Seymour Street. Available collision records were focused on the Highway 11 / 17 and Seymour Street intersection.

2. FUTURE TRAFFIC CONDITIONS

2.1 Traffic Growth

A traffic growth rate of 1% per annum was calculated based on historic traffic data obtained from MTO data sources (*Provincial Highways Traffic Volumes 1988-2008*) and the *Extended Stay Hotel – Addendum to Seymour Street Hotel Traffic Impact Study, October 2006* prepared by Tranplan Associates. The 1% growth rate was applied to the existing traffic to forecast five, ten, fifteen, and twenty year horizons.

Based on discussions with the City of North Bay, no future development of significant size has been identified near the vicinity of the study area. There is a small residential

condominium development planned for Wallace Road with the traffic generated by this development to be captured with the 1% growth rate. A future extension of Seymour Street westward to Worthing Street East has also been proposed in the City of North Bay Official Plan, however the additional traffic volume resulting from completion of this extension is not included in this report because a firm timetable for the extension has not yet been determined.

The future traffic volumes for the 2016 (five year), 2021 (ten year), 2026 (fifteen year), and 2031 (twenty year) horizons are illustrated in **Exhibit 4**, **Exhibit 5**, **Exhibit 6**, and **Exhibit 7** respectively.

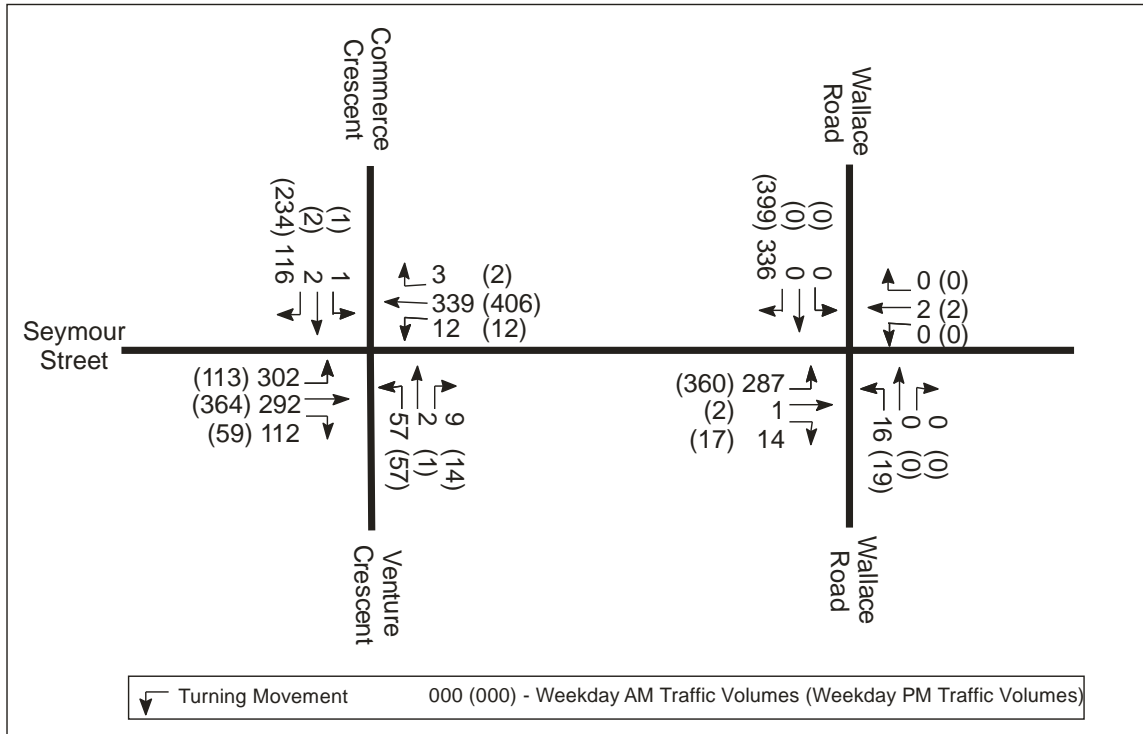


Exhibit 4: 2016 Traffic Volumes

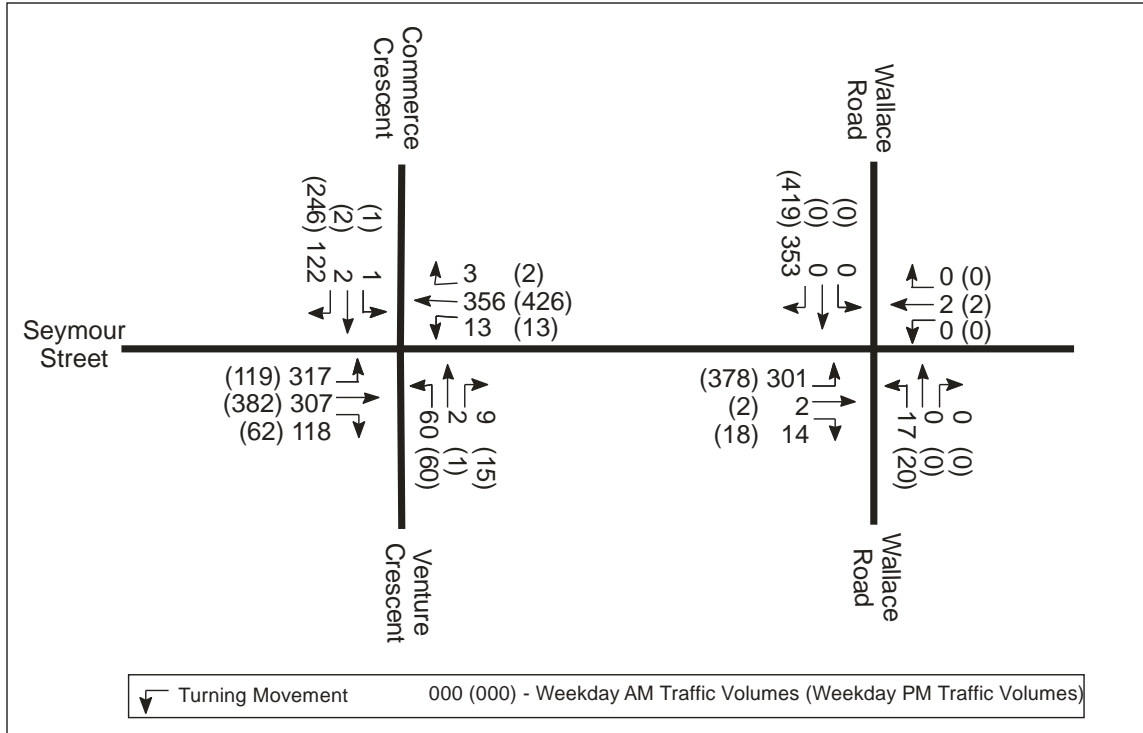


Exhibit 5: 2021 Traffic Volumes

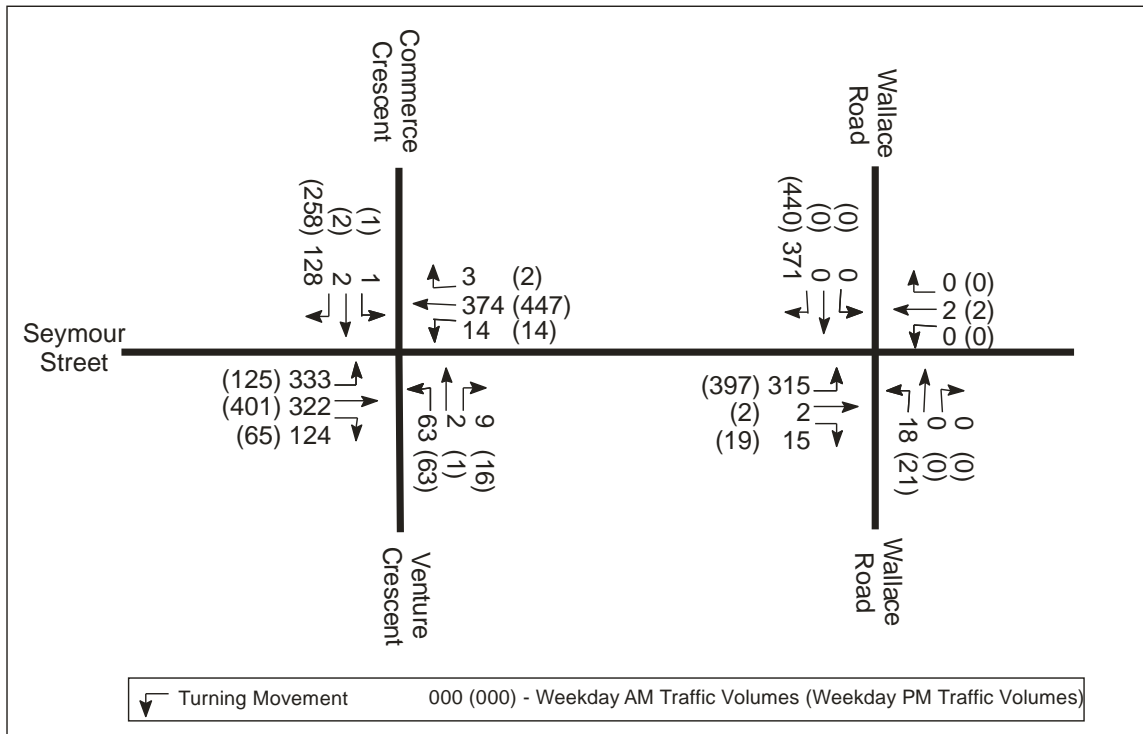


Exhibit 6: 2026 Traffic Volumes

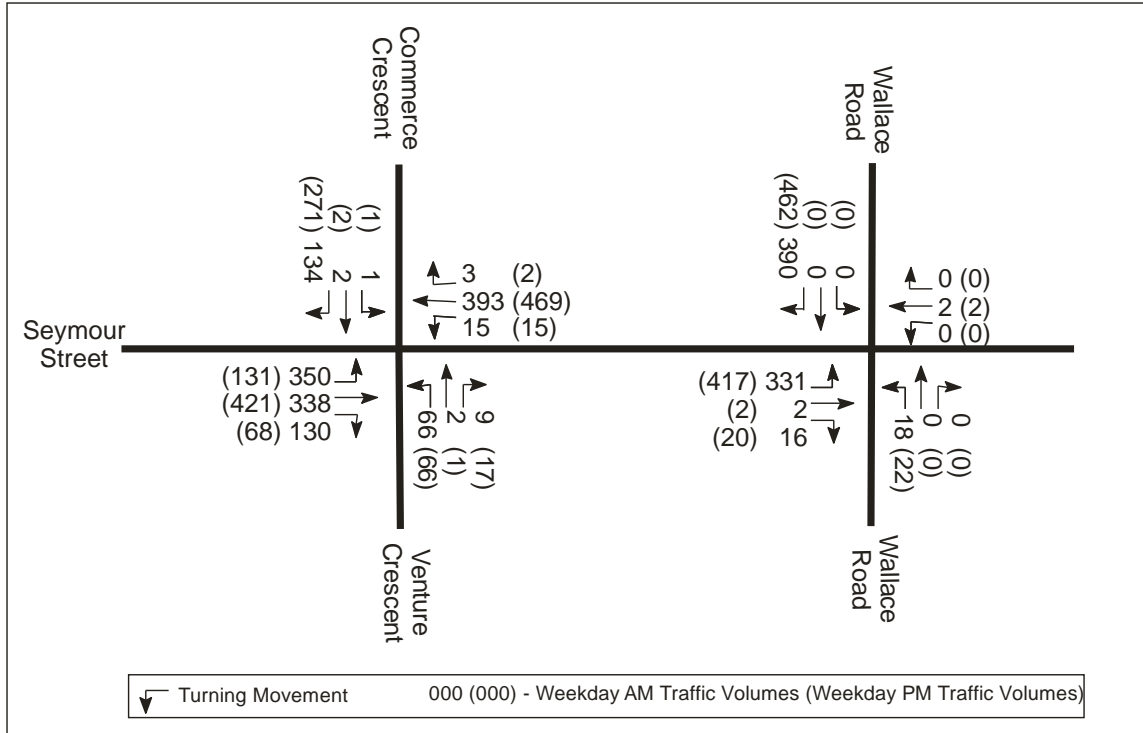


Exhibit 7: 2031 Traffic Volumes

2.2 Roadway Configuration Assumptions

Based on the results of the existing traffic operations, the following roadway improvement assumptions were used in the future traffic operations analysis:

- Signalize intersection of Seymour Street at Commerce Crescent / Venture Crescent;
- Exclusive eastbound left turn lane at the intersection of Seymour Street at Commerce Crescent / Venture Crescent.

Signal timing plans have been optimized for all horizon year time periods.

2.3 2016 Intersection Operations

2.3.1 Signalized Intersections

The 2016 traffic operations for the weekday AM and PM peak hours are summarized in **Table 4**. Detailed output results are provided in Appendix D.

Table 4: 2016 Intersection Operations

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|---|----------------------|-----|-------|----------------------|-----|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (signalized) | | | | | | |

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|-------------------------------|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Overall | A | | | A | | |
| Eastbound left | A | 0.57 | 9.6 | A | 0.26 | 6.5 |
| Eastbound through-right | A | 0.46 | 5.8 | A | 0.55 | 8.1 |
| Westbound left-through-right | A | 0.40 | 5.9 | A | 0.55 | 8.4 |
| Northbound left-through-right | B | 0.24 | 15.1 | B | 0.22 | 10.4 |
| Southbound left-through-right | A | 0.28 | 6.2 | A | 0.42 | 4.7 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – control delay in seconds

The intersection of Seymour Street and Commerce Crescent / Venture Crescent would operate with an overall level of service “A” for both weekday AM and PM peak hours during 2016 future traffic conditions.

2.3.1.1 2016 Queue Lengths

Queue lengths at the intersection of Seymour Street at Commerce Crescent / Venture Crescent were calculated using SimTraffic software and are shown in **Table 5** below.

Table 5: 2016 Queue Lengths

| Intersection & Movement | Available Storage (m) | AM Peak Hour | | PM Peak Hour | |
|--------------------------------------|-----------------------|--------------------------|--|--------------------------|--|
| | | Average Queue Length (m) | 95 th Percentile Queue Length (m) | Average Queue Length (m) | 95 th Percentile Queue Length (m) |
| Seymour at Commerce / Venture | | | | | |
| Eastbound left** | 40 | 23.5 | 38.7 | 14.8 | 27.3 |
| Eastbound through-right* | | 19.3 | 45.9 | 25.0 | 41.5 |
| Westbound left-through-right | | 17.3 | 29.4 | 25.6 | 45.9 |
| Northbound left-through-right | | 9.8 | 19.5 | 10.5 | 19.5 |
| Southbound left-through-right | | 10.6 | 18.8 | 15.1 | 26.1 |

*Available storage distance back to nearest intersection / driveway (at-grade rail crossing for the Highway 11/17 southbound through movement). ** The Seymour Street eastbound left turn storage lane assumed at 40m.

As shown in the above table, the average queue lengths for all movements at the intersection of Seymour Street and Commerce Crescent / Venture Crescent can be accommodated.

2.3.2 Roundabout

Under 2016 traffic conditions, single-lane roundabout capacities were analyzed at the intersection of Seymour Street and Commerce Crescent / Venture Crescent using SIDRA software. The single-lane roundabout capacity results under 2016 traffic conditions are summarized in **Table 6**. Detailed output results are provided in Appendix D.

Table 6: 2016 Seymour & Commerce / Venture Roundabout Analysis

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (roundabout) | | | | | | |
| Overall | A | | | A | | |
| Eastbound approach | A | 0.51 | 5.0 | A | 0.39 | 3.3 |
| Westbound approach | B | 0.46 | 5.6 | B | 0.43 | 3.4 |
| Northbound approach | B | 0.11 | 12.5 | B | 0.10 | 11.1 |
| Southbound approach | B | 0.17 | 6.3 | B | 0.36 | 7.5 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – average delay in seconds

Under 2016 future traffic conditions, a single lane roundabout would operate with an overall level of service ‘A’ during both the weekday AM and PM peak hours.

