# AGENDA
## Council Meeting
**9:00 AM - Thursday, May 4, 2023**
**Council Chambers**

Page

**A. CALL TO ORDER**

**B. ADOPTION OF AGENDA**

**C. ADOPTION OF MINUTES**

4 - 11 1. **County Council Meeting Minutes**
Council Meeting - 20 Apr 2023 - Minutes

**D. SUBDIVISION APPLICATIONS**

12 - 23 1. **Subdivision Application #2022-0-187 – Nieboer - NW1/4 33-10-23-W4M**
Subdivision Application #2022-0-187 – Nieboer - NW1/4 33-10-23-W4M

24 - 35 2. **Subdivision Application #2023-0-023 – Green Haven Tree Farm - Parcel X, Plan 7156HS & Lot 1, Block 1, Plan 0213343 within SW1/4 2-9-21-W4M**
Subdivision Application #2023-0-023 – Green Haven Tree Farm - Parcel X, Plan 7156HS & Lot 1, Block 1, Plan 0213343 within SW1/4 2-9-21-W4M

36 - 44 3. **Subdivision Application #2023-0-025 – Variety Farms Inc. - Lot 1, Block 1, Plan 0010552 and SW1/4 26-11-23-W4M**
Subdivision Application #2023-0-025 – Variety Farms Inc. - Lot 1, Block 1, Plan 0010552 and SW1/4 26-11-23-W4M

45 - 53 4. **Subdivision Application #2023-0-037 – Vandenbroek - NE1/4 30-10-22-W4M**
Subdivision Application #2023-0-037 – Vandenbroek - NE1/4 30-10-22-W4M

54 - 64 5. **Subdivision Application #2023-0-038 – Neher/Hohlbein - Lot 8, Block 1, Plan 1712357 & Lot 11, Block 1, Plan 2111421 within N1/2 5-10-21-W4M**

Subdivision Application #2023-0-038 – Neher/Hohlbein - Lot 8, Block 1, Plan 1712357 & Lot 11, Block 1, Plan 2111421 within N1/2 5-10-21-W4M

## E. PUBLIC HEARINGS - 10:00 A.M.

65 - 701 1. **Bylaw 23-008 - Amendment to Bylaw 18-012 being the Chinook Industrial Park Area Structure Plan and Bylaw and Bylaw 23-009 - Land Use Bylaw Amendment from Lethbridge Urban Fringe To Rural General Industrial and Business Light Industrial - Public Hearing**

Bylaw 23-008 - Amendment to Bylaw 18-012 being the Chinook Industrial Park Area Structure Plan and Bylaw and Bylaw 23-009 - Land Use Bylaw Amendment from Lethbridge Urban Fringe To Rural General Industrial and Business Light Industrial - Public Hearing - Pdf

## F. DEPARTMENT REPORTS

### F.1. COMMUNITY SERVICES

702 - 704 F.1.1. **January-March 2023 Community Peace Officer Report.**

January-March 2023 Community Peace Officer Report

### F.2. MUNICIPAL SERVICES

705 - 707 F.2.1. **Proclamation of National Public Works Week - May 21 - 27, 2023**

Proclamation of National Public Works Week - May 21-27, 2023

### F.3. CORPORATE SERVICES

708 - 715 F.3.1. **Bylaw 23-017 Tax Mill Rate**

Bylaw 23-017 Tax Mill Rate

716 - 735 F.3.2. **Quarterly Financial Report - January - March 2023**

Quarterly Financial Report - January - March 2023

### F.4. INFRASTRUCTURE

### F.5. ADMINISTRATION

## G. CORRESPONDENCE

736 1. **Lethbridge-Coaldale 4-H Beef Club - 100th Anniversary Gala Invitation**

Lethbridge-Coaldale 4-H Beef Club - 100th Anniversary Gala Invitation

737 2. **Invitation to bid on the 2026 Alberta Winter and Summer Games**

Invitation to bid on the 2026 Alberta Winter and Summer Games

738 3. **Farming for Tomorrow - Lethbridge Exhibition & Agri-Food Hub Trade Center Commemorative Publication**
Farming For Tommorrow - Lethbridge Exhibition & Agri-Food Hub Trade Center Commemorative Publication

## H. NEW BUSINESS

## I. COUNTY COUNCIL AND COMMITTEE UPDATES

## J. CLOSED SESSION

## K. ADJOURN

# MINUTES
# Council Meeting

**9:00 AM - Thursday, April 20, 2023**
Council Chambers

The Council Meeting of Lethbridge County was called to order on Thursday, April 20, 2023, at 9:00 AM, in the Council Chambers, with the following members present:

**PRESENT:** Reeve Tory Campbell
Deputy Reeve John Kuerbis
Councillor Lorne Hickey
Councillor Mark Sayers
Councillor Eric Van Essen
Councillor Morris Zeinstra
Interim Chief Administrative Officer, Larry Randle
Director of Public Operations, Jeremy Wickson
Director of Infrastructure, Devon Thiele
Director of Finance & Administration, Jennifer Place
Supervisor of Planning & Development, Hilary Janzen
Executive Assistant, Candice Robison
Municipal Intern – Finance, Jeremy Vander Meulen

## A. CALL TO ORDER

Reeve Campbell called the meeting to order at 9:03 A.M.

Reeve Campbell thanked Staff and everyone involved in the CAO hiring process.

## B. ADOPTION OF AGENDA

The following items were added to the agenda:

I.5. - Closed Session - Water Discussion (FOIP Section 25 - Disclosure harmful to economic and other interests of a public body)

I.6. - Closed Session - Personnel Matter (FOIP Section 19 - Confidential Evaluations)

116-2023 Deputy Reeve Kuerbis MOVED that the April 20, 2023 Lethbridge County Council Meeting Agenda be adopted as amended.

CARRIED

## C. ADOPTION OF MINUTES

### C.1. *County Council Meeting Minutes*

117-2023 Councillor Van Essen MOVED that the April 6, 2023 Lethbridge County Council Minutes be adopted as presented.

CARRIED

Councillor Lorne Hickey arrived at the meeting at 9:16 A.M.

## F. DEPARTMENT REPORTS

### F.1. COMMUNITY SERVICES

#### F.1.1. *Planning and Development Department - 1st Quarter Report 2023*

The Interim Director of Community Services presented the Planning and Development Department - 1 st Quarter Report 2023.

## D. DELEGATIONS

### D.1. *9:15 a.m. - Phil McFarland - KPMG - 2022 Audited Financial Statements*

118-2023 Councillor Van Essen — MOVED that Council approved the Audited Financial Statements for the fiscal year ended December 31, 2022 as presented by KPMG LLP.

CARRIED

## F. DEPARTMENT REPORTS

### F.1. *COMMUNITY SERVICES*

#### F.1.2. *Industrial-Commercial Land Use Strategy*

119-2023 Councillor Van Essen — MOVED that County Council approves the Industrial-Commercial Land Use Strategy and directs administration to proceed with implementation of the Strategy.

CARRIED

#### F.1.3. *Bylaw 23-012 - Road Closure, Sale and Consolidation- First Reading*

120-2023 Councillor Hickey — MOVED that Bylaw 23-012 be read a first time.

CARRIED

#### F.1.4. *Proclamation of 'Economic Development Week' - May 8-12, 2023*

121-2023 Councillor Sayers — MOVED that Lethbridge County proclaim May 8-12, 2023 as 'Economic Development Week'.

CARRIED

### F.2. MUNICIPAL SERVICES

#### F.2.1. *Water Co-op Liaison Committee Bylaw and Terms of Reference*

122-2023 Councillor Van Essen — MOVED that Water Co-op Liaison Committee Bylaw No. 23-015 be read a first time.

CARRIED

123-2023 Deputy Reeve Kuerbis — MOVED that Water Co-op Liaison Committee Bylaw No. 23-015 be read a second time.

CARRIED

124-2023 Councillor Hickey — MOVED that third reading of Water Co-op Liaison Committee Bylaw No. 23-015 be considered.

CARRIED

125-2023 Deputy Reeve Kuerbis — MOVED that Water Co-op Liaison Committee Bylaw No. 23-015 be read a third time.

CARRIED

126-2023 Councillor Van Essen MOVED that Water Co-op Liaison Committee Terms of Reference be approved.

CARRIED

127-2023 Councillor Van Essen MOVED that Councillor Sayers, Councillor Kuerbis, and Councillor VanderVeen be appointed to the Water Co-op Liaison Committee.

CARRIED

Reeve Campbell recessed the meeting at 9:51 A.M.

Reeve Campbell reconvened the meeting at 10:00 A.M.

## E. PUBLIC HEARINGS - 10:00 A.M.

### E.1. *Bylaw 23-002 - Country Crossroads Estate Area Structure Plan and Bylaw 23-003 Land Use Bylaw Amendment (Rural Agriculture to Grouped Country Residential) - Public Hearing*

Reeve Campbell called a recess to the Council Meeting, for the Public Hearing for Bylaw 23-002 and Bylaw 23-003 at 10:00 A.M.

128-2023 Councillor Van Essen MOVED that the Public Hearing for Bylaw 23-002 and Bylaw 23-003 commence at 10:00 A.M.

CARRIED

The Interim Director of Community Services reviewed Bylaw 23-002 and Bylaw 23-003.

Reeve Campbell asked if anyone wished to speak in favour or opposition of Bylaw 23-002 and Bylaw 23-003.

Ray Martin of Martin Geomatics spoke in favour of the proposed bylaws on behalf of the applicant Jody Nakamura.

Jody Nakamura and Scott Sterr - applicants - spoke in favour of the bylaws due to the land not being agriculturally viable.

Warren Salberg spoke against the proposed bylaws for the following reasons: potable water, light industrial zoning setbacks, viable agriculture land, noise concerns, Range Road 20-5 concerns, water supply and table concerns, and drainage issues.

Conrad Walburger spoke in favour of the proposed bylaws as it keeps traffic close to Lethbridge.

Mark Heninger spoke against the proposed bylaws due to the proposed parcel size of the development and Range Road 20-5 concerns.

Floyd Joss spoke in favour of the proposed bylaw because the land is not viable farmland.

Kelsey Nadeau spoke against the proposed bylaws due to concerns about septic collection concerns.

Anita Salberg spoke against the proposed bylaws due to concerns about dust, noise, traffic increases, and privacy.

Rick Kille spoke against the proposed bylaws due to concerns about quality of life and the size of the development.

Ed Martin of Martin Geomatics spoke in favour of the proposed bylaws and noted that SMRID will be upgrading the water supply line to the area.

Moira Warnock spoke against the proposed bylaws with concerns about dust, noise, and quality of life.

Susan Whishaw spoke against the proposed bylaws.

Deb Richter spoke against the proposed bylaws with concerns about road usage and quality of life.

Lyndon Nakamura spoke in favour of the proposed bylaw due to the land not being viable agriculture land.

Reeve Campbell asked for any further comments in favour or opposition to the bylaws. No further comments were made.

129-2023 Councillor Sayers MOVED that the Public Hearing for Bylaw 23-002 and Bylaw 23-003 adjourn at 11:13 A.M.

CARRIED

Reeve Campbell reconvened the Council meeting at 11:13 A.M.

130-2023 Councillor Van Essen MOVED that Bylaw 23-002 (Country Crossroad Estate ASP) and Bylaw 23-003 (Land Use Bylaw Amendment - RA to GCR) be postponed to a future meeting for further information on availability of potable water, lot sizes that are currently listed at under 2 acres and sewage disposal on the size of the lots proposed.

CARRIED

Reeve Campbell recessed the meeting at 11:40 A.M.

Reeve Campbell reconvened the meeting at 11:45 A.M.

## D. DELEGATIONS

### D.1. *11:00 a.m. - James Oudshoorn*

131-2023 Deputy Reeve Kuerbis MOVED that Council direct Administration to investigate and liaison with other municipalities to determine what their normal course of events are in terms of crowd control and traffic control during protests.

CARRIED

## F. DEPARTMENT REPORTS

### F.3. ADMINISTRATION

#### F.3.1. *Donation Request - Courageous Companions*

Council reviewed the request from Courageous Companions.

### F.4. INFRASTRUCTURE

### F.5. CORPORATE SERVICES

## G. CORRESPONDENCE

### G.1. *Alberta Fire Fighters' Burn Camp for Children*

Council reviewed the correspondence from the Alberta Fire Fighters' Burn Camp for Children.

### G.2. *Alberta Association of Nurses - Nursing Week*

Council reviewed the correspondence from the Alberta Association of Nurses regarding Nursing Week from May 8 to 14.

## H. COUNTY COUNCIL AND COMMITTEE UPDATES

### H.1. *Lethbridge County Council Attendance Update - March 2023*

Council reviewed the highlights from the Lethbridge County Council Attendance Update for March 2023.

**Division 1**
**Councillor Lorne Hickey**

| | |
|---|---|
| March 1 | FCSS Meeting |
| March 2 | Lethbridge County Council Meeting |
| March 3 | CAO Search Meeting |
| March 6 | CAO Search Meeting |
| March 9 | Industrial Commercial Land Use Strategy Workshop |
| March 15 | Lethbridge County/City of Lethbridge IDP Meeting |
| March 16 | Lethbridge County Council Meeting |
| March 19-22 | RMA Spring Convention |
| March 22 | Green Acres Finance Meeting |
| March 28 | ASB Meeting |
| March 29 | Green Acres Board Meeting |
| March 31 | CAO Search Meeting |
| March 31 | Deputy Fire Chief Gettman Retirement Send-off |

**Division 2**
**Reeve Tory Campbell**

| | |
|---|---|
| March 1 | Virtual Meeting with CAO Search Firm |
| March 2 | Lethbridge County Council Meeting |
| March 2 | Rotary Scholarship Dinner |
| March 3 | CAO Search Meeting |
| March 3 | Mayors and Reeves |
| March 3 | Canada's Premier Food Corridor Meeting |
| March 6 | CAO Search Meeting |
| March 7 | Meeting re: Draft CAO Contract with Legal Advice |
| March 7 | Virtual RMA Meeting re: Unpaid Oil & Gas Taxes |
| March 7 | Media |
| March 8 | Exhibition Park Board Meeting |
| March 9 | Industrial Commercial Land Use Strategy Workshop |
| March 9 | "From the Field" Virtual Oldman Watershed Event |
| March 13 | CAO Search Meeting |
| March 14 | Exhibition Park Ottawa Trade Mission De-brief |
| March 15 | Lethbridge County/City of Lethbridge IDP Meeting |
| March 15 | EDL AGM |
| March 16 | Lethbridge County Council Meeting |
| March 17 | Safety Audit Interview |
| March 17 | Chinese Consul General Meeting |
| March 17 | Horsefly Regional Emergency Spillway Groundbreaking |
| March 20-22 | RMA Spring Convention |
| March 23 | Virtual Meeting with CAO Search Firm |
| March 27 | Bursary Voiceover Recording |
| March 28 | Highway 3 Infrastructure Virtual Meeting |

| | |
|---|---|
| March 28 | Virtual Meeting with CAO Search Firm |
| March 29 | Meeting with McCain Representatives |
| March 30 | Southern Alberta Economic Development Forum |
| March 31 | Virtual Meeting with CAO Search Firm & Council |
| March 31 | Deputy Fire Chief Gettman Retirement Send-off |

**Division 3**
**Councillor Mark Sayers**

| | |
|---|---|
| March 2 | Lethbridge County Council Meeting |
| March 3 | CAO Search Meeting |
| March 6 | CAO Search Meeting |
| March 11 | Coaldale Library Open House |
| March 19 | EOEP Course |
| March 19-22 | RMA Spring Convention |
| March 30 | Southern Alberta Economic Development Forum |
| March 31 | CAO Search Meeting |

**Division 4**
**Deputy Reeve John Kuerbis**

| | |
|---|---|
| March 2 | Lethbridge County Council Meeting |
| March 3 | CAO Search Meeting |
| March 6 | CAO Search Meeting |
| March 9 | Industrial Commercial Land Use Strategy Workshop |
| March 15 | Lethbridge County/City of Lethbridge IDP Meeting |
| March 15 | Lethbridge County/Town of Nobleford IDP Meeting |
| March 16 | Lethbridge County Council Meeting |
| March 20-22 | RMA Spring Convention |
| March 24 | Safety Audit Interview |
| March 28 | ASB Meeting |
| March 31 | CAO Search Meeting |

**Division 5**
**Councillor Eric Van Essen**

| | |
|---|---|
| March 2 | Lethbridge County Council Meeting |
| March 3 | CAO Search Meeting |
| March 6 | CAO Search Meeting |
| March 9 | Picture Butte Chamber of Commerce |
| March 9 | Industrial Commercial Land Use Strategy Workshop |
| March 15 | Lethbridge County/Town of Nobleford IDP Meeting |
| March 16 | Lethbridge County Council Meeting |
| March 20-22 | RMA Spring Convention |
| March 28 | ASB Meeting |
| March 31 | CAO Search Meeting |

**Division 6**
**Councillor Klaas VanderVeen**

| | |
|---|---|
| March 2 | Lethbridge County Council Meeting |
| March 3 | CAO Search Meeting |
| March 6 | CAO Search Meeting |
| March 16 | Lethbridge County Council Meeting |
| March 19-22 | RMA Spring Convention |
| March 20 | EOEP Course |
| March 24 | SAEWA Meeting |
| March 28 | ASB Meeting |
| March 30 | Southern Alberta Economic Development Forum |
| March 31 | CAO Search Meeting |

**Division 7**
**Councillor Morris Zeinstra**

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|---|---|
| March 2 | Lethbridge County Council Meeting |

| | |
|---|---|
| March 3 | CAO Search Meeting |
| March 6 | CAO Search Meeting |
| March 8 | Prairie Tractor Annual Meeting |
| March 9 | Industrial Commercial Land Use Strategy Workshop |
| March 16 | Lethbridge County Council Meeting |
| March 19-22 | RMA Spring Convention |
| March 31 | CAO Search Meeting |

Reeve Campbell recessed the meeting at 12:36 P.M.

Reeve Campbell reconvened the meeting at 1:05 P.M.

## I. CLOSED SESSION

***I.1. - Agricultural Services Board Remuneration Discussion (FOIP Section 24 - Advice from Officials)***

***I.2. - Waterline Installation Borrowing Bylaw 23-016 (FOIP Section 25 - Disclosure harmful to economic and other interests of a public body)***

***I.3. - Road Closure Compensation Discussion (FOIP Section 25 - Disclosure harmful to economic and other interest of a public body)***

***I.4. - Drainage Discussion (FOIP Section 16 - Disclosure harmful to business interests of a third party)***

***I.5. - Closed Session - Water Discussion (FOIP Section 25 - Disclosure harmful to economic and other interests of a public body)***

***I.6. - Closed Session - Personnel Matter (FOIP Section 19 - Confidential Evaluations)***

132-2023 Deputy Reeve Kuerbis MOVED that the Lethbridge County Council Meeting move into Closed Session, pursuant to Section 197 of the Municipal Government Act, the time being 1:05 P.M. for the discussion on the following:

I.1. - Agricultural Services Board Remuneration Discussion (FOIP Section 24 - Advice from Officials)

I.2. - Waterline Installation Borrowing Bylaw 23-016 (FOIP Section 25 - Disclosure harmful to economic and other interests of a public body)

I.3. - Road Closure Compensation Discussion (FOIP Section 25 - Disclosure harmful to economic and other interest of a public body)

I.4. - Drainage Discussion (FOIP Section 16 - Disclosure harmful to business interests of a third party)

I.5. - Closed Session - Water Discussion (FOIP Section 25 - Disclosure harmful to economic and other interests of a public body)

I.6. - Closed Session - Personnel Matter (FOIP Section 19 - Confidential Evaluations)

Present during the Closed Session:
Lethbridge County Council
Chief Administrative Officer
Senior Management
Administrative Staff
CARRIED

133-2023 MOVED that the Lethbridge County Council Meeting move out of the closed session at 2:19 p.m.

CARRIED

**I.2.** ***Waterline Installation Borrowing Bylaw 23-016 (FOIP Section 25 - Disclosure harmful to economic and other interests of a public body)***

134-2023 Councillor Sayers MOVED that Water Pipeline Purchase Borrowing Bylaw No. 23-016 in the amount of $6,000,000 be read a first time.

CARRIED

**I.4.** ***Drainage Discussion (FOIP Section 16 - Disclosure harmful to business interests of a third party)***

135-2023 Councillor Van Essen MOVED that Administration discuss drainage infrastructure with LNID.

CARRIED

**I.5.** ***Water Discussion (FOIP Section 25 - Disclosure harmful to economic and other interests of a public body.)***

136-2023 Councillor Hickey MOVED that Council authorize Administration to purchase up to 40 acre-feet of Water License to be funded from the Commercial Industrial Land Reserve.

CARRIED

**J. NEW BUSINESS**

**K. ADJOURN**

137-2023 Deputy Reeve Kuerbis MOVED that the Lethbridge County Council Meeting adjourn at 2:22 P.M.

CARRIED

_____

Reeve

_____

CAO

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Subdivision Application #2022-0-187 – Nieboer - NW1/4 33-10-23-W4M |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | ORRSC |
| **Report Author:** | Steve Harty |

**APPROVAL(S):**

| | |
|---|---|
| Hilary Janzen, Supervisor of Planning & Development | Approved - 20 Apr 2023 |
| Larry Randle, Interim Chief Administrative Officer | Approved - 21 Apr 2023 |

**STRATEGIC ALIGNMENT:**

| Governance | Relationships | Region | Prosperity |
|---|---|---|---|
| ☐ | ☐ | ☐ | ☒ |

**EXECUTIVE SUMMARY:**

The proposal is to reconfigure the layout/location of an existing 6.0-acre county residential use parcel through subdivision and consolidation, by realigning the rectangular 6.0-acre title boundary with the adjacent agricultural title. The proposal meets the subdivision criteria of the Land Use Bylaw.

**RECOMMENDATION:**

That S.D. Application #2022-0-187 be approved subject to the conditions as outlined in the draft resolution.

**REASON(S) FOR RECOMMENDATION(S):**

The proposed subdivision meets the provincial Subdivision and Development Regulations, the municipal subdivision policies as stated in the Land Use Bylaw and brings the private sewage system into compliance.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

- LUB No. 1404 contains policies that enable the subdivision and consolidation of land in consideration of a reconfiguration of titles, with no additional titles being created above what presently exist. A separate standalone title is not being created but it is being relocated and reconfigured within the ¼-section.
- The realigned country residential title parcel size will not change from its' existing 6.0-acres, and it still complies with the size requirements of the bylaw as established by Council. The resulting adjusted agricultural parcel title also complies.
- The land is situated within the Intermunicipal Development Plan with the Town of Nobleford and the reconfiguration is allowed and does not contravene any IDP policies.

- Private septic systems are required to be entirely contained within property boundaries and this reconfiguration will rectify an encroachment issue of the septic system and bring it into compliance.
- The original yard title was subdivided out back in 1910 prior to any municipal subdivision policies or bylaws.

**BACKGROUND INFORMATION:**

Located approximately 1000m southwest of the Town of Nobleford boundary on the old Highway 23 road (Rge Rd 23-4), approximately ½-mile south of Highway 519. The proposal is to accommodate a land swap and property line adjustment between the county residential title and the adjacent agricultural title.

The main purpose is to realign the boundaries and orientation of the acreage to relocate it more north and to capture the dwelling's private on-site sewer septic field system that encroaches over the yard's east property line and include it on the residential title to bring the system into compliance. Additionally, the proposal will reconfigure the county residential acreage layout and return the south 2.44-acre portion of undeveloped land to the adjacent agricultural title. The surveyor's sketch indicates all the buildings and structures (dwelling, garage, and sheds) meet the bylaw setback requirements and there are no other encroachments. There are no abandoned wells located in proximity to this proposal or identified historical resources.

Overall, the proposal meets the subdivision criteria of the County's Land Use Bylaw No. 1404 for a reconfiguration/realignment of titles or boundaries. The application was circulated to the required external agencies with no concerns expressed and no utility easements are requested. Alberta Transportation has no objections. (The Town of Nobleford has not responded.)

**ALTERNATIVES / PROS / CONS:**

The Subdivision Authority could decide to not approve if it is determined the proposed realignment is not suitable and the titles would remain as is.

Pros:

- there are no advantages to denying the subdivision as it meets the subdivision criteria

Cons:

- the septic system encroachment problem would not be rectified, and the decision would likely be appealed as the County's subdivision criteria have been met

**FINANCIAL IMPACT:**

None.

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

5A 2022-0-187 Lethbridge County APPROVAL
2022-0-187 Regional Location (1)
2022-0-187 Subd Sketch 1-5000 EXISTING (1)
2022-0-187 Subd Sketch 1-5000 (1)
2022-0-187 Subd Sketch 1-5000 (Photo)

22-15858T (Revised)

# RESOLUTION

2022-0-187

**Lethbridge County** **Country Residential** subdivision of NW1/4 33-10-23-W4M

THAT the Country Residential subdivision of NW1/4 33-10-23-W4M (Certificate of Title No. 091 044 920, 221 069 363), to reconfigure the layout (property boundary) and title size of an existing parcel through subdivision and consolidation, by realigning/relocating a rectangular 6.0-acre (2.43 ha) title boundary with the adjacent agricultural title, for county residential use; BE APPROVED subject to the following:

**CONDITIONS:**

1. That, pursuant to Section 654(1)(d) of the Municipal Government Act, all outstanding property taxes shall be paid to Lethbridge County.
2. That, pursuant to Section 655(1)(b) of the Municipal Government Act, the applicant or owner or both enter into and comply with a Development Agreement with Lethbridge County which shall be registered concurrently with the final plan against the title(s) being created.
3. That the applicant submits a surveyed plan as prepared by an Alberta Land Surveyor that certifies the exact location and dimensions of the 6.0-acre parcel being reconfigured. The titles and portions of land to be subdivided and consolidated to reconfigure the boundaries (property line) of the two adjacent parcels, are to be done by a plan prepared by a certified Alberta Land Surveyor in a manner such that the resulting titles cannot be further subdivided without approval of the Subdivision Authority.

**REASONS:**

1. The proposed subdivision is consistent with the South Saskatchewan Regional Plan and complies with both the Municipal Development Plan and Land Use Bylaw.
2. The Subdivision Authority is satisfied that the proposed subdivision reconfiguration is suitable for the purpose for which the subdivision is intended pursuant to Section 9 of the Matters Related to Subdivision and Development Regulation.
3. The Subdivision Authority has determined the proposal meets the criteria of the bylaw for a property reconfiguration/property line adjustment, with no additional titles being created above what presently exist, as separate standalone titles are not being created, but the land being subdivided and consolidated is between existing titles.
4. The Subdivision Authority is satisfied the reconfiguration of boundaries is in conformity to the policies of the IDP with the Town of Nobleford and no objections have been received from the Town, or Alberta Transportation due to the proximity of Highway 519.

**INFORMATIVE:**

(a) Since the proposed subdivision is for a property line adjustment, it complies with Section 663 of the Municipal Government Act, and Reserve is not required.

(b) That a legal description for the proposed parcel be approved by the Surveys Branch, Land Titles Office, Calgary.

(c) The applicant/owner is advised that other municipal, provincial or federal government or agency approvals may be required as they relate to the subdivision and the applicant/owner is responsible for verifying and obtaining any other approval, permit, authorization, consent or license that may be required to subdivide, develop and/or service the affected land (this may include but is not limited to Alberta Environment and Protected Areas, Alberta Transportation, and the Department of Fisheries and Oceans.)

(d) Telus Communications Inc has no objection.

(e) Thank you for contacting FortisAlberta regarding the above application for subdivision. We have reviewed the plan and determined that no easement is required by FortisAlberta.

FortisAlberta is the Distribution Wire Service Provider for this area. The developer can arrange installation of electrical services for this subdivision through FortisAlberta. Please have the developer contact 310-WIRE (310-9473) to make application for electrical services.

Please contact FortisAlberta land services at landserv@fortisalberta.com or by calling (403) 514-4783 for any questions.

(f) ATCO Gas has no objection.

(g) Alberta Health Services has no objection.

(h) Alberta Transportation – Leah Olsen, Development/Planning Technologist:

"This will acknowledge receipt of your circulation regarding the above noted proposal. The subdivision application would be subject to the requirements of Sections 18 and 19 of the Matters Related to Subdivision and Development Regulation (The Regulation), due to the proximity of Highway(s) 519, 23

Transportation and Economic Corridors offers the following comments with respect to this application:

The requirements of Section 18 of the Regulation are not met. The department anticipates minimal impact on the highway from this proposal. Pursuant to Section 20(1) of the Regulation, Transportation and Economic Corridors grants approval for the subdivision authority to vary the requirements of Section 18 of the Regulation.

The requirements of Section 19 of the Regulation are not met. There is no direct access to the highway and there is sufficient local road access to the subdivision and adjacent lands. Pursuant to Section 20(1) of the Regulation, Transportation and Economic Corridors grants approval for the subdivision authority to vary the requirements of Section 19 of the Regulation.

Transportation and Economic Corridors has the following additional comments and/or requirements with respect to this proposal:

1. The department expects that the municipality will mitigate the impacts of traffic generated by developments approved on the local road connections to the highway system, pursuant to Policy 7 of the Provincial Land Use Policies and Section 618.4 of the Municipal Government Act

(i) Canada Post has no comment.

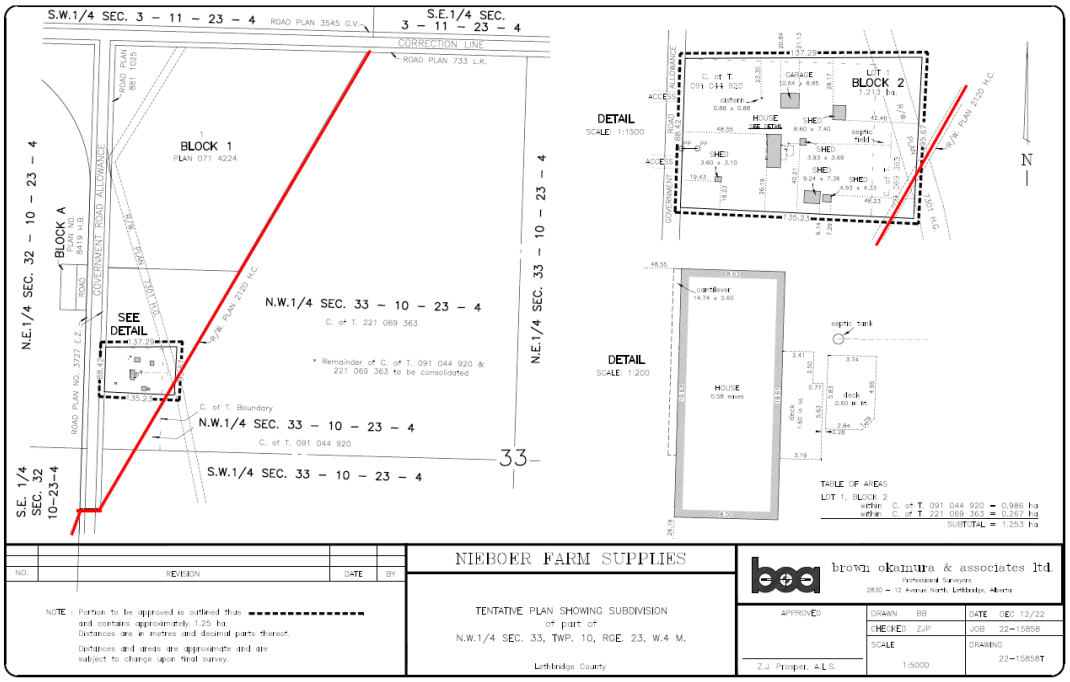
(j) ATCO Transmission – Isabel Solis-Jarek, Sr. Administrative Coordinator, Operations Engineering:

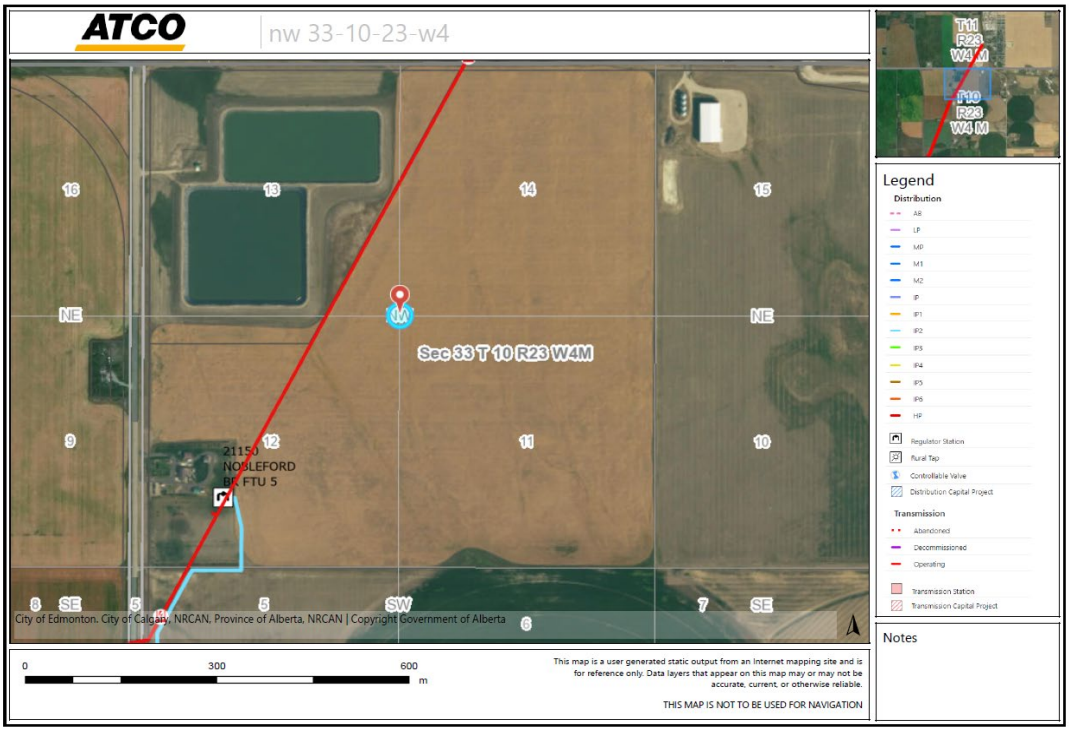
"The Engineering Department of ATCO Transmission, (a division of ATCO Gas and Pipelines Ltd.) has reviewed the above named plan and has no objections subject to the following conditions:

1. Any existing land rights shall be carried forward in kind and registered on any newly created lots, public utility lots, or other properties.
2. Ground disturbances and surface works within 30 meters require prior written approval from ATCO Transmission before commencing any work.
    - Municipal circulation file number must be referenced; proposed works must be compliant with ATCO Transmission requirements as set forth in the company's conditional approval letter.
    - Contact ATCO Transmission Land Department at 1-888-420-3464 or landadmin@atco.com for more information.

3. Road crossings are subject to Engineering review and approval.
    - Road crossing(s) must be paved and cross at a perpendicular angle.
    - Road crossing(s) must not be over any pipeline bend.
    - Parallel roads are not permitted within ATCO Transmission right(s)-of-way.
    - If the road crossing(s) requires a pipeline alteration, the cost will be borne by the developer/owner and can take up to 18 months to complete.
4. Parking and/or storage is not permitted on ATCO Transmission facility(s) and/or right(s)-of-way.
5. Encroachments are not permitted on ATCO Transmission facility(s) and/or right(s)-of-way.
6. ATCO Transmission recommends a minimum 15 meter setback from the centerline of the pipeline(s) to any buildings.
7. Any changes to grading that alter drainage affecting ATCO Transmission right-of-way or facilities must be adequate to allow for ongoing access and maintenance activities.
    - If alterations are required, the cost will be borne by the developer/owner.
8. Any revisions or amendments to the proposed plans(s) must be re-circulated to ATCO Transmission for further review.

If you have any questions or concerns, please contact the undersigned at hp.circulations@atco.com."



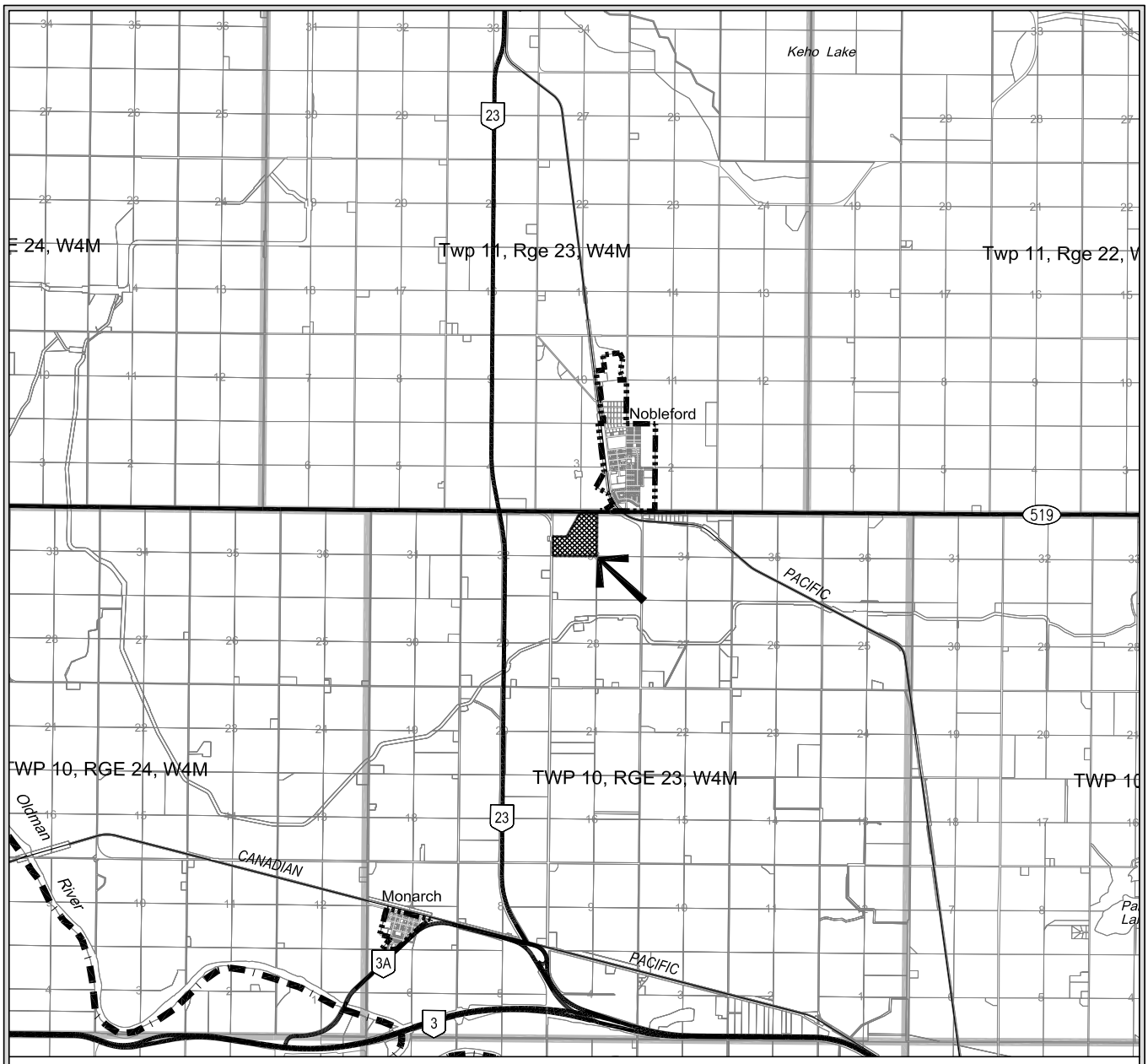



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MOVER REEVE

_____

DATE

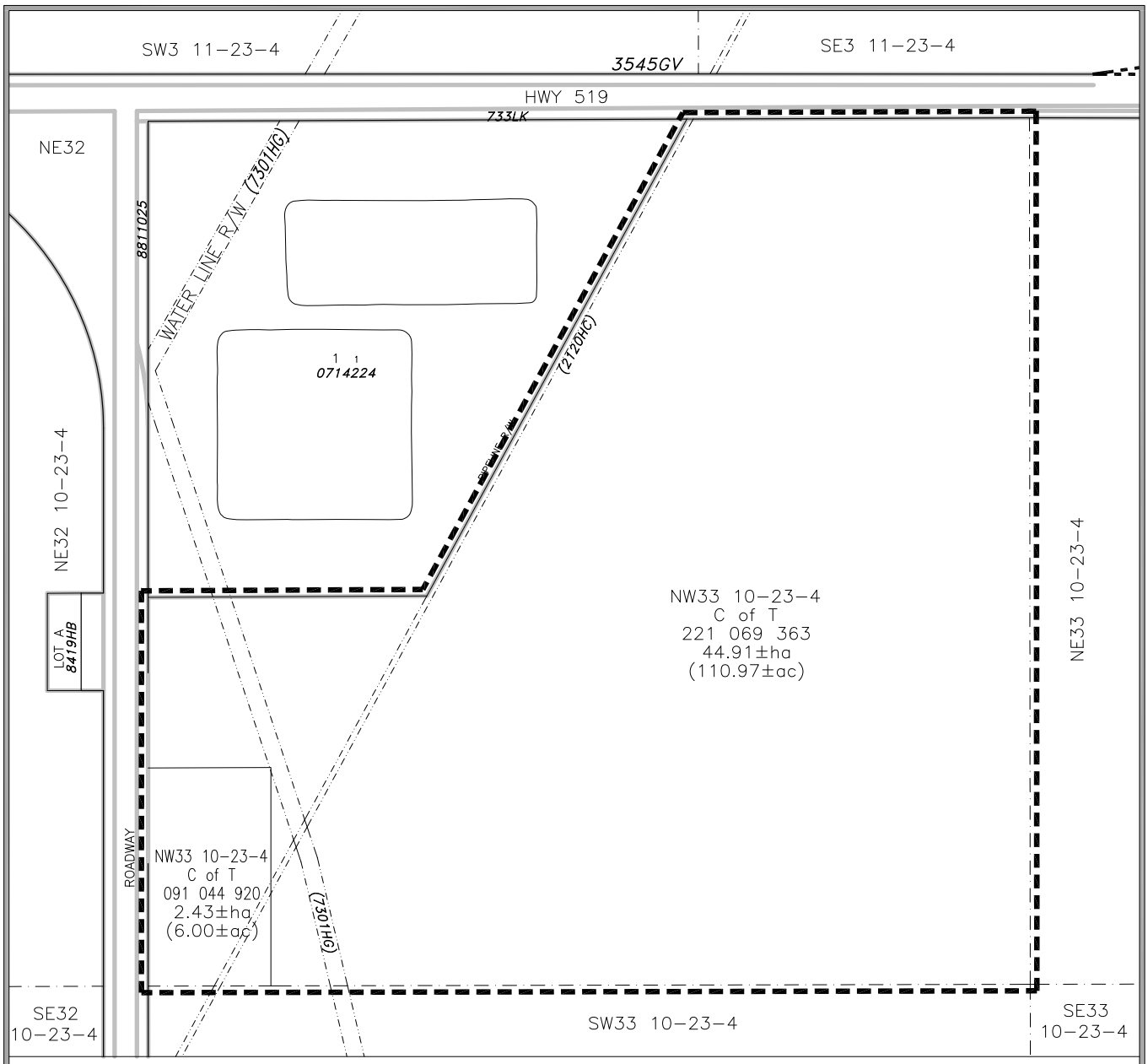



SUBDIVISION LOCATION SKETCH
WITHIN NW 1/4 SEC 33, TWP 10, RGE 23, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 14, 2023
FILE No: 2022-0-187

MAP PREPARED BY:
OLDMAN RIVER REGIONAL SERVICES COMMISSION
3105 16th AVENUE NORTH, LETHBRIDGE, AB T1H 5E8
"NOT RESPONSIBLE FOR ERRORS OR OMISSIONS"

OLDMAN RIVER REGIONAL SERVICES COMMISSION

March 15, 2023 N:\Subdivision\2022\2022-0-187.dwg

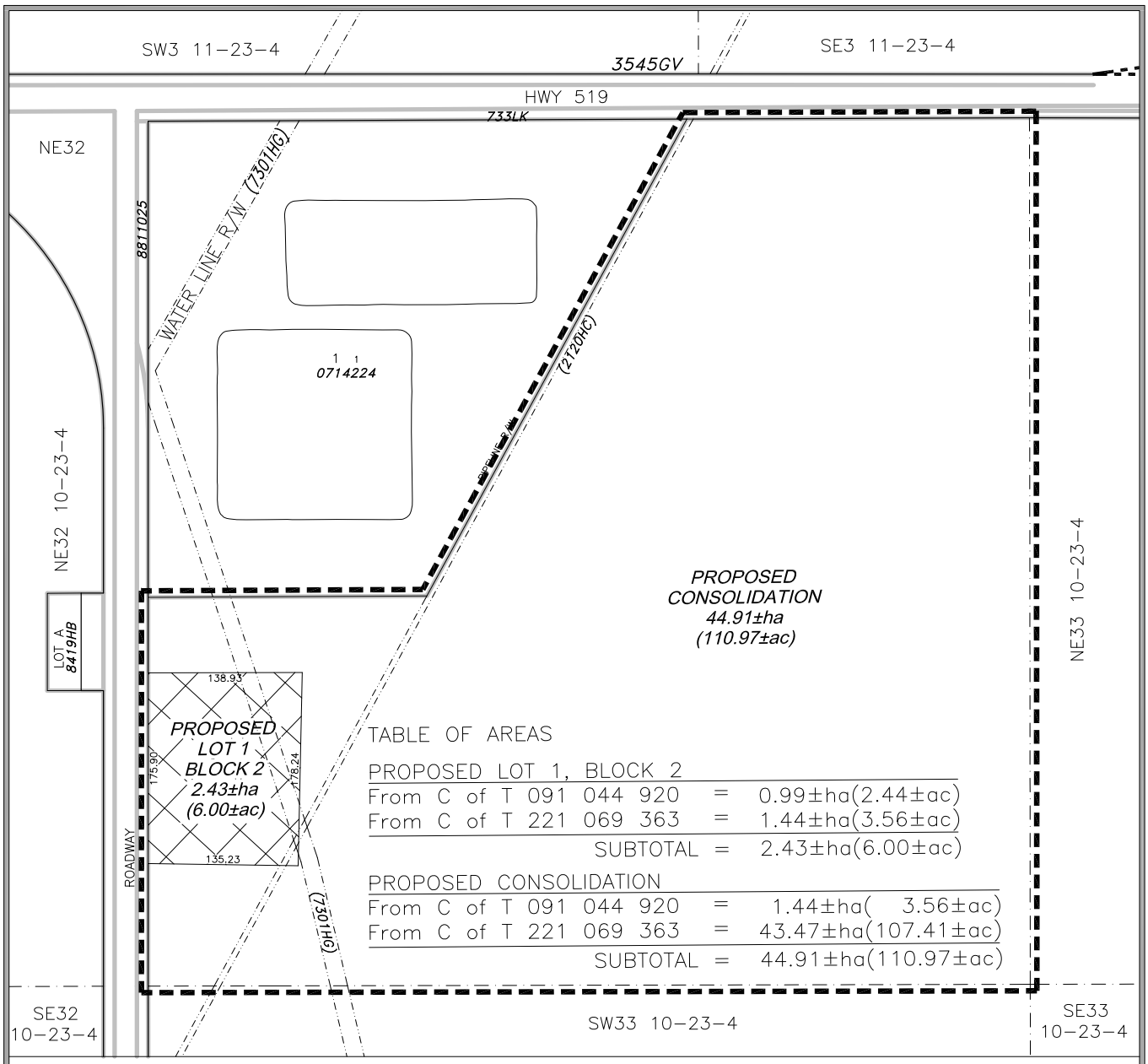



SUBDIVISION SKETCH - **EXISTING**
WITHIN NW 1/4 SEC 33, TWP 10, RGE 23, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 14, 2023
FILE No: 2022-0-187

OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

March 15, 2023 N:\Subdivision\2022\2022-0-187.dwg



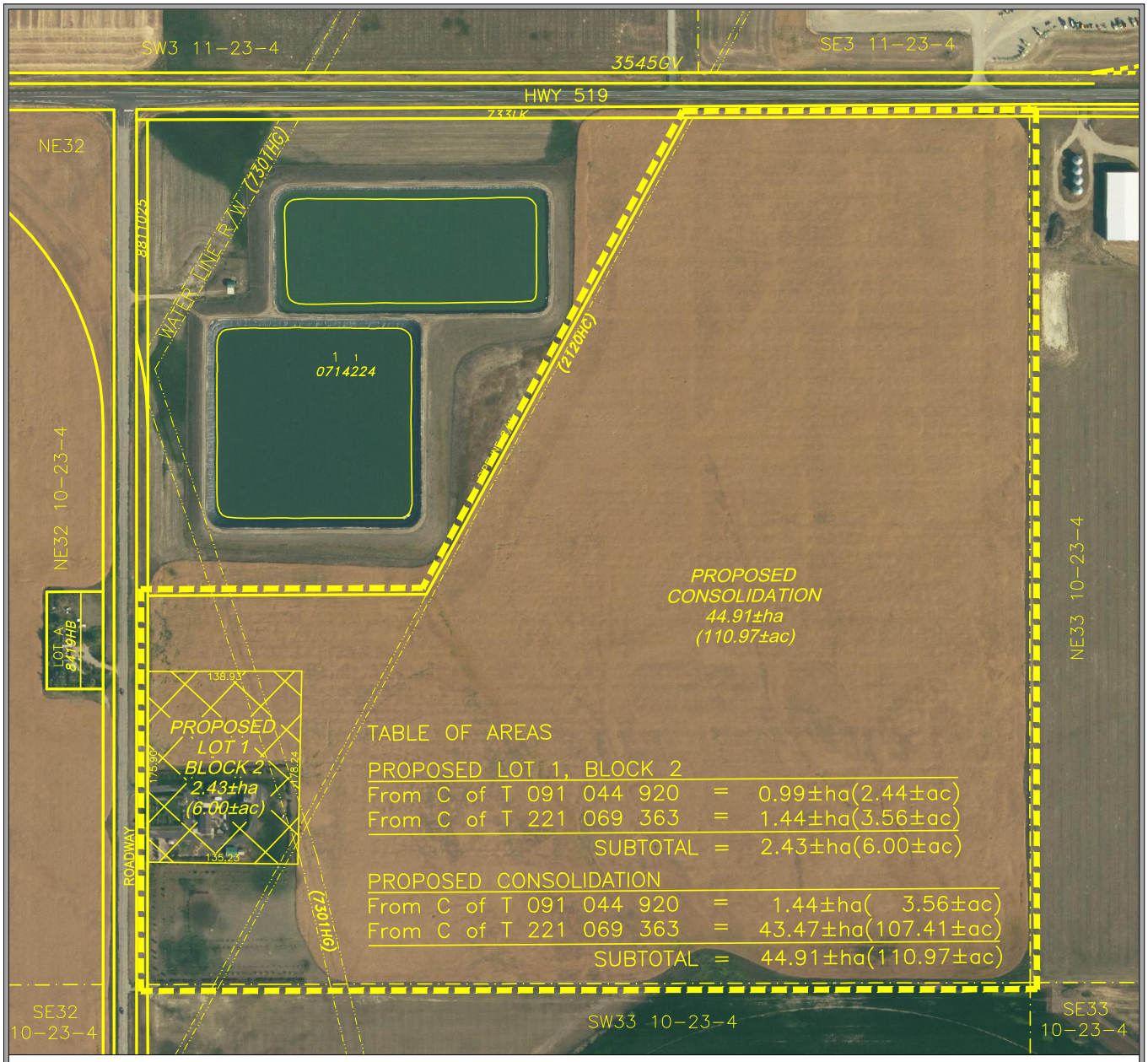

SUBDIVISION SKETCH - **PROPOSED**
WITHIN NW 1/4 SEC 33, TWP 10, RGE 23, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 14, 2023
FILE No: 2022-0-187

OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

N

March 15, 2023 N:\Subdivision\2022\2022-0-187.dwg



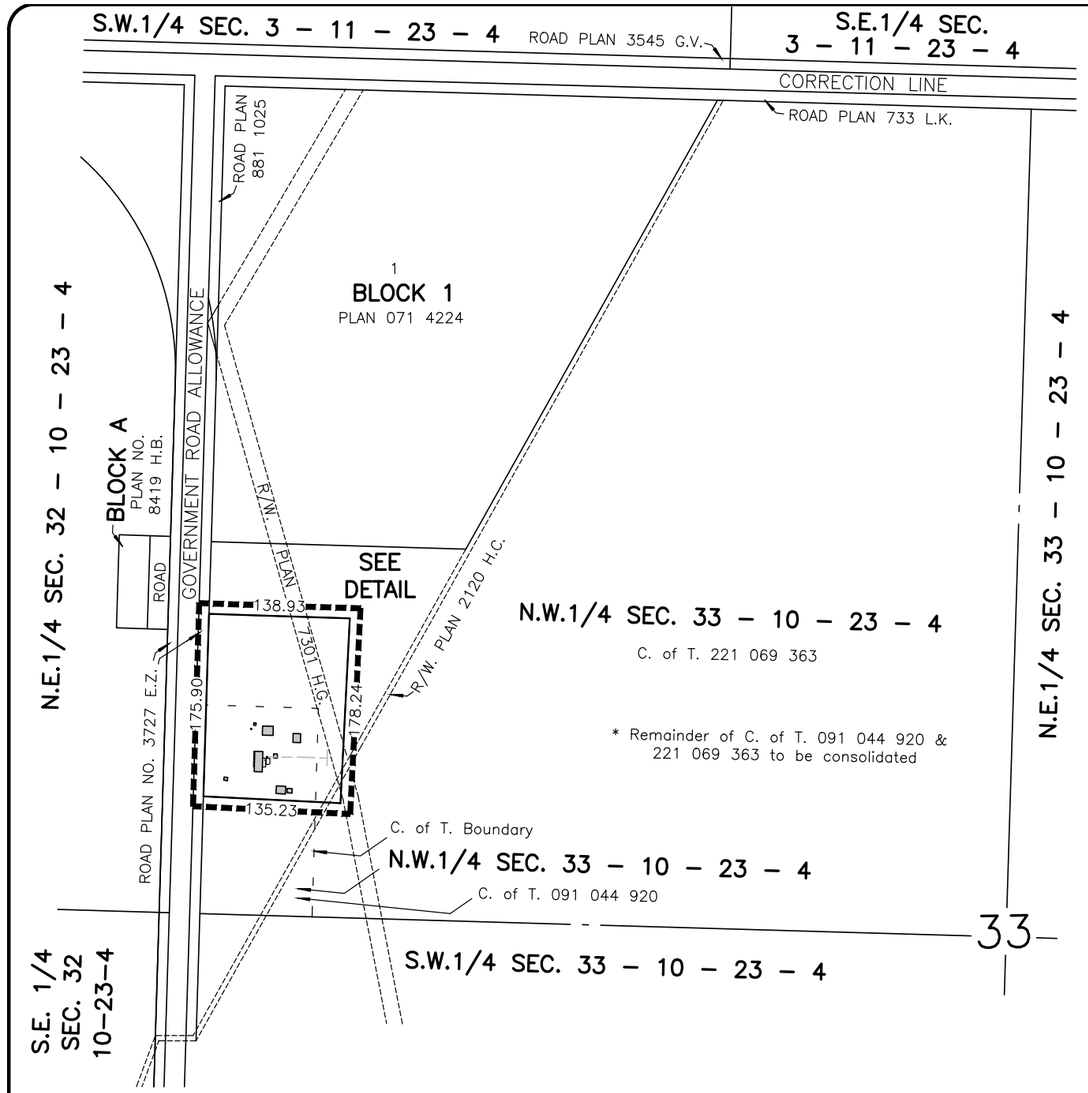

SUBDIVISION SKETCH - **PROPOSED**
WITHIN NW 1/4 SEC 33, TWP 10, RGE 23, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 14, 2023
FILE No: 2022-0-187

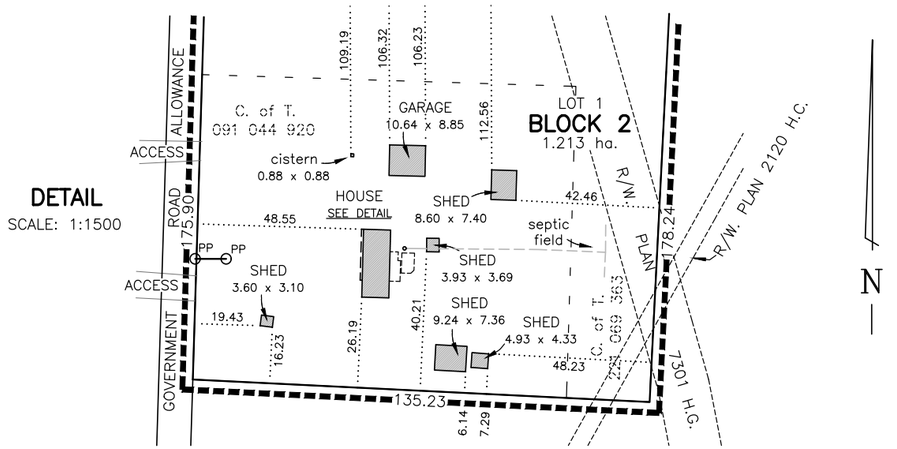
OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

March 15, 2023 N:\Subdivision\2022\2022-0-187.dwg

***AERIAL PHOTO DATE: 2021***



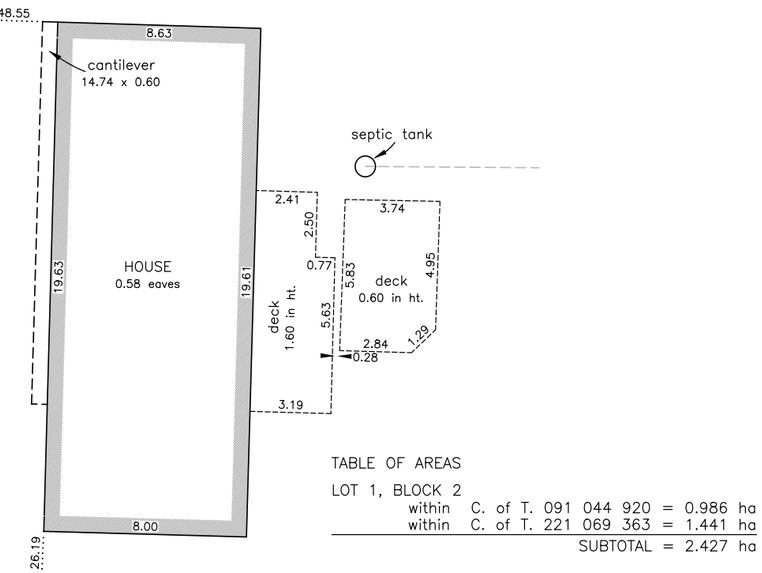




TABLE OF AREAS

LOT 1, BLOCK 2

| | | |
|---|---|---|
| within | C. of T. 091 044 920 | = 0.986 ha |
| within | C. of T. 221 069 363 | = 1.441 ha |
| | SUBTOTAL | = 2.427 ha |

| NO. | REVISION | DATE | BY |
|---|---|---|---|
| 1 | REVISE ACREAGE BOUNDARIES | FEB 3/23 | BB |

NOTE : Portion to be approved is outlined thus ▬▬▬▬▬▬▬▬
and contains approximately 2.43 ha.
Distances are in metres and decimal parts thereof.

Distances and areas are approximate and are subject to change upon final survey.

# NIEBOER FARM SUPPLIES

TENTATIVE PLAN SHOWING SUBDIVISION
of part of
N.W.1/4 SEC. 33, TWP. 10, RGE. 23, W.4 M.

Lethbridge County

brown okamura & associates ltd.
Professional Surveyors
2830 – 12 Avenue North, Lethbridge, Alberta

| | | |
|---|---|---|
| APPROVED | DRAWN BB | DATE DEC 12/22 |
| | CHECKED ZJP | JOB 22–15858 |
| Z.J. Prosper, A.L.S. | SCALE 1:5000 | DRAWING 22–15858T |

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Subdivision Application #2023-0-023 – Green Haven Tree Farm<br>- Parcel X, Plan 7156HS & Lot 1, Block 1, Plan 0213343 within SW1/4 2-9-21-W4M |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | ORRSC |
| **Report Author:** | Steve Harty |

**APPROVAL(S):**

| | |
|---|---|
| Hilary Janzen, Supervisor of Planning & Development | Approved - 20 Apr 2023 |
| Larry Randle, Interim Chief Administrative Officer | Approved - 21 Apr 2023 |

**STRATEGIC ALIGNMENT:**



**Governance** ☐ **Relationships** ☐ **Region** ☐ **Prosperity** ☒

**EXECUTIVE SUMMARY:**

The application is to enable a property line adjustment and parcel size adjustment of two adjacent parcels resulting in a 1.30-acre country residential title being enlarged to 2.17-acres, and secondly, to subdivide the adjacent commercial parcel by creating a new 6.37-acre vacant title and a remnant 7.90-acre title for commercial use. The proposal meets the subdivision criteria of the Land Use Bylaw.

**RECOMMENDATION:**

That S.D. Application #2023-0-023 be approved subject to the conditions as outlined in the draft resolution.

**REASON(S) FOR RECOMMENDATION(S):**

The proposed subdivision meets the provincial Subdivision and Development Regulations, the IDP with the City of Lethbridge, and both the municipal resplit and reconfiguration of title subdivision policies as stated in the Land Use Bylaw.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

- The subdivision policies are within LUB No. 1404 which allows the resplit (resubdivision) of commercial titles 20-acres or less in size, applicable to the 14.27-acre title.
- The LUB No. 1404 reconfiguration of titles policy enables land boundaries to be realigned based on factors such as the improvements present, land use, and the rationale of the land swap with consideration for final parcel sizes.
- The current subdivision criteria stipulate a minimum 2.00-acre lot size, and the enlarged new 2.17-acre lot size will now comply with this.

- This land is situated within the IDP area with the City of Lethbridge. A reconfiguration/property line adjustment and a resplit of a title 20-acres or less in size conforms to the IDP policies.

**BACKGROUND INFORMATION:**

Located immediately east of the City of Lethbridge boundary and the Research Station, adjacent to Highway 3 and 400 m north of Highway 512. The title owners (Green Haven Tree Farm Ltd.) are proposing to rearrange their title holdings and parcel layouts.

The first part of the proposal is to realign the boundary/size of the owner's residential property at the south end. The intent is to better delineate the property line between the yard and the greenhouse business and to remedy an encroachment issue (one greenhouse building is located over onto the residential title). The adjusted parcel size will also bring it into conformity with the bylaw's minimum 2.0-acre parcel size for country residential use. The second component is to reduce the size of the commercial greenhouse portion by subdividing out a 6.37-acre vacant parcel on the north end. This is an area of land not required for the greenhouse operations. An existing dugout on the northwest corner will remain as part of the greenhouse title. There is a septic field associated with the greenhouse in the very southeast corner of the proposed new parcel that will be decommissioned and relocated for the business. There is also a manufactured home dwelling south of the dugout that is intended to be removed from the property and the dwellings' septic field will also be decommissioned. Access to the greenhouse lot will remain unchanged from the west municipal road (Rge Rd 21-2), while access to the 6.37-acre lot will come from the north service road adjacent to Highway 3.

Overall, the proposal meets the criteria of the County's Land Use Bylaw No. 1404 for a reconfiguration/realignment of boundaries subdivision and a resplit of a title 20-acres or less in size. Such subdivisions are also allowed in accordance with the IDP with the City of Lethbridge. It is noted that any further subdivision would require an area structure plan in consideration of the IDP. The application was circulated to the required external agencies with no concerns expressed and no utility easements are requested. (Alberta Transportation and the City have no objections.)

**ALTERNATIVES / PROS / CONS:**

The Subdivision Authority could decide to not approve if it is determined the proposed boundary reconfiguration and resplit is not suitable and the titles would remain as is.

Pros:

- there are no advantages to denying the subdivision as the County's bylaws are met as well as the IDP policies with the City

Cons:

- the land will not be configured to benefit the long-established County business, an encroachment issue would remain, and a refusal would be appealed by the applicants

**FINANCIAL IMPACT:**

None. However, the County will benefit from a municipal reserve payment evaluated at $40,000 per acre (approx. $35,080) on the 7.90-acres.

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

5A Lethbridge County 2023-0-023 APPROVAL

Diagrams for Lethbridge County 2023-0-023

# RESOLUTION

2023-0-023

**Lethbridge County** **Commercial and Country Residential** subdivision of Parcel X, Plan 7156HS & Lot 1, Block 1, Plan 0213343 within SW1/4 2-9-21-W4M

THAT the Commercial and Country Residential subdivision of Parcel X, Plan 7156HS & Lot 1, Block 1, Plan 0213343 within SW1/4 2-9-21-W4M (Certificate of Title No. 091 285 093, 161 086 278), to reconfigure the property boundaries (property line adjustment) and size of two adjacent parcels resulting in a 1.30-acre (0.527 ha) country residential title being enlarged to 2.17-acres (0.88 ha), and then subdivide the adjacent resized commercial parcel by creating a new 6.37-acre title and a remnant 7.90-acre (3.20 ha) title for commercial use; BE APPROVED subject to the following:

**RESERVE:** The 10% reserve requirement, pursuant to Sections 666 and 667 of the Municipal Government Act, be provided as money in place of land on the on the 0.87 land area difference for the yard (2.17 acres less 1.3 acres previously paid) and on the 7.90-acres at the market value of $40,000 per acre with the actual acreage and amount to be paid (approx. $35,080) to Lethbridge County be determined at the final stage, for Municipal Reserve purposes.

AND FURTHER that a Deferred Reserve caveat be registered on the new 6.37-acre title to reflect the 10% reserve requirement, with the actual acreage and amount be determined at the final stage, for Municipal Reserve purposes.

AND FURTHERMORE, upon payment of the Municipal Reserve, the existing deferred reserve caveat registered on the parent title in the 10% amount of 1.43 acres shall be discharged in its entirety.

**CONDITIONS:**

1. That, pursuant to Section 654(1)(d) of the Municipal Government Act, all outstanding property taxes shall be paid to Lethbridge County.
2. That, pursuant to Section 655(1)(b) of the Municipal Government Act, the applicant or owner or both enter into and comply with a Development Agreement with Lethbridge County which shall be registered concurrently with the final plan against the title(s) being created.
3. That the applicant submits a final surveyed plan as prepared by an Alberta Land Surveyor that certifies the exact location and dimensions of the parcels being subdivided as approved. The titles and portions of land to be subdivided and consolidated to reconfigure the boundaries (property line) of the two adjacent parcels, is to be done by a plan prepared by a certified Alberta Land Surveyor in a manner such that the resulting titles cannot be further subdivided without approval of the Subdivision Authority.
4. That the septic field associated with the greenhouse in the very southeast corner of the proposed new 6.37-acre parcel be decommissioned and relocated for the business, with confirmation provided to the satisfaction of the Subdivision Authority, prior to final endorsement.
5. That the septic field associated with the manufactured home dwelling be decommissioned, with confirmation provided to the satisfaction of the Subdivision Authority, prior to final endorsement.

**REASONS:**

1. The proposed subdivision is consistent with the South Saskatchewan Regional Plan and complies with both the Municipal Development Plan and Land Use Bylaw.
2. The Subdivision Authority is satisfied that the proposed subdivision is suitable for the purpose for which the subdivision is intended pursuant to Section 9 of the Matters Related to Subdivision and Development Regulation.

3. The Subdivision Authority has determined the proposal meets the subdivision criteria as a reconfiguration and a resplit of titles. Additionally, the new 2.17-acre lot size complies with the 2.00-acre bylaw minimum size and an encroachment issue will be resolved.

4. No objections or concerns have been received on the application, including Alberta Transportation and the City of Lethbridge. The proposal is deemed to be in compliance with the IDP with the City of Lethbridge.

**INFORMATIVE:**

(a) The applicant is advised further subdivision of these parcels would require an area structure plan to be prepared.

(b) That a legal description for the proposed parcel be approved by the Surveys Branch, Land Titles Office, Calgary.

(c) The applicant/owner is advised that other municipal, provincial or federal government or agency approvals may be required as they relate to the subdivision and the applicant/owner is responsible for verifying and obtaining any other approval, permit, authorization, consent or license that may be required to subdivide, develop and/or service the affected land (this may include but is not limited to Alberta Environment and Protected Areas, Alberta Transportation, and the Department of Fisheries and Oceans.)

(d) The City of Lethbridge has no concerns with the proposed subdivision application with the understanding that this proposal complies with the applicable policies of the Intermunicipal Development Plan adopted by the Lethbridge County and City of Lethbridge.

It is expected that any further subdivisions, as per the IDP, would require an Area Structure Plan before proceeding.

(e) Telus Communications Inc has no objection.

(f) Thank you for contacting FortisAlberta regarding the above application for subdivision. We have reviewed the plan and determined that no easement is required by FortisAlberta.

FortisAlberta is the Distribution Wire Service Provider for this area. The developer can arrange installation of electrical services for this subdivision through FortisAlberta. Please have the developer contact 310-WIRE (310-9473) to make application for electrical services.

Please contact FortisAlberta land services at landserv@fortisalberta.com or by calling (403) 514-4783 for any questions.

(g) In reference to the above request, please be advised of ATCO Gas' response and notify the landowner of the following:

- ATCO Gas Objects with the following comments –
    - The Landowner is required to contact ATCO Gas via Email: southlandadmin@atcogas.com to facilitate execution of Utility Right of Way to the satisfaction of ATCO Gas

*Once the URW has been registered at the Alberta Land Titles Office, we will notify the MD/County*
ATCO Gas would also like to make the MD/County and Landowner/Developer aware of the following:

- If conducting any ground disturbance on the subject property, the landowner/developer must ensure the location of all utilities by contacting Utility Safety Partners at 1-800-242-3447 or https://utilitysafety.ca/
- For any ground disturbance within 30m of an existing gas line please contact Crossings@atcogas.com to obtain permission (submit locate slip as back up)
- ATCO Gas requires a minimum of 6 months' notice to design and construct a new gas line, or alter an existing gas line. New Service installations, pipeline alterations, and Main extensions will be performed at the landowner/developers expense.
- If the landowner requires a single gas service please visit https://gas.atco.com/en-ca/products-services-rates/new-services-changes/new-natural-gas-line.html

Any further questions please email southlandadmin@atco.com.

(h) ATCO Transmission high pressure pipelines has no objections. Questions or concerns can be forwarded to hp.circulations@atco.com.

(i) Alberta Health Services does not objection.

(j) SMRID – Linda Park, Land Administrator:

"In reply to your March 16th, 2023 correspondence, the district has no objection to the reconfiguration of the property boundaries as described in your correspondence; however, we do have the following comments:

1. The permanent water rights may need to be removed from the area that the greenhouse, parking lot and mobile home occupy as you cannot have more water rights than land.
2. If they require non potable water for their greenhouse from the district, they will need to enter into a Water Conveyance Agreement - Agriculture with the District. This involves purchasing a volume of water at the current rate of $2,500.00 plus GST. They would be required to install a meter at the point of delivery and would be charged $50.00 an acre foot or a minimum charge of $500.00 plus GST whichever is greater.
3. The present lot described as Plan 0213343, Block 1, Lot 1 currently has an active Household Purposes Agreement with the district.

(k) Alberta Transportation – Leah Olsen, Development/Planning Technologist:

"This will acknowledge receipt of your circulation regarding the above noted proposal. The subsequent subdivision application would be subject to the requirements of Sections 18 and 19 of the Matters Related to Subdivision and Development Regulation (The Regulation), due to the proximity of Highway(s) 3, 4, 512

**Alberta Transportation offers the following comments with respect to this application:**

The requirements of Section 18 of the Regulation are not met. The department anticipates minimal impact on the highway from this proposal. Pursuant to Section 20(1) of the Regulation, Alberta Transportation grants approval for the subdivision authority to vary the requirements of Section 18 of the Regulation.

The requirements of Section 19 are met, therefore no variance is required.

Further, should the approval authority receive any appeals in regard to this application and as per Section 678(2.1) of the Municipal Government Act and Section 7(6)(d) of the regulation, Transportation and Economic Corridors agrees to waive the referral distance for this particular subdivision application. As far as Transportation and Economic Corridors is concerned, an appeal of this subdivision application may be heard by the local Subdivision and Development Appeal Board provided that no other provincial agency is involved in the application

**Alberta Transportation and Economic Corridors has the following additional comments and/or requirements with respect to this proposal:**

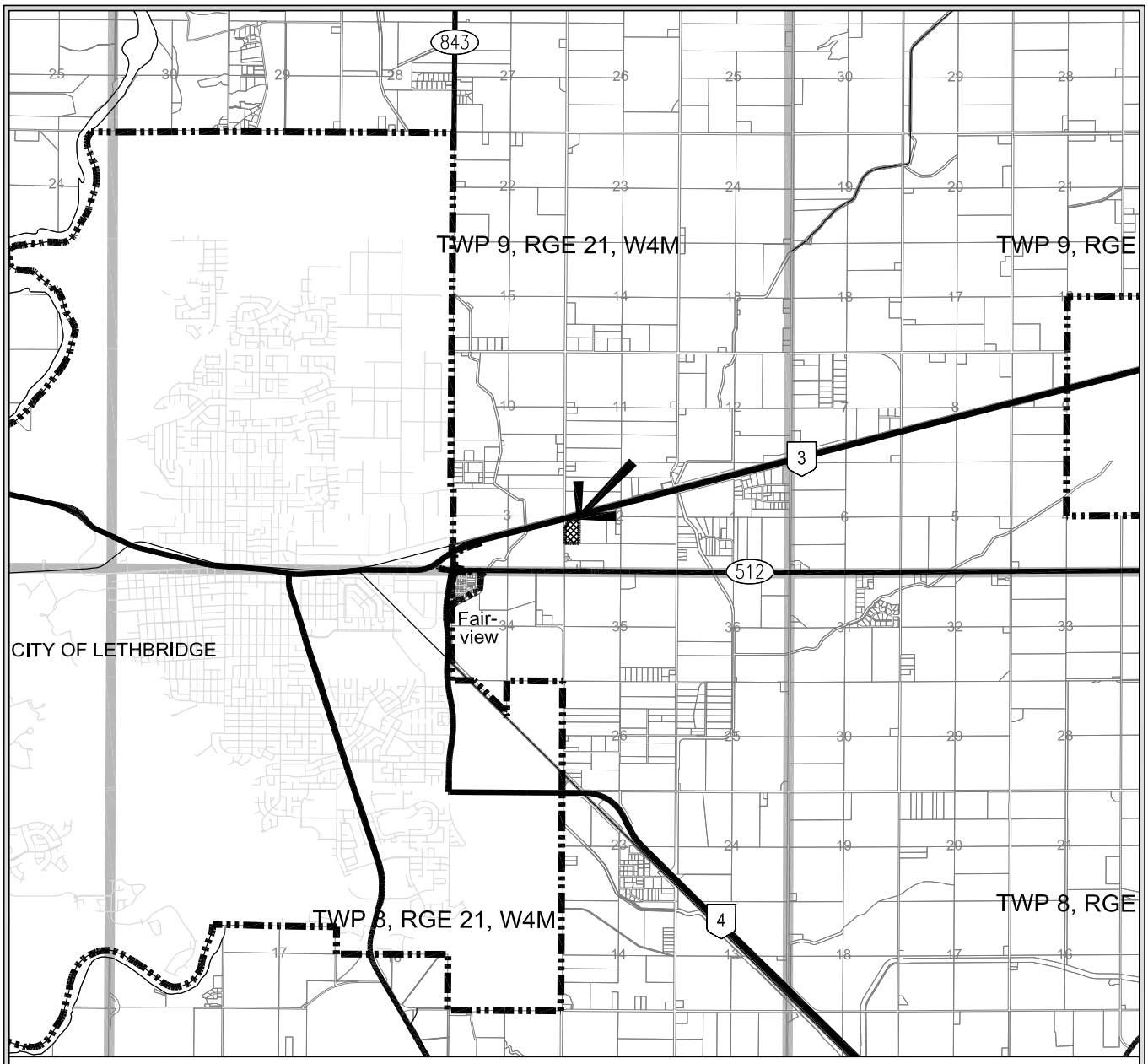
1. The department expects that the municipality will mitigate the impacts of traffic generated by developments approved on the local road connections to the highway system, pursuant to Policy 7 of the Provincial Land Use Policies and Section 618.4 of the Municipal Government Act"

_____ _____

MOVER REEVE

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DATE

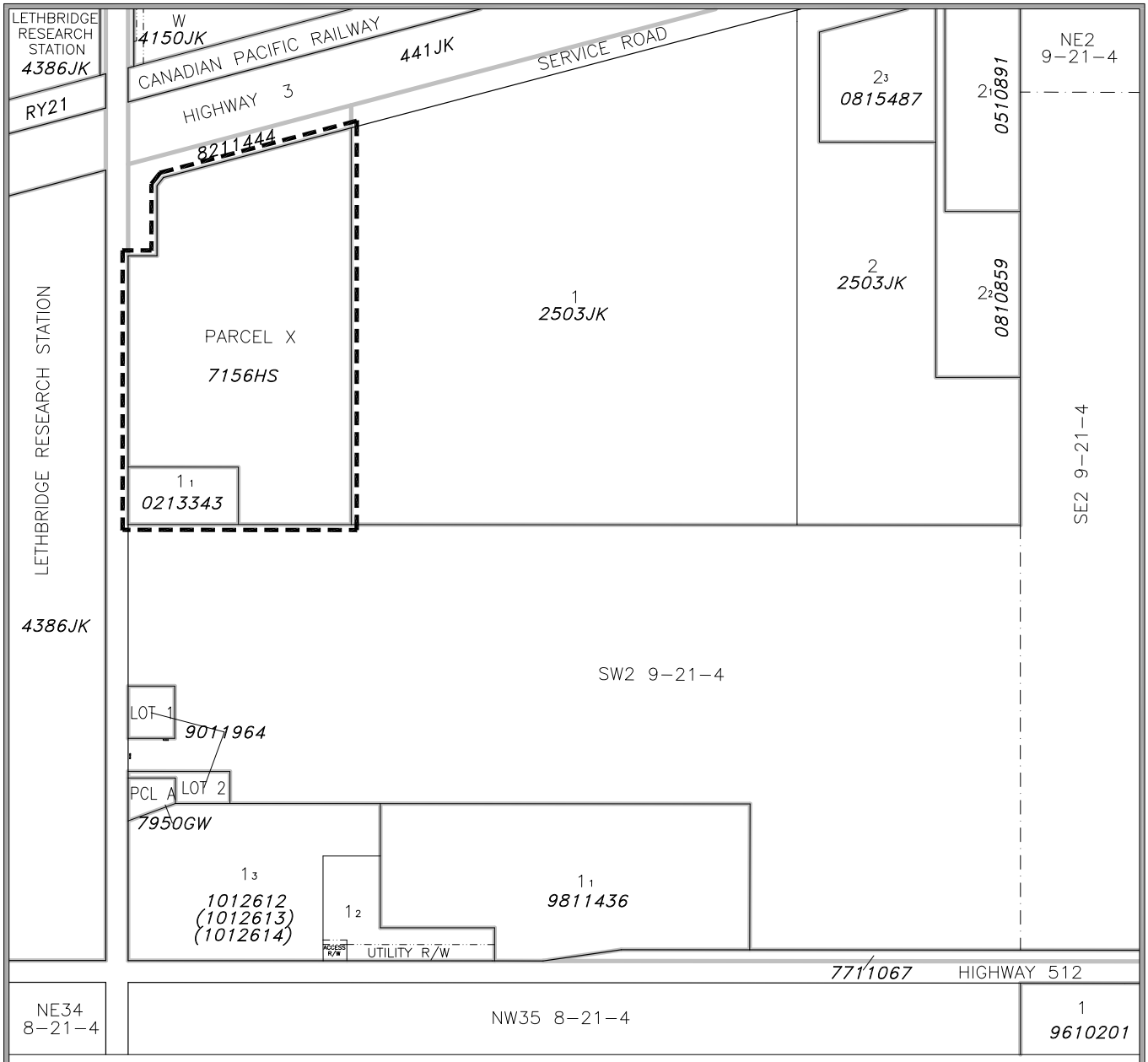



SUBDIVISION LOCATION SKETCH
LOT 1; BLOCK 1; PLAN 0213343 & PARCEL X; PLAN 7156HS
ALL WITHIN SW 1/4 SEC 2, TWP 9, RGE 21, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: FEBRUARY 27, 2023
FILE No: 2023-0-023

MAP PREPARED BY:
OLDMAN RIVER REGIONAL SERVICES COMMISSION
3105 16th AVENUE NORTH, LETHBRIDGE, AB T1H 5E8
"NOT RESPONSIBLE FOR ERRORS OR OMISSIONS"

OLDMAN RIVER REGIONAL SERVICES COMMISSION

February 28, 2023 N:\Subdivision\2023\2023-0-023.dwg



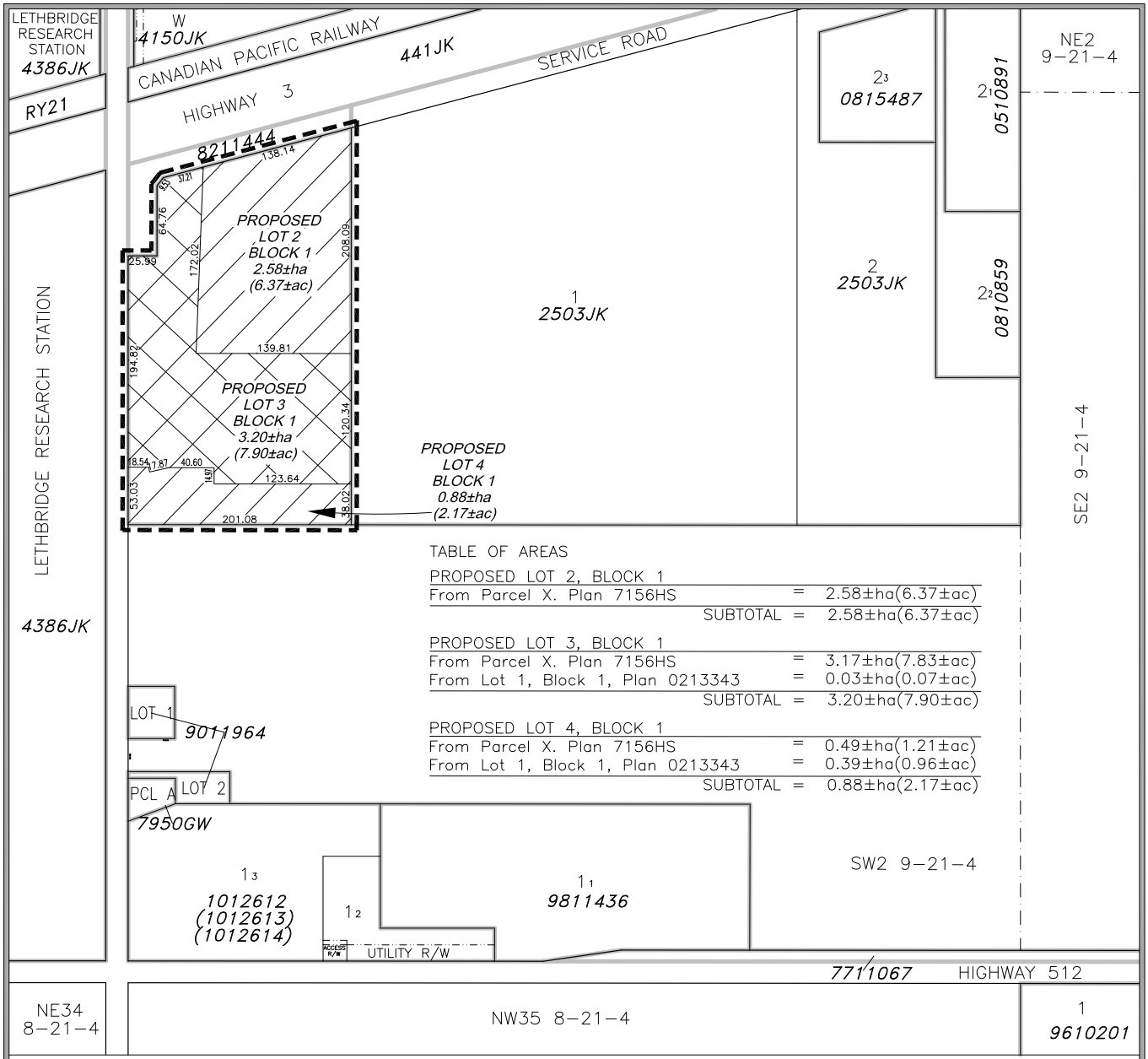

SUBDIVISION SKETCH - **EXISTING**
LOT 1; BLOCK 1; PLAN 0213343 & PARCEL X; PLAN 7156HS
ALL WITHIN SW 1/4 SEC 2, TWP 9, RGE 21, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: FEBRUARY 27, 2023
FILE No: 2023-0-023

OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

N

February 28, 2023 N:\Subdivision\2023\2023-0-023.dwg



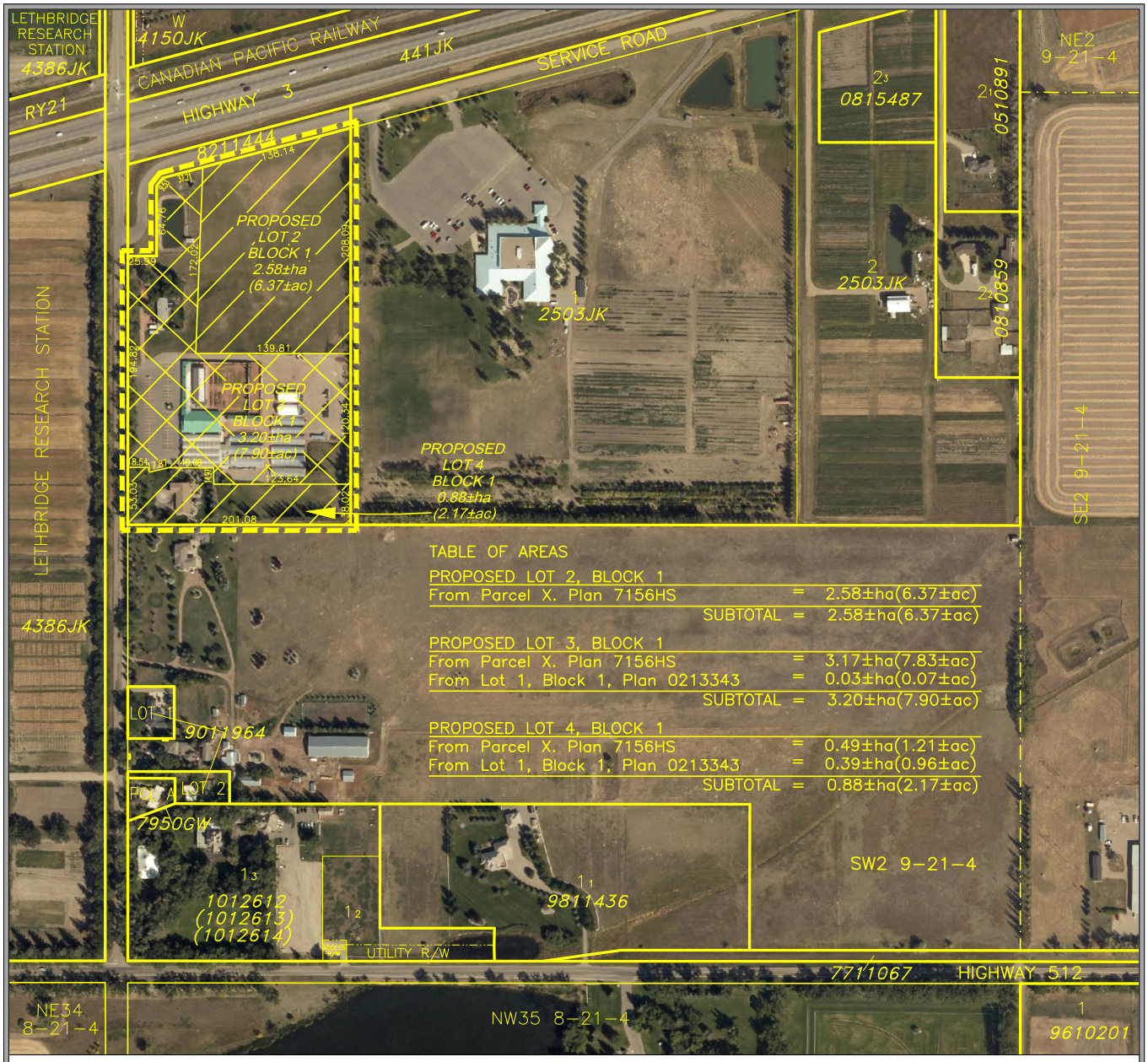

# SUBDIVISION SKETCH - **PROPOSED**

LOT 1; BLOCK 1; PLAN 0213343 & PARCEL X; PLAN 7156HS
ALL WITHIN SW 1/4 SEC 2, TWP 9, RGE 21, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: FEBRUARY 27, 2023
FILE No: 2023-0-023

OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

February 28, 2023 N:\Subdivision\2023\2023-0-023.dwg



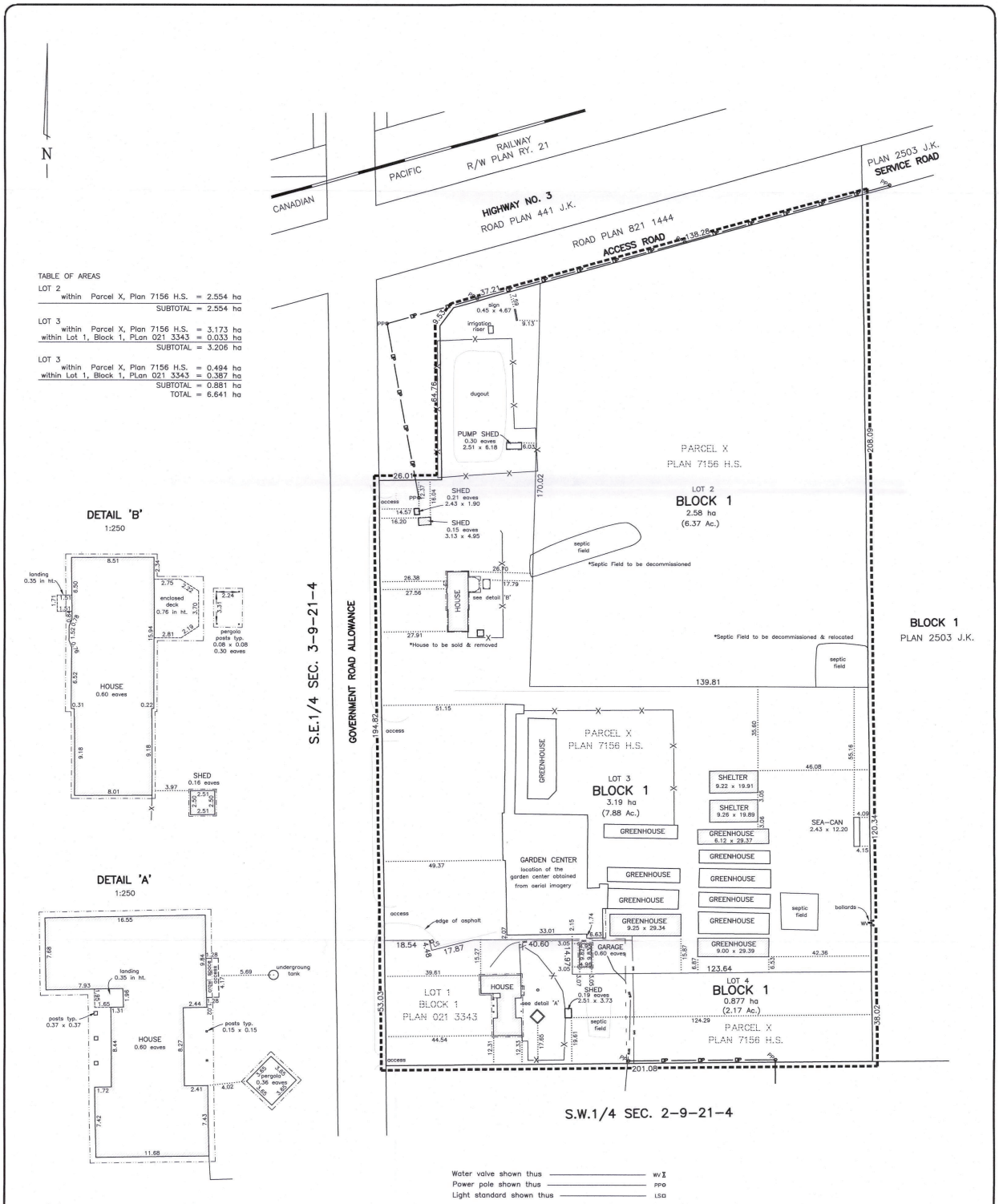

SUBDIVISION SKETCH - **PROPOSED**
LOT 1; BLOCK 1; PLAN 0213343 & PARCEL X; PLAN 7156HS
ALL WITHIN SW 1/4 SEC 2, TWP 9, RGE 21, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: FEBRUARY 27, 2023
FILE No: 2023-0-023

OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

February 28, 2023 N:\Subdivision\2023\2023-0-023.dwg

***AERIAL PHOTO DATE: 2018***




| NO. | REVISION | DATE | BY |
|---|---|---|---|
| | | | |

NOTE : Portion to be approved is outlined thus
and contains approximately 6.641 ha.
Distances are in metres and decimal parts thereof.

Distances and areas are approximate and are subject to change upon final survey.

GREEN HAVEN TREE FARMS LTD.

TENTATIVE PLAN SHOWING SUBDIVISION
of all of
LOT 1, BLOCK 1, PLAN 021 3343 & PARCEL X, PLAN 7156 H.S.
all within
S.W.1/4 SEC. 2, TWP. 9, RGE. 21, W.4 M.
Lethbridge County


brown okamura & associates ltd.
Professional Surveyors
2830 – 12 Avenue North, Lethbridge, Alberta


| APPROVED | DRAWN MJ | DATE FEB 16/23 |
|---|---|---|
| | CHECKED DJA | JOB 23-15883 |
| D.J. Amantea, A.L.S. | SCALE 1:1000 | DRAWING 23-15883TA |

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Subdivision Application #2023-0-025 – Variety Farms Inc.<br>- Lot 1, Block 1, Plan 0010552 and SW1/4 26-11-23-W4M |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | ORRSC |
| **Report Author:** | Steve Harty |

**APPROVAL(S):**

| | |
|---|---|
| Hilary Janzen, Supervisor of Planning & Development | Approved - 20 Apr 2023 |
| Larry Randle, Interim Chief Administrative Officer | Approved - 21 Apr 2023 |

**STRATEGIC ALIGNMENT:**



Governance ☐ Relationships ☐ Region ☐ Prosperity ☒

**EXECUTIVE SUMMARY:**

The application to reconfigure an existing 4.45-acre title and reduce it in size to 3.0-acres for country residential use. The proposal meets the subdivision criteria of the Land Use Bylaw.

**RECOMMENDATION:**

That S.D. Application #2023-0-025 be approved subject to the conditions as outlined in the draft resolution.

**REASON(S) FOR RECOMMENDATION(S):**

The proposed subdivision meets the provincial Subdivision and Development Regulations and the municipal subdivision policies as stated in the Land Use Bylaw.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

- LUB No. 1404 contains policies for the reconfiguration of titles that enables the reduction in a parcel size of a previously subdivided title, provided no additional titles are created.
- LUB No. 1404 contains the minimum parcel size requirements as established by Council, and the 3.0-acre country residential parcel size complies with the bylaw. The reconfiguration will result in a larger agricultural parcel which also complies.
- The Subdivision Authority has the discretion to decide on the suitability of the reconfigured parcels and the final parcel sizes as determined to be logical.

**BACKGROUND INFORMATION:**

Located a half-mile west of Keho Lake and 1-½ miles east of Highway 23. The proposal is to reduce the parcel size of the residential yard and remove from the northeast portion a shop building, a couple

fuel tanks, and several grain bins that will be returned to the adjacent agricultural title (SW 26-11-23-W4).

The yard portion being reduced to 3-acres contains a dwelling Quonset, barn, and large dugout. The dwelling's septic field is situated to the north of the house and will remain within the confines of the reconfigured yard title's reduced parcel size. Access to the lot will remain unchanged from the west municipal road. There is also a second approach situated just to the north of the northern boundary of the yard that provides access to the agricultural title. There are no abandoned gas wells or confined feeding operations located in proximity that impact the land. There are also no identified Historical Resources located on the land or on adjacent lands.

Overall, the proposal meets the criteria of the County's Land Use Bylaw No. 1404 for a reconfiguration/realignment of titles subdivision and the reduced parcel at 3.0-acres complies to the 2.00-acre bylaw minimum parcel size. The application was circulated to the required external agencies with no concerns expressed but Fortis Alberta requested an easement.

**ALTERNATIVES / PROS / CONS:**

The Subdivision Authority could decide to not approve if it is determined the proposed reconfiguration is not suitable and the titles would remain as is.

Pros:

- there are no advantages to denying the subdivision as it meets the subdivision criteria of the County

Cons:

- the agricultural shop and grain bins would not be sited on the associated agricultural title and a refusal would likely be appealed by the applicants

**FINANCIAL IMPACT:**

None.

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

5A Lethbridge County 2023-0-025
Diagrams for Lethbridge County 2023-0-025

# RESOLUTION

2023-0-025

**Lethbridge County** **Country Residential** subdivision of Lot 1, Block 1, Plan 0010552 and SW1/4 26-11-23-W4M all within SW1/4 26-11-23-W4M

THAT the Country Residential subdivision of Lot 1, Block 1, Plan 0010552 and SW1/4 26-11-23-W4M all within SW1/4 26-11-23-W4M (Certificate of Title No. 141 030 106 +3, 141 030 106 +4), to reconfigure an existing 4.45-acre (1.8 ha) title and reduce it in size to 3.0-acres (1.21 ha) for country residential use; BE APPROVED subject to the following:

**CONDITIONS:**

1. That, pursuant to Section 654(1)(d) of the Municipal Government Act, all outstanding property taxes shall be paid to Lethbridge County.
2. That, pursuant to Section 655(1)(b) of the Municipal Government Act, the applicant or owner or both enter into and comply with a Development Agreement with Lethbridge County which shall be registered concurrently with the final plan against the title(s) being created.
3. That the applicant submits a surveyed plan as prepared by an Alberta Land Surveyor that certifies the exact location and dimensions of the parcels being subdivided and consolidated. The titles and portions of land to be subdivided and consolidated to reconfigure the boundaries (property line) of the two adjacent parcels, is to be done by a plan prepared by a certified Alberta Land Surveyor in a manner such that the resulting titles cannot be further subdivided without approval of the Subdivision Authority.
4. That the easement(s) as required by FortisAlberta shall be established prior to finalization.

**REASONS:**

1. The proposed subdivision is consistent with the South Saskatchewan Regional Plan and complies with both the Municipal Development Plan and Land Use Bylaw.
2. The Subdivision Authority is satisfied that the proposed subdivision is suitable for the purpose for which the subdivision is intended pursuant to Section 9 of the Matters Related to Subdivision and Development Regulation.
3. The subdivision complies with the County's subdivision criteria as a property realignment/ reconfiguration of titles and the reduced parcel at 3.0-acres in size complies to the 2.00-acre bylaw minimum parcel size.

**INFORMATIVE:**

(a) Since the proposed subdivision complies with Section 663(a) of the Municipal Government Act, Reserve is not required.

(b) That a legal description for the proposed parcel be approved by the Surveys Branch, Land Titles Office, Calgary.

(c) The applicant/owner is advised that other municipal, provincial or federal government or agency approvals may be required as they relate to the subdivision and the applicant/owner is responsible for verifying and obtaining any other approval, permit, authorization, consent or license that may be required to subdivide, develop and/or service the affected land (this may include but is not limited to Alberta Environment and Protected Areas, Alberta Transportation, and the Department of Fisheries and Oceans.)

(d) Telus Communications Inc has no objection.

(e) Easements are required for this development. The developer can initiate the process of securing an easement for the proposed subdivision by contacting the undersigned. FortisAlberta is requesting that the county defer its subdivision approval until such time as this easement process is complete and the developer has entered into an appropriate easement agreement with FortisAlberta and the easement has been properly registered with Land Titles (Alberta). FortisAlberta will notify the county once these steps have been completed and confirm that FortisAlberta no longer has any concerns with approval of this subdivision.

FortisAlberta is the Distribution Wire Service Provider for this area. The developer can arrange installation of electrical services for this subdivision and for the easement by contacting FortisAlberta at 310-WIRE (310-9473) to make application.

Please contact FortisAlberta land services at landserv@fortisalberta.com or by calling (403) 514-4783 for any questions. Please contact FortisAlberta land services at landserv@fortisalberta.com or by calling (403) 514-4783 for any questions.

(f) ATCO Gas has no objection.

(g) ATCO Transmission high pressure pipelines has no objections. Questions or concerns can be forwarded to hp.circulations@atco.com.

