



Franklin Station TOD

Transportation Impact Assessment

Final Report

Prepared for
City of Calgary

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CORPORATE AUTHORIZATION

Prepared By: Gloria Shu, EIT
Amrit Uppal, P.Eng.

Bunt & Associates Engineering Ltd.
#113 – 334 11 Avenue SE
Calgary, AB T2G 0Y2
Canada

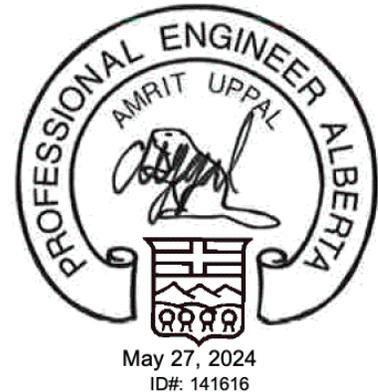
Reviewed By: Amrit Uppal, P.Eng.
Ezekiel Dada, Ph.D., P.Eng.

Telephone: (403) 252-3343

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1. EXECUTIVE SUMMARY

A land use redesignation is proposed to allow for the redevelopment of Franklin Station's south Park & Ride lot into mixed-market multi-family housing with up to 450 units. A Transportation Impact Assessment (TIA) was requested to assess the impacts of the proposed change. Study findings are outlined below.

Park & Ride Operations

| | |
|--------------------------|---|
| Supply | - Franklin Station south lot Park & Ride (297 stalls) will be removed to accommodate the development. The north lot park & ride (280 stalls) will remain. |
| Demand | - Franklin Station Park & Ride lots operate at 80% occupancy with minimal demand for paid reserved stalls. Pre-Covid, the lots operated near capacity (95%). - The adjacent Grace Baptist Church lot (160 stalls) provides paid public parking. Negligible commuter usage of this lot was observed. - Park & Ride lots along the Blue Line are operating at a combined occupancy of 57% (30-91% individual lot range). Pre-Covid occupancy was 83% (58-98% individual lot range). |
| Stall Loss Impact | - With limited capacity in the north lot, limited demand for paid Church lot parking, and many parkers originating from communities east of 36 Street NE, the loss of the south Park & Ride will result in many parkers relocating to other lots where capacity exists (e.g. Marlborough Park & Ride) or shifting to other travel options (e.g. bus service). |

Vehicles

| | |
|------------------------------|--|
| Network | - The City of Calgary completed two sets of active transportation focused improvements (2021 & 2023) to 28 Street SE along the site frontage. 2023 improvements were to address conflicts associated with Radisson Park School. |
| Volumes | - The south station area is currently generating 160-200 peak hour vehicle trips of which at least 60-70 are associated with the Park & Ride lot. With worst-case vehicle usage assumptions, the proposed development will generate 170-240 peak hour vehicle trips. Actual usage will be lower and is off-set in part by the removal of Park & Ride trips. |
| Intersection Analysis | - Intersection capacity analysis identified that development traffic will have negligible impact on study area intersection operations. <ul style="list-style-type: none"> o <i>28 Street & Memorial Drive SE</i> - Some movements near capacity during peak periods and will operate at capacity during the long-term forecast horizon. o <i>All Other Study Intersections</i> - Will operate acceptably during all horizons. |
| Mitigation | - No external vehicle network mitigation measures are required beyond the proposed narrowing of site access to standard dimensions. |

Active Transportation

| | |
|-------------------|--|
| Pedestrian | - Sidewalk and crosswalk connectivity is provided. The City recently completed upgrades (curb extensions, RRFB crossing). Both concept plans maintain connectivity from the platform to the community. |
| Cycling | - A cycling facility is provided on 28 Street/Radcliffe Drive SE. Connectivity to the station will be maintained. |
| Transit | - Two bus routes (#155, #440) use the Franklin Station bus loop located within the south station area. A south station bus loop will be maintained. |

Parking

| | |
|------------------|--|
| Bylaw | - Part 6 (Multi-Residential district) Bylaw 1P2007 parking requirements will apply. |
| On-Street | - Residential parking permit (RPP) restrictions are in place to limit on-street spillover. The need to extend restrictions to additional blocks will need to be monitored. |

2. INTRODUCTION

2.1 Scope of Work

Based on discussions with the City of Calgary's Mobility Engineering department, the scope of work for this study is:

Park & Ride Operation

- *Parking Supply* – Identify current Franklin Station parking supply and restrictions.
- *Parking Demand* – Observe parking occupancy in the Franklin Station parking lots. Identify impact of parking supply reduction.
- *Other Activity* – Identify bus loop and pick-up/drop-off activity.

Vehicles

- *Network* – Identify controls and lanes at the following study intersections:
 - 28 Street & Memorial Drive SE
 - 28 Street & Radcliffe Drive SE
 - Radcliffe Drive SE & Franklin Station Access
 - 28 Street & 11 Avenue SE
- *Volumes* – Identify weekday AM & PM peak hour traffic volumes for the following horizons:
 - Existing
 - Opening Day (Existing + Re-assigned Park & Ride Traffic + Development)
 - Long Term (2039 Forecast + Re-assigned Park & Ride Traffic + Development)
- *Analysis* – Complete the following analysis:
 - Intersection Capacity Analysis
 - Signal Warrant Analysis
 - Roadway Daily Volume Review
- *Mitigation* – Identify any mitigation measures needed to accommodate development traffic.

Active Transportation

- *Pedestrians* – Review sidewalk connectivity and crossing controls near the site. Identify any required improvements.
- *Cyclists* – Identify connectivity to cycling facilities.
- *Transit* – Identify routes/service. Review impacts of any changes to station connectivity.

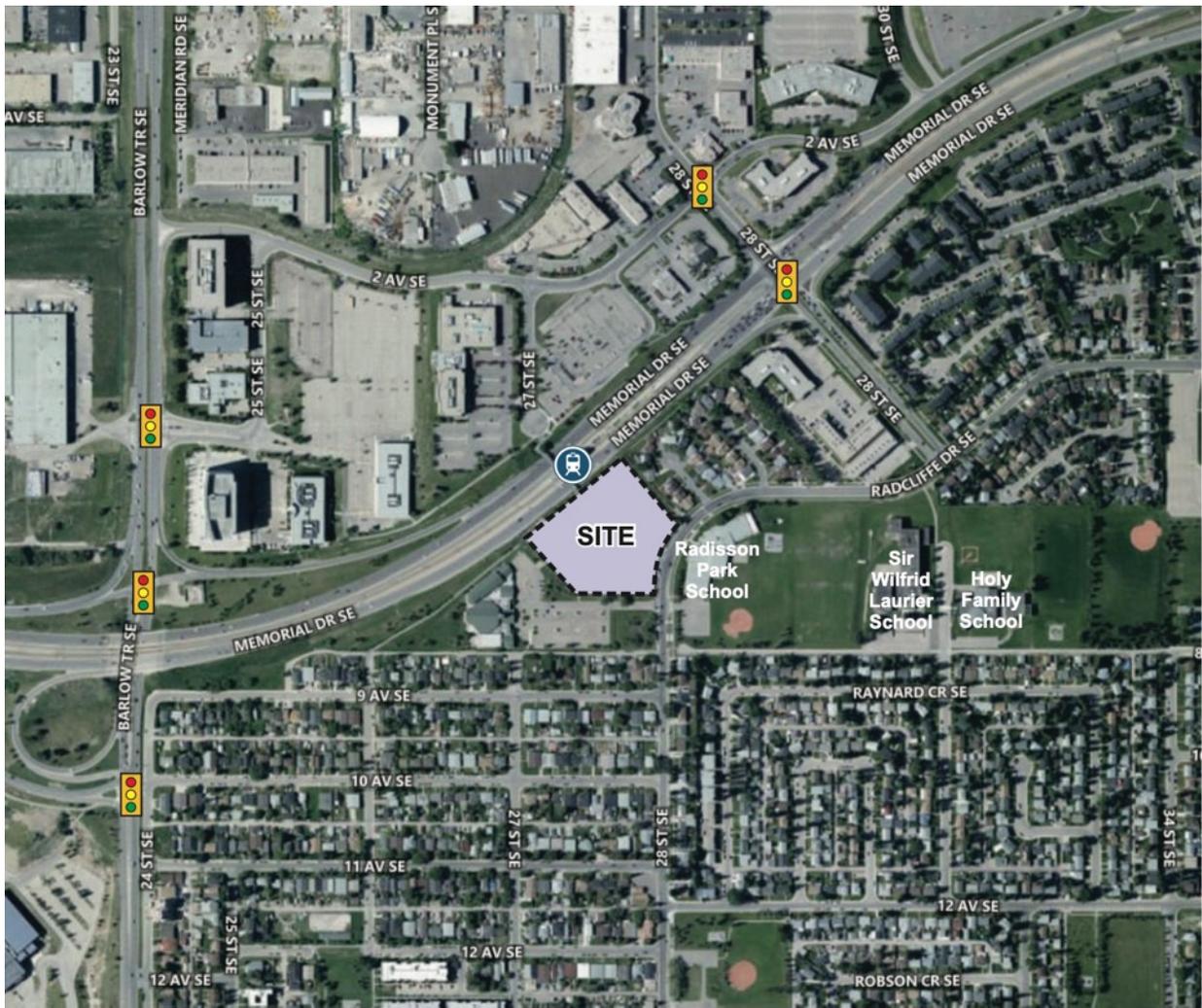
Parking

- *Bylaw Requirement* – Identify vehicle and bicycle parking requirements.
- *On-Street* – Identify area parking restrictions.

2.2 Site Context

The Franklin Station south Park & Ride site is in the community of Albert Park/Radisson Heights and bounded by Memorial Drive SE to the northwest, a church (Grace Baptist Church of Calgary) to the south, Radcliffe Drive SE to the east, and residential dwellings to the northeast. The site context is shown in Figure 2.1.

Figure 2.1: Site Context



2.3 Development Plan

Concept plans are illustrated in **Figure 2.2**. All concept designs remove south park & ride parking while maintaining a bus loop. The concept designs accommodate up to 450 multi-family residential units and 10,000 ft² of commercial. Densities and a site plan will be confirmed with future development permit applications.

Figure 2.2: Concept Plans



3. PARK & RIDE OPERATION

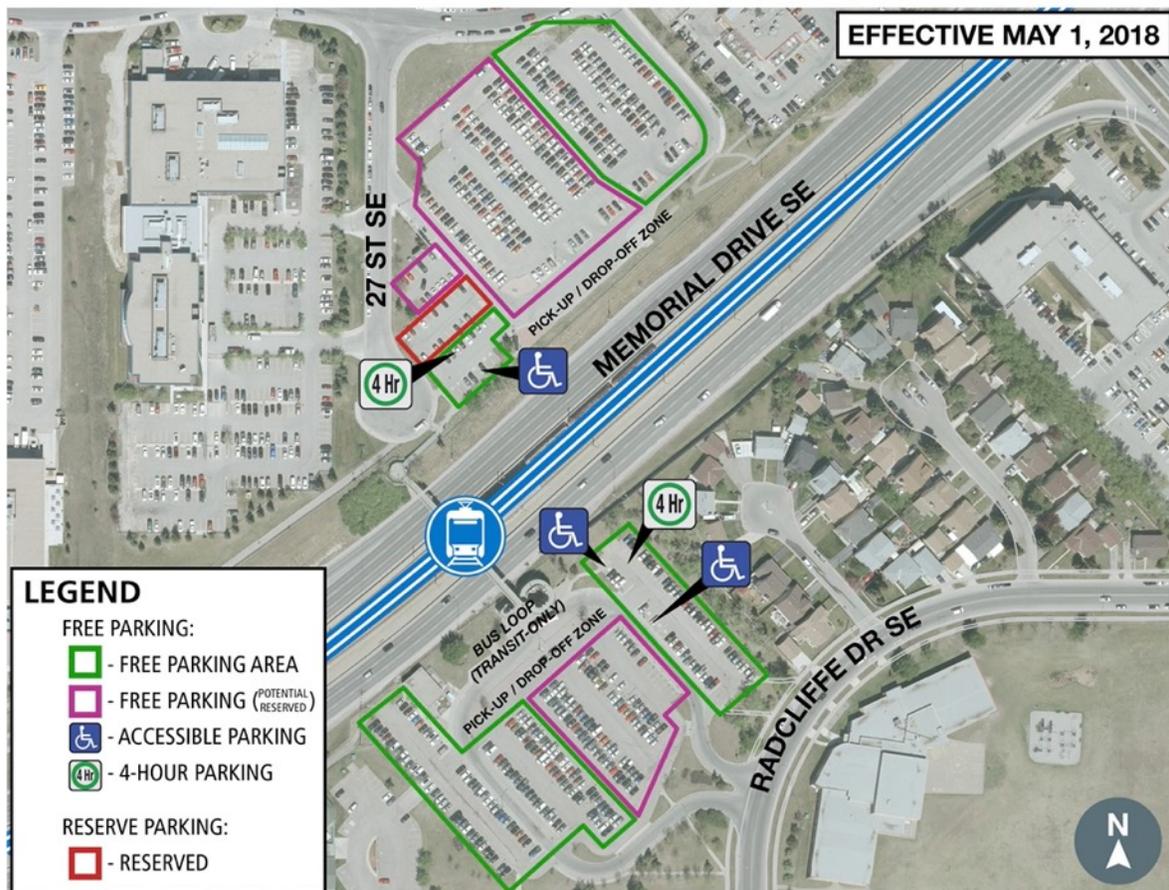
3.1 Parking Supply

Current parking supplies at the Franklin Station Park & Ride facility are summarized in **Table 3.1** and **Figure 3.1**. All 297 south lot stalls will be removed with the proposed redevelopment.

Table 3.1: Existing Franklin Park & Ride Supply

| RESTRICTION | STALLS | | |
|--------------|------------|------------|------------|
| | All | North | South |
| Free | 524 | 239 | 285 |
| Reserved | 22 | 22 | 0 |
| 4-Hour | 16 | 11 | 5 |
| Accessible | 15 | 8 | 7 |
| TOTAL | 577 | 280 | 297 |

Figure 3.1: Existing Park & Ride Locations



3.2 Parking Demand

3.2.1 Origin

A City of Calgary report¹ identified that reserve parking users at Franklin station are generally commuting in from the Applewood/Abbeydale/Marlborough/Dover area. **Figure 3.2** illustrates Park & Ride customer origins (teal dots identify Franklin reserve customers). The 2016 study identified Park & Ride users comprised 22% of total Franklin station riders.

Figure 3.2: Park & Ride Reserve Customer Origins



3.2.2 Franklin Station Occupancy

Parking observations were completed by Bunt & Associates to determine current parking demand associated with the Park & Ride facility. Observed demand is compared in **Table 3.2** with historical demand over the last 10-years. Recent observations were completed mid-weekday during February 2024. Historical demand was observed from City of Calgary aerial imagery.

Table 3.2: Franklin Station Park & Ride Demand

| YEAR | | DEMAND | | | OCCUPANCY | | |
|------------|------|--------|-------|-------|-----------|-------|-------|
| | | Total | North | South | Total | North | South |
| Current | 2024 | 463 | 242 | 221 | 80% | 86% | 74% |
| Historical | 2013 | 546 | 280 | 266 | 95% | 100% | 90% |
| | 2015 | 536 | 273 | 263 | 93% | 98% | 89% |
| | 2017 | 566 | 279 | 287 | 98% | 100% | 97% |
| | 2018 | 530 | 268 | 261 | 92% | 96% | 88% |

*2024 counts completed in winter. Effective supply reduced due to pavement being covered by snow (stall marking lines not visible; snow storage blocking stalls). Occupancy based on typical marked supply.

*Historical imagery years not listed did not have imagery taken mid-day on a weekday.

The observations identify that the Franklin Station lots currently operate near but below effective capacity (95% of supply). Historically the lots have been at or above effective capacity (95% of supply). Reserve stall usage has remained minimal (7 stalls currently; 18 historically). Reserved stalls cost \$91.88 per month.

¹ A Review of Calgary Transit Park & Ride (May 2016).

<https://pub-calgary.escribemeetings.com/filestream.ashx?DocumentId=8528>

3.2.3 Church

The site adjacent Grace Baptist Church has a 160 stall parking supply. The lot is managed by Indigo with a current daily parking rate of \$5.70 and monthly parking rate of \$53.42. Occupancy during weekdays (7:00-18:00) is minimal with 5 stalls occupied during a February 2024 mid-weekday count; occupied stalls are assumed to be associated with the church.

3.2.4 Blue Line Park & Ride Facilities

Parking observations (2024 and historical aerial imagery) completed at other Blue Line Park & Ride lots are summarized in **Table 3.3**. Details are included in **Appendix A**. The observations identify most lots have historically (pre-Covid) operated near capacity except for Marlborough (West) and Whitehorn. Lots are currently (post-Covid) operating at lower occupancy with capacity remaining at Marlborough Mall to accommodate parking reductions at Franklin station.

Table 3.3: Blue Line Park & Ride Demand

| STATION/LOTS | | SUPPLY | DEMAND | | OCCUPANCY | |
|--------------------|---------------------------|--------------|--------------|--------------|------------|------------|
| | | | Current | Historic* | Current | Historic |
| Franklin | North | 280 | 242 | 275 | 86% | 98% |
| | South | 297 | 221 | 272 | 74% | 91% |
| Marlborough | West - Canadian Tire Mall | 312 | 80 | 250 | 26% | 80% |
| | East - Marlborough Mall | 205 | 125 | 195 | 61% | 95% |
| Rundle | Sunridge Mall | 279 | 266 | 270 | 95% | 97% |
| Whitehorn | | 815 | 248 | 471 | 30% | 58% |
| McKnight-Westwinds | | 950 | 565 | 842 | 59% | 89% |
| Saddletowne | | 130 | 104 | 123 | 80% | 94% |
| TOTAL | | 3,268 | 1,851 | 2,698 | 57% | 83% |

*Weekday mid-day (non-holiday) average of 2013, 2015, 2017, and 2018 demand identified from aerial imagery.

3.3 Other Activity

The Franklin Station bus loop provides a stop for two bus routes (#155 Dover; #440 Chateau Estates) and a replacement shuttle when the CTrain is not operating. The bus loop is in the south station area site.

A pick-up/drop-off zone is in the south station area site. A secondary on-street pick-up/drop-off zone is provided on 27 Street SE for the north station area site.

3.4 Impact

With the loss of the south Park & Ride facility, current parkers will have to relocate. Expected impacts are:

- *Franklin North Lot* - Limited capacity exists. The north lot will reach capacity earlier in the day.
- *Grace Baptist Church* - Some parkers will shift to the church lot. The monthly fee will limit this shift.
- *Marlborough Park & Ride* - With many Park & Ride users originating from communities east of 36 Street NE, some parkers may relocate to the Marlborough Park & Ride lots where some capacity exists.
- *Other Travel Options* - Some parkers may shift to other travel options including bus service.

4. VEHICLES

4.1 Road Network

Roadway characteristics near the site are summarized in **Table 4.1**. The cross-section of Radcliffe Drive at the site access is shown in **Figure 4.1**.

Table 4.1: Existing Roadway Characteristics

| ROADWAY | CLASSIFICATION | CROSS-SECTION | | SPEED LIMIT | FACILITIES | | |
|--------------------|----------------|---------------|--------|-------------|------------|------------|-----------|
| | | # Lanes | Median | | Parking | Bike Lanes | Bus Stops |
| Radcliffe Drive SE | Collector | 2 | No | 40 km/h | Yes** | Yes | Yes |
| Memorial Drive SE | Arterial | 6 | Yes | 80 km/h | No | No | No |
| 28 Street SE* | Arterial | 4 | Yes | 50 km/h | No | No | No |

*250m section from Memorial Drive to Radcliffe Drive SE only.

**On-street parking locations vary along Radcliffe Drive SE. East side only south of 9 Avenue.

Figure 4.1: Radcliffe Drive SE

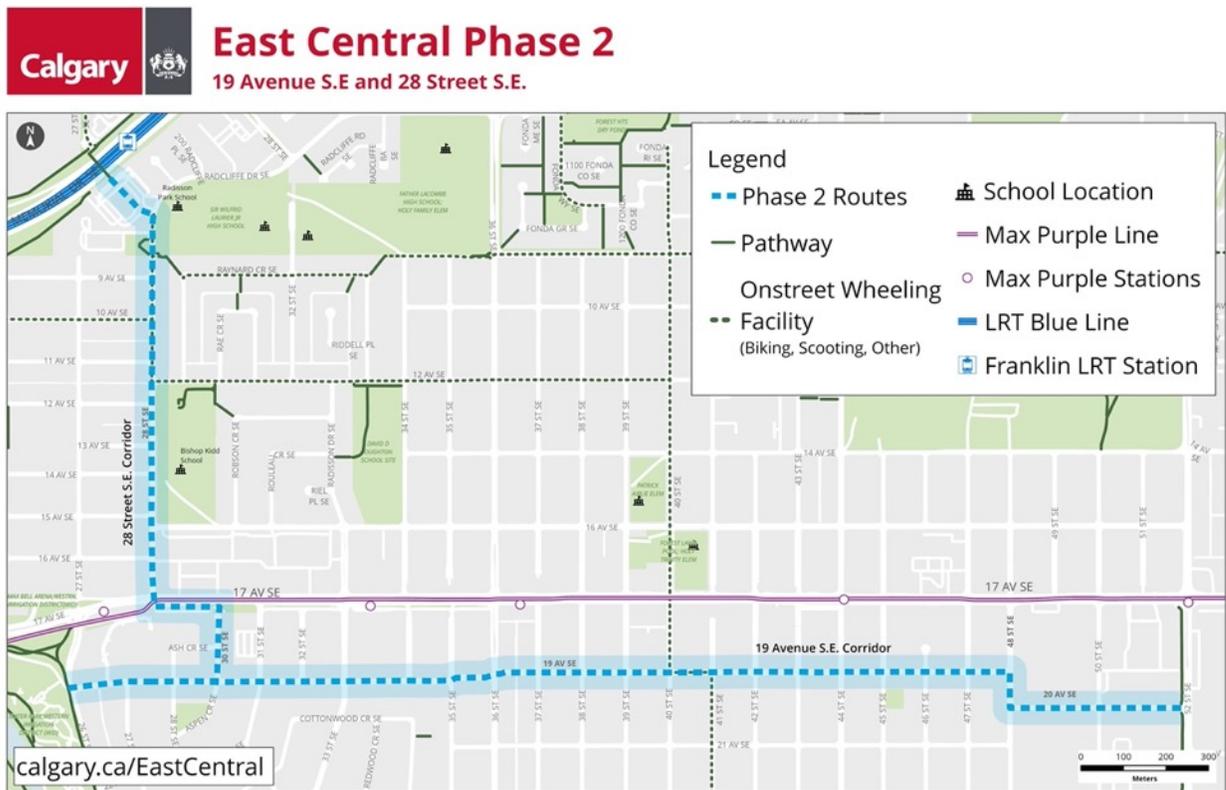
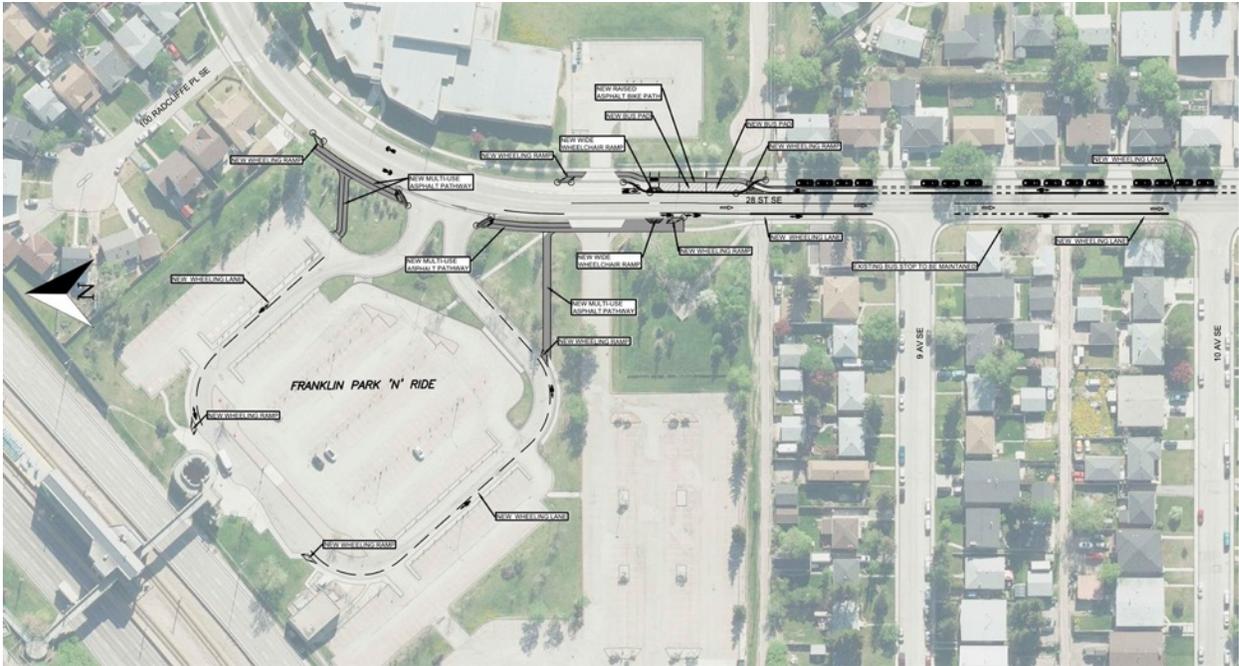


2021 Improvements

In 2021, the City of Calgary completed *East Central Phase 2* improvements.² These improvements, as illustrated in **Figure 4.2**, included the addition of cycling facilities on 28 Street SE (Franklin Station to 19 Avenue SE).

² <https://www.calgary.ca/planning/transportation/east-central-phase-2.html>

Figure 4.2: East Central (28 Street SE) Improvements



2023 Improvements

Further improvements to 28 Street SE near Franklin station were completed in 2023 to reduce conflicts associated with the adjacent Raddison Park school. These improvements included the following changes:

- *Improved Crosswalk at Radcliffe Place SE* - Addition of RRFB (rectangular rapid flashing beacon) and curb extensions.
- *Multi-Use Pathway* - Extension of multi-use pathway on east/south side of Radcliffe Drive SE from the school to the east (28 Street SE). This pathway reduces the previous conflict between school pick-up/drop-off parked vehicles and cyclists travelling on-street.

4.2 Intersections

Existing intersection controls and lane configurations at study intersections are illustrated in **Exhibit 4.1**.

4.3 Volumes (Baseline)

Baseline traffic volumes are summarized in **Exhibit 4.2**. These volumes assume no redevelopment of the subject site. Count and forecast data are included in **Appendix A**.

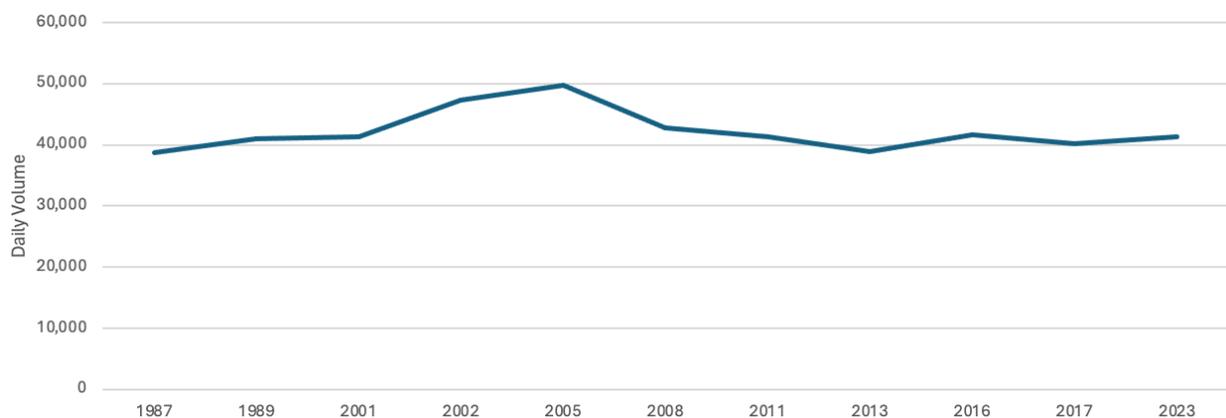
4.3.1 Short-Term

Traffic counts were completed on January 30, 2024 (Tuesday) & February 29, 2024 (Thursday).

Historical Growth (Memorial Drive)

City of Calgary AAWT (average annual weekday traffic) volume maps identify that traffic volumes on Memorial Drive SE have not increased in the last 30 years. City of Calgary 24-hour tube count data is illustrated in **Figure 4.3**.

Figure 4.3: Memorial Drive SE (West of 28 Street SE) Historical Daily Volume



Historical Growth (Local Roadways)

Table 4.2 confirms no recent traffic growth on Radcliffe Drive SE and 28 Street SE. No short-term growth rate was therefore required.

Table 4.2: Historical Traffic Volumes (Nearby Roadways)

| YEAR | 6-HOUR VOLUMES | | DAILY VOLUMES | |
|------|--------------------|--------------|--------------------|--------------|
| | Radcliffe Drive SE | 28 Street SE | Radcliffe Drive SE | 28 Street SE |
| 1982 | 3,022 | 3,173 | 7,253 | 7,615 |
| 1988 | 3,241 | 3,060 | 7,778 | 7,344 |
| 1989 | 3,121 | 3,266 | 7,490 | 7,838 |
| 2003 | 3,082 | 3,137 | 7,397 | 7,529 |
| 2008 | 3,355 | 3,039 | 8,052 | 7,294 |
| 2014 | 2,914 | 2,807 | 6,994 | 6,737 |
| 2018 | 2,290 | 2,215 | 5,496 | 5,316 |
| 2024 | 2,171 | 2,164 | 5,210 | 5,194 |

*Data obtained from City of Calgary traffic count data at 28 Street & Radcliffe Drive SE. Daily volume conversion factor of 2.4 applied to 6-hour volumes. All counts completed during the school year.

4.3.2 2039 Horizon

2039 horizon traffic forecasts were provided by the City of Calgary. These volumes account for other area developments and associated traffic growth. Volumes were balanced to the site access. The forecasted growth in peak hour entering vehicle volumes at study intersections are summarized in **Table 4.3**.

Table 4.3: Forecast Traffic Volumes (Intersection Entering Hourly Volumes)

| YEAR | 28 ST & RADCLIFFEE DR SE | | 28 ST & MEMORIAL DR SE | |
|-----------------|--------------------------|--------------|------------------------|--------------|
| | AM Peak Hour | PM peak Hour | AM Peak Hour | PM peak Hour |
| 2024 (Observed) | 677 | 701 | 2,856 | 3,970 |
| 2028 (Forecast) | 770 | 1,070 | 2,740 | 4,250 |
| 2039 (Forecast) | 970 | 1,130 | 3,130 | 4,500 |

4.4 Volumes (After Development)

Park & Ride Traffic

Observed traffic volumes at the south park & ride driveway are summarized in **Table 4.4**. The development will result in the removal of all south Park & Ride lot stalls. The south parking lot is currently generating a minimum of 67 inbound AM peak hour and 58 outbound PM peak hour trips. The remainder of trips are associated with bus and pick-up/drop-off activity. The following traffic volume adjustments are completed:

- *North Lot* - 15% of south parking lot trips are re-assigned to the north lot.
- *Church Lot* - 25% of south parking lot trips are re-assigned to the church lot.
- *Others* - Bus and pick-up/drop-off trips are maintained. Remaining parking lot trips are removed from the network. These vehicles are redistributed to other Park & Ride facilities along the Blue Line.

Table 4.4: Existing Site Trip Generation

| DATE | AM PEAK HOUR | | | PM PEAK HOUR | | |
|-----------------|--------------|-----|-----|--------------|----|-----|
| | Total | In | Out | Total | In | Out |
| 2024 (Observed) | 159 | 113 | 46 | 204 | 73 | 131 |

*AM (113 in - 46 out = 67 Park & Ride Trips); PM (131 out - 73 in = 58 Park & Ride Trips)

Development Traffic

Anticipated development trip generation based on different sources are summarized in **Table 4.5**. To be conservative, analysis is completed using the highest trip generation source, which provides a worst-case analysis with very high vehicle usage. Vehicle trips are distributed based on select zone forecasts.

Table 4.5: Trip Generation (Vehicle)

| USE | RATE SOURCE | RATE | | AM PEAK HOUR | | | PM PEAK HOUR | | |
|--|-----------------------|-------------------------------------|--------------------------------------|--------------|------------|------------|--------------|------------|------------|
| | | AM Peak Hour | PM Peak Hour | Total | In | Out | Total | In | Out |
| 450 residential units | City (TOD) | 0.11 per unit | 0.21 per unit | 50 | 21 | 29 | 95 | 62 | 33 |
| | Bunt (TOD) | 0.18 per unit | 0.26 per unit | 81 | 34 | 47 | 117 | 55 | 62 |
| | ITE 221 (TOD) | 0.32 per unit | 0.29 per unit | 144 | 52 | 92 | 131 | 85 | 46 |
| | TIA Guidelines | 0.35 per unit | 0.45 per unit | 158 | 40 | 118 | 203 | 132 | 71 |
| 10,000 ft ² commercial | ITE 820 | 0.84 per 1,000 ft ² | 3.40 per 1,000 ft ² | 8 | 5 | 3 | 34 | 17 | 17 |
| | TIA Standard | 1.00 per 1000 ft² | 3.50 per 1,000 ft² | 10 | 6 | 4 | 35 | 18 | 17 |
| Removed Trips (60% of current Park & Ride traffic) | | | | -40 | -40 | 0 | -35 | 0 | -35 |
| TOTAL | | | | 128 | 6 | 122 | 203 | 150 | 53 |

*City data observed for general multi-family (transit oriented) and affordable housing (non-transit oriented).