2.4 2021 Intersection Operations

The 2021 traffic operations for the weekday AM and PM peak hours are summarized in **Table 7**. Detailed output results are provided in Appendix E.

Table 7: 2021 Intersection Operations

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (signalized) | | | | | | |
| Overall | A | | | A | | |
| Eastbound left | B | 0.60 | 10.3 | A | 0.28 | 6.7 |
| Eastbound through-right | A | 0.47 | 5.9 | A | 0.56 | 8.3 |
| Westbound left-through-right | A | 0.41 | 5.9 | A | 0.56 | 8.6 |
| Northbound left-through-right | B | 0.23 | 15.1 | B | 0.24 | 10.9 |
| Southbound left-through-right | A | 0.29 | 6.3 | A | 0.44 | 4.9 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – control delay in seconds

The intersection of Seymour Street and Commerce Crescent / Venture Crescent would operate with an overall level of service “A” for both weekday AM and PM peak hours during 2021 future traffic conditions.

2.4.1.1 2021 Queue Lengths

Queue lengths at the intersection of Seymour Street at Commerce Crescent / Venture Crescent were calculated using SimTraffic software and are shown in **Table 8** below.

Table 8: 2021 Queue Lengths

| Intersection & Movement | Available Storage (m) | AM Peak Hour | | PM Peak Hour | |
|--------------------------------------|-----------------------|--------------------------|--|--------------------------|--|
| | | Average Queue Length (m) | 95 th Percentile Queue Length (m) | Average Queue Length (m) | 95 th Percentile Queue Length (m) |
| Seymour at Commerce / Venture | | | | | |
| Eastbound left** | 40 | 24.1 | 40.2 | 14.7 | 26.5 |
| Eastbound through-right* | | 22.4 | 43.8 | 23.9 | 41.4 |
| Westbound left-through-right | | 17.1 | 29.7 | 25.0 | 41.5 |
| Northbound left-through-right | | 11.0 | 21.0 | 9.8 | 22.2 |
| Southbound left-through-right | | 10.1 | 16.6 | 15.1 | 28.4 |

*Available storage distance back to nearest intersection / driveway. ** The Seymour Street eastbound left turn storage lane assumed at 40m.

As shown in the above table, the average queue lengths for all movements at the intersection of Seymour Street and Commerce Crescent / Venture Crescent can be accommodated.

2.4.2 Roundabout

Under 2021 traffic conditions, single-lane roundabout capacities were analyzed at the intersection of Seymour Street and Commerce Crescent / Venture Crescent using SIDRA software. The single-lane roundabout capacity results under 2021 traffic conditions are summarized in **Table 9**. Detailed output results are provided in Appendix E.

Table 9: 2021 Seymour & Commerce / Venture Roundabout Analysis

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (roundabout) | | | | | | |
| Overall | A | | | A | | |
| Eastbound approach | A | 0.53 | 5.0 | A | 0.41 | 3.3 |
| Westbound approach | B | 0.49 | 6.3 | B | 0.46 | 3.5 |
| Northbound approach | B | 0.12 | 12.9 | B | 0.11 | 11.4 |
| Southbound approach | B | 0.18 | 6.5 | B | 0.39 | 7.9 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – average delay in seconds

Under 2021 future traffic conditions, a single lane roundabout would operate with an overall level of service ‘A’ during both the weekday AM and PM peak hours.

2.5 2026 Intersection Operations

The 2026 traffic operations for the weekday AM and PM peak hours are summarized in **Table 10**. Detailed output results are provided in Appendix F.

Table 10: 2026 Intersection Operations

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (signalized) | | | | | | |
| Overall | A | | | A | | |
| Eastbound left | B | 0.63 | 11.2 | A | 0.30 | 6.9 |
| Eastbound through-right | A | 0.48 | 5.9 | A | 0.57 | 8.5 |
| Westbound left-through-right | A | 0.42 | 6.0 | A | 0.57 | 8.8 |
| Northbound left-through-right | B | 0.24 | 16.0 | B | 0.27 | 11.8 |
| Southbound left-through-right | A | 0.31 | 6.4 | A | 0.46 | 5.0 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – control delay in seconds

The intersection of Seymour Street and Commerce Crescent / Venture Crescent would operate with an overall level of service “A” for both weekday AM and PM peak hours during 2026 future traffic conditions.