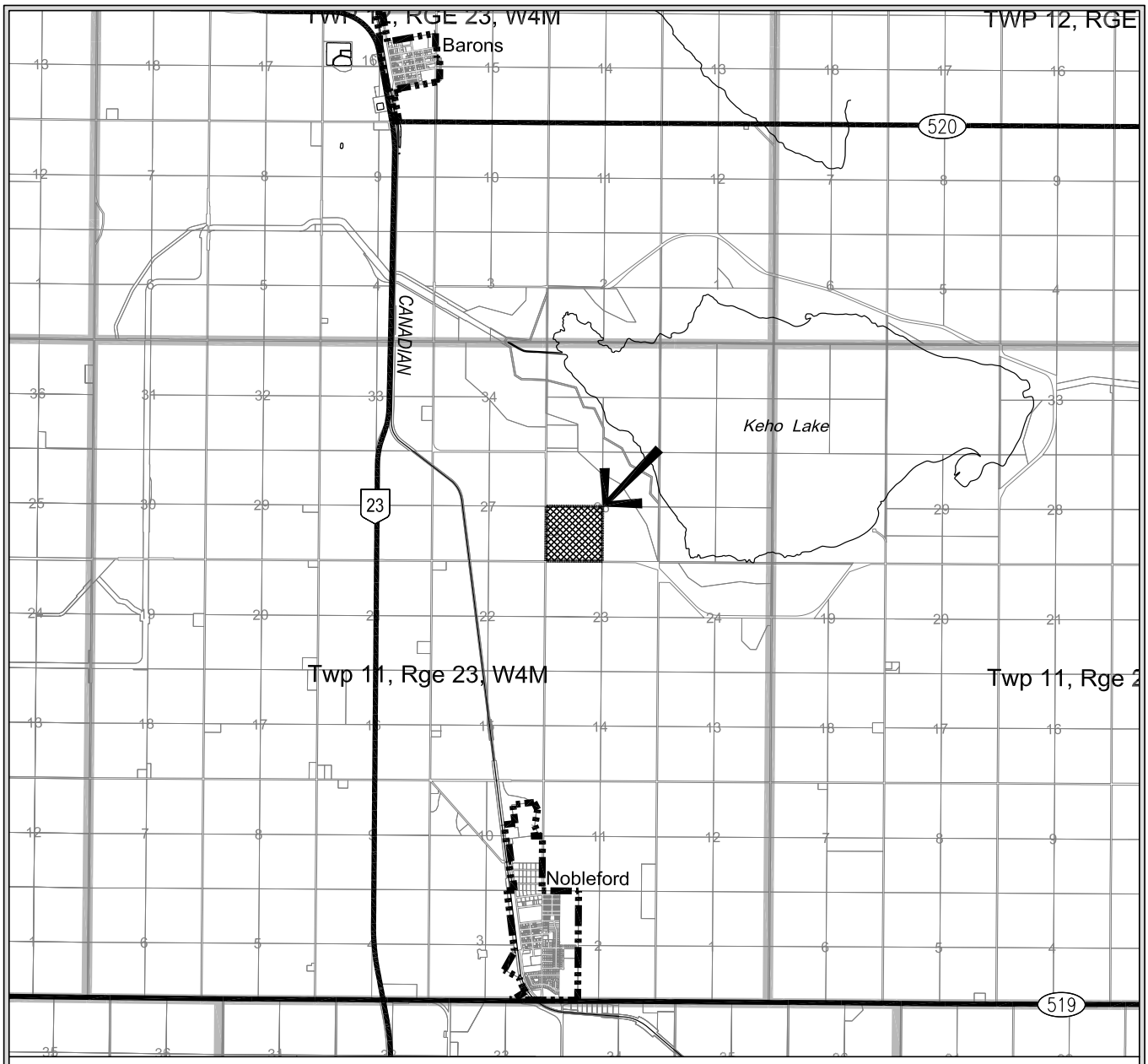
(h) Alberta Health Services does not object.

_____ _____

MOVER REEVE

_____

DATE



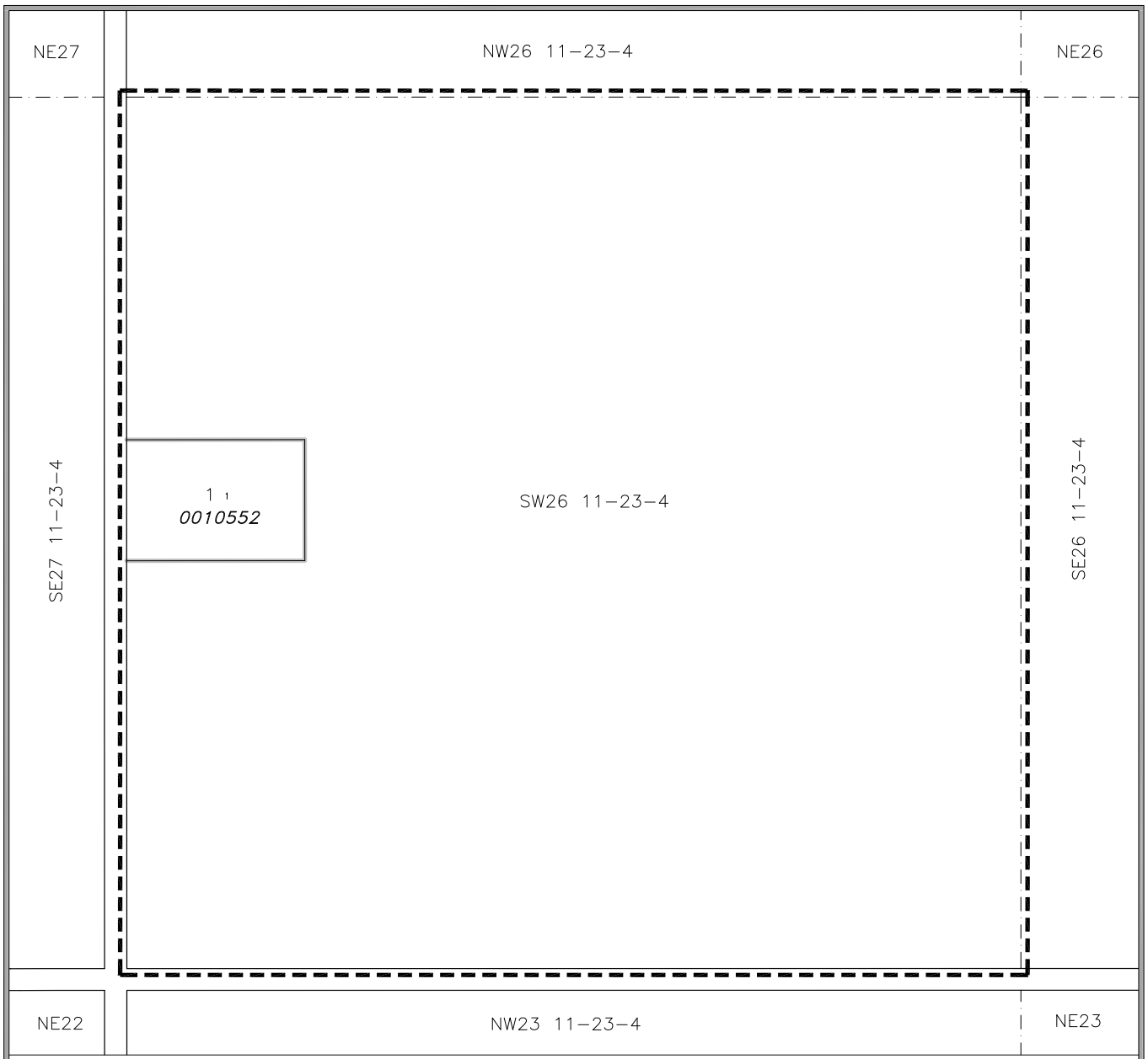

SUBDIVISION LOCATION SKETCH
LOT 1, BLOCK 1, PLAN 0010552 & SW 1/4 SEC 26
ALL WITHIN SW 1/4 SEC 26, TWP 11, RGE 23, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 13, 2023
FILE No: 2023-0-025

MAP PREPARED BY:
OLDMAN RIVER REGIONAL SERVICES COMMISSION
3105 16th AVENUE NORTH, LETHBRIDGE, AB T1H 5E8
"NOT RESPONSIBLE FOR ERRORS OR OMISSIONS"

OLDMAN RIVER REGIONAL SERVICES COMMISSION

March 14, 2023 N:\Subdivision\2023\2023-0-025.dwg

N



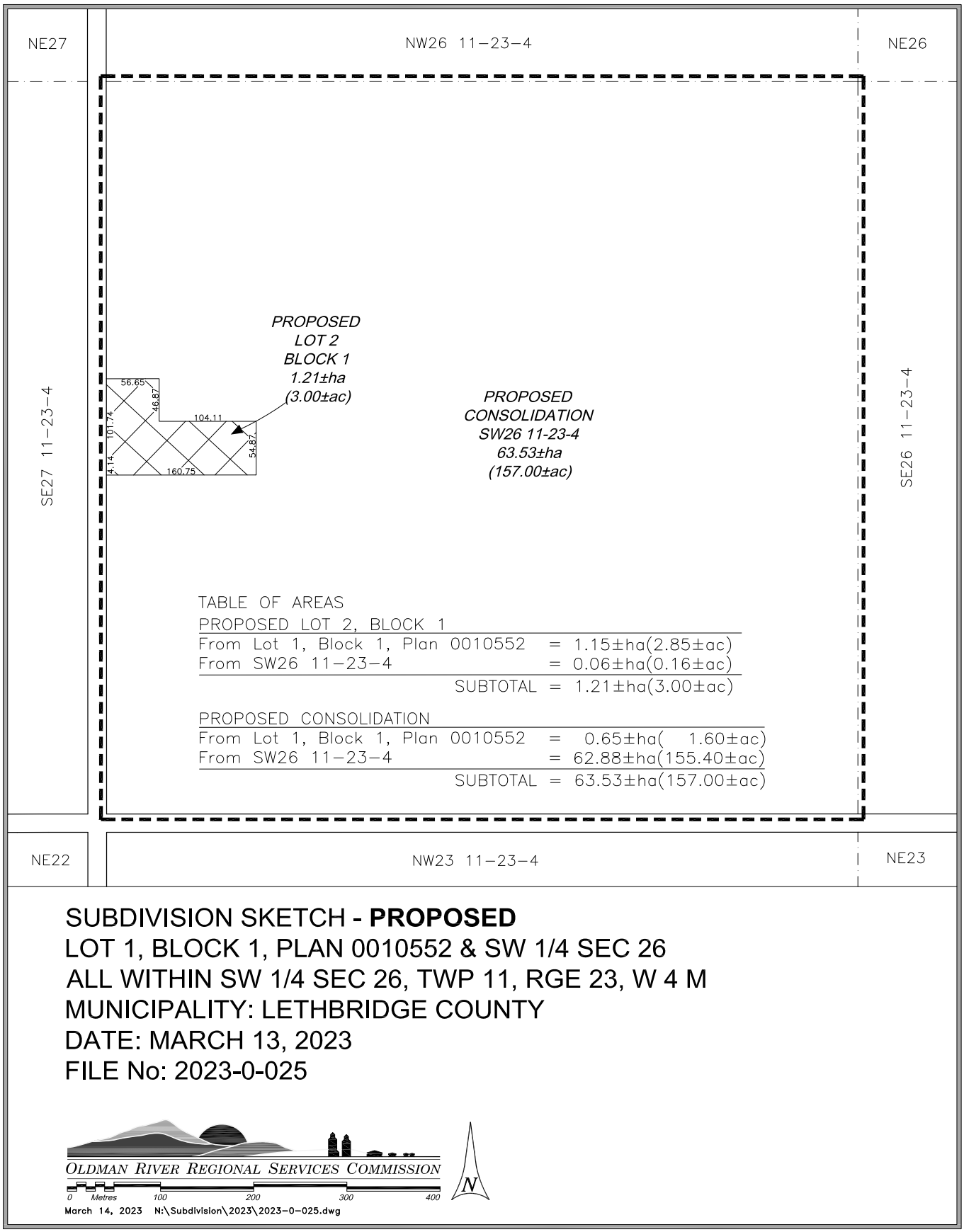

SUBDIVISION SKETCH - **EXISTING**
LOT 1, BLOCK 1, PLAN 0010552 & SW 1/4 SEC 26
ALL WITHIN SW 1/4 SEC 26, TWP 11, RGE 23, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 13, 2023
FILE No: 2023-0-025

OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

N

March 14, 2023 N:\Subdivision\2023\2023-0-025.dwg




# SUBDIVISION SKETCH - **PROPOSED**

LOT 1, BLOCK 1, PLAN 0010552 & SW 1/4 SEC 26
ALL WITHIN SW 1/4 SEC 26, TWP 11, RGE 23, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 13, 2023
FILE No: 2023-0-025

OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

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March 14, 2023 N:\Subdivision\2023\2023-0-025.dwg



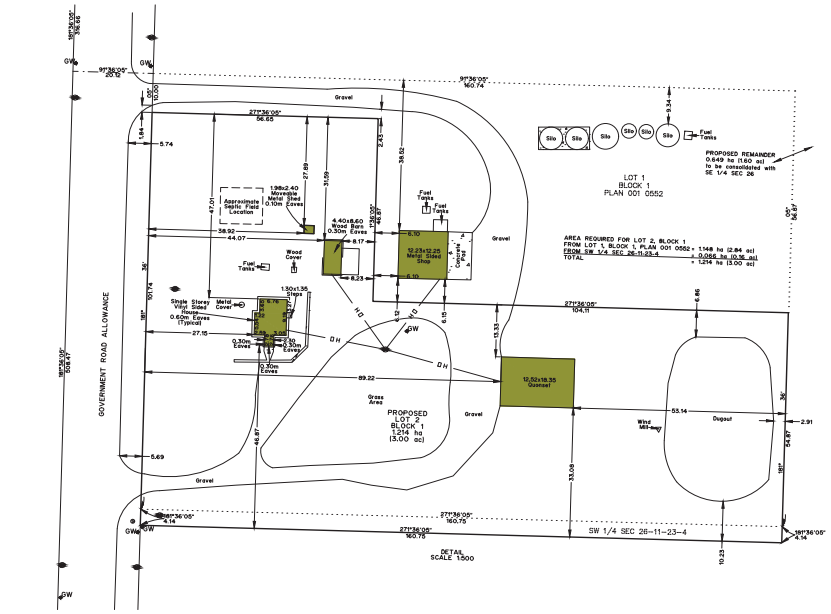

SUBDIVISION SKETCH - **PROPOSED**
LOT 1, BLOCK 1, PLAN 0010552 & SW 1/4 SEC 26
ALL WITHIN SW 1/4 SEC 26, TWP 11, RGE 23, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 13, 2023
FILE No: 2023-0-025

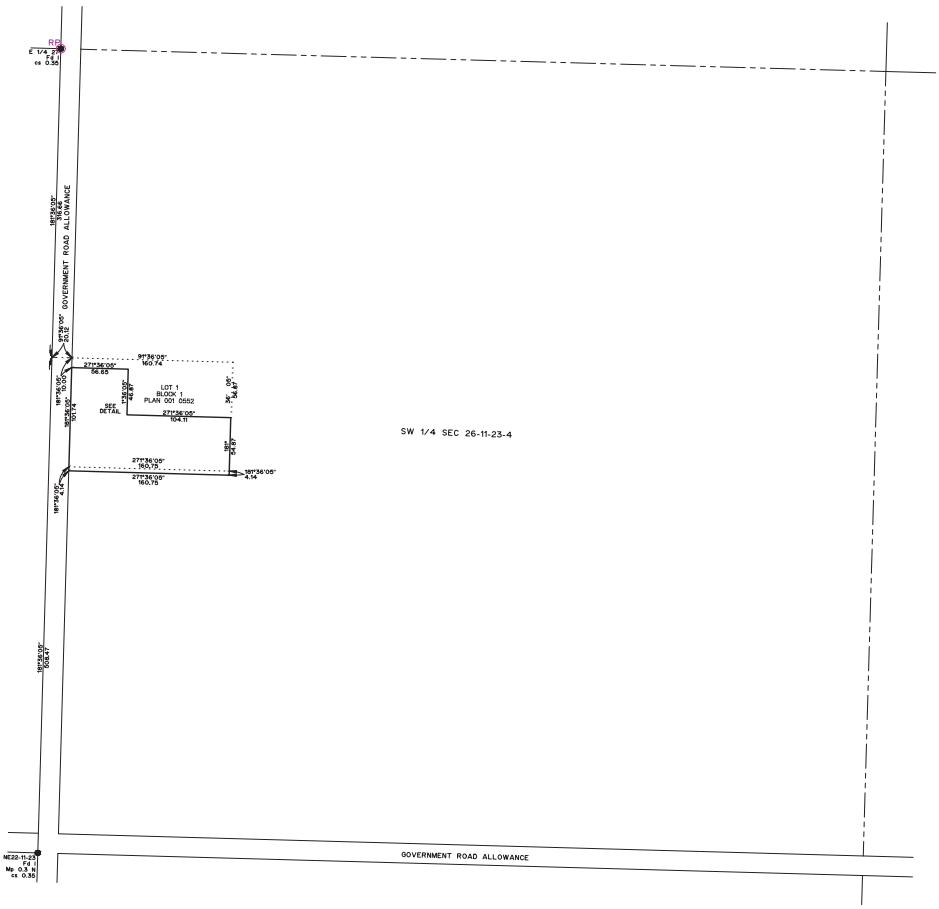
OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

March 14, 2023 N:\Subdivision\2023\2023-0-025.dwg

***AERIAL PHOTO DATE: 2018***




SUBDIVISION AUTHORITY
OLDMAN RIVER REGIONAL SERVICES COMMISSION

ALBERTA LAND SURVEYORS' ASSOCIATION
PERMIT NUMBER P 254
Halma Thompson Land Surveys Ltd.

FILE: _____

SURVEYOR: MICHAEL A. THOMPSON, ALS

CLIENT:
VARIETY FARMS INCORPORATED
BOX 1084
PICTURE BUTTE, AB
T0K 1V0

DESCRIPTION OF PROPERTY:
CIVIC ADDRESS: 114019 RGE RD 232

ATS DESCRIPTION: SW 1/4 SEC 26, TWP 11, RGE 23, W 4th MER

C of T 141 030 106 +4, 141 030 106 +3

REGISTERED OWNERS: VARIETY FARMS INCORPORATED

ABBREVIATIONS:

| | | | |
|---|---|---|---|
| Δ | Central Angle of Curve | Mp | 2 metre standard Alberta Survey Marker Post |
| ø | Diameter | MR | Municipal Reserve |
| A | Arc | N,E,S,W | North, East, South, West |
| ac | Acres | NAD | North American Datum |
| ASCM | Alberta Survey Control Marker | PPP | Precise Point Positioning |
| A/R | Access Road | Pit | 4 Pits |
| C of T | Certificate of Title | Pits | 4 Road Pits |
| ckm | Check Measured | Pl | Placed |
| cs | Countersunk | P/L | Pipeline |
| CSRS | Canadian Spatial Reference System | PUL | Public Utility Lot |
| FCP | Fence Corner Post | R | Radius |
| Fd | Found | (R) | Radial Bearing |
| ha | Hectares | R/W | Right of Way |
| I | Statutory Iron Post | Re-est | Re-established |
| km | Kilometre | Rest | Restored |
| LSD | Legal Subdivision | RGE | Range |
| m | Metre | SEC | Section |
| M | Mound | TWP | Township |
| MER | Meridian | URW | Utility Right-of-Way |
| Mk | Mark | UTM | Universal Transverse Mercator |

LEGEND:

- Alberta Survey Control Marker
- Statutory iron post found
- Statutory iron post placed, marked P254
- Utility box
- Sign
- Power Pole
- Guy Wire
- Fence Line — X —
- Overhead Power — OH —

RP Georeferenced Point

- Distances are ground and are in metres and decimals thereof, and are between survey monuments unless otherwise shown.
- Bearings are grid (UTM NAD'83), derived from GNSS observations, and are referred to the meridian through 111° West Longitude.
- Lands dealt with by this plan are bounded thus _____ and contain 1.214 ha

NOTES:

1. The georeferenced point is a found statutory iron post, UTM NAD'83 (ORIGINAL) Coordinate: 5,533,860.96 N, 352,670.37 E.
2. The georeferenced coordinate was calculated using the published ATS Ver. 4.1 coordinate value for E 1/4 SEC 27-11-23-4.
3. A combined factor of 0.999717 was used to scale ground distances to the projected plane.
4. Field survey was completed on the date of March 2, 2023
5. Fence lines along property lines are within 0.2m of the property line unless noted otherwise.

THE EXISTENCE OR LOCATION OF ALL UTILITIES AS SHOWN ON OR OMITTED FROM THIS PLAN MAY BE BASED ON INFORMATION RECEIVED FROM THE RESPECTIVE AUTHORITIES AND ARE NOT GUARANTEED BY THE LAND SURVEYOR. NO RESPONSIBILITY IS IMPLIED OR ASSUMED BY THE LAND SURVEYOR AS TO THE LOCATION OR ANY OMISSIONS. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXISTENCE AND LOCATION OF ALL SUCH UTILITIES AND MUST CONTACT THE VARIOUS UTILITY COMPANIES FOR ON SITE INFORMATION PRIOR TO COMMENCEMENT OF ANY OPERATIONS.

| ISSUE | DATE | REVISION | CAD | CHK |
|---|---|---|---|---|
| 0 | 2023-03-09 | ORIGINAL SUBMISSION | D.L. | M.T. |

VARIETY FARMS INCORPORATED

**TENTATIVE PLAN**

SHOWING PROPOSED SUBDIVISION OF
PART OF
LOT 1, BLOCK 1, PLAN 001 0552
(SW 1/4 SEC 26-11-23-4)
AND PART OF
SW 1/4 SEC 26,
TWP 11, RGE 23, W 4th MER

LETHBRIDGE COUNTY
ALBERTA

SUBJECT TO APPROVAL OF THE LOCAL APPROVING AUTHORITY

SCALE 1:2000 0 20 50 100

HALMA THOMPSON LAND SURVEYS LTD.
200-410 Stafford Drive S
Lethbridge AB, T1J 2L2
Phone (403) 381-1320
Fax (403) 381-1366

JOB H02923
DRAWING H02923T

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Subdivision Application #2023-0-037 – Vandenbroek - NE1/4 30-10-22-W4M |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | ORRSC |
| **Report Author:** | Steve Harty |

**APPROVAL(S):**

| | |
|---|---|
| Hilary Janzen, Supervisor of Planning & Development | Approved - 20 Apr 2023 |
| Larry Randle, Interim Chief Administrative Officer | Approved - 21 Apr 2023 |

**STRATEGIC ALIGNMENT:**



Governance ☐ Relationships ☐ Region ☐ Prosperity ☒

**EXECUTIVE SUMMARY:**

The application is to create a 4.24-acre commercial parcel from a cut-off/fragmented quarter-section title comprised of 98.88 acres for rural commercial use. The proposal meets the subdivision criteria of the Land Use Bylaw.

**RECOMMENDATION:**

That S.D. Application #2023-0-037 be approved subject to the conditions as outlined in the draft resolution.

**REASON(S) FOR RECOMMENDATION(S):**

The proposed subdivision meets the provincial Subdivision and Development Regulations and the municipal subdivision policies as stated in the Land Use Bylaw.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

- The isolated rural commercial subdivision policies are within Land Use Bylaw (LUB) No. 1404 that allows a commercial subdivision from a ¼-section or cut-off/fragmented title.
- LUB No. 1404 stipulates a minimum 2.0-acre to maximum 10.0-acre parcel size for a rural commercial use, which the 4.24-acre parcel size complies with.
- The application conforms to the County's Industrial-Commercial Land Use Strategy which supports the development and subdivision of rural commercial businesses that are agriculturally related.

**BACKGROUND INFORMATION:**

Located 2½-miles northwest of Park Lake Provincial Park and 1¼-miles south of Highway 519. The proposal is for the subdivision of an existing specialty food (pork) business in the very north-east corner adjacent to an irrigation canal.

The owner desires to separate the business portion onto a separate title from the agricultural land and a residential yard on the remainder 94.64-acres. The proposed commercial subdivision contains a single commercial building used for the processing and retail component associated with custom pork products. The parcel title's south boundary is being squared straight west to the canal boundary and will include the on-site private septic system situated to the west of the building. The use is also serviced by a private cistern system for water. There is an existing access approach in place to the east municipal road allowance. The parent quarter-section is split by a main LNID canal and drain R/W. The quarter-section title severance was the result of a public/institutional agency actions and not the landowner. Thus, this is a fragmented title that enables the landowner to be eligible to subdivide from the greater half of the cut-off title.

Overall, the proposal meets the criteria of the County's Land Use Bylaw No. 1404 regarding an isolated rural commercial subdivision. The proposed 4.24-acre sized commercial title complies with the bylaw's rural commercial parcel size requirements. The application was circulated to the required external agencies with no objections, but ATCO Gas requested a utility easement.

**ALTERNATIVES / PROS / CONS:**

The Subdivision Authority could decide not to approve if it is not satisfied the criteria are met, or the proposed parcel is suitable.

Pros:

- there are no advantages to denying the subdivision as it meets the subdivision criteria of the County

Cons:

- the business would not be supported, and a refusal would likely be appealed as the County's subdivision criteria have been met

**FINANCIAL IMPACT:**

None.

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

5A Lethbridge County 2023-0-037
Diagrams for Lethbridge County 2023-0-037

# RESOLUTION

2023-0-037

**Lethbridge County** **Rural Commercial** subdivision of NE1/4 30-10-22-W4M

THAT the Rural Commercial subdivision of NE1/4 30-10-22-W4M (Certificate of Title No. 091 102 352 +4), to create a 4.24 acre (1.72 ha) commercial parcel from a cut-off/fragmented quarter-section title comprised of 98.88 acres (40.02 ha) for rural commercial use; BE APPROVED subject to the following:

**CONDITIONS:**

1. That, pursuant to Section 654(1)(d) of the Municipal Government Act, all outstanding property taxes shall be paid to Lethbridge County.
2. That, pursuant to Section 655(1)(b) of the Municipal Government Act, the applicant or owner or both enter into and comply with a Development Agreement with Lethbridge County which shall be registered concurrently with the final plan against the title(s) being created.
3. That the applicant provides a final subdivision plan by a certified Alberta Land Surveyor to certify final parcel dimensions and to correspond to the approval for endorsement.
4. That the easement(s) as required by ATCO Gas shall be established prior to final endorsement.

**REASONS:**

1. The proposed subdivision is consistent with the South Saskatchewan Regional Plan and complies with both the Municipal Development Plan and Land Use Bylaw.
2. The Subdivision Authority is satisfied that the proposed subdivision is suitable for the purpose for which the subdivision is intended pursuant to Section 9 of the Matters Related to Subdivision and Development Regulation.
3. The Subdivision Authority has determined the proposed subdivision is for an existing rural commercial use and conforms to the bylaw criteria regarding a subdivision from a cut-off/fragmented quarter-section title of land.
4. The proposed 4.24-acre sized commercial yard title complies with Lethbridge County's Land Use Bylaw rural commercial parcel size requirements of between 2.0-to-10.0-acre parcel size.

**INFORMATIVE:**

(a) Since the proposed subdivision complies with Section 663(a) of the Municipal Government Act, Reserve is not required.

(b) That a legal description for the proposed parcel be approved by the Surveys Branch, Land Titles Office, Calgary.

(c) The applicant/owner is advised that other municipal, provincial or federal government or agency approvals may be required as they relate to the subdivision and the applicant/owner is responsible for verifying and obtaining any other approval, permit, authorization, consent or license that may be required to subdivide, develop and/or service the affected land (this may include but is not limited to Alberta Environment and Protected Areas, Alberta Transportation, and the Department of Fisheries and Oceans.)

(d) Telus Communications Inc has no objection.

(e) In reference to the above request, please be advised of ATCO Gas' response and notify the landowner of the following:

- ATCO Gas Objects with the following comments –
    - The Landowner is required to contact ATCO Gas via Email: southlandadmin@atcogas.com to facilitate execution of Utility Right of Way to the satisfaction of ATCO Gas

*Once the URW has been registered at the Alberta Land Titles Office, we will notify the MD/County*
ATCO Gas would also like to make the MD/County and Landowner/Developer aware of the following:

- If conducting any ground disturbance on the subject property, the landowner/developer must ensure the location of all utilities by contacting Utility Safety Partners at 1-800-242-3447 or https://utilitysafety.ca/
- For any ground disturbance within 30m of an existing gas line please contact Crossings@atcogas.com to obtain permission (submit locate slip as back up)
- ATCO Gas requires a minimum of 6 months' notice to design and construct a new gas line, or alter an existing gas line. New Service installations, pipeline alterations, and Main extensions will be performed at the landowner/developers expense.
- If the landowner requires a single gas service please visit https://gas.atco.com/en-ca/products-services-rates/new-services-changes/new-natural-gas-line.html

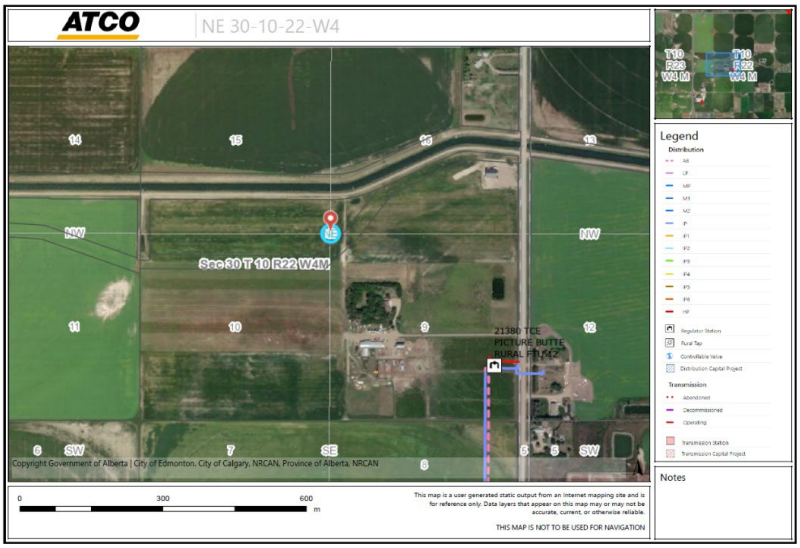
Any further questions please email southlandadmin@atco.com.

(f) ATCO Transmission, a division of ATCO Gas and Pipelines Ltd. - Isabel Solis-Jarek, Sr. Administrative Coordinator, Operations Engineering:

"The Engineering Department of ATCO Transmission, (a division of ATCO Gas and Pipelines Ltd.) has reviewed the above named plan and has no objections subject to the following conditions:

1. Any existing land rights shall be carried forward in kind and registered on any newly created lots, public utility lots, or other properties.
2. Parking and/or storage is not permitted on ATCO Transmission facility(s) and/or right(s)-of-way.
3. Any revisions or amendments to the proposed plans(s) must be re-circulated to ATCO Transmission for further review.

If you have any questions or concerns, please contact the undersigned at hp.circulations@atco.com."



(g) Thank you for contacting FortisAlberta regarding the above application for subdivision. We have reviewed the plan and determined that no easement is required by FortisAlberta.

FortisAlberta is the Distribution Wire Service Provider for this area. The developer can arrange installation of electrical services for this subdivision through FortisAlberta. Please have the developer contact 310-WIRE (310-9473) to make application for electrical services.

Please contact FortisAlberta land services at landserv@fortisalberta.com or by calling (403) 514-4783 for any questions.

(h) Lethbridge Northern Irrigation District (LNID) – Alan Harrold, General Manager:

"The above noted Application for Subdivision has been reviewed by the Lethbridge Northern Irrigation District (LNID) and is approved subject to the following conditions:

1. Payment in full of any outstanding irrigation rates that may be assessed on the original parcel at the time of finalization of the subdivision.
2. Payment of the District's subdivision administration fee. The current fee is $630.00 (includes GST).
3. Approximately 4.24 acres assessed as "irrigation acres" cannot be re-arranged to suitable areas within the parcel and must be either transferred to another 50 acre minimum irrigation parcel or removed from the Assessment Roll.
4. A Water Agreement suitable to meet the needs of the proposed subdivision may be required if the proposed new subdivision requires the use of irrigation water.
5. Any future permanent structures such as buildings with footings, pilings or foundations, septic tanks/ fields/mounds, barns/shops, and silage pits, etc., must meet the minimum set-back distance of 30 meters (100 ft.) from the outside toe of the canal bank.
6. An Easement for the subdivided parcel for access to water from the District's works must be in place for the supply of domestic/yard usage water.
7. Any alteration to District works required as a result of this subdivision is subject to District approval and payment by the applicant of all applicable costs.

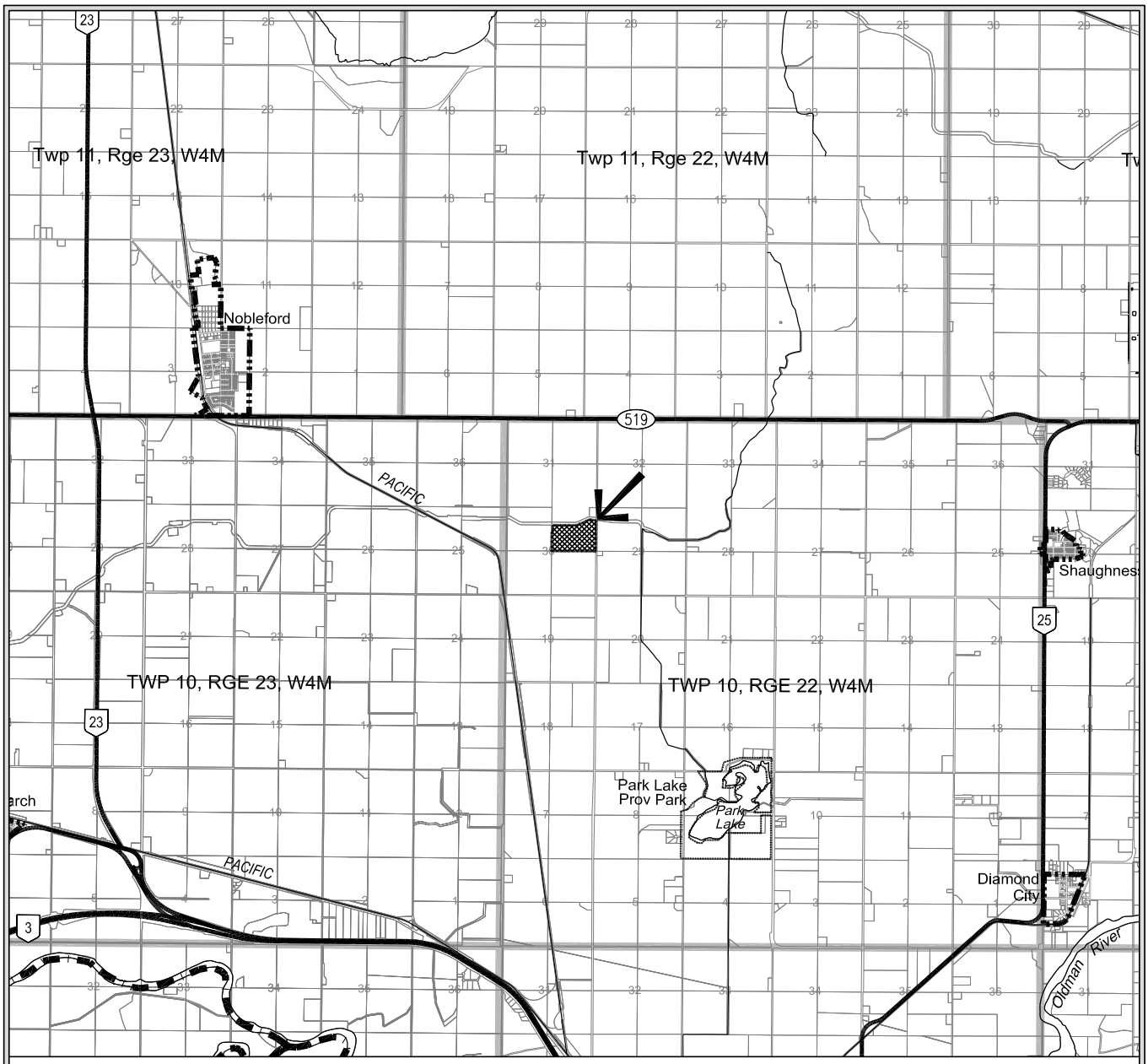
Thank you for the opportunity to comment. If you require more information or would like to set up an appointment to discuss the conditions above, please contact Janet Beck, Land Agent, at the Lethbridge Northern Irrigation District Office, 403-327-3302."

_____ _____

MOVER REEVE

_____

DATE



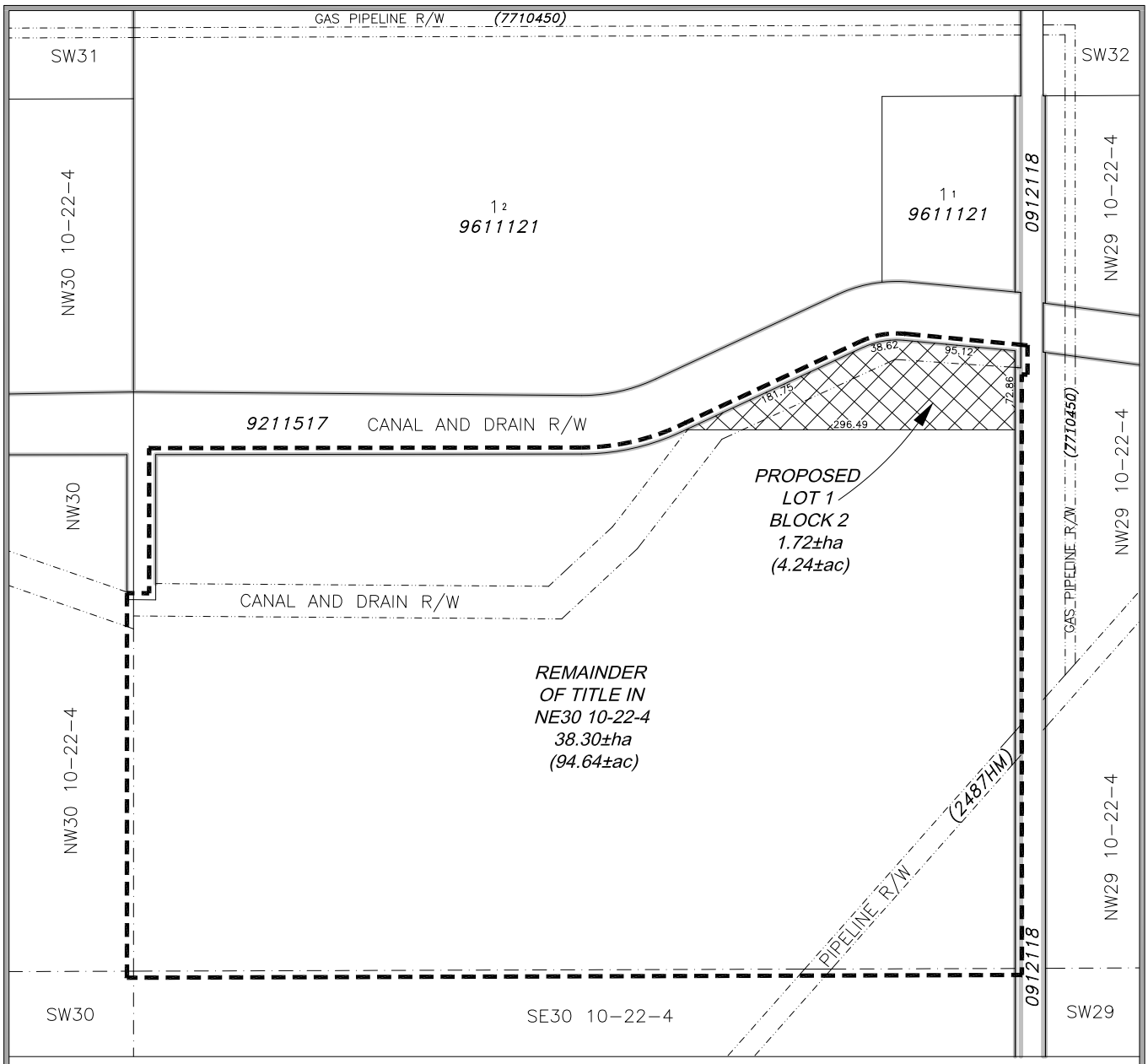

SUBDIVISION LOCATION SKETCH
WITHIN NE 1/4 SEC 30, TWP 10, RGE 22, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 20, 2023
FILE No: 2023-0-037

MAP PREPARED BY:
OLDMAN RIVER REGIONAL SERVICES COMMISSION
3105 16th AVENUE NORTH, LETHBRIDGE, AB T1H 5E8
"NOT RESPONSIBLE FOR ERRORS OR OMISSIONS"

OLDMAN RIVER REGIONAL SERVICES COMMISSION

March 20, 2023 N:\Subdivision\2023\2023-0-037.dwg

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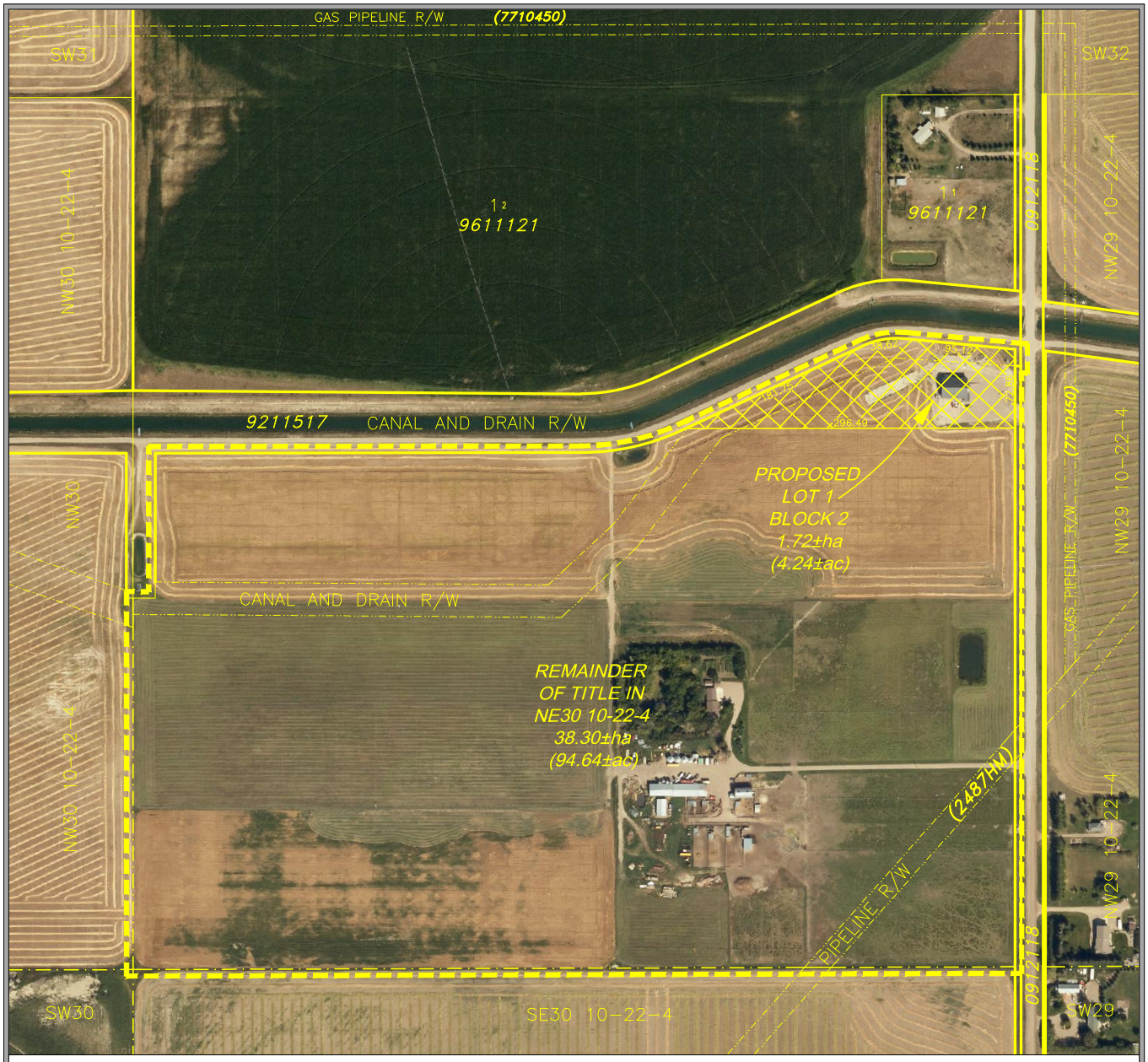

SUBDIVISION SKETCH
WITHIN NE 1/4 SEC 30, TWP 10, RGE 22, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 20, 2023
FILE No: 2023-0-037

OLDMAN RIVER REGIONAL SERVICES COMMISSION

0 Metres 100 200 300 400

N

March 21, 2023 N:\Subdivision\2023\2023-0-037.dwg



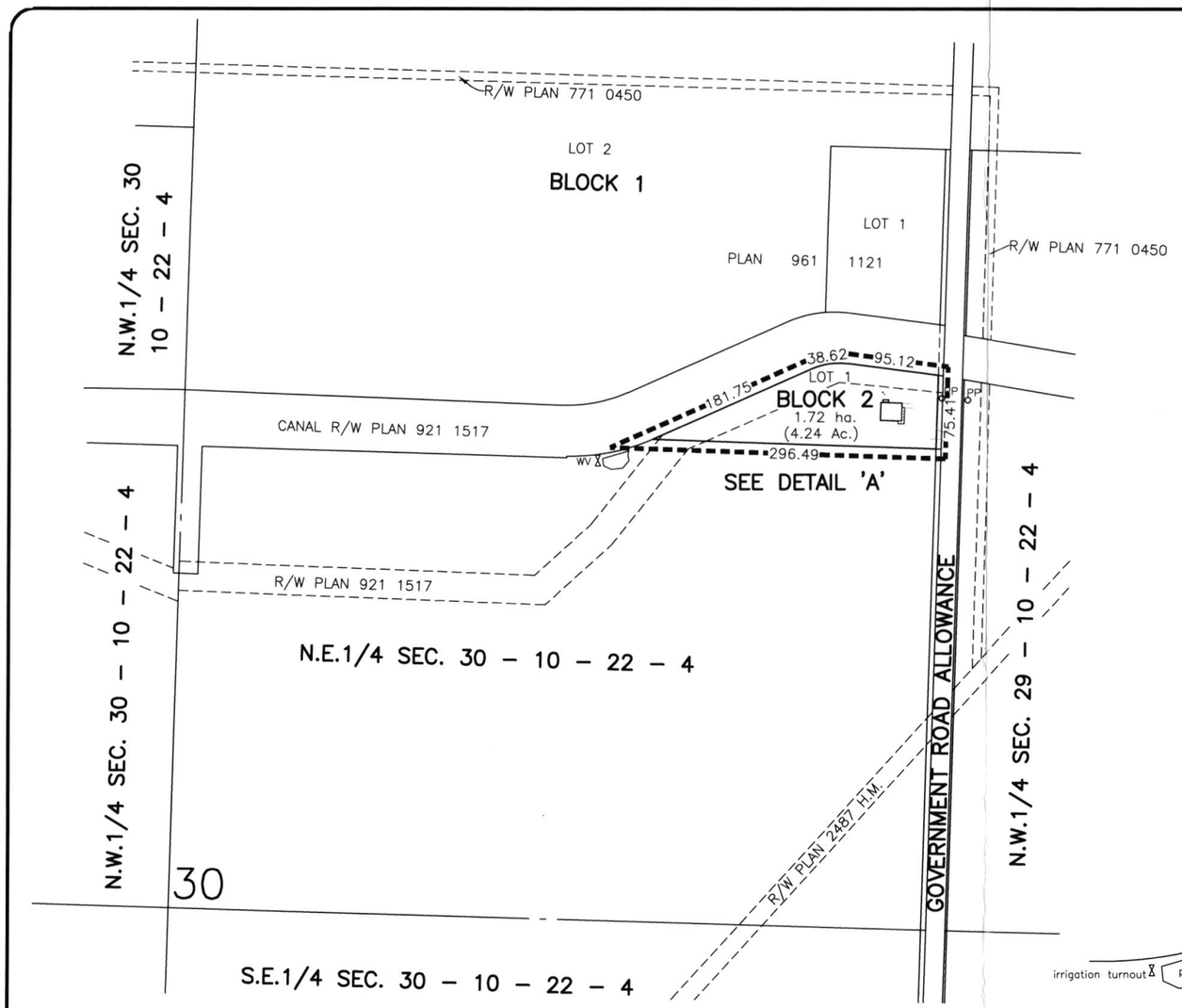

SUBDIVISION SKETCH
WITHIN NE 1/4 SEC 30, TWP 10, RGE 22, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 20, 2023
FILE No: 2023-0-037

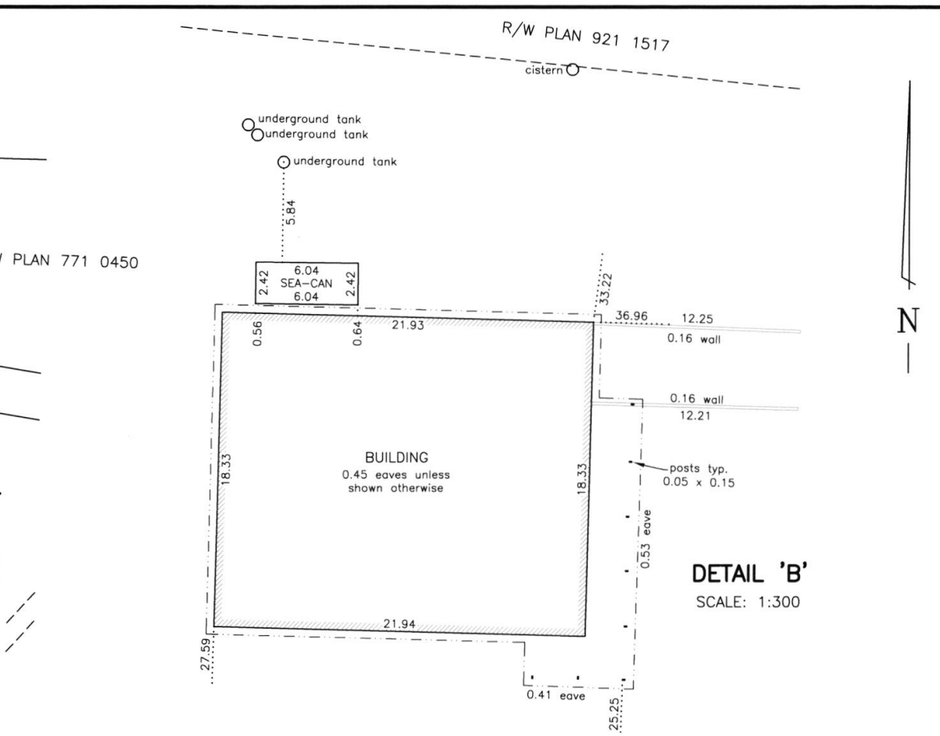
OLDMAN RIVER REGIONAL SERVICES COMMISSION

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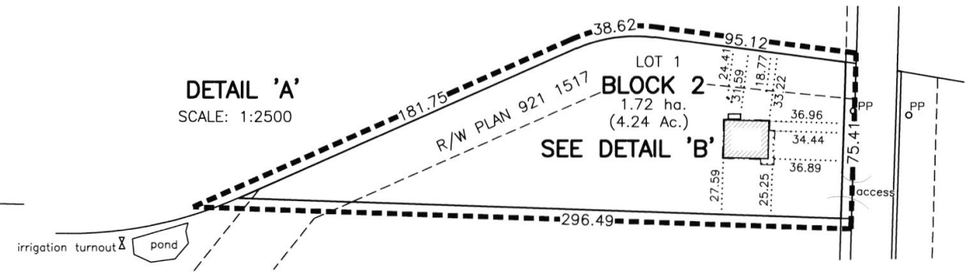
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***AERIAL PHOTO DATE: 2018***




DETAIL 'B'
SCALE: 1:300




| NO. | REVISION | DATE | BY |
|---|---|---|---|
| | | | |

NOTE : Portion to be approved is outlined thus ---------- and contains approximately 1.72 ha.
Distances are in metres and decimal parts thereof.

Distances and areas are approximate and are subject to change upon final survey.

# ALLAN & JOANNE VANDENBROEK

TENTATIVE PLAN SHOWING SUBDIVISION
of part of
N.E.1/4 SEC. 30, TWP. 10, RGE. 22, W.4 M.