*Institute of Transportation Engineers (ITE) *Trip Generation Manual (11th Edition)* rates for use #221 (multi-family mid-rise) near rail transit identified.

Development generated traffic volume changes are illustrated in **Exhibit 4.3**. Resulting After Development (Baseline + Development) volumes are illustrated in **Exhibit 4.4**.

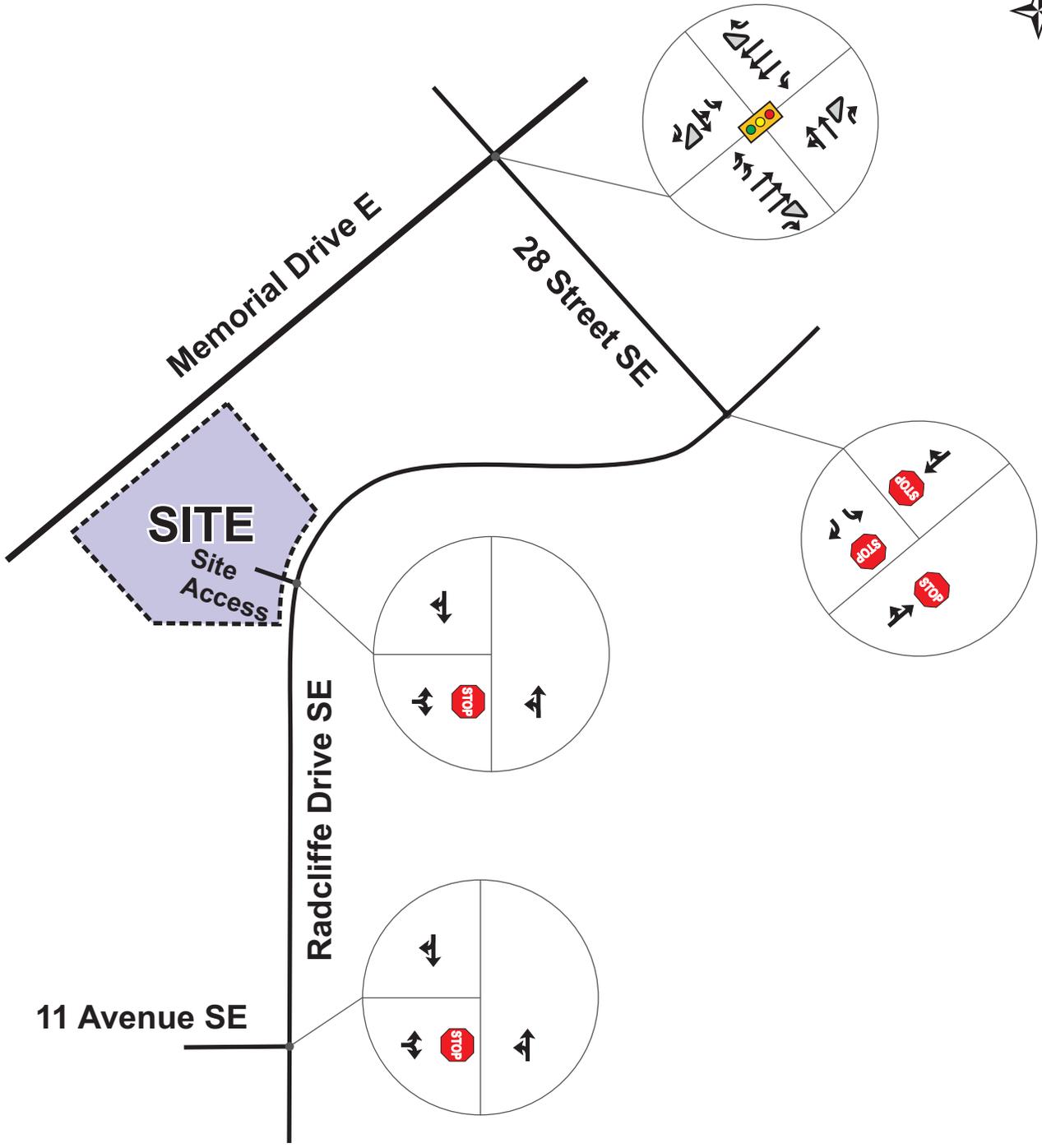


Exhibit 4.1
Intersection Configurations



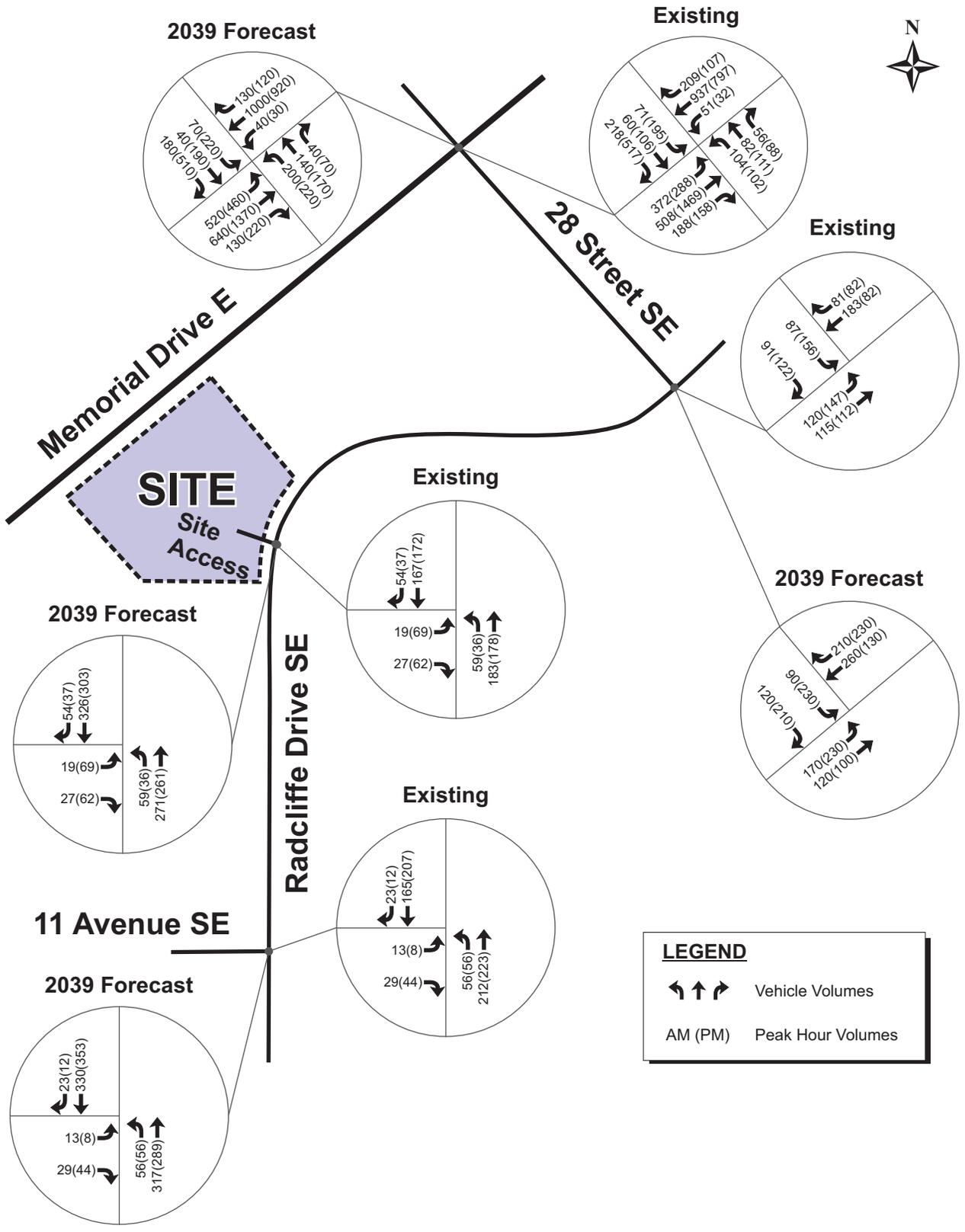


Exhibit 4.2
Baseline Traffic Volumes



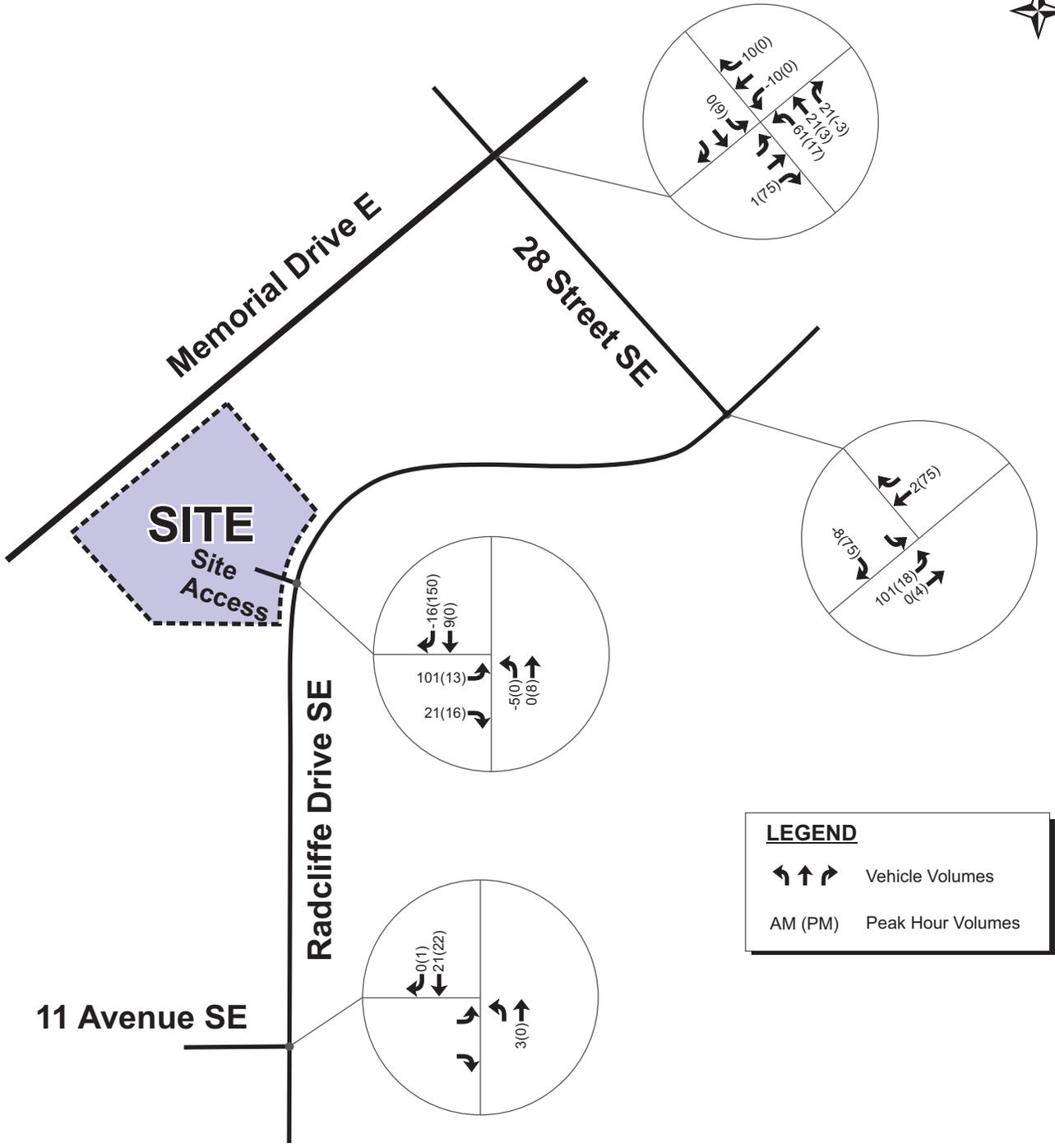


Exhibit 4.3
Development Traffic Volume Changes



4.5 Analysis

4.5.1 Intersection Capacity

Synchro 11 traffic analysis software was used to review intersection operational conditions based on the methods outlined in the Highway Capacity Manual. Traffic operations were assessed using the performance measures of volume-to-capacity (v/c) and Level of Service (LOS).

The volume-to-capacity (v/c) ratio of an intersection movement represents the ratio between the demand volume and available capacity. A v/c ratio over 1.0 indicates a congested intersection where drivers may have to wait through more than one signal cycle. The Level of Service (LOS) rating is based on average vehicle delays ranging from LOS A (minimal delay) to LOS F (significant delay).

The analysis was completed as per City of Calgary TIA guidelines. For turning movements impacted by LRT pre-emption at Memorial Drive & 28 Street SE, the saturation flow rate was reduced from the standard of 1850 vehicles per hour per lane to 1500 vehicles per hour per lane.³ To be conservative, no increase to the flow rate for Memorial Drive (through movements) was applied. Synchro output reports are provided in **Appendix B**. The volume to capacity (v/c) ratio, level of service, average control delay (in seconds), and 95th percentile queue (in metres) are summarized in **Table 4.6** and **Table 4.7**.

Intersection capacity analysis indicated:

- **28 Street & Memorial Drive SE**
 - *Short-Term Horizon* – The intersection operates acceptably. Some movements are nearing capacity during peak periods. Development traffic has no appreciable impact on operations.
 - *Long-Term (2039) Horizon* – Some movements will operate at capacity during peak periods. Development traffic has no appreciable impact on operations.
- **28 Street & Radcliffe Drive SE** – Will continue to operate acceptably during all horizons.
- **Radcliffe Drive SE & Site Access** – Will continue to operate acceptably during all horizons.
- **28 Street & 11 Avenue SE** – Will continue to operate acceptably during all horizons.

³ $1850 \text{ vehicles/lane/hour} \times (3600 \text{ seconds/hour} - (22 \text{ trains/hour} \times 30 \text{ second pre-emption average})) / 3600 \text{ seconds} = 1510 \text{ vehicles/lane/hour}$. Note actual pre-emption impacts may be lower as some train pre-emption may occur at the same time (e.g. east and west trains crossing at the same time).

Table 4.6: Intersection Analysis (28 Street & Memorial Drive SE)

| INTERSECTION | HORIZON | MOVEMENT & LANES | | AM PEAK HOUR | | | | PM PEAK HOUR | | | | |
|--|--------------------------------------|------------------------------------|---------|--------------|-------------|-----------|-------|--------------|-------------|------------|------------|-----|
| | | | | v/c | LOS | Delay | Queue | v/c | LOS | Delay | Queue | |
| 28 Street & Memorial Drive E (Signal) | Baseline (Existing) | EBL | 2 | 0.76 | E | 58 | 90 | 0.74 | E | 68 | 71 | |
| | | EBT | 3 | 0.51 | D | 45 | 70 | 0.87 | D | 40 | 189 | |
| | | EBR | 1 | 0.13 | A | 1 | <5 | 0.11 | A | 1 | <5 | |
| | | WBL | 1 | 0.14 | C | 35 | 25 | 0.34 | E | 75 | 24 | |
| | | WBT | 3 | 0.83 | D | 46 | 119 | 0.61 | D | 38 | 92 | |
| | | WBR | 1 | 0.38 | A | 7 | 19 | 0.19 | A | 5 | 10 | |
| | | NBL | 1 | 0.61 | E | 67 | 53 | 0.62 | E | 75 | 55 | |
| | | NBT | 1 | 0.36 | D | 55 | 42 | 0.51 | E | 66 | 57 | |
| | | NBR | 1 | 0.04 | A | 1 | <5 | 0.06 | A | 1 | <5 | |
| | | SBL | 1 | 0.50 | E | 68 | 39 | 0.76 | E | 80 | 102 | |
| | | SBLT | 1 | 0.38 | E | 60 | 39 | 0.62 | E | 68 | 89 | |
| | | SBR | 1 | 0.17 | A | 1 | <5 | 0.36 | A | 1 | <5 | |
| | | Overall | | - | D | 39 | - | - | D | 38 | - | |
| | Baseline (2039) | <i>Optimized signal timing</i> | EBL | 2 | 0.91 | E | 69 | 126 | 0.96 | F | 86 | 112 |
| | | | EBLT | 3 | 0.43 | D | 37 | 81 | 0.87 | D | 45 | 195 |
| | | | EBR | 1 | 0.09 | A | 1 | <5 | 0.15 | A | 1 | <5 |
| | | | WBL | 1 | 0.18 | D | 47 | 23 | 0.43 | F | 82 | 22 |
| | | | WBT | 3 | 0.94 | E | 62 | 156 | 1.00 | E | 80 | 143 |
| | | | WBR | 1 | 0.27 | A | 6 | 14 | 0.25 | A | 2 | <5 |
| | | | NBL | 1 | 0.83 | E | 76 | 89 | 0.85 | E | 80 | 96 |
| | | | NBT | 1 | 0.44 | D | 51 | 59 | 0.50 | D | 53 | 69 |
| | | | NBR | 1 | 0.03 | A | 0 | <5 | 0.05 | A | 1 | <5 |
| | | | SBL | 1 | 0.50 | E | 74 | 34 | 0.96 | F | 109 | 123 |
| | | | SBT | 1 | 0.37 | E | 65 | 33 | 0.81 | E | 78 | 116 |
| | | | SBR | 1 | 0.14 | A | 1 | <5 | 0.35 | A | 1 | <5 |
| | | | Overall | | - | D | 49 | - | - | D | 54 | - |
| | After Development (Short-Term) | | EBL | 2 | 0.81 | E | 66 | 98 | 0.75 | E | 70 | 73 |
| | | | EBLT | 3 | 0.41 | D | 42 | 74 | 0.88 | D | 42 | 195 |
| | | | EBR | 1 | 0.13 | A | 1 | <5 | 0.16 | A | 1 | <5 |
| | | | WBL | 1 | 0.15 | D | 42 | 23 | 0.35 | E | 76 | 24 |
| | | | WBT | 3 | 0.84 | D | 50 | 128 | 0.62 | D | 39 | 95 |
| | | | WBR | 1 | 0.39 | A | 7 | 21 | 0.20 | A | 5 | 10 |
| | | | NBL | 1 | 0.75 | E | 73 | 82 | 0.68 | E | 77 | 63 |
| | | | NBT | 1 | 0.35 | D | 53 | 51 | 0.49 | E | 64 | 58 |
| | | | NBR | 1 | 0.06 | A | 1 | <5 | 0.06 | A | 1 | <5 |
| | | | SBL | 1 | 0.53 | E | 74 | 41 | 0.77 | F | 82 | 108 |
| | | | SBT | 1 | 0.40 | E | 65 | 41 | 0.63 | E | 69 | 96 |
| | | | SBR | 1 | 0.17 | A | 1 | <5 | 0.36 | A | 1 | <5 |
| | | | Overall | | - | D | 42 | - | - | D | 39 | - |
| | After Development (2039) | <i>Optimized signal timing</i> | EBL | 2 | 0.95 | E | 78 | 126 | 0.97 | F | 89 | 112 |
| | | | EBLT | 3 | 0.45 | D | 39 | 81 | 0.88 | D | 46 | 195 |
| | | | EBR | 1 | 0.09 | A | 1 | <5 | 0.20 | A | 1 | <5 |
| WBL | | | 1 | 0.14 | D | 48 | 18 | 0.44 | F | 83 | 22 | |
| WBT | | | 3 | 0.99 | E | 73 | 156 | 1.01 | F | 83 | 143 | |
| WBR | | | 1 | 0.30 | A | 8 | 17 | 0.25 | A | 2 | <5 | |
| NBL | | | 1 | 0.91 | F | 84 | 133 | 0.88 | F | 82 | 111 | |
| NBT | | | 1 | 0.42 | D | 49 | 67 | 0.48 | D | 52 | 71 | |
| NBR | | | 1 | 0.04 | A | 0 | <5 | 0.05 | A | 1 | <5 | |
| SBL | | | 1 | 0.52 | E | 77 | 34 | 1.01 | F | 121 | 129 | |
| SBT | | | 1 | 0.38 | E | 67 | 33 | 0.82 | E | 80 | 116 | |
| SBR | | | 1 | 0.14 | A | 1 | <5 | 0.35 | A | 1 | <5 | |
| Overall | | | | - | D | 55 | - | - | E | 55 | - | |

Table 4.7: Intersection Analysis (Other Intersections)

| INTERSECTION | HORIZON | MOVEMENT & LANES | | AM PEAK HOUR | | | | PM PEAK HOUR | | | | |
|--|---|------------------------|---------|--------------|------|-------|-------|--------------|------|-------|-------|----|
| | | | | v/c | LOS | Delay | Queue | v/c | LOS | Delay | Queue | |
| 28 Street & Radcliffe Drive SE <i>(All-Way Stop)</i> | Baseline (Existing) | EBL | 1 | 0.16 | A | 10 | 18 | 0.28 | B | 11 | 22 | |
| | | EBR | 1 | 0.14 | A | 8 | 17 | 0.17 | A | 8 | 18 | |
| | | SBL | 1 | 0.34 | B | 11 | 27 | 0.38 | B | 12 | 26 | |
| | | SBR | 1 | 0.36 | B | 11 | 32 | 0.23 | A | 10 | 21 | |
| | | Overall | | - | A | 10 | - | - | A | 10 | - | |
| | Baseline (2039) | EBL | 1 | 0.19 | B | 11 | 17 | 0.47 | B | 15 | 41 | |
| | | EBR | 1 | 0.21 | A | 10 | 20 | 0.36 | A | 11 | 29 | |
| | | SBL | 1 | 0.46 | B | 13 | 34 | 0.57 | B | 17 | 37 | |
| | | SBR | 1 | 0.67 | C | 17 | 64 | 0.57 | C | 16 | 40 | |
| | | Overall | | - | B | 15 | - | - | B | 15 | - | |
| | After Development (Short-Term) | EBL | 1 | 0.17 | A | 10 | 17 | 0.29 | B | 11 | 22 | |
| | | EBR | 1 | 0.13 | A | 8 | 16 | 0.30 | A | 10 | 26 | |
| | | SBL | 1 | 0.49 | B | 13 | 35 | 0.44 | B | 13 | 28 | |
| | | SBR | 1 | 0.37 | B | 11 | 29 | 0.36 | B | 12 | 24 | |
| | | Overall | | - | B | 12 | - | - | B | 12 | - | |
| | After Development (2039) | EBL | 1 | 0.19 | B | 11 | 19 | 0.50 | C | 17 | 36 | |
| | | EBR | 1 | 0.20 | A | 10 | 21 | 0.51 | B | 15 | 44 | |
| | | SBL | 1 | 0.63 | C | 18 | 49 | 0.65 | C | 21 | 42 | |
| | | SBR | 1 | 0.69 | C | 19 | 76 | 0.74 | C | 24 | 60 | |
| | | Overall | | - | C | 17 | - | - | C | 20 | - | |
| Radcliffe Drive SE & Site Access <i>(Southbound Stop)</i> | Baseline (Existing) | EB | 1 | 0.09 | B | 13 | <5 | 0.24 | B | 14 | 8 | |
| | | NB | 1 | 0.05 | A | 3 | <5 | 0.03 | A | 2 | <5 | |
| | | SB | 1 | 0.14 | A | 0 | <5 | 0.13 | A | 0 | <5 | |
| | | Overall | | - | A | 3 | - | - | A | 4 | - | |
| | Baseline (2039) | EB | 1 | 0.12 | C | 16 | <5 | 0.31 | C | 17 | 11 | |
| | | NB | 1 | 0.06 | A | 2 | <5 | 0.03 | A | 2 | <5 | |
| | | SB | 1 | 0.24 | A | 0 | <5 | 0.21 | A | 0 | <5 | |
| | | Overall | | - | A | 2 | - | - | A | 4 | - | |
| | After Development (Short-Term) | EB | 1 | 0.38 | C | 18 | 14 | 0.32 | C | 16 | 12 | |
| | | NB | 1 | 0.04 | A | 3 | <5 | 0.04 | A | 2 | <5 | |
| | | SB | 1 | 0.13 | A | 0 | <5 | 0.22 | A | 0 | <5 | |
| | | Overall | | - | A | 6 | - | - | A | 4 | - | |
| | After Development (2039) | EB | 1 | 0.53 | D | 24 | 24 | 0.42 | C | 21 | 17 | |
| | | NB | 1 | 0.05 | A | 3 | <5 | 0.04 | A | 2 | <5 | |
| | | SB | 1 | 0.23 | A | 0 | <5 | 0.30 | A | 0 | <5 | |
| | | Overall | | - | A | 6 | - | - | A | 4 | - | |
| | 28 Street & 11 Avenue SE <i>(Eastbound Stop)</i> | Baseline (Existing) | EB | 1 | 0.07 | B | 12 | <5 | 0.08 | B | 11 | <5 |
| | | | NB | 1 | 0.05 | A | 2 | <5 | 0.05 | A | 2 | <5 |
| | | | SB | 1 | 0.12 | A | 0 | <5 | 0.15 | A | 0 | <5 |
| | | | Overall | | - | A | 2 | - | - | A | 2 | - |
| Baseline (2039) | | EB | 1 | 0.10 | B | 15 | <5 | 0.10 | B | 13 | <5 | |
| | | NB | 1 | 0.05 | A | 2 | <5 | 0.05 | A | 2 | <5 | |
| | | SB | 1 | 0.22 | A | 0 | <5 | 0.23 | A | 0 | <5 | |
| | | Overall | | - | A | 2 | - | - | A | 2 | - | |
| After Development (Short-Term) | | EB | 1 | 0.08 | B | 12 | <5 | 0.08 | B | 12 | <5 | |
| | | NB | 1 | 0.05 | A | 2 | <5 | 0.05 | A | 2 | <5 | |
| | | SB | 1 | 0.13 | A | 0 | <5 | 0.15 | A | 0 | <5 | |
| | | Overall | | - | A | 2 | - | - | A | 2 | - | |
| After Development (2039) | | EB | 1 | 0.11 | B | 15 | <5 | 0.11 | B | 13 | <5 | |
| | | NB | 1 | 0.05 | A | 2 | <5 | 0.05 | A | 2 | <5 | |
| | | SB | 1 | 0.23 | A | 0 | <5 | 0.24 | A | 0 | <5 | |
| | | Overall | | - | A | 2 | - | - | A | 2 | - | |

4.5.2 Signal Warrant Analysis

Signal warrant analysis was completed for 28 Street & Radcliffe Drive SE based on the methods outlined in the Transportation Association of Canada (TAC) *Traffic Signal and Pedestrian Signal Head Warrant Handbook* (2014). A score of 100 points or more indicates a traffic signal is warranted. The signal warrant analysis is summarized in **Table 4.8** and included in **Appendix B**.

Table 4.8: Signal Warrant Analysis

| INTERSECTION | HORIZON | SIGNAL WARRANT SCORE | COMMENT |
|--------------------------------|-------------------|----------------------|---------------|
| 28 Street & Radcliffe Drive SE | Existing | 32/100 | Not warranted |
| | After Development | 61/100 | |

The analysis confirms that a traffic signal is not currently warranted at 28 Street & Radcliffe Drive SE and will also not be warranted after development.

4.5.3 Daily Volumes

Anticipated daily vehicle traffic volumes on Radcliffe Drive SE were calculated and compared to City of Calgary guidelines in **Table 4.9**. The review confirms daily vehicle volumes are currently within the City's guidelines and will remain within guidelines after development.

Table 4.9: Daily Volume Analysis

| ROADWAY | TYPE | SECTION | DAILY VOLUMES | | |
|--------------------|-----------|---------|---------------|----------|-------------------|
| | | | Guideline | Existing | After Development |
| Radcliffe Drive SE | Collector | North | 2,000 - 8,000 | 5,210 | 6,790 |
| | | South | | 4,875 | 5,320 |

**Existing daily volumes are determined by applying an observed factor of 2.27 to 6-hour volumes.*

**New site generated daily volumes are determined by applying a factor of 10 to PM development volumes. Distributed by average of AM/PM select zone distributions.*

4.5.4 Access Review

The existing site access is illustrated in **Figure 4.4**. A one-way loop is currently provided within the site. Both concept plans propose a relocated two-way driveway access. The access location is shifted slightly north. As the access is located on the outside of a curve, and no on-street parking is provided on that side of the roadway, no sight line issues are associated with the relocated access. The new access will reduce pedestrian crossing distances.

Figure 4.4: Existing Site Access



4.5.5 Conclusion

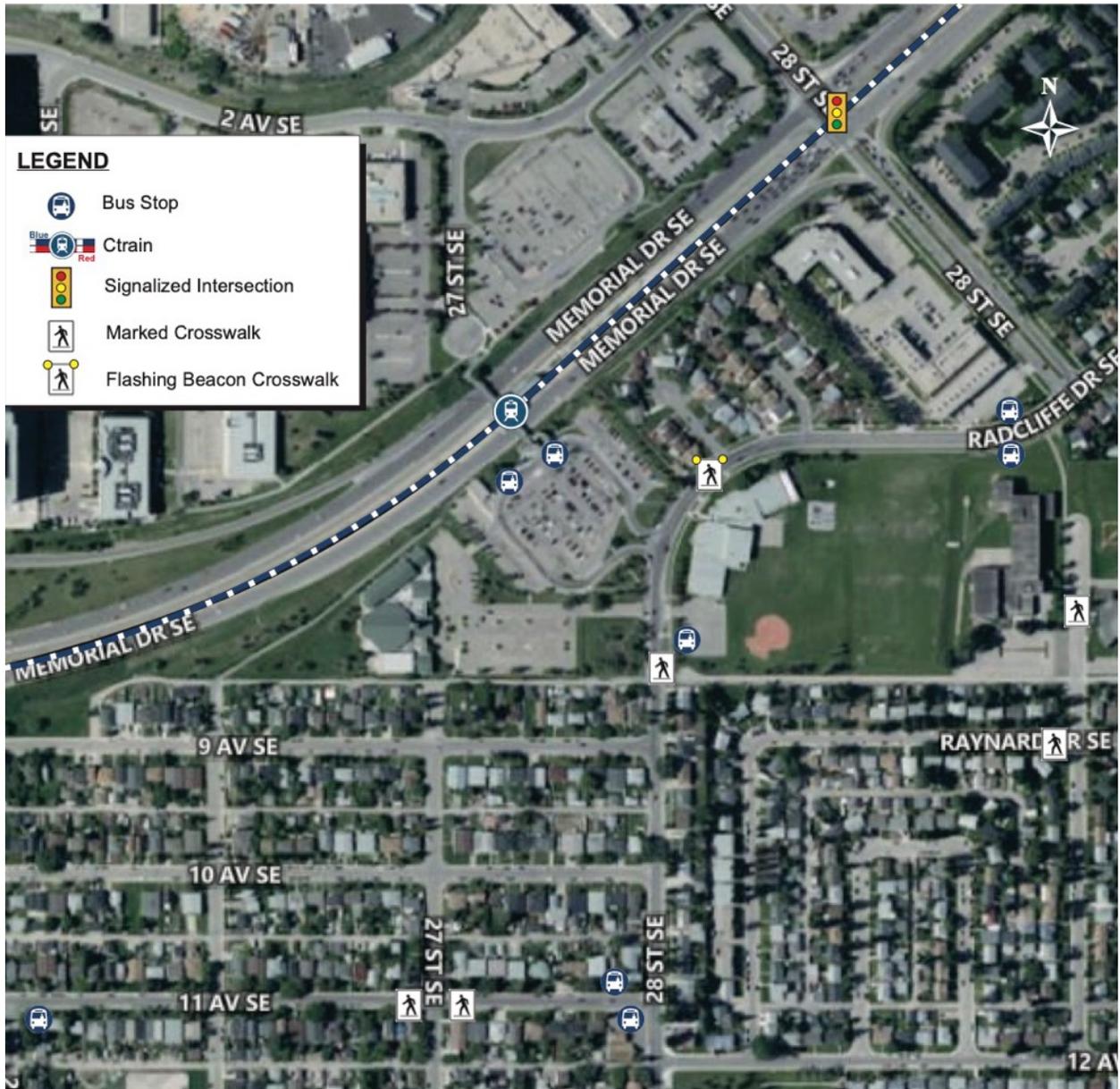
The traffic analysis confirms that no external vehicle infrastructure changes are required to accommodate Baseline or After Development traffic volumes.

5. ACTIVE TRANSPORTATION

5.1 Pedestrians

Pedestrian infrastructure within the study area is illustrated in **Figure 5.1**.

Figure 5.1: Pedestrian Network



Site Visit

Site visit observations during Radisson Park School pick-up period identified:

- **No LRT Station Draw** – No parents/students were observed walking to/from the LRT station.
- **Jaywalking** – As is typical of school pick-up/drop-off, jaywalking was observed by parents in certain locations. Specifically, to/from the Grace Baptist Church where parents were parking illegally along the Church drive aisle. This jaywalking occurred within 25 metres of an existing crosswalk.
- **Raynard Crescent SE Walkway** – The walkway from Radcliffe Drive SE to Raynard Crescent SE (located between 752 and 804 Raynard Crescent SE) was used by students and LRT users. During engagement, safety concerns were raised regarding the lack of lighting on this walkway.