2.5.1.1 2026 Queue Lengths

Queue lengths at the intersection of Seymour Street at Commerce Crescent / Venture Crescent were calculated using SimTraffic software and are shown in **Table 11** below.

Table 11: 2026 Queue Lengths

| Intersection & Movement | Available Storage (m) | AM Peak Hour | | PM Peak Hour | |
|--------------------------------------|-----------------------|--------------------------|--|--------------------------|--|
| | | Average Queue Length (m) | 95 th Percentile Queue Length (m) | Average Queue Length (m) | 95 th Percentile Queue Length (m) |
| Seymour at Commerce / Venture | | | | | |
| Eastbound left** | 40 | 25.9 | 40.4 | 15.8 | 29.4 |
| Eastbound through-right* | | 22.3 | 53.1 | 28.2 | 54.6 |
| Westbound left-through-right | | 19.6 | 37.5 | 26.8 | 44.6 |
| Northbound left-through-right | | 10.9 | 19.8 | 11.6 | 23.0 |
| Southbound left-through-right | | 10.6 | 19.1 | 16.3 | 26.9 |

*Available storage distance back to nearest intersection / driveway. ** The Seymour Street eastbound left turn storage lane assumed at 40m.

As shown in the above table, the average queue lengths for all movements at the intersection of Seymour Street and Commerce Crescent / Venture Crescent can be accommodated.

2.5.2 Roundabout

Under 2026 traffic conditions, single-lane roundabout capacities were analyzed at the intersection of Seymour Street and Commerce Crescent / Venture Crescent using SIDRA software. The single-lane roundabout capacity results under 2026 traffic conditions are summarized in **Table 12**. Detailed output results are provided in Appendix F.

Table 12: 2026 Seymour & Commerce / Venture Roundabout Analysis

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (roundabout) | | | | | | |
| Overall | A | | | A | | |
| Eastbound approach | A | 0.56 | 5.0 | A | 0.43 | 3.4 |
| Westbound approach | B | 0.53 | 7.1 | B | 0.49 | 3.7 |
| Northbound approach | B | 0.13 | 13.4 | B | 0.12 | 11.6 |
| Southbound approach | B | 0.20 | 6.8 | B | 0.42 | 8.6 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – average delay in seconds

Under 2026 future traffic conditions, a single lane roundabout would operate with an overall level of service ‘A’ during both the weekday AM and PM peak hours.

2.6 2031 Intersection Operations

The 2031 traffic operations for the weekday AM and PM peak hours are summarized in **Table 13**. Detailed output results are provided in Appendix G.

Table 13: 2031 Intersection Operations

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (signalized) | | | | | | |
| Overall | A | | | A | | |
| Eastbound left | B | 0.65 | 11.8 | A | 0.32 | 7.4 |
| Eastbound through-right | A | 0.48 | 5.9 | A | 0.59 | 8.8 |
| Westbound left-through-right | A | 0.42 | 5.9 | A | 0.59 | 9.1 |
| Northbound left-through-right | B | 0.28 | 17.5 | B | 0.30 | 12.9 |
| Southbound left-through-right | A | 0.33 | 6.6 | A | 0.47 | 5.2 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – control delay in seconds

The intersection of Seymour Street and Commerce Crescent / Venture Crescent would operate with an overall level of service “A” for both weekday AM and PM peak hours during 2031 future traffic conditions.

2.6.1.1 2031 Queue Lengths

Queue lengths at the intersection of Seymour Street at Commerce Crescent / Venture Crescent were calculated using SimTraffic software and are shown in **Table 14** below.