Lethbridge County


brown okamura & associates ltd.
Professional Surveyors
2830 – 12 Avenue North, Lethbridge, Alberta


| APPROVED | DRAWN MJ | DATE MAR 7/23 |
|---|---|---|
| | CHECKED DJA | JOB 23–15939 |
| D.J. Amantea, A.L.S. | SCALE 1:5000 | DRAWING 23–15939TA |

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Subdivision Application #2023-0-038 – Neher/Hohlbein<br>- Lot 8, Block 1, Plan 1712357 & Lot 11, Block 1, Plan 2111421 within N1/2 5-10-21-W4M |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | ORRSC |
| **Report Author:** | Steve Harty |

**APPROVAL(S):**

| | |
|---|---|
| Hilary Janzen, Supervisor of Planning & Development | Approved - 20 Apr 2023 |
| Larry Randle, Interim Chief Administrative Officer | Approved - 21 Apr 2023 |

**STRATEGIC ALIGNMENT:**


Governance


Relationships


Region


Prosperity

**EXECUTIVE SUMMARY:**

The application is to reconfigure the layout (property boundaries) and title acreage size of two adjacent parcels though subdivision and consolidation, by adjusting titles 37.06 & 43.45 acres in size and creating reconfigured new titles 14.00 & 66.61 acres respectively in size, for county residential use. The proposal meets the subdivision criteria of the Land Use Bylaw.

**RECOMMENDATION:**

That S.D. Application #2023-0-038 be approved subject to the conditions as outlined in the draft resolution.

**REASON(S) FOR RECOMMENDATION(S):**

The proposed subdivision meets the provincial Subdivision and Development Regulations and the municipal reconfiguration of title subdivision policies as stated in the Land Use Bylaw.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

- LUB No. 1404 contains policies and subdivision criteria to allow a realignment/reconfiguration of titles and property lines without an increase in titles of what would normally be permitted.
- The LUB No. 1404 reconfiguration of titles policy enables land boundaries to be realigned based on factors such as the improvements present, land use, developable land areas, access, and the rationale of the land swap with consideration for final parcel sizes.
- The subdivision criteria stipulate there is to be a developable building site and no parcel shall be less than 2.0-acres in size.
- A reconfiguration of titles subdivision is considered at the discretion of the Subdivision Authority, with a determination if the proposal is a logical and rational use of the land.

**BACKGROUND INFORMATION:**

Located immediately west of the Oldman River boundary, 1-mile east of the Hamlet of Diamond City. The proposal is for a land swap and a reconfiguration/parcel size adjustment between adjacent titles.

The purpose is to reduce the 37.06-acre lot size (to 14.00-acres) and separate the dwelling on the south portion from the sheds and moveable animal shelters on the north portion. This involves subdividing 23.06-acres of land and consolidating it with a separate title to the west comprised of 43.45-acres (thereby enlarging it to 66.61-acres) so there will be no additional standalone title. The existing west 43.45-acre title contains no improvements. It is pasture coulee land and contains the main existing private driveway that goes into the river bottom and which provides access to adjacent neighboring titles. All the existing parcels take legal access from the private access road, provided through long-standing easement agreements, which will not change with the subdivision as proposed. The reconfiguration will result in the opportunity for a building site outside the flood hazard zone and the potential for a future additional dwelling to be constructed in the river valley and take access by a private easement. The existing dwelling is serviced by the potable water co-op and has a private septic field system for sewage. The on-site septic system will remain within the 14.00-acre parcel boundary of the smaller title associated with the existing dwelling. The province has identified the land as potentially containing Historical Resources of a category HRV 5a,P (archaeological & paleontological) and a smaller area of HRV 4a (archaeological) on the western coulee lands containing the access roadway.

Overall, the proposal meets the County's Land Use Bylaw No. 1404 criteria for a reconfiguration/realignment of titles subdivision with no additional titles created. The Subdivision Authority has the discretion to determine if it is logical or if it creates a problematic situation for future development. The application was circulated to the required external agencies with no concerns expressed and no utility easements requested. (AB Culture has not responded regarding Historical Resources Act approval at time of agenda preparation.)

**ALTERNATIVES / PROS / CONS:**

The Subdivision Authority could not approve the subdivision if it is determined the proposed boundary reconfiguration is not suitable and the titles would remain as is.

Pros:

- there would not be the potential for a new additional dwelling to be constructed that would take access from a private access easement and not a public roadway, and possible future requests to the County to take over the access roadway

Cons:

- the bylaw criteria have been met and a refusal would be appealed by the applicants to the LPRT

**FINANCIAL IMPACT:**

None at this time. However, there may be future pressure for the County to take over the private access roadway and maintain it as a public roadway.

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

5A Lethbridge County 2023-0-038

Diagrams for Lethbridge County 2023-0-038
Diagrams color

# RESOLUTION

2023-0-038

**Lethbridge County** **Country Residential** subdivision of Lot 8, Block 1, Plan 1712357 and Lot 11, Block 1, Plan 2111421 within N1/2 5-10-21-W4M

THAT the Country Residential subdivision of Lot 8, Block 1, Plan 1712357 and Lot 11, Block 1, Plan 2111421 within N1/2 5-10-21-W4M (Certificate of Title No. 211 168 948 +2, 211 168 948 +3), to reconfigure the layout (property boundaries) and title acreage size amounts of two adjacent parcels though subdivision and consolidation, by adjusting titles 37.06 & 43.45 acres (14.99 & 17.58 ha) in size and creating reconfigured new titles 14.00 & 66.61 acres (5.67 & 26.95 ha) respectively in size, for county residential use; BE APPROVED subject to the following:

**CONDITIONS:**

1. That, pursuant to Section 654(1)(d) of the Municipal Government Act, all outstanding property taxes shall be paid to Lethbridge County.
2. That, pursuant to Section 655(1)(b) of the Municipal Government Act, the applicant or owner or both enter into and comply with a Development Agreement with Lethbridge County which shall be registered concurrently with the final plan against the title(s) being created.
3. That the applicant submits a surveyed plan as prepared by an Alberta Land Surveyor that certifies the exact location and dimensions of the parcels being subdivided. The titles and portions of land to be subdivided and consolidated to reconfigure the boundaries (property line) of the two adjacent parcels, are to be done by a plan prepared by a certified Alberta Land Surveyor in a manner such that the resulting titles cannot be further subdivided without approval of the Subdivision Authority.
4. That the existing access easements for property owners shall remain as registered on title(s) to enable landowners to continue to use the private road access.
5. The applicant must meet any requirements of Alberta Culture for Historical Resources and is responsible for submitting a Historic Resources (HR) Application to Alberta Culture via the Online Permitting and Clearance (OPaC) system as applicable. A copy in writing of any Historical Resources Act exemption or clearance must be provided to the Subdivision Authority prior to final endorsement.

**REASONS:**

1. The proposed subdivision is consistent with the South Saskatchewan Regional Plan and complies with both the Municipal Development Plan and Land Use Bylaw.
2. The Subdivision Authority is satisfied that the proposed subdivision is suitable for the purpose for which the subdivision is intended pursuant to Section 9 of the Matters Related to Subdivision and Development Regulation.
3. The Subdivision Authority has determined the subdivision is in accordance with the County's subdivision criteria as a reconfiguration of titles, with no additional titles being created above what presently exist. In this situation, separate standalone titles are not being created, but the land being subdivided and consolidated is between existing titles.

**INFORMATIVE:**

(a) The payment of Municipal Reserve is not applicable on the parcel pursuant to Section 663 of the MGA, as the application is a reconfiguration of titles with no additional titles created.

(b) That a legal description for the proposed parcel be approved by the Surveys Branch, Land Titles Office, Calgary.

(c) The applicant/owner is advised that other municipal, provincial or federal government or agency approvals may be required as they relate to the subdivision and the applicant/owner is responsible for verifying and obtaining any other approval, permit, authorization, consent or license that may be required to subdivide, develop and/or service the affected land (this may include but is not limited to Alberta Environment and Protected Areas, Alberta Transportation, and the Department of Fisheries and Oceans.)

(d) Telus Communications Inc has no objection.

(e) Thank you for contacting FortisAlberta regarding the above application for subdivision. We have reviewed the plan and determined that no easement is required by FortisAlberta.

FortisAlberta is the Distribution Wire Service Provider for this area. The developer can arrange installation of electrical services for this subdivision through FortisAlberta. Please have the developer contact 310-WIRE (310-9473) to make application for electrical services.

Please contact FortisAlberta land services at landserv@fortisalberta.com or by calling (403) 514-4783 for any questions.

(f) Alberta Agriculture and Irrigation, Water Infrastructure and Operations Branch has reviewed the lands in question and has no comments concerns to add.

(g) ATCO Gas has no objection to the proposed boundary adjustment.

(h) The above noted Application for Subdivision 2023-0-038 (Hohlbein) has been reviewed by the Lethbridge Northern Irrigation District (LNID) and is approved subject to the following condition:

1. Payment of the District's subdivision endorsement for consent fee. The current fee is $52.50 (includes GST).

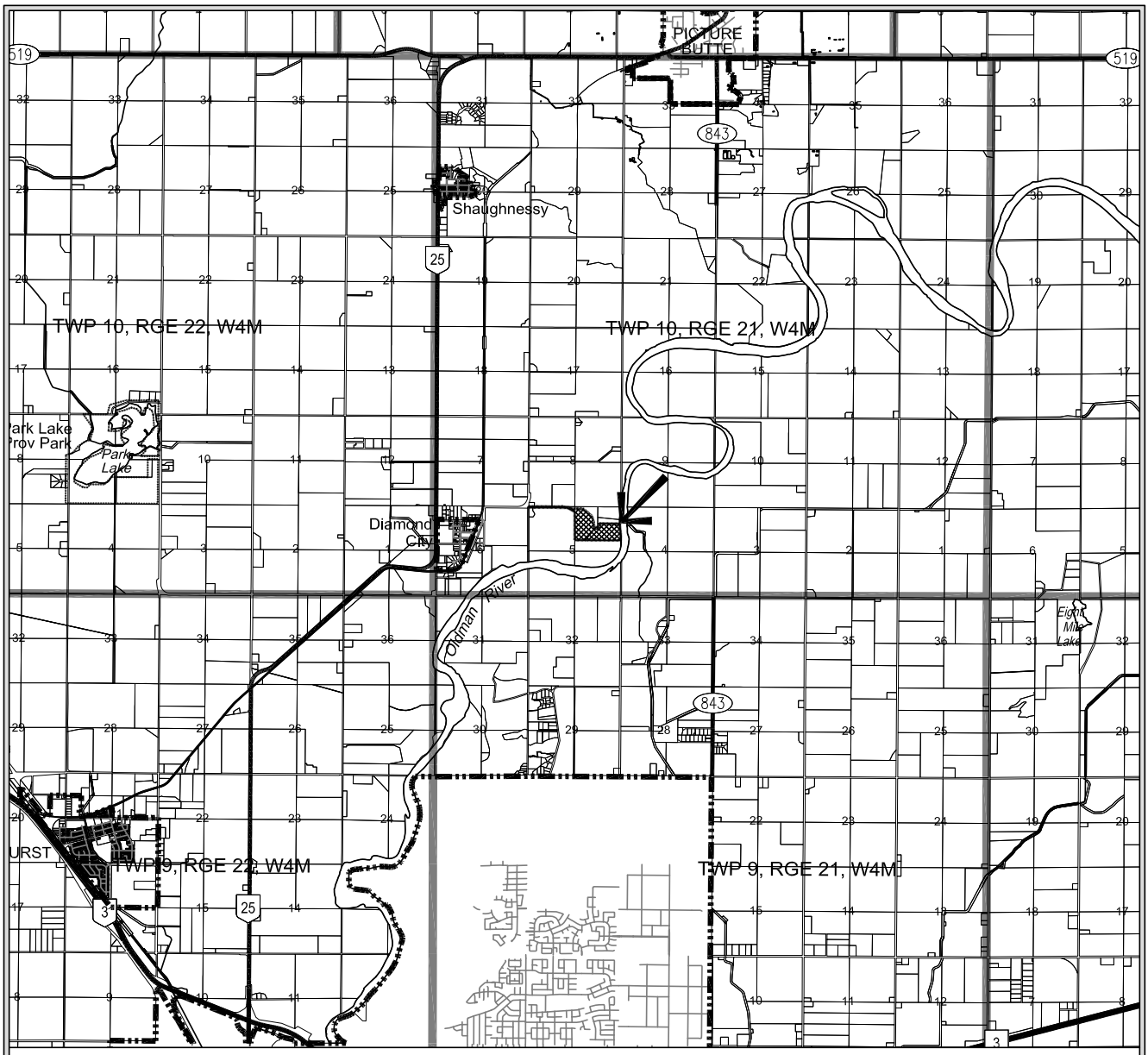
Thank you for the opportunity to comment on this proposed development.

_____ _____

MOVER REEVE

_____

DATE



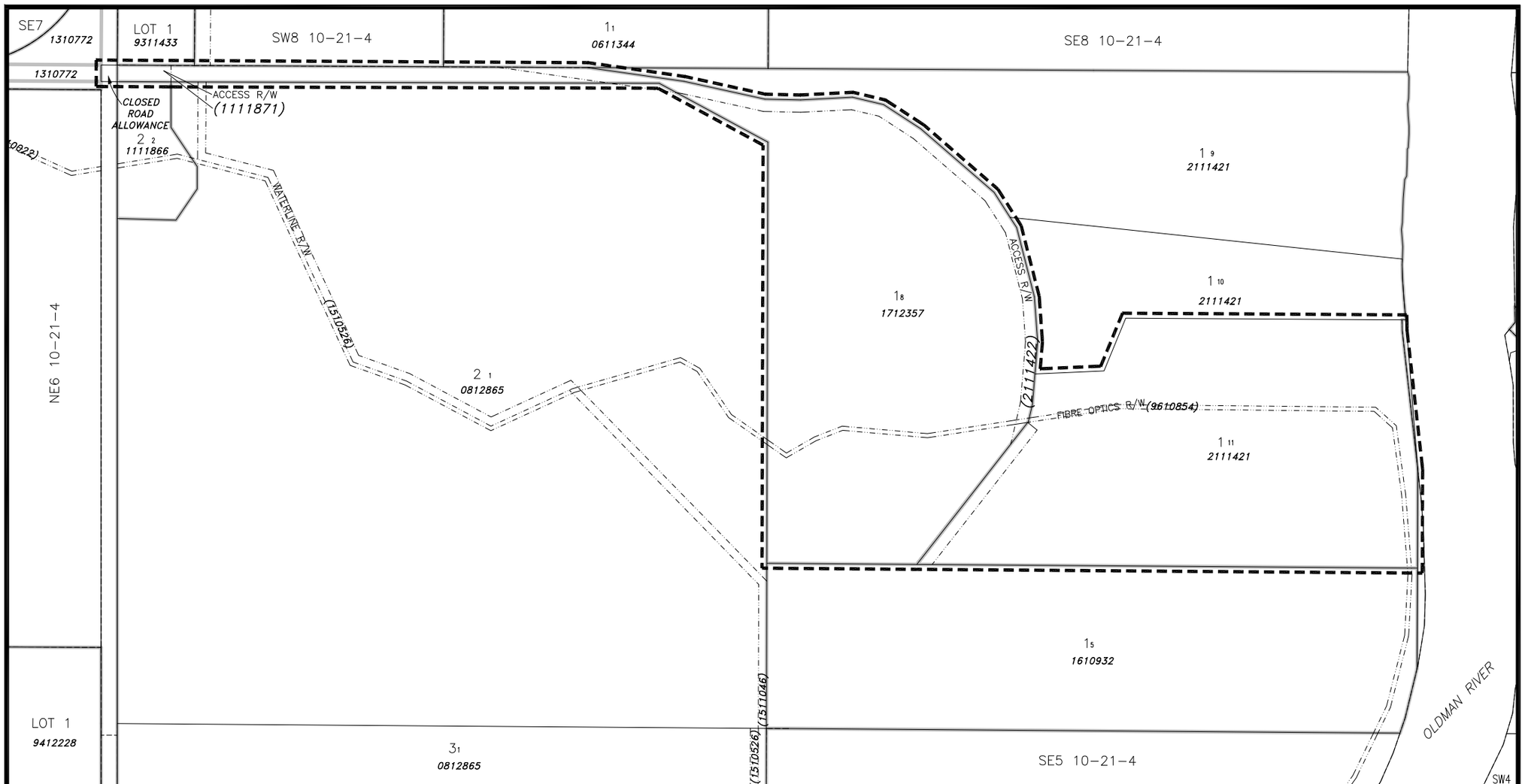

SUBDIVISION LOCATION SKETCH
LOT 8, BLOCK 1, PLAN 1712357 & LOT 11, BLOCK 1, PLAN 211421
WITHIN N 1/2 SEC 5, TWP 10, RGE 21, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 27, 2023
FILE No: 2023-0-038

MAP PREPARED BY:
OLDMAN RIVER REGIONAL SERVICES COMMISSION
3105 16th AVENUE NORTH, LETHBRIDGE, AB T1H 5E8
"NOT RESPONSIBLE FOR ERRORS OR OMISSIONS"

OLDMAN RIVER REGIONAL SERVICES COMMISSION

March 28, 2023 N:\Subdivision\2023\2023-0-038.dwg

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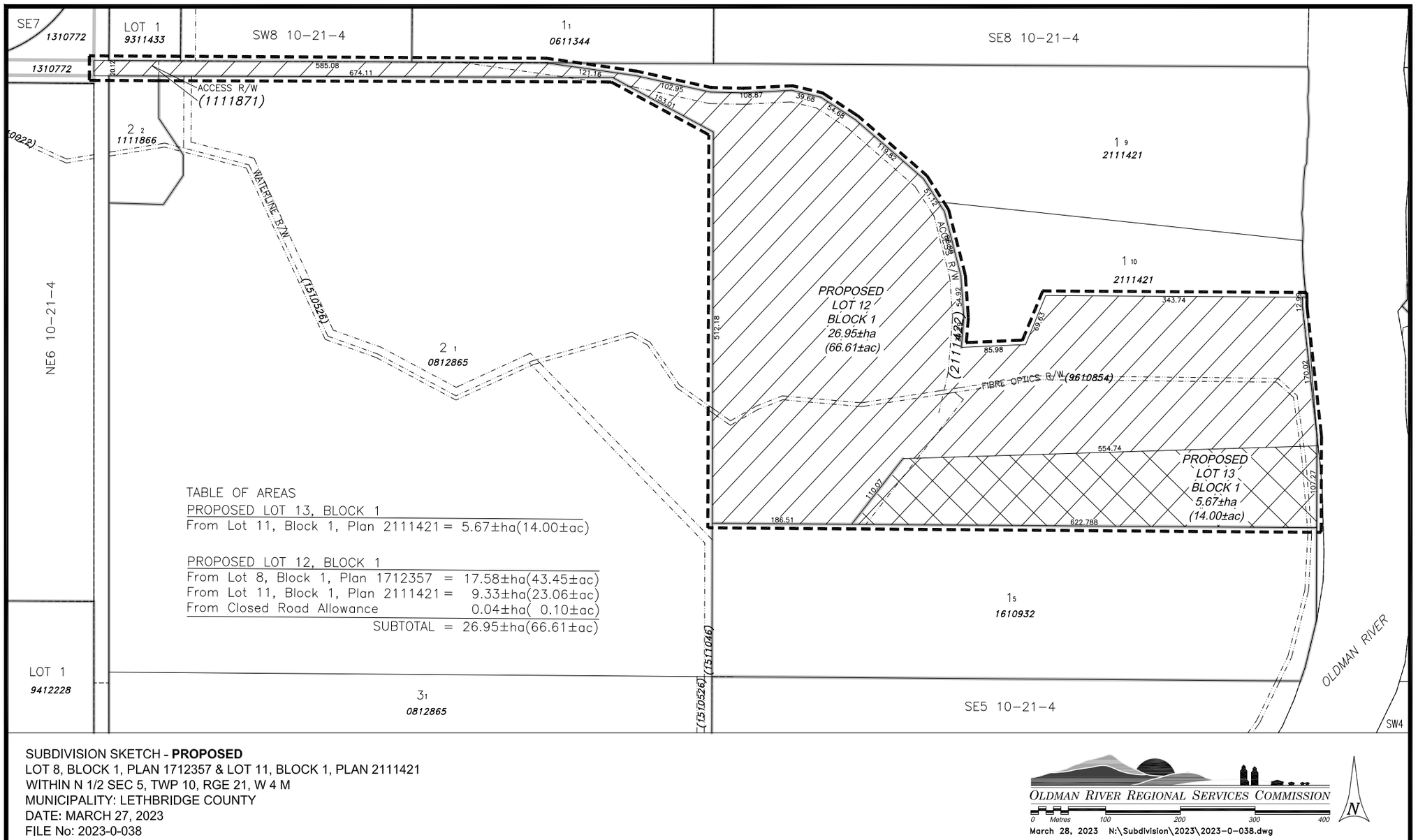

SUBDIVISION SKETCH - **EXISTING**
LOT 8, BLOCK 1, PLAN 1712357 & LOT 11, BLOCK 1, PLAN 211421
WITHIN N 1/2 SEC 5, TWP 10, RGE 21, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 27, 2023
FILE No: 2023-0-038

OLDMAN RIVER REGIONAL SERVICES COMMISSION

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March 28, 2023 N:\Subdivision\2023\2023-0-038.dwg

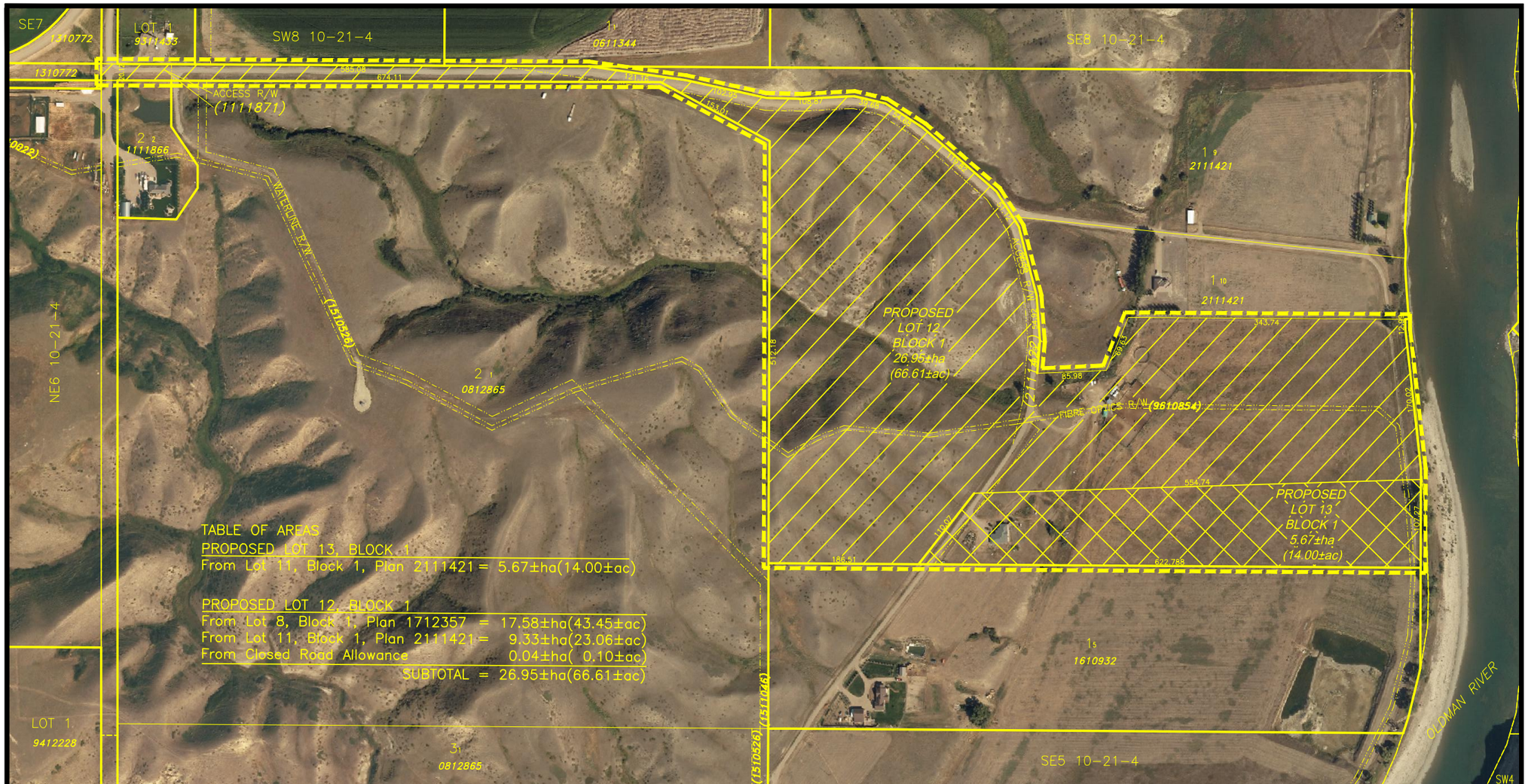



SUBDIVISION SKETCH - **PROPOSED**
LOT 8, BLOCK 1, PLAN 1712357 & LOT 11, BLOCK 1, PLAN 2111421
WITHIN N 1/2 SEC 5, TWP 10, RGE 21, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 27, 2023
FILE No: 2023-0-038

OLDMAN RIVER REGIONAL SERVICES COMMISSION

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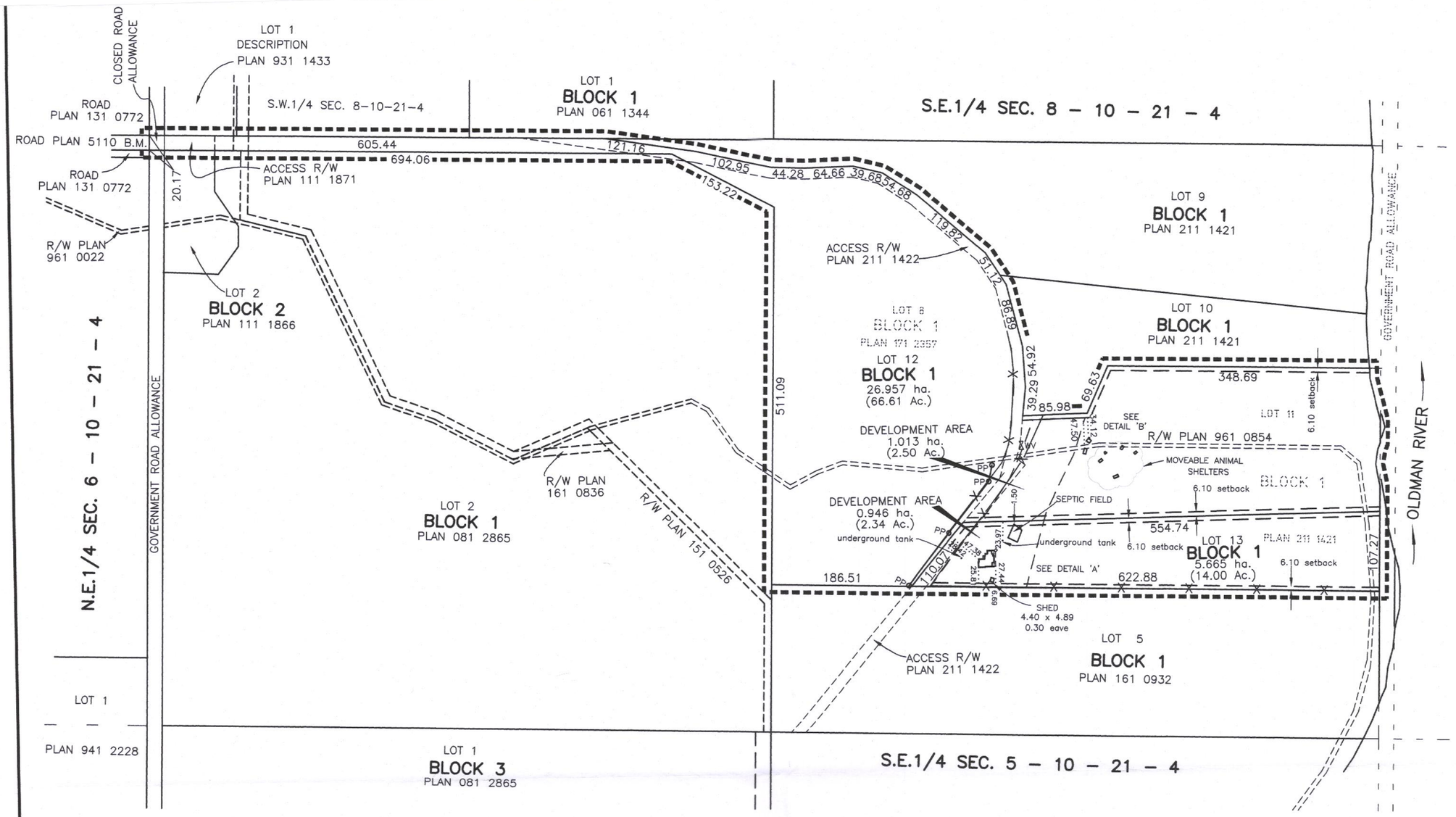
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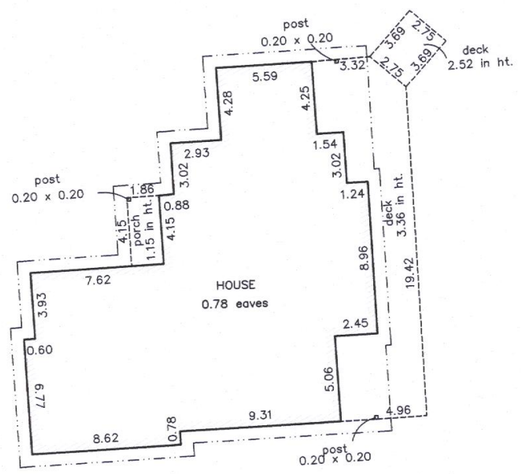

*AERIAL PHOTO DATE: 2018*

SUBDIVISION SKETCH - **PROPOSED**
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WITHIN N 1/2 SEC 5, TWP 10, RGE 21, W 4 M
MUNICIPALITY: LETHBRIDGE COUNTY
DATE: MARCH 27, 2023
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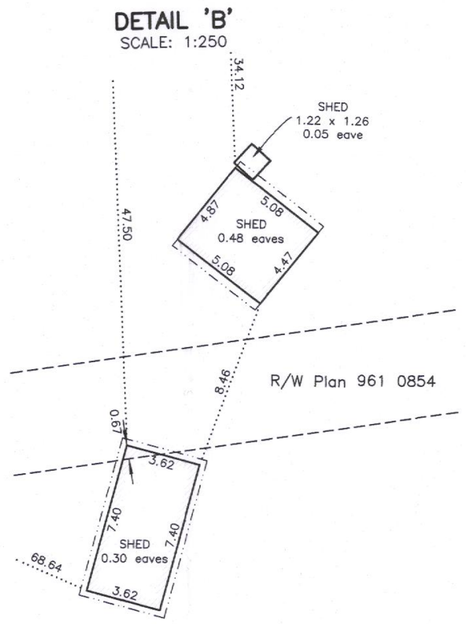
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March 28, 2023 N:\Subdivision\2023\2023-0-038.dwg




## DETAIL 'A'
SCALE: 1:200




## DETAIL 'B'
SCALE: 1:250




## TABLE OF AREAS

LOT 12; BLOCK 1

within Closed Government Road Allowance= 0.040 ha.
within Lot 8; Block 1; Plan 171 2357=17.583 ha.(C. of T. 231 060 580 +2)
within Lot 11; Block 1; Plan 211 1421= 9.334 ha.(C. of T. 211 168 948 +2)
sub-total=26.957 ha.

LOT 13; BLOCK 1

within Lot 11; Block 1; Plan 211 1421= 5.665 ha.(C. of T. 211 168 948 +2)
Total=32.622 ha.

| NO. | REVISION | DATE | BY |
|---|---|---|---|
| 1 | Revised Lot Size | Mar.15/23 | cjb |

Improvements shown were copied from tentative plan by BOA file #20-15113TA Dated: Jan. 11/21

NOTE : Portion to be approved is outlined thus ▬▬▬▬▬▬▬▬▬▬ and contains approximately 32.622 ha.
Distances are in metres and decimal parts thereof.

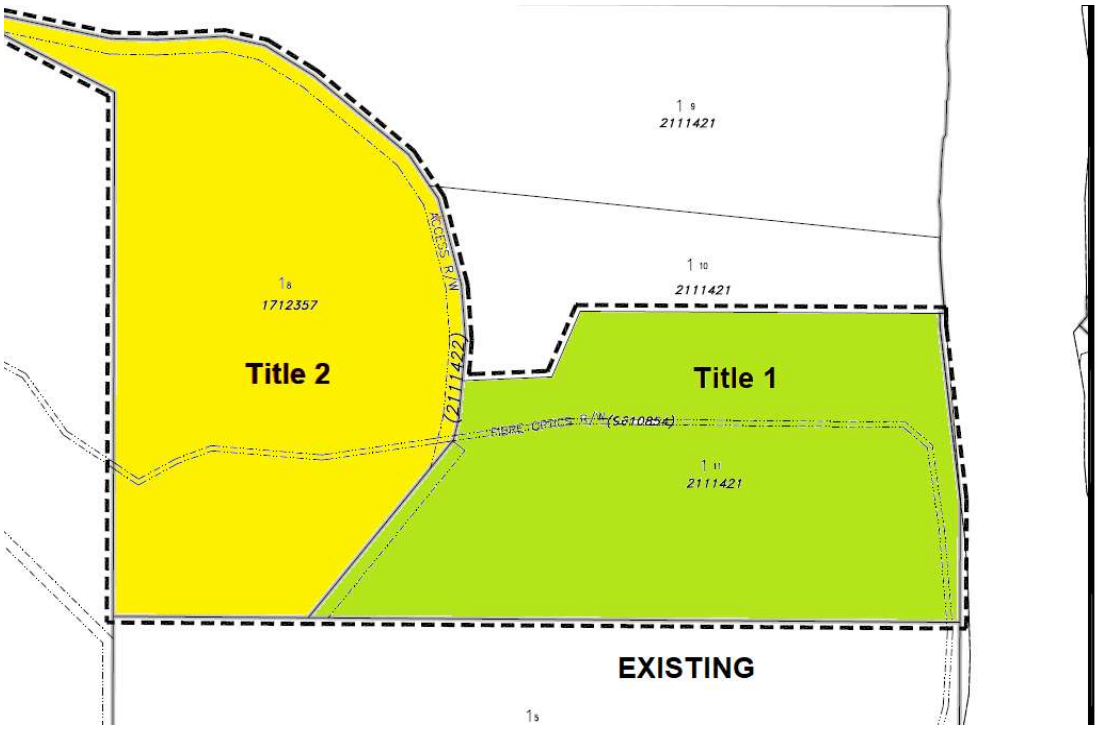
Distances and areas are approximate and are subject to change upon final survey.

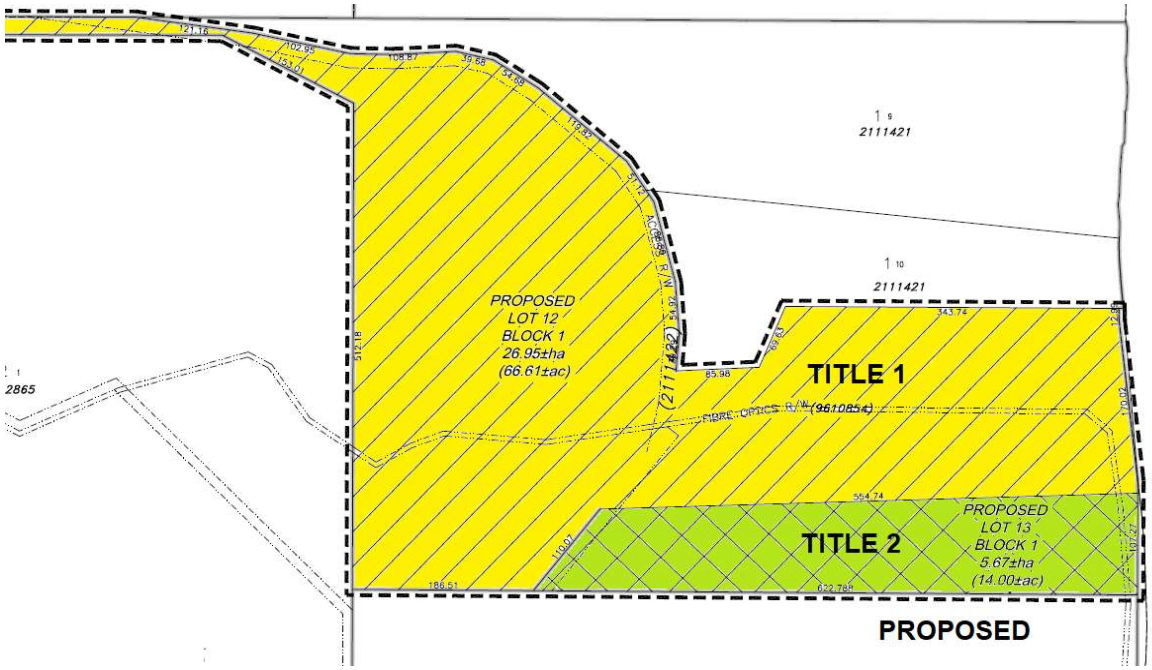
# SERENA HOHLBEIN

TENTATIVE PLAN SHOWING SUBDIVISION
of part of
GOVERNMENT ROAD ALLOWANCE
and all of
LOT 8; BLOCK 1; PLAN 171 2357 & LOT 11; BLOCK 1; PLAN 211 1421
all within
N.1/2 SEC. 5; TWP. 10; RGE. 21; W.4 M.
LETHBRIDGE COUNTY

brown okamura & associates ltd.
Professional Surveyors
2830 - 12th Avenue North, Lethbridge, Alberta

| | | | |
|---|---|---|---|
| APPROVED | DRAWN CJB | DATE MARCH 1/23 | |
| | CHECKED DJA | JOB 23-15941 | |
| D. J. Amantea, A.L.S. | SCALE 1:5000 | DRAWING 23-15941T | |


1 9
2111421
1 10
2111421
1 8
1712357
Title 2
Title 1
ACCESS R/W (2111422)
FIBRE OPTICS R/W (S61085K)
1 11
2111421
EXISTING


1 9
2111421
1 10
2111421
PROPOSED
LOT 12
BLOCK 1
26.95±ha
(66.61±ac)
ACCESS R/W (2111422)
TITLE 1
FIBRE OPTICS R/W (961085K)
TITLE 2
PROPOSED
LOT 13
BLOCK 1
5.67±ha
(14.00±ac)
PROPOSED

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Bylaw 23-008 - Amendment to Bylaw 18-012 being the Chinook Industrial Park Area Structure Plan and Bylaw and Bylaw 23-009 - Land Use Bylaw Amendment from Lethbridge Urban Fringe To Rural General Industrial and Business Light Industrial - Public Hearing |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | Community Services |
| **Report Author:** | Hilary Janzen |

**APPROVAL(S):**

Larry Randle, Interim Chief Administrative Officer — Approved - 24 Apr 2023

**STRATEGIC ALIGNMENT:**



**Governance** ☒ **Relationships** ☐ **Region** ☐ **Prosperity** ☐

**EXECUTIVE SUMMARY:**

- Bylaw 23-008 proposes to amend the Chinook Industrial Area Structure Plan to align with the development objectives of the current landowner and development group. The amendments address servicing (water and on-site waste water treatment), access, storm-water management, and future land use of the area.
- Bylaw 23-009 proposing to amend the Land Use Bylaw by re-designating a portion of Plan 1113173 Block 1 Lot 5 from Lethbridge Urban Fringe to Rural General Industrial and Business Light Industrial.

**RECOMMENDATION:**

That Bylaw 23-008 be read a second time.
That Bylaw 23-009 be read a second time.

That Bylaw 23-008 be read a third time.
That Bylaw 23-009 be read a third time.

**REASON(S) FOR RECOMMENDATION(S):**

The proposed bylaws meet the policy requirements of the Lethbridge County and City of Lethbridge Intermunicipal Development Plan and the Lethbridge County Municipal Development Plan.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

- The Chinook Industrial Park Area Structure Plan (Bylaw 18-012) was approved by County Council on November 15, 2018.
- First Reading of the Bylaws 23-008 and 23-009 was held on April 6, 2023

**BACKGROUND INFORMATION:**

Bylaw 23-008 proposes to amend the existing Chinook Industrial Park Area Structure Plan. The proposed amendments align with the development objectives of the current landowner and address the following:

- servicing of the sites for water and on-site waste water treatment as they no longer desire municipal waste water services
- amend the road network within the plan area and update the Traffic Impact Assessment
- update the storm-water management plan
- update the land use districts proposed within the plan area
- update the phasing and implementation of development for the plan area

Bylaw 23-009 proposes to re-designate a portion of Plan 1113171 Block 1 Lot 5 from Lethbridge Urban Fringe to Rural General Industrial and Business Light Industrial. The intent of this application is to allow for the future subdivision and development of the parcel for industrial and commercial uses.

The application has been circulated to all County Departments, the City of Lethbridge and external agencies for review and comment. No concerns were expressed from from Telus, ATCO Gas, Alberta Transportation, ORRSC, and Fortis. Comments from the SMRID and ORRSC have been addressed in the document presented to County Council at first reading of the Bylaw.

The City of Lethbridge also provided comments and some amendments were made to the ASP to reflect some of their concerns:

- Removal of the reference to the City of Lethbridge Engineering Standards and only include the Lethbridge County Standards
- Added text to end of Section 7 (Roads) regarding the road and intersection improvements that reflect earlier conversations with the City (September 2022)

The other items they raised will be handled at later stages in the development process:

- On-site parking and landscaping will be addressed at the development permitting stage.
- The development agreement at the time of subdivision will address the improvements that are required at each phase of the development (i.e. improvements to roads and intersections).
- The Developer and the County will work with the City of Lethbridge during the detailed design stage (subdivision) to address any additional concerns regarding the TIA.

The Planning and Development Department reviewed the applications and provides the following comments based on the County's current policies:

The proposed amendments to the Area Structure Plan conform to the policies of the County's Municipal Development Plan (Bylaw 22-001) as well as the Lethbridge County and City of Lethbridge Intermunicipal Development Plan. In addition, the lands proposed in the ASP have been identified in the Lethbridge County Industrial-Commercial Land Use Strategy as an area for future growth.

The bylaws were advertised in the April 11 and 18 editions of the Sunny South News and also mailed to the adjacent landowners.

**ALTERNATIVES / PROS / CONS:**

County Council may refuse second reading of Bylaw 23-008 and 23-009.
Pros - none identified
Cons - loss of development opportunities and tax revenue.

**FINANCIAL IMPACT:**

If the bylaws are approved, future development would be taxed at the County's tax rate.

**LEVEL OF PUBLIC PARTICIPATION:**

☐ Inform ☐ Consult ☒ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

Amendments to Byalw 18-012 Clean Draft
Amendments to Byalw 18-012 Redline Draft
Appendix A - Traffic Impact Assessment
Appendix B - Stormwater Management Plan
Appendix C - Geotechnical Evaluation
Appendix D - Phase I ESA
Bylaw 23-009 - Signed First Reading
Bylaw 23-008 - Signed First Reading
Telus Response
SMRID Comments March 14 2023
Fortis Response
Chinook Industrial ASP Amendment - City Comments_March 2023_to County - Received March 24 2023
Email from City - Sept 2022
AT Comments - March 20 2023
AT Comments - Bylaw 23-008
AT Comments - Bylaw 23-009
ACTO GAS Response
Applicant Response to External Comments 042023
Proposed Chinook Industrial ASP Amendment - Submission to May 4 Public Hearing

**CHINOOK INDUSTRIAL PARK**
**AREA STRUCTURE PLAN**

April 2023

Prepared for:

Sumus

Prepared by:

Stantec Consulting Ltd.

Project Number:

116549063

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APPENDIX B Stormwater Report
APPENDIX C Geotechnical Information
APPENDIX D Phase 1 Environmental Site Assessment

# 1. Introduction

## 1.1 PLAN AREA

The Chinook Industrial Area Structure Plan (ASP) consists of ±84.18 ha (±208.00 ac) of land (located within two quarter sections) in northeast Lethbridge County. The lands are bounded by 43 St N/City of Lethbridge boundary to the west, 9 Ave N to the south, the St. Mary River Irrigation District Canal to the east, and Township Road 92 to the north (herein referred to as the 'Plan Area'). There are undeveloped agricultural lands located to the east, some industrial development on the south and west sides, and a small pocket of residential lands on the north side, illustrated in Map 1.0.

## 1.2 HISTORY AND SURROUNDING CONTEXT

The existing Chinook Industrial ASP was approved by County Council in September 2018 (Bylaw 18-012). The previous iteration of the ASP detailed the two southernmost parcels as well as a portion of the south Stormpond area (Pond 100) on the east side. A business is existing in this area at the time of Plan creation.

Since the original adoption of this ASP the ownership of these lands has changed, and further detail is now needed to give direction on the Plan Area moving north. The ASP is also being fully reviewed and brought up to current planning and engineering standards as well as assessing the Plan against current market demands at the time of Plan adoption.

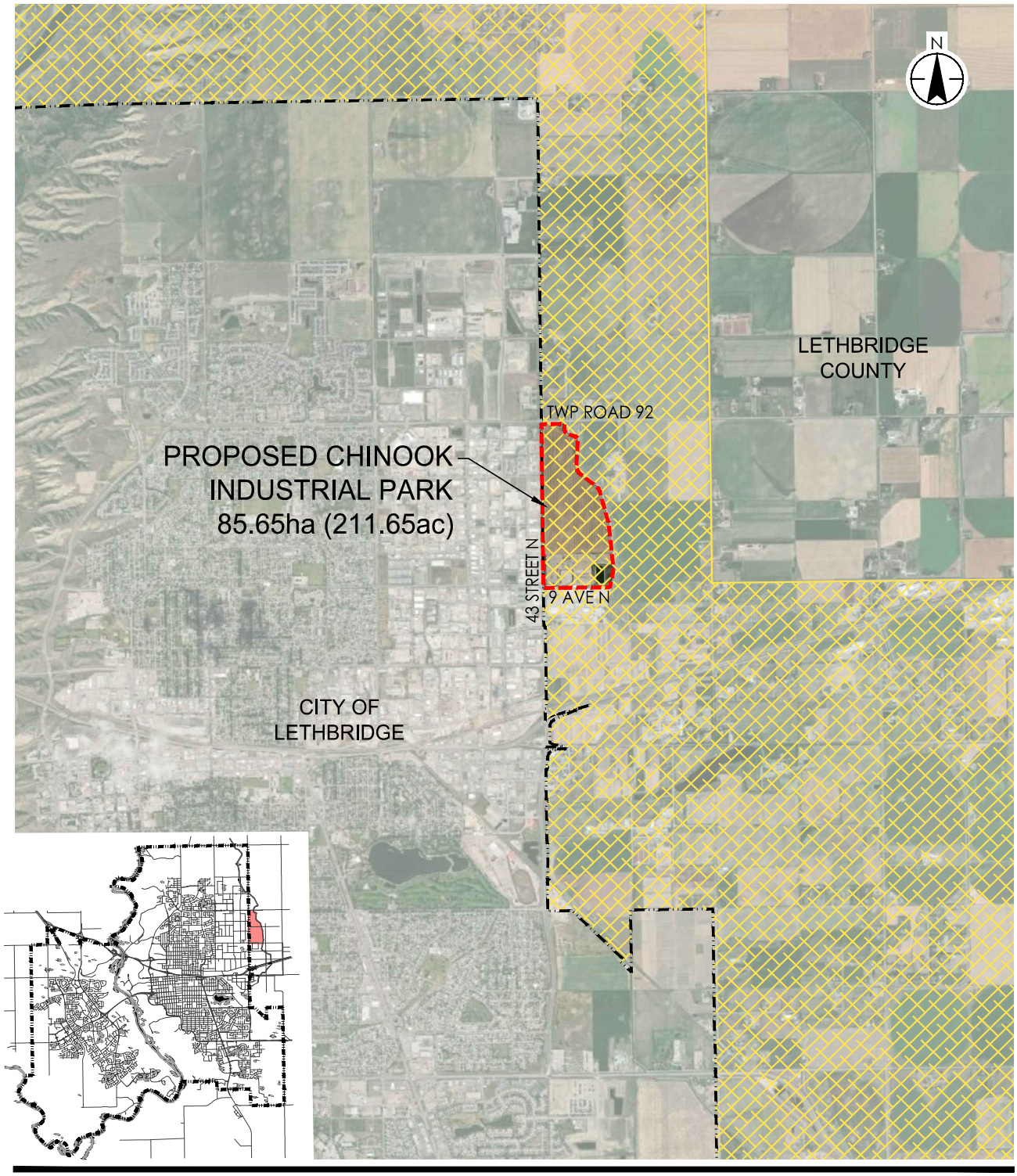
The amended ASP will provide a basis for evaluation of future applications for proposed Land Use Bylaw amendments (rezoning) and evaluation of subsequent subdivision applications.

The Chinook Industrial ASP consists of ±84.18 ha (±208.00 ac) of land (located within two quarter sections) in northeast Lethbridge County. The lands are bounded by 43rd St N/City of Lethbridge boundary to the west, 9th Ave N to the south, the St. Mary River Irrigation District Canal to the east, and Township Road 92 to the north. There are undeveloped agricultural lands located to the east, industrial development south and west, and a small pocket of residential lands on the north side, illustrated in Map 2.0.

This ASP describes the ultimate development of the Plan Area, which include portions of NW & SW Section 10, Township 9, Range 21, West of the 4th Meridian. The Plan Area is located adjacent to the northeast quadrant of the City of Lethbridge municipal boundary within Lethbridge County. These lands are Identified within the Industrial-Commercial Land Use Strategy and the Lethbridge County-

City of Lethbridge Intermunicipal Development Plan as a growth area for commercial and industrial development as well as the MDP as a Potential Business Park Area or a growth area.

Lot 7, Block 1, Plan 1911847 and Lot 4 Block 1 Plan 1113171 totaling approximately ±22.26 hectares (±55.00 acres), have been partially developed as a gravel parking area with an accessory warehouse building. Lot 5 Block 1 Plan 1113171 which is in the northern portion of the Plan Area consists of ±59.56 hectares (±147.18 acres) of undeveloped land. The remaining portion of the Plan Area is Lot 6PUL, Block 1, Plan 1410178, a ±4.38 hectares (±10.82 acres) Lethbridge County Public Utility Lot which acts as a stormwater detention pond. The total development area is ±86.20 hectares (±213.00 acres) in size.




MAP 1.0 | CHINOOK INDUSTRIAL PARK ASP

# LOCATION PLAN

ASP BOUNDARY
COUNTY/CITY BOUNDARY
INTERMUNICIPAL DEVELOPMENT PLAN AREA

Stantec

116549063
December 7, 2022

PREPARED FOR: SUMUS

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2022/12/07 1:59 PM By: Wickland, Ryne
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# 2. Planning Process

## 2.1 WHAT IS AN AREA STRUCTURE PLAN

An ASP is a statutory document approved by Council and adopted through a Bylaw. The Plan outlines a vision for the future physical development of an area with regard to such things as land use, transportation, protection of the natural environment, emergency services, general design, and utility service requirements.

An ASP provides Council with a ten to twenty year roadmap when considering land use changes, subdivision, and development. When making decisions regarding development in the Plan area, Council must consider the Plan and a wide range of other factors such as the economic goals of the County, County-wide growth, and the ability to provide servicing.

An ASP does not predict the rate of development within the Plan Area; ultimately growth is determined by market demand, which reflects the overall economic climate of the region.

Through the process of preparing an ASP, citizens are provided with opportunities, at various stages in the process, to have input into the development of policy. It is important that the vision, goals, and policies contained in the Plan address the interests of residents and stakeholders in the Plan area, as well as the interests of those in other parts of the County.

The Alberta Municipal Government Act states an ASP must describe:

- proposed land uses;
- density of population and sequence of development;
- general location of major transportation routes and public utilities; and
- any other matters Council considers necessary.