External

A review of facilities finds:

- **Sidewalks** – There are no missing links impacting site connectivity. CPTED improvements should be considered by the City for the existing Raynard Crescent SE walkway.
- **Crossings** – Crosswalk changes are not required. Improvements (RRFB, curb extensions) were recently provided. Crosswalk treatments meet Transportation Association of Canada (TAC) *Pedestrian Crossing Control Guide* recommendations (ground mounted crosswalk for 2-lane roadways less than 9,000 vehicles per day).

Internal

Current connectivity between the station platform and the community is illustrated in **Figure 5.2**. Routes require most users to traverse through the parking lot. Connectivity with a concept plan is illustrated in **Figure 5.3**. All concept plans maintain and improve connectivity with more formal connections that do not require traversing parked vehicles. Pedestrian connections will be refined at the development permit stage.

Figure 5.2: On-Site Pedestrian Connectivity (Current)

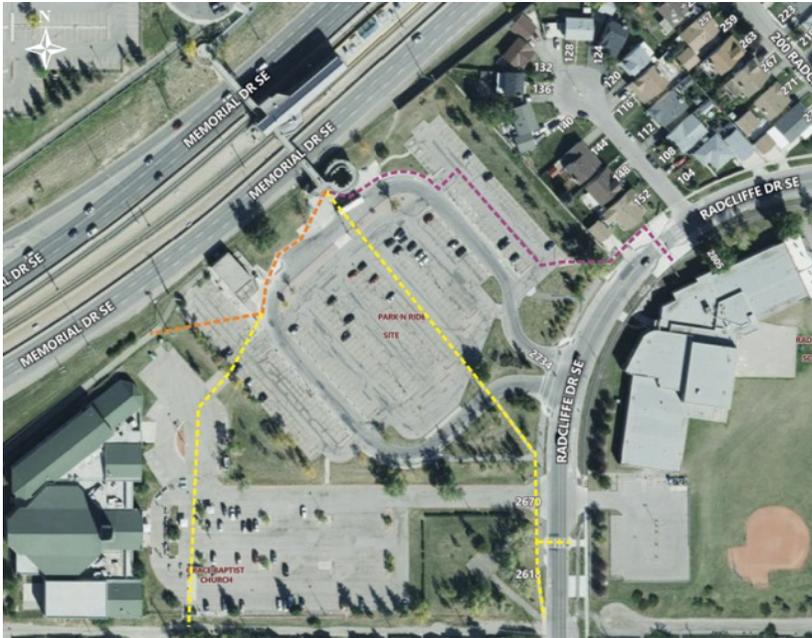


Figure 5.3: On-Site Pedestrian Connectivity (Concept)

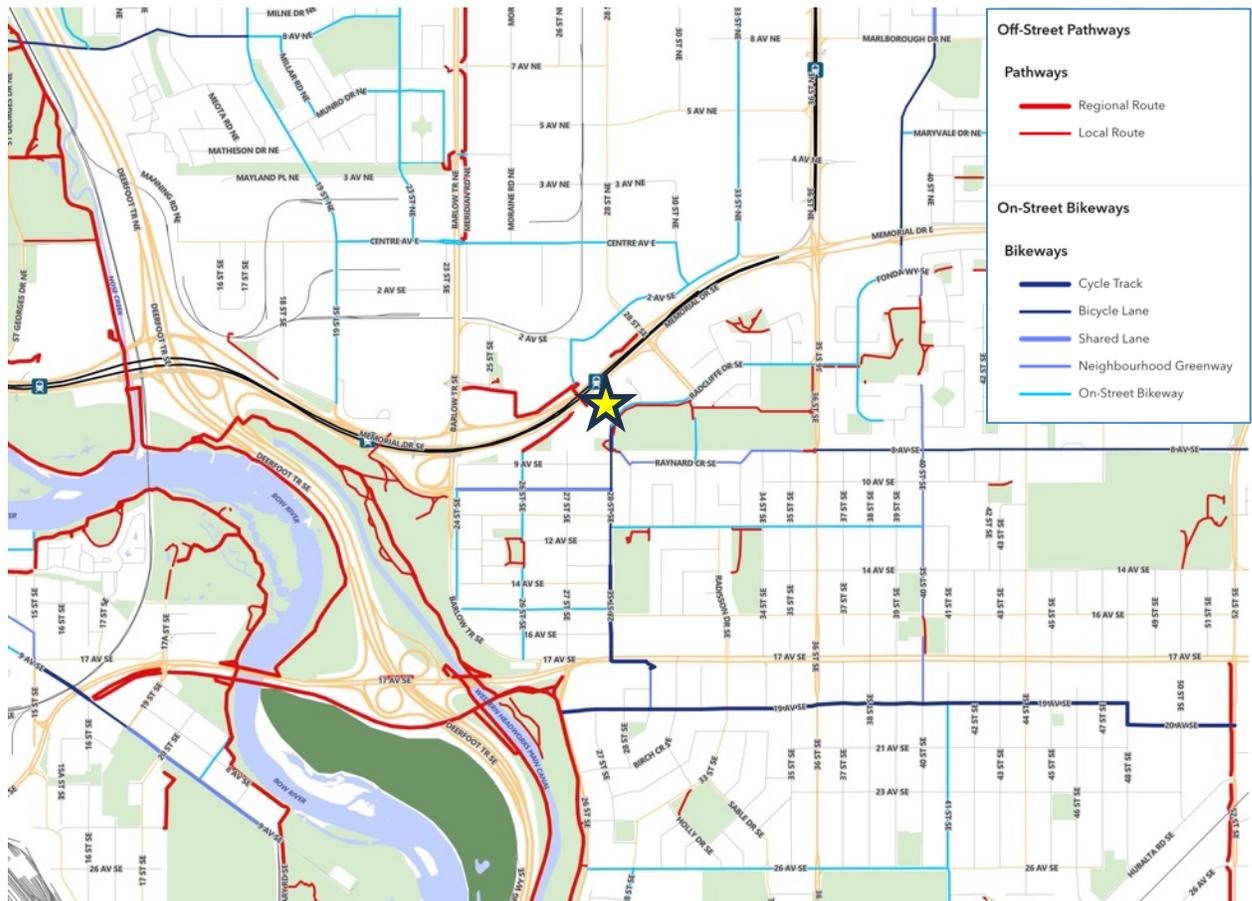


5.2 Cycling

Cycling facilities near the site are illustrated in **Figure 5.4**. Cycling facilities were recently implemented on 28 Street SE (Franklin Station to 19 Avenue SE) as part of the East Central (Phase 2) project.

A painted bike lane currently carries into the site on the one-way loop road. Cycling connections through the site will be refined at the development permit stage with an intent to provide direct cycling connectivity.

Figure 5.4: Existing Cycling Network



5.3 Transit

The existing area transit network is illustrated in **Figure 5.5** and summarized **Table 5.1**. The concept plan maintains the bus loop.

Figure 5.5: Existing Transit Service

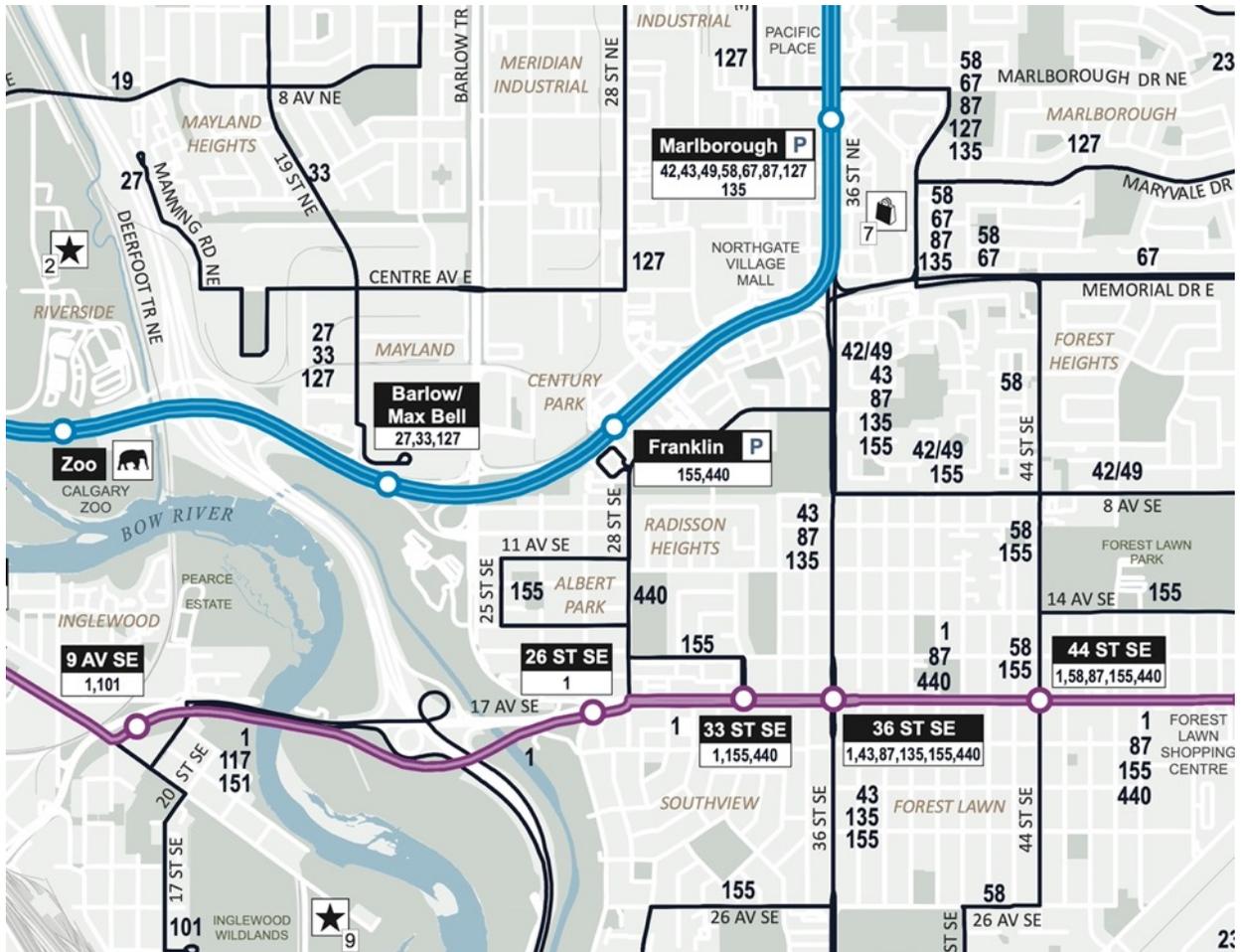


Table 5.1: Existing Transit Frequency

| ROUTE | | FREQUENCY | | |
|-------|--------------------------|-----------|------------|---|
| # | Name | | Peaks | Off-Peak |
| Blue | Saddletown/69 Street | | 6 minutes | 15 minutes |
| 155 | West Dover/Forest Lawn | | 23 minutes | 33 minutes |
| 440 | Chateau Estates/Franklin | | 46 minutes | 48-50 minutes (No service evening/weekend) |

6. PARKING

6.1 Bylaw

The minimum residential parking ratios identified in Part 6 (Multi-Residential Districts) of Land Use Bylaw 1P2007 are listed in **Table 6.1**. Parking supplies will be confirmed with future development permits.

Table 6.1: Bylaw Parking Requirements

| STALL TYPE | BYLAW RATIO |
|-------------------|---|
| Vehicle | 0.625 stalls per unit – 25% transit reduction |
| Bicycle (Class 1) | 1.00 stalls per unit |
| Bicycle (Class 2) | 0.10 stalls per unit |

6.2 On-Street

On-street parking restrictions near the site are identified in **Figure 6.1**. Residential parking permit (RPP) and time restrictions are in place near the station. Extensions of restrictions may be necessary on 200 Radcliffe Place SE or further along 9 Avenue SE should spillover parking occur in the future.

Figure 6.1: On-Street Parking Restrictions



APPENDIX A

Traffic Data



SIGNAL TIMING SUMMARY

LOCATION: MEMORIAL DRIVE - 28 STREET SE

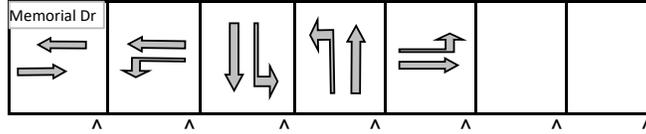
Int #: 275

Date Coded: _____

Date Installed: _____

THIS INTERSECTION IS FREQUENTLY PREEMPTED

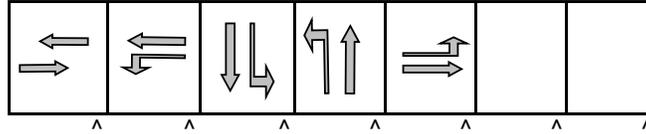
TIMING PLAN NO: Pattern 1
CYCLE LENGTH: -
OFFSET: -
START TIME: 6:00
END TIME: 9:00



| | Pro Only | Pro/Per | Per Only |
|------|----------|---------|----------|
| NBLT | X | | |
| SBLT | X | | |
| EBLT | X | | |
| WBLT | X | | |

| | 5.0+2.0 | 4.0+3.5 | 3.5+4.0 | 3.5+4.0 | 4.0+3.5 | | |
|-----------------|---------|---------|-------------------------------|---------|---------|--|--|
| MAX | 30 | 12 | 20 | 20 | 25 | | |
| MIN if Actuated | 10 | 7 | 10 | 10 | 7 | | |
| Pedestrian | 12+14 | - | SW Xwalk 8+23 NW Xwalk 8+7 | | - | | |

TIMING PLAN NO: Pattern 2
CYCLE LENGTH: -
OFFSET: -
START TIME: 9:00
END TIME: 15:30

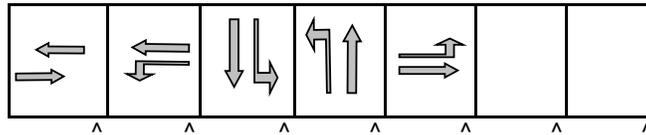


| | Pro Only | Pro/Per | Per Only |
|------|----------|---------|----------|
| NBLT | X | | |
| SBLT | X | | |
| EBLT | X | | |
| WBLT | X | | |

09:00 - 18:00 SAT
12:00 - 18:00 SUN

| | 5.0+2.0 | 4.0+3.5 | 3.5+4.0 | 3.5+4.0 | 4.0+3.5 | | |
|-----------------|---------|---------|-------------------------------|---------|---------|--|--|
| MAX | 30 | 15 | 20 | 20 | 22 | | |
| MIN if Actuated | 10 | 7 | 10 | 10 | 7 | | |
| Pedestrian | 12+14 | - | SW Xwalk 8+23 NW Xwalk 8+7 | | - | | |

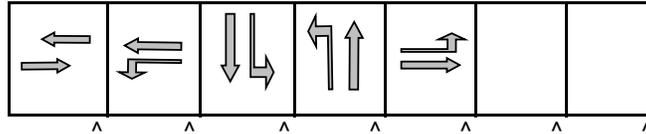
TIMING PLAN NO: Pattern 3
CYCLE LENGTH: -
OFFSET: -
START TIME: 15:30
END TIME: 18:00



| | Pro Only | Pro/Per | Per Only |
|------|----------|---------|----------|
| NBLT | X | | |
| SBLT | X | | |
| EBLT | X | | |
| WBLT | X | | |

| | 5.0+2.0 | 4.0+3.5 | 3.5+4.0 | 3.5+4.0 | 4.0+3.5 | | |
|-----------------|---------|---------|-------------------------------|---------|---------|--|--|
| MAX | 40 | 15 | 20 | 20 | 22 | | |
| MIN if Actuated | 10 | 7 | 10 | 10 | 7 | | |
| Pedestrian | 12+14 | - | SW Xwalk 8+23 NW Xwalk 8+7 | | - | | |

TIMING PLAN NO: Pattern 4
CYCLE LENGTH: -
OFFSET: -
START TIME: 21:00
END TIME: 6:00

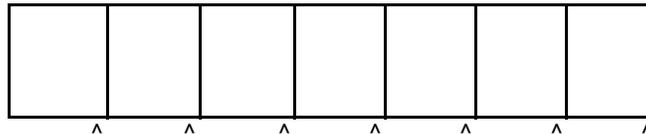


| | Pro Only | Pro/Per | Per Only |
|------|----------|---------|----------|
| NBLT | X | | |
| SBLT | X | | |
| EBLT | X | | |
| WBLT | X | | |

18:00 - 09:00 SAT
18:00 - 12:00 SUN

| | 5.0+2.0 | 4.0+3.5 | 3.5+4.0 | 3.5+4.0 | 4.0+3.5 | | |
|-----------------|---------|---------|-------------------------------|---------|---------|--|--|
| MAX | 30 | 15 | 20 | 20 | 22 | | |
| MIN if Actuated | 10 | 7 | 10 | 10 | 7 | | |
| Pedestrian | 12+14 | - | SW Xwalk 8+23 NW Xwalk 8+7 | | - | | |

TIMING PLAN NO: _____
CYCLE LENGTH: _____
OFFSET: _____
START TIME: _____
END TIME: _____



| | Pro Only | Pro/Per | Per Only |
|------|----------|---------|----------|
| NBLT | | | |
| SBLT | | | |
| EBLT | | | |
| WBLT | | | |

| MAX | | | | | | | |
|-----------------|--|--|--|--|--|--|--|
| MIN if Actuated | | | | | | | |
| Pedestrian | | | | | | | |

Notes: The offset point is referenced to the beginning of the first column of traffic movements.
 If the max time is less than the pedestrian time, the extra unused pedestrian time is passed to the main street unless otherwise noted.
 If any of the summary is unclear, please contact the Signals Division with the City of Calgary, by phoning 311.

Intersection Turning Movement Count Summary:

N/S Road: Radcliffe Drive SE
 E/W Road: Franklin Station Parking Lot
 Count Date: January 30, 2024 Tuesday
 Weather: Clear
 Road Condition: Dry
 Project #: 02-24-0006

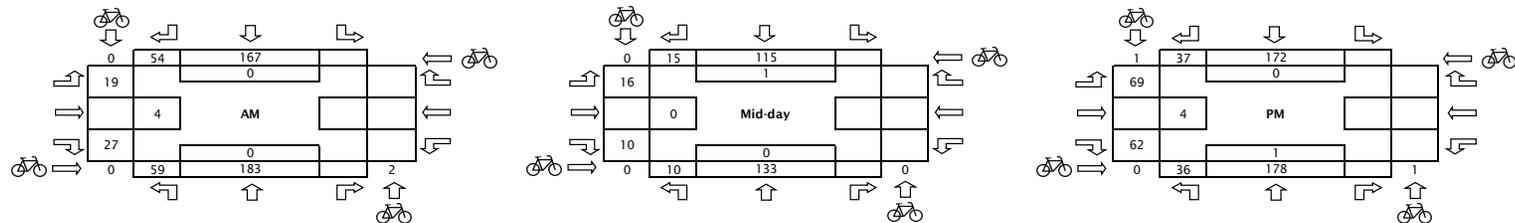
Radcliffe Drive SE & Franklin Station Parking Lot

AM Peak Hour: 7:45 AM to 8:45 AM PHF (AM Peak Hour): 0.77
 Mid-day Peak Hour: 11:15 AM to 12:15 PM PHF (Mid-day Peak Hour): 0.92
 PM Peak Hour: 4:30 PM to 5:30 PM PHF (PM Peak Hour): 0.94

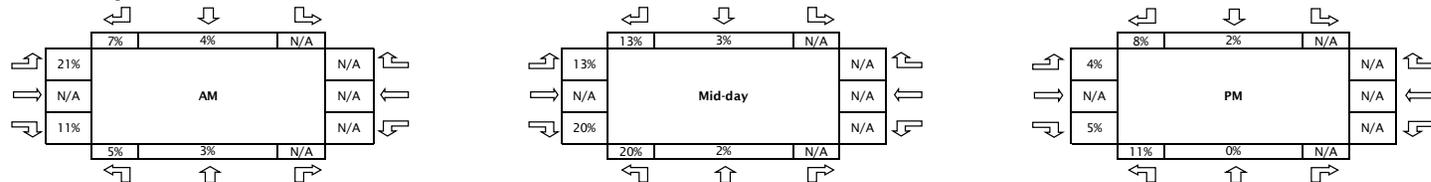


| Time Starting | Radcliffe Drive SE | | | | | | | | | | | | Franklin Station Parking Lot | | | | | | | | | | | | Total Vehicles 15 Min | Pedestrians | | | | Cyclists | | | | | | | | |
|-----------------|------------------------|---------|-------|------|---------|-------|------------------------|---------|-------|------|---------|-------|------------------------------|---------|-------|------|---------|-------|----------------------|-----|--|--|-----|-----|--------------------------|-------------|-----------|------------|------------|----------|----|----|----|---|---|---|---|---|
| | Northbound (South Leg) | | | | | | Southbound (North Leg) | | | | | | Westbound (East Leg) | | | | | | Eastbound (West Leg) | | | | | | | West Side | East Side | North Side | South Side | NB | SB | WB | EB | | | | | |
| | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right | | | | | | | | | | | | | | | | | | | | |
| 7:00 | 17 | 0 | 8 | 0 | | | | | 21 | 0 | 13 | 0 | | | | | | | 6 | 1 | | | 9 | 1 | 76 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7:15 | 21 | 2 | 8 | 0 | | | | | 24 | 3 | 12 | 1 | | | | | | | 3 | 1 | | | 5 | 1 | 81 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7:30 | 16 | 2 | 19 | 2 | | | | | 27 | 1 | 13 | 0 | | | | | | | 8 | 0 | | | 5 | 1 | 94 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7:45 | 14 | 0 | 31 | 1 | | | | | 32 | 1 | 14 | 1 | | | | | | | 6 | 1 | | | 4 | 1 | 106 | 357 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | | |
| 8:00 | 20 | 1 | 39 | 3 | | | | | 38 | 3 | 11 | 1 | | | | | | | 2 | 2 | | | 8 | 0 | 128 | 409 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | | |
| 8:15 | 12 | 2 | 64 | 1 | | | | | 61 | 2 | 11 | 1 | | | | | | | 3 | 0 | | | 7 | 2 | 166 | 494 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8:30 | 10 | 0 | 44 | 0 | | | | | 29 | 1 | 14 | 1 | | | | | | | 4 | 1 | | | 5 | 0 | 109 | 509 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 8:45 | 5 | 1 | 16 | 2 | | | | | 19 | 4 | 9 | 1 | | | | | | | 5 | 0 | | | 1 | 1 | 64 | 467 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | |
| 2 Hour Total | 115 | 8 | 229 | 9 | | | | | 251 | 15 | 97 | 6 | | | | | | | 37 | 6 | | | 44 | 7 | | 5 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | | |
| Peak Hour Total | 56 | 3 | 178 | 5 | | | | | 160 | 7 | 50 | 4 | | | | | | | 15 | 4 | | | 24 | 3 | | 4 | | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | | |
| | | 59 | 183 | | | | | | | 167 | | 54 | | | | | | | | 19 | | | | 27 | | | | | | | | | | | | | | |
| 11:00 | 1 | 0 | 43 | 2 | | | | | 25 | 0 | 0 | 0 | | | | | | | 0 | 0 | | | 2 | 0 | 73 | 2 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 11:15 | 3 | 1 | 41 | 1 | | | | | 22 | 1 | 5 | 1 | | | | | | | 2 | 0 | | | 3 | 1 | 81 | 0 | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 11:30 | 2 | 0 | 35 | 1 | | | | | 23 | 0 | 1 | 0 | | | | | | | 4 | 1 | | | 4 | 0 | 71 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 11:45 | 2 | 1 | 21 | 0 | | | | | 34 | 1 | 3 | 1 | | | | | | | 4 | 0 | | | 0 | 1 | 68 | 293 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12:00 | 1 | 0 | 34 | 0 | | | | | 33 | 1 | 4 | 0 | | | | | | | 4 | 1 | | | 1 | 0 | 79 | 299 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 12:15 | 3 | 0 | 28 | 0 | | | | | 28 | 2 | 1 | 1 | | | | | | | 3 | 0 | | | 4 | 1 | 71 | 289 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 12:30 | 7 | 0 | 21 | 1 | | | | | 32 | 4 | 1 | 0 | | | | | | | 1 | 1 | | | 5 | 0 | 73 | 291 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 12:45 | 1 | 0 | 25 | 1 | | | | | 23 | 0 | 1 | 1 | | | | | | | 2 | 0 | | | 3 | 0 | 57 | 280 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2 Hour Total | 20 | 2 | 248 | 6 | | | | | 220 | 9 | 16 | 4 | | | | | | | 20 | 3 | | | 22 | 3 | | 9 | | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Peak Hour Total | 8 | 2 | 131 | 2 | | | | | 112 | 3 | 13 | 2 | | | | | | | 14 | 2 | | | 8 | 2 | | 5 | | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 10 | 133 | | | | | | | 115 | | 15 | | | | | | | | 16 | | | | 10 | | | | | | | | | | | | | | |
| 16:00 | 5 | 0 | 25 | 0 | | | | | 38 | 0 | 5 | 0 | | | | | | | 10 | 0 | | | 10 | 1 | 94 | 5 | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | |
| 16:15 | 4 | 1 | 39 | 0 | | | | | 47 | 0 | 5 | 1 | | | | | | | 14 | 1 | | | 17 | 1 | 130 | 1 | | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | |
| 16:30 | 12 | 2 | 33 | 0 | | | | | 47 | 1 | 3 | 0 | | | | | | | 12 | 1 | | | 14 | 1 | 126 | 3 | | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | | |
| 16:45 | 10 | 0 | 54 | 0 | | | | | 41 | 0 | 9 | 1 | | | | | | | 14 | 0 | | | 17 | 1 | 147 | 497 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 17:00 | 5 | 1 | 39 | 0 | | | | | 47 | 1 | 8 | 1 | | | | | | | 22 | 2 | | | 14 | 1 | 141 | 544 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 17:15 | 5 | 1 | 52 | 0 | | | | | 34 | 1 | 14 | 1 | | | | | | | 18 | 0 | | | 14 | 0 | 140 | 554 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | | |
| 17:30 | 6 | 2 | 39 | 1 | | | | | 40 | 0 | 6 | 0 | | | | | | | 18 | 1 | | | 11 | 2 | 126 | 554 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 17:45 | 3 | 0 | 37 | 0 | | | | | 40 | 0 | 1 | 1 | | | | | | | 11 | 0 | | | 6 | 1 | 100 | 507 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 2 Hour Total | 50 | 7 | 318 | 1 | | | | | 334 | 3 | 51 | 5 | | | | | | | 119 | 5 | | | 103 | 8 | | 13 | | 0 | 1 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | | |
| Peak Hour Total | 32 | 4 | 178 | 0 | | | | | 169 | 3 | 34 | 3 | | | | | | | 66 | 3 | | | 59 | 3 | | 4 | | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | | |
| | | 36 | 178 | | | | | | | 172 | | 37 | | | | | | | | 69 | | | | 62 | | | | | | | | | | | | | | |
| 6 Hour Total | 185 | 17 | 795 | 16 | | | | | 805 | 27 | 164 | 15 | | | | | | | 176 | 14 | | | 169 | 18 | | 27 | | 2 | 1 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 202 | 811 | | | | | | | 832 | | 179 | | | | | | | | 190 | | | | 187 | | | | | | | | | | | | | | |

Peak Hour Volumes



Heavy Vehicle Percentage



Franklin Station TOD TIA(R2633)
 Transportation Forecast
 ISC: Unrestricted
 00-Jan-00
 RTM Database Used:
 2015 LUN 092618-CTP MDP Scenario Series
 2028 LUN 092618-CTP MDP Scenario Series
 2039 LUN 101118-CTP MDP Scenario Series
 2048 LUN 050421-CTP MDP Scenario Series

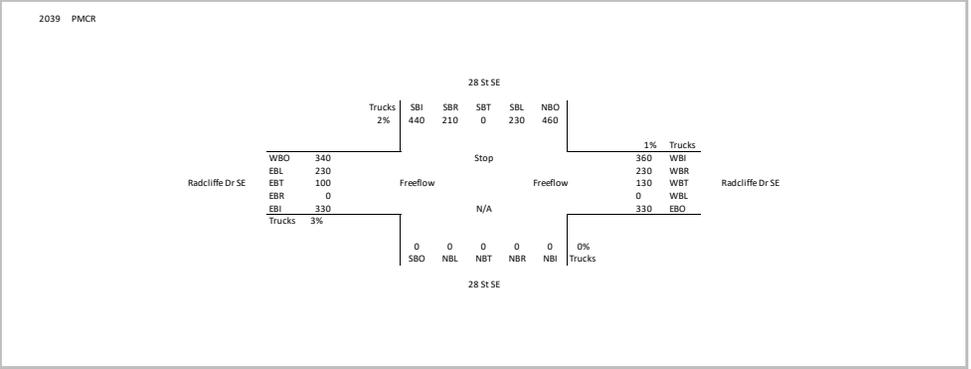
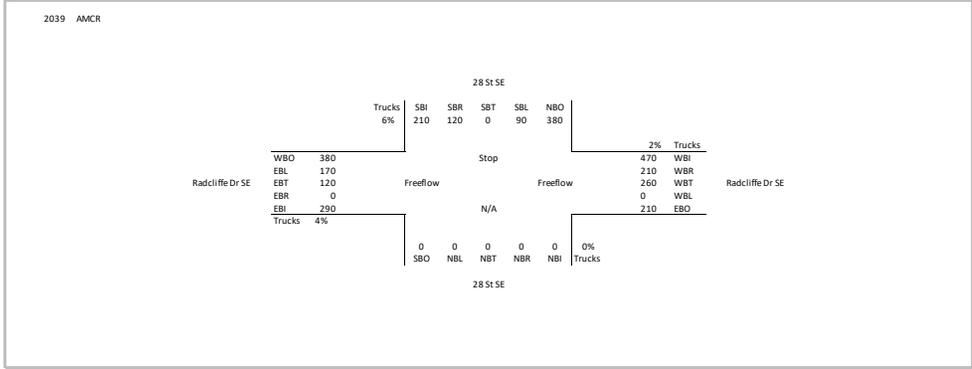
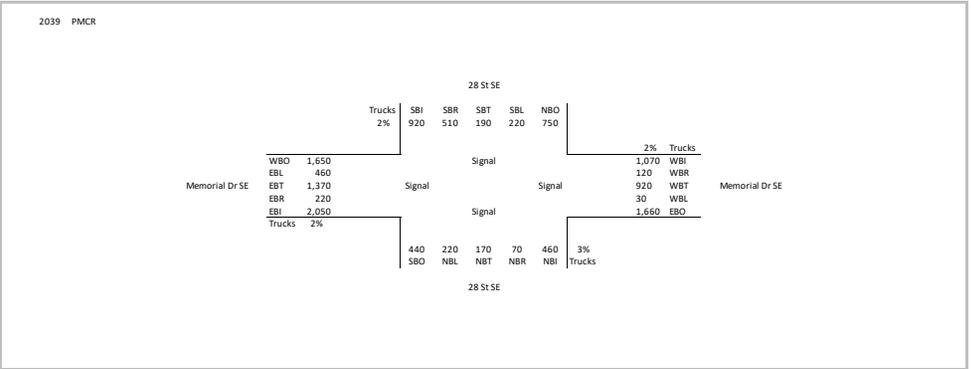
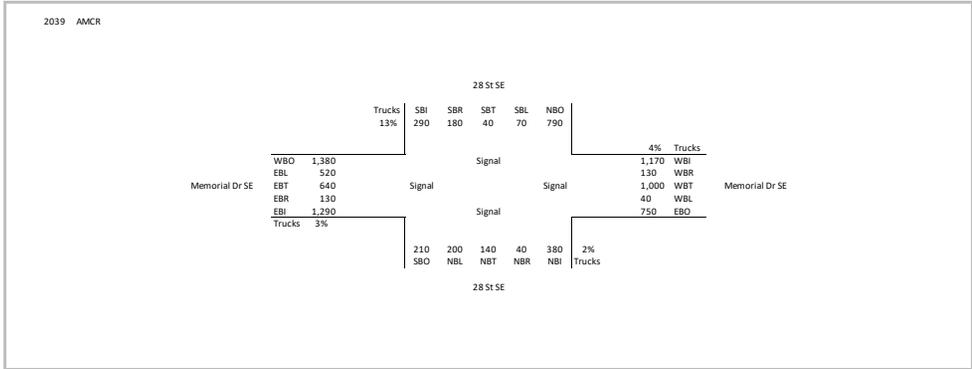
Understanding turning movement diagrams:

| | | | |
|--------|-----------------|---|----------------------------|
| NB | Northbound | I | In (entering intersection) |
| SB | Southbound | O | Out (leaving intersection) |
| EB | Eastbound | R | Right turn |
| WB | Westbound | T | Through |
| Trucks | Inbound Truck % | L | Left Turn |



AM Peak Hour Forecast

PM Peak Hour Forecast





Select Zone Plots

R2633-Franklin Station TOD TIA

Client: Shanti Acharjee
City of Calgary-Development Engineering

Prepared By: Ahsan Tariq
March 05, 2024

Notes:

Notes: All data presented here represent raw model outputs and require adjustment and interpretation prior to application in any study. Please contact TranPlanForecast@calgary.ca for a copy of the scenario assumptions used to prepare this forecast.