Table 14: 2031 Queue Lengths

| Intersection & Movement | Available Storage (m) | AM Peak Hour | | PM Peak Hour | |
|--------------------------------------|-----------------------|--------------------------|--|--------------------------|--|
| | | Average Queue Length (m) | 95 th Percentile Queue Length (m) | Average Queue Length (m) | 95 th Percentile Queue Length (m) |
| Seymour at Commerce / Venture | | | | | |
| Eastbound left** | 40 | 29.4 | 44.3 | 16.9 | 31.6 |
| Eastbound through-right* | | 31.9 | 75.5 | 29.4 | 55.6 |
| Westbound left-through-right | | 21.0 | 41.8 | 29.0 | 54.9 |
| Northbound left-through-right | | 11.7 | 21.7 | 11.9 | 23.5 |
| Southbound left-through-right | | 11.4 | 19.5 | 16.7 | 28.4 |

*Available storage distance back to nearest intersection / driveway. ** The Seymour Street eastbound left turn storage lane assumed at 40m.

As shown in the above table, the average queue lengths for all movements at the intersection of Seymour Street and Commerce Crescent / Venture Crescent can be accommodated.

2.6.2 Roundabout

Under 2031 traffic conditions, single-lane roundabout capacities were analyzed at the intersection of Seymour Street and Commerce Crescent / Venture Crescent using SIDRA software. The single-lane roundabout capacity results under 2031 traffic conditions are summarized in **Table 15**. Detailed output results are provided in Appendix G.

Table 15: 2031 Seymour & Commerce / Venture Roundabout Analysis

| Intersection | Weekday AM Peak Hour | | | Weekday PM Peak Hour | | |
|--|----------------------|------|-------|----------------------|------|-------|
| | LOS | v/c | Delay | LOS | v/c | Delay |
| Seymour St at Commerce / Venture (roundabout) | | | | | | |
| Overall | A | | | A | | |
| Eastbound approach | A | 0.59 | 5.1 | A | 0.45 | 3.4 |
| Westbound approach | B | 0.57 | 8.0 | B | 0.52 | 3.8 |
| Northbound approach | B | 0.14 | 13.9 | B | 0.13 | 11.9 |
| Southbound approach | B | 0.21 | 7.0 | B | 0.46 | 9.6 |

LOS – Level of Service, v/c – volume to capacity ratio, Delay – average delay in seconds

Under 2031 future traffic conditions, a single lane roundabout would operate with an overall level of service ‘A’ during both the weekday AM and PM peak hours.

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

3.1.1 Existing Conditions

Under existing conditions, the unsignalized intersection of Seymour Street at Commerce Crescent / Venture Crescent operates with an overall level of service ‘D’ during both the weekday AM and PM peak hours. The shared northbound left-through-right turn movement is experiencing a higher delay than acceptable thresholds during both the weekday AM and PM peak hours.

A left turn lane warrant analysis shows that a 40m eastbound left turn lane is required at the intersection of Seymour Street and Commerce Crescent / Venture Crescent during the weekday AM peak hour.

A signal warrant analysis shows that the intersection of Seymour Street and Commerce Crescent / Venture Crescent is warranted under Justification 3 – combination of minor vehicular volume and delay to cross traffic under existing conditions.

Under existing traffic conditions, a single lane roundabout with an ICD of 40m would operate with an overall level of service ‘A’ during both the weekday AM and PM peak hours. Depending on property and geometric constraints, a roundabout could be considered as an

alternative form of traffic control for the intersection of Seymour Street and Commerce Crescent / Venture Crescent.

3.1.2 Future Conditions

For future years, the intersection of Seymour Street at Commerce Crescent / Venture Crescent would operate with overall acceptable levels of service for the five year, ten year, fifteen year, and twenty year horizon periods.

3.2 Recommendations

It is recommended that either traffic signals or a roundabout be installed at the intersection of Seymour Street and Commerce Crescent / Venture Crescent. If traffic signals are the preferred form of traffic control, then an exclusive eastbound left turn lane with 40m of storage on Seymour Street should be provided as well.

It is also recommended that Seymour Street should have a three lane cross-section from east of Station Road to Wallace Road which consists of one lane eastbound, one lane westbound, as well as a two-way centre left turn lane. The two-way centre left turn lane will provide safer turning opportunities into and out of the many driveways located along this section of Seymour Street.

Att.