The policies in an ASP form a bridge between the general planning policies contained in the Municipal Development Plan (MDP) and the more detailed planning and design direction contained in a subdivision and development permit application. ASP policies must align with the MDP and all applicable County policies. The ASP must be based on sound planning principles and respond to the particular natural and built form of the Plan Area.

## 2.2 PLAN INTERPRETATION

Where “shall” is used in a policy, the policy is considered mandatory. Where “should” is used in a policy, it is intended to be complied with. However, the acceptable response to a policy may vary in a specific situation where the variance is necessary to address unique circumstances. Such a variance may be appropriate given special circumstances that would otherwise render compliance impractical or impossible. Where “may” is used in a policy it is a discretionary term, meaning the policy in question can be enforced by the County if it chooses to do so, dependent on the particular circumstances of the site and/or application.




MAP 2.0 | CHINOOK INDUSTRIAL PARK ASP

# TOPOGRAPHY MAP

ASP BOUNDARY

COUNTY/CITY BOUNDARY

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January 31, 2023

PREPARED FOR: SUMUS

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2023/01/31 10:57 AM By: Wickend, Ryne

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# 3. Vision

The Chinook Industrial Park (ASP) has been developed through rigorous planning and careful consideration of the needs of a diverse group of stakeholders. The focus in developing this plan was to put forward a development proposal which would minimize the impact on infrastructure, ensure a good fit with adjacent land uses, protect and preserve the natural environment and ultimately provide Lethbridge County with a cost-effective model for future commercial/industrial development adjacent to the City of Lethbridge.

The Chinook Industrial Park is proposed to be a combination of Business Light Industrial and Rural General Industrial uses adjacent to 43rd Street between 9th Ave and 26th Ave. The goal of this development is to create an industrial center adjacent to the City of Lethbridge that has excellent access to existing transportation networks and various services. With a limited supply of existing commercial and industrial lands with adequate servicing, the key to achieving this goal is collaboration with the County, the City and the developer to establish the right balance of servicing level and cost.

Lethbridge and the surrounding community have deep agricultural roots and a strong culture embracing rural and farm living. However, there is still a need for industrial development in the right locations. The Plan Area is located adjacent to the Rave Industrial Park to the south and the Lethbridge Industrial Park to the west. This results in a perfect location for continued industrial growth with direct access to 43rd Street, one of the major access points for industrial uses in the area. Additionally, the east boundary is bordered by the SMRID canal which provides a barrier between existing agricultural uses east of the development.

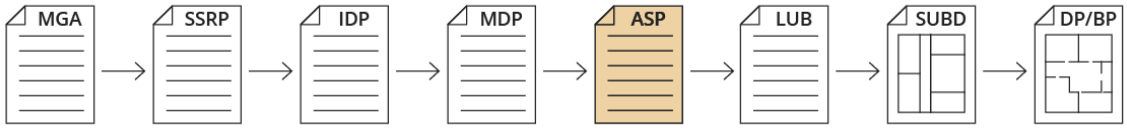
As with any development there are numerous challenges and opportunities. The opportunity is to provide a unique Commercial/Industrial development in a rural municipality with urban access and amenities. Key challenges to this development are identified and ultimately addressed in the remainder of this document.

Overall, the development concept acknowledges and seeks to positively integrate with the existing natural and built conditions in the area while successfully expanding the commercial/industrial uses adjacent to northeast Lethbridge. This plan has been designed to offer a new high-quality industrial and agribusiness development to Lethbridge County and create opportunities for new businesses while increasing the overall tax base.

# 4. Regulatory Compliance and Consultation

This ASP has been prepared in accordance with applicable legislative requirements outlined in the Municipal Government Act (MGA) and overarching County policies, such as the Lethbridge County Municipal Development Plan (MDP), as well as other applicable County policies and guiding documents.

In accordance with the MGA, all statutory plans passed by a municipality must be consistent with each other. Should a conflict or inconsistency arise between this ASP and the MDP, the MDP prevails to the extent of the conflict or inconsistency, unless otherwise noted. The diagram below illustrates the planning hierarchy in Alberta (generally), and where an ASP fits in with the process, with each heading highlighted in bold throughout the text below.




The Plan has been prepared to be consistent with, and to support the goals, of higher-level legislation and plans including:

- The MGA (RSA 2000, c M-26) and any associated regulations,
- The South Saskatchewan Regional Plan (SSRP), a southern Alberta regional plan based around the South Saskatchewan watershed,
- Lethbridge County and City of Lethbridge: Intermunicipal Development Plan (IDP) (Bylaw No. 6015 & 1478),
- The Lethbridge County Municipal Development Plan (Bylaw No. 22-001),
- Lethbridge County Land Use Bylaw (LUB) (Bylaw No. 1404),
- Lethbridge County: Industrial-Commercial Land Use Strategy, 2016.

In accordance with the IDP, the following agencies were consulted when preparing this document. Their comments and concerns are addressed throughout the remaining sections of the ASP.

- Lethbridge County
- Alberta Environment and Parks (AEP)
- St. Mary River Irrigation District (SMRID)
- City of Lethbridge

# 5. Land Use Concept

The land use areas of the Plan are intended to be flexible and evolve with potential market demand changes over time. Any refinements to the exact land use boundaries and districts may be made without an amendment to this ASP as long as the overall vision and core values of the Plan are maintained. Current and future land use areas with respect to location, size, and mix of commercial and industrial uses will be confirmed at land use, Subdivision, or Development Permit stage (whichever applies, under the discretion of the Development Authority), to provide flexibility and adaptability to market conditions. The objective of the Chinook Industrial Park is:

"To create a high-quality environment that will provide a location for the establishment and growth of businesses which provide service to the commercial and industrial base of the Lethbridge County."

## 5.1 EXISTING CONDITIONS and CURRENT LAND USE

Currently the land is used primarily for Agricultural purposes and is designated as Lethbridge Urban Fringe (LUF) District. The land is relatively flat with a natural drainage pattern flowing towards the southeast portion of the Plan Area. There is an existing break in topography located centrally within the Plan area where the natural drainage begins to flow in the northeast direction as shown in Map 2.0.

This ASP concept has been designed with the existing conditions of the land in mind as well as any impacts to adjacent lands that could be caused through development to the area. This consideration includes the following:

- East of the SMRID canal lie agricultural lands which include an agricultural cattle feeding area
- Agricultural lands located to the north
- Industrial business located to the west across 43rd Street
- Rave Industrial Park located to the south

## 5.2 PREFERRED DEVELOPMENT CONCEPT

The proposed Land Use Plan appears on Map 3.0, with the ultimate development consisting of approximately ±85.65 hectares (±211.65 acres) with ±69.61 hectares (±172.01 acres) of developable area for primarily industrial business uses.

The lands adjacent to 43rd Avenue have been identified as General Industrial or Flex lands to allow for commercial or industrial business development that would benefit from direct adjacency to the street. This is consistent with existing developments located to the west and south of the Plan Area. Lots in Phase 1 are expected to vary in size in order to accommodate a range of business exposure needs, however they are anticipated to range from approximately ±0.45 ha to ±2.3 ha (±1.0 ac to ±5.0 ac) in size. Larger lot sizes may be considered if the market permits. Lot sizes for Phases 2 and 3 expected to range from approximately ±1.77 ha to ±13.43 ha (±4.37 ac to ±33.19 ac) in size, however any minor adjustments to these areas shall not require an amendment to this plan. The Plan Area is proposed to be developed in 3 Phases, which is discussed in further detail in Section 11.

## 5.3 LAND USE CLASSIFICATION AND ANALYSIS

This section provides direction for the general land use areas shown on Map 3.0. A land use, Subdivision, and/or Development Permit application submitted for a site within the Plan Area shall demonstrate compliance with the policies of the land use area in the approximate area the site is located.

The proposed land use classification of the subdivision is Business Light Industrial (BLI) or Rural General Industrial (RGI) per the Lethbridge County Land Use Bylaw (No. 1404).

### Business Light Industrial (BLI)

The intent of the Business Light Industrial lands is to provide for a lower intensity business, such as light industrial or a use compatible to adjacent development in the area. These lands can be highly visible and accessible by both the travelling public and industrial users.

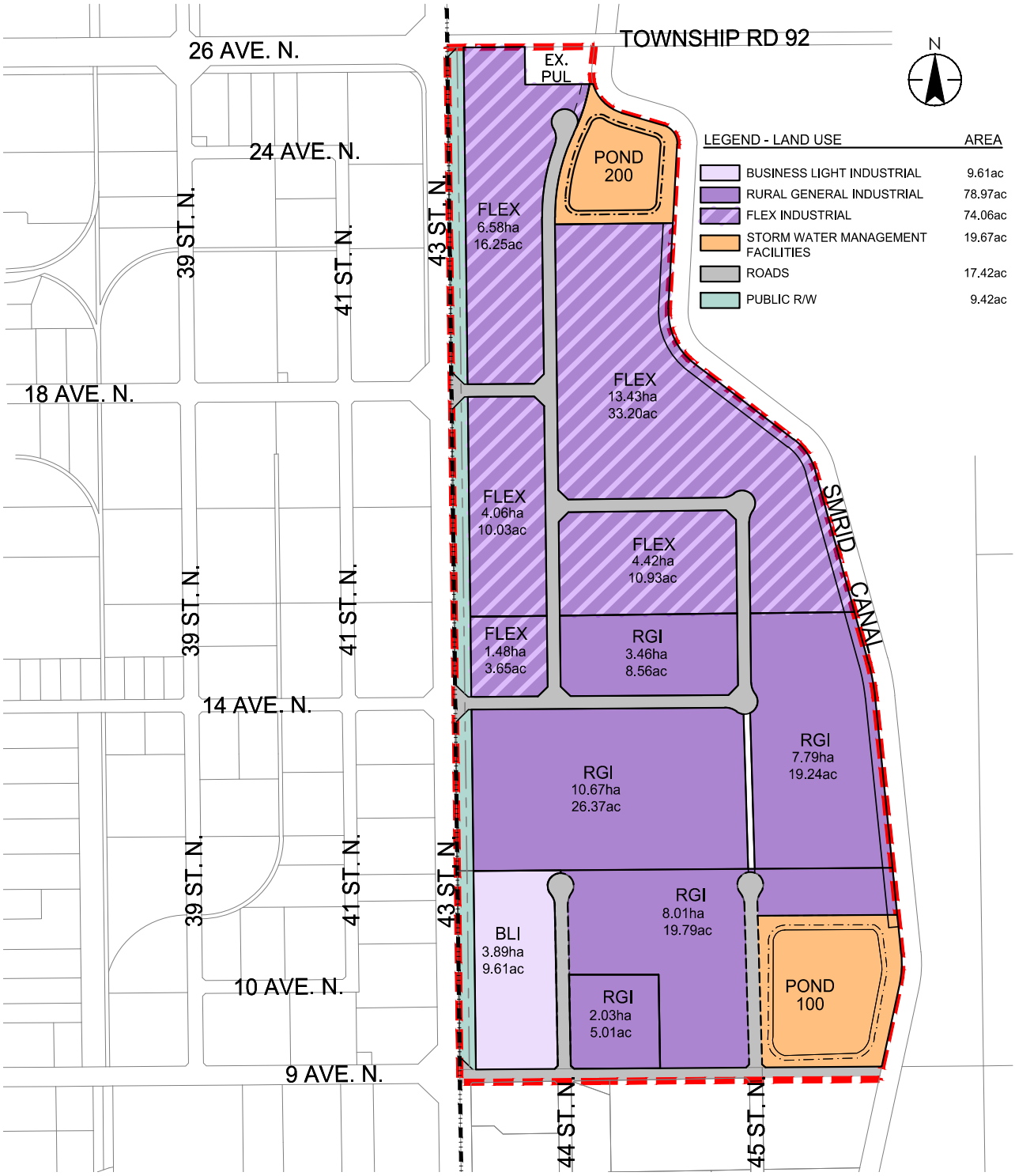
### Rural General Industrial (RGI)

The intent of the Rural General Industrial lands is to provide for general industrial uses as well as rural or agricultural type uses.

### Flex Industrial Area

The intent of the Flex Industrial Area is to provide flexible options for multiple forms of industrial related uses. Buildout of the Flex Industrial Area could take a variety of forms depending on market conditions and landowner requirements. This is not a land use district and should be phased out of the development overtime and as development progresses towards either BLI or RGI land uses. Possible scenarios for buildout include, but are not limited to:

- 100% business light industrial uses,
- 100% rural general industrial uses,
- Mix or “checker” layout of industrial uses.




MAP 3.0 | CHINOOK INDUSTRIAL PARK ASP

# PROPOSED LAND USE

ASP BOUNDARY
COUNTY/CITY BOUNDARY
POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

Stantec

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March 15, 2023

PREPARED FOR: SUMUS

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2023/03/15 2:24 PM By: Wickland, Ryne

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## 5.4 PROPOSED LAND USE AND STATISTICS

The distribution of land use within the proposed ASP is shown in Table 1 below. The projected number of industrial lots will vary depending on economic conditions. Lot locations and size will be established during subdivision.

Table 1. Land Use Statistics*

| | Hectares (ac.) | Percent |
|---|---|---|
| Roads & Right-of-Ways | ±7.05 (±17.42) | 8% |
| Rural General Industrial (RGI) | ±32.57 (±80.49) | 39% |
| Business Light Industrial (BLI) | ±4.64 (±11.47) | 6% |
| Flex Industrial** | ±32.40 (±80.05) | 38% |
| Public Utility Lots (Stormwater Management) | ±7.96 (±19.67) | 9% |
| Parks/Green-Space/ER | 0 | 0% |
| Gross Area | ±84.62 (±209.10) | 100% |
| Developable Area | ±69.61 (±172.01) | |

*Land Use Statistics are calculated at time of Plan preparation. Land within the plan area is to be redesignated over time and reflected in this table until the time of full build out.

**Flex Industrial lands represented on Map 3.0 shall be considered for Business Light Industrial or Rural General Industrial land use districts to be determined at time of application and reviewed by the Development Authority.

## 5.4 MUNICIPAL RESERVE

At this time, it is anticipated that at the time of subdivision, the municipal reserve requirements will be met by providing cash in lieu of land.

# 6. Servicing

To determine the viability of this development, preliminary evaluations have been performed with respect to servicing. Key service items include sewer, water, electricity, natural gas and telecommunications. Additional information on key services is included in this section.

## 6.1 SANITARY SEWER SYSTEM

In initial meetings with County and City officials, it was determined that the current city sanitary infrastructure was not capable of accommodating the flows from the development. However, there were indications that temporary off-peak sewage flows could be routed through their system. As such, the primary sanitary servicing concept is to ultimately send the sewage to the County-managed system to the east. This servicing strategy has been completed for the Phase 1 Area along 9th Avenue N. This servicing strategy may be applied to the remainder of Phase 1 along 9th Avenue North in consultation with the City of Lethbridge.

Phases 2 and 3 will be serviced through septic fields or pump out tanks and no provision will be made in public roads for a municipal gravity system, nor any connection to municipal treatment facilities. As such, parcels will need to be a minimum of 0.81 ha (2.0 acres) in size, and high consumption water users producing large quantities of sewage effluent cannot be accommodated under this servicing strategy. Detailed evaluations, designs and regulatory approvals for onsite septic systems will be prepared by others during subdivision and permitting.

In order to facilitate future design of sewage facilities for Phases 1A and 1B; preliminary design analysis has been conducted. This analysis uses the City of Lethbridge criteria for industrial discharge. It has been assumed that for the purposes of sewage disposal, businesses will comply with Business Light Industrial standards. Businesses that produce more waste will need to incorporate recycling and reuse of water into their building and site design. Sewage generation estimates are shown in the following Table 2. Sewage generation estimates are not being provided for Phases 2 and 3 where septic systems will be utilized as these statistics will have no relevance to future County conveyance and treatment systems.

Table 2. Sewage Generation Estimates

| Phase | Area | | Dry Weather flow | Peak Factor | Wet Weather Flow | Infiltration | Total | Flow |
|---|---|---|---|---|---|---|---|---|
| | Acres | Hectares | $m^3$/hectare/day | | $m^3$/hectare/day | $m^3$/hectare/day | | L/min |
| 1A | 22.6 | 9.2 | 20 | NA | 7.5 | 2.25 | 29.75 | 209.4 |
| 1B | 16.6 | 6.7 | 20 | NA | 7.5 | 2.25 | 29.75 | 153.8 |
| Total | 39.2 | 15.9 | | | | | | 363.2 |

## 6.2 WATER SYSTEM

It is proposed that each lot have a water service fed from a water main located in the adjacent roadways which will be fed by the existing water main currently servicing the Rave Industrial Park for Phases 1A and 1B. Phases 2 and 3 will be serviced from a connection to the City of Lethbridge Water System directly west of the Chinook Industrial Area as well as a connection to Township Road 92. The provision of potable water is contingent on the City of Lethbridge and Lethbridge County coming to a conveyance agreement.

### 6.2.1 POTABLE WATER AND FIRE PROTECTION

The proposed primary water source to this development will be through a connection to the distribution system servicing Rave Industrial park and City of Lethbridge. A conceptual water system layout has been provided on Map 4.0. Water Conveyance agreements between the County and City will be required at the subdivision and permitting stage including payment of any connection and administrative fees by the developer. Each connection point to the City system shall have a meter chamber and premise/isolation backflow protection. Potable water will be used for human consumption and firefighting.

#### Fire Protection

Hydrant spacings shall meet the requirements of the jurisdiction providing the service at the time of construction. Currently, fire protection services are from the Town of Coaldale. All water mains are to be a minimum of 250 mm in diameter. Initial demand and flow analysis has been completed based on the developable area of Phases 2 and 3, (51.89Ha). A demand of 5m³/Ha/day was assumed, and fire flows has been assumed at 9,000 L/min. Table 3.0 shows the calculated demands. Water network and flow analysis will be conducted as part of the subdivision application.

Table 3. Water System Demands (Phase 2 and 3)

| | |
|---|---|
| Average Day Demand (ADD) | 259 m³/day |
| Maximum Day Demand (MDD) | 518 m³/day |
| Maximum Day Demand (MDD) + Fire Flows | 156 L/s |
| Peak Hour Demand (PHD) | 12 L/s |

#### 6.2.2 NON-POTABLE WATER / INDUSTRIAL USE

The use of non-potable water by future development is not anticipated at this time.

### 6.3 GAS

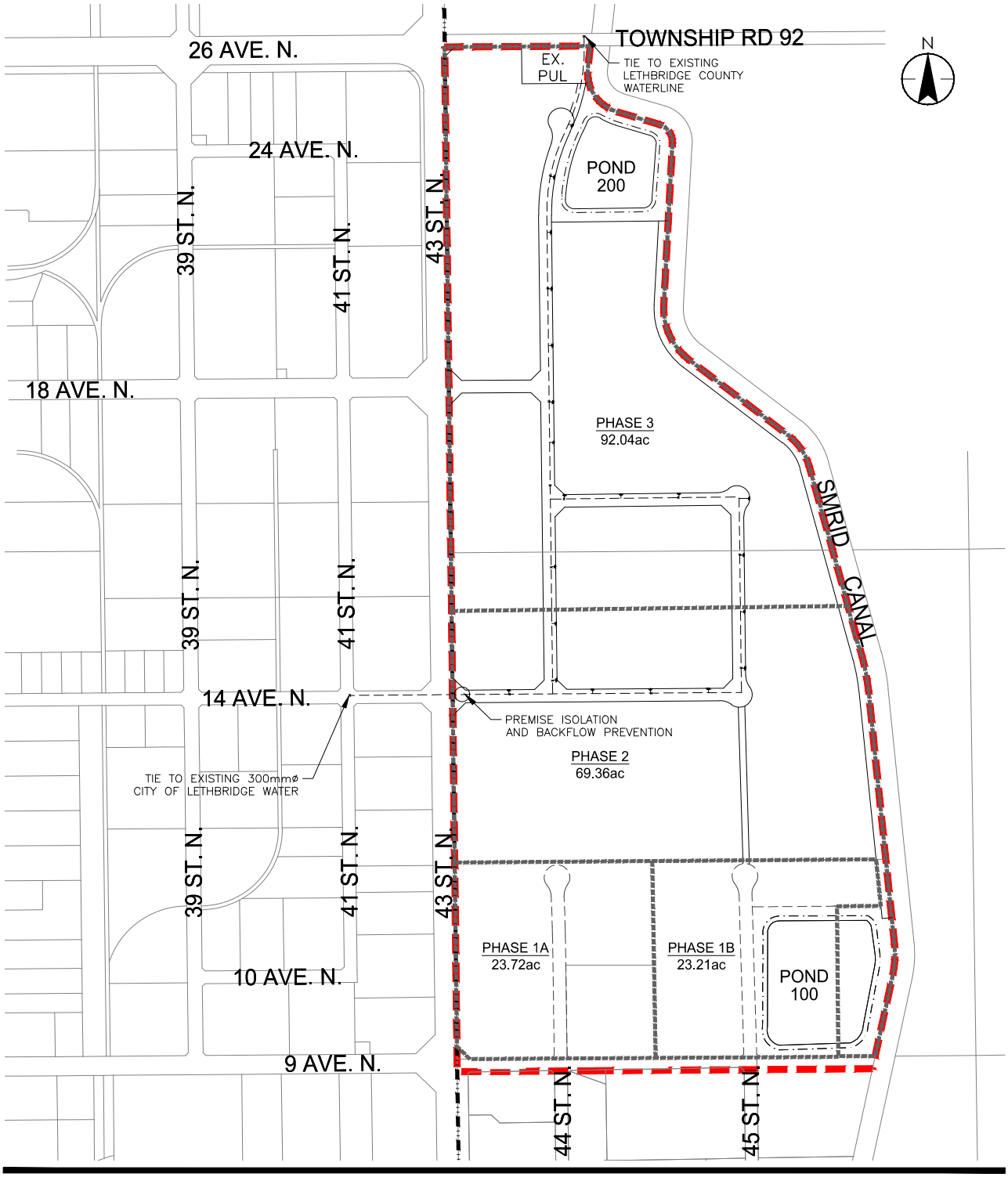
Natural gas distribution infrastructure in the area surrounding the site is operated by ATCO Gas. The developer will pay for the installation of natural gas distribution infrastructure to each lot. ATCO Gas will distribute natural gas within the development and lot purchasers will be able to select a retailer for natural gas supply. Future Developers will coordinate with ATCO to determine connection locations during the design phase.

### 6.4 ELECTRICAL POWER

Fortis will provide services to the proposed subdivision and underground services to each property line. Future Developers will coordinate with Fortis to determine connection locations during the design phase.

### 6.5 TELECOMMUNICATIONS

During design development local service providers will be contacted for the provision of phone and internet services. These future systems may be incorporated in overall regional servicing or be completed by future parcel developers. Currently Telus and Satellite Service providers are the most viable options for these services.




MAP 4.0 | CHINOOK INDUSTRIAL PARK ASP

# WATER SERVICING

PREPARED FOR: SUMUS

ASP BOUNDARY
PHASING BOUNDARY
COUNTY/CITY BOUNDARY
POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED
PROPOSED WATERMAIN

Stantec

116549063
February 1, 2023

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2023/02/01 2:11 PM By: Wickland, Ryne

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# 7. Roads

A layout of the streets and accesses is shown in Map 5.0. In general, roads within the subdivision will comply with Lethbridge County engineering standards throughout with no sidewalks.

Roads in the Phase 1 area will be reconstructed to an urban cross-section as identified with some provision for parking. Optional local access roads have been identified north of 9th Avenue. The completion of these roads, if required, will be determined at the subdivision stage.

Roads in the Phases 2 and 3 area will be constructed as identified with no provision for on street parking as industrial land uses in these phases will be required to accommodate all customer and employee parking on site. Roadway widths in these phases will be 10 meters wide (two 5m driving lanes), and all internal intersections will be designed with two-centered curves to accommodate WB20 truck turning movements.

All Roads will be paved and will meet Lethbridge County standards to allow for truck access. The transportation improvements will be paid for by the developer.

There will ultimately be three access points to this development:

1. 9th Avenue North
2. 14th Avenue North
3. 18th Avenue North

The access to Phase 1 will be via 9th Avenue North, which runs east to west along the south border of the development. Phase 2 will be accessed via a new intersection at 14th Avenue North. This intersection will be carried east and terminate at the 45th Street intersection. Portions of 44th Street and 45th Street will also be built to the northern limit of Phase 2. Phase 3 roads would include the rest of 44th Street North as well as 45th Street North, 16th Avenue North and 18th Avenue North access.

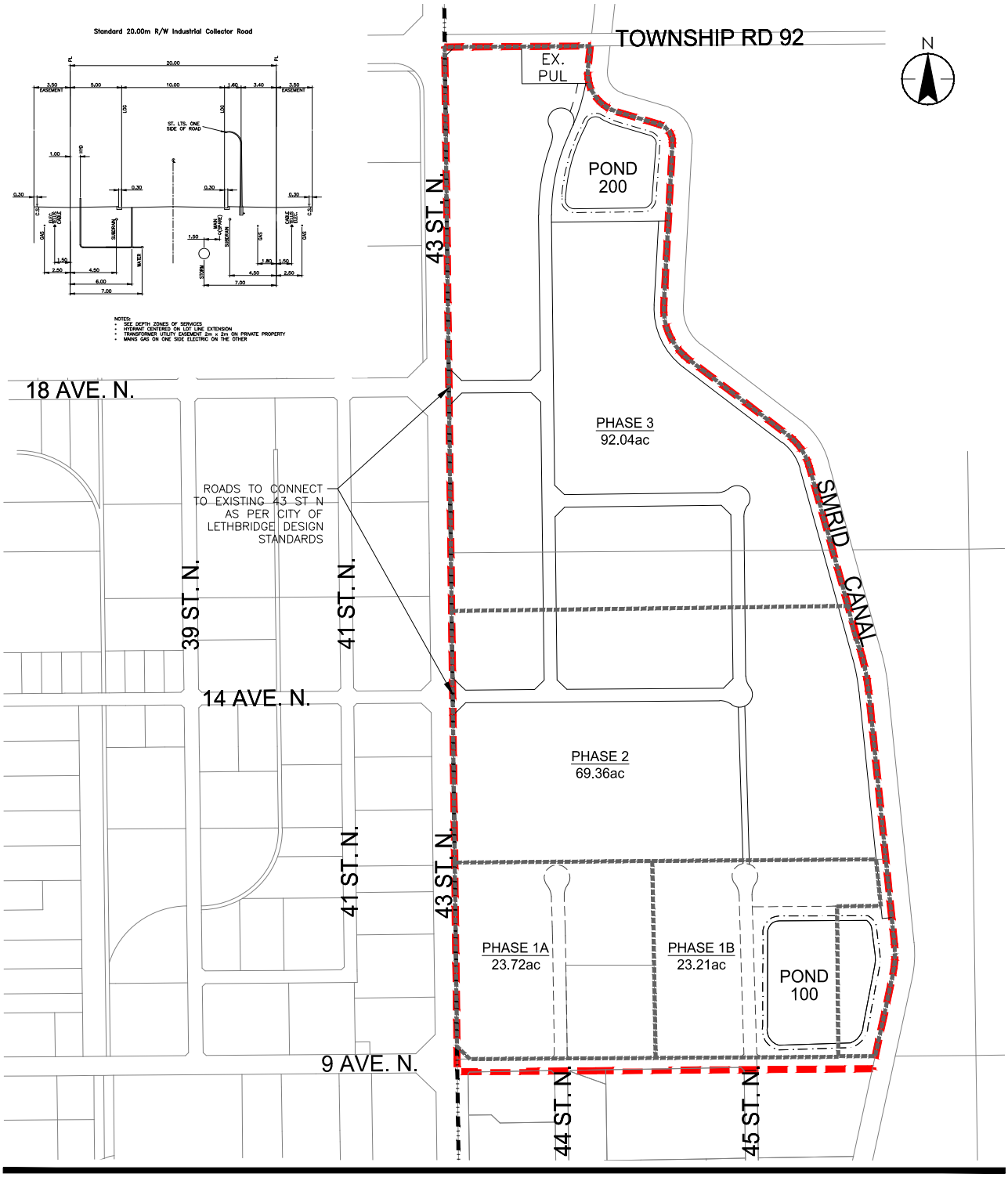
A Traffic Impact Assessment (TIA) has been completed for the proposed Chinook Industrial Park and assumes that ultimate development will be 25% Business Light Industrial (BLI). The original traffic study was completed by EASL based on the projected land use and roadway layout at the time. The updated internal roadway network alters the way in which vehicles access the arterial roadway network from Phase 2 and Phase 3 developments. As such, new traffic analysis was undertaken and determined that the access points at 14th Avenue North and 18th Avenue North will accommodate post-development traffic volumes in Phases 2 and 3.

Although the TIA does indicate this development is feasible there are future improvements that are suggested for the (full build out horizon. These recommendations are as follows:

- Installation of westbound left turn only lane on 26th Avenue
- Traffic signals at 43rd Street and 14th Avenue
- Installation of a northbound left turn lane at 14 Avenue
- Traffic signals at 43rd Street and 18th Avenue
- Installation of a northbound left turn lane at 18 Avenue
- Installation of second eastbound left turn only lane at the intersection of 43rd Street and Highway 3.

All road and intersection improvements shall be evaluated following final land use designation, subdivision, and detailed design to ensure that improvements are constructed when appropriate to support growth. Improvements to 43rd Street Intersections will be shared between the City of Lethbridge and Lethbridge County. Allocation of final costs will be determined at the subdivision stage and administered through a future Lethbridge County Development Agreement.

For additional details and analysis refer to Appendix A.




MAP 5.0 | CHINOOK INDUSTRIAL PARK ASP

# ROAD LAYOUT

ASP BOUNDARY
PHASING BOUNDARY
COUNTY/CITY BOUNDARY
POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

Stantec

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February 1, 2023

PREPARED FOR: SUMUS

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2023/02/01 10:57 AM By: Wickend, Ryne

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# 8. Stormwater Management

The Chinook Industrial Park Stormwater Management Systems are defined by existing topography and can be characterized into two distinct zones.

Zone 100 is comprised of existing development in the Rave Industrial Park south of our ASP, partially developed Phase 1A/1B, and future development in Phase 2.

Zone 200 is comprised of future Phase 3 development and the existing water filling station adjacent to Township Road 92.

All future drainage designs and construction shall meet the requirements Lethbridge County and the Province of Alberta. Documents referred to when completing this analysis included Alberta Environment and Parks Storm Water Management Guidelines (Current Edition). Unique to the stormwater management of the site is the requirement of a conveyance agreement between Lethbridge County and St. Mary River Irrigation District (SMRID). A current agreement exists for Pond 100 between the County and SMRID which requires the following before a pumped discharge of stormwater to the canal will be permitted.

1) Water must be sampled, tested and meet SMRID water quality standards.
2) Available conveyance capacity within the canal must be confirmed prior to operation of pump system.

Based on the above, Ponds will need to operate as "zero-release" facilities storing an entire 1:100 year rainfall event until such time as permission is granted by SMRID to discharge stormwater. Please refer to Section 8.3 for further discussion on the Major storm event conveyance and attenuation systems, and the Chinook Industrial Park Stormwater Management Plan report Appendix B. A hydrologic model was developed for the post-development condition using PCSWMM computer modelling software. Intensity-duration-frequency (IDF) storm data for the City of Lethbridge was used as the basis for the design storms used in the analysis.

## 8.1 PRE-DEVELOPMENT CONDITION

As can be seen in Map 2.0 of the ASP, existing lands generally flow from the west side along 43rd Street North to the east towards the existing SMRID irrigation canal. These general drainage patterns will be respected during the ultimate grading design of the site to minimize overall grading efforts during development.

Pond 100 is currently partially constructed and services portions of Phase 1 and the Rave Industrial area to the south. The completion of Phase 1 and Phase 2 will require the expansion of this facility and a review of the existing lift station pumping capacity to determine if upgrades are required.

## 8.2 POST DEVELOPMENT MINOR STORM SYSTEM

A minor storm sewer system is outlined on Map 6.0 and has been designed for a 1:5-year rainfall event using the following unit rates as outlined in City of Lethbridge Design Standards:

- Roadways 90L/s/Ha
- Private Parcels 40L/s/Ha (Restricted 1:5 Year Outflow)

Given the parcel coverage (by buildings) in general industrial areas is quite small, large parking and storage areas can be utilized to reduce outflow minimizing the size of downstream infrastructure. For private parcels, this will require that future parcel designs provide some stormwater attenuation and outflow control structure as part of permitting process. Sediment control through the implementation of sumps and or other control measures to collect pollutants should be reviewed at detailed design.

## 8.3 POST DEVELOPMENT MAJOR STORM SYSTEM

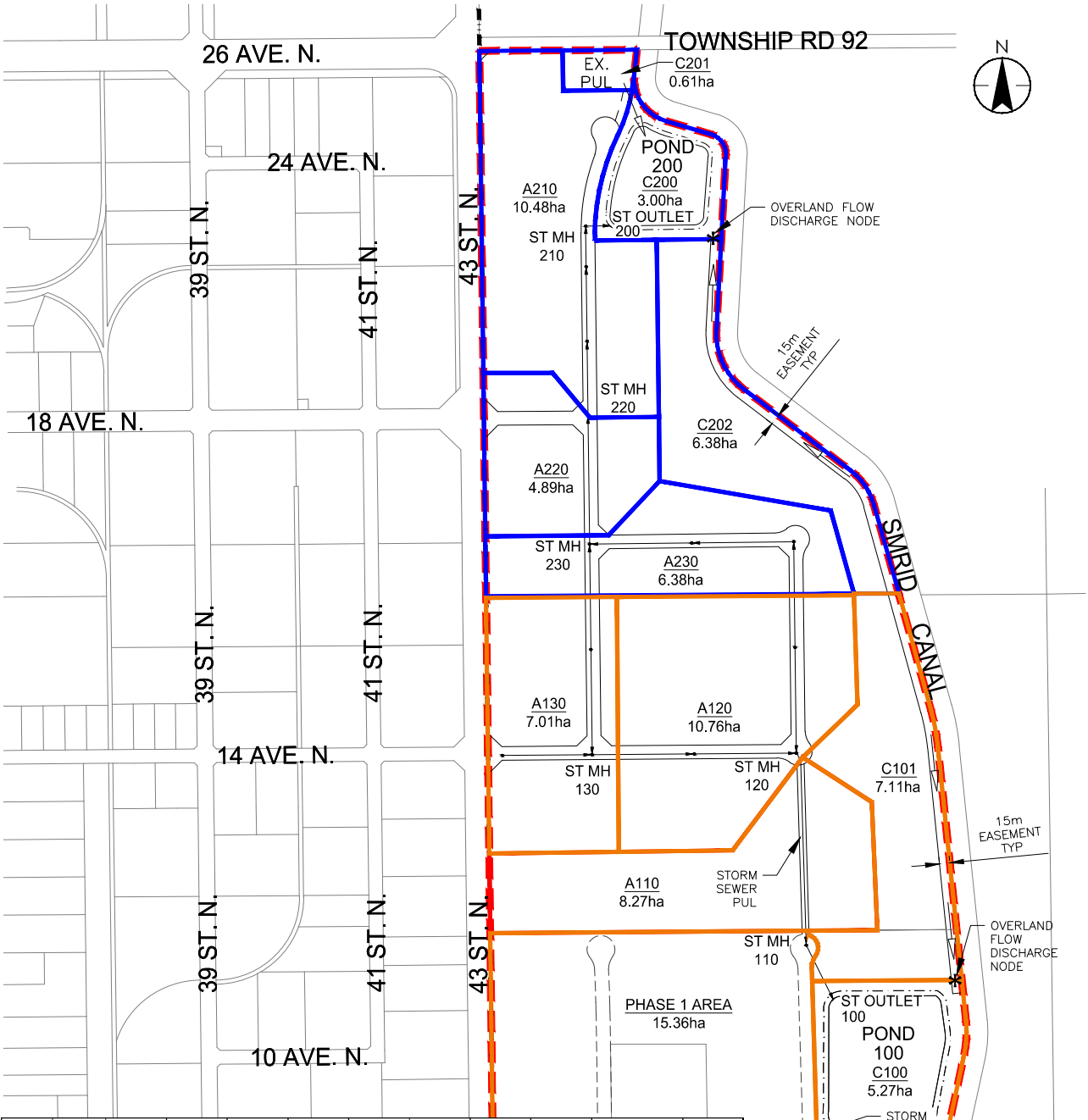
Major storm systems are outlined on Map 7.0 and must accommodate 1:100 year rainfall events. These systems include public roadways, swales, ditches and detention facilities. The pumped discharge of stormwater to the SMRID canal will be required at Pond 100 and Pond 200. Other options may be explored to eliminate the need for a second lift station; however, topography limitations and additional infrastructure costs will likely be prohibitive to try to combine both ponds to one pump station. If a second lift station is installed at Pond 200, a new conveyance agreement will be required between the County and SMRID.

In general, each private parcel within the study area will require some onsite storage and will have a restricted release rate. However, a few areas along the east edge of the study area boundary will not be restricted and will be serviced via swales, conveying runoff to the proposed ponds.

Future emergency overland drainage from private parcels will be directed to public ROW's and/or public conveyance systems. Detention storage on private parcels during the 1:100-year rainfall event will greatly reduce overland flows in roads and ditches thereby facilitating the achievement of safe flow depths and velocities as outlined by provincial guidelines. Private parcel drainage will not be permitted to pass through another private parcel unless covered under a drainage agreement.

For the purpose of preliminary pond sizing below, a 1:100-year rainfall for Lethbridge (109mm) is being utilized assuming a zero-release scenario during the storm event, due to conveyance agreement requirements with SMRID.

| Stormwater Storage Requirements | | | |
|---|---|---|---|
| | | 1:100 year rainfall amount (m)= | 0.109 |
| Zone | Area (Ha) | Required 1:100 year Storage (m³) | % of Total Storage |
| Pond 100 | 5.27 | 5 744 | 7.0% |
| Phase 2 | 33.15 | 36 134 | 43.9% |
| Phase 1 | 15.36 | 16 742 | 20.3% |
| Rave | 21.74 | 23 697 | 28.8% |
| **Total** | **75.52** | **82 317** | **100.0%** |
| Pond 200 | 3.00 | 3 270 | 9.5% |
| Phase 3 | 28.74 | 31 327 | 90.5% |
| **Total** | **31.74** | **34 597** | **100.0%** |




| FROM | TO | AREA | UNIT RATE | Q Area | Q Cumm. | SIZE | SLOPE | MANN | V Pipe | Q Pipe | Q Area |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MH | MH | (ha) | (m3/s/Ha) | (m3/s) | (m3/s) | (m) | m/m | n | (m/s) | (m³/s) | (m³/s) |
| 130 | 120 | 7.01 | 0.04 / 0.09 | **0.324** | **0.324** | 0.675 | 0.00300 | 0.013 | 1.29 | **0.460** | **0.324** |
| 120 | 110 | 10.76 | 0.04 / 0.09 | **0.481** | **0.805** | 0.900 | 0.00300 | 0.013 | 1.56 | **0.992** | **0.805** |
| 110 | Outlet 100 | 8.27 | 0.040 | **0.331** | **1.136** | 1.050 | 0.00300 | 0.013 | 1.73 | **1.496** | **1.136** |
| 230 | 220 | 6.38 | 0.04 / 0.09 | **0.304** | **0.304** | 0.600 | 0.00300 | 0.013 | 1.19 | **0.336** | **0.304** |
| 220 | 210 | 4.89 | 0.04 / 0.09 | **0.231** | **0.536** | 0.750 | 0.00300 | 0.013 | 1.38 | **0.610** | **0.536** |
| 210 | Outlet 210 | 10.48 | 0.04 / 0.09 | **0.466** | **1.002** | 1.050 | 0.00300 | 0.013 | 1.73 | **1.496** | **1.002** |

MAP 6.0 | CHINOOK INDUSTRIAL PARK ASP

# STORM DRAINAGE MINOR

PIPE SYSTEM

PREPARED FOR: SUMUS

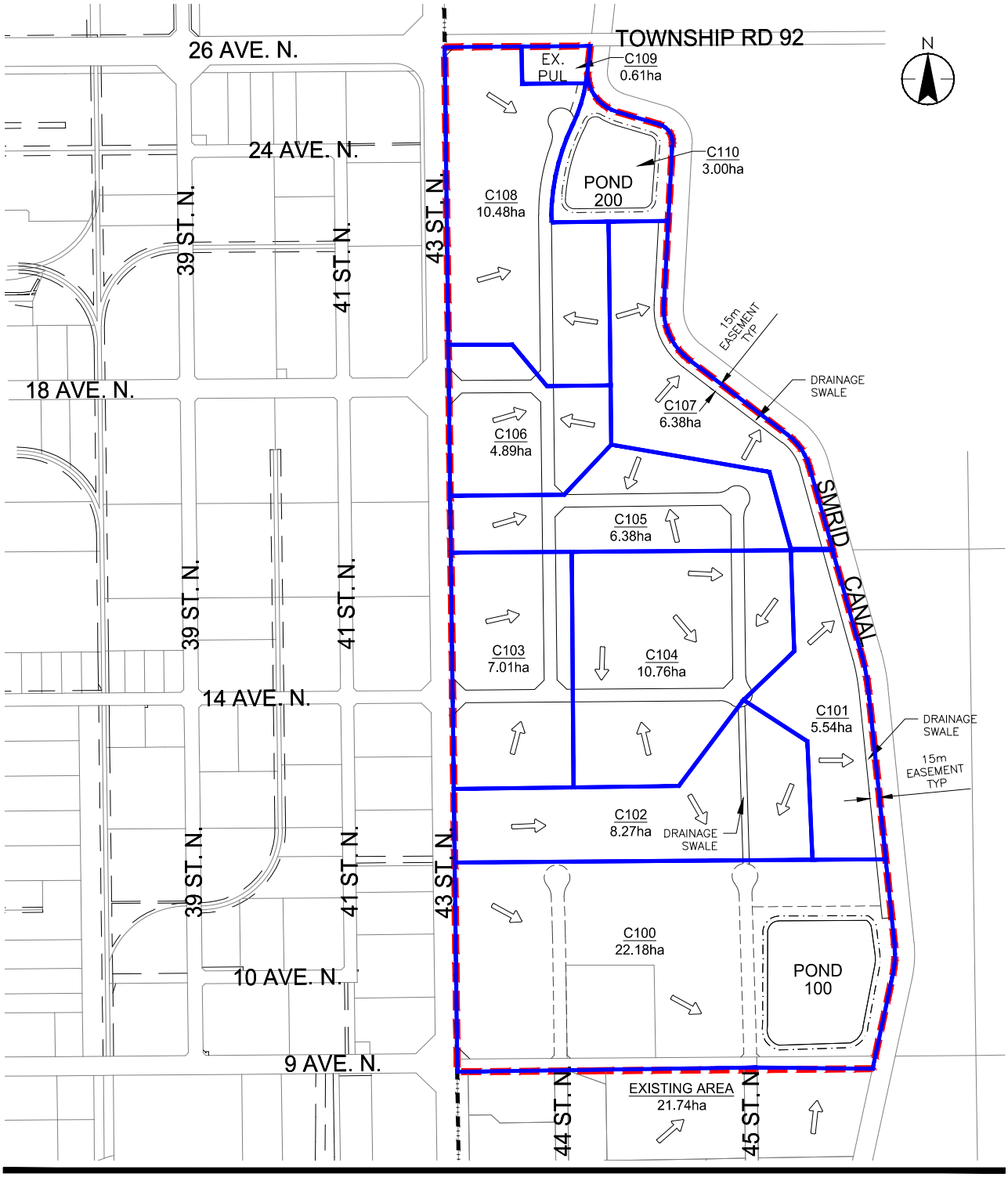
ASP BOUNDARY
COUNTY/CITY BOUNDARY
POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

Stantec

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December 7, 2022

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MAP 7.0 | CHINOOK INDUSTRIAL PARK ASP

# STORM DRAINAGE MAJOR

OVERLAND SYSTEM

PREPARED FOR: SUMUS

ASP BOUNDARY

COUNTY/CITY BOUNDARY

POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

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December 7, 2022

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# 9. Geotechnical

Two geotechnical reports were conducted for this project. One for the south parcel (Lot 4 Block 1 and Lot 6 Block 1) conducted in March of 2012 and one for the north parcel (SW¼ 10-9-21- W4M) conducted on May 2, 2017. As part of the ASP amendment, a Geotechnical Report (March 2023) and a Phase 1 Environmental Assessment (February 2023) was completed (W½ 10-9-21-W4M). All reports and detailed analysis are in Appendix D.

Sieve analysis and Atterberg limits were conducted on site soils to evaluate grain size distribution and plastic and liquid limits. Recommendations were also given for site grading and future foundations. Overall the site soil conditions are amenable to site development and building construction. For additional details and analysis refer to Appendix D. This information will be used to facilitate design of grading, drainage and infrastructure. Additional geotechnical analysis will be required on each site to allow for proper foundation design.

# 10. Solid Waste Disposal

Lot purchasers shall be responsible to make arrangements for solid waste disposal. The City of Lethbridge Regional Solid Waste Facility is located approximately 23 km driving distance from the development. Alternatively, lot purchasers may contract with a private solid waste hauler.

# 11. Phasing & Implementation

In accordance with the City of Lethbridge / Lethbridge County IDP Section 3.4.4.13, landscaping will follow standards with respect to shielding and buffering. The Highway Entranceways Design Guidelines, as specified in Appendix B of the IDP, will also be followed. Other internal parcel landscaping and building architecture will be at the discretion of the parcel developer and subject to Lethbridge County Land Use Bylaw and Permitting.

All construction will follow current Lethbridge County standards and development permit process.

Phasing identifies the strategy for development of the Plan Area over time. The purpose of the phasing strategy is to provide for the logical and cost-effective progression of development. Phasing of development will be driven by the availability of servicing, transportation infrastructure, market demand, and landowner timing. Industrial uses should develop generally in accordance with the development staging sequence identified in Map 8.0. Industrial development proposing to proceed out of sequence may do so without requiring an amendment to this Plan; however, shall be required to provide rationale for the proposal in accordance with the provisions of this Plan and as required by the County.

Phase 1 will be completed in two separate phases, consisting of Lot 4 Block 1 Plan 1113171 and Lot 7 Block 1 Plan 1911847 and a portion of Lot 6PUL, Block 1, Plan 141 0178. It is proposed that both Phase 1A & 1B could include up to 13 lots each, and lot sizes may range from approximately ±0.45 ha to ±2.3 ha (±1.00 ac to ±5.00 ac).

Both Phases 2 & 3 will be subdivided out from Lot 5, Block 1, Plan 111 3171 for commercial and industrial uses as economic conditions allow. Each lot shall have a minimum lot size of ± 0.81 ha (±2.0 ac). The development of these phases over time requires critical infrastructure components in order to subdivide, service and market.

### Phase 1A and 1B

These phases are currently serviced and operational from 9th Ave S. However, Pond 100 expansion will be required for any further onsite development as will the reconstruction of roads and storm systems in the Rave Subdivision.

### Phase 2

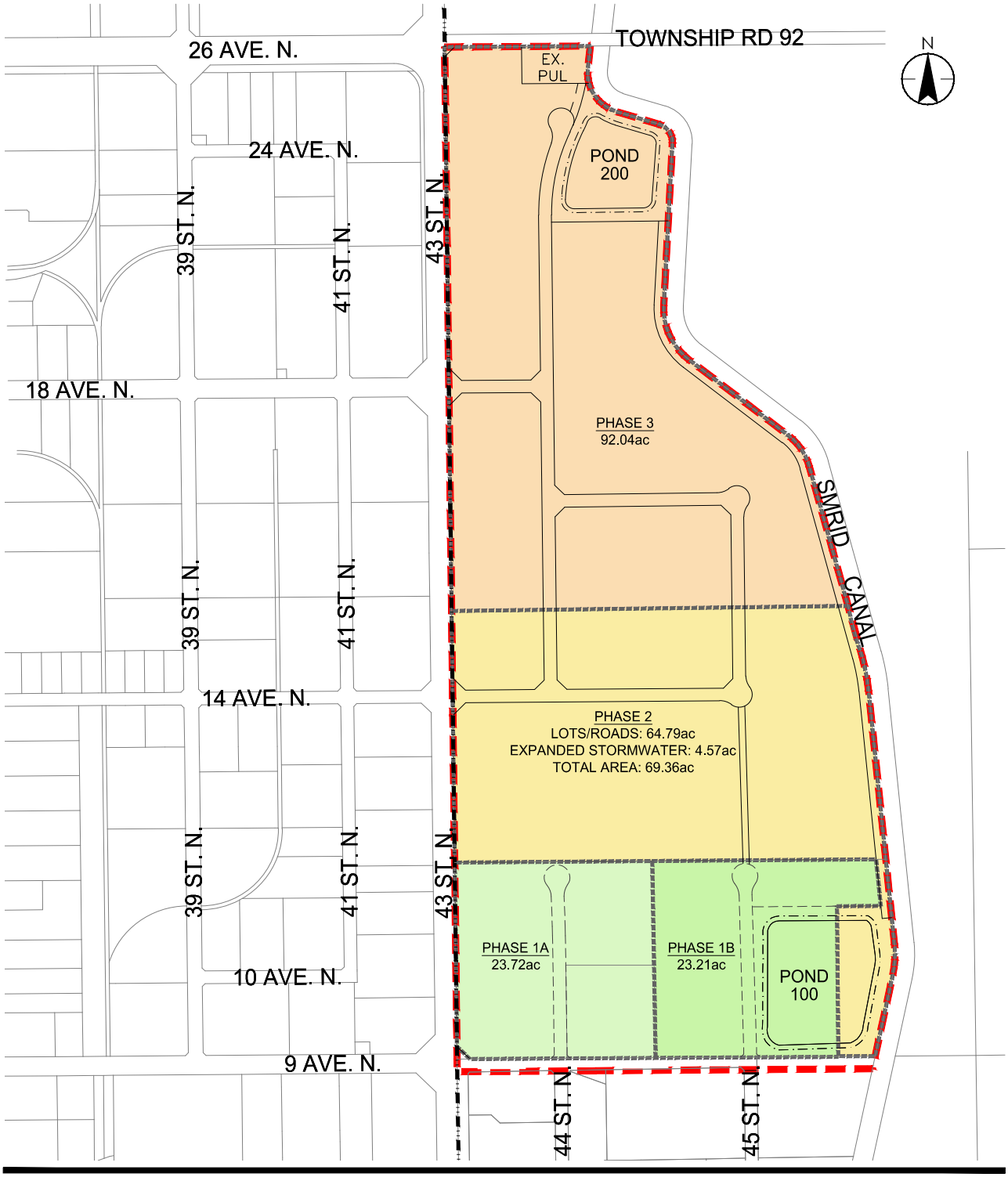
The construction of Phase 2 requires the following for servicing:

- Utility Crossing Agreement Approvals at 43rd Street
- Connection to the City of Lethbridge's Potable Water System
- Expansion of Pond 100 to accommodate additional stormwater run-off
- Lift Station Evaluation
- Extension of natural gas and power from 43rd Street

### Phase 3

The construction of Phase 3 requires the following for servicing:

- Utility Crossing Agreement Approvals at 43rd Street
- Connection to Lethbridge County's Potable Water System (Township Road 92) and Phase 2 System
- Construction of Pond 200 and Lift Station to accommodate stormwater run-off and offsite conveyance
- Completion of Water Conveyance agreement between SMRID and Lethbridge County
- Stormwater Facility Registration with the province
- Extension of power, gas and telecommunications from Phase 2 and 43rd Street N (if required)




MAP 8.0 | CHINOOK INDUSTRIAL PARK ASP

# PHASING PLAN

ASP BOUNDARY
PHASING BOUNDARY
COUNTY/CITY BOUNDARY
POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

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PREPARED FOR: SUMUS

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# CHINOOK INDUSTRIAL PARK
# AREA STRUCTURE PLAN

April 2023

Prepared for:

Sumus

Prepared by:

Stantec Consulting Ltd.