If you have questions or would like additional details please contact TranPlanForecast@calgary.ca.

ADVISORY: It's the recipient's responsibility to review network and land use assumptions used to produce this analysis. Prior to application in any study, all model inputs and outputs require interpretation and adjustment.

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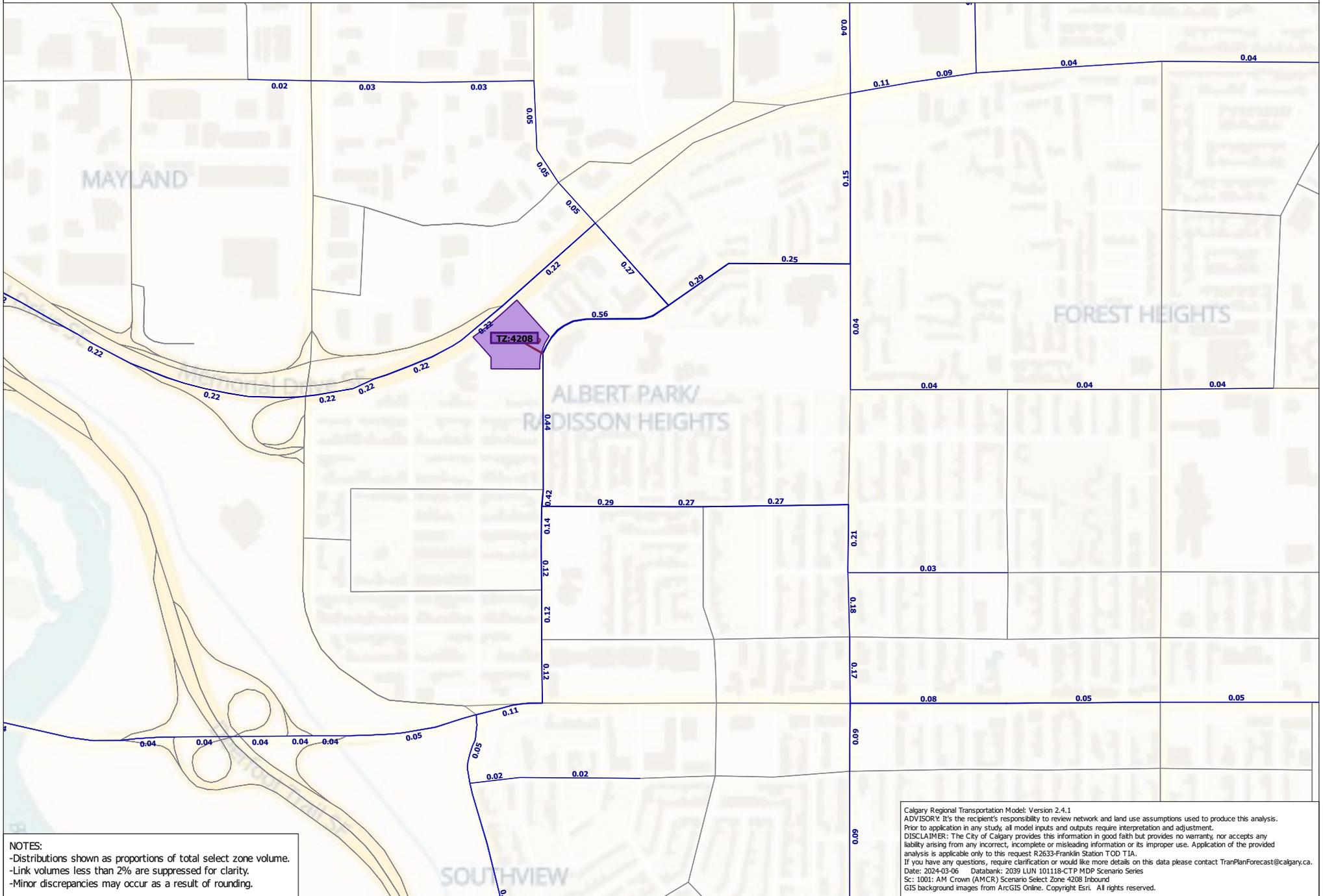


Inbound Distribution for Zone(s): 4208

2039 LUN - AM Crown

R2633-Franklin Station TOD TIA

Total Inbound Select Zone Volume = 130 veh/hr



NOTES:
 -Distributions shown as proportions of total select zone volume.
 -Link volumes less than 2% are suppressed for clarity.
 -Minor discrepancies may occur as a result of rounding.

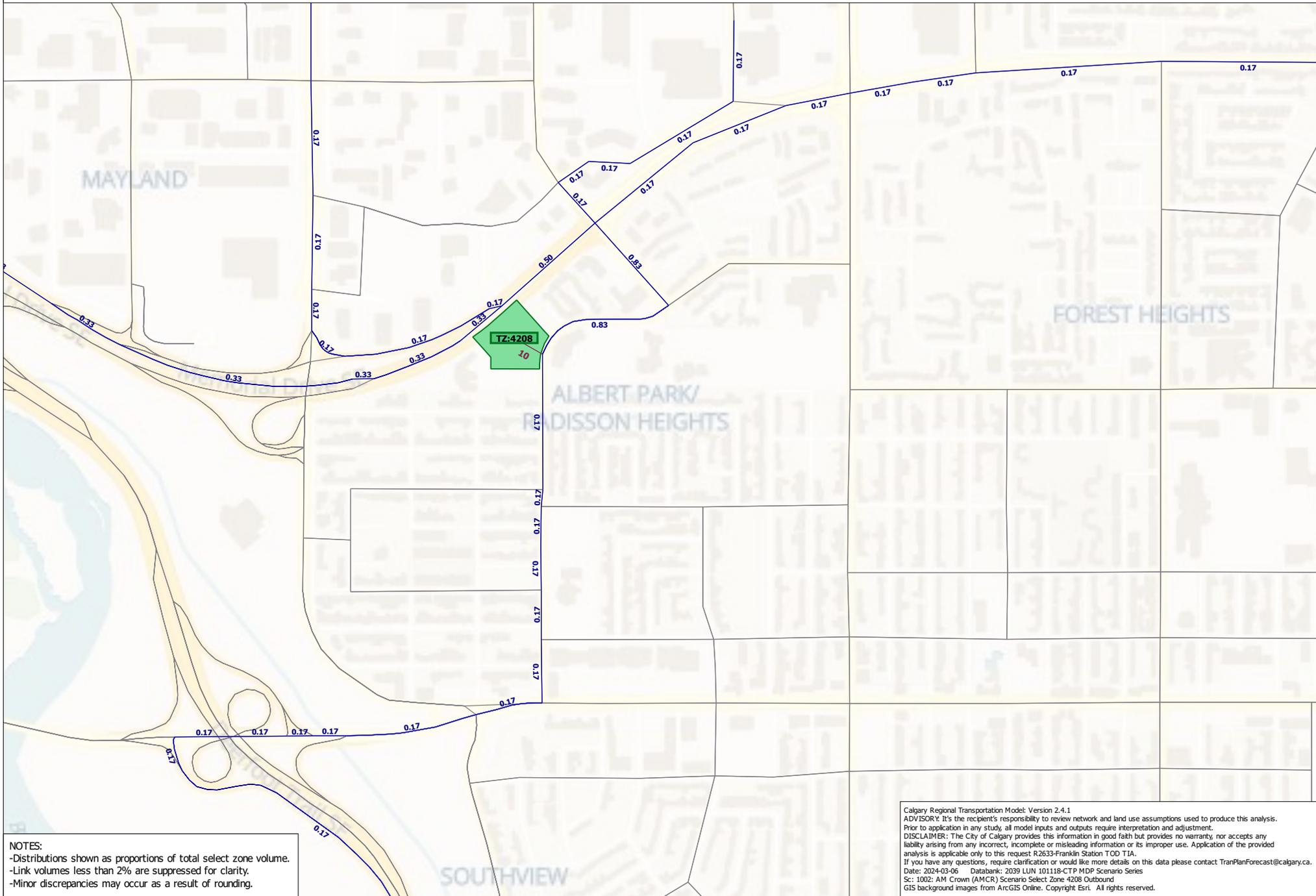
Calgary Regional Transportation Model: Version 2.4.1
 ADVISORY: It's the recipient's responsibility to review network and land use assumptions used to produce this analysis.
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 If you have any questions, require clarification or would like more details on this data please contact TranPlanForecast@calgary.ca.
 Date: 2024-03-06 Databank: 2039 LUN 101118-CTP MDP Scenario Series
 Sc: 1001: AM Crown (AMCR) Scenario Select Zone 4208 Inbound
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Outbound Distribution for Zone(s): 4208

2039 LUN - AM Crown

R2633-Franklin Station TOD TIA

Total Outbound Select Zone Volume = 10 veh/hr



NOTES:
-Distributions shown as proportions of total select zone volume.
-Link volumes less than 2% are suppressed for clarity.
-Minor discrepancies may occur as a result of rounding.

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Date: 2024-03-06 Databank: 2039 LUN 101118-CTP MDP Scenario Series
Sc: 1002: AM Crown (AMCR) Scenario Select Zone 4208 Outbound
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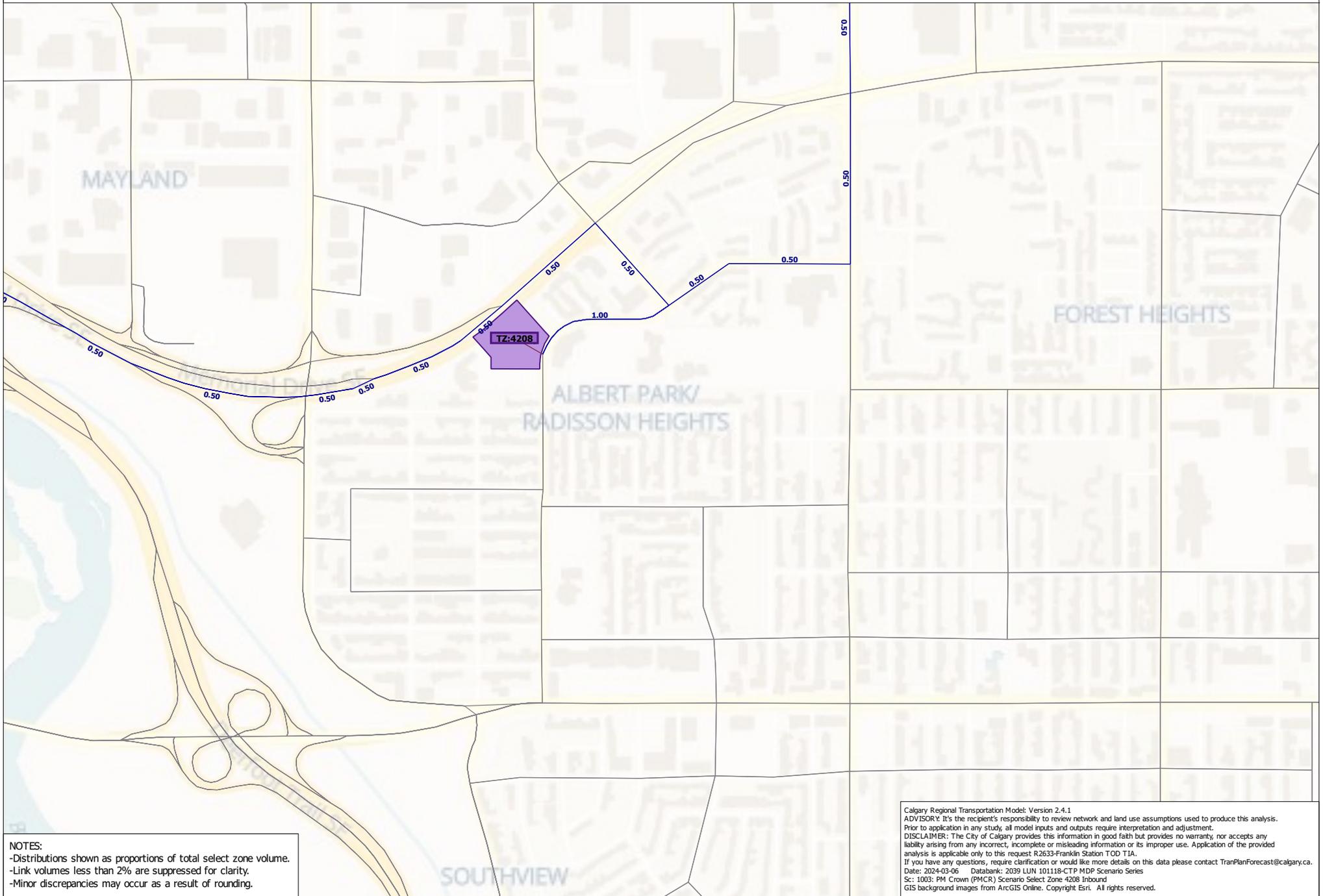


Inbound Distribution for Zone(s): 4208

2039 LUN - PM Crown

R2633-Franklin Station TOD TIA

Total Inbound Select Zone Volume = 0 veh/hr



NOTES:
 -Distributions shown as proportions of total select zone volume.
 -Link volumes less than 2% are suppressed for clarity.
 -Minor discrepancies may occur as a result of rounding.

Calgary Regional Transportation Model: Version 2.4.1
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 Date: 2024-03-06 Databank: 2039 LUN: 101118-CTP MDP Scenario Series
 Sc: 1003: PM Crown (PMCR) Scenario Select Zone 4208 Inbound
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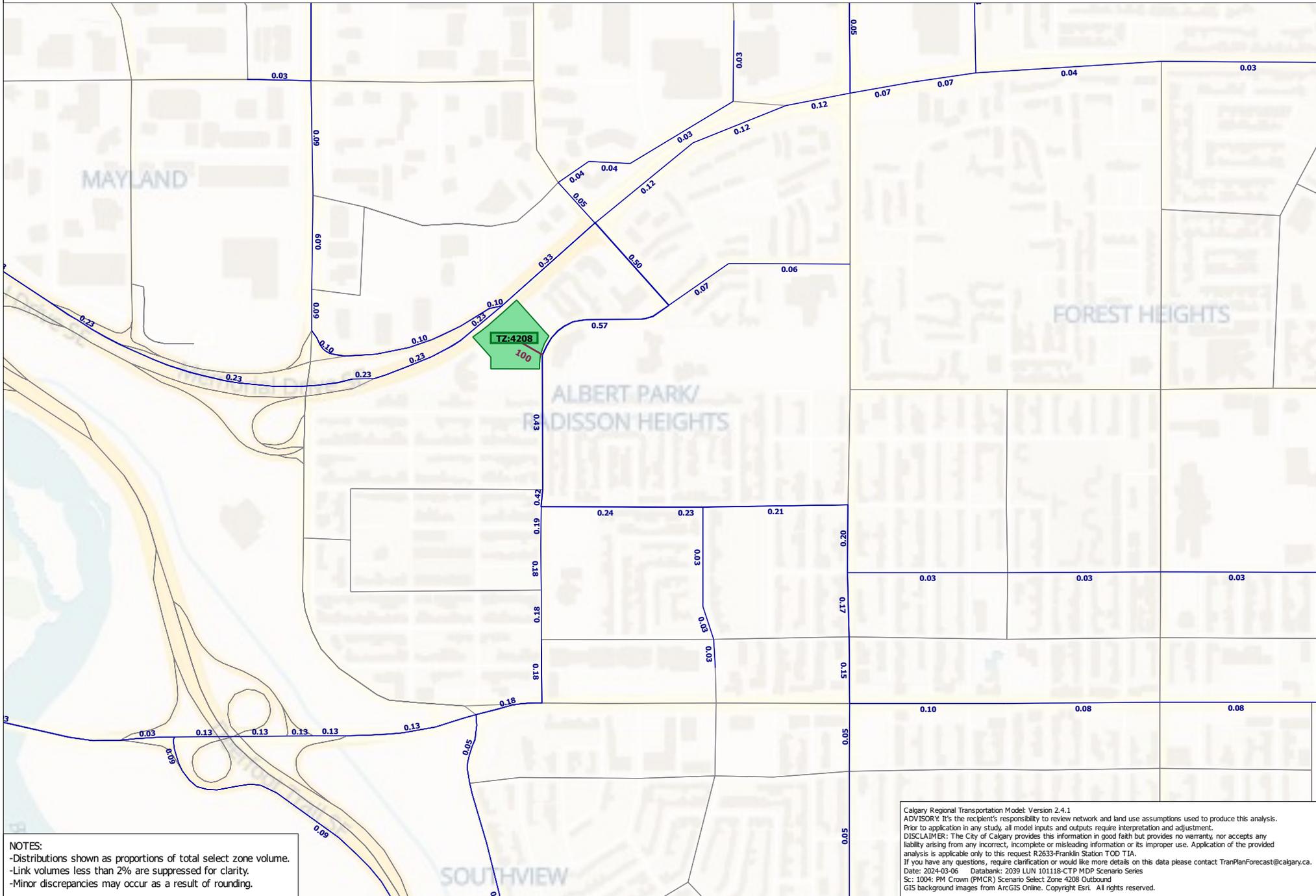


Outbound Distribution for Zone(s): 4208

2039 LUN - PM Crown

R2633-Franklin Station TOD TIA

Total Outbound Select Zone Volume = 90 veh/hr



NOTES:
 -Distributions shown as proportions of total select zone volume.
 -Link volumes less than 2% are suppressed for clarity.
 -Minor discrepancies may occur as a result of rounding.

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 Date: 2024-03-06 Databank: 2039 LUN: 101118-CTP MDP Scenario Series
 Sc: 1004: PM Crown (PMCR) Scenario Select Zone 4208 Outbound
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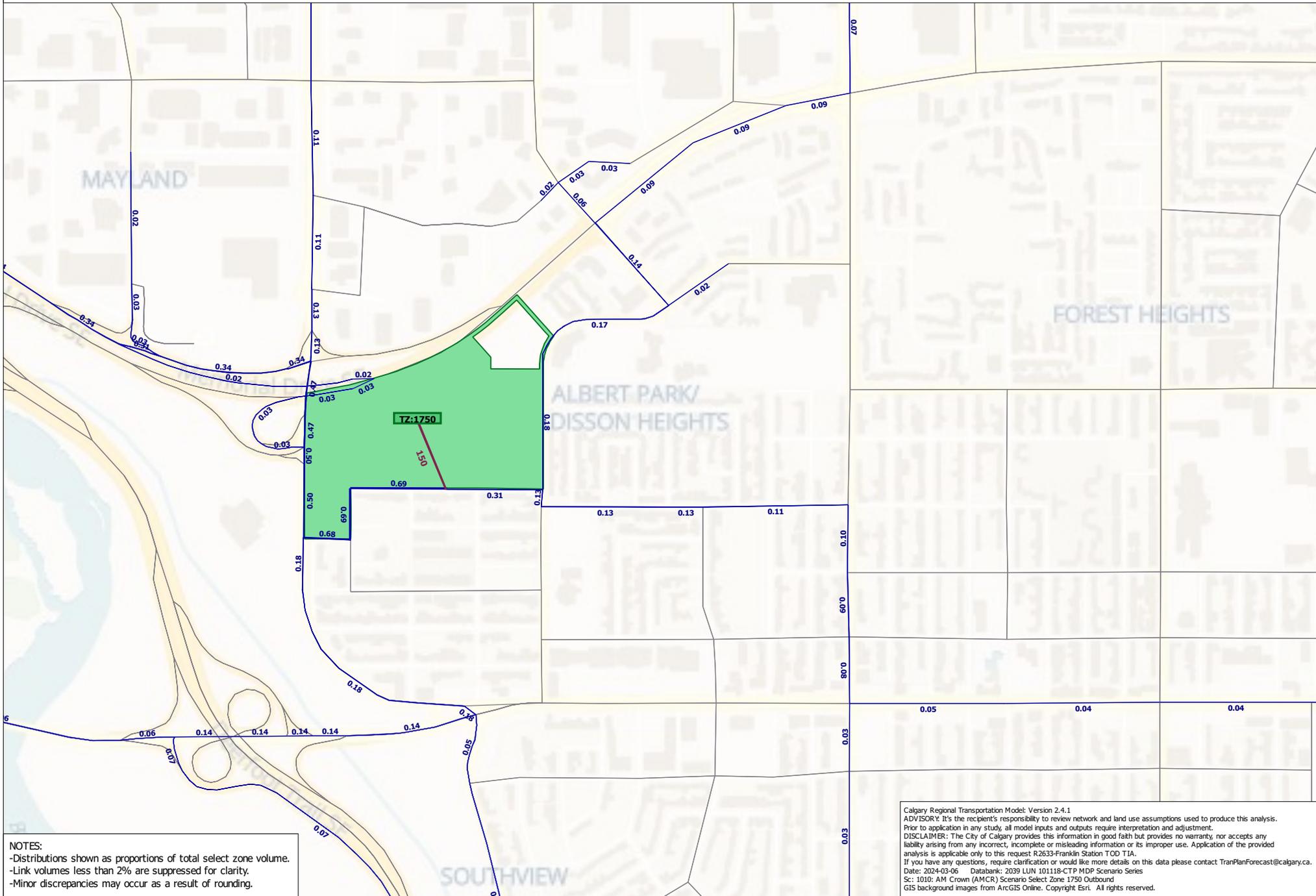


Outbound Distribution for Zone(s): 1750

2039 LUN - AM Crown

R2633-Franklin Station TOD TIA

Total Outbound Select Zone Volume = 150 veh/hr



NOTES:
 -Distributions shown as proportions of total select zone volume.
 -Link volumes less than 2% are suppressed for clarity.
 -Minor discrepancies may occur as a result of rounding.

Calgary Regional Transportation Model: Version 2.4.1
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 If you have any questions, require clarification or would like more details on this data please contact TranPlanForecast@calgary.ca.
 Date: 2024-03-06 Databank: 2039 LUN 101118-CTP MDP Scenario Series
 Sc: 1010: AM Crown (AMCR) Scenario Select Zone 1750 Outbound
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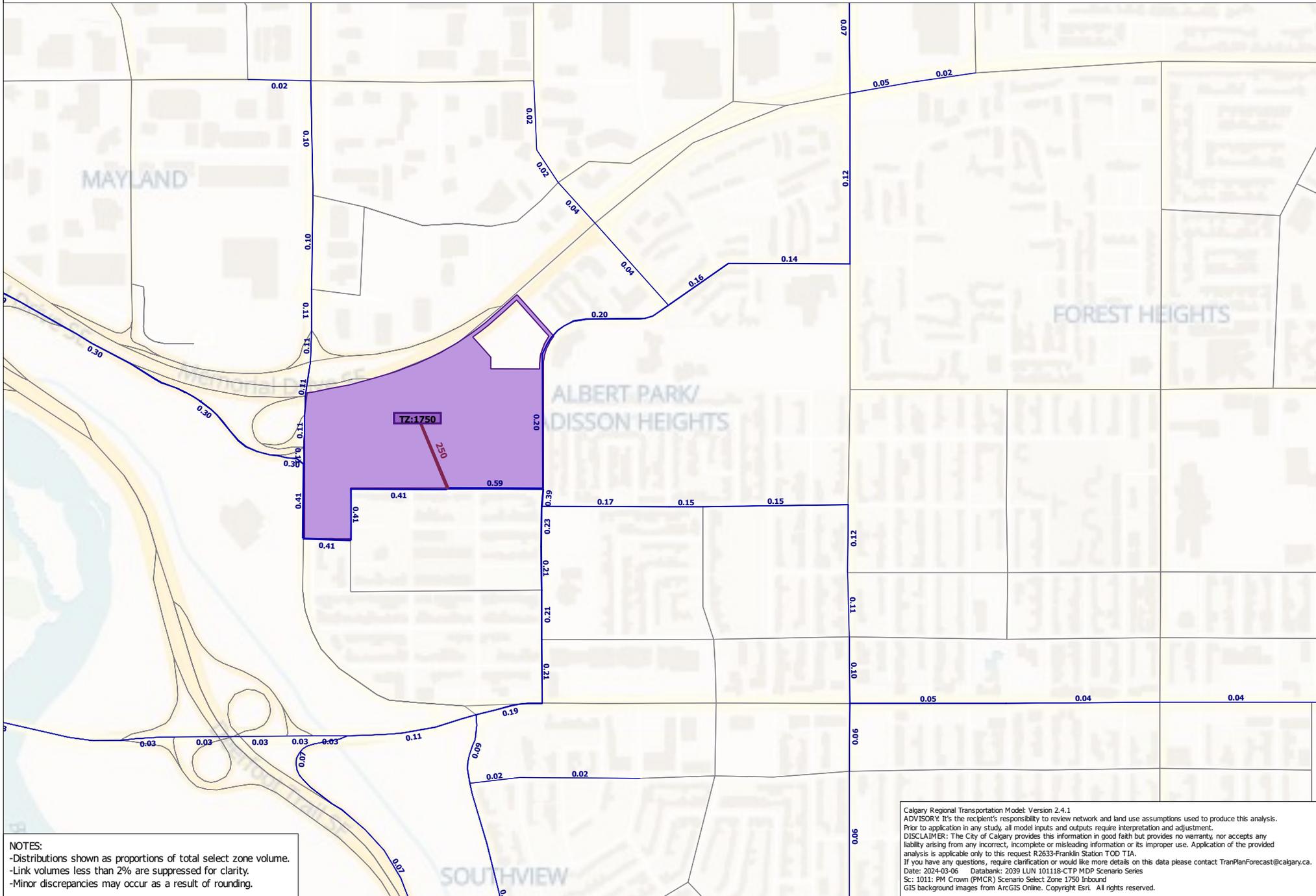


Inbound Distribution for Zone(s): 1750

2039 LUN - PM Crown

R2633-Franklin Station TOD TIA

Total Inbound Select Zone Volume = 240 veh/hr



NOTES:
 -Distributions shown as proportions of total select zone volume.
 -Link volumes less than 2% are suppressed for clarity.
 -Minor discrepancies may occur as a result of rounding.

Calgary Regional Transportation Model: Version 2.4.1
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 Date: 2024-03-06 Databank: 2039 LUN 101118-CTP MDP Scenario Series
 Sc: 1011: PM Crown (PMCR) Scenario Select Zone 1750 Inbound
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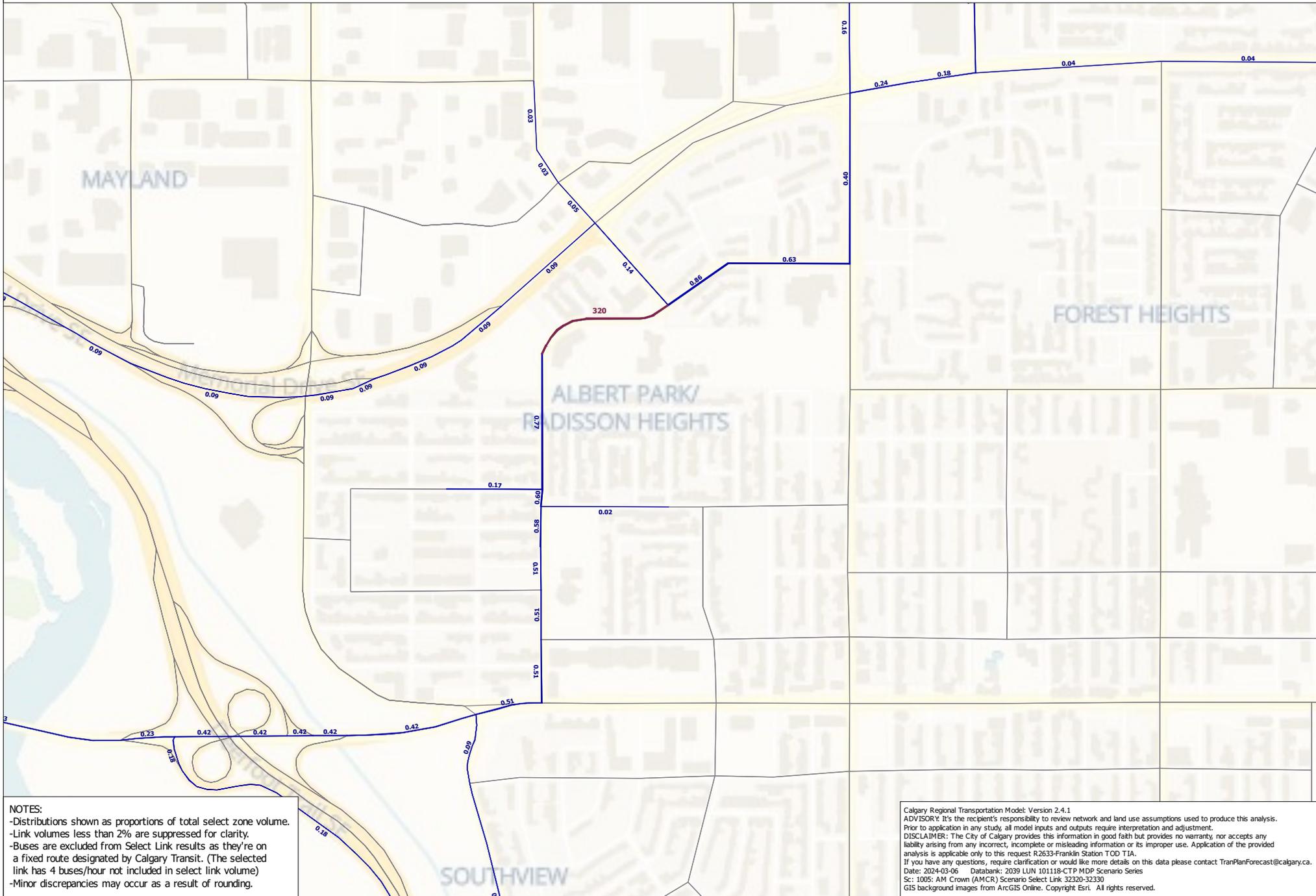


Link Distribution (Select Link) - Westbound

2039 LUN - AM Crown

R2633-Franklin Station TOD TIA

Total Select Link Volume = 310 veh/hr



NOTES:
 -Distributions shown as proportions of total select zone volume.
 -Link volumes less than 2% are suppressed for clarity.
 -Buses are excluded from Select Link results as they're on a fixed route designated by Calgary Transit. (The selected link has 4 buses/hour not included in select link volume)
 -Minor discrepancies may occur as a result of rounding.

Calgary Regional Transportation Model: Version 2.4.1
 ADVISORY: It's the recipient's responsibility to review network and land use assumptions used to produce this analysis. Prior to application in any study, all model inputs and outputs require interpretation and adjustment.
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 If you have any questions, require clarification or would like more details on this data please contact TranPlanForecast@calgary.ca.
 Date: 2024-03-06 Databank: 2039 LUN 101118-CTP MDP Scenario Series
 Sc: 1005: AM Crown (AMCR) Scenario Select Link 32320-32330
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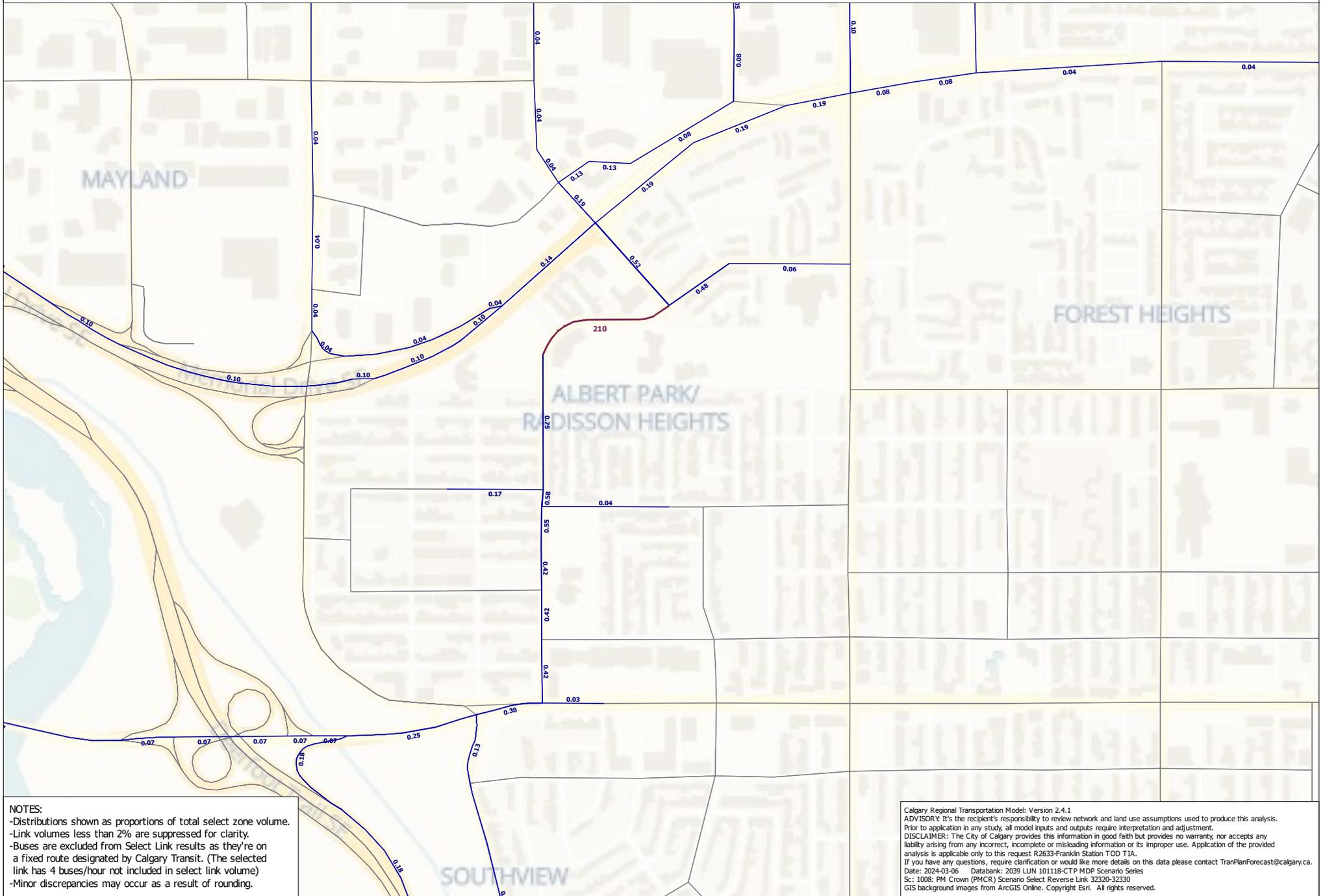


Link Distribution (Select Link) - Eastbound

2039 LUN - PM Crown

R2633-Franklin Station TOD TIA

Total Select Link Volume = 210 veh/hr



NOTES:
 -Distributions shown as proportions of total select zone volume.
 -Link volumes less than 2% are suppressed for clarity.
 -Buses are excluded from Select Link results as they're on a fixed route designated by Calgary Transit. (The selected link has 4 buses/hour not included in select link volume)
 -Minor discrepancies may occur as a result of rounding.