Project Number:

116549063

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APPENDIX A Traffic Impact Assessment
APPENDIX B Stormwater Report
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# 1. Introduction

## 1.1 PLAN AREA

The Chinook Industrial Area Structure Plan (ASP) consists of ±84.18 ha (±208.00 ac) of land (located within two quarter sections) in northeast Lethbridge County. The lands are bounded by 43 St N/City of Lethbridge boundary to the west, 9 Ave N to the south, the St. Mary River Irrigation District Canal to the east, and Township Road 92 to the north (herein referred to as the 'Plan Area'). There are undeveloped agricultural lands located to the east, some industrial development on the south and west sides, and a small pocket of residential lands on the north side, illustrated in Map 1.0.

## 1.2 HISTORY AND SURROUNDING CONTEXT

The existing Chinook Industrial ASP was approved by County Council in September 2018 (Bylaw 18-012). The previous iteration of the ASP detailed the two southernmost parcels as well as a portion of the south Stormpond area (Pond 100) on the east side. A business is existing in this area at the time of Plan creation.

Since the original adoption of this ASP the ownership of these lands has changed, and further detail is now needed to give direction on the Plan Area moving north. The ASP is also being fully reviewed and brought up to current planning and engineering standards as well as assessing the Plan against current market demands at the time of Plan adoption.

The amended ASP will provide a basis for evaluation of future applications for proposed Land Use Bylaw amendments (rezoning) and evaluation of subsequent subdivision applications.

The Chinook Industrial ASP consists of ±84.18 ha (±208.00 ac) of land (located within two quarter sections) in northeast Lethbridge County. The lands are bounded by 43rd St N/City of Lethbridge boundary to the west, 9th Ave N to the south, the St. Mary River Irrigation District Canal to the east, and Township Road 92 to the north. There are undeveloped agricultural lands located to the east, industrial development south and west, and a small pocket of residential lands on the north side, illustrated in Map 2.0.

This ASP describes the ultimate development of the Plan Area, which include portions of NW & SW Section 10, Township 9, Range 21, West of the 4th Meridian. The Plan Area is located adjacent to the northeast quadrant of the City of Lethbridge municipal boundary within Lethbridge County. These lands are Identified within the Industrial-Commercial Land Use Strategy and the Lethbridge County-City of Lethbridge Intermunicipal Development Plan as a growth area for commercial and industrial development as well as the MDP as a Potential Business Park Area or a growth area.

Lot 7, Block 1, Plan 1911847 and Lot 4 Block 1 Plan 1113171 totaling approximately ±22.26 hectares (±55.00 acres), have been partially developed as a gravel parking area with an accessory warehouse building. Lot 5 Block 1 Plan 1113171 which is in the northern portion of the Plan Area consists of ±59.56 hectares (±147.18 acres) of undeveloped land. The remaining portion of the Plan Area is Lot 6PUL, Block 1, Plan 1410178, a ±4.38 hectares (±10.82 acres) Lethbridge County Public Utility Lot which acts as a stormwater detention pond. The total development area is ±86.20 hectares (±213.00 acres) in size.

# 2. Planning Process

## 2.1 WHAT IS AN AREA STRUCTURE PLAN

An ASP is a statutory document approved by Council and adopted through a Bylaw. The Plan outlines a vision for the future physical development of an area with regard to such things as land use, transportation, protection of the natural environment, emergency services, general design, and utility service requirements.

An ASP provides Council with a ten to twenty year roadmap when considering land use changes, subdivision, and development. When making decisions regarding development in the Plan area, Council must consider the Plan and a wide range of other factors such as the economic goals of the County, County-wide growth, and the ability to provide servicing.

An ASP does not predict the rate of development within the Plan Area; ultimately growth is determined by market demand, which reflects the overall economic climate of the region.

Through the process of preparing an ASP, citizens are provided with opportunities, at various stages in the process, to have input into the development of policy. It is important that the vision, goals, and policies contained in the Plan address the interests of residents and stakeholders in the Plan area, as well as the interests of those in other parts of the County.

The Alberta Municipal Government Act states an ASP must describe:

- proposed land uses;
- density of population and sequence of development;
- general location of major transportation routes and public utilities; and
- any other matters Council considers necessary.

The policies in an ASP form a bridge between the general planning policies contained in the Municipal Development Plan (MDP) and the more detailed planning and design direction contained in a subdivision and development permit application. ASP policies must align with the MDP and all applicable County policies. The ASP must be based on sound planning principles and respond to the particular natural and built form of the Plan Area.

## 2.2 PLAN INTERPRETATION

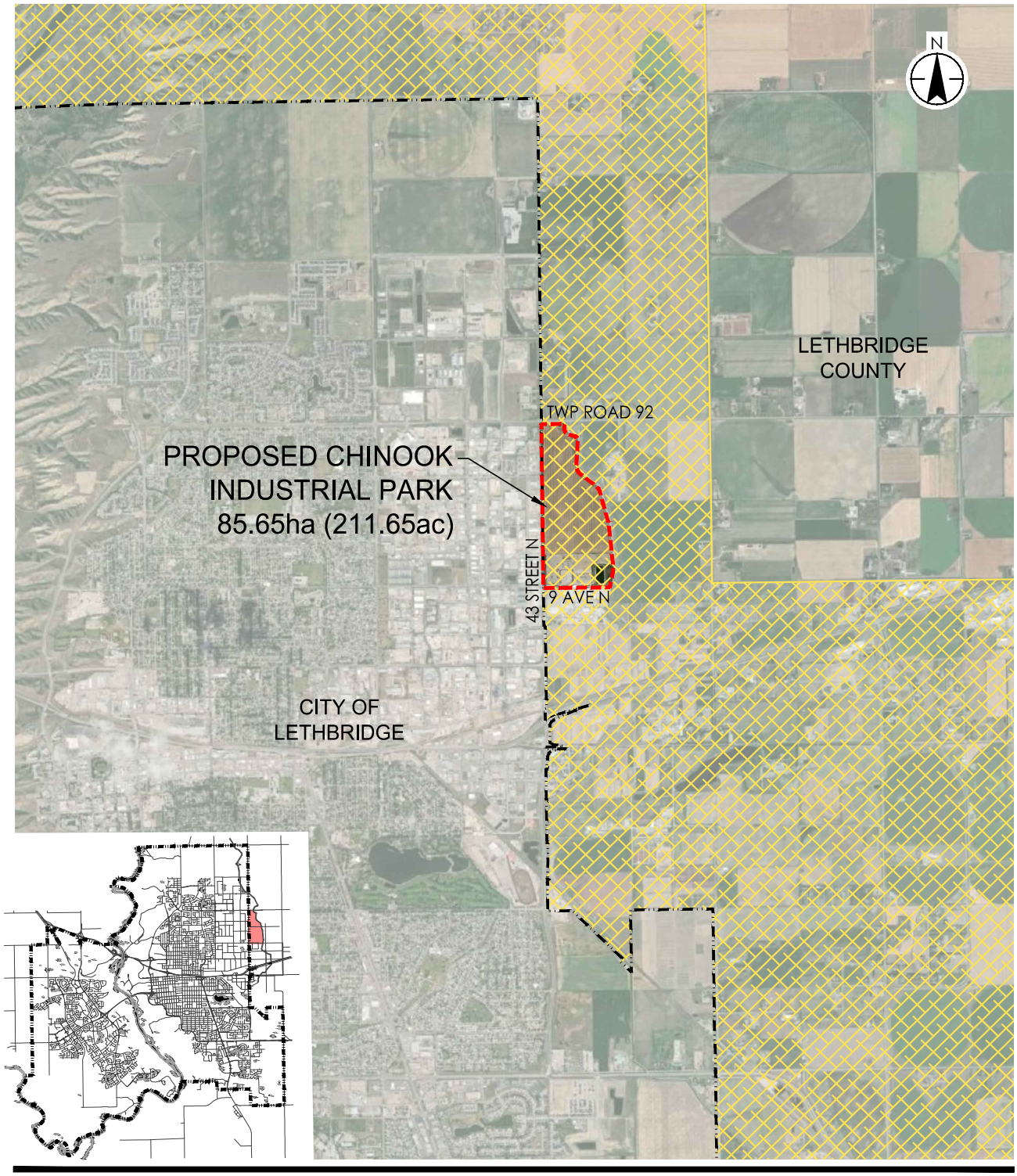
Where “shall” is used in a policy, the policy is considered mandatory. Where “should” is used in a policy, it is intended to be complied with. However, the acceptable response to a policy may vary in a specific situation where the variance is necessary to address unique circumstances. Such a variance may be appropriate given special circumstances that would otherwise render compliance impractical

or impossible. Where "may" is used in a policy it is a discretionary term, meaning the policy in question can be enforced by the County if it chooses to do so, dependent on the particular circumstances of the site and/or application.

~~This Area Structure Plan has been prepared by Stantec Consulting Ltd. on behalf of Ed Friesen and George Kirkham to describe the proposed development concept and municipal servicing strategy to be provided for the Chinook industrial/commercial business park. The Area Structure Plan describes the ultimate development of the subject lands, which include portions of NW & SW Section 10, Township 9, Range 21, West of the 4th Meridian.~~

~~Hasegawa respectfully submits this Area Structure Plan as support for the application to adopt the Plan as a By-Law of Lethbridge County. The Area Structure Plan will provide a basis for evaluation of future applications for a change in the proposed Land Use Designation of the parcels and evaluation of subsequent subdivision applications. The preliminary engineering and preparation of the area structure plan are parallel processes.~~

~~Two separate land owners are making the application for this development. George Kirkham (Kirkham Holdings Lethbridge Ltd.) owns Lot 4 Block 1 Plan 1113171 which is 20.24 hectares. This land has already been developed as a gravel parking area. 1000824 Alberta Ltd. owns Lot 5 Block 1 Plan 1113171 which is the large, undeveloped, northern portion of the development consisting of 59.56 hectares. The remaining portion of the development is Lot 6 Block 1 Plan 1410178, which is a 4.38-hectare Lethbridge County Public Utility Lot consisting of a stormwater detention pond. The total development area is 84.18 hectares (208.0 acres) located within Lethbridge County, directly adjacent to the City of Lethbridge (refer to Figures 2 and 3).~~




MAP 1.0 | CHINOOK INDUSTRIAL PARK ASP

# LOCATION PLAN

ASP BOUNDARY
COUNTY/CITY BOUNDARY
INTERMUNICIPAL DEVELOPMENT PLAN AREA

Stantec

116549063
December 7, 2022

PREPARED FOR: SUMUS

V:\116\Active\116549063\drawings\figures\ASP Figures\49063_CP_MAP 1.0-ASP Location Plan.dwg
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# 3. Vision

The Chinook Industrial Park (ASP) ~~Area Structure Plan~~ has been developed through rigorous planning and careful consideration of the needs of a diverse group of stakeholders. The focus in developing this plan was to put forward a development proposal which would minimize the impact on ~~area~~ infrastructure, ensure a good fit with adjacent land uses, protect and preserve the natural environment and ultimately provide Lethbridge County with a cost-effective model for future commercial/industrial development adjacent to the City of Lethbridge.

The Chinook Industrial Park is proposed to be a combination of Business Light Industrial and Rural General Industrial uses ~~sited~~ adjacent to 43rd Street between 9th Ave and 26th Ave. The goal of this development is to create an industrial center ~~in the County~~ adjacent to the City of Lethbridge that has excellent access to existing transportation networks and various services. ~~Good~~ With a limited supply of existing commercial and industrial lands with adequate servicing, the ~~is currently limited in the County.~~ key to achieving this goal is collaboration with the County, the City and the developer to establish the right balance of servicing level and cost.

Lethbridge and the surrounding community have deep agricultural roots and ~~there is~~ a strong culture ~~trend to~~ embracing rural and farm living. However, there is still a ~~strong~~ need for industrial development in the right locations. The Plan Area ~~land~~ is located adjacent to the Rave Industrial Park to the south and the Lethbridge Industrial Park to the west. This results in a perfect location for continued industrial growth ~~this use and has great~~ with direct access to 43rd Street, ~~which is~~ one of the major access points for ~~the~~ industrial uses in the area. ~~Since 43rd Street has been upgraded to 9th Avenue, this location also has great access for an industrial development~~. ~~Also~~ Additionally, the east boundary is bordered by the SMRID canal which provides a barrier between existing agricultural uses east of the development.

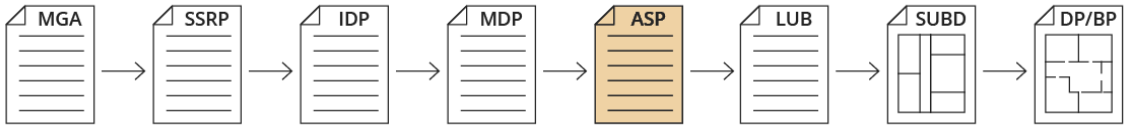
As with any development there are numerous challenges and opportunities. The opportunity is to provide a unique Commercial/Industrial development in a rural municipality ~~jurisdiction~~ with urban access and amenities. Key challenges to this development are identified and ultimately addressed in the remainder of this document.

Overall, the development concept acknowledges and seeks to positively integrate with the existing natural and built conditions in the area while successfully expanding the ~~adding to existing~~ commercial/industrial ~~land~~ uses adjacent to northeast Lethbridge. This ~~proposal and~~ plan has been designed to offer a new high-quality industrial and agribusiness development to Lethbridge County and create opportunities for new businesses ~~in the County and~~ while increasing the overall tax base.

# 4. Regulatory Compliance and Consultation

This ASP has been prepared in accordance with applicable legislative requirements outlined in the Municipal Government Act (MGA) and overarching County policies, such as the Lethbridge County Municipal Development Plan (MDP), as well as other applicable County policies and guiding documents.

In accordance with the MGA, all statutory plans passed by a municipality must be consistent with each other. Should a conflict or inconsistency arise between this ASP and the MDP, the MDP prevails to the extent of the conflict or inconsistency, unless otherwise noted. The diagram below illustrates the planning hierarchy in Alberta (generally), and where an ASP fits in with the process, with each heading highlighted in bold throughout the text below.




~~There are several documents that provide direction for the future development of Industrial/Commercial land in the Lethbridge Urban Fringe area. These documents include:~~

The Plan has been prepared to be consistent with, and to support the goals, of higher-level legislation and plans including:

- The MGA (RSA 2000, c M-26) and any associated regulations,
- The South Saskatchewan Regional Plan (SSRP), a southern Alberta regional plan based around the South Saskatchewan watershed,
- Lethbridge County and City of Lethbridge: Intermunicipal Development Plan (IDP) (Bylaw No. 6015 & 1478), ~~October~~ 2016, ~~(link to document)~~
- The Lethbridge County Municipal Development Plan ~~2010~~ (Bylaw No. 22-001), 2022,
- Lethbridge County Land Use Bylaw (LUB) (Bylaw No. 1404), 2013
- Lethbridge County: Industrial-Commercial Land Use Strategy, ~~October~~ 2016. ~~(link to document)~~

~~This document has been prepared taking these important documents into account. For example, according to the Industrial Commercial Land Use Strategy:~~

~~"The areas identified for future industrial-commercial growth as types of grouped or clustered land use developments consist primarily of expansions to existing industrial business parks, along with some new areas which are in close proximity to the existing parks." (refer to Section 5.6).~~

~~This development is essentially an extension of the Rave Industrial area. It is also intended to help improve the servicing level of that development. It is also adjacent to the City of Lethbridge Industrial Park to the East. As such, the IDP applies to this land and is specifically identified in Sections 3.4.4.12 for Policy Area 4 Subarea 1. Key to this expansion is improving the servicing and addressing issues such as storm drainage and sewage services. In addition, Section 4 of the IDP (Natural Environment, open spaces and water) have been observed.~~

In accordance with the IDP, the following agencies were consulted when preparing this document. Their comments and concerns are addressed throughout the remaining sections of the ASP.

- Lethbridge County
- Alberta Environment and Parks (AEP)
- St. Mary River Irrigation District (SMRID)
- City of Lethbridge

~~These plans have been prepared, taking into account feedback from each of these entities.~~

# ~~4. Plans and Drawings~~

~~To illustrate the location of the property, site drainage, and the proposed subdivision layout, numerous figures have been prepared. The figures are provided in Appendix A and are as follows:~~

1. ~~Location Plan~~
2. ~~Land Ownership Map and Shallow Utility Connection~~
3. ~~Existing Features and Topography~~
4. ~~Proposed Development & Phasing Plan~~
5. ~~Sections C-C & D-D~~
6. ~~Section E-E~~
7. ~~Details~~
8. ~~Pond Details~~

~~These maps are conceptual in nature and are to be used for planning purposes only. Upon ASP acceptance, detailed design drawings and plans will be prepared and submitted for review.~~




MAP 2.0 | CHINOOK INDUSTRIAL PARK ASP

# TOPOGRAPHY MAP

ASP BOUNDARY

COUNTY/CITY BOUNDARY

Stantec

116549063
January 31, 2023

PREPARED FOR: SUMUS

V:\116\Active\116549063\drawings\figures\ASP Figures\49063_CP_MAP 2.0-ASP Land Ownership Map.dwg
2023/01/31 10:57 AM By: Wickend, Ryne

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# 5. Land Use Concept

The land use areas of the Plan are intended to be flexible and evolve with potential market demand changes over time. Any refinements to the exact land use boundaries and districts may be made without an amendment to this ASP as long as the overall vision and core values of the Plan are maintained. Current and future land use areas with respect to location, size, and mix of commercial and industrial uses will be confirmed at land use, Subdivision, or Development Permit stage (whichever applies, under the discretion of the Development Authority), to provide flexibility and adaptability to market conditions. The objective of the Chinook Industrial Park is:

"To create a high-quality environment that will provide a location for the establishment and growth of businesses which provide service to the commercial and industrial base of the Lethbridge County."

## 5.1 EXISTING CONDITIONS and CURRENT LAND USE

Currently the land is used primarily for Agricultural purposes and is designated as ~~located within the~~ Lethbridge Urban Fringe (LUF) District ~~Zoning~~. The land is relatively flat with a natural drainage pattern flowing towards the southeast portion of the Plan Area. There is an existing break in topography located centrally within the Plan area where the natural drainage begins to flow in the northeast direction as shown in Map 2.0. ~~most of it draining to the southeast with the northern ¼ draining to the northeast. It is bounded by 43rd Street on the west, the SMRID canal on the north, 9th Avenue on the south and 26th Avenue on the north (refer to Figure 3). Cross- sections of existing site conditions can be seen in Figures 9-12. The~~

This ASP concept has been ~~is~~ designed with the existing conditions of the land in mind as well as any impacts to adjacent lands that could be caused through development to the area. This consideration includes the following: ~~The impact on adjacent landowners and residents was carefully considered in the preparation of the plan.~~

~~The northern portion lands within the boundaries of the proposed Area Structure Plan are currently used as cultivated land. The southern 20.2 hectares have been developed into a parking area for trucks. In addition, a drainage pond has been created on the southeast corner. Adjacent land owners include:~~

- ~~To the east Across the~~ East of the SMRID canal lie agricultural lands which include an agricultural cattle feeding area
- ~~To the north is~~ Agricultural lands located to the north
- Industrial business located to the west across 43rd Street ~~are Industrial businesses~~
- ~~To the south is~~ Rave Industrial Park located to the south

~~5.2 DEVELOPMENT OBJECTIVES~~

~~The objective of the Developers of the Chinook Industrial/Commercial Park is:~~

~~"To create a high-quality environment that will provide a location for the establishment and growth of businesses which provide service to the commercial and industrial base of the Lethbridge County."~~

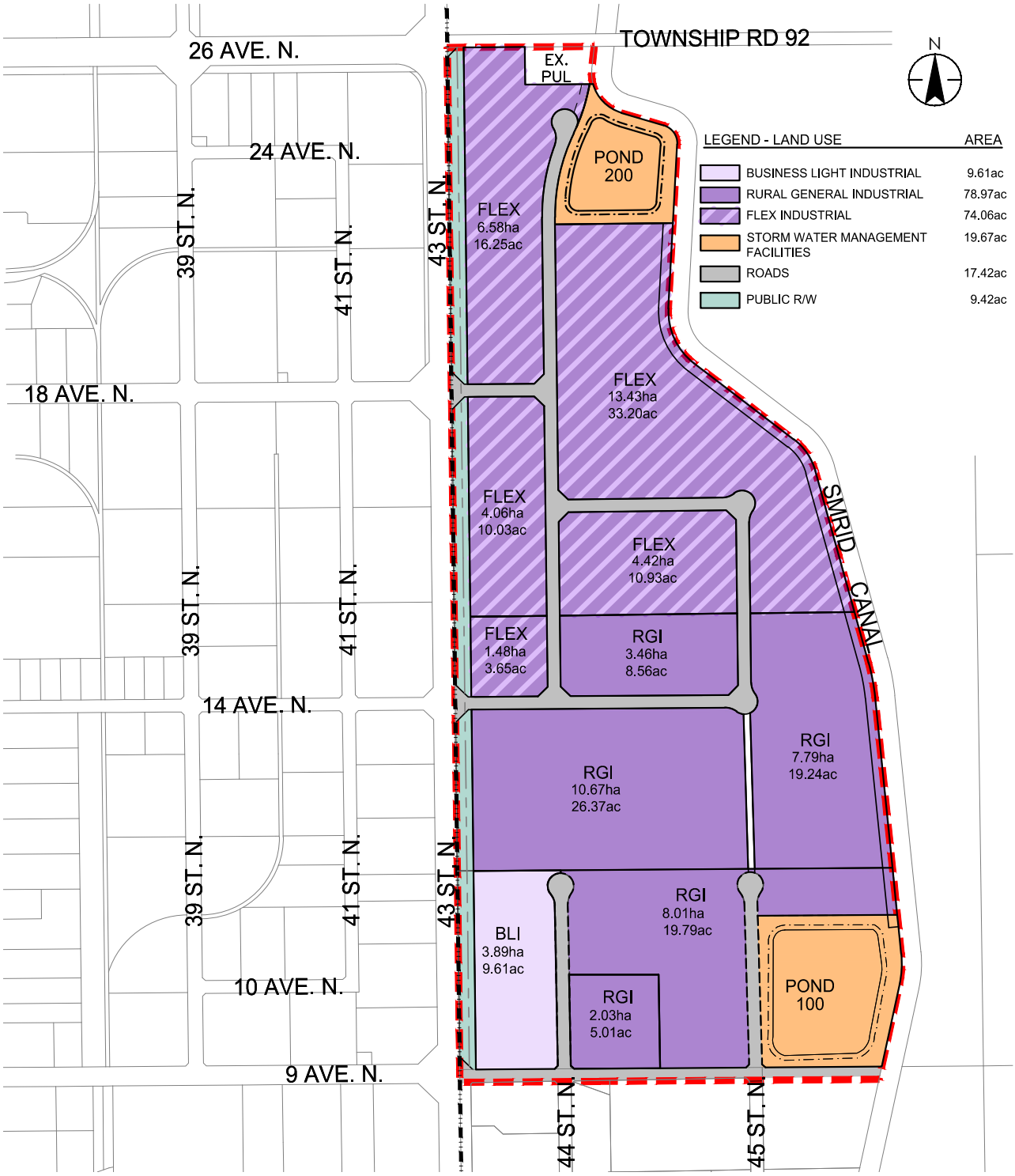
## 5.2 PREFERRED DEVELOPMENT CONCEPT

The proposed Land Use Plan ~~development and phasing plan~~ appears on ~~Figure~~ Map 3.0, with the ultimate development ~~will~~ consisting of approximately ±85.65 hectares (±211.65 acres) with ~~66.7~~ ±69.61 hectares (±172.01 acres) of developable area for primarily industrial business uses ~~properties~~. ~~The developer has proposed that the area will be developed in four phases.~~

The lands adjacent to 43rd Avenue have been identified as General Industrial or Flex lands to allow for commercial or industrial business development that would benefit from direct adjacency to the street. ~~The adjacent 43rd Avenue Business Light Industrial will be used to allow for businesses that will benefit from exposure to 43rd Street.~~ ~~The remainder of the development will be Rural General Industrial.~~ This is consistent ~~fits~~ with ~~current~~ existing developments located ~~ages~~ to the west and south of the Plan Area. Lots in Phase 1 are expected to ~~will~~ vary in size in order to accommodate a range of business exposure needs, however they are ~~Future lot sizes are~~ anticipated to range from approximately ±0.45 ha to ±2.3 ha (±1.0 ac to ±5.0 ac) in size. Larger lot sizes may be considered if the market permits. Lot sizes for Phases 2 and 3 expected to range from approximately ±1.77 ha to ±13.43 ha (±4.37 ac to ±33.19 ac) in size, however any minor adjustments to these areas shall not require an amendment to this plan. The Plan Area is proposed to be developed in 3 Phases, which is discussed in further detail in Section 11.

~~Phase 1 will be completed in two separate phases. They will consist of Lot 4, Block 1, Plan 111 3171 and PUL Lot 6, Block 1, Plan 141 0178 and a portion of Lot 5 Block 1 Plan 111 3171. It is proposed that Phase 1A include up to 13 lots to be serviced by the water supply currently servicing the Rave Industrial Park. Wastewater will flow to a storage tank to be pumped off peak to the City of Lethbridge sewer system. Phase 1B will be of similar size and have the same servicing concept. The existing overland drainage system will remain. Lot sizes in Phase 1 should range from ±0.45 to ±2.3 hectares (±1.00 to ±5.00 acres).~~

~~Phase 2A and 2B of the development will consist of Lot 5, Block 1, Plan 111 3171 and will have both commercial and industrial use properties. Phase 3, 4 and 5 will be constructed as economic conditions allow. It is proposed that complete underground water, sanitary, and storm services be installed in the new roadways which will also be constructed in Phase 2. Servicing concepts for these phases are further discussed in subsequent sections.~~




MAP 3.0 | CHINOOK INDUSTRIAL PARK ASP

# PROPOSED LAND USE

ASP BOUNDARY
COUNTY/CITY BOUNDARY
POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

Stantec

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PREPARED FOR: SUMUS

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2023/03/15 2:24 PM By: Wickland, Ryne

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## 5.3 LAND USE CLASSIFICATION AND ANALYSIS

This section provides direction for the general land use areas shown on Map 3.0. A land use, Subdivision, and/or Development Permit application submitted for a site within the Plan Area shall demonstrate compliance with the policies of the land use area in the approximate area the site is located.

The proposed land use classification of the subdivision is Business Light Industrial (BLI) or Rural General Industrial (RGI) per the Lethbridge County Land Use Bylaw (No. 1404). ~~A figure depicting the anticipated land use designations within the Park is provided on Map 3.0.~~

### Business Light Industrial (BLI)

The intent of the Business Light Industrial lands is to provide for a lower intensity business, such as light industrial or a use compatible to adjacent development in the area. These lands can be highly visible and accessible by both the travelling public and industrial users.

### Rural General Industrial (RGI)

The intent of the Rural General Industrial lands is to provide for general industrial uses as well as rural or agricultural type uses.

### Flex Industrial Area

The intent of the Flex Industrial Area is to provide flexible options for multiple forms of industrial related uses. Buildout of the Flex Industrial Area could take a variety of forms depending on market conditions and landowner requirements. Possible scenarios for buildout include, but are not limited to:

- 100% business light industrial uses,
- 100% rural general industrial uses,
- Mix or “checker” layout of industrial uses.

## 5.4 PROPOSED LAND USE AND STATISTICS

The distribution of land use within the proposed ASP is shown in Table 1 below. The projected number of industrial lots will vary depending on economic conditions ~~the market~~. Lot locations and size will be established during subdivision.

Table 1. Land Use Statistics*

| | Hectares (ac.) | Percent |
|---|---|---|
| Roads & Right-of-Ways | ±7.05 (±17.42) ~~8.75 (21.62)~~ | 8% ~~10.7%~~ |
| Rural General Industrial (RGI) | ±32.57 (±80.49) ~~46.04 (113.78)~~ | 39% ~~56.3%~~ |
| Business Light Industrial (BLI) | ±4.64 (±11.47) ~~20.66 (51.06)~~ | 6% ~~25.2%~~ |
| Flex Industrial** | ±32.40 (±80.05) | 38% |
| Public Utility Lots (Stormwater Management) | ±7.96 (±19.67) ~~6.39 (15.79)~~ | 9% ~~7.8%~~ |
| Parks/Green-Space/ER | 0 | 0% |
| Gross Area | ±84.62 (±209.10) ~~81.84 (202.25)~~ | 100% |
| Developable Area | ±69.61 (±172.01) ~~81.84 (202.25)~~ | |

*Land Use Statistics are calculated at time of Plan preparation. Land within the plan area is to be redesignated over time and reflected in this table until the time of full build out.
**Flex Industrial lands represented on Map 3.0 shall be considered for Business Light Industrial or Rural General Industrial land use districts to be determined at time of application and reviewed by the Development Authority.

## 5.4 MUNICIPAL RESERVE

At this time, it is anticipated that at the time of subdivision, the municipal reserve requirements will be met by providing cash in lieu of land.

# 6. Servicing

To determine the viability of this development, preliminary evaluations have been performed with respect to servicing. Key service items include sewer, water, electricity, natural gas and telecommunications. ~~telephone, television, and electric~~. Additional information on key services is included in this section.

## 6.1 SANITARY SEWER SYSTEM

In initial meetings with County and City officials, it was determined that the current city sanitary infrastructure was not capable of accommodating the flows from the development. However, there were indications that temporary off-peak sewage flows could be routed through their system. As such, the primary sanitary servicing concept is to ultimately send the sewage to the County-managed system to the east. This servicing strategy has been completed for the Phase 1 Area along 9th Avenue N. This servicing strategy may be applied to the remainder of Phase 1 along 9th Avenue North in consultation with the City of Lethbridge.

Phases 2 and 3 will be serviced through septic fields or pump out tanks and no provision will be made in public roads for a municipal gravity system, nor any connection to municipal treatment facilities. As such, parcels will need to be a minimum of 0.81 ha (2.0 acres) in size, and high consumption water users producing large quantities of sewage effluent cannot be accommodated under this servicing strategy. Detailed evaluations, designs and regulatory approvals for onsite septic systems will be prepared by others during subdivision and permitting.

~~Alternate sewage servicing concepts have also been evaluated. A second concept is to create a private sewage treatment lagoon to the east. This would be funded and approved by the developer. A third option is to create a communal septic field system on the property. The final alternative to sewage treatment is to work with the City to allow for access to their sewage distribution infrastructure. Planning for a County-managed sewage system is currently underway. However, it is proposed that Phase 1 be serviced with a temporary system that utilizes off-peak discharge to the City sewage system.~~

In order to facilitate future design of sewage facilities for Phases 1A and 1B; preliminary design analysis has been conducted. This analysis uses the City of Lethbridge criteria for industrial discharge. It has been assumed that for the purposes of sewage disposal, businesses will comply with Business Light Industrial standards. Businesses that produce more waste will need to incorporate recycling and reuse of water into their building and site design. Sewage generation estimates are shown in the following Table 2. Sewage generation estimates are not being provided for Phases 2 and 3 where septic systems will be utilized as these statistics will have no relevance to future County conveyance and treatment systems.

Table 2. Sewage Generation Estimates

| Phase | Area | | Dry Weather flow | Peak Factor | Wet Weather Flow | Infiltration | Total | Flow |
|---|---|---|---|---|---|---|---|---|
| | Acres | Hectares | $m^3$/hectare/day | | $m^3$/hectare/day | $m^3$/hectare/day | | L/min |
| 1A | 22.6 | 9.2 | 20 | NA | 7.5 | 2.25 | 29.75 | 209.4 |
| 1B | 16.6 | 6.7 | 20 | NA | 7.5 | 2.25 | 29.75 | 153.8 |
| ~~2A~~ | ~~17.9~~ | ~~7.2~~ | ~~20~~ | ~~NA~~ | ~~7.5~~ | ~~2.25~~ | ~~29.75~~ | ~~165.8~~ |
| ~~2B~~ | ~~21.6~~ | ~~8.7~~ | ~~20~~ | ~~NA~~ | ~~7.5~~ | ~~2.25~~ | ~~29.75~~ | ~~200.1~~ |
| ~~3~~ | ~~37.3~~ | ~~15.1~~ | ~~20~~ | ~~NA~~ | ~~7.5~~ | ~~2.25~~ | ~~29.75~~ | ~~345.6~~ |
| ~~4~~ | ~~35.3~~ | ~~14.3~~ | ~~20~~ | ~~NA~~ | ~~7.5~~ | ~~2.25~~ | ~~29.75~~ | ~~327.0~~ |
| ~~5~~ | ~~36.3~~ | ~~14.7~~ | ~~20~~ | ~~NA~~ | ~~7.5~~ | ~~2.25~~ | ~~29.75~~ | ~~337.2~~ |
| Total | 39.2 | 15.9 | | | | | | 363.2 |

~~Phase 2-5 sanitary sewage will be handled through underground services to each lot from the sanitary mains located in the road. The sanitary sewage will be gravity fed away from the development to the south and into a lift station located offsite. This will ultimately flow into the County sewer system proposed for this phase. Plans for this system are underway. Alternative solutions are also under consideration as mentioned earlier in this document.~~

~~Piping sizes have been established using the calculations derived in Table 1. Due to the flat nature of the site, Phases 3-5 will require an additional sanitary lift station to convey sewage to the gravity system (refer to Figure 5).~~

## 6.2 WATER SYSTEM

It is proposed that each lot have a water service fed from a water main located in the adjacent roadways which will be fed by the existing water main currently servicing the Rave Industrial Park for Phases 1A and 1B. Phases 2 and 3 will be serviced from a connection to the City of Lethbridge Water System directly west of the Chinook Industrial Area as well as a connection to Township Road 92. ~~Water for firefighting purposes will be provided by the same infrastructure. This section covers how each of these water supply issues will be addressed.~~ The provision of potable water is contingent on the City of Lethbridge and Lethbridge County coming to a conveyance agreement.

### 6.2.1 POTABLE WATER AND FIRE PROTECTION

The proposed primary water source to this development will be through a connection ~~by connecting~~ to the distribution system servicing Rave Industrial park and City of Lethbridge. ~~This water is ultimately provided by the City of Lethbridge through metered connections.~~ A conceptual water system layout has been provided on Map 4.0. ~~Initial meetings with the City of Lethbridge infrastructure team gave indication that there is adequate supply of water in this area to service this development. The developers will formalize agreements with both the City and County to confirm access.~~ Water Conveyance agreements between the County and City will be required at the subdivision and permitting stage including payment of any connection and administrative fees by the developer. Each connection point to the City system shall have a meter chamber and premise/isolation backflow protection.

~~This water will be used for potable and fire protection purposes~~. Potable water will be used for human consumption and firefighting.

#### Fire Protection

Hydrant spacings shall meet the requirements of the jurisdiction providing the service at the time of construction. Currently, fire protection services are from the Town of Coaldale. ~~This will be the only source of potable water for this development. A preliminary design layout has been proposed in Figure 6. This gives an indication of phasing as well. For Phase 1 there will be a single access point. Coincident with Phase 3, a second connection point will be added to the County line on the north edge of the property allowing for looping of the system.~~ All water mains are to be a minimum of 250 mm in diameter. Initial demand and flow analysis has been completed based on the developable area of Phases 2 and 3, (51.89Ha). A demand of 5m³/Ha/day was assumed, and fire flows has been assumed at 9,000 L/min. Table 3.0 shows the calculated demands. ~~Potential hydrant and valve locations are also shown in Figure 6~~. Water network and flow analysis will be conducted as part of the subdivision application.

Table 3. Water System Demands (Phase 2 and 3)

| | |
|---|---|
| Average Day Demand (ADD) | 259 m³/day |
| Maximum Day Demand (MDD) | 518 m³/day |
| Maximum Day Demand (MDD) + Fire Flows | 156 L/s |
| Peak Hour Demand (PHD) | 12 L/s |

### 6.2.2 NON-POTABLE WATER / INDUSTRIAL USE

~~In the event a business needs additional industrial water supply to accommodate a specialized or unique process, water may be available through the SMRID. The non-potable water system will distribute water from the SMRID canal to potential users. These users would need to be adjacent to the SMRID canal on the east side of the property. Each business owner would be responsible for providing their own infrastructure to support this use.~~ The use of non-potable water by future development is not anticipated at this time.

## 6.3 GAS

Natural gas distribution infrastructure in the area surrounding the site is operated by ATCO Gas. The developer will pay for the installation of natural gas distribution infrastructure to each lot. ATCO Gas will distribute natural gas within the development and lot purchasers will be able to select a retailer for natural gas supply. Future Developers will coordinate with ATCO to determine connection locations during the design phase. ~~The closest service connection point is shown on Figure 2.~~

## 6.4 ELECTRICAL POWER

Fortis will provide services to the proposed subdivision and underground services to each property line. Future Developers will coordinate with Fortis to determine connection locations during the design phase.

## ~~6.5 TELEPHONE~~

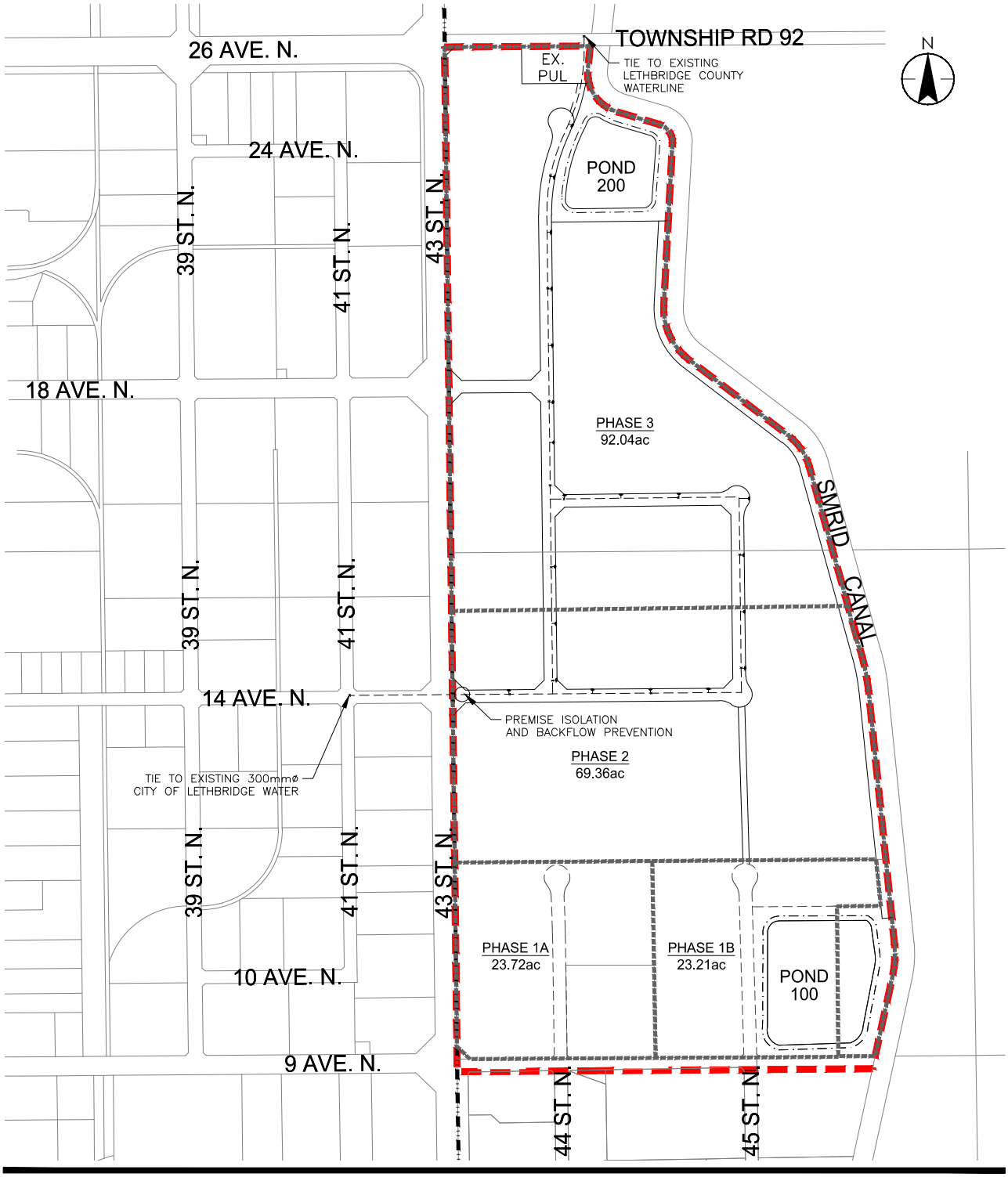
~~Telus will provide services to the lots, but each individual owner must apply for the service when building. The development will connect to an existing Telus pedestal at the corner of 9th Avenue North and 44th Street North. The service would require boring under 9th Avenue.~~

~~6.6 CABLE TELEVISION~~

~~There is no cable television available in the area, however, small satellite dishes may be installed by the lot owner.~~

## 6.5 TELECOMMUNICATIONS

During design development local service providers will be contacted for the provision of phone and internet services. These future systems may be incorporated in overall regional servicing or be completed by future parcel developers. Currently Telus and Satellite Service providers are the most viable options for these services.




MAP 4.0 | CHINOOK INDUSTRIAL PARK ASP

# WATER SERVICING

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ASP BOUNDARY
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POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED
PROPOSED WATERMAIN

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February 1, 2023

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# 7. Roads

A layout of the streets and accesses is shown in Map 5.0. In general, roads within the subdivision will comply with and Lethbridge County engineering standards ~~for a 20m right-of-way industrial collector and industrial local road~~ throughout with no sidewalks.

Roads in the Phase 1 area will be reconstructed to an urban cross-section as identified with some provision for parking. Optional local access roads have been identified north of 9th Avenue. The completion of these roads, if required, will be determined at the subdivision stage.

Roads in the Phases 2 and 3 area will be constructed as identified with no provision for on street parking as industrial land uses in these phases will be required to accommodate all customer and employee parking on site. Roadway widths in these phases will be 10 meters wide (two 5m driving lanes), and all internal intersections will be designed with two-centered curves to accommodate WB20 truck turning movements.

All Roads will be paved and will meet Lethbridge County Engineering standards to allow for truck access ~~(refer to Figure 13)~~. The transportation improvements will be paid for by the developer.

There will ultimately be three access points to this development:

1. 9th Avenue North
2. 14th Avenue North
3. 18th Avenue North

The access to Phase 1 will be via 9th Avenue North, which runs east to west along the south border of the development. ~~A portion of 44th Street North would be constructed from its intersection with 9th Avenue North to the north) to facilitate access to the proposed new building in Phase 1 and to the north for Phase 2 businesses.~~ Phase 2 will be accessed via a new intersection at 14th Avenue North. This intersection will be carried east and terminate at the 45th Street intersection. Portions of 44th Street and 45th Street will also be built to the northern limit of Phase 2. Phase 3 roads would include the rest of 44th Street North as well as 45th Street North, 16th Avenue North and ~~14~~18th Avenue North access. ~~Access to 18th Avenue and 43rd Street will be constructed as part of Phase 5. The north side of 9th Avenue will be upgraded to an industrial collector standard (City standard) by the developer.~~

A Traffic Impact Assessment ~~study~~ (TIA) has been completed for the proposed Chinook Industrial Park and assumes that ultimate development will be 25% Business Light Industrial (BLI). The original traffic study was completed by EASL based on the projected land use and roadway layout at the time. ~~shown on Figure 4 Proposed Development & Phasing Plan (refer to Appendix C). The results of this study indicate that the existing infrastructure on 43rd Street North from 9th Avenue North to 26th Avenue North will accommodate this development.~~ The updated internal roadway network alters the way in which vehicles access the arterial roadway network from Phase 2 and Phase 3 developments. As

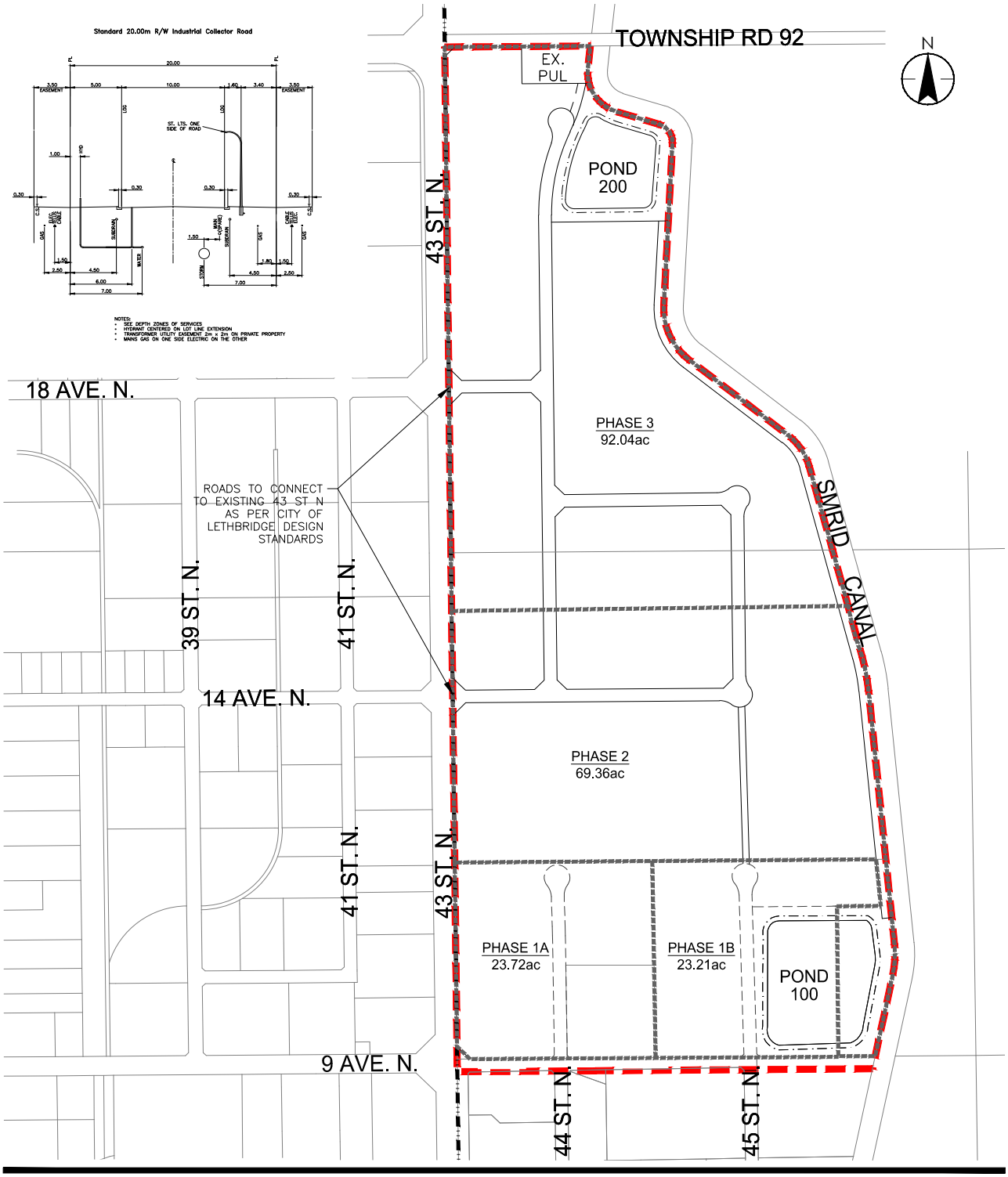
such, new traffic analysis was undertaken and determined that the access points at 14th Avenue North and 18th Avenue North will accommodate post-development traffic volumes in Phases 2 and 3.

Although the TIA does indicate this development is feasible there are future improvements that are suggested for the ~~year 2022 (~~full build out horizon. ~~assumed).~~ These recommendations are as follows:

- Installation of westbound left turn only lane on 26th Avenue
- Traffic signals at 43rd Street and 14th Avenue
- Installation of a northbound left turn lane at 14 Avenue
- Traffic signals at 43rd Street and 18th Avenue
- Installation of a northbound left turn lane at 18 Avenue
- Installation of second eastbound left turn only lane at the intersection of 43rd Street and Highway 3.

All road and intersection improvements shall be evaluated following final land use designation, subdivision, and detailed design to ensure that improvements are constructed when appropriate to support growth. Improvements to 43rd Street Intersections will be shared between the City of Lethbridge and Lethbridge County. Allocation of final costs will be determined at the subdivision stage and administered through a future Lethbridge County Development Agreement.

For additional details and analysis refer to Appendix A.




MAP 5.0 | CHINOOK INDUSTRIAL PARK ASP

# ROAD LAYOUT

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# 8. ~~Site Drainage and Grading~~ Stormwater Management

The Chinook Industrial Park Stormwater Management Systems are defined by existing topography and can be characterized into two distinct zones.

Zone 100 is comprised of existing development in the Rave Industrial Park south of our ASP, partially developed Phase 1A/1B, and future development in Phase 2.

Zone 200 is comprised of future Phase 3 development and the existing water filling station adjacent to Township Road 92.

All future drainage designs and construction shall meet the requirements Lethbridge County and the Province of Alberta. Documents referred to when completing this analysis included Alberta Environment and Parks Storm Water Management Guidelines (Current Edition). Unique to the stormwater management of the site is the requirement of a conveyance agreement between Lethbridge County and St. Mary River Irrigation District (SMRID). A current agreement exists for Pond 100 between the County and SMRID which requires the following before a pumped discharge of stormwater to the canal will be permitted.

1) Water must be sampled, tested and meet SMRID water quality standards.
2) Available conveyance capacity within the canal must be confirmed prior to operation of pump system.

Based on the above, Ponds will need to operate as "zero-release" facilities storing an entire 1:100 year rainfall event until such time as permission is granted by SMRID to discharge stormwater. Please refer to Section 8.3 for further discussion on the Major storm event conveyance and attenuation systems, and the Chinook Industrial Park Stormwater Management Plan report Appendix B. A hydrologic model was developed for the post-development condition using PCSWMM computer modelling software. Intensity-duration-frequency (IDF) storm data for the City of Lethbridge was used as the basis for the design storms used in the analysis.

## 8.1 PRE-DEVELOPMENT CONDITION

As can be seen in Map 2.0 of the ASP, existing lands generally flow from the west side along 43rd Street North to the east towards the existing SMRID irrigation canal. These general drainage patterns will be respected during the ultimate grading design of the site to minimize overall grading efforts during development.

Pond 100 is currently partially constructed and services portions of Phase 1 and the Rave Industrial area to the south. The completion of Phase 1 and Phase 2 will require the expansion of this facility and a review of the existing lift station pumping capacity to determine if upgrades are required.

## 8.2 POST DEVELOPMENT MINOR STORM SYSTEM

A minor storm sewer system is outlined on Map 6.0 and has been designed for a 1:5-year rainfall event using the following unit rates as outlined in City of Lethbridge Design Standards:

- Roadways 90L/s/Ha
- Private Parcels 40L/s/Ha (Restricted 1:5 Year Outflow)

Given the parcel coverage (by buildings) in general industrial areas is quite small, large parking and storage areas can be utilized to reduce outflow minimizing the size of downstream infrastructure. For private parcels, this will require that future parcel designs provide some stormwater attenuation and outflow control structure as part of permitting process. Sediment control through the implementation of sumps and or other control measures to collect pollutants should be reviewed at detailed design.

## 8.3 POST DEVELOPMENT MAJOR STORM SYSTEM

Major storm systems are outlined on Map 7.0 and must accommodate 1:100 year rainfall events. These systems include public roadways, swales, ditches and detention facilities. The pumped discharge of stormwater to the SMRID canal will be required at Pond 100 and Pond 200. Other options may be explored to eliminate the need for a second lift station; however, topography limitations and additional infrastructure costs will likely be prohibitive to try to combine both ponds to one pump station. If a second lift station is installed at Pond 200, a new conveyance agreement will be required between the County and SMRID.

In general, each private parcel within the study area will require some onsite storage and will have a restricted release rate. However, a few areas along the east edge of the study area boundary will not be restricted and will be serviced via swales, conveying runoff to the proposed ponds.

Future emergency overland drainage from private parcels will be directed to public ROW's and/or public conveyance systems. Detention storage on private parcels during the 1:100-year rainfall event will greatly reduce overland flows in roads and ditches thereby facilitating the achievement of safe flow depths and velocities as outlined by provincial guidelines. Private parcel drainage will not be permitted to pass through another private parcel unless covered under a drainage agreement.

For the purpose of preliminary pond sizing below, a 1:100-year rainfall for Lethbridge (109mm) is being utilized assuming a zero-release scenario during the storm event, due to conveyance agreement requirements with SMRID.

| Stormwater Storage Requirements | | | |
|---|---|---|---|
| | | 1:100 year rainfall amount (m)= | 0.109 |
| Zone | Area (Ha) | Required 1:100 year Storage (m³) | % of Total Storage |
| Pond 100 | 5.27 | 5 744 | 7.0% |
| Phase 2 | 33.15 | 36 134 | 43.9% |
| Phase 1 | 15.36 | 16 742 | 20.3% |
| Rave | 21.74 | 23 697 | 28.8% |
| Total | 75.52 | 82 317 | 100.0% |
| Pond 200 | 3.00 | 3 270 | 9.5% |
| Phase 3 | 28.74 | 31 327 | 90.5% |
| Total | 31.74 | 34 597 | 100.0% |

~~All drainage onsite must conform to Lethbridge County and Alberta Environmental requirements. Documents referred to when completing this analysis included Alberta Environment and Parks Storm Water Management Guidelines (2013). This document also includes descriptions of Best Management Practices (BMPs) which are used to mitigate peak runoff values. These practices, combined with the storm ponds, will provide control and containment of storm runoff over the entire development.~~

~~As can be seen in Figure 3 of the ASP, drainage on the existing ground on Lot 5 to the north generally flows from the east side along 43rd Street North to the east towards the existing SMRID irrigation canal. Grading on Lot 4 where the gravel parking lot is located is to the south into the drainage ditch, which then directs the stormwater east into the storm pond. Lot drainage will be directed to the street. It will not cross the various lots.~~

~~1.1 SITE DRAINAGE~~

~~The proposed development will have two stormwater detention ponds. The ponds will receive storm water runoff from the subdivision by means of an overland drainage system constructed within the development area. The overland drainage system will consist of a curb and gutter system along the roads and lot line swales to collect storm water runoff from major events, and a storm drain system for minor events to convey the storm water to the ponds. The existing storm water management facility (SWMF) located at Lot 6 Block 1 Plan 141 0178 will remain and be extended both to the east and the north (refer to Figure 8). A second storm pond will be constructed at the north end of the development to provide additional storage for the northern lots. An additional lift station will need to be constructed at the north pond to pump effluent off- peak to the SMRID canal.~~

~~The south pond is currently released to the St Mary Reservoir Irrigation District (SMRID) main canal, which bounds the site to the east. There is an existing stormwater lift station that is used to pump storm water off-peak to the SMRID canal. This system would be capable of accommodating Phase 1A~~

but would need to be upsized with future developments to a final capacity of approximately 235 l/sec (3750 US gal/min) to achieve drain down times of about 3 days in this enlarged SWMF.

The new stormwater detention pond to the north and the expansion of the existing pond to the south will require approval from, and registration with Alberta Environment prior to construction.

Storm water runoff from the subject lands presently flows into the existing roadside ditches. The ditch system will be replaced with a full urban curb and gutter cross-section using a major and minor storm water system. Pre-development storm drainage patterns are described in greater detail in the Hydrogeological and Site Drainage Analysis completed for the site by Hasegawa Engineering and attached to this document as Appendix D.

1.2 POST-DEVELOPMENT

A detailed drainage analysis was performed for the site to compare pre-and post- development storm drainage patterns. A hydrologic model of the site was prepared using the PC SWMM hydrologic modeling software package. The hydrologic model was used to estimate the pre- development release rate for a 1:5 year, 4-hour storm event. The second hydrologic model of the post-development site was then analyzed using a 1:100-year 24-hour design storm event. This storm event is a synthetic Modified Chicago storm based on City of Lethbridge weather data. The storm water management facilities were sized based on the results of these models. Detailed methods and results of surface runoff analysis are provided in Appendix D. A summary of the findings of this report appears below.

Primary channels for storm drainage within the proposed development are provided within the internal road right-of-ways. A storm drain system is utilized to accommodate minor storms.

Storm water runoff will be detained in two storm water management facilities. The existing Storm Water Management Facility (SWMF) continues to receive drainage from the Southland International parking area and Rave Industrial area through existing drainage channels but the parking area will be further developed and generate additional runoff. According to the July 2013 storm water management report for this facility, excess capacity already exists in this facility and the excess volume generated after development is well under this excess capacity.

Table 3 below and the following paragraphs summarize performance of the storage areas in the 100-year design storm comparing predevelopment and post development conditions.

Table 3. Predevelopment vs Post Development Runoff / Retention Pond Capacity

| | Predevelopment Inflow Vol/ Rate | Post-development Inflow Vol/Rate | Post-develop. Outflow | Retention Pond Maximums Volume/Depth/% Capacity [a] |
|---|---|---|---|---|
| North Storage | 7055 m3<br>0.882 m3/sec | 10,464 m3<br>2.893 m3/sec | Pumped - 0.04m3/sec assumed | 8723 m3/1.3 m/58% |
| Existing South Storage [b] | 34,016 m3 5.951 m3/sec | Not Applicable [c] | Not Applicable | Not Applicable |
| Proposed South Storage [b] | Not Applicable | 76,718 m3<br>8.226 m3/sec | 0 (delayed release) | 69,690 m3/2.87 m/ 78% |

*[a] Pond statistics for the north storage pond are based on assumed pumping rate of 40 l/sec into the outflow throughout the storm. Capacities shown include 0.6m freeboard.*

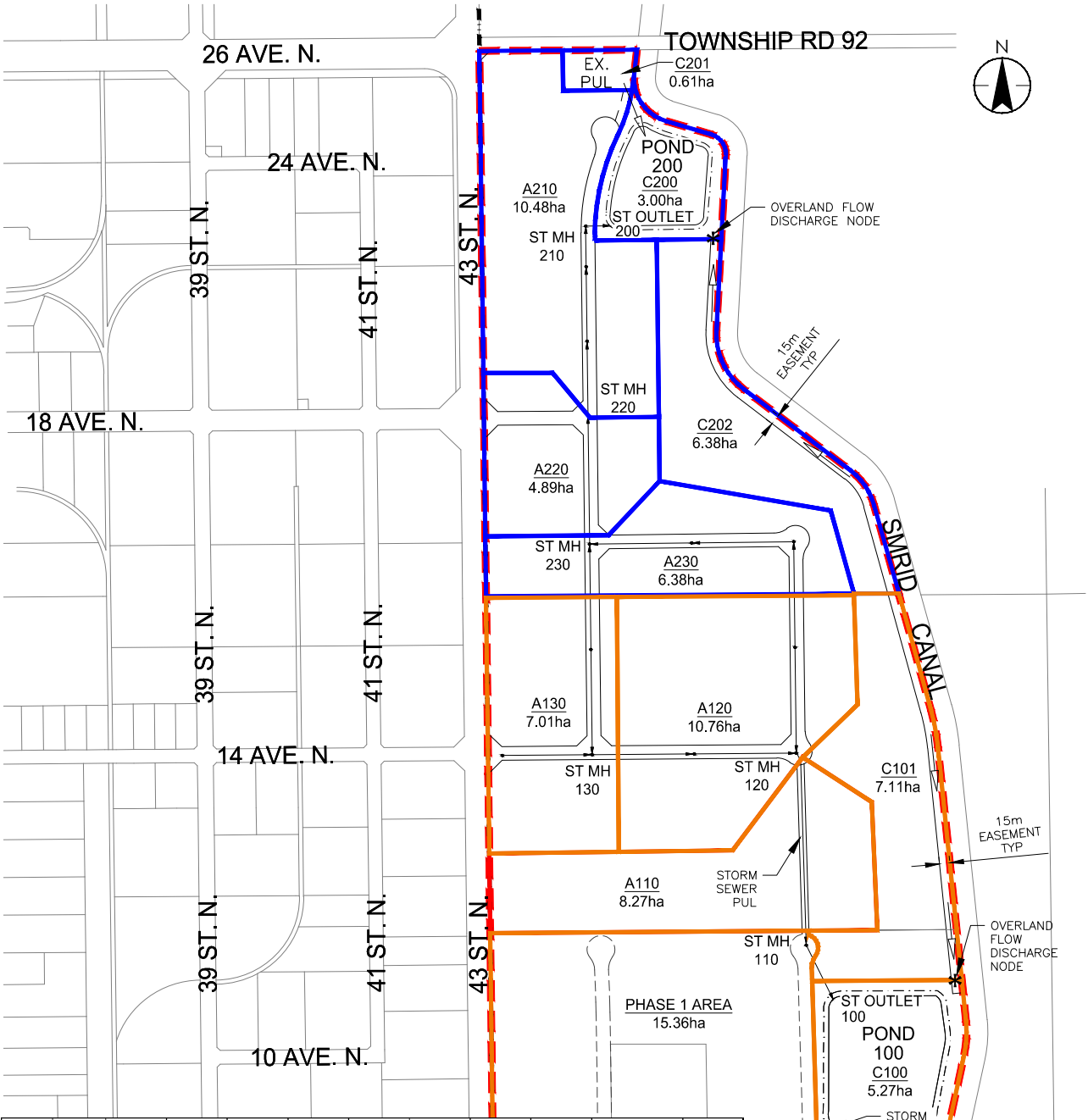
*[b] The Rave Industrial Area Runoff model is not available – these volume figures include 17,000 $m^3$ to account for reported Rave volume but runoff rates do not include Rave contributions.*

*[c] Post development runoff for the existing parking lot modeled separately for comparison to predevelopment column, shows a volume of 35,269 $m^3$ & a maximum inflow rate of 5.112 $m^3$/sec. The area of new development contributing southbound runoff was also modeled separately for comparison although tributary areas are only approximate between pre- and post-development models - runoff volume increases from 12,163 $m^3$ in the predevelopment model to a post development volume of 32,186 $m^3$ while peak rates rise from 2.126 $m^3$/sec to 6.62 $m^3$/sec.*

The "new" runoff from the south portion of the development will be routed into the existing storm water management facility which will be enlarged to accommodate the increased volume. This will occur during Phase 3 of the development. This facility will store the storm runoff until permission is received to release it into the adjacent SMRID irrigation canal. Upgrading pump capacity may need to be considered to avoid the risk associated with extended retention times – this will probably also depend on re-negotiating release agreements with SMRID. Expanding the capacity of this SWMF will be accomplished by enlarging the top 2.9 metres of the existing pond east and north to about 5 metres from the lot line to create an upper bench continuous from the inlet ditch (refer to Figure 14 Appendix A). Lesser storm events are passed through to the deeper storage area and major storm events back up into the extended pond and drainage ditch along the east boundary. Runoff models indicate that the 100-year storm will generate about 76,718 $m^3$ of runoff routed to the south SWMF–

~~by utilizing the drainage ditch itself to augment storage, the existing SWMF needs to be enlarged to store 69,690 $m^3$ of this volume. Final design may adjust elevations and capacities of the ditch and SWMF extension.~~

~~A smaller area on the north of the proposed development will drain into a second retention area in the northeast corner. This runoff will also need to be pumped out, but the possibility exists for release into the ditch of a nearby Lethbridge County road during the storm. It is assumed that the limit for this release will be pump capacity rather than predevelopment runoff rates – assuming a constant pump outflow of 0.04 $m^3$/sec (600 US gal/min), modeling indicates that 8720 $m^3$ of storage is required at the north end and drain down times are about 3.5 days.~~




| FROM | TO | AREA | UNIT RATE | Q Area | Q Cumm. | SIZE | SLOPE | MANN | V Pipe | Q Pipe | Q Area |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MH | MH | (ha) | (m3/s/Ha) | (m3/s) | (m3/s) | (m) | m/m | n | (m/s) | (m³/s) | (m³/s) |
| 130 | 120 | 7.01 | 0.04 / 0.09 | **0.324** | **0.324** | 0.675 | 0.00300 | 0.013 | 1.29 | **0.460** | **0.324** |
| 120 | 110 | 10.76 | 0.04 / 0.09 | **0.481** | **0.805** | 0.900 | 0.00300 | 0.013 | 1.56 | **0.992** | **0.805** |
| 110 | Outlet 100 | 8.27 | 0.040 | **0.331** | **1.136** | 1.050 | 0.00300 | 0.013 | 1.73 | **1.496** | **1.136** |
| 230 | 220 | 6.38 | 0.04 / 0.09 | **0.304** | **0.304** | 0.600 | 0.00300 | 0.013 | 1.19 | **0.336** | **0.304** |
| 220 | 210 | 4.89 | 0.04 / 0.09 | **0.231** | **0.536** | 0.750 | 0.00300 | 0.013 | 1.38 | **0.610** | **0.536** |
| 210 | Outlet 210 | 10.48 | 0.04 / 0.09 | **0.466** | **1.002** | 1.050 | 0.00300 | 0.013 | 1.73 | **1.496** | **1.002** |

MAP 6.0 | CHINOOK INDUSTRIAL PARK ASP

# STORM DRAINAGE MINOR

PIPE SYSTEM

PREPARED FOR: SUMUS

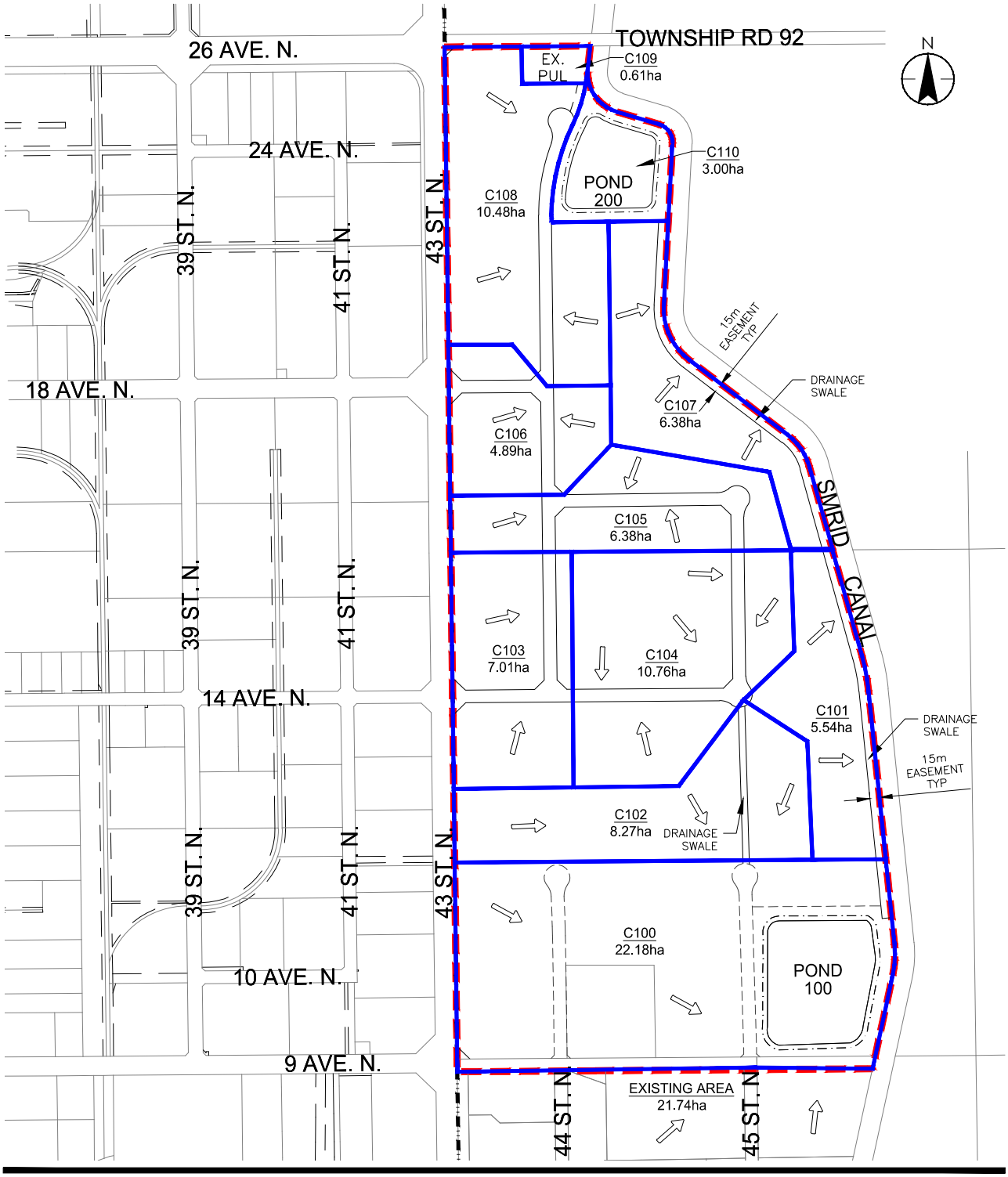
ASP BOUNDARY
COUNTY/CITY BOUNDARY
POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

Stantec

116549063
December 7, 2022

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2022/12/07 1:50 PM By: Wickland, Ryne

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MAP 7.0 | CHINOOK INDUSTRIAL PARK ASP

# STORM DRAINAGE MAJOR

OVERLAND SYSTEM

PREPARED FOR: SUMUS

ASP BOUNDARY

COUNTY/CITY BOUNDARY

POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

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December 7, 2022

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# 9. Geotechnical

Two geotechnical reports were conducted for this project. One for the south parcel (Lot 4 Block 1 and Lot 6 Block 1) conducted in March of 2012 and one for the north parcel (SW¼ 10-9-21-W4M) conducted on May 2, 2017. As part of the ASP Amendment, a Geotechnical Report (March 2023) and Phase 1 Environmental Assessment (February 2023) was completed (W½ 10-9-21-W4M). All reports and detailed analysis are in Appendix D.

~~As part of the analysis on the Parcel 2 test pits and 4 boreholes were advanced to approximately 10 m depth. The overall lithology consisted of:~~

~~0.0 – 0.2 m topsoil~~

~~0.2 – 1.5 m clay~~

~~1.5 – 10 m clay till~~

~~The groundwater was encountered between depths of 3.2 m and 9 m with the shallower water table being encountered closer to the SMRID canal.~~ Sieve analysis and Atterberg limits were conducted on site soils to evaluate grain size distribution and plastic and liquid limits. Recommendations were also given for site grading and future foundations. Overall the site soil conditions are amenable to site development and building construction. For additional details and analysis refer to Appendix D. This information will be used to facilitate design of grading, drainage and infrastructure. Additional geotechnical analysis will be required on each site to allow for proper foundation design.

# 10. Solid Waste Disposal

Lot purchasers shall be responsible to make arrangements for solid waste disposal. The City of Lethbridge Regional Solid Waste Facility is located approximately 23 km driving distance from the development. Alternatively, lot purchasers may contract with a private solid waste hauler.

# 11. ~~Architectural Controls~~ Phasing & Implementation

In accordance with the City of Lethbridge / Lethbridge County IDP Section 3.4.4.13, landscaping will follow standards with respect to shielding and buffering. The Highway Entranceways Design Guidelines, as specified in Appendix B of the IDP, will also be followed. Other internal parcel landscaping and building architecture will be at the discretion of the parcel developer and subject to Lethbridge County Land Use Bylaw and Permitting.

All construction will follow current Lethbridge County standards and development permit process. ~~The development of each lot will be considered on a case by case basis during the development permit process~~.

Phasing identifies the strategy for development of the Plan Area over time. The purpose of the phasing strategy is to provide for the logical and cost-effective progression of development. Phasing of development will be driven by the availability of servicing, transportation infrastructure, market demand, and landowner timing. Industrial uses should develop generally in accordance with the development staging sequence identified in Map 8.0. Industrial development proposing to proceed out of sequence may do so without requiring an amendment to this Plan; however, shall be required to provide rationale for the proposal in accordance with the provisions of this Plan and as required by the County.

Phase 1 will be completed in two separate phases, consisting of Lot 4 Block 1 Plan 1113171 and Lot 7 Block 1 Plan 1911847 and a portion of Lot 6PUL, Block 1, Plan 141 0178. It is proposed that both Phase 1A & 1B could include up to 13 lots each, and lot sizes may range from approximately ±0.45 ha to ±2.3 ha (±1.00 ac to ±5.00 ac).

Both Phases 2 & 3 will be subdivided out from Lot 5, Block 1, Plan 111 3171 for commercial and industrial uses as economic conditions allow. Each lot shall have a minimum lot size of ± 0.81 ha (±2.0 ac). The development of these phases over time requires critical infrastructure components in order to subdivide, service and market.

## Phase 1A and 1B

These phases are currently serviced and operational from 9th Ave S. However, Pond 100 expansion will be required for any further onsite development as will the reconstruction of roads and storm systems in the Rave Subdivision.

## Phase 2

The construction of Phase 2 requires the following for servicing:

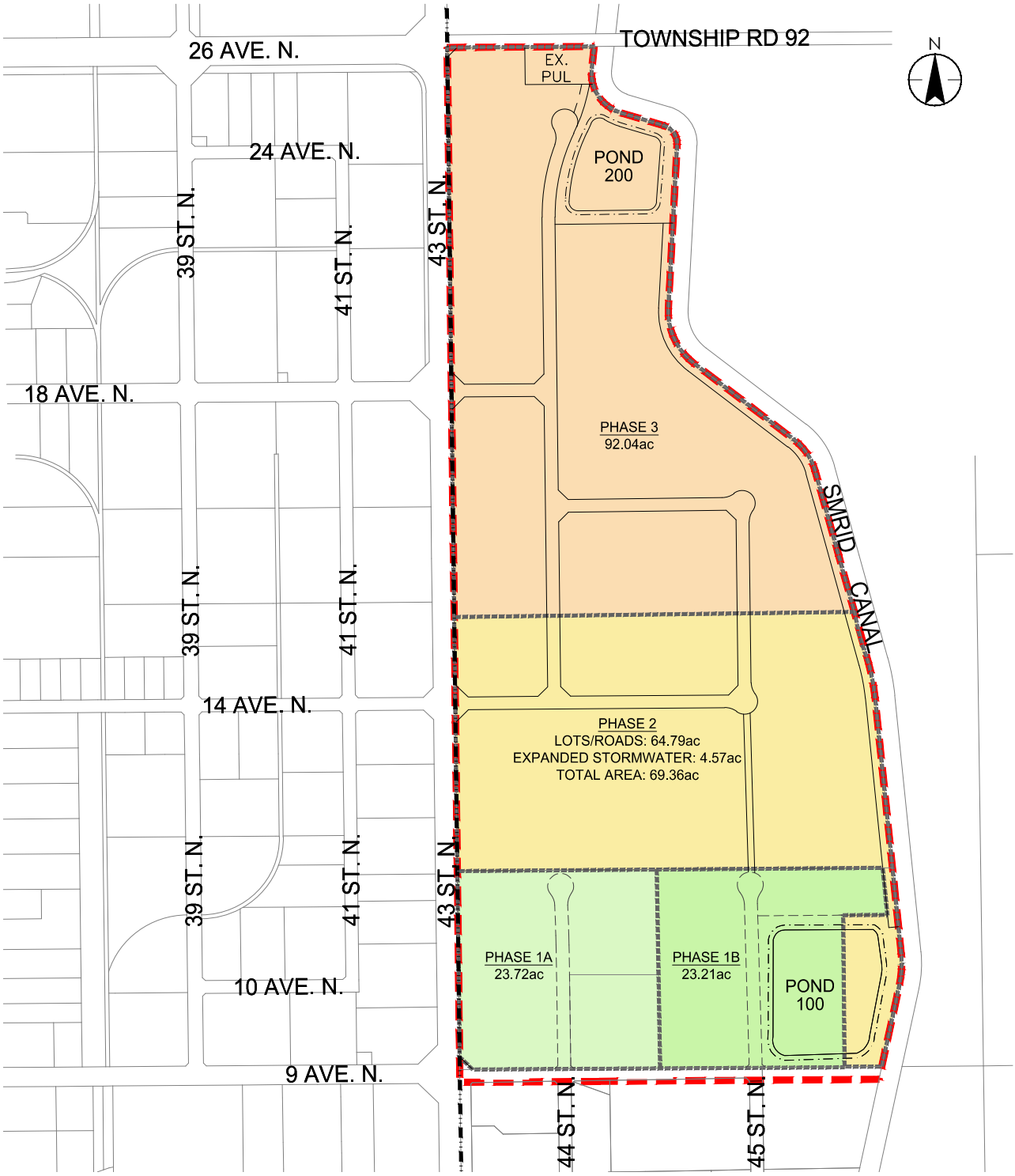
- Utility Crossing Agreement Approvals at 43rd Street
- Connection to the City of Lethbridge's Potable Water System

- Expansion of Pond 100 to accommodate additional stormwater run-off
- Lift Station Evaluation
- Extension of natural gas and power from 43rd Street

### Phase 3

The construction of Phase 3 requires the following for servicing:

- Utility Crossing Agreement Approvals at 43rd Street
- Connection to Lethbridge County's Potable Water System (Township Road 92) and Phase 2 System
- Construction of Pond 200 and Lift Station to accommodate stormwater run-off and offsite conveyance
- Completion of Water Conveyance agreement between SMRID and Lethbridge County
- Stormwater Facility Registration with the province
- Extension of power, gas and telecommunications from Phase 2 and 43rd Street N (if required)




MAP 8.0 | CHINOOK INDUSTRIAL PARK ASP

# PHASING PLAN

ASP BOUNDARY
PHASING BOUNDARY
COUNTY/CITY BOUNDARY
POTENTIAL PHASE 1 ROAD OPTIONS TO BE CONFIRMED

Stantec

116549063
December 7, 2022

PREPARED FOR: SUMUS

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# APPENDIX A

# Traffic Impact Assessment

Chinook Industrial Park Area Structure Plan

February 2, 2023

Prepared for:

Sumus

Prepared by:

Stantec Consulting Ltd.
Unit 230, 704 4 Avenue South
Lethbridge AB  T1J 0N8



**TRAFFIC IMPACT ASSESSMENT**

This document entitled Traffic Impact Assessment was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Sumus (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

**Prepared by: Angela Forsyth, P.Eng.**

**Reviewed by: Japji Chahal-Virk, P.Eng.**

**Corporate Authorization**



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Appendix B – Existing TIA

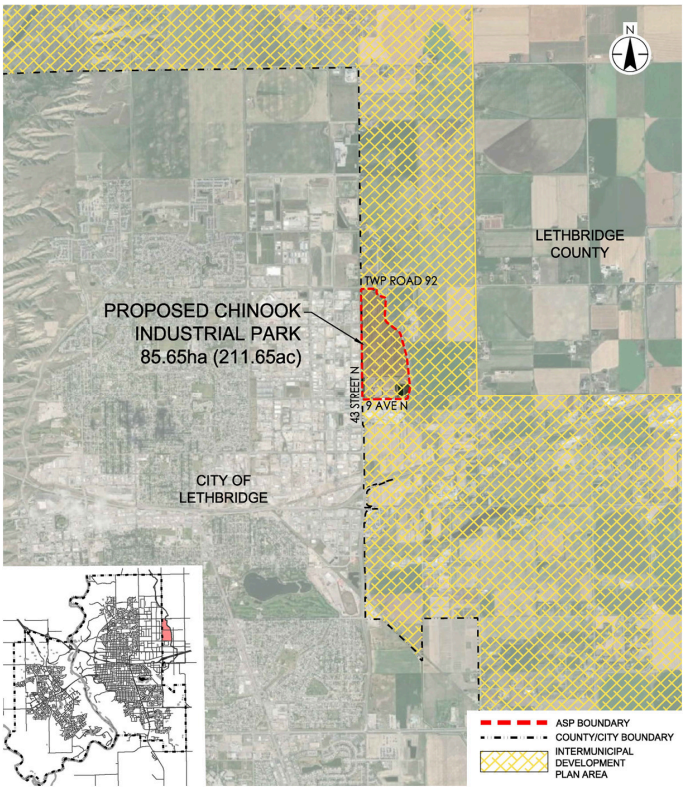


# 1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Sumus to complete a Traffic Impact Assessment (TIA) as part of the Chinook Industrial Park Area Structure Plan (ASP). This is an updated ASP to reflect the reconfigured land uses and access points in the area. Previously, there was an internal roadway network connecting the 9 Avenue N access point to the 14 Avenue N and 18 Avenue N access points via a north-south local roadway. This roadway has since been discontinued, leaving the two access points for the proposed remaining development. The current 9 Avenue N access remains to service the existing developed portion of the ASP area.

The development is located in Lethbridge County adjacent to the City of Lethbridge boundary. It is bounded by 43 Street N to the west, 9 Avenue N to the south, the SMRID canal to the east, and Township Road 92 to the north. Figure 1 illustrates the location of the site.

**Figure 1: Site Location**



## 1.1 OBJECTIVES

The objectives of this TIA are as follows:

- Collect the traffic data from the existing traffic impact assessment.
- Estimate the magnitude and characteristics of the peak hour traffic generated by the proposed development.
- Evaluate the impacts of vehicular traffic generated by the proposed development on the adjacent intersections on 43 Street N.
- Identify proposed roadway and intersection geometry for the planned new intersections.
- Identify and recommend appropriate traffic operation and/or infrastructure improvements necessary to accommodate the anticipated traffic.

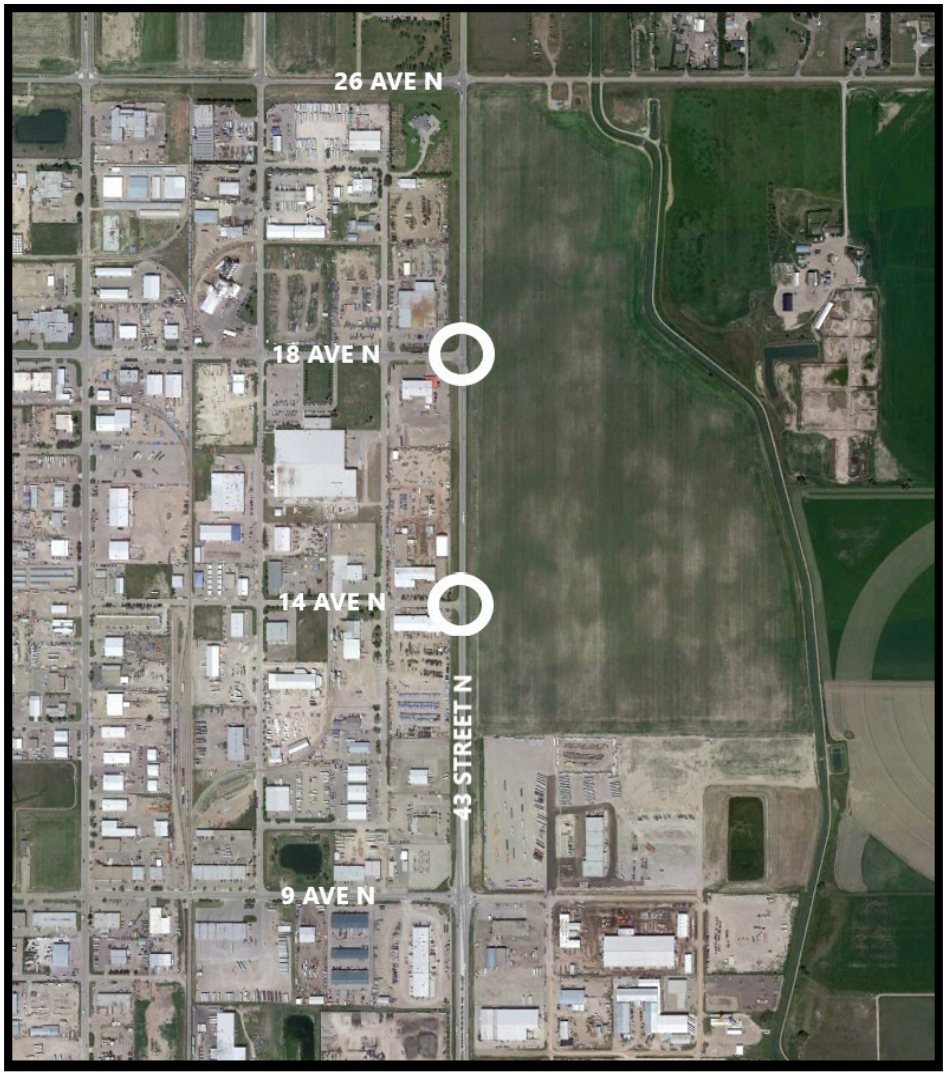
## 1.2 STUDY AREA

The study area includes the following intersections:

- 43 Street N and 18 Avenue N
- 43 Street N and 14 Avenue N

The study area is illustrated in Figure 2.

**Figure 2: Study Intersections**



# 2.0 EXISTING INFRASTRUCTURE

## 2.1 ROAD NETWORK

43 Street N is a two-lane urban and rural cross-section along the east limits of the City of Lethbridge. From Highway 3 to north of 9 Avenue N, the roadway is an urban 4-lane cross section with signalized intersections. Just north of 9 Avenue N, the road transitions from the 4-lane urban to a 2-lane rural cross section, and continues as such to the City of Lethbridge limits at 62 Avenue N.

14 Avenue N and 18 Avenue N are both urban industrial collector roads connecting the Churchill Industrial Park to the arterial road network. Both intersections with 43 Street N are three-leg unsignalized, rural type intersections, intersecting at 90 degrees. There is a stop condition on the minor approach in both locations. 43 Street N is posted at 60 kilometres per hour, and all other roadways are 50 kilometres per hour.

## 2.2 EXISTING GEOMETRY

43 Street N at the project location has two 3.75-metre-wide lanes with a 2.25 metre shoulder on each side. There are no horizontal curves, and the grade is relatively flat.

The three-leg intersection of 43 Street with 14 Avenue is at 90 degrees with little to no vertical curvature. Sight lines are excellent at this intersection. The cross section is transitioned from urban to rural at the edge of shoulder of 43 Street, where the curb terminates, and the shoulder is introduced. Two-centered curves are used on both radii.

Similarly, the three-leg intersection of 43 Street with 18 Avenue is at 90 degrees with little to no vertical curvature. Sight lines are excellent at this intersection. The cross section is transitioned from urban to rural at the edge of shoulder of 43 Street, where the curb terminates, and the shoulder is introduced. Two-centered curves are used on both radii.

## 2.3 LAND USE

The existing land is currently greenfield and zoned as Lethbridge Urban Fringe (LUF) by Lethbridge County. To the west, parcels are zoned as General Industrial (I-G) by the City of Lethbridge and the area is largely developed.

## 2.4 BACKGROUND TRAFFIC VOLUMES AND INTERSECTION ANALYSIS

The original TIA entitled *A Traffic Impact Assessment (TIA) Report* was completed in October 2018 by EASL Transportation Consultants Inc. This report was used for the background volumes for all scenarios,

and analysis performed is still valid for the purposes of this TIA. The previous TIA and relevant background analysis can be found in Appendix A.



# 3.0 PROPOSED DEVELOPMENT

## 3.1 TRIP GENERATION

Proposed land uses for the ASP area are a mixture of Business Light Industrial (BLI) and Rural General Industrial (RGI). The proposed land use areas are outlined in Figure 3. Table 1 summarizes the development proposal for the ASP area.

**Figure 3: Proposed Land Uses**

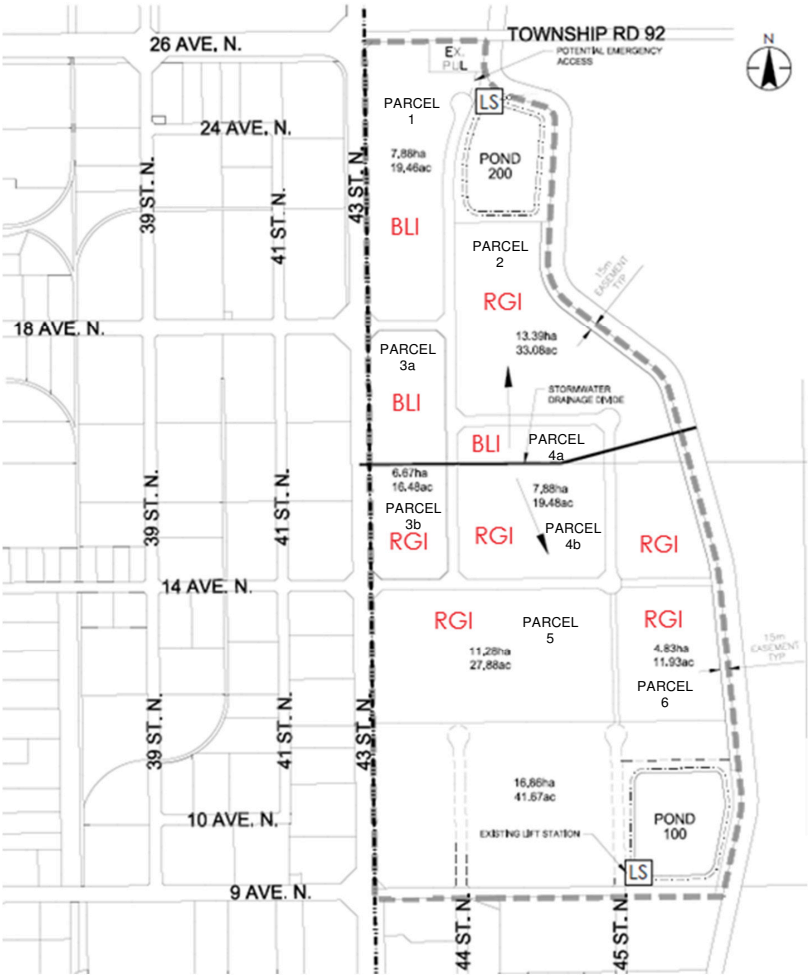


**Table 1: Construction Site Traffic Projections**

| Parcel | Use | Gross Area |
|---|---|---|
| 1 | Business Light Industrial | 19.46 ac |
| 2 | Rural General Industrial | 33.08 ac |
| 3a | Business Light Industrial | 8.86 ac |
| 3b | Rural General Industrial | 7.62 ac |
| 4a | Business Light Industrial | 4.79 ac |
| 4b | Rural General Industrial | 14.69 ac |
| 5 | Rural General Industrial | 27.88 ac |
| 6 | Rural General Industrial | 11.93 ac |

To estimate the peak hour traffic generated by the proposed development, the trip generation rates from Table 4 were applied. This includes a factor of 8,200 square feet of developed gross floor building area (GFA) per acre for the proposed development, as utilized in the pervious TIA (EASL Transportation Consultants Inc, 2018). The trip generation rates were taken from ITE's Trip Generation Web-based App, 11th Edition. Table 2 summarizes the site traffic generated by the proposed development for the weekday AM and PM peak hours.

**Table 2: Site Generated Traffic Volumes**

| Parcel | Land Use | Area | ITE 11 Ed | | Intensity | Weekday | | | | | | Weekday | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | AM | | | PM | | | AM | | | PM | | |
| | | | Land Use Code | | | Trip Rate | In % | Out % | Trip Rate | In % | Out % | Total Trips (vph) | In | Out | Total Trips (vph) | In | Out |
| 1 | BLI | 19.46 ac | 110 | Light Industrial | 159.572 x1000 sqft | 0.74 | 88% | 12% | 0.65 | 14% | 86% | 118 | 104 | 14 | 104 | 15 | 89 |
| 2 | RGI | 33.08 ac | 130 | Industrial Park | 271.256 x1000 sqft | 0.34 | 81% | 19% | 0.34 | 22% | 78% | 92 | 75 | 18 | 92 | 20 | 72 |
| 3a | BLI | 8.86 ac | 110 | Light Industrial | 72.652 x1000 sqft | 0.74 | 88% | 12% | 0.65 | 14% | 86% | 54 | 47 | 6 | 47 | 7 | 41 |
| 3b | RGI | 7.62 ac | 130 | Industrial Park | 62.484 x1000 sqft | 0.34 | 81% | 19% | 0.34 | 22% | 78% | 21 | 17 | 4 | 21 | 5 | 17 |
| 4a | BLI | 4.79 ac | 110 | Light Industrial | 39.278 x1000 sqft | 0.74 | 88% | 12% | 0.65 | 14% | 86% | 29 | 26 | 3 | 26 | 4 | 22 |
| 4b | RGI | 14.69 ac | 130 | Industrial Park | 120.458 x1000 sqft | 0.34 | 81% | 19% | 0.34 | 22% | 78% | 41 | 33 | 8 | 41 | 9 | 32 |
| 5 | RGI | 27.88 ac | 130 | Industrial Park | 228.616 x1000 sqft | 0.34 | 81% | 19% | 0.34 | 22% | 78% | 78 | 63 | 15 | 78 | 17 | 61 |
| 6 | RGI | 11.93 ac | 130 | Industrial Park | 97.826 x1000 sqft | 0.34 | 81% | 19% | 0.34 | 22% | 78% | 33 | 27 | 6 | 33 | 7 | 26 |
| | | | | | | | | | | | Total | **466** | **392** | **75** | **442** | **83** | **359** |

### 3.1.1 Trip Distribution and Assignment

Estimated traffic volumes were distributed similarly to the previous TIA (EASL Transportation Consultants Inc, 2018). Percentage of vehicles arriving from and departing to the north, south and west were maintained for consistency in this analysis. There will be no change to the other intersections along 43 Street N corridor since there is no significant net volume change.

Traffic generated by the proposed development was assigned to the roadway network based on the trip distributions used in the previous TIA. The following trip distribution pattern was applied:

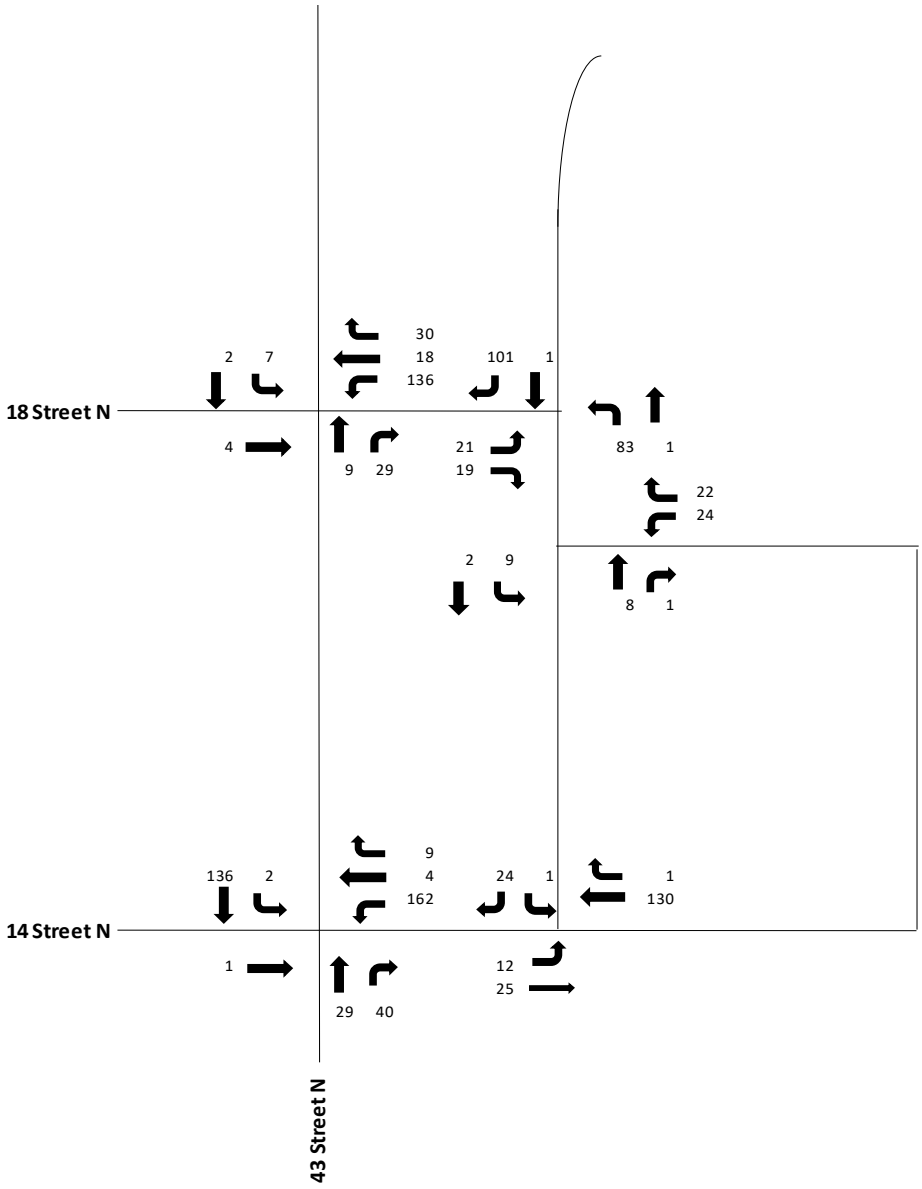
- To / from the north on 43 Street N: 11%
- To / from the south on 43 Street N: 83%
- To / from the west on 14 Avenue N: 1%
- To / from the west on 18 Avenue N: 5%

Peak hour development traffic volumes are shown in Figures 4 and 5, for the AM peak hour and PM peak hour, respectively.

**Figure 4: AM Peak Hour Development Traffic**



**Figure 5: PM Peak Hour Development Traffic**



# 4.0 2037 HORIZON ANAYLSIS

## 4.1 OPERATING CONDITIONS

The intersection analysis in this TIA was undertaken using the Synchro 11 software package, supporting the Highway Capacity Manual 6th Edition (HCM 6th).

The methodology considers the intersection geometry, traffic volumes, posted speed limit, and intersection control for unsignalized intersections. For signalized intersections, the intersection geometry, traffic volumes, posted speed limit, traffic signal phasing/timing plan and pedestrian volumes are all considered.

The average delay for each lane group, as well as the overall intersection; is calculated and computed into a level-of-service (LOS) category. The level-of-service criteria is tabulated below in Table 3 for both unsignalized and signalized intersections.

**Table 3: Level of Service Criteria**

| Level of Service | Average Control Delay (seconds per vehicle) | | Comment |
|---|---|---|---|
| | Signalized Intersection | Unsignalized Intersection | |
| A | 10.0 or less | 10.0 or less | Very good operation |
| B | 10.1 to 20.0 | 10.1 to 15.0 | Good operation |
| C | 20.1 to 35.0 | 15.1 to 25.0 | Acceptable operation |
| D | 35.1 to 55.0 | 25.1 to 35.0 | Congestion |
| E | 55.1 to 80.0 | 35.1 to 50.0 | Significant congestion |
| F | More than 80.0 | More than 50.0 | Unacceptable operation |

The volume-to-capacity (v/c) ratio was also considered in the analyses. The v/c ratio represents the percentage of capacity the traffic volumes are consuming. If the v/c ratio is above 1.0, then the movement or intersection has exceeded capacity.

## 4.2 TRAFFIC VOLUMES

To obtain the total post development 2037 traffic volumes, the 2037 background volumes from the previous TIA (EASL Transportation Consultants Inc, 2018) were extracted from the report. The site



generated traffic volumes were added to the 2037 background volumes to obtain the total post-development 2037 traffic volumes. Figure 6 and Figure 7 show the 2037 projected total peak hour traffic volumes in the AM peak hour and PM peak hour, respectively.

**Figure 6: Projected Total 2037 AM Peak Hour Traffic Volumes**

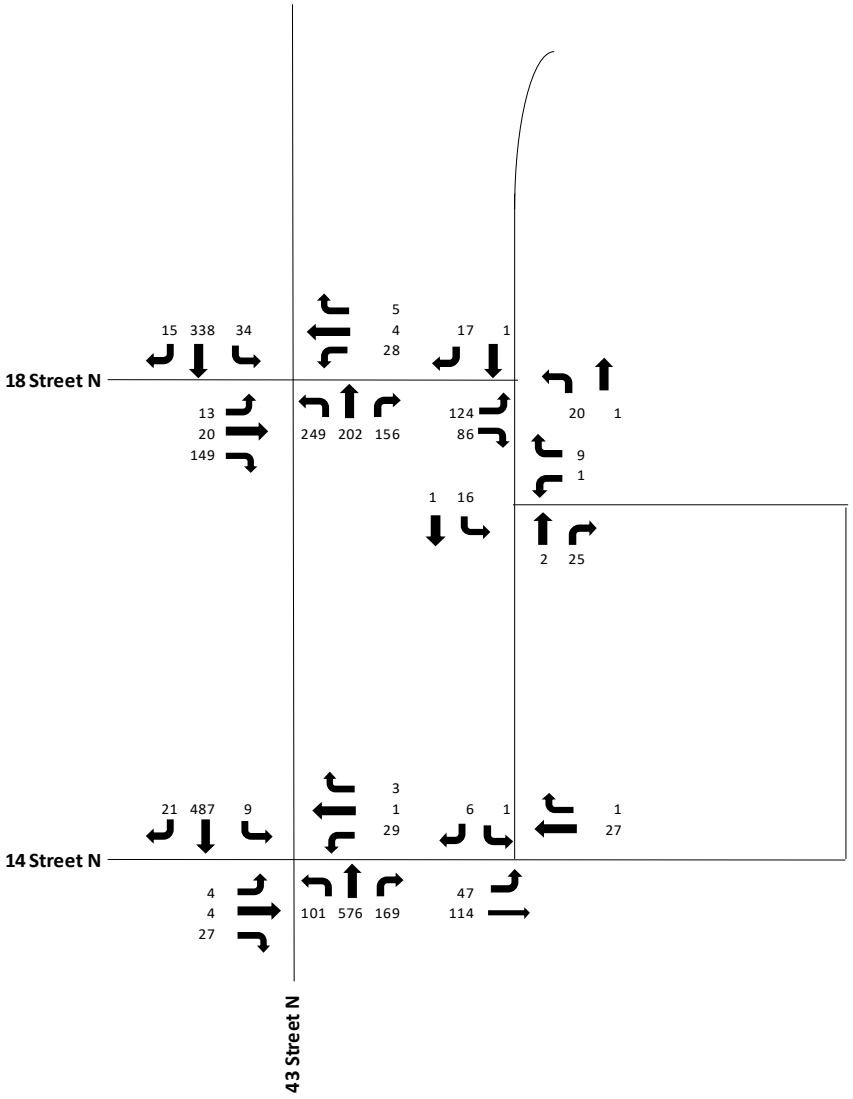
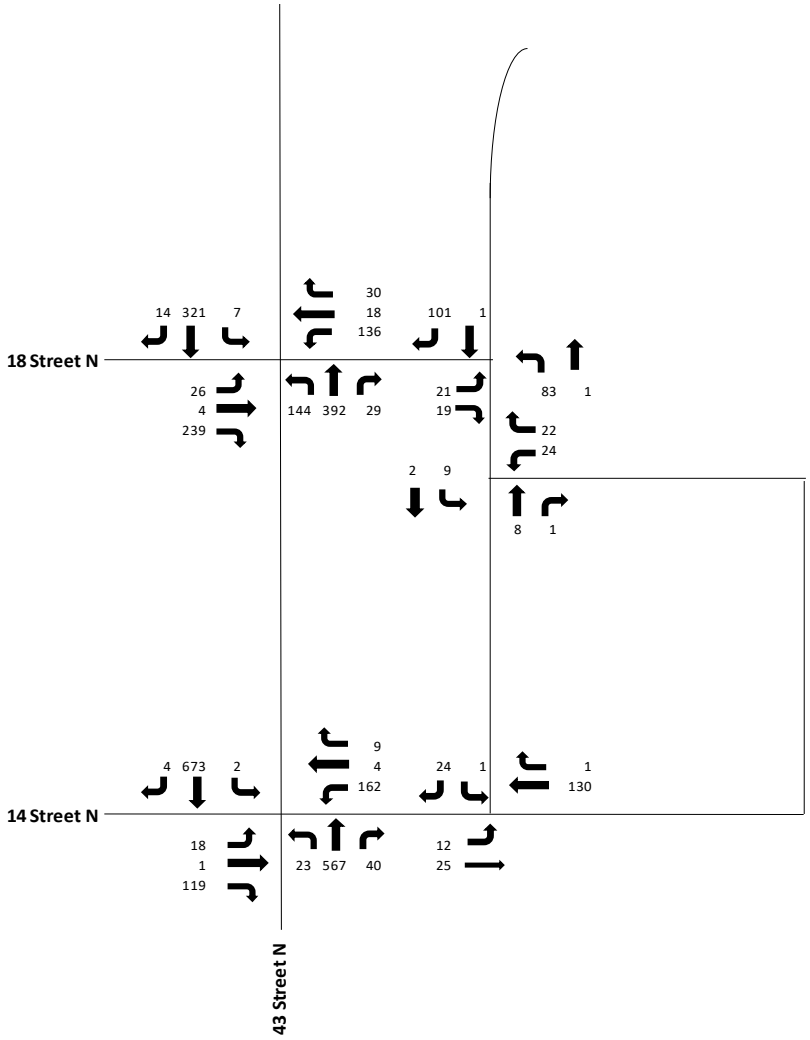


**Figure 7: Projected Total 2037 PM Peak Hour Traffic Volumes**



## 4.3 INTERSECTION CAPACITY ANALYSIS

The projected traffic volumes were applied to roadway network, and the intersections were reviewed for both the AM and PM peak hours, based on proposed geometrics, lane conditions and traffic control measures. Traffic signals were added to the intersections of 43 Street N with 18 Street N and 14 Street N based on the analysis of the existing TIA (EASL Transportation Consultants Inc, 2018).