Calgary Regional Transportation Model: Version 2.4.1
 ADVISORY: It's the recipient's responsibility to review network and land use assumptions used to produce this analysis.
 Prior to application in any study, all model inputs and outputs require interpretation and adjustment.
 DISCLAIMER: The City of Calgary provides this information in good faith but provides no warranty, nor accepts any liability arising from any incorrect, incomplete or misleading information or its improper use. Application of the provided analysis is applicable only to this request R2633-Franklin Station TOD TIA.
 If you have any questions, require clarification or would like more details on this data please contact TranPlanForecast@calgary.ca.
 Date: 2024-03-06 Databank: 2039 LUN 101118-CTP MDP Scenario Series
 Sc: 1008: PM Crown (PMCR) Scenario Select Reverse Link 32320-32330
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APPENDIX B

Analysis Outputs

1: 28 Street SE & Memorial Drive E
04-18-2024

Existing
AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 372 | 508 | 188 | 51 | 937 | 209 | 104 | 82 | 56 | 71 | 60 | 218 |
| Future Volume (vph) | 372 | 508 | 188 | 51 | 937 | 209 | 104 | 82 | 56 | 71 | 60 | 218 |
| Ideal Flow (vphpl) | 1500 | 1500 | 1850 | 1500 | 1500 | 1850 | 1500 | 1850 | 1850 | 1500 | 1850 | 1850 |
| Storage Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | 0.0 | | 30.0 | 0.0 | | 0.0 |
| Storage Lanes | 2 | | 1 | 1 | | 3 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | |
| Ped Bike Factor | | | 0.98 | | | 0.94 | | | 0.98 | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.994 | |
| Satd. Flow (prot) | 2684 | 3900 | 1527 | 1425 | 3900 | 1512 | 1397 | 1850 | 1498 | 1220 | 1726 | 1404 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.994 | |
| Satd. Flow (perm) | 2684 | 3900 | 1494 | 1425 | 3900 | 1418 | 1397 | 1850 | 1465 | 1220 | 1726 | 1374 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 239 | | | 222 | | | 239 | | | 239 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 513.5 | | | 198.8 | | | 295.7 | | | 190.7 | |
| Travel Time (s) | | 37.0 | | | 14.3 | | | 21.3 | | | 13.7 | |
| Confl. Peds. (#/hr) | | | 25 | | | 25 | | | 25 | | | 25 |
| Confl. Bikes (#/hr) | | | 10 | | | 10 | | | 10 | | | 10 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 3% | 5% | 3% | 0% | 5% | 4% | 2% | 0% | 5% | 11% | 0% | 12% |
| Adj. Flow (vph) | 396 | 540 | 200 | 54 | 997 | 222 | 111 | 87 | 60 | 76 | 64 | 232 |
| Shared Lane Traffic (%) | | | | | | | | | | 10% | | |
| Lane Group Flow (vph) | 396 | 540 | 200 | 54 | 997 | 222 | 111 | 87 | 60 | 68 | 72 | 232 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Split | NA | Free | Split | NA | Free |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | Free |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 10.0 | | 7.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 14.5 | 33.0 | | 14.5 | 33.0 | 33.0 | 38.5 | 38.5 | | 22.5 | 22.5 | |
| Total Split (s) | 32.5 | 69.5 | | 19.5 | 56.5 | 56.5 | 38.5 | 38.5 | | 27.5 | 27.5 | |
| Total Split (%) | 21.0% | 44.8% | | 12.6% | 36.5% | 36.5% | 24.8% | 24.8% | | 17.7% | 17.7% | |
| Maximum Green (s) | 25.0 | 62.5 | | 12.0 | 49.5 | 49.5 | 31.0 | 31.0 | | 20.0 | 20.0 | |
| Yellow Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 3.5 | 2.0 | | 3.5 | 2.0 | 2.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| 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) | 7.5 | 7.0 | | 7.5 | 7.0 | 7.0 | 7.5 | 7.5 | | 7.5 | 7.5 | |
| Lead/Lag | Lead | Lead | | Lag | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Min | | None | Min | Min | None | None | | None | None | |
| Walk Time (s) | | 12.0 | | | 12.0 | 12.0 | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Flash Dont Walk (s) | | 14.0 | | | 14.0 | 14.0 | 23.0 | 23.0 | | 7.0 | 7.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | 0 | 0 | | 10 | 10 | |
| Act Effect Green (s) | 22.9 | 31.9 | 118.6 | 31.4 | 36.7 | 36.7 | 15.5 | 15.5 | 118.6 | 13.1 | 13.1 | 118.6 |
| Actuated g/C Ratio | 0.19 | 0.27 | 1.00 | 0.26 | 0.31 | 0.31 | 0.13 | 0.13 | 1.00 | 0.11 | 0.11 | 1.00 |

Existing - V2.syn
Synchro 11 Report

GS

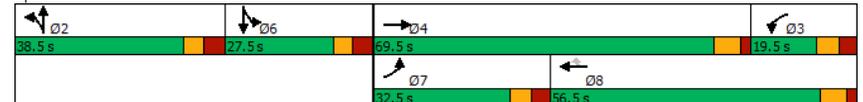
1: 28 Street SE & Memorial Drive E
04-18-2024

Existing
AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|-------|------|-------|-------|------|-------|------|------|------|-------|
| v/c Ratio | 0.76 | 0.51 | 0.13 | 0.14 | 0.83 | 0.38 | 0.61 | 0.36 | 0.04 | 0.50 | 0.38 | 0.17 |
| Control Delay | 58.0 | 44.6 | 0.2 | 34.2 | 45.2 | 6.1 | 66.4 | 54.6 | 0.1 | 67.8 | 59.3 | 0.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 58.0 | 44.6 | 0.2 | 34.2 | 45.2 | 6.1 | 66.4 | 54.6 | 0.1 | 67.8 | 59.3 | 0.3 |
| LOS | E | D | A | C | D | A | E | D | A | E | E | A |
| Approach Delay | | 41.4 | | | 37.9 | | | 47.0 | | | | 24.0 |
| Approach LOS | | D | | | D | | | D | | | | C |
| Queue Length 50th (m) | 46.8 | 45.9 | 0.0 | 9.2 | 82.8 | 0.0 | 26.2 | 19.8 | 0.0 | 16.9 | 17.6 | 0.0 |
| Queue Length 95th (m) | #89.4 | 70.0 | 0.0 | 24.2 | 118.1 | 18.8 | 52.8 | 41.7 | 0.0 | 38.5 | 38.9 | 0.0 |
| Internal Link Dist (m) | | 489.5 | | | 174.8 | | | 271.7 | | | | 166.7 |
| Turn Bay Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | | | 30.0 | | | |
| Base Capacity (vph) | 581 | 2111 | 1494 | 393 | 1672 | 734 | 375 | 496 | 1465 | 211 | 299 | 1374 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.26 | 0.13 | 0.14 | 0.60 | 0.30 | 0.30 | 0.18 | 0.04 | 0.32 | 0.24 | 0.17 |

| Intersection Summary | |
|---|------------------|
| Area Type: | Other |
| Cycle Length: | 155 |
| Actuated Cycle Length: | 118.6 |
| Natural Cycle: | 120 |
| Control Type: | Semi Act-Uncoord |
| Maximum v/c Ratio: | 0.83 |
| Intersection Signal Delay: | 38.3 |
| Intersection LOS: | D |
| Intersection Capacity Utilization: | 75.4% |
| ICU Level of Service: | D |
| Analysis Period (min): | 15 |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

Splits and Phases: 1: 28 Street SE & Memorial Drive E



Existing - V2.syn
Synchro 11 Report

GS

2: Radcliffe Drive SE & 28 Street SE
04-18-2024

Existing
AM Peak Hour

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|------|-------|-------|-------|----------------------|------|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | | Stop | Stop | |
| Traffic Volume (vph) | 87 | 91 | 120 | 115 | 183 | 81 |
| Future Volume (vph) | 87 | 91 | 120 | 115 | 183 | 81 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 93 | 97 | 128 | 122 | 195 | 86 |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 | | |
| Volume Total (vph) | 93 | 97 | 250 | 281 | | |
| Volume Left (vph) | 93 | 0 | 128 | 0 | | |
| Volume Right (vph) | 0 | 97 | 0 | 86 | | |
| Hadj (s) | 0.52 | -0.68 | 0.14 | -0.15 | | |
| Departure Headway (s) | 6.3 | 5.1 | 4.9 | 4.6 | | |
| Degree Utilization, x | 0.16 | 0.14 | 0.34 | 0.36 | | |
| Capacity (veh/h) | 533 | 653 | 704 | 749 | | |
| Control Delay (s) | 9.3 | 7.7 | 10.4 | 10.1 | | |
| Approach Delay (s) | 8.5 | | 10.4 | 10.1 | | |
| Approach LOS | A | | B | B | | |
| Intersection Summary | | | | | | |
| Delay | | | 9.8 | | | |
| Level of Service | | | A | | | |
| Intersection Capacity Utilization | | | 48.4% | | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | | |

3: Radcliffe Drive SE & Site Access
04-18-2024

Existing
AM Peak Hour

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 19 | 27 | 59 | 183 | 167 | 54 |
| Future Volume (Veh/h) | 19 | 27 | 59 | 183 | 167 | 54 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 20 | 29 | 63 | 195 | 178 | 57 |
| Pedestrians | 25 | | | 25 | 25 | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | |
| Percent Blockage | 2 | | | 2 | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 578 | 256 | 260 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 578 | 256 | 260 | | | |
| tC, single (s) | 6.6 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.7 | 3.4 | 2.2 | | | |
| p0 queue free % | 95 | 96 | 95 | | | |
| cM capacity (veh/h) | 408 | 729 | 1260 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 49 | 258 | 235 | | | |
| Volume Left | 20 | 63 | 0 | | | |
| Volume Right | 29 | 0 | 57 | | | |
| cSH | 552 | 1260 | 1700 | | | |
| Volume to Capacity | 0.09 | 0.05 | 0.14 | | | |
| Queue Length 95th (m) | 2.3 | 1.3 | 0.0 | | | |
| Control Delay (s) | 12.2 | 2.3 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 12.2 | 2.3 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 2.2 | | | |
| Intersection Capacity Utilization | | | 45.8% | | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | | |

4: 28 Street SE & 11 Avenue SE
04-18-2024

Existing
AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|----------------------|------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 13 | 29 | 56 | 212 | 165 | 23 |
| Future Volume (Veh/h) | 13 | 29 | 56 | 212 | 165 | 23 |
| Sign Control | Stop | | | Free | | Free |
| Grade | 0% | | | 0% | | 0% |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 14 | 31 | 60 | 226 | 176 | 24 |
| Pedestrians | 25 | | 25 | | 25 | |
| Lane Width (m) | 3.6 | | 3.6 | | 3.6 | |
| Walking Speed (m/s) | 1.2 | | 1.2 | | 1.2 | |
| Percent Blockage | 2 | | 2 | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 584 | 238 | 225 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 584 | 238 | 225 | | | |
| tC, single (s) | 6.5 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.6 | 3.4 | 2.2 | | | |
| p0 queue free % | 97 | 96 | 95 | | | |
| cM capacity (veh/h) | 414 | 756 | 1298 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 45 | 286 | 200 | | | |
| Volume Left | 14 | 60 | 0 | | | |
| Volume Right | 31 | 0 | 24 | | | |
| cSH | 602 | 1298 | 1700 | | | |
| Volume to Capacity | 0.07 | 0.05 | 0.12 | | | |
| Queue Length 95th (m) | 1.9 | 1.2 | 0.0 | | | |
| Control Delay (s) | 11.5 | 2.0 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 11.5 | 2.0 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 2.0 | | | | | |
| Intersection Capacity Utilization | 46.2% | | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | | |

SimTraffic Simulation Summary
AM Peak Hour

04-18-2024

Summary of All Intervals

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Start Time | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 |
| End Time | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 |
| Total Time (min) | 70 | 70 | 70 | 70 | 70 | 70 |
| Time Recorded (min) | 60 | 60 | 60 | 60 | 60 | 60 |
| # of Intervals | 2 | 2 | 2 | 2 | 2 | 2 |
| # of Recorded Intervals | 1 | 1 | 1 | 1 | 1 | 1 |
| Vehs Entered | 3059 | 3013 | 2984 | 2966 | 2911 | 2987 |
| Vehs Exited | 3072 | 3024 | 2990 | 2983 | 2918 | 2999 |
| Starting Vehs | 107 | 103 | 90 | 104 | 88 | 98 |
| Ending Vehs | 94 | 92 | 84 | 87 | 81 | 83 |
| Travel Distance (km) | 2112 | 2067 | 2027 | 2043 | 1993 | 2049 |
| Travel Time (hr) | 281.5 | 344.5 | 399.5 | 369.5 | 277.6 | 334.5 |
| Total Delay (hr) | 236.4 | 300.3 | 356.2 | 325.8 | 234.8 | 290.7 |
| Total Stops | 2604 | 2525 | 2480 | 2377 | 2513 | 2496 |
| Fuel Used (l) | 378.8 | 431.1 | 472.7 | 447.8 | 366.9 | 419.5 |

Interval #0 Information Seeding

| | |
|-------------------------------------|------|
| Start Time | 6:57 |
| End Time | 7:07 |
| Total Time (min) | 10 |
| Volumes adjusted by Growth Factors. | |
| No data recorded this interval. | |

Interval #1 Information Recording

| | |
|-------------------------------------|------|
| Start Time | 7:07 |
| End Time | 8:07 |
| Total Time (min) | 60 |
| Volumes adjusted by Growth Factors. | |

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|----------------------|-------|-------|-------|-------|-------|-------|
| Vehs Entered | 3059 | 3013 | 2984 | 2966 | 2911 | 2987 |
| Vehs Exited | 3072 | 3024 | 2990 | 2983 | 2918 | 2999 |
| Starting Vehs | 107 | 103 | 90 | 104 | 88 | 98 |
| Ending Vehs | 94 | 92 | 84 | 87 | 81 | 83 |
| Travel Distance (km) | 2112 | 2067 | 2027 | 2043 | 1993 | 2049 |
| Travel Time (hr) | 281.5 | 344.5 | 399.5 | 369.5 | 277.6 | 334.5 |
| Total Delay (hr) | 236.4 | 300.3 | 356.2 | 325.8 | 234.8 | 290.7 |
| Total Stops | 2604 | 2525 | 2480 | 2377 | 2513 | 2496 |
| Fuel Used (l) | 378.8 | 431.1 | 472.7 | 447.8 | 366.9 | 419.5 |

Queuing and Blocking Report
AM Peak Hour

04-18-2024

Intersection: 2: Radcliffe Drive SE & 28 Street SE

| Movement | EB | EB | NB | SB |
|-----------------------|-------|-------|------|------|
| Directions Served | L | R | LT | TR |
| Maximum Queue (m) | 23.2 | 17.7 | 33.7 | 40.3 |
| Average Queue (m) | 10.1 | 9.4 | 17.1 | 18.6 |
| 95th Queue (m) | 17.6 | 15.2 | 26.8 | 31.4 |
| Link Distance (m) | 267.4 | 267.4 | 30.7 | 89.4 |
| Upstream Blk Time (%) | | | 0 | |
| Queuing Penalty (veh) | | | 1 | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

1: 28 Street SE & Memorial Drive E
04-18-2024

Existing
PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 288 | 1469 | 158 | 32 | 797 | 107 | 102 | 111 | 88 | 195 | 106 | 517 |
| Future Volume (vph) | 288 | 1469 | 158 | 32 | 797 | 107 | 102 | 111 | 88 | 195 | 106 | 517 |
| Ideal Flow (vphpl) | 1500 | 1500 | 1850 | 1500 | 1500 | 1850 | 1500 | 1850 | 1850 | 1500 | 1850 | 1850 |
| Storage Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | 0.0 | | 30.0 | 0.0 | | 0.0 |
| Storage Lanes | 2 | | 1 | 1 | | 3 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | | 0.98 | | | 0.94 | | | | 0.98 | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.985 | |
| Satd. Flow (prot) | 2764 | 3976 | 1557 | 1425 | 4054 | 1572 | 1383 | 1832 | 1572 | 1354 | 1707 | 1557 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.985 | |
| Satd. Flow (perm) | 2764 | 3976 | 1523 | 1425 | 4054 | 1472 | 1383 | 1832 | 1539 | 1354 | 1707 | 1523 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 175 | | | 129 | | | 175 | | | 446 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 513.5 | | | 198.8 | | | 295.7 | | | 190.7 | |
| Travel Time (s) | | 37.0 | | | 14.3 | | | 21.3 | | | 13.7 | |
| Confl. Peds. (#/hr) | | | 25 | | | 25 | | | 25 | | | 25 |
| Confl. Bikes (#/hr) | | | 10 | | | 10 | | | 10 | | | 10 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 0% | 3% | 1% | 0% | 1% | 0% | 3% | 1% | 0% | 0% | 2% | 1% |
| Adj. Flow (vph) | 303 | 1546 | 166 | 34 | 839 | 113 | 107 | 117 | 93 | 205 | 112 | 544 |
| Shared Lane Traffic (%) | | | | | | | | | | 24% | | |
| Lane Group Flow (vph) | 303 | 1546 | 166 | 34 | 839 | 113 | 107 | 117 | 93 | 156 | 161 | 544 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Split | NA | Free | Split | NA | Free |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | Free |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 10.0 | | 7.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 14.5 | 33.0 | | 14.5 | 33.0 | 33.0 | 38.5 | 38.5 | | 22.5 | 22.5 | |
| Total Split (s) | 29.5 | 76.5 | | 22.5 | 69.5 | 69.5 | 38.5 | 38.5 | | 27.5 | 27.5 | |
| Total Split (%) | 17.9% | 46.4% | | 13.6% | 42.1% | 42.1% | 23.3% | 23.3% | | 16.7% | 16.7% | |
| Maximum Green (s) | 22.0 | 69.5 | | 15.0 | 62.5 | 62.5 | 31.0 | 31.0 | | 20.0 | 20.0 | |
| Yellow Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 3.5 | 2.0 | | 3.5 | 2.0 | 2.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| 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) | 7.5 | 7.0 | | 7.5 | 7.0 | 7.0 | 7.5 | 7.5 | | 7.5 | 7.5 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Min | | None | Min | Min | None | None | | None | None | |
| Walk Time (s) | | 12.0 | | | 12.0 | 12.0 | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Flash Dont Walk (s) | | 14.0 | | | 14.0 | 14.0 | 23.0 | 23.0 | | 7.0 | 7.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | 0 | 0 | | 10 | 10 | |
| Act Effect Green (s) | 19.4 | 58.3 | 129.9 | 9.1 | 43.9 | 43.9 | 16.2 | 16.2 | 129.9 | 19.8 | 19.8 | 129.9 |
| Actuated g/C Ratio | 0.15 | 0.45 | 1.00 | 0.07 | 0.34 | 0.34 | 0.12 | 0.12 | 1.00 | 0.15 | 0.15 | 1.00 |

Existing - V2.syn
Synchro 11 Report

GS

1: 28 Street SE & Memorial Drive E
04-18-2024

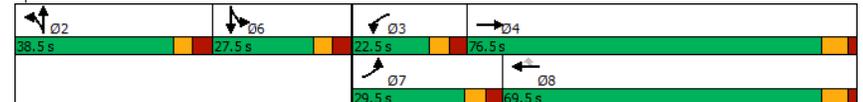
Existing
PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|-------|------|-------|-------|------|-------|------|--------|-------|-------|
| v/c Ratio | 0.74 | 0.87 | 0.11 | 0.34 | 0.61 | 0.19 | 0.62 | 0.51 | 0.06 | 0.76 | 0.62 | 0.36 |
| Control Delay | 67.1 | 39.5 | 0.1 | 74.2 | 37.5 | 4.2 | 74.2 | 65.2 | 0.1 | 80.0 | 67.6 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 67.1 | 39.5 | 0.1 | 74.2 | 37.5 | 4.2 | 74.2 | 65.2 | 0.1 | 80.0 | 67.6 | 0.7 |
| LOS | E | D | A | E | D | A | E | E | A | E | E | A |
| Approach Delay | | 40.4 | | | 34.9 | | | 49.1 | | | | 27.5 |
| Approach LOS | | D | | | C | | | D | | | | C |
| Queue Length 50th (m) | 41.5 | 140.6 | 0.0 | 9.2 | 69.7 | 0.0 | 28.8 | 31.0 | 0.0 | 44.4 | 44.8 | 0.0 |
| Queue Length 95th (m) | #70.1 | 188.2 | 0.0 | 23.1 | 91.7 | 9.9 | 54.2 | 56.8 | 0.0 | #101.5 | #89.0 | 0.0 |
| Internal Link Dist (m) | | 489.5 | | | 174.8 | | | 271.7 | | | | 166.7 |
| Turn Bay Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | | | 30.0 | | | |
| Base Capacity (vph) | 485 | 2207 | 1523 | 170 | 2024 | 799 | 342 | 453 | 1539 | 216 | 272 | 1523 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.70 | 0.11 | 0.20 | 0.41 | 0.14 | 0.31 | 0.26 | 0.06 | 0.72 | 0.59 | 0.36 |

Intersection Summary

| | |
|---|------------------------|
| Area Type: | Other |
| Cycle Length: | 165 |
| Actuated Cycle Length: | 129.9 |
| Natural Cycle: | 130 |
| Control Type: | Semi Act-Uncoord |
| Maximum v/c Ratio: | 0.87 |
| Intersection Signal Delay: | 37.1 |
| Intersection Signal Delay: | Intersection LOS: D |
| Intersection Capacity Utilization: | 80.7% |
| Intersection Capacity Utilization: | ICU Level of Service D |
| Analysis Period (min): | 15 |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

Splits and Phases: 1: 28 Street SE & Memorial Drive E



Existing - V2.syn
Synchro 11 Report

GS

2: Radcliffe Drive SE & 28 Street SE
04-18-2024

Existing
PM Peak Hour

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|------|-------|-------|-------|----------------------|------|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | | Stop | Stop | |
| Traffic Volume (vph) | 156 | 122 | 147 | 112 | 82 | 82 |
| Future Volume (vph) | 156 | 122 | 147 | 112 | 82 | 82 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 164 | 128 | 155 | 118 | 86 | 86 |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 | | |
| Volume Total (vph) | 164 | 128 | 273 | 172 | | |
| Volume Left (vph) | 164 | 0 | 155 | 0 | | |
| Volume Right (vph) | 0 | 128 | 0 | 86 | | |
| Hadj (s) | 0.50 | -0.68 | 0.13 | -0.27 | | |
| Departure Headway (s) | 6.1 | 4.9 | 5.0 | 4.8 | | |
| Degree Utilization, x | 0.28 | 0.17 | 0.38 | 0.23 | | |
| Capacity (veh/h) | 556 | 686 | 687 | 707 | | |
| Control Delay (s) | 10.3 | 7.8 | 11.1 | 9.2 | | |
| Approach Delay (s) | 9.2 | | 11.1 | 9.2 | | |
| Approach LOS | A | | B | A | | |
| Intersection Summary | | | | | | |
| Delay | | | 9.9 | | | |
| Level of Service | | | A | | | |
| Intersection Capacity Utilization | | | 48.0% | | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | | |

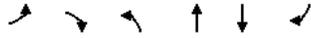
3: Radcliffe Drive SE & Site Access
04-18-2024

Existing
PM Peak Hour

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|------|------|-------|------|----------------------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 69 | 62 | 36 | 178 | 172 | 37 |
| Future Volume (Veh/h) | 69 | 62 | 36 | 178 | 172 | 37 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 73 | 65 | 38 | 187 | 181 | 39 |
| Pedestrians | 25 | | | 25 | 25 | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | |
| Percent Blockage | 2 | | | 2 | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 514 | 250 | 245 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 514 | 250 | 245 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.2 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.3 | | | |
| p0 queue free % | 85 | 91 | 97 | | | |
| cM capacity (veh/h) | 481 | 749 | 1244 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 138 | 225 | 220 | | | |
| Volume Left | 73 | 38 | 0 | | | |
| Volume Right | 65 | 0 | 39 | | | |
| cSH | 578 | 1244 | 1700 | | | |
| Volume to Capacity | 0.24 | 0.03 | 0.13 | | | |
| Queue Length 95th (m) | 7.4 | 0.8 | 0.0 | | | |
| Control Delay (s) | 13.2 | 1.6 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 13.2 | 1.6 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 3.7 | | | |
| Intersection Capacity Utilization | | | 45.8% | | ICU Level of Service | A |
| Analysis Period (min) | | | 15 | | | |

4: 28 Street SE & 11 Avenue SE
04-18-2024

Existing
PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | 8 | 44 | 56 | 223 | 207 | 12 |
| Traffic Volume (veh/h) | 8 | 44 | 56 | 223 | 207 | 12 |
| Future Volume (Veh/h) | 8 | 44 | 56 | 223 | 207 | 12 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 8 | 46 | 59 | 235 | 218 | 13 |
| Pedestrians | 22 | | | | 22 | |
| Lane Width (m) | 3.6 | | | | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | | 1.2 | |
| Percent Blockage | 2 | | | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | None | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 622 | 246 | 253 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 622 | 246 | 253 | | | |
| tC, single (s) | 6.8 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.8 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 94 | 95 | | | |
| cM capacity (veh/h) | 366 | 783 | 1288 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 54 | 294 | 231 | | | |
| Volume Left | 8 | 59 | 0 | | | |
| Volume Right | 46 | 0 | 13 | | | |
| cSH | 669 | 1288 | 1700 | | | |
| Volume to Capacity | 0.08 | 0.05 | 0.14 | | | |
| Queue Length 95th (m) | 2.1 | 1.2 | 0.0 | | | |
| Control Delay (s) | 10.8 | 1.9 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 10.8 | 1.9 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | 2.0 | | | | |
| Intersection Capacity Utilization | | 41.3% | | ICU Level of Service | A | |
| Analysis Period (min) | | 15 | | | | |

SimTraffic Simulation Summary
PM Peak Hour

04-18-2024

Summary of All Intervals

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Start Time | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 |
| End Time | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 |
| Total Time (min) | 70 | 70 | 70 | 70 | 70 | 70 |
| Time Recorded (min) | 60 | 60 | 60 | 60 | 60 | 60 |
| # of Intervals | 2 | 2 | 2 | 2 | 2 | 2 |
| # of Recorded Intervals | 1 | 1 | 1 | 1 | 1 | 1 |
| Vehs Entered | 4350 | 4481 | 4438 | 4334 | 4245 | 4372 |
| Vehs Exited | 4365 | 4528 | 4466 | 4351 | 4250 | 4391 |
| Starting Vehs | 146 | 164 | 138 | 125 | 124 | 137 |
| Ending Vehs | 131 | 117 | 110 | 108 | 119 | 115 |
| Travel Distance (km) | 3027 | 3128 | 3092 | 3027 | 2989 | 3053 |
| Travel Time (hr) | 123.8 | 134.7 | 129.6 | 125.6 | 122.6 | 127.3 |
| Total Delay (hr) | 59.7 | 68.5 | 64.3 | 61.3 | 59.2 | 62.6 |
| Total Stops | 3716 | 3677 | 3809 | 3779 | 3580 | 3711 |
| Fuel Used (l) | 298.6 | 314.0 | 309.1 | 300.4 | 293.5 | 303.1 |

Interval #0 Information Seeding

| | |
|-------------------------------------|------|
| Start Time | 6:57 |
| End Time | 7:07 |
| Total Time (min) | 10 |
| Volumes adjusted by Growth Factors. | |
| No data recorded this interval. | |

Interval #1 Information Recording

| | |
|-------------------------------------|------|
| Start Time | 7:07 |
| End Time | 8:07 |
| Total Time (min) | 60 |
| Volumes adjusted by Growth Factors. | |

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|----------------------|-------|-------|-------|-------|-------|-------|
| Vehs Entered | 4350 | 4481 | 4438 | 4334 | 4245 | 4372 |
| Vehs Exited | 4365 | 4528 | 4466 | 4351 | 4250 | 4391 |
| Starting Vehs | 146 | 164 | 138 | 125 | 124 | 137 |
| Ending Vehs | 131 | 117 | 110 | 108 | 119 | 115 |
| Travel Distance (km) | 3027 | 3128 | 3092 | 3027 | 2989 | 3053 |
| Travel Time (hr) | 123.8 | 134.7 | 129.6 | 125.6 | 122.6 | 127.3 |
| Total Delay (hr) | 59.7 | 68.5 | 64.3 | 61.3 | 59.2 | 62.6 |
| Total Stops | 3716 | 3677 | 3809 | 3779 | 3580 | 3711 |
| Fuel Used (l) | 298.6 | 314.0 | 309.1 | 300.4 | 293.5 | 303.1 |

Queuing and Blocking Report
PM Peak Hour

04-18-2024

Intersection: 2: Radcliffe Drive SE & 28 Street SE

| Movement | EB | EB | NB | SB |
|-----------------------|-------|-------|------|------|
| Directions Served | L | R | LT | TR |
| Maximum Queue (m) | 25.0 | 23.8 | 28.9 | 24.9 |
| Average Queue (m) | 12.7 | 11.0 | 16.7 | 13.0 |
| 95th Queue (m) | 21.1 | 17.6 | 25.3 | 21.0 |
| Link Distance (m) | 267.4 | 267.4 | 30.7 | 89.4 |
| Upstream Blk Time (%) | | | 0 | |
| Queuing Penalty (veh) | | | 1 | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

1: 28 Street SE & Memorial Drive E
04-24-2024

Existing After Development
AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 372 | 508 | 189 | 41 | 937 | 219 | 165 | 103 | 77 | 71 | 60 | 218 |
| Future Volume (vph) | 372 | 508 | 189 | 41 | 937 | 219 | 165 | 103 | 77 | 71 | 60 | 218 |
| Ideal Flow (vphpl) | 1500 | 1500 | 1850 | 1500 | 1500 | 1850 | 1500 | 1850 | 1850 | 1500 | 1850 | 1850 |
| Storage Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | 0.0 | | 30.0 | 0.0 | | 0.0 |
| Storage Lanes | 2 | | 1 | 1 | | 3 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | | 0.98 | | | 0.94 | | | 0.98 | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.994 | |
| Satd. Flow (prot) | 2684 | 3900 | 1527 | 1425 | 3900 | 1512 | 1397 | 1850 | 1498 | 1220 | 1726 | 1404 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.994 | |
| Satd. Flow (perm) | 2684 | 3900 | 1494 | 1425 | 3900 | 1418 | 1397 | 1850 | 1465 | 1220 | 1726 | 1374 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 239 | | | 233 | | | 239 | | | 239 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | | 50 |
| Link Distance (m) | | 513.5 | | | 198.8 | | | 295.7 | | | | 190.7 |
| Travel Time (s) | | 37.0 | | | 14.3 | | | 21.3 | | | | 13.7 |
| Confl. Peds. (#/hr) | | | 25 | | | 25 | | | 25 | | | 25 |
| Confl. Bikes (#/hr) | | | 10 | | | 10 | | | 10 | | | 10 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 3% | 5% | 3% | 0% | 5% | 4% | 2% | 0% | 5% | 11% | 0% | 12% |
| Adj. Flow (vph) | 396 | 540 | 201 | 44 | 997 | 233 | 176 | 110 | 82 | 76 | 64 | 232 |
| Shared Lane Traffic (%) | | | | | | | | | | 10% | | |
| Lane Group Flow (vph) | 396 | 540 | 201 | 44 | 997 | 233 | 176 | 110 | 82 | 68 | 72 | 232 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Split | NA | Free | Split | NA | Free |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | | 6 |
| Permitted Phases | | | Free | | | 8 | | | Free | | | Free |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 10.0 | | 7.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | | 10.0 |
| Minimum Split (s) | 14.5 | 33.0 | | 14.5 | 33.0 | 33.0 | 38.5 | 38.5 | | 22.5 | | 22.5 |
| Total Split (s) | 32.5 | 69.5 | | 19.5 | 56.5 | 56.5 | 38.5 | 38.5 | | 27.5 | | 27.5 |
| Total Split (%) | 21.0% | 44.8% | | 12.6% | 36.5% | 36.5% | 24.8% | 24.8% | | 17.7% | | 17.7% |
| Maximum Green (s) | 25.0 | 62.5 | | 12.0 | 49.5 | 49.5 | 31.0 | 31.0 | | 20.0 | | 20.0 |
| Yellow Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 3.5 | 3.5 | | 3.5 | | 3.5 |
| All-Red Time (s) | 3.5 | 2.0 | | 3.5 | 2.0 | 2.0 | 4.0 | 4.0 | | 4.0 | | 4.0 |
| 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) | 7.5 | 7.0 | | 7.5 | 7.0 | 7.0 | 7.5 | 7.5 | | 7.5 | | 7.5 |
| Lead/Lag | Lead | Lead | | Lag | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | | 3.0 |
| Recall Mode | None | Min | | None | Min | Min | None | None | | None | | None |
| Walk Time (s) | | 12.0 | | | 12.0 | 12.0 | 8.0 | 8.0 | | 8.0 | | 8.0 |
| Flash Dont Walk (s) | | 14.0 | | | 14.0 | 14.0 | 23.0 | 23.0 | | 7.0 | | 7.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | 0 | 0 | | 10 | | 10 |
| Act Effect Green (s) | 23.3 | 43.2 | 127.0 | 25.7 | 38.5 | 38.5 | 21.4 | 21.4 | 127.0 | 13.5 | 13.5 | 127.0 |
| Actuated g/C Ratio | 0.18 | 0.34 | 1.00 | 0.20 | 0.30 | 0.30 | 0.17 | 0.17 | 1.00 | 0.11 | 0.11 | 1.00 |

Existing AD - V2.syn
Synchro 11 Report

GS

1: 28 Street SE & Memorial Drive E
04-24-2024

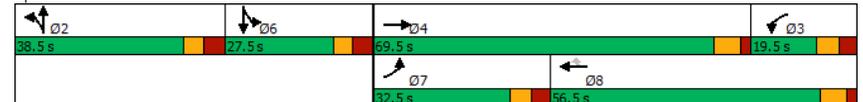
Existing After Development
AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|-------|------|-------|-------|------|-------|------|------|------|-------|
| v/c Ratio | 0.81 | 0.41 | 0.13 | 0.15 | 0.84 | 0.39 | 0.75 | 0.35 | 0.06 | 0.53 | 0.40 | 0.17 |
| Control Delay | 65.3 | 41.8 | 0.2 | 41.3 | 49.7 | 6.4 | 72.5 | 52.4 | 0.1 | 74.0 | 64.3 | 0.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 65.3 | 41.8 | 0.2 | 41.3 | 49.7 | 6.4 | 72.5 | 52.4 | 0.1 | 74.0 | 64.3 | 0.3 |
| LOS | E | D | A | D | D | A | E | D | A | E | E | A |
| Approach Delay | | 42.6 | | | 41.5 | | | 50.4 | | | | 26.1 |
| Approach LOS | | D | | | D | | | D | | | | C |
| Queue Length 50th (m) | 51.8 | 50.1 | 0.0 | 8.3 | 90.4 | 0.0 | 45.0 | 26.2 | 0.0 | 18.5 | 19.2 | 0.0 |
| Queue Length 95th (m) | #97.7 | 73.7 | 0.0 | 22.2 | 127.6 | 20.6 | 81.1 | 50.4 | 0.0 | 40.2 | 40.6 | 0.0 |
| Internal Link Dist (m) | | 489.5 | | | 174.8 | | | 271.7 | | | | 166.7 |
| Turn Bay Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | | | 30.0 | | | |
| Base Capacity (vph) | 543 | 1980 | 1494 | 315 | 1564 | 708 | 351 | 464 | 1465 | 197 | 279 | 1374 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.27 | 0.13 | 0.14 | 0.64 | 0.33 | 0.50 | 0.24 | 0.06 | 0.35 | 0.26 | 0.17 |

Intersection Summary

| | |
|---|------------------|
| Area Type: | Other |
| Cycle Length: | 155 |
| Actuated Cycle Length: | 127 |
| Natural Cycle: | 120 |
| Control Type: | Semi Act-Uncoord |
| Maximum v/c Ratio: | 0.84 |
| Intersection Signal Delay: | 41.1 |
| Intersection LOS: | D |
| Intersection Capacity Utilization: | 77.2% |
| ICU Level of Service: | D |
| Analysis Period (min): | 15 |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

Splits and Phases: 1: 28 Street SE & Memorial Drive E



Existing AD - V2.syn
Synchro 11 Report

GS

2: Radcliffe Drive SE & 28 Street SE
04-24-2024

Existing After Development
AM Peak Hour

| | ↖ ↗ | | ↖ ↗ | | ↖ ↗ | |
|-----------------------------------|-------------|-------------|----------------------|-------------|------|------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ↖ | ↗ | | ↖ | ↗ | |
| Sign Control | Stop | | | Stop | Stop | |
| Traffic Volume (vph) | 87 | 83 | 221 | 115 | 185 | 81 |
| Future Volume (vph) | 87 | 83 | 221 | 115 | 185 | 81 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 93 | 88 | 235 | 122 | 197 | 86 |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 | | |
| Volume Total (vph) | 93 | 88 | 357 | 283 | | |
| Volume Left (vph) | 93 | 0 | 235 | 0 | | |
| Volume Right (vph) | 0 | 88 | 0 | 86 | | |
| Hadj (s) | 0.52 | -0.68 | 0.17 | -0.15 | | |
| Departure Headway (s) | 6.6 | 5.3 | 4.9 | 4.7 | | |
| Degree Utilization, x | 0.17 | 0.13 | 0.49 | 0.37 | | |
| Capacity (veh/h) | 505 | 612 | 705 | 726 | | |
| Control Delay (s) | 9.7 | 7.9 | 12.6 | 10.5 | | |
| Approach Delay (s) | 8.8 | | 12.6 | 10.5 | | |
| Approach LOS | A | | B | B | | |
| Intersection Summary | | | | | | |
| Delay | 11.1 | | | | | |
| Level of Service | B | | | | | |
| Intersection Capacity Utilization | 54.2% | | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | | |

3: Radcliffe Drive SE & Site Access
04-24-2024

Existing After Development
AM Peak Hour

| | ↖ ↗ | | ↖ ↗ | | ↖ ↗ | |
|-----------------------------------|-------------|-------------|----------------------|------|------|------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ↖ | ↗ | | ↖ | ↗ | |
| Traffic Volume (veh/h) | 120 | 48 | 54 | 183 | 176 | 38 |
| Future Volume (Veh/h) | 120 | 48 | 54 | 183 | 176 | 38 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 128 | 51 | 57 | 195 | 187 | 40 |
| Pedestrians | 25 | | | 25 | 25 | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | |
| Percent Blockage | 2 | | | 2 | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 566 | 257 | 252 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 566 | 257 | 252 | | | |
| tC, single (s) | 6.6 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.7 | 3.4 | 2.2 | | | |
| p0 queue free % | 69 | 93 | 96 | | | |
| cM capacity (veh/h) | 417 | 729 | 1269 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 179 | 252 | 227 | | | |
| Volume Left | 128 | 57 | 0 | | | |
| Volume Right | 51 | 0 | 40 | | | |
| cSH | 474 | 1269 | 1700 | | | |
| Volume to Capacity | 0.38 | 0.04 | 0.13 | | | |
| Queue Length 95th (m) | 13.9 | 1.1 | 0.0 | | | |
| Control Delay (s) | 17.1 | 2.1 | 0.0 | | | |
| Lane LOS | C | A | | | | |
| Approach Delay (s) | 17.1 | 2.1 | 0.0 | | | |
| Approach LOS | C | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 5.5 | | | | | |
| Intersection Capacity Utilization | 47.9% | | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | | |

4: 28 Street SE & 11 Avenue SE
04-24-2024

Existing After Development
AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|----------------------|------|------|------|
| Lane Configurations | ↔ ↗ ↖ ↕ ↘ ↙ | | | | | |
| Traffic Volume (veh/h) | 13 | 29 | 56 | 215 | 186 | 23 |
| Future Volume (Veh/h) | 13 | 29 | 56 | 215 | 186 | 23 |
| Sign Control | Stop | | | Free | | |
| Grade | 0% | | | 0% | | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 14 | 31 | 60 | 229 | 198 | 24 |
| Pedestrians | 25 | | 25 | | 25 | |
| Lane Width (m) | 3.6 | | 3.6 | | 3.6 | |
| Walking Speed (m/s) | 1.2 | | 1.2 | | 1.2 | |
| Percent Blockage | 2 | | 2 | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 609 | 260 | 247 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 609 | 260 | 247 | | | |
| tC, single (s) | 6.5 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.6 | 3.4 | 2.2 | | | |
| p0 queue free % | 96 | 96 | 95 | | | |
| cM capacity (veh/h) | 400 | 735 | 1274 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 45 | 289 | 222 | | | |
| Volume Left | 14 | 60 | 0 | | | |
| Volume Right | 31 | 0 | 24 | | | |
| cSH | 583 | 1274 | 1700 | | | |
| Volume to Capacity | 0.08 | 0.05 | 0.13 | | | |
| Queue Length 95th (m) | 2.0 | 1.2 | 0.0 | | | |
| Control Delay (s) | 11.7 | 2.0 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 11.7 | 2.0 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 2.0 | | | | | |
| Intersection Capacity Utilization | 46.8% | | ICU Level of Service | | A | |
| Analysis Period (min) | 15 | | | | | |

Existing AD AM
04-24-2024

AM Peak Hour

Summary of All Intervals

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Start Time | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 |
| End Time | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 |
| Total Time (min) | 70 | 70 | 70 | 70 | 70 | 70 |
| Time Recorded (min) | 60 | 60 | 60 | 60 | 60 | 60 |
| # of Intervals | 2 | 2 | 2 | 2 | 2 | 2 |
| # of Recorded Intervals | 1 | 1 | 1 | 1 | 1 | 1 |
| Vehs Entered | 3155 | 3134 | 3129 | 3090 | 3015 | 3107 |
| Vehs Exited | 3148 | 3137 | 3150 | 3098 | 3016 | 3108 |
| Starting Vehs | 94 | 99 | 109 | 91 | 98 | 98 |
| Ending Vehs | 101 | 96 | 88 | 83 | 97 | 92 |
| Travel Distance (km) | 2175 | 2177 | 2173 | 2166 | 2093 | 2157 |
| Travel Time (hr) | 316.8 | 347.7 | 336.6 | 324.3 | 320.9 | 329.3 |
| Total Delay (hr) | 270.2 | 301.0 | 290.1 | 277.8 | 275.9 | 283.0 |
| Total Stops | 2694 | 2725 | 2680 | 2750 | 2637 | 2695 |
| Fuel Used (l) | 413.1 | 440.7 | 429.1 | 418.2 | 410.9 | 422.4 |

Interval #0 Information Seeding

| | |
|-------------------------------------|------|
| Start Time | 6:57 |
| End Time | 7:07 |
| Total Time (min) | 10 |
| Volumes adjusted by Growth Factors. | |
| No data recorded this interval. | |

Interval #1 Information Recording

| | |
|-------------------------------------|------|
| Start Time | 7:07 |
| End Time | 8:07 |
| Total Time (min) | 60 |
| Volumes adjusted by Growth Factors. | |

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|----------------------|-------|-------|-------|-------|-------|-------|
| Vehs Entered | 3155 | 3134 | 3129 | 3090 | 3015 | 3107 |
| Vehs Exited | 3148 | 3137 | 3150 | 3098 | 3016 | 3108 |
| Starting Vehs | 94 | 99 | 109 | 91 | 98 | 98 |
| Ending Vehs | 101 | 96 | 88 | 83 | 97 | 92 |
| Travel Distance (km) | 2175 | 2177 | 2173 | 2166 | 2093 | 2157 |
| Travel Time (hr) | 316.8 | 347.7 | 336.6 | 324.3 | 320.9 | 329.3 |
| Total Delay (hr) | 270.2 | 301.0 | 290.1 | 277.8 | 275.9 | 283.0 |
| Total Stops | 2694 | 2725 | 2680 | 2750 | 2637 | 2695 |
| Fuel Used (l) | 413.1 | 440.7 | 429.1 | 418.2 | 410.9 | 422.4 |

Existing AD AM
04-24-2024

AM Peak Hour

Intersection: 2: Radcliffe Drive SE & 28 Street SE

| Movement | EB | EB | NB | SB |
|-----------------------|-------|-------|------|------|
| Directions Served | L | R | LT | TR |
| Maximum Queue (m) | 18.0 | 18.9 | 42.6 | 36.7 |
| Average Queue (m) | 9.6 | 9.4 | 20.8 | 18.5 |
| 95th Queue (m) | 16.4 | 15.5 | 34.4 | 28.6 |
| Link Distance (m) | 267.4 | 267.4 | 30.7 | 89.4 |
| Upstream Blk Time (%) | 2 | | | |
| Queuing Penalty (veh) | 5 | | | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

1: 28 Street SE & Memorial Drive E
04-24-2024

Existing After Development
PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↖↗ | ↖↖ | ↖↗ | ↖↗ | ↖↖ | ↖↗ | ↖↖ | ↖↗ | ↖↗ | ↖↗ | ↖↗ | ↖↗ |
| Traffic Volume (vph) | 288 | 1469 | 233 | 32 | 797 | 107 | 119 | 114 | 85 | 204 | 106 | 517 |
| Future Volume (vph) | 288 | 1469 | 233 | 32 | 797 | 107 | 119 | 114 | 85 | 204 | 106 | 517 |
| Ideal Flow (vphpl) | 1500 | 1500 | 1850 | 1500 | 1500 | 1850 | 1500 | 1850 | 1850 | 1500 | 1850 | 1850 |
| Storage Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | 0.0 | | 30.0 | 0.0 | | 0.0 |
| Storage Lanes | 2 | | 1 | 1 | | 3 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | | 0.98 | | | 0.94 | | | 0.98 | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.984 | |
| Satd. Flow (prot) | 2764 | 3976 | 1557 | 1425 | 4054 | 1572 | 1383 | 1832 | 1572 | 1354 | 1706 | 1557 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.984 | |
| Satd. Flow (perm) | 2764 | 3976 | 1523 | 1425 | 4054 | 1472 | 1383 | 1832 | 1539 | 1354 | 1706 | 1523 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 210 | | | 129 | | | 175 | | | 431 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | | 50 |
| Link Distance (m) | | 513.5 | | | 198.8 | | | 295.7 | | | | 190.7 |
| Travel Time (s) | | 37.0 | | | 14.3 | | | 21.3 | | | | 13.7 |
| Confl. Peds. (#/hr) | | | 25 | | | 25 | | | 25 | | | 25 |
| Confl. Bikes (#/hr) | | | 10 | | | 10 | | | 10 | | | 10 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 0% | 3% | 1% | 0% | 1% | 0% | 3% | 1% | 0% | 0% | 2% | 1% |
| Adj. Flow (vph) | 303 | 1546 | 245 | 34 | 839 | 113 | 125 | 120 | 89 | 215 | 112 | 544 |
| Shared Lane Traffic (%) | | | | | | | | | 25% | | | |
| Lane Group Flow (vph) | 303 | 1546 | 245 | 34 | 839 | 113 | 125 | 120 | 89 | 161 | 166 | 544 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Split | NA | Free | Split | NA | Free |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | Free |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 10.0 | | 7.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 14.5 | 33.0 | | 14.5 | 33.0 | 33.0 | 38.5 | 38.5 | | 22.5 | 22.5 | |
| Total Split (s) | 29.5 | 76.5 | | 22.5 | 69.5 | 69.5 | 38.5 | 38.5 | | 27.5 | 27.5 | |
| Total Split (%) | 17.9% | 46.4% | | 13.6% | 42.1% | 42.1% | 23.3% | 23.3% | | 16.7% | 16.7% | |
| Maximum Green (s) | 22.0 | 69.5 | | 15.0 | 62.5 | 62.5 | 31.0 | 31.0 | | 20.0 | 20.0 | |
| Yellow Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 3.5 | 2.0 | | 3.5 | 2.0 | 2.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| 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) | 7.5 | 7.0 | | 7.5 | 7.0 | 7.0 | 7.5 | 7.5 | | 7.5 | 7.5 | |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Min | | None | Min | Min | None | None | | None | None | |
| Walk Time (s) | | 12.0 | | | 12.0 | 12.0 | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Flash Dont Walk (s) | | 14.0 | | | 14.0 | 14.0 | 23.0 | 23.0 | | 7.0 | 7.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | 0 | 0 | | 10 | 10 | |
| Act Effect Green (s) | 19.5 | 58.9 | 133.0 | 9.2 | 44.5 | 44.5 | 17.8 | 17.8 | 133.0 | 20.6 | 20.6 | 133.0 |
| Actuated g/C Ratio | 0.15 | 0.44 | 1.00 | 0.07 | 0.33 | 0.33 | 0.13 | 0.13 | 1.00 | 0.15 | 0.15 | 1.00 |

Existing AD - V2.syn
Synchro 11 Report

GS

1: 28 Street SE & Memorial Drive E
04-24-2024

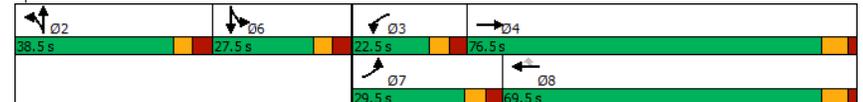
Existing After Development
PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|-------|-------|-------|------|-------|-------|-------|------|------|--------|-------|------|
| v/c Ratio | 0.75 | 0.88 | 0.16 | 0.35 | 0.62 | 0.20 | 0.68 | 0.49 | 0.06 | 0.77 | 0.63 | 0.36 |
| Control Delay | 69.5 | 41.5 | 0.2 | 75.9 | 38.8 | 4.2 | 76.6 | 63.5 | 0.1 | 81.6 | 69.0 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 69.5 | 41.5 | 0.2 | 75.9 | 38.8 | 4.2 | 76.6 | 63.5 | 0.1 | 81.6 | 69.0 | 0.7 |
| LOS | E | D | A | E | D | A | E | E | A | F | E | A |
| Approach Delay | | 40.8 | | | | 36.1 | | 51.5 | | | | 28.7 |
| Approach LOS | | D | | | | D | | D | | | | C |
| Queue Length 50th (m) | 42.7 | 145.0 | 0.0 | 9.5 | 71.7 | 0.0 | 34.5 | 32.3 | 0.0 | 47.5 | 47.8 | 0.0 |
| Queue Length 95th (m) | #72.1 | 194.9 | 0.0 | 23.6 | 94.5 | 10.0 | 62.3 | 57.5 | 0.0 | #107.6 | #95.8 | 0.0 |
| Internal Link Dist (m) | | 489.5 | | | 174.8 | | 271.7 | | | | 166.7 | |
| Turn Bay Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | | 30.0 | | | | |
| Base Capacity (vph) | 473 | 2150 | 1523 | 166 | 1972 | 782 | 333 | 441 | 1539 | 210 | 265 | 1523 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.64 | 0.72 | 0.16 | 0.20 | 0.43 | 0.14 | 0.38 | 0.27 | 0.06 | 0.77 | 0.63 | 0.36 |

Intersection Summary

| | |
|---|------------------|
| Area Type: | Other |
| Cycle Length: | 165 |
| Actuated Cycle Length: | 133 |
| Natural Cycle: | 130 |
| Control Type: | Semi Act-Uncoord |
| Maximum v/c Ratio: | 0.88 |
| Intersection Signal Delay: | 38.1 |
| Intersection LOS: | D |
| Intersection Capacity Utilization: | 81.3% |
| ICU Level of Service: | D |
| Analysis Period (min): | 15 |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

Splits and Phases: 1: 28 Street SE & Memorial Drive E



Existing AD - V2.syn
Synchro 11 Report

GS

2: Radcliffe Drive SE & 28 Street SE
04-24-2024

Existing After Development
PM Peak Hour

| | ↖ | ↗ | ↙ | ↘ | ↕ | ↖ |
|-----------------------------------|-------|-------|----------------------|-------|------|------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ↖ | ↗ | | ↖ | ↗ | |
| Sign Control | Stop | | | Stop | Stop | |
| Traffic Volume (vph) | 156 | 197 | 165 | 116 | 157 | 82 |
| Future Volume (vph) | 156 | 197 | 165 | 116 | 157 | 82 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 164 | 207 | 174 | 122 | 165 | 86 |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 | | |
| Volume Total (vph) | 164 | 207 | 296 | 251 | | |
| Volume Left (vph) | 164 | 0 | 174 | 0 | | |
| Volume Right (vph) | 0 | 207 | 0 | 86 | | |
| Hadj (s) | 0.50 | -0.68 | 0.13 | -0.16 | | |
| Departure Headway (s) | 6.4 | 5.3 | 5.4 | 5.2 | | |
| Degree Utilization, x | 0.29 | 0.30 | 0.44 | 0.36 | | |
| Capacity (veh/h) | 530 | 647 | 643 | 660 | | |
| Control Delay (s) | 10.9 | 9.3 | 12.6 | 11.1 | | |
| Approach Delay (s) | 10.0 | | 12.6 | 11.1 | | |
| Approach LOS | B | | B | B | | |
| Intersection Summary | | | | | | |
| Delay | 11.1 | | | | | |
| Level of Service | B | | | | | |
| Intersection Capacity Utilization | 51.5% | | ICU Level of Service | A | | |
| Analysis Period (min) | 15 | | | | | |

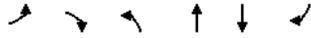
3: Radcliffe Drive SE & Site Access
04-24-2024

Existing After Development
PM Peak Hour

| | ↖ | ↗ | ↙ | ↘ | ↕ | ↖ |
|-----------------------------------|-------|------|----------------------|------|------|------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ↖ | | | ↖ | ↗ | |
| Traffic Volume (veh/h) | 82 | 78 | 36 | 186 | 172 | 187 |
| Future Volume (Veh/h) | 82 | 78 | 36 | 186 | 172 | 187 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 86 | 82 | 38 | 196 | 181 | 197 |
| Pedestrians | 25 | | | 25 | 25 | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | |
| Percent Blockage | 2 | | | 2 | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 602 | 330 | 403 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 602 | 330 | 403 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.2 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.3 | | | |
| p0 queue free % | 80 | 88 | 96 | | | |
| cM capacity (veh/h) | 425 | 676 | 1086 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 168 | 234 | 378 | | | |
| Volume Left | 86 | 38 | 0 | | | |
| Volume Right | 82 | 0 | 197 | | | |
| cSH | 519 | 1086 | 1700 | | | |
| Volume to Capacity | 0.32 | 0.04 | 0.22 | | | |
| Queue Length 95th (m) | 11.1 | 0.9 | 0.0 | | | |
| Control Delay (s) | 15.2 | 1.6 | 0.0 | | | |
| Lane LOS | C | A | | | | |
| Approach Delay (s) | 15.2 | 1.6 | 0.0 | | | |
| Approach LOS | C | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 3.8 | | | | | |
| Intersection Capacity Utilization | 56.6% | | ICU Level of Service | B | | |
| Analysis Period (min) | 15 | | | | | |

4: 28 Street SE & 11 Avenue SE
04-24-2024

Existing After Development
PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 8 | 44 | 56 | 223 | 229 | 13 |
| Future Volume (Veh/h) | 8 | 44 | 56 | 223 | 229 | 13 |
| Sign Control | Stop | | Free | | Free | |
| Grade | 0% | | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 8 | 46 | 59 | 235 | 241 | 14 |
| Pedestrians | 22 | | 22 | | 22 | |
| Lane Width (m) | 3.6 | | 3.6 | | 3.6 | |
| Walking Speed (m/s) | 1.2 | | 1.2 | | 1.2 | |
| Percent Blockage | 2 | | 2 | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 645 | 270 | 277 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 645 | 270 | 277 | | | |
| tC, single (s) | 6.8 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.8 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 94 | 95 | | | |
| cM capacity (veh/h) | 353 | 759 | 1262 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 54 | 294 | 255 | | | |
| Volume Left | 8 | 59 | 0 | | | |
| Volume Right | 46 | 0 | 14 | | | |
| cSH | 649 | 1262 | 1700 | | | |
| Volume to Capacity | 0.08 | 0.05 | 0.15 | | | |
| Queue Length 95th (m) | 2.2 | 1.2 | 0.0 | | | |
| Control Delay (s) | 11.1 | 2.0 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 11.1 | 2.0 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.9 | | | |
| Intersection Capacity Utilization | | | 41.9% | ICU Level of Service | A | |
| Analysis Period (min) | | | 15 | | | |

Existing AD PM
04-24-2024

PM Peak Hour

Summary of All Intervals

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Start Time | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 |
| End Time | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 |
| Total Time (min) | 70 | 70 | 70 | 70 | 70 | 70 |
| Time Recorded (min) | 60 | 60 | 60 | 60 | 60 | 60 |
| # of Intervals | 2 | 2 | 2 | 2 | 2 | 2 |
| # of Recorded Intervals | 1 | 1 | 1 | 1 | 1 | 1 |
| Vehs Entered | 4552 | 4565 | 4526 | 4474 | 4490 | 4521 |
| Vehs Exited | 4567 | 4564 | 4470 | 4482 | 4473 | 4511 |
| Starting Vehs | 135 | 131 | 89 | 123 | 134 | 122 |
| Ending Vehs | 120 | 132 | 145 | 115 | 151 | 134 |
| Travel Distance (km) | 3210 | 3200 | 3141 | 3141 | 3146 | 3167 |
| Travel Time (hr) | 130.5 | 151.7 | 126.9 | 132.2 | 156.8 | 139.6 |
| Total Delay (hr) | 62.0 | 83.7 | 60.1 | 65.3 | 89.8 | 72.2 |
| Total Stops | 3876 | 3777 | 3936 | 3854 | 3735 | 3840 |
| Fuel Used (l) | 318.3 | 334.7 | 307.8 | 316.2 | 335.4 | 322.5 |

Interval #0 Information Seeding

| | |
|-------------------------------------|------|
| Start Time | 6:57 |
| End Time | 7:07 |
| Total Time (min) | 10 |
| Volumes adjusted by Growth Factors. | |
| No data recorded this interval. | |

Interval #1 Information Recording

| | |
|-------------------------------------|------|
| Start Time | 7:07 |
| End Time | 8:07 |
| Total Time (min) | 60 |
| Volumes adjusted by Growth Factors. | |

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|----------------------|-------|-------|-------|-------|-------|-------|
| Vehs Entered | 4552 | 4565 | 4526 | 4474 | 4490 | 4521 |
| Vehs Exited | 4567 | 4564 | 4470 | 4482 | 4473 | 4511 |
| Starting Vehs | 135 | 131 | 89 | 123 | 134 | 122 |
| Ending Vehs | 120 | 132 | 145 | 115 | 151 | 134 |
| Travel Distance (km) | 3210 | 3200 | 3141 | 3141 | 3146 | 3167 |
| Travel Time (hr) | 130.5 | 151.7 | 126.9 | 132.2 | 156.8 | 139.6 |
| Total Delay (hr) | 62.0 | 83.7 | 60.1 | 65.3 | 89.8 | 72.2 |
| Total Stops | 3876 | 3777 | 3936 | 3854 | 3735 | 3840 |
| Fuel Used (l) | 318.3 | 334.7 | 307.8 | 316.2 | 335.4 | 322.5 |

Existing AD PM
04-24-2024

PM Peak Hour

Intersection: 2: Radcliffe Drive SE & 28 Street SE

| Movement | EB | EB | NB | SB |
|-----------------------|-------|-------|------|------|
| Directions Served | L | R | LT | TR |
| Maximum Queue (m) | 25.9 | 31.8 | 32.7 | 28.1 |
| Average Queue (m) | 13.0 | 15.4 | 17.4 | 14.7 |
| 95th Queue (m) | 21.2 | 25.6 | 27.1 | 23.7 |
| Link Distance (m) | 267.4 | 267.4 | 30.7 | 89.4 |
| Upstream Blk Time (%) | | | 0 | |
| Queuing Penalty (veh) | | | 1 | |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

1: 28 Street SE & Memorial Drive E
04-22-2024

2039 Background
AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 520 | 640 | 130 | 40 | 1000 | 130 | 200 | 140 | 40 | 70 | 40 | 180 |
| Future Volume (vph) | 520 | 640 | 130 | 40 | 1000 | 130 | 200 | 140 | 40 | 70 | 40 | 180 |
| Ideal Flow (vphpl) | 1500 | 1500 | 1850 | 1500 | 1500 | 1850 | 1500 | 1850 | 1850 | 1500 | 1850 | 1850 |
| Storage Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | 0.0 | | 30.0 | 0.0 | | 0.0 |
| Storage Lanes | 2 | | 1 | 1 | | 3 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | | 0.98 | | | 0.94 | | | 0.98 | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.987 | |
| Satd. Flow (prot) | 2684 | 3900 | 1527 | 1425 | 3900 | 1512 | 1397 | 1850 | 1498 | 1220 | 1684 | 1404 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.987 | |
| Satd. Flow (perm) | 2684 | 3900 | 1494 | 1425 | 3900 | 1422 | 1397 | 1850 | 1465 | 1220 | 1684 | 1374 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 265 | | | 152 | | | 265 | | | 265 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 513.5 | | | 198.8 | | | 295.7 | | | 190.7 | |
| Travel Time (s) | | 37.0 | | | 14.3 | | | 21.3 | | | 13.7 | |
| Confl. Peds. (#/hr) | | | 25 | | | 25 | | | 25 | | | 25 |
| Confl. Bikes (#/hr) | | | 10 | | | 10 | | | 10 | | | 10 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 3% | 5% | 3% | 0% | 5% | 4% | 2% | 0% | 5% | 11% | 0% | 12% |
| Adj. Flow (vph) | 553 | 681 | 138 | 43 | 1064 | 138 | 213 | 149 | 43 | 74 | 43 | 191 |
| Shared Lane Traffic (%) | | | | | | | | | | 22% | | |
| Lane Group Flow (vph) | 553 | 681 | 138 | 43 | 1064 | 138 | 213 | 149 | 43 | 58 | 59 | 191 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Split | NA | Free | Split | NA | Free |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | Free |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 10.0 | | 7.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 14.5 | 33.0 | | 14.5 | 33.0 | 33.0 | 38.5 | 38.5 | | 22.5 | 22.5 | |
| Total Split (s) | 35.8 | 60.4 | | 18.4 | 43.0 | 43.0 | 38.7 | 38.7 | | 22.5 | 22.5 | |
| Total Split (%) | 25.6% | 43.1% | | 13.1% | 30.7% | 30.7% | 27.6% | 27.6% | | 16.1% | 16.1% | |
| Maximum Green (s) | 28.3 | 53.4 | | 10.9 | 36.0 | 36.0 | 31.2 | 31.2 | | 15.0 | 15.0 | |
| Yellow Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 3.5 | 2.0 | | 3.5 | 2.0 | 2.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| 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) | 7.5 | 7.0 | | 7.5 | 7.0 | 7.0 | 7.5 | 7.5 | | 7.5 | 7.5 | |
| Lead/Lag | Lead | Lead | | Lag | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Min | | None | Min | Min | None | None | | None | None | |
| Walk Time (s) | | 12.0 | | | 12.0 | 12.0 | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Flash Dont Walk (s) | | 14.0 | | | 14.0 | 14.0 | 23.0 | 23.0 | | 7.0 | 7.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | 0 | 0 | | 10 | 10 | |
| Act Effect Green (s) | 28.7 | 50.9 | 126.2 | 20.9 | 36.5 | 36.5 | 23.4 | 23.4 | 126.2 | 12.0 | 12.0 | 126.2 |
| Actuated g/C Ratio | 0.23 | 0.40 | 1.00 | 0.17 | 0.29 | 0.29 | 0.19 | 0.19 | 1.00 | 0.10 | 0.10 | 1.00 |

1: 28 Street SE & Memorial Drive E
04-22-2024

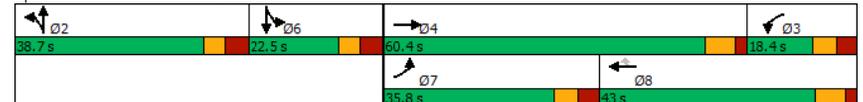
2039 Background
AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|--------|-------|-------|------|--------|-------|------|-------|------|------|------|-------|
| v/c Ratio | 0.91 | 0.43 | 0.09 | 0.18 | 0.94 | 0.27 | 0.83 | 0.44 | 0.03 | 0.50 | 0.37 | 0.14 |
| Control Delay | 68.7 | 36.8 | 0.1 | 46.5 | 61.4 | 6.0 | 75.5 | 50.4 | 0.0 | 73.5 | 64.1 | 0.2 |
| 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 | 68.7 | 36.8 | 0.1 | 46.5 | 61.4 | 6.0 | 75.5 | 50.4 | 0.0 | 73.5 | 64.1 | 0.2 |
| LOS | E | D | A | D | E | A | E | D | A | E | E | A |
| Approach Delay | | 46.0 | | | | 54.7 | | | 58.2 | | | 26.3 |
| Approach LOS | | D | | | | D | | | E | | | C |
| Queue Length 50th (m) | 76.2 | 64.1 | 0.0 | 8.7 | 104.5 | 0.0 | 55.4 | 35.7 | 0.0 | 16.0 | 16.1 | 0.0 |
| Queue Length 95th (m) | #125.5 | 80.3 | 0.0 | 22.3 | #155.1 | 13.6 | 88.1 | 58.8 | 0.0 | 33.6 | 33.0 | 0.0 |
| Internal Link Dist (m) | | 489.5 | | | 174.8 | | | 271.7 | | | | 166.7 |
| Turn Bay Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | | | 30.0 | | | |
| Base Capacity (vph) | 610 | 1934 | 1494 | 256 | 1129 | 519 | 350 | 464 | 1465 | 147 | 203 | 1374 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.91 | 0.35 | 0.09 | 0.17 | 0.94 | 0.27 | 0.61 | 0.32 | 0.03 | 0.39 | 0.29 | 0.14 |

Intersection Summary

| | |
|---|------------------|
| Area Type: | Other |
| Cycle Length: | 140 |
| Actuated Cycle Length: | 126.2 |
| Natural Cycle: | 140 |
| Control Type: | Semi Act-Uncoord |
| Maximum v/c Ratio: | 0.94 |
| Intersection Signal Delay: | 48.9 |
| Intersection LOS: | D |
| Intersection Capacity Utilization: | 94.5% |
| ICU Level of Service: | F |
| Analysis Period (min): | 15 |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

Splits and Phases: 1: 28 Street SE & Memorial Drive E



2: Radcliffe Drive SE & 28 Street SE
04-22-2024

2039 Background
AM Peak Hour

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------|-------|----------------------|-------|------|------|
| Lane Configurations | | | | | | |
| Sign Control | Stop | | | Stop | Stop | |
| Traffic Volume (vph) | 90 | 120 | 170 | 120 | 260 | 210 |
| Future Volume (vph) | 90 | 120 | 170 | 120 | 260 | 210 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 96 | 128 | 181 | 128 | 277 | 223 |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 | | |
| Volume Total (vph) | 96 | 128 | 309 | 500 | | |
| Volume Left (vph) | 96 | 0 | 181 | 0 | | |
| Volume Right (vph) | 0 | 128 | 0 | 223 | | |
| Hadj (s) | 0.52 | -0.68 | 0.16 | -0.23 | | |
| Departure Headway (s) | 7.0 | 5.8 | 5.4 | 4.8 | | |
| Degree Utilization, x | 0.19 | 0.21 | 0.46 | 0.67 | | |
| Capacity (veh/h) | 473 | 566 | 643 | 732 | | |
| Control Delay (s) | 10.4 | 9.1 | 13.0 | 16.8 | | |
| Approach Delay (s) | 9.6 | | 13.0 | 16.8 | | |
| Approach LOS | A | | B | C | | |
| Intersection Summary | | | | | | |
| Delay | 14.1 | | | | | |
| Level of Service | B | | | | | |
| Intersection Capacity Utilization | 64.2% | | ICU Level of Service | | C | |
| Analysis Period (min) | 15 | | | | | |

3: Radcliffe Drive SE & Site Access
04-22-2024

2039 Background
AM Peak Hour

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------|------|----------------------|------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 19 | 27 | 59 | 270 | 326 | 54 |
| Future Volume (Veh/h) | 19 | 27 | 59 | 270 | 326 | 54 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 20 | 29 | 63 | 287 | 347 | 57 |
| Pedestrians | 25 | | | 25 | 25 | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | |
| Percent Blockage | 2 | | | 2 | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 838 | 426 | 429 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 838 | 426 | 429 | | | |
| tC, single (s) | 6.6 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.7 | 3.4 | 2.2 | | | |
| p0 queue free % | 93 | 95 | 94 | | | |
| cM capacity (veh/h) | 282 | 585 | 1091 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 49 | 350 | 404 | | | |
| Volume Left | 20 | 63 | 0 | | | |
| Volume Right | 29 | 0 | 57 | | | |
| cSH | 406 | 1091 | 1700 | | | |
| Volume to Capacity | 0.12 | 0.06 | 0.24 | | | |
| Queue Length 95th (m) | 3.3 | 1.5 | 0.0 | | | |
| Control Delay (s) | 15.1 | 2.0 | 0.0 | | | |
| Lane LOS | C | A | | | | |
| Approach Delay (s) | 15.1 | 2.0 | 0.0 | | | |
| Approach LOS | C | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 1.8 | | | | | |
| Intersection Capacity Utilization | 58.6% | | ICU Level of Service | | B | |
| Analysis Period (min) | 15 | | | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|------|----------------------|------|
| Lane Configurations | ↔ ↘ ↙ ↕ ↓ ↔ | | | | | |
| Traffic Volume (veh/h) | 13 | 29 | 56 | 317 | 330 | 23 |
| Future Volume (Veh/h) | 13 | 29 | 56 | 317 | 330 | 23 |
| Sign Control | Stop | | | Free | | Free |
| Grade | 0% | | | 0% | | 0% |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 14 | 31 | 60 | 337 | 351 | 24 |
| Pedestrians | 25 | | 25 | | 25 | |
| Lane Width (m) | 3.6 | | 3.6 | | 3.6 | |
| Walking Speed (m/s) | 1.2 | | 1.2 | | 1.2 | |
| Percent Blockage | 2 | | 2 | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 870 | 413 | 400 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 870 | 413 | 400 | | | |
| tC, single (s) | 6.5 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.6 | 3.4 | 2.2 | | | |
| p0 queue free % | 95 | 95 | 95 | | | |
| cM capacity (veh/h) | 277 | 603 | 1119 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 45 | 397 | 375 | | | |
| Volume Left | 14 | 60 | 0 | | | |
| Volume Right | 31 | 0 | 24 | | | |
| cSH | 441 | 1119 | 1700 | | | |
| Volume to Capacity | 0.10 | 0.05 | 0.22 | | | |
| Queue Length 95th (m) | 2.7 | 1.4 | 0.0 | | | |
| Control Delay (s) | 14.1 | 1.7 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 14.1 | 1.7 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.6 | | | |
| Intersection Capacity Utilization | | | 59.1% | | ICU Level of Service | B |
| Analysis Period (min) | | | 15 | | | |

SimTraffic Simulation Summary
AM Peak Hour

04-22-2024

Summary of All Intervals

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Start Time | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 |
| End Time | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 |
| Total Time (min) | 70 | 70 | 70 | 70 | 70 | 70 |
| Time Recorded (min) | 60 | 60 | 60 | 60 | 60 | 60 |
| # of Intervals | 2 | 2 | 2 | 2 | 2 | 2 |
| # of Recorded Intervals | 1 | 1 | 1 | 1 | 1 | 1 |
| Vehs Entered | 3403 | 3437 | 3466 | 3464 | 3452 | 3445 |
| Vehs Exited | 3407 | 3433 | 3476 | 3484 | 3453 | 3450 |
| Starting Vehs | 126 | 99 | 125 | 121 | 120 | 114 |
| Ending Vehs | 122 | 103 | 115 | 101 | 119 | 111 |
| Travel Distance (km) | 2549 | 2518 | 2554 | 2551 | 2568 | 2548 |
| Travel Time (hr) | 327.4 | 258.6 | 260.2 | 247.3 | 279.6 | 274.6 |
| Total Delay (hr) | 273.1 | 205.0 | 205.7 | 192.9 | 224.9 | 220.3 |
| Total Stops | 3320 | 3515 | 3555 | 3483 | 3417 | 3458 |
| Fuel Used (l) | 444.7 | 384.1 | 386.9 | 378.9 | 406.4 | 400.2 |

Interval #0 Information Seeding

| | |
|-------------------------------------|------|
| Start Time | 6:57 |
| End Time | 7:07 |
| Total Time (min) | 10 |
| Volumes adjusted by Growth Factors. | |
| No data recorded this interval. | |

Interval #1 Information Recording

| | |
|-------------------------------------|------|
| Start Time | 7:07 |
| End Time | 8:07 |
| Total Time (min) | 60 |
| Volumes adjusted by Growth Factors. | |

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|----------------------|-------|-------|-------|-------|-------|-------|
| Vehs Entered | 3403 | 3437 | 3466 | 3464 | 3452 | 3445 |
| Vehs Exited | 3407 | 3433 | 3476 | 3484 | 3453 | 3450 |
| Starting Vehs | 126 | 99 | 125 | 121 | 120 | 114 |
| Ending Vehs | 122 | 103 | 115 | 101 | 119 | 111 |
| Travel Distance (km) | 2549 | 2518 | 2554 | 2551 | 2568 | 2548 |
| Travel Time (hr) | 327.4 | 258.6 | 260.2 | 247.3 | 279.6 | 274.6 |
| Total Delay (hr) | 273.1 | 205.0 | 205.7 | 192.9 | 224.9 | 220.3 |
| Total Stops | 3320 | 3515 | 3555 | 3483 | 3417 | 3458 |
| Fuel Used (l) | 444.7 | 384.1 | 386.9 | 378.9 | 406.4 | 400.2 |

Queuing and Blocking Report
AM Peak Hour

04-22-2024

Intersection: 2: Radcliffe Drive SE & 28 Street SE

| Movement | EB | EB | NB | SB |
|-----------------------|-------|-------|------|------|
| Directions Served | L | R | LT | TR |
| Maximum Queue (m) | 20.4 | 27.3 | 39.5 | 78.2 |
| Average Queue (m) | 9.6 | 11.5 | 20.7 | 34.9 |
| 95th Queue (m) | 16.6 | 19.7 | 33.8 | 63.6 |
| Link Distance (m) | 267.4 | 267.4 | 30.7 | 89.4 |
| Upstream Blk Time (%) | | | 1 | 1 |
| Queuing Penalty (veh) | | | 4 | 0 |
| Storage Bay Dist (m) | | | | |
| Storage Blk Time (%) | | | | |
| Queuing Penalty (veh) | | | | |

1: 28 Street SE & Memorial Drive E
04-22-2024

2039 Background
PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↔↔ | ↔↔↔ | ↔ | ↔ | ↔↔↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Traffic Volume (vph) | 460 | 1370 | 220 | 30 | 920 | 120 | 220 | 170 | 70 | 220 | 190 | 510 |
| Future Volume (vph) | 460 | 1370 | 220 | 30 | 920 | 120 | 220 | 170 | 70 | 220 | 190 | 510 |
| Ideal Flow (vphpl) | 1500 | 1500 | 1850 | 1500 | 1500 | 1850 | 1500 | 1850 | 1850 | 1500 | 1850 | 1850 |
| Storage Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | 0.0 | | 30.0 | 0.0 | | 0.0 |
| Storage Lanes | 2 | | 1 | 1 | | 3 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | | 0.98 | | | 0.94 | | | | 0.98 | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | | 0.850 | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.995 | |
| Satd. Flow (prot) | 2764 | 3976 | 1557 | 1425 | 4054 | 1572 | 1383 | 1832 | 1572 | 1354 | 1718 | 1557 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.995 | |
| Satd. Flow (perm) | 2764 | 3976 | 1523 | 1425 | 4054 | 1477 | 1383 | 1832 | 1539 | 1354 | 1718 | 1523 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 265 | | | 210 | | | 265 | | | 502 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | | 50 |
| Link Distance (m) | | 513.5 | | | 198.8 | | | 295.7 | | | | 190.7 |
| Travel Time (s) | | 37.0 | | | 14.3 | | | 21.3 | | | | 13.7 |
| Confl. Peds. (#/hr) | | | 25 | | | 25 | | | 25 | | | 25 |
| Confl. Bikes (#/hr) | | | 10 | | | 10 | | | 10 | | | 10 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 0% | 3% | 1% | 0% | 1% | 0% | 3% | 1% | 0% | 0% | 2% | 1% |
| Adj. Flow (vph) | 484 | 1442 | 232 | 32 | 968 | 126 | 232 | 179 | 74 | 232 | 200 | 537 |
| Shared Lane Traffic (%) | | | | | | | | | | 10% | | |
| Lane Group Flow (vph) | 484 | 1442 | 232 | 32 | 968 | 126 | 232 | 179 | 74 | 209 | 223 | 537 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Split | NA | Free | Split | NA | Free |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | | 6 |
| Permitted Phases | | | Free | | | 8 | | | Free | | | Free |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 10.0 | | 7.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | | 10.0 |
| Minimum Split (s) | 14.5 | 33.0 | | 14.5 | 33.0 | 33.0 | 38.5 | 38.5 | | 22.5 | | 22.5 |
| Total Split (s) | 32.0 | 56.5 | | 14.5 | 39.0 | 39.0 | 40.0 | 40.0 | | 29.0 | | 29.0 |
| Total Split (%) | 22.9% | 40.4% | | 10.4% | 27.9% | 27.9% | 28.6% | 28.6% | | 20.7% | | 20.7% |
| Maximum Green (s) | 24.5 | 49.5 | | 7.0 | 32.0 | 32.0 | 32.5 | 32.5 | | 21.5 | | 21.5 |
| Yellow Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 3.5 | 3.5 | | 3.5 | | 3.5 |
| All-Red Time (s) | 3.5 | 2.0 | | 3.5 | 2.0 | 2.0 | 4.0 | 4.0 | | 4.0 | | 4.0 |
| 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) | 7.5 | 7.0 | | 7.5 | 7.0 | 7.0 | 7.5 | 7.5 | | 7.5 | | 7.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | | 3.0 |
| Recall Mode | None | Min | | None | Min | Min | None | None | | None | | None |
| Walk Time (s) | | 12.0 | | | 12.0 | 12.0 | 8.0 | 8.0 | | 8.0 | | 8.0 |
| Flash Dont Walk (s) | | 14.0 | | | 14.0 | 14.0 | 23.0 | 23.0 | | 7.0 | | 7.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | 0 | 0 | | 10 | | 10 |
| Act Effect Green (s) | 24.5 | 55.7 | 134.1 | 7.0 | 32.1 | 32.1 | 26.4 | 26.4 | 134.1 | 21.5 | 21.5 | 134.1 |
| Actuated g/C Ratio | 0.18 | 0.42 | 1.00 | 0.05 | 0.24 | 0.24 | 0.20 | 0.20 | 1.00 | 0.16 | 0.16 | 1.00 |

1: 28 Street SE & Memorial Drive E
04-22-2024

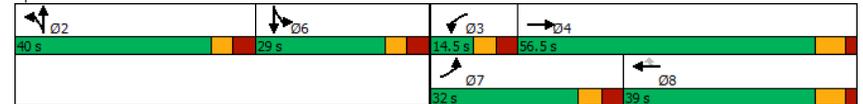
2039 Background
PM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|--------|--------|-------|------|--------|-------|-------|-------|------|--------|--------|-------|
| v/c Ratio | 0.96 | 0.87 | 0.15 | 0.43 | 1.00 | 0.25 | 0.85 | 0.50 | 0.05 | 0.96 | 0.81 | 0.35 |
| Control Delay | 85.3 | 44.7 | 0.2 | 81.9 | 79.7 | 1.1 | 79.2 | 52.5 | 0.1 | 108.7 | 77.7 | 0.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 85.3 | 44.7 | 0.2 | 81.9 | 79.7 | 1.1 | 79.2 | 52.5 | 0.1 | 108.7 | 77.7 | 0.6 |
| LOS | F | D | A | F | E | A | E | D | A | F | E | A |
| Approach Delay | | 49.0 | | | 71.0 | | | 57.3 | | | | 41.7 |
| Approach LOS | | D | | | E | | | E | | | | D |
| Queue Length 50th (m) | 70.3 | 146.7 | 0.0 | 8.9 | ~101.8 | 0.0 | 62.9 | 44.8 | 0.0 | 62.3 | 64.5 | 0.0 |
| Queue Length 95th (m) | #111.9 | #194.9 | 0.0 | 21.1 | #142.1 | 0.0 | #95.9 | 69.0 | 0.0 | #122.8 | #115.2 | 0.0 |
| Internal Link Dist (m) | | 489.5 | | | 174.8 | | | 271.7 | | | | 166.7 |
| Turn Bay Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | | | 30.0 | | | |
| Base Capacity (vph) | 505 | 1650 | 1523 | 74 | 969 | 512 | 335 | 444 | 1539 | 217 | 275 | 1523 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.96 | 0.87 | 0.15 | 0.43 | 1.00 | 0.25 | 0.69 | 0.40 | 0.05 | 0.96 | 0.81 | 0.35 |

Intersection Summary

| | |
|---|------------------|
| Area Type: | Other |
| Cycle Length: | 140 |
| Actuated Cycle Length: | 134.1 |
| Natural Cycle: | 140 |
| Control Type: | Semi Act-Uncoord |
| Maximum v/c Ratio: | 1.00 |
| Intersection Signal Delay: | 53.6 |
| Intersection LOS: | D |
| Intersection Capacity Utilization: | 97.3% |
| ICU Level of Service: | F |
| Analysis Period (min): | 15 |
| ~ Volume exceeds capacity, queue is theoretically infinite. | |
| Queue shown is maximum after two cycles. | |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

Splits and Phases: 1: 28 Street SE & Memorial Drive E



2: Radcliffe Drive SE & 28 Street SE
04-22-2024

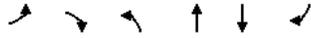
2039 Background
PM Peak Hour

| | ↖ | ↗ | ↙ | ↘ | ↕ | ↔ |
|-----------------------------------|-------|-------|----------------------|-------|------|------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ↖ | ↗ | | ↖ | ↗ | |
| Sign Control | Stop | | | Stop | Stop | |
| Traffic Volume (vph) | 230 | 210 | 230 | 100 | 130 | 230 |
| Future Volume (vph) | 230 | 210 | 230 | 100 | 130 | 230 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 242 | 221 | 242 | 105 | 137 | 242 |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 | | |
| Volume Total (vph) | 242 | 221 | 347 | 379 | | |
| Volume Left (vph) | 242 | 0 | 242 | 0 | | |
| Volume Right (vph) | 0 | 221 | 0 | 242 | | |
| Hadj (s) | 0.50 | -0.68 | 0.15 | -0.36 | | |
| Departure Headway (s) | 7.0 | 5.8 | 6.0 | 5.4 | | |
| Degree Utilization, x | 0.47 | 0.36 | 0.57 | 0.57 | | |
| Capacity (veh/h) | 493 | 591 | 578 | 638 | | |
| Control Delay (s) | 14.9 | 10.8 | 16.7 | 15.5 | | |
| Approach Delay (s) | 12.9 | | 16.7 | 15.5 | | |
| Approach LOS | B | | C | C | | |
| Intersection Summary | | | | | | |
| Delay | 14.8 | | | | | |
| Level of Service | B | | | | | |
| Intersection Capacity Utilization | 64.7% | | ICU Level of Service | C | | |
| Analysis Period (min) | 15 | | | | | |

3: Radcliffe Drive SE & Site Access
04-22-2024

2039 Background
PM Peak Hour

| | ↖ | ↗ | ↙ | ↘ | ↕ | ↔ |
|-----------------------------------|-------|------|----------------------|------|------|------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ↖ | | | ↖ | ↗ | |
| Traffic Volume (veh/h) | 69 | 62 | 36 | 261 | 303 | 37 |
| Future Volume (Veh/h) | 69 | 62 | 36 | 261 | 303 | 37 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 73 | 65 | 38 | 275 | 319 | 39 |
| Pedestrians | 25 | | | 25 | 25 | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | |
| Percent Blockage | 2 | | | 2 | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 740 | 388 | 383 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 740 | 388 | 383 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.2 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.3 | | | |
| p0 queue free % | 79 | 90 | 97 | | | |
| cM capacity (veh/h) | 353 | 626 | 1104 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 138 | 313 | 358 | | | |
| Volume Left | 73 | 38 | 0 | | | |
| Volume Right | 65 | 0 | 39 | | | |
| cSH | 444 | 1104 | 1700 | | | |
| Volume to Capacity | 0.31 | 0.03 | 0.21 | | | |
| Queue Length 95th (m) | 10.5 | 0.9 | 0.0 | | | |
| Control Delay (s) | 16.7 | 1.3 | 0.0 | | | |
| Lane LOS | C | A | | | | |
| Approach Delay (s) | 16.7 | 1.3 | 0.0 | | | |
| Approach LOS | C | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 3.4 | | | | | |
| Intersection Capacity Utilization | 56.5% | | ICU Level of Service | B | | |
| Analysis Period (min) | 15 | | | | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | ↔ | ↔ | ↔ | ↕ | ↕ | ↔ |
| Traffic Volume (veh/h) | 8 | 44 | 56 | 289 | 353 | 12 |
| Future Volume (Veh/h) | 8 | 44 | 56 | 289 | 353 | 12 |
| Sign Control | Stop | | Free | | Free | |
| Grade | 0% | | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 8 | 46 | 59 | 304 | 372 | 13 |
| Pedestrians | 22 | | 22 | | 22 | |
| Lane Width (m) | 3.6 | | 3.6 | | 3.6 | |
| Walking Speed (m/s) | 1.2 | | 1.2 | | 1.2 | |
| Percent Blockage | 2 | | 2 | | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | None | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 844 | 400 | 407 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 844 | 400 | 407 | | | |
| tC, single (s) | 6.8 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.8 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 93 | 95 | | | |
| cM capacity (veh/h) | 265 | 642 | 1131 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 54 | 363 | 385 | | | |
| Volume Left | 8 | 59 | 0 | | | |
| Volume Right | 46 | 0 | 13 | | | |
| cSH | 530 | 1131 | 1700 | | | |
| Volume to Capacity | 0.10 | 0.05 | 0.23 | | | |
| Queue Length 95th (m) | 2.7 | 1.3 | 0.0 | | | |
| Control Delay (s) | 12.6 | 1.8 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 12.6 | 1.8 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.7 | | | |
| Intersection Capacity Utilization | | | 52.0% | ICU Level of Service | A | |
| Analysis Period (min) | | | 15 | | | |

SimTraffic Simulation Summary
PM Peak Hour

04-22-2024

Summary of All Intervals

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Start Time | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 |
| End Time | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 |
| Total Time (min) | 70 | 70 | 70 | 70 | 70 | 70 |
| Time Recorded (min) | 60 | 60 | 60 | 60 | 60 | 60 |
| # of Intervals | 2 | 2 | 2 | 2 | 2 | 2 |
| # of Recorded Intervals | 1 | 1 | 1 | 1 | 1 | 1 |
| Vehs Entered | 4788 | 4769 | 4790 | 4645 | 4760 | 4752 |
| Vehs Exited | 4798 | 4763 | 4786 | 4619 | 4750 | 4744 |
| Starting Vehs | 155 | 147 | 157 | 126 | 160 | 149 |
| Ending Vehs | 145 | 153 | 161 | 152 | 170 | 154 |
| Travel Distance (km) | 3476 | 3496 | 3507 | 3383 | 3427 | 3458 |
| Travel Time (hr) | 216.7 | 214.9 | 211.4 | 234.5 | 245.3 | 224.6 |
| Total Delay (hr) | 142.7 | 140.4 | 136.6 | 162.2 | 172.2 | 150.8 |
| Total Stops | 4573 | 4705 | 4644 | 4230 | 4474 | 4526 |
| Fuel Used (l) | 411.6 | 410.2 | 407.4 | 421.0 | 432.4 | 416.5 |

Interval #0 Information Seeding

| | |
|-------------------------------------|------|
| Start Time | 6:57 |
| End Time | 7:07 |
| Total Time (min) | 10 |
| Volumes adjusted by Growth Factors. | |
| No data recorded this interval. | |

Interval #1 Information Recording

| | |
|-------------------------------------|------|
| Start Time | 7:07 |
| End Time | 8:07 |
| Total Time (min) | 60 |
| Volumes adjusted by Growth Factors. | |

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|----------------------|-------|-------|-------|-------|-------|-------|
| Vehs Entered | 4788 | 4769 | 4790 | 4645 | 4760 | 4752 |
| Vehs Exited | 4798 | 4763 | 4786 | 4619 | 4750 | 4744 |
| Starting Vehs | 155 | 147 | 157 | 126 | 160 | 149 |
| Ending Vehs | 145 | 153 | 161 | 152 | 170 | 154 |
| Travel Distance (km) | 3476 | 3496 | 3507 | 3383 | 3427 | 3458 |
| Travel Time (hr) | 216.7 | 214.9 | 211.4 | 234.5 | 245.3 | 224.6 |
| Total Delay (hr) | 142.7 | 140.4 | 136.6 | 162.2 | 172.2 | 150.8 |
| Total Stops | 4573 | 4705 | 4644 | 4230 | 4474 | 4526 |
| Fuel Used (l) | 411.6 | 410.2 | 407.4 | 421.0 | 432.4 | 416.5 |

Queuing and Blocking Report
PM Peak Hour

04-22-2024

Intersection: 2: Radcliffe Drive SE & 28 Street SE

| Movement | EB | EB | NB | B5 | SB |
|-----------------------|-------|-------|------|-------|------|
| Directions Served | L | R | LT | T | TR |
| Maximum Queue (m) | 55.5 | 33.6 | 45.1 | 4.3 | 48.8 |
| Average Queue (m) | 22.6 | 16.9 | 22.1 | 0.1 | 22.8 |
| 95th Queue (m) | 41.0 | 28.4 | 36.6 | 2.4 | 39.6 |
| Link Distance (m) | 267.4 | 267.4 | 30.7 | 300.3 | 89.4 |
| Upstream Blk Time (%) | 3 | | | | |
| Queuing Penalty (veh) | 9 | | | | |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queuing Penalty (veh) | | | | | |

1: 28 Street SE & Memorial Drive E
04-24-2024

2039 After Development
AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑↑↑ | ↑ | ↑↑ | ↑ | ↑ | ↑ | ↑ | ↑ |
| Traffic Volume (vph) | 520 | 640 | 131 | 30 | 1000 | 140 | 261 | 161 | 61 | 70 | 40 | 180 |
| Future Volume (vph) | 520 | 640 | 131 | 30 | 1000 | 140 | 261 | 161 | 61 | 70 | 40 | 180 |
| Ideal Flow (vphpl) | 1500 | 1500 | 1850 | 1500 | 1500 | 1850 | 1500 | 1850 | 1850 | 1500 | 1850 | 1850 |
| Storage Length (m) | 75.0 | | 170.0 | 75.0 | 140.0 | 0.0 | 30.0 | 0.0 | | | | 0.0 |
| Storage Lanes | 2 | | 1 | 1 | 3 | 1 | 1 | 1 | | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | 7.5 | | 7.5 | | | | | |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 | |
| Ped Bike Factor | | | 0.98 | | 0.94 | | 0.98 | | 0.98 | | | 0.98 |
| Frt | | | 0.850 | | 0.850 | | 0.850 | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | 0.950 | | 0.950 | | 0.987 | | | 0.987 |
| Satd. Flow (prot) | 2684 | 3900 | 1527 | 1425 | 3900 | 1512 | 1397 | 1850 | 1498 | 1220 | 1684 | 1404 |
| Flt Permitted | 0.950 | | 0.950 | | 0.950 | | 0.950 | | 0.987 | | | 0.987 |
| Satd. Flow (perm) | 2684 | 3900 | 1494 | 1425 | 3900 | 1422 | 1397 | 1850 | 1465 | 1220 | 1684 | 1374 |
| Right Turn on Red | | | Yes | | Yes | | Yes | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 265 | | 152 | | 265 | | 265 | | | 265 |
| Link Speed (k/h) | | 50 | | 50 | | 50 | | 50 | | 50 | | 50 |
| Link Distance (m) | | 513.5 | | 198.8 | | 295.7 | | 190.7 | | | | |
| Travel Time (s) | | 37.0 | | 14.3 | | 21.3 | | 13.7 | | | | |
| Confl. Peds. (#/hr) | | | 25 | | 25 | | 25 | | 25 | | | 25 |
| Confl. Bikes (#/hr) | | | 10 | | 10 | | 10 | | 10 | | | 10 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles (%) | 3% | 5% | 3% | 0% | 5% | 4% | 2% | 0% | 5% | 11% | 0% | 12% |
| Adj. Flow (vph) | 553 | 681 | 139 | 32 | 1064 | 149 | 278 | 171 | 65 | 74 | 43 | 191 |
| Shared Lane Traffic (%) | | | | | | | | | 22% | | | |
| Lane Group Flow (vph) | 553 | 681 | 139 | 32 | 1064 | 149 | 278 | 171 | 65 | 58 | 59 | 191 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Split | NA | Free | Split | NA | Free |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | Free |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 10.0 | | 7.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 14.5 | 33.0 | | 14.5 | 33.0 | 33.0 | 38.5 | 38.5 | | 22.5 | 22.5 | |
| Total Split (s) | 35.8 | 60.4 | | 18.4 | 43.0 | 43.0 | 38.7 | 38.7 | | 22.5 | 22.5 | |
| Total Split (%) | 25.6% | 43.1% | | 13.1% | 30.7% | 30.7% | 27.6% | 27.6% | | 16.1% | 16.1% | |
| Maximum Green (s) | 28.3 | 53.4 | | 10.9 | 36.0 | 36.0 | 31.2 | 31.2 | | 15.0 | 15.0 | |
| Yellow Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 3.5 | 2.0 | | 3.5 | 2.0 | 2.0 | 4.0 | 4.0 | | 4.0 | 4.0 | |
| 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) | 7.5 | 7.0 | | 7.5 | 7.0 | 7.0 | 7.5 | 7.5 | | 7.5 | 7.5 | |
| Lead/Lag | Lead | Lead | | Lag | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | Min | | None | Min | Min | None | None | | None | None | |
| Walk Time (s) | | 12.0 | | | 12.0 | 12.0 | 8.0 | 8.0 | | 8.0 | 8.0 | |
| Flash Dont Walk (s) | | 14.0 | | | 14.0 | 14.0 | 23.0 | 23.0 | | 7.0 | 7.0 | |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | 0 | 0 | | 10 | 10 | |
| Act Effect Green (s) | 28.6 | 50.5 | 131.3 | 20.8 | 36.4 | 36.4 | 28.7 | 28.7 | 131.3 | 12.1 | 12.1 | 131.3 |
| Actuated g/C Ratio | 0.22 | 0.38 | 1.00 | 0.16 | 0.28 | 0.28 | 0.22 | 0.22 | 1.00 | 0.09 | 0.09 | 1.00 |

1: 28 Street SE & Memorial Drive E
04-24-2024

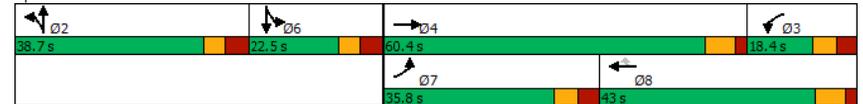
2039 After Development
AM Peak Hour

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|--------|-------|-------|------|--------|-------|--------|-------|------|------|------|-------|
| v/c Ratio | 0.95 | 0.45 | 0.09 | 0.14 | 0.99 | 0.30 | 0.91 | 0.42 | 0.04 | 0.52 | 0.38 | 0.14 |
| Control Delay | 78.0 | 38.6 | 0.1 | 47.3 | 72.2 | 7.4 | 83.9 | 48.9 | 0.0 | 76.5 | 66.1 | 0.2 |
| 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 | 78.0 | 38.6 | 0.1 | 47.3 | 72.2 | 7.4 | 83.9 | 48.9 | 0.0 | 76.5 | 66.1 | 0.2 |
| LOS | E | D | A | D | E | A | F | D | A | E | E | A |
| Approach Delay | | 50.6 | | | 63.8 | | | 61.7 | | | | 27.2 |
| Approach LOS | | D | | | E | | | E | | | | C |
| Queue Length 50th (m) | 81.7 | 67.8 | 0.0 | 7.0 | ~118.7 | 0.0 | 76.6 | 41.6 | 0.0 | 16.9 | 17.0 | 0.0 |
| Queue Length 95th (m) | #125.5 | 80.3 | 0.0 | 17.8 | #155.1 | 17.0 | #132.6 | 66.7 | 0.0 | 33.6 | 33.0 | 0.0 |
| Internal Link Dist (m) | | 489.5 | | | 174.8 | | | 271.7 | | | | 166.7 |
| Turn Bay Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | | 30.0 | | | | |
| Base Capacity (vph) | 584 | 1843 | 1494 | 244 | 1079 | 503 | 335 | 444 | 1465 | 140 | 194 | 1374 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.95 | 0.37 | 0.09 | 0.13 | 0.99 | 0.30 | 0.83 | 0.39 | 0.04 | 0.41 | 0.30 | 0.14 |

Intersection Summary

| | |
|---|------------------|
| Area Type: | Other |
| Cycle Length: | 140 |
| Actuated Cycle Length: | 131.3 |
| Natural Cycle: | 140 |
| Control Type: | Semi Act-Uncoord |
| Maximum v/c Ratio: | 0.99 |
| Intersection Signal Delay: | 54.9 |
| Intersection Capacity Utilization: | 94.5% |
| Analysis Period (min): | 15 |
| Intersection LOS: | D |
| ICU Level of Service: | F |
| ~ Volume exceeds capacity, queue is theoretically infinite. | |
| Queue shown is maximum after two cycles. | |
| # 95th percentile volume exceeds capacity, queue may be longer. | |
| Queue shown is maximum after two cycles. | |

Splits and Phases: 1: 28 Street SE & Memorial Drive E



2: Radcliffe Drive SE & 28 Street SE
04-24-2024

2039 After Development
AM Peak Hour

| | ↖ | | ↗ | | ↙ | | ↘ | |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|---|--|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR | | |
| Lane Configurations | ↕ | ↕ | | ↕ | ↕ | | | |
| Sign Control | Stop | | | Stop | Stop | | | |
| Traffic Volume (vph) | 90 | 112 | 271 | 120 | 262 | 210 | | |
| Future Volume (vph) | 90 | 112 | 271 | 120 | 262 | 210 | | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | |
| Hourly flow rate (vph) | 96 | 119 | 288 | 128 | 279 | 223 | | |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 | | | | |
| Volume Total (vph) | 96 | 119 | 416 | 502 | | | | |
| Volume Left (vph) | 96 | 0 | 288 | 0 | | | | |
| Volume Right (vph) | 0 | 119 | 0 | 223 | | | | |
| Hadj (s) | 0.52 | -0.68 | 0.18 | -0.23 | | | | |
| Departure Headway (s) | 7.3 | 6.1 | 5.4 | 5.0 | | | | |
| Degree Utilization, x | 0.19 | 0.20 | 0.63 | 0.69 | | | | |
| Capacity (veh/h) | 452 | 536 | 637 | 708 | | | | |
| Control Delay (s) | 10.8 | 9.4 | 17.2 | 18.4 | | | | |
| Approach Delay (s) | 10.0 | | 17.2 | 18.4 | | | | |
| Approach LOS | B | | C | C | | | | |
| Intersection Summary | | | | | | | | |
| Delay | | | 16.4 | | | | | |
| Level of Service | | | C | | | | | |
| Intersection Capacity Utilization | | | 70.0% | ICU Level of Service | C | | | |
| Analysis Period (min) | | | 15 | | | | | |

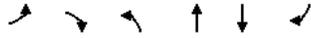
3: Radcliffe Drive SE & Site Access
04-24-2024

2039 After Development
AM Peak Hour

| | ↖ | | ↗ | | ↙ | | ↘ | |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|---|--|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR | | |
| Lane Configurations | ↕ | | | ↕ | ↕ | | | |
| Traffic Volume (veh/h) | 120 | 48 | 54 | 271 | 335 | 38 | | |
| Future Volume (Veh/h) | 120 | 48 | 54 | 271 | 335 | 38 | | |
| Sign Control | Stop | | | Free | Free | | | |
| Grade | 0% | | | 0% | 0% | | | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | | |
| Hourly flow rate (vph) | 128 | 51 | 57 | 288 | 356 | 40 | | |
| Pedestrians | 25 | | | 25 | 25 | | | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | | | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | | | |
| Percent Blockage | 2 | | | 2 | 2 | | | |
| Right turn flare (veh) | | | | | | | | |
| Median type | | | | None | None | | | |
| Median storage (veh) | | | | | | | | |
| Upstream signal (m) | | | | | | | | |
| pX, platoon unblocked | | | | | | | | |
| vC, conflicting volume | 828 | 426 | 421 | | | | | |
| vC1, stage 1 conf vol | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | |
| vCu, unblocked vol | 828 | 426 | 421 | | | | | |
| tC, single (s) | 6.6 | 6.3 | 4.1 | | | | | |
| tC, 2 stage (s) | | | | | | | | |
| tF (s) | 3.7 | 3.4 | 2.2 | | | | | |
| p0 queue free % | 56 | 91 | 95 | | | | | |
| cM capacity (veh/h) | 288 | 585 | 1099 | | | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | | | |
| Volume Total | 179 | 345 | 396 | | | | | |
| Volume Left | 128 | 57 | 0 | | | | | |
| Volume Right | 51 | 0 | 40 | | | | | |
| cSH | 336 | 1099 | 1700 | | | | | |
| Volume to Capacity | 0.53 | 0.05 | 0.23 | | | | | |
| Queue Length 95th (m) | 23.7 | 1.3 | 0.0 | | | | | |
| Control Delay (s) | 27.2 | 1.8 | 0.0 | | | | | |
| Lane LOS | D | A | | | | | | |
| Approach Delay (s) | 27.2 | 1.8 | 0.0 | | | | | |
| Approach LOS | D | | | | | | | |
| Intersection Summary | | | | | | | | |
| Average Delay | | | 6.0 | | | | | |
| Intersection Capacity Utilization | | | 60.5% | ICU Level of Service | B | | | |
| Analysis Period (min) | | | 15 | | | | | |

4: 28 Street SE & 11 Avenue SE
04-24-2024

2039 After Development
AM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | T | | | T | T | |
| Traffic Volume (veh/h) | 13 | 29 | 56 | 320 | 351 | 23 |
| Future Volume (Veh/h) | 13 | 29 | 56 | 320 | 351 | 23 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Hourly flow rate (vph) | 14 | 31 | 60 | 340 | 373 | 24 |
| Pedestrians | 25 | | | 25 | 25 | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | |
| Percent Blockage | 2 | | | 2 | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | None | | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 895 | 435 | 422 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 895 | 435 | 422 | | | |
| tC, single (s) | 6.5 | 6.3 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.6 | 3.4 | 2.2 | | | |
| p0 queue free % | 95 | 95 | 95 | | | |
| cM capacity (veh/h) | 268 | 585 | 1098 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 45 | 400 | 397 | | | |
| Volume Left | 14 | 60 | 0 | | | |
| Volume Right | 31 | 0 | 24 | | | |
| cSH | 427 | 1098 | 1700 | | | |
| Volume to Capacity | 0.11 | 0.05 | 0.23 | | | |
| Queue Length 95th (m) | 2.8 | 1.4 | 0.0 | | | |
| Control Delay (s) | 14.4 | 1.8 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 14.4 | 1.8 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.6 | | | |
| Intersection Capacity Utilization | | | 60.4% | ICU Level of Service | B | |
| Analysis Period (min) | | | 15 | | | |

2039 AD AM
04-24-2024

2039 After Development
AM Peak Hour

Summary of All Intervals

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Start Time | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 |
| End Time | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 |
| Total Time (min) | 70 | 70 | 70 | 70 | 70 | 70 |
| Time Recorded (min) | 60 | 60 | 60 | 60 | 60 | 60 |
| # of Intervals | 2 | 2 | 2 | 2 | 2 | 2 |
| # of Recorded Intervals | 1 | 1 | 1 | 1 | 1 | 1 |
| Vehs Entered | 3556 | 3645 | 3603 | 3575 | 3497 | 3575 |
| Vehs Exited | 3563 | 3653 | 3620 | 3546 | 3511 | 3579 |
| Starting Vehs | 126 | 133 | 128 | 123 | 114 | 121 |
| Ending Vehs | 119 | 125 | 111 | 152 | 100 | 119 |
| Travel Distance (km) | 2677 | 2696 | 2691 | 2640 | 2596 | 2660 |
| Travel Time (hr) | 329.3 | 289.2 | 258.7 | 302.8 | 310.7 | 298.2 |
| Total Delay (hr) | 272.0 | 231.7 | 201.1 | 246.3 | 255.2 | 241.3 |
| Total Stops | 3633 | 3862 | 3877 | 3760 | 3547 | 3736 |
| Fuel Used (l) | 455.8 | 423.7 | 396.8 | 430.9 | 434.5 | 428.3 |

Interval #0 Information Seeding

| | |
|-------------------------------------|------|
| Start Time | 6:57 |
| End Time | 7:07 |
| Total Time (min) | 10 |
| Volumes adjusted by Growth Factors. | |
| No data recorded this interval. | |

Interval #1 Information Recording

| | |
|-------------------------------------|------|
| Start Time | 7:07 |
| End Time | 8:07 |
| Total Time (min) | 60 |
| Volumes adjusted by Growth Factors. | |

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|----------------------|-------|-------|-------|-------|-------|-------|
| Vehs Entered | 3556 | 3645 | 3603 | 3575 | 3497 | 3575 |
| Vehs Exited | 3563 | 3653 | 3620 | 3546 | 3511 | 3579 |
| Starting Vehs | 126 | 133 | 128 | 123 | 114 | 121 |
| Ending Vehs | 119 | 125 | 111 | 152 | 100 | 119 |
| Travel Distance (km) | 2677 | 2696 | 2691 | 2640 | 2596 | 2660 |
| Travel Time (hr) | 329.3 | 289.2 | 258.7 | 302.8 | 310.7 | 298.2 |
| Total Delay (hr) | 272.0 | 231.7 | 201.1 | 246.3 | 255.2 | 241.3 |
| Total Stops | 3633 | 3862 | 3877 | 3760 | 3547 | 3736 |
| Fuel Used (l) | 455.8 | 423.7 | 396.8 | 430.9 | 434.5 | 428.3 |

2039 AD AM
04-24-2024

2039 After Development
AM Peak Hour

Intersection: 2: Radcliffe Drive SE & 28 Street SE

| Movement | EB | EB | NB | B5 | SB |
|------------------------|-------|-------|------|-------|------|
| Directions Served | L | R | LT | T | TR |
| Maximum Queue (m) | 22.4 | 26.5 | 54.1 | 22.1 | 88.0 |
| Average Queue (m) | 10.9 | 11.4 | 28.4 | 1.8 | 40.0 |
| 95th Queue (m) | 18.5 | 20.4 | 48.5 | 13.6 | 75.1 |
| Link Distance (m) | 267.4 | 267.4 | 30.7 | 300.3 | 89.4 |
| Upstream Blk Time (%) | | | 10 | | 2 |
| Queueing Penalty (veh) | | | 39 | | 0 |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queueing Penalty (veh) | | | | | |

1: 28 Street SE & Memorial Drive E
04-24-2024

2039 After Development
PM Peak Hour

| | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Lane Configurations | ↔↔ | ↔↔↔ | ↔ | ↔ | ↔↔↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ | ↔ |
| Traffic Volume (vph) | 460 | 1370 | 295 | 30 | 920 | 120 | 237 | 173 | 67 | 229 | 190 | 510 |
| Future Volume (vph) | 460 | 1370 | 295 | 30 | 920 | 120 | 237 | 173 | 67 | 229 | 190 | 510 |
| Ideal Flow (vphpl) | 1500 | 1500 | 1850 | 1500 | 1500 | 1850 | 1500 | 1850 | 1850 | 1500 | 1850 | 1850 |
| Storage Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | 0.0 | | 30.0 | 0.0 | | 0.0 |
| Storage Lanes | 2 | | 1 | 1 | | 3 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 1.00 | 1.00 | 0.91 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | | 0.98 | | | 0.94 | | | 0.98 | | | 0.98 |
| Frt | | | 0.850 | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.995 | |
| Satd. Flow (prot) | 2764 | 3976 | 1557 | 1425 | 4054 | 1572 | 1383 | 1832 | 1572 | 1354 | 1718 | 1557 |
| Flt Permitted | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | 0.995 | |
| Satd. Flow (perm) | 2764 | 3976 | 1523 | 1425 | 4054 | 1477 | 1383 | 1832 | 1539 | 1354 | 1718 | 1523 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 311 | | | 210 | | | 265 | | | 494 |
| Link Speed (k/h) | | 50 | | | 50 | | | 50 | | | 50 | |
| Link Distance (m) | | 513.5 | | | 198.8 | | | 295.7 | | | 190.7 | |
| Travel Time (s) | | 37.0 | | | 14.3 | | | 21.3 | | | 13.7 | |
| Confl. Peds. (#/hr) | | | 25 | | | 25 | | | 25 | | | 25 |
| Confl. Bikes (#/hr) | | | 10 | | | 10 | | | 10 | | | 10 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Heavy Vehicles (%) | 0% | 3% | 1% | 0% | 1% | 0% | 3% | 1% | 0% | 0% | 2% | 1% |
| Adj. Flow (vph) | 484 | 1442 | 311 | 32 | 968 | 126 | 249 | 182 | 71 | 241 | 200 | 537 |
| Shared Lane Traffic (%) | | | | | | | | | 10% | | | |
| Lane Group Flow (vph) | 484 | 1442 | 311 | 32 | 968 | 126 | 249 | 182 | 71 | 217 | 224 | 537 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Split | NA | Free | Split | NA | Free |
| Protected Phases | 7 | 4 | | 3 | 8 | | 2 | 2 | | 6 | | 6 |
| Permitted Phases | | | Free | | | 8 | | | Free | | | Free |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 2 | 2 | | 6 | | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 10.0 | | 7.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.0 | | 10.0 |
| Minimum Split (s) | 14.5 | 33.0 | | 14.5 | 33.0 | 33.0 | 38.5 | 38.5 | | 22.5 | | 22.5 |
| Total Split (s) | 32.0 | 56.5 | | 14.5 | 39.0 | 39.0 | 40.0 | 40.0 | | 29.0 | | 29.0 |
| Total Split (%) | 22.9% | 40.4% | | 10.4% | 27.9% | 27.9% | 28.6% | 28.6% | | 20.7% | | 20.7% |
| Maximum Green (s) | 24.5 | 49.5 | | 7.0 | 32.0 | 32.0 | 32.5 | 32.5 | | 21.5 | | 21.5 |
| Yellow Time (s) | 4.0 | 5.0 | | 4.0 | 5.0 | 5.0 | 3.5 | 3.5 | | 3.5 | | 3.5 |
| All-Red Time (s) | 3.5 | 2.0 | | 3.5 | 2.0 | 2.0 | 4.0 | 4.0 | | 4.0 | | 4.0 |
| 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) | 7.5 | 7.0 | | 7.5 | 7.0 | 7.0 | 7.5 | 7.5 | | 7.5 | | 7.5 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | | | | | | |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | | 3.0 |
| Recall Mode | None | Min | | None | Min | Min | None | None | | None | | None |
| Walk Time (s) | | 12.0 | | | 12.0 | 12.0 | 8.0 | 8.0 | | 8.0 | | 8.0 |
| Flash Dont Walk (s) | | 14.0 | | | 14.0 | 14.0 | 23.0 | 23.0 | | 7.0 | | 7.0 |
| Pedestrian Calls (#/hr) | | 0 | | | 0 | 0 | 0 | 0 | | 10 | | 10 |
| Act Effect Green (s) | 24.5 | 55.6 | 135.5 | 7.0 | 32.0 | 32.0 | 27.8 | 27.8 | 135.5 | 21.5 | 21.5 | 135.5 |
| Actuated g/C Ratio | 0.18 | 0.41 | 1.00 | 0.05 | 0.24 | 0.24 | 0.21 | 0.21 | 1.00 | 0.16 | 0.16 | 1.00 |

1: 28 Street SE & Memorial Drive E
04-24-2024

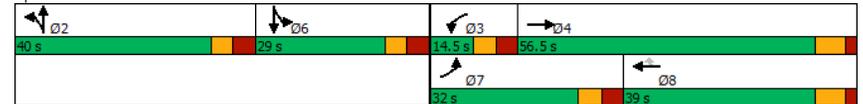
2039 After Development
PM Peak Hour

| | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|------------------------|--------|--------|-------|------|--------|-------|--------|-------|------|--------|--------|-------|
| v/c Ratio | 0.97 | 0.88 | 0.20 | 0.44 | 1.01 | 0.25 | 0.88 | 0.48 | 0.05 | 1.01 | 0.82 | 0.35 |
| Control Delay | 88.2 | 46.0 | 0.3 | 82.6 | 82.8 | 1.2 | 81.8 | 51.8 | 0.1 | 120.9 | 79.9 | 0.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 88.2 | 46.0 | 0.3 | 82.6 | 82.8 | 1.2 | 81.8 | 51.8 | 0.1 | 120.9 | 79.9 | 0.6 |
| LOS | F | D | A | F | F | A | F | D | A | F | E | A |
| Approach Delay | | 48.8 | | | 73.7 | | | 59.4 | | | | 45.5 |
| Approach LOS | | D | | | E | | | E | | | | D |
| Queue Length 50th (m) | 72.1 | ~154.3 | 0.0 | 9.1 | ~108.5 | 0.0 | 68.5 | 45.6 | 0.0 | ~69.7 | 66.5 | 0.0 |
| Queue Length 95th (m) | #111.9 | #194.9 | 0.0 | 21.1 | #142.1 | 0.0 | #110.3 | 70.2 | 0.0 | #128.6 | #115.8 | 0.0 |
| Internal Link Dist (m) | | 489.5 | | | 174.8 | | | 271.7 | | | | 166.7 |
| Turn Bay Length (m) | 75.0 | | 170.0 | 75.0 | | 140.0 | | | 30.0 | | | |
| Base Capacity (vph) | 500 | 1632 | 1523 | 73 | 958 | 509 | 332 | 440 | 1539 | 214 | 272 | 1523 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.97 | 0.88 | 0.20 | 0.44 | 1.01 | 0.25 | 0.75 | 0.41 | 0.05 | 1.01 | 0.82 | 0.35 |

Intersection Summary

| | |
|---|------------------|
| Area Type: | Other |
| Cycle Length: | 140 |
| Actuated Cycle Length: | 135.5 |
| Natural Cycle: | 140 |
| Control Type: | Semi Act-Uncoord |
| Maximum v/c Ratio: | 1.01 |
| Intersection Signal Delay: | 55.0 |
| Intersection LOS: | E |
| Intersection Capacity Utilization: | 97.9% |
| ICU Level of Service: | F |
| Analysis Period (min): | 15 |
| ~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles. | |
| # 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. | |

Splits and Phases: 1: 28 Street SE & Memorial Drive E



2: Radcliffe Drive SE & 28 Street SE
04-24-2024

2039 After Development
PM Peak Hour

| | ↖ | ↗ | ↙ | ↘ | ↕ | ↔ |
|-----------------------------------|-------|-------|------|----------------------|------|------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ↕ | ↕ | | ↕ | ↕ | |
| Sign Control | Stop | | | Stop | Stop | |
| Traffic Volume (vph) | 230 | 285 | 248 | 104 | 205 | 230 |
| Future Volume (vph) | 230 | 285 | 248 | 104 | 205 | 230 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 242 | 300 | 261 | 109 | 216 | 242 |
| Direction, Lane # | EB 1 | EB 2 | NB 1 | SB 1 | | |
| Volume Total (vph) | 242 | 300 | 370 | 458 | | |
| Volume Left (vph) | 242 | 0 | 261 | 0 | | |
| Volume Right (vph) | 0 | 300 | 0 | 242 | | |
| Hadj (s) | 0.50 | -0.68 | 0.15 | -0.28 | | |
| Departure Headway (s) | 7.4 | 6.2 | 6.4 | 5.8 | | |
| Degree Utilization, x | 0.50 | 0.51 | 0.65 | 0.74 | | |
| Capacity (veh/h) | 472 | 560 | 543 | 595 | | |
| Control Delay (s) | 16.2 | 14.3 | 20.5 | 23.4 | | |
| Approach Delay (s) | 15.1 | | 20.5 | 23.4 | | |
| Approach LOS | C | | C | C | | |
| Intersection Summary | | | | | | |
| Delay | 19.4 | | | | | |
| Level of Service | C | | | | | |
| Intersection Capacity Utilization | 69.7% | | | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | | | |

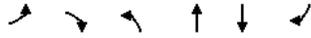
3: Radcliffe Drive SE & Site Access
04-24-2024

2039 After Development
PM Peak Hour

| | ↖ | ↗ | ↙ | ↘ | ↕ | ↔ |
|-----------------------------------|-------|------|------|----------------------|------|------|
| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
| Lane Configurations | ↕ | | | ↕ | ↕ | |
| Traffic Volume (veh/h) | 82 | 78 | 36 | 269 | 303 | 187 |
| Future Volume (Veh/h) | 82 | 78 | 36 | 269 | 303 | 187 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 86 | 82 | 38 | 283 | 319 | 197 |
| Pedestrians | 25 | | | 25 | 25 | |
| Lane Width (m) | 3.6 | | | 3.6 | 3.6 | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | 1.2 | |
| Percent Blockage | 2 | | | 2 | 2 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 826 | 468 | 541 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 826 | 468 | 541 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.2 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.3 | | | |
| p0 queue free % | 72 | 85 | 96 | | | |
| cM capacity (veh/h) | 312 | 565 | 963 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 168 | 321 | 516 | | | |
| Volume Left | 86 | 38 | 0 | | | |
| Volume Right | 82 | 0 | 197 | | | |
| cSH | 399 | 963 | 1700 | | | |
| Volume to Capacity | 0.42 | 0.04 | 0.30 | | | |
| Queue Length 95th (m) | 16.3 | 1.0 | 0.0 | | | |
| Control Delay (s) | 20.4 | 1.4 | 0.0 | | | |
| Lane LOS | C | A | | | | |
| Approach Delay (s) | 20.4 | 1.4 | 0.0 | | | |
| Approach LOS | C | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | 3.9 | | | | | |
| Intersection Capacity Utilization | 64.5% | | | ICU Level of Service | C | |
| Analysis Period (min) | 15 | | | | | |

4: 28 Street SE & 11 Avenue SE
04-24-2024

2039 After Development
PM Peak Hour



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|-----------------------------------|-------------|-------------|-------------|----------------------|------|------|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 8 | 44 | 56 | 289 | 375 | 13 |
| Future Volume (Veh/h) | 8 | 44 | 56 | 289 | 375 | 13 |
| Sign Control | Stop | | | Free | | Free |
| Grade | 0% | | | 0% | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 8 | 46 | 59 | 304 | 395 | 14 |
| Pedestrians | 22 | | | 22 | | |
| Lane Width (m) | 3.6 | | | 3.6 | | |
| Walking Speed (m/s) | 1.2 | | | 1.2 | | |
| Percent Blockage | 2 | | | 2 | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage (veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 868 | 424 | 431 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 868 | 424 | 431 | | | |
| tC, single (s) | 6.8 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.8 | 3.3 | 2.2 | | | |
| p0 queue free % | 97 | 93 | 95 | | | |
| cM capacity (veh/h) | 256 | 623 | 1108 | | | |
| Direction, Lane # | EB 1 | NB 1 | SB 1 | | | |
| Volume Total | 54 | 363 | 409 | | | |
| Volume Left | 8 | 59 | 0 | | | |
| Volume Right | 46 | 0 | 14 | | | |
| cSH | 514 | 1108 | 1700 | | | |
| Volume to Capacity | 0.11 | 0.05 | 0.24 | | | |
| Queue Length 95th (m) | 2.8 | 1.3 | 0.0 | | | |
| Control Delay (s) | 12.8 | 1.8 | 0.0 | | | |
| Lane LOS | B | A | | | | |
| Approach Delay (s) | 12.8 | 1.8 | 0.0 | | | |
| Approach LOS | B | | | | | |
| Intersection Summary | | | | | | |
| Average Delay | | | 1.6 | | | |
| Intersection Capacity Utilization | | | 53.3% | ICU Level of Service | A | |
| Analysis Period (min) | | | 15 | | | |

2039 AD PM
04-24-2024

2039 After Development
PM Peak Hour

Summary of All Intervals

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Start Time | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 | 6:57 |
| End Time | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 | 8:07 |
| Total Time (min) | 70 | 70 | 70 | 70 | 70 | 70 |
| Time Recorded (min) | 60 | 60 | 60 | 60 | 60 | 60 |
| # of Intervals | 2 | 2 | 2 | 2 | 2 | 2 |
| # of Recorded Intervals | 1 | 1 | 1 | 1 | 1 | 1 |
| Vehs Entered | 4906 | 5011 | 4914 | 4882 | 4883 | 4919 |
| Vehs Exited | 4902 | 5025 | 4936 | 4864 | 4886 | 4922 |
| Starting Vehs | 176 | 162 | 164 | 157 | 175 | 166 |
| Ending Vehs | 180 | 148 | 142 | 175 | 172 | 163 |
| Travel Distance (km) | 3568 | 3684 | 3627 | 3565 | 3589 | 3606 |
| Travel Time (hr) | 258.8 | 263.8 | 291.1 | 223.0 | 248.9 | 257.1 |
| Total Delay (hr) | 182.2 | 184.9 | 213.3 | 146.5 | 171.8 | 179.7 |
| Total Stops | 4661 | 4790 | 4674 | 4795 | 4716 | 4726 |
| Fuel Used (l) | 454.0 | 467.0 | 484.8 | 423.0 | 446.5 | 455.0 |

Interval #0 Information Seeding

| | |
|-------------------------------------|------|
| Start Time | 6:57 |
| End Time | 7:07 |
| Total Time (min) | 10 |
| Volumes adjusted by Growth Factors. | |
| No data recorded this interval. | |

Interval #1 Information Recording

| | |
|-------------------------------------|------|
| Start Time | 7:07 |
| End Time | 8:07 |
| Total Time (min) | 60 |
| Volumes adjusted by Growth Factors. | |

| Run Number | 1 | 2 | 3 | 4 | 5 | Avg |
|----------------------|-------|-------|-------|-------|-------|-------|
| Vehs Entered | 4906 | 5011 | 4914 | 4882 | 4883 | 4919 |
| Vehs Exited | 4902 | 5025 | 4936 | 4864 | 4886 | 4922 |
| Starting Vehs | 176 | 162 | 164 | 157 | 175 | 166 |
| Ending Vehs | 180 | 148 | 142 | 175 | 172 | 163 |
| Travel Distance (km) | 3568 | 3684 | 3627 | 3565 | 3589 | 3606 |
| Travel Time (hr) | 258.8 | 263.8 | 291.1 | 223.0 | 248.9 | 257.1 |
| Total Delay (hr) | 182.2 | 184.9 | 213.3 | 146.5 | 171.8 | 179.7 |
| Total Stops | 4661 | 4790 | 4674 | 4795 | 4716 | 4726 |
| Fuel Used (l) | 454.0 | 467.0 | 484.8 | 423.0 | 446.5 | 455.0 |

2039 AD PM
04-24-2024

2039 After Development
PM Peak Hour

Intersection: 2: Radcliffe Drive SE & 28 Street SE

| Movement | EB | EB | NB | B5 | SB |
|------------------------|-------|-------|------|-------|------|
| Directions Served | L | R | LT | T | TR |
| Maximum Queue (m) | 42.1 | 51.2 | 48.5 | 3.9 | 78.0 |
| Average Queue (m) | 20.4 | 24.6 | 25.5 | 0.1 | 33.8 |
| 95th Queue (m) | 35.1 | 43.9 | 41.2 | 1.7 | 59.7 |
| Link Distance (m) | 267.4 | 267.4 | 30.7 | 300.3 | 89.4 |
| Upstream Blk Time (%) | | | 6 | | 0 |
| Queueing Penalty (veh) | | | 20 | | 0 |
| Storage Bay Dist (m) | | | | | |
| Storage Blk Time (%) | | | | | |
| Queueing Penalty (veh) | | | | | |



City of Calgary - Traffic Signal Warrant Analysis

Main Street (name) **28 Street** Direction (EW or NS) **NS**
 Side Street (name) **Radcliffe Drive** Direction (EW or NS) **EW**
 Quadrant / Int # **SE** Comments **Existing**
 for Warrant Calculation Results, please hit 'Page Down'

Road Authority: **City of Calgary**
 City: **Calgary**
 Analysis Date: **2024 Feb 15, Thu**
 Count Date: **2024 Jan 30, Tue**
 Date Entry Format: (yyyy-mm-dd)

| Lane Configuration | Head LT | Th & LT | Through | Th-RT-UT | Th & RT | Rad RT | Left Turn Signalization | # of These Lanes |
|--------------------|---------|---------|---------|----------|---------|--------|-------------------------|------------------|
| 28 Street NB | | | | | | | | 0 |
| 28 Street SB | 1 | | | | | 1 | | 275 |
| Radcliffe Drive WB | | | | | | | | 0 |
| Radcliffe Drive EB | | 1 | | | | | | 0 |

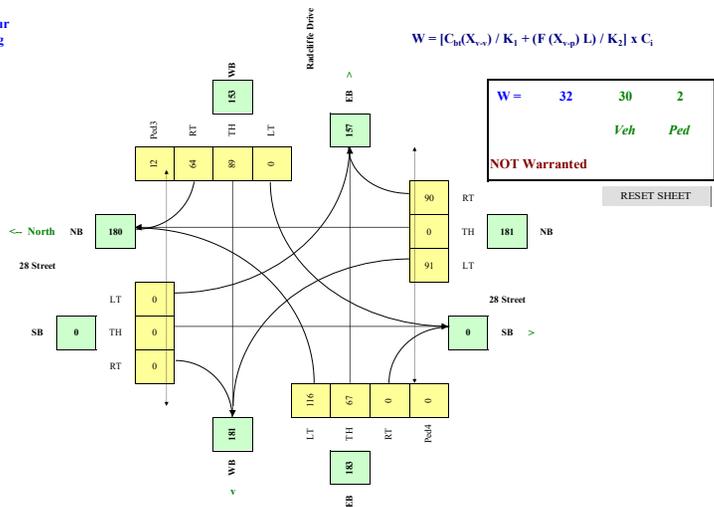
| Demographics | (y/n) | (y) |
|----------------------------------|-------|-----------|
| Elem. School Mobility Challenged | (y/n) | y |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | y |
| Metro Area Population (M) | (M) | 1,500,000 |
| Central Business District | (y/n) | n |

Are the Radcliffe Drive WB right turns significantly impeded by through movements? (y/n) **n**
 Are the Radcliffe Drive EB right turns significantly impeded by through movements? (y/n) **n**

| Other input | Speed (K/mh) | Track % | Th-RT Median (m) |
|--------------------|--------------|---------|------------------|
| 28 Street NS | 50 | 1.0% | y 4.5 |
| Radcliffe Drive EW | | 2.0% | v |

| Set Peak Hours | NB | | | | SB | | | | WB | | | | EB | | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|-----------------------|-----|----|-----|----|----|----|----|----|-----|-----|-----|-----|----|----|-----|--------|---------|---------|---------|---------|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | | | | |
| Existing (6-Hour) | 548 | | 538 | | | | | | 536 | 384 | 694 | 403 | | | 170 | 106 | 71 | | | |
| Total (6-hour peak) | 548 | 0 | 538 | 0 | 0 | 0 | 0 | 0 | 536 | 384 | 694 | 403 | 0 | 0 | 120 | 186 | 71 | 0 | 0 | |
| Average (6-hour peak) | 91 | 0 | 90 | 0 | 0 | 0 | 0 | 0 | 89 | 64 | 116 | 67 | 0 | 0 | 20 | 18 | 12 | 0 | 0 | |

Average 6-hour Peak Turning Movements



City of Calgary - Traffic Signal Warrant Analysis

Main Street (name) **28 Street** Direction (EW or NS) **NS**
 Side Street (name) **Radcliffe Drive** Direction (EW or NS) **EW**
 Quadrant / Int # **SE** Comments **Existing AD**
 for Warrant Calculation Results, please hit 'Page Down'

Road Authority: **City of Calgary**
 City: **Calgary**
 Analysis Date: **2024 Feb 15, Thu**
 Count Date: **2024 Jan 30, Tue**
 Date Entry Format: (yyyy-mm-dd)

| Lane Configuration | Head LT | Th & LT | Through | Th-RT-UT | Th & RT | Rad RT | Left Turn Signalization | # of These Lanes |
|--------------------|---------|---------|---------|----------|---------|--------|-------------------------|------------------|
| 28 Street NB | | | | | | | | 0 |
| 28 Street SB | 1 | | | | | 1 | | 275 |
| Radcliffe Drive WB | | | | | | | | 0 |
| Radcliffe Drive EB | | 1 | | | | | | 0 |

| Demographics | (y/n) | (y) |
|----------------------------------|-------|-----------|
| Elem. School Mobility Challenged | (y/n) | y |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | y |
| Metro Area Population (M) | (M) | 1,500,000 |
| Central Business District | (y/n) | n |

Are the Radcliffe Drive WB right turns significantly impeded by through movements? (y/n) **n**
 Are the Radcliffe Drive EB right turns significantly impeded by through movements? (y/n) **n**

| Other input | Speed (K/mh) | Track % | Th-RT Median (m) |
|--------------------|--------------|---------|------------------|
| 28 Street NS | 50 | 1.0% | y 4.5 |
| Radcliffe Drive EW | | 2.0% | v |

| Set Peak Hours | NB | | | | SB | | | | WB | | | | EB | | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|-----------------------|-----|----|-----|-----|----|----|----|----|-----|-----|-----|-----|----|----|-----|--------|---------|---------|---------|---------|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | | | | |
| Existing (6-Hour) | 548 | | 538 | | | | | | 536 | 384 | 694 | 403 | | | 170 | 106 | 71 | | | |
| (AM + PM) * 2.27 | | | 151 | | | | | | 174 | 174 | 270 | 8 | | | 114 | 114 | 114 | | | |
| Total (6-hour peak) | 0 | 0 | 0 | 548 | 0 | 0 | 0 | 0 | 710 | 384 | 964 | 411 | 0 | 0 | 234 | 220 | 185 | 0 | 0 | |
| Average (6-hour peak) | 0 | 0 | 0 | 91 | 0 | 0 | 0 | 0 | 118 | 64 | 161 | 69 | 0 | 0 | 39 | 37 | 31 | 0 | 0 | |

Average 6-hour Peak Turning Movements