The results of the Synchro analysis are summarized in Table 4 and Table 5 for the AM and PM peak hours, respectively.

**Table 4: Analysis Results for 2037 AM Peak Hour Total Traffic Conditions**

| Intersection | Intersection Control | Measure | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | Level of Service |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right | |
| 43 Street N / 18 Avenue N | Traffic Signals | Volumes (vph) | 13 | 20 | 149 | 28 | 4 | 5 | 249 | 202 | 156 | 34 | 338 | 15 | B |
| | | Level of Service | | B | | | D | | | C | | | A | | |
| | | V/C Ratio by Movement | | 0.59 | | | 0.33 | | | 0.89 | | | 0.42 | | |
| | | 95th Percentile Queue (m) | | 23.6 | | | 14.6 | | | 166.1 | | | 39.7 | | |
| 43 Street N / 14 Avenue N | Traffic Signals | Volumes (vph) | 4 | 4 | 27 | 29 | 1 | 3 | 101 | 576 | 169 | 9 | 487 | 21 | B |
| | | Level of Service | | B | | | C | | | B | | | A | | |
| | | V/C Ratio by Movement | | 0.21 | | | 0.27 | | | 0.84 | | | 0.44 | | |
| | | 95th Percentile Queue (m) | | 9.7 | | | 9.6 | | | 210.7 | | | 42.3 | | |
| Internal Intersection 1 | Stop Controlled | Volumes (vph) | 124 | | 86 | | | | 20 | 1 | | | 1 | 17 | A |
| | | Level of Service | | A | | | | | | A | | | A | | |
| | | V/C Ratio by Movement | | 0.25 | | | | | | 0.01 | | | 0.01 | | |
| | | 95th Percentile Queue (m) | | 7.4 | | | | | | 0.3 | | | 0 | | |
| Internal Intersection 2 | Stop Controlled | Volumes (vph) | | | | 1 | | 9 | | 2 | 25 | 16 | 1 | | A |
| | | Level of Service | | | | | A | | | A | | | A | | |
| | | V/C Ratio by Movement | | | | | 0.01 | | | 0.02 | | | 0.01 | | |
| | | 95th Percentile Queue (m) | | | | | 0.2 | | | 0 | | | 0.3 | | |
| Internal Intersection 3 | Stop Controlled | Volumes (vph) | 47 | 114 | | | 27 | 1 | | | | 1 | | 6 | A |
| | | Level of Service | | A | | | A | | | | | | A | | |
| | | V/C Ratio by Movement | | 0.03 | | | 0.02 | | | | | | 0.01 | | |
| | | 95th Percentile Queue (m) | | 0.8 | | | 0 | | | | | | 0.2 | | |

**Table 5: Analysis Results for 2037 PM Peak Hour Total Traffic Conditions**

| Intersection | Intersection Control | Measure | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | Level of Service |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right | |
| 43 Street N / 18 Avenue N | Traffic Signals | Volumes (vph) | 26 | 4 | 239 | 136 | 18 | 30 | 144 | 392 | 29 | 7 | 321 | 14 | C |
| | | Level of Service | | A | | | D | | | C | | | A | | |
| | | V/C Ratio by Movement | | 0.52 | | | 0.85 | | | 0.92 | | | 0.46 | | |
| | | 95th Percentile Queue (m) | | 19.3 | | | 56.8 | | | 121.7 | | | 38.7 | | |
| 43 Street N / 14 Avenue N | Traffic Signals | Volumes (vph) | 18 | 1 | 119 | 162 | 4 | 9 | 23 | 567 | 40 | 2 | 673 | 4 | B |
| | | Level of Service | | A | | | C | | | B | | | B | | |
| | | V/C Ratio by Movement | | 0.32 | | | 0.64 | | | 0.73 | | | 0.76 | | |
| | | 95th Percentile Queue (m) | | 12.1 | | | 41.1 | | | 121.7 | | | 133.3 | | |
| Internal Intersection 1 | Stop Controlled | Volumes (vph) | 21 | | 19 | | | | 83 | 1 | | | 1 | 101 | A |
| | | Level of Service | | A | | | | | | A | | | A | | |
| | | V/C Ratio by Movement | | 0.06 | | | | | | 0.07 | | | 0.07 | | |
| | | 95th Percentile Queue (m) | | 1.4 | | | | | | 1.6 | | | 0 | | |
| Internal Intersection 2 | Stop Controlled | Volumes (vph) | | | | 24 | | 22 | | 8 | 1 | 9 | 2 | | A |
| | | Level of Service | | | | | A | | | A | | | A | | |
| | | V/C Ratio by Movement | | | | | 0.05 | | | 0.01 | | | 0.01 | | |
| | | 95th Percentile Queue (m) | | | | | 1.3 | | | 0 | | | 0.1 | | |
| Internal Intersection 3 | Stop Controlled | Volumes (vph) | 12 | 25 | | | 130 | 1 | | | | 1 | | 24 | A |
| | | Level of Service | | A | | | A | | | | | | A | | |
| | | V/C Ratio by Movement | | 0.01 | | | 0.09 | | | | | | 0.03 | | |
| | | 95th Percentile Queue (m) | | 0.2 | | | 0 | | | | | | 0.8 | | |

From the analysis, it appears that the intersection will operate acceptably through the 2037 post-development conditions. Level of service is maintained at LOS D or better for any given movement, v/c

ratios are for the most part well below 1.0. Scenarios approaching 1.0 include northbound movements at 43 Street N and 18 Avenue N in the AM and PM peak hours, as well as the westbound movement at that intersection in the PM peak hour. 95$^{th}$ percentiles queue lengths are lengthy for some movements, with the highest being 210 meters for the northbound movement at 43 Street N and 14 Avenue N.. All queue lengths are able to be contained in the respective blocks, with no queues extending to the adjacent intersection.

To reduce queue lengths, a northbound left turn lane was introduced at both 14 Avenue N and 18 Avenue N. These turn lanes were effective in reducing the longer queue lengths by more than 50% in some cases. The results of this Synchro analysis are summarized in Table 6 and Table 7 for the AM and PM peak hours, respectively.

**Table 6: Analysis Results for 2037 AM Peak Hour Total Traffic Conditions (Adjusted Geometry)**

| Intersection | Intersection Control | Measure | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | Level of Service |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right | |
| 43 Street N / 18 Avenue N | Traffic Signals | Volumes (vph) | 13 | 20 | 149 | 28 | 4 | 5 | 249 | 202 | 156 | 34 | 338 | 15 | A |
| | | Level of Service | A | | | B | | | B | A | | A | | | |
| | | V/C Ratio by Movement | 0.46 | | | 0.15 | | | 0.6 | 0.46 | | 0.52 | | | |
| | | 95th Percentile Queue (m) | 15.9 | | | 9 | | | 33.1 | 26.2 | | 37.6 | | | |
| 43 Street N / 14 Avenue N | Traffic Signals | Volumes (vph) | 4 | 4 | 27 | 29 | 1 | 3 | 101 | 576 | 169 | 9 | 487 | 21 | A |
| | | Level of Service | B | | | C | | | A | A | | A | | | |
| | | V/C Ratio by Movement | 0.14 | | | 0.16 | | | 0.19 | 0.67 | | 0.46 | | | |
| | | 95th Percentile Queue (m) | 8.7 | | | 9.1 | | | 8.2 | 88.6 | | 42.1 | | | |

**Table 7:Analysis Results for 2037 PM Peak Hour Total Traffic Conditions (Adjusted Geometry)**

| Intersection | Intersection Control | Measure | Eastbound | | | Westbound | | | Northbound | | | Southbound | | | Level of Service |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right | |
| 43 Street N / 18 Avenue N | Traffic Signals | Volumes (vph) | 26 | 4 | 239 | 136 | 18 | 30 | 144 | 392 | 29 | 7 | 321 | 14 | B |
| | | Level of Service | A | | | C | | | B | B | | B | | | |
| | | V/C Ratio by Movement | 0.51 | | | 0.69 | | | 0.41 | 0.64 | | 0.53 | | | |
| | | 95th Percentile Queue (m) | 13.8 | | | 35.5 | | | 21.5 | 55.1 | | 42 | | | |
| 43 Street N / 14 Avenue N | Traffic Signals | Volumes (vph) | 18 | 1 | 119 | 162 | 4 | 9 | 23 | 567 | 40 | 2 | 673 | 4 | B |
| | | Level of Service | A | | | C | | | A | B | | B | | | |
| | | V/C Ratio by Movement | 0.32 | | | 0.64 | | | 0.07 | 0.68 | | 0.76 | | | |
| | | 95th Percentile Queue (m) | 12.1 | | | 41.1 | | | 4.2 | 110.9 | | 133.3 | | | |

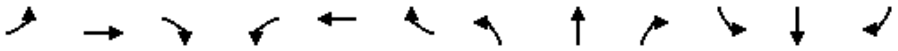
# 5.0 CONCLUSION

The proposed changes in the development's roadway network appear to have no detrimental effect on the operations at the 43 Street N access points. The recommendations from the previous TIA (EASL Transportation Consultants Inc, 2018) still allow both intersections to operate acceptably. Therefore, this analysis indicates that:

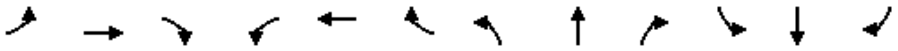
- The two access points at 14 Street N and 18 Street N continue to operate acceptably under the new internal roadway network.
- The two access points at 14 Street N and 18 Street N will require signalization to maintain acceptable operations.
- Both intersections should be monitored periodically for traffic operations. If traffic operations deteriorate, consideration should be given to installing a northbound left turn lane at one or both intersections.
- Internal roadways should operate as two-lane cross sections with a stop-condition on the "T" approach.
- Other recommendations from the previous TIA (EASL Transportation Consultants Inc, 2018) should be preserved:
    - 43 Street N & 26 Avenue N, to mitigate the 2037 background condition:
        - Installation of a traffic signal.
    - 43 Street and Highway 3, to mitigate the 2037 background condition:
        - Installation of a second westbound left turn lane.
        - Installation of a second eastbound left turn lane.
        - Installation of a third westbound through lane.
        - Installation of a third eastbound through lane.
        - Optimization of the traffic signal splits.

# APPENDIX A

## Synchro Reports



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 4 | 4 | 27 | 29 | 1 | 3 | 101 | 576 | 169 | 9 | 487 | 21 |
| Future Volume (vph) | 4 | 4 | 27 | 29 | 1 | 3 | 101 | 576 | 169 | 9 | 487 | 21 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 50.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.6 | | | 7.6 | | | 7.6 | | | 7.6 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.898 | | | 0.989 | | | 0.973 | | | 0.994 | |
| Flt Protected | | 0.994 | | | 0.957 | | | 0.994 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1404 | 0 | 0 | 1489 | 0 | 0 | 1522 | 0 | 0 | 1562 | 0 |
| Flt Permitted | | 0.953 | | | 0.720 | | | 0.868 | | | 0.985 | |
| Satd. Flow (perm) | 0 | 1346 | 0 | 0 | 1120 | 0 | 0 | 1329 | 0 | 0 | 1540 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 31 | | | 3 | | | 33 | | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 131.7 | | | 164.3 | | | 548.3 | | | 495.0 | |
| Travel Time (s) | | 9.5 | | | 11.8 | | | 32.9 | | | 29.7 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Adj. Flow (vph) | 5 | 5 | 31 | 33 | 1 | 3 | 115 | 655 | 192 | 10 | 553 | 24 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 41 | 0 | 0 | 37 | 0 | 0 | 962 | 0 | 0 | 587 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.9 | | | 4.9 | | | 4.9 | | | 4.9 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |



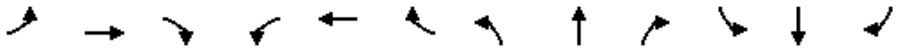
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 24.5 | 24.5 | | 24.5 | 24.5 | |
| Total Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 67.5 | 67.5 | | 67.5 | 67.5 | |
| Total Split (%) | 25.0% | 25.0% | | 25.0% | 25.0% | | 75.0% | 75.0% | | 75.0% | 75.0% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 63.0 | 63.0 | | 63.0 | 63.0 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 10.2 | | | 10.2 | | | 71.9 | | | 71.9 | |
| Actuated g/C Ratio | | 0.12 | | | 0.12 | | | 0.86 | | | 0.86 | |
| v/c Ratio | | 0.21 | | | 0.27 | | | 0.84 | | | 0.44 | |
| Control Delay | | 18.5 | | | 34.0 | | | 15.8 | | | 3.9 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 18.5 | | | 34.0 | | | 15.8 | | | 3.9 | |
| LOS | | B | | | C | | | B | | | A | |
| Approach Delay | | 18.5 | | | 34.0 | | | 15.8 | | | 3.9 | |
| Approach LOS | | B | | | C | | | B | | | A | |
| Queue Length 50th (m) | | 1.5 | | | 5.2 | | | 91.2 | | | 25.6 | |
| Queue Length 95th (m) | | 9.7 | | | m9.6 | | | #210.7 | | | 42.3 | |
| Internal Link Dist (m) | | 107.7 | | | 140.3 | | | 524.3 | | | 471.0 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 314 | | | 244 | | | 1150 | | | 1328 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.13 | | | 0.15 | | | 0.84 | | | 0.44 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 83.4 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.84 | | | |
| Intersection Signal Delay: 12.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 99.8% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |

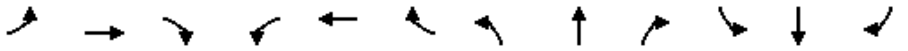
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: 43 St N & 14 Ave N





| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 13 | 20 | 149 | 28 | 4 | 5 | 249 | 202 | 156 | 34 | 338 | 15 |
| Future Volume (vph) | 13 | 20 | 149 | 28 | 4 | 5 | 249 | 202 | 156 | 34 | 338 | 15 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 50.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.6 | | | 7.6 | | | 7.6 | | | 7.6 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.890 | | | 0.981 | | | 0.965 | | | 0.995 | |
| Flt Protected | | 0.996 | | | 0.964 | | | 0.980 | | | 0.996 | |
| Satd. Flow (prot) | 0 | 1395 | 0 | 0 | 1488 | 0 | 0 | 1488 | 0 | 0 | 1559 | 0 |
| Flt Permitted | | 0.977 | | | 0.541 | | | 0.688 | | | 0.917 | |
| Satd. Flow (perm) | 0 | 1368 | 0 | 0 | 835 | 0 | 0 | 1045 | 0 | 0 | 1435 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 169 | | | 6 | | | 46 | | | 5 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 143.5 | | | 159.4 | | | 495.0 | | | 516.3 | |
| Travel Time (s) | | 10.3 | | | 11.5 | | | 29.7 | | | 31.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Adj. Flow (vph) | 15 | 23 | 169 | 32 | 5 | 6 | 283 | 230 | 177 | 39 | 384 | 17 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 207 | 0 | 0 | 43 | 0 | 0 | 690 | 0 | 0 | 440 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.9 | | | 4.9 | | | 4.9 | | | 4.9 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 24.5 | 24.5 | | 24.5 | 24.5 | |
| Total Split (s) | 22.6 | 22.6 | | 22.6 | 22.6 | | 67.4 | 67.4 | | 67.4 | 67.4 | |
| Total Split (%) | 25.1% | 25.1% | | 25.1% | 25.1% | | 74.9% | 74.9% | | 74.9% | 74.9% | |
| Maximum Green (s) | 18.1 | 18.1 | | 18.1 | 18.1 | | 62.9 | 62.9 | | 62.9 | 62.9 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 11.6 | | | 11.6 | | | 55.2 | | | 55.2 | |
| Actuated g/C Ratio | | 0.15 | | | 0.15 | | | 0.73 | | | 0.73 | |
| v/c Ratio | | 0.59 | | | 0.33 | | | 0.89 | | | 0.42 | |
| Control Delay | | 16.5 | | | 35.7 | | | 25.1 | | | 5.5 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 16.5 | | | 35.7 | | | 25.1 | | | 5.5 | |
| LOS | | B | | | D | | | C | | | A | |
| Approach Delay | | 16.5 | | | 35.7 | | | 25.1 | | | 5.5 | |
| Approach LOS | | B | | | D | | | C | | | A | |
| Queue Length 50th (m) | | 5.4 | | | 5.4 | | | 50.5 | | | 17.2 | |
| Queue Length 95th (m) | | 23.6 | | | 14.6 | | | #166.1 | | | 39.7 | |
| Internal Link Dist (m) | | 119.5 | | | 135.4 | | | 471.0 | | | 492.3 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 462 | | | 208 | | | 869 | | | 1184 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.45 | | | 0.21 | | | 0.79 | | | 0.37 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 90 | | | |
| Actuated Cycle Length: 76 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.89 | | | |
| Intersection Signal Delay: 17.9 | | Intersection LOS: B | |
| Intersection Capacity Utilization 83.2% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

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

Splits and Phases: 3: 43 St N & 18 Ave N



| Intersection | |
|---|---|
| Int Delay, s/veh | 9 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 124 | 86 | 20 | 1 | 1 | 17 |
| Future Vol, veh/h | 124 | 86 | 20 | 1 | 1 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 10 | 10 | 10 | 10 | 10 | 10 |
| Mvmt Flow | 141 | 98 | 23 | 1 | 1 | 19 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 58 | 11 | 20 | 0 | - | 0 |
| Stage 1 | 11 | - | - | - | - | - |
| Stage 2 | 47 | - | - | - | - | - |
| Critical Hdwy | 6.5 | 6.3 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.5 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.5 | - | - | - | - | - |
| Follow-up Hdwy | 3.59 | 3.39 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 929 | 1047 | 1546 | - | - | - |
| Stage 1 | 991 | - | - | - | - | - |
| Stage 2 | 955 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 915 | 1047 | 1546 | - | - | - |
| Mov Cap-2 Maneuver | 915 | - | - | - | - | - |
| Stage 1 | 976 | - | - | - | - | - |
| Stage 2 | 955 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10 | 7 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1546 | - | 965 | - | - |
| HCM Lane V/C Ratio | 0.015 | - | 0.247 | - | - |
| HCM Control Delay (s) | 7.4 | 0 | 10 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.7 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 1 | 9 | 2 | 25 | 16 | 1 |
| Future Vol, veh/h | 1 | 9 | 2 | 25 | 16 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 10 | 10 | 10 | 10 | 10 | 10 |
| Mvmt Flow | 1 | 10 | 2 | 28 | 18 | 1 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 53 | 16 | 0 | 0 | 30 | 0 |
| Stage 1 | 16 | - | - | - | - | - |
| Stage 2 | 37 | - | - | - | - | - |
| Critical Hdwy | 6.5 | 6.3 | - | - | 4.2 | - |
| Critical Hdwy Stg 1 | 5.5 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.5 | - | - | - | - | - |
| Follow-up Hdwy | 3.59 | 3.39 | - | - | 2.29 | - |
| Pot Cap-1 Maneuver | 936 | 1040 | - | - | 1533 | - |
| Stage 1 | 986 | - | - | - | - | - |
| Stage 2 | 965 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 925 | 1040 | - | - | 1533 | - |
| Mov Cap-2 Maneuver | 925 | - | - | - | - | - |
| Stage 1 | 986 | - | - | - | - | - |
| Stage 2 | 953 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.5 | 0 | 6.9 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 1027 | 1533 | - |
| HCM Lane V/C Ratio | - | - | 0.011 | 0.012 | - |
| HCM Control Delay (s) | - | - | 8.5 | 7.4 | 0 |
| HCM Lane LOS | - | - | A | A | A |
| HCM 95th %tile Q(veh) | - | - | 0 | 0 | - |

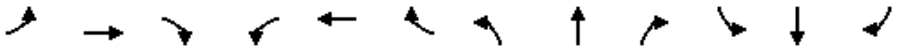
| Intersection | |
|---|---|
| Int Delay, s/veh | 2.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 47 | 114 | 27 | 1 | 1 | 6 |
| Future Vol, veh/h | 47 | 114 | 27 | 1 | 1 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 10 | 10 | 10 | 10 | 10 | 10 |
| Mvmt Flow | 53 | 130 | 31 | 1 | 1 | 7 |

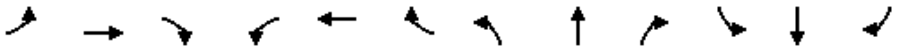
| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 32 | 0 | - | 0 | 268 | 32 |
| Stage 1 | - | - | - | - | 32 | - |
| Stage 2 | - | - | - | - | 236 | - |
| Critical Hdwy | 4.2 | - | - | - | 6.5 | 6.3 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.5 | - |
| Follow-up Hdwy | 2.29 | - | - | - | 3.59 | 3.39 |
| Pot Cap-1 Maneuver | 1530 | - | - | - | 704 | 1019 |
| Stage 1 | - | - | - | - | 970 | - |
| Stage 2 | - | - | - | - | 785 | - |
| Platoon blocked, % | | | - | - | - | |
| Mov Cap-1 Maneuver | 1530 | - | - | - | 678 | 1019 |
| Mov Cap-2 Maneuver | - | - | - | - | 678 | - |
| Stage 1 | - | - | - | - | 934 | - |
| Stage 2 | - | - | - | - | 785 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 2.2 | 0 | 8.8 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1530 | - | - | - | 951 |
| HCM Lane V/C Ratio | 0.035 | - | - | - | 0.008 |
| HCM Control Delay (s) | 7.4 | 0 | - | - | 8.8 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0 |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 1 | 119 | 162 | 4 | 9 | 23 | 567 | 40 | 2 | 673 | 4 |
| Future Volume (vph) | 18 | 1 | 119 | 162 | 4 | 9 | 23 | 567 | 40 | 2 | 673 | 4 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 50.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.6 | | | 7.6 | | | 7.6 | | | 7.6 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.883 | | | 0.993 | | | 0.992 | | | 0.999 | |
| Flt Protected | | 0.994 | | | 0.956 | | | 0.998 | | | | |
| Satd. Flow (prot) | 0 | 1381 | 0 | 0 | 1493 | 0 | 0 | 1558 | 0 | 0 | 1572 | 0 |
| Flt Permitted | | 0.949 | | | 0.672 | | | 0.965 | | | 0.999 | |
| Satd. Flow (perm) | 0 | 1318 | 0 | 0 | 1050 | 0 | 0 | 1506 | 0 | 0 | 1570 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 135 | | | 5 | | | 9 | | | 1 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 131.7 | | | 164.3 | | | 548.3 | | | 495.0 | |
| Travel Time (s) | | 9.5 | | | 11.8 | | | 32.9 | | | 29.7 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Adj. Flow (vph) | 20 | 1 | 135 | 184 | 5 | 10 | 26 | 644 | 45 | 2 | 765 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 156 | 0 | 0 | 199 | 0 | 0 | 715 | 0 | 0 | 772 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.9 | | | 4.9 | | | 4.9 | | | 4.9 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 24.5 | 24.5 | | 24.5 | 24.5 | |
| Total Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 37.5 | 37.5 | | 37.5 | 37.5 | |
| Total Split (%) | 37.5% | 37.5% | | 37.5% | 37.5% | | 62.5% | 62.5% | | 62.5% | 62.5% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 15.2 | | | 15.2 | | | 33.4 | | | 33.4 | |
| Actuated g/C Ratio | | 0.29 | | | 0.29 | | | 0.65 | | | 0.65 | |
| v/c Ratio | | 0.32 | | | 0.64 | | | 0.73 | | | 0.76 | |
| Control Delay | | 7.0 | | | 29.0 | | | 17.0 | | | 18.3 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 7.0 | | | 29.0 | | | 17.0 | | | 18.3 | |
| LOS | | A | | | C | | | B | | | B | |
| Approach Delay | | 7.0 | | | 29.0 | | | 17.0 | | | 18.3 | |
| Approach LOS | | A | | | C | | | B | | | B | |
| Queue Length 50th (m) | | 1.6 | | | 18.1 | | | 54.7 | | | 62.0 | |
| Queue Length 95th (m) | | 12.1 | | | #41.1 | | | #121.7 | | | #133.3 | |
| Internal Link Dist (m) | | 107.7 | | | 140.3 | | | 524.3 | | | 471.0 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 579 | | | 397 | | | 1004 | | | 1044 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.27 | | | 0.50 | | | 0.71 | | | 0.74 | |

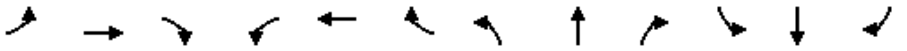
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 60 | | | |
| Actuated Cycle Length: 51.6 | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.76 | | | |
| Intersection Signal Delay: 18.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 78.6% | | 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: 6: 43 St N & 14 Ave N



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 26 | 4 | 239 | 136 | 18 | 30 | 144 | 392 | 29 | 7 | 321 | 14 |
| Future Volume (vph) | 26 | 4 | 239 | 136 | 18 | 30 | 144 | 392 | 29 | 7 | 321 | 14 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 50.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.6 | | | 7.6 | | | 7.6 | | | 7.6 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.880 | | | 0.978 | | | 0.993 | | | 0.994 | |
| Flt Protected | | 0.995 | | | 0.964 | | | 0.987 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1378 | 0 | 0 | 1483 | 0 | 0 | 1542 | 0 | 0 | 1562 | 0 |
| Flt Permitted | | 0.956 | | | 0.512 | | | 0.812 | | | 0.989 | |
| Satd. Flow (perm) | 0 | 1324 | 0 | 0 | 788 | 0 | 0 | 1269 | 0 | 0 | 1547 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 272 | | | 15 | | | 7 | | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 143.5 | | | 159.4 | | | 495.0 | | | 516.3 | |
| Travel Time (s) | | 10.3 | | | 11.5 | | | 29.7 | | | 31.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Adj. Flow (vph) | 30 | 5 | 272 | 155 | 20 | 34 | 164 | 445 | 33 | 8 | 365 | 16 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 307 | 0 | 0 | 209 | 0 | 0 | 642 | 0 | 0 | 389 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.9 | | | 4.9 | | | 4.9 | | | 4.9 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 24.5 | 24.5 | | 24.5 | 24.5 | |
| Total Split (s) | 23.0 | 23.0 | | 23.0 | 23.0 | | 42.0 | 42.0 | | 42.0 | 42.0 | |
| Total Split (%) | 35.4% | 35.4% | | 35.4% | 35.4% | | 64.6% | 64.6% | | 64.6% | 64.6% | |
| Maximum Green (s) | 18.5 | 18.5 | | 18.5 | 18.5 | | 37.5 | 37.5 | | 37.5 | 37.5 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 18.2 | | | 18.2 | | | 33.4 | | | 33.4 | |
| Actuated g/C Ratio | | 0.30 | | | 0.30 | | | 0.55 | | | 0.55 | |
| v/c Ratio | | 0.52 | | | 0.85 | | | 0.92 | | | 0.46 | |
| Control Delay | | 7.7 | | | 53.9 | | | 33.3 | | | 9.9 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 7.7 | | | 53.9 | | | 33.3 | | | 9.9 | |
| LOS | | A | | | D | | | C | | | A | |
| Approach Delay | | 7.7 | | | 53.9 | | | 33.3 | | | 9.9 | |
| Approach LOS | | A | | | D | | | C | | | A | |
| Queue Length 50th (m) | | 3.1 | | | 22.3 | | | 58.2 | | | 23.1 | |
| Queue Length 95th (m) | | 19.3 | | | #56.8 | | | #121.7 | | | 38.7 | |
| Internal Link Dist (m) | | 119.5 | | | 135.4 | | | 471.0 | | | 492.3 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 597 | | | 254 | | | 798 | | | 973 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.51 | | | 0.82 | | | 0.80 | | | 0.40 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 65 | | | |
| Actuated Cycle Length: 60.7 | | | |
| Natural Cycle: 65 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.92 | | | |
| Intersection Signal Delay: 25.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 96.7% | | 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: 3: 43 St N & 18 Ave N



| Intersection | |
|---|---|
| Int Delay, s/veh | 4.6 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 21 | 19 | 83 | 1 | 1 | 101 |
| Future Vol, veh/h | 21 | 19 | 83 | 1 | 1 | 101 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 10 | 10 | 10 | 10 | 10 | 10 |
| Mvmt Flow | 24 | 22 | 94 | 1 | 1 | 115 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 248 | 59 | 116 | 0 | - | 0 |
| Stage 1 | 59 | - | - | - | - | - |
| Stage 2 | 189 | - | - | - | - | - |
| Critical Hdwy | 6.5 | 6.3 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.5 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.5 | - | - | - | - | - |
| Follow-up Hdwy | 3.59 | 3.39 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 723 | 985 | 1424 | - | - | - |
| Stage 1 | 944 | - | - | - | - | - |
| Stage 2 | 824 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 675 | 985 | 1424 | - | - | - |
| Mov Cap-2 Maneuver | 675 | - | - | - | - | - |
| Stage 1 | 882 | - | - | - | - | - |
| Stage 2 | 824 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 9.8 | 7.6 | 0 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1424 | - | 794 | - | - |
| HCM Lane V/C Ratio | 0.066 | - | 0.057 | - | - |
| HCM Control Delay (s) | 7.7 | 0 | 9.8 | - | - |
| HCM Lane LOS | A | A | A | - | - |
| HCM 95th %tile Q(veh) | 0.2 | - | 0.2 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 7.1 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 24 | 22 | 8 | 1 | 9 | 2 |
| Future Vol, veh/h | 24 | 22 | 8 | 1 | 9 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 10 | 10 | 10 | 10 | 10 | 10 |
| Mvmt Flow | 27 | 25 | 9 | 1 | 10 | 2 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 32 | 10 | 0 | 0 | 10 | 0 |
| Stage 1 | 10 | - | - | - | - | - |
| Stage 2 | 22 | - | - | - | - | - |
| Critical Hdwy | 6.5 | 6.3 | - | - | 4.2 | - |
| Critical Hdwy Stg 1 | 5.5 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.5 | - | - | - | - | - |
| Follow-up Hdwy | 3.59 | 3.39 | - | - | 2.29 | - |
| Pot Cap-1 Maneuver | 962 | 1048 | - | - | 1559 | - |
| Stage 1 | 993 | - | - | - | - | - |
| Stage 2 | 980 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 956 | 1048 | - | - | 1559 | - |
| Mov Cap-2 Maneuver | 956 | - | - | - | - | - |
| Stage 1 | 993 | - | - | - | - | - |
| Stage 2 | 974 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 8.8 | 0 | 6 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 998 | 1559 | - |
| HCM Lane V/C Ratio | - | - | 0.052 | 0.007 | - |
| HCM Control Delay (s) | - | - | 8.8 | 7.3 | 0 |
| HCM Lane LOS | - | - | A | A | A |
| HCM 95th %tile Q(veh) | - | - | 0.2 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 12 | 25 | 130 | 1 | 1 | 24 |
| Future Vol, veh/h | 12 | 25 | 130 | 1 | 1 | 24 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 10 | 10 | 10 | 10 | 10 | 10 |
| Mvmt Flow | 14 | 28 | 148 | 1 | 1 | 27 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 149 | 0 | - | 0 | 205 | 149 |
| Stage 1 | - | - | - | - | 149 | - |
| Stage 2 | - | - | - | - | 56 | - |
| Critical Hdwy | 4.2 | - | - | - | 6.5 | 6.3 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.5 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.5 | - |
| Follow-up Hdwy | 2.29 | - | - | - | 3.59 | 3.39 |
| Pot Cap-1 Maneuver | 1385 | - | - | - | 766 | 877 |
| Stage 1 | - | - | - | - | 859 | - |
| Stage 2 | - | - | - | - | 947 | - |
| Platoon blocked, % | | | - | - | - | |
| Mov Cap-1 Maneuver | 1385 | - | - | - | 758 | 877 |
| Mov Cap-2 Maneuver | - | - | - | - | 758 | - |
| Stage 1 | - | - | - | - | 850 | - |
| Stage 2 | - | - | - | - | 947 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 2.5 | 0 | 9.3 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1385 | - | - | - | 872 |
| HCM Lane V/C Ratio | 0.01 | - | - | - | 0.033 |
| HCM Control Delay (s) | 7.6 | 0 | - | - | 9.3 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 4 | 4 | 27 | 29 | 1 | 3 | 101 | 576 | 169 | 9 | 487 | 21 |
| Future Volume (vph) | 4 | 4 | 27 | 29 | 1 | 3 | 101 | 576 | 169 | 9 | 487 | 21 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 50.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.6 | | | 7.6 | | | 7.6 | | | 7.6 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.898 | | | 0.989 | | | 0.966 | | | 0.994 | |
| Flt Protected | | 0.994 | | | 0.957 | | 0.950 | | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1404 | 0 | 0 | 1489 | 0 | 1495 | 1520 | 0 | 0 | 1562 | 0 |
| Flt Permitted | | 0.950 | | | 0.742 | | 0.473 | | | | 0.988 | |
| Satd. Flow (perm) | 0 | 1342 | 0 | 0 | 1154 | 0 | 744 | 1520 | 0 | 0 | 1545 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 31 | | | 3 | | | 39 | | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 131.7 | | | 164.3 | | | 548.3 | | | 495.0 | |
| Travel Time (s) | | 9.5 | | | 11.8 | | | 32.9 | | | 29.7 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Adj. Flow (vph) | 5 | 5 | 31 | 33 | 1 | 3 | 115 | 655 | 192 | 10 | 553 | 24 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 41 | 0 | 0 | 37 | 0 | 115 | 847 | 0 | 0 | 587 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.9 | | | 4.9 | | | 4.9 | | | 4.9 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 24.5 | 24.5 | | 24.5 | 24.5 | |
| Total Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 57.5 | 57.5 | | 57.5 | 57.5 | |
| Total Split (%) | 28.1% | 28.1% | | 28.1% | 28.1% | | 71.9% | 71.9% | | 71.9% | 71.9% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 53.0 | 53.0 | | 53.0 | 53.0 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 10.7 | | | 10.7 | | 45.8 | 45.8 | | | 45.8 | |
| Actuated g/C Ratio | | 0.19 | | | 0.19 | | 0.83 | 0.83 | | | 0.83 | |
| v/c Ratio | | 0.14 | | | 0.16 | | 0.19 | 0.67 | | | 0.46 | |
| Control Delay | | 14.8 | | | 26.5 | | 3.8 | 8.2 | | | 4.9 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 14.8 | | | 26.5 | | 3.8 | 8.2 | | | 4.9 | |
| LOS | | B | | | C | | A | A | | | A | |
| Approach Delay | | 14.8 | | | 26.5 | | | 7.7 | | | 4.9 | |
| Approach LOS | | B | | | C | | | A | | | A | |
| Queue Length 50th (m) | | 1.0 | | | 3.4 | | 3.7 | 49.1 | | | 25.6 | |
| Queue Length 95th (m) | | 8.7 | | | m9.1 | | 8.2 | 88.6 | | | 42.1 | |
| Internal Link Dist (m) | | 107.7 | | | 140.3 | | | 524.3 | | | 471.0 | |
| Turn Bay Length (m) | | | | | | | 50.0 | | | | | |
| Base Capacity (vph) | | 485 | | | 401 | | 657 | 1347 | | | 1365 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.08 | | | 0.09 | | 0.18 | 0.63 | | | 0.43 | |

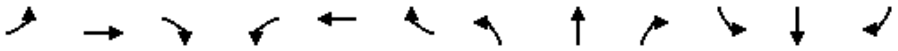
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 80 | | | |
| Actuated Cycle Length: 55.5 | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.67 | | | |
| Intersection Signal Delay: 7.3 | | Intersection LOS: A | |
| Intersection Capacity Utilization 88.4% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

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

Splits and Phases: 6: 43 St N & 14 Ave N



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 13 | 20 | 149 | 28 | 4 | 5 | 249 | 202 | 156 | 34 | 338 | 15 |
| Future Volume (vph) | 13 | 20 | 149 | 28 | 4 | 5 | 249 | 202 | 156 | 34 | 338 | 15 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 50.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.6 | | | 7.6 | | | 7.6 | | | 7.6 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.890 | | | 0.981 | | | 0.935 | | | 0.995 | |
| Flt Protected | | 0.996 | | | 0.964 | | 0.950 | | | | 0.996 | |
| Satd. Flow (prot) | 0 | 1395 | 0 | 0 | 1488 | 0 | 1495 | 1471 | 0 | 0 | 1559 | 0 |
| Flt Permitted | | 0.979 | | | 0.806 | | 0.527 | | | | 0.947 | |
| Satd. Flow (perm) | 0 | 1371 | 0 | 0 | 1244 | 0 | 829 | 1471 | 0 | 0 | 1482 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 169 | | | 6 | | | 103 | | | 5 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 143.5 | | | 159.4 | | | 495.0 | | | 516.3 | |
| Travel Time (s) | | 10.3 | | | 11.5 | | | 29.7 | | | 31.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Adj. Flow (vph) | 15 | 23 | 169 | 32 | 5 | 6 | 283 | 230 | 177 | 39 | 384 | 17 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 207 | 0 | 0 | 43 | 0 | 283 | 407 | 0 | 0 | 440 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.9 | | | 4.9 | | | 4.9 | | | 4.9 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |



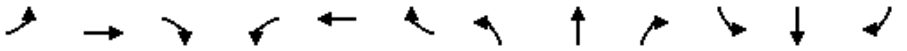
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 24.5 | 24.5 | | 24.5 | 24.5 | |
| Total Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 37.5 | 37.5 | | 37.5 | 37.5 | |
| Total Split (%) | 37.5% | 37.5% | | 37.5% | 37.5% | | 62.5% | 62.5% | | 62.5% | 62.5% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 10.7 | | | 10.7 | | 26.0 | 26.0 | | | 26.0 | |
| Actuated g/C Ratio | | 0.23 | | | 0.23 | | 0.57 | 0.57 | | | 0.57 | |
| v/c Ratio | | 0.46 | | | 0.15 | | 0.60 | 0.46 | | | 0.52 | |
| Control Delay | | 8.7 | | | 14.7 | | 13.3 | 6.3 | | | 8.9 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 8.7 | | | 14.7 | | 13.3 | 6.3 | | | 8.9 | |
| LOS | | A | | | B | | B | A | | | A | |
| Approach Delay | | 8.7 | | | 14.7 | | | 9.2 | | | 8.9 | |
| Approach LOS | | A | | | B | | | A | | | A | |
| Queue Length 50th (m) | | 1.9 | | | 1.9 | | 11.8 | 10.6 | | | 17.0 | |
| Queue Length 95th (m) | | 15.9 | | | 9.0 | | 33.1 | 26.2 | | | 37.6 | |
| Internal Link Dist (m) | | 119.5 | | | 135.4 | | | 471.0 | | | 492.3 | |
| Turn Bay Length (m) | | | | | | | 50.0 | | | | | |
| Base Capacity (vph) | | 649 | | | 501 | | 607 | 1106 | | | 1087 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.32 | | | 0.09 | | 0.47 | 0.37 | | | 0.40 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 60 | | | |
| Actuated Cycle Length: 45.9 | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.60 | | | |
| Intersection Signal Delay: 9.2 | | Intersection LOS: A | |
| Intersection Capacity Utilization 68.2% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: 43 St N & 18 Ave N



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 18 | 1 | 119 | 162 | 4 | 9 | 23 | 567 | 40 | 2 | 673 | 4 |
| Future Volume (vph) | 18 | 1 | 119 | 162 | 4 | 9 | 23 | 567 | 40 | 2 | 673 | 4 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 50.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.6 | | | 7.6 | | | 7.6 | | | 7.6 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.883 | | | 0.993 | | | 0.990 | | | 0.999 | |
| Flt Protected | | 0.994 | | | 0.956 | | 0.950 | | | | | |
| Satd. Flow (prot) | 0 | 1381 | 0 | 0 | 1493 | 0 | 1495 | 1558 | 0 | 0 | 1572 | 0 |
| Flt Permitted | | 0.949 | | | 0.672 | | 0.352 | | | | 0.999 | |
| Satd. Flow (perm) | 0 | 1318 | 0 | 0 | 1050 | 0 | 554 | 1558 | 0 | 0 | 1570 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 135 | | | 5 | | | 9 | | | 1 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 131.7 | | | 164.3 | | | 548.3 | | | 495.0 | |
| Travel Time (s) | | 9.5 | | | 11.8 | | | 32.9 | | | 29.7 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Adj. Flow (vph) | 20 | 1 | 135 | 184 | 5 | 10 | 26 | 644 | 45 | 2 | 765 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 156 | 0 | 0 | 199 | 0 | 26 | 689 | 0 | 0 | 772 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.9 | | | 4.9 | | | 4.9 | | | 4.9 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 24.5 | 24.5 | | 24.5 | 24.5 | |
| Total Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 37.5 | 37.5 | | 37.5 | 37.5 | |
| Total Split (%) | 37.5% | 37.5% | | 37.5% | 37.5% | | 62.5% | 62.5% | | 62.5% | 62.5% | |
| Maximum Green (s) | 18.0 | 18.0 | | 18.0 | 18.0 | | 33.0 | 33.0 | | 33.0 | 33.0 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 15.2 | | | 15.2 | | 33.4 | 33.4 | | | 33.4 | |
| Actuated g/C Ratio | | 0.29 | | | 0.29 | | 0.65 | 0.65 | | | 0.65 | |
| v/c Ratio | | 0.32 | | | 0.64 | | 0.07 | 0.68 | | | 0.76 | |
| Control Delay | | 7.0 | | | 29.0 | | 7.0 | 14.8 | | | 18.3 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 7.0 | | | 29.0 | | 7.0 | 14.8 | | | 18.3 | |
| LOS | | A | | | C | | A | B | | | B | |
| Approach Delay | | 7.0 | | | 29.0 | | | 14.5 | | | 18.3 | |
| Approach LOS | | A | | | C | | | B | | | B | |
| Queue Length 50th (m) | | 1.6 | | | 18.1 | | 1.1 | 49.5 | | | 62.0 | |
| Queue Length 95th (m) | | 12.1 | | | #41.1 | | 4.2 | #110.9 | | | #133.3 | |
| Internal Link Dist (m) | | 107.7 | | | 140.3 | | | 524.3 | | | 471.0 | |
| Turn Bay Length (m) | | | | | | | 50.0 | | | | | |
| Base Capacity (vph) | | 579 | | | 397 | | 368 | 1038 | | | 1044 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.27 | | | 0.50 | | 0.07 | 0.66 | | | 0.74 | |

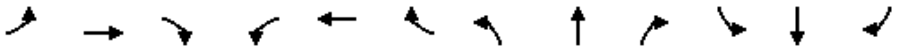
| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 60 | | | |
| Actuated Cycle Length: 51.6 | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.76 | | | |
| Intersection Signal Delay: 17.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 65.2% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

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

Splits and Phases: 6: 43 St N & 14 Ave N



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 26 | 4 | 239 | 136 | 18 | 30 | 144 | 392 | 29 | 7 | 321 | 14 |
| Future Volume (vph) | 26 | 4 | 239 | 136 | 18 | 30 | 144 | 392 | 29 | 7 | 321 | 14 |
| Ideal Flow (vphpl) | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| Lane Width (m) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 50.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.6 | | | 7.6 | | | 7.6 | | | 7.6 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.880 | | | 0.978 | | | 0.990 | | | 0.994 | |
| Flt Protected | | 0.995 | | | 0.964 | | 0.950 | | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1378 | 0 | 0 | 1483 | 0 | 1495 | 1558 | 0 | 0 | 1562 | 0 |
| Flt Permitted | | 0.955 | | | 0.583 | | 0.534 | | | | 0.990 | |
| Satd. Flow (perm) | 0 | 1322 | 0 | 0 | 897 | 0 | 840 | 1558 | 0 | 0 | 1548 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 272 | | | 22 | | | 10 | | | 6 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 143.5 | | | 159.4 | | | 495.0 | | | 516.3 | |
| Travel Time (s) | | 10.3 | | | 11.5 | | | 29.7 | | | 31.0 | |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% | 10% |
| Adj. Flow (vph) | 30 | 5 | 272 | 155 | 20 | 34 | 164 | 445 | 33 | 8 | 365 | 16 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 307 | 0 | 0 | 209 | 0 | 164 | 478 | 0 | 0 | 389 | 0 |
| Enter Blocked Intersection | No | No | No | No | No | No | No | No | No | No | No | No |
| Lane Alignment | Left | Left | Right | Left | Left | Right | Left | Left | Right | Left | Left | Right |
| Median Width(m) | | 0.0 | | | 0.0 | | | 3.5 | | | 3.5 | |
| Link Offset(m) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Crosswalk Width(m) | | 4.9 | | | 4.9 | | | 4.9 | | | 4.9 | |
| Two way Left Turn Lane | | | | | | | | | | | | |
| Headway Factor | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 | 1.13 |
| Turning Speed (k/h) | 24 | | 14 | 24 | | 14 | 24 | | 14 | 24 | | 14 |
| Number of Detectors | 1 | 2 | | 1 | 2 | | 1 | 2 | | 1 | 2 | |
| Detector Template | Left | Thru | | Left | Thru | | Left | Thru | | Left | Thru | |
| Leading Detector (m) | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | | 6.1 | 30.5 | |
| Trailing Detector (m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Position(m) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Size(m) | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | | 6.1 | 1.8 | |
| Detector 1 Type | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | | Cl+Ex | Cl+Ex | |
| Detector 1 Channel | | | | | | | | | | | | |
| Detector 1 Extend (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Queue (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 1 Delay (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Detector 2 Position(m) | | 28.7 | | | 28.7 | | | 28.7 | | | 28.7 | |
| Detector 2 Size(m) | | 1.8 | | | 1.8 | | | 1.8 | | | 1.8 | |
| Detector 2 Type | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | | | Cl+Ex | |
| Detector 2 Channel | | | | | | | | | | | | |
| Detector 2 Extend (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |

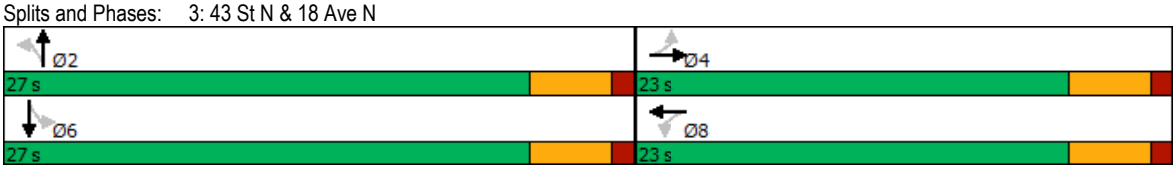


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 20.0 | 20.0 | | 20.0 | 20.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 24.5 | 24.5 | | 24.5 | 24.5 | |
| Total Split (s) | 23.0 | 23.0 | | 23.0 | 23.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| Total Split (%) | 46.0% | 46.0% | | 46.0% | 46.0% | | 54.0% | 54.0% | | 54.0% | 54.0% | |
| Maximum Green (s) | 18.5 | 18.5 | | 18.5 | 18.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Yellow Time (s) | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | | 3.5 | 3.5 | |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | | 1.0 | 1.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 4.5 | | | 4.5 | | 4.5 | 4.5 | | | 4.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | | 7.0 | 7.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 14.2 | | | 14.2 | | 21.1 | 21.1 | | | 21.1 | |
| Actuated g/C Ratio | | 0.32 | | | 0.32 | | 0.48 | 0.48 | | | 0.48 | |
| v/c Ratio | | 0.51 | | | 0.69 | | 0.41 | 0.64 | | | 0.53 | |
| Control Delay | | 6.0 | | | 25.9 | | 12.8 | 14.6 | | | 12.2 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 6.0 | | | 25.9 | | 12.8 | 14.6 | | | 12.2 | |
| LOS | | A | | | C | | B | B | | | B | |
| Approach Delay | | 6.0 | | | 25.9 | | | 14.1 | | | 12.2 | |
| Approach LOS | | A | | | C | | | B | | | B | |
| Queue Length 50th (m) | | 1.8 | | | 11.5 | | 7.4 | 24.4 | | | 18.5 | |
| Queue Length 95th (m) | | 13.8 | | | #35.5 | | 21.5 | 55.1 | | | 42.0 | |
| Internal Link Dist (m) | | 119.5 | | | 135.4 | | | 471.0 | | | 492.3 | |
| Turn Bay Length (m) | | | | | | | 50.0 | | | | | |
| Base Capacity (vph) | | 714 | | | 390 | | 430 | 803 | | | 796 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.43 | | | 0.54 | | 0.38 | 0.60 | | | 0.49 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 50 | | | |
| Actuated Cycle Length: 44.4 | | | |
| Natural Cycle: 50 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.69 | | | |
| Intersection Signal Delay: 13.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 88.0% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |

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

Splits and Phases: 3: 43 St N & 18 Ave N



# APPENDIX B

## Existing TIA

**A Traffic Impact Assessment (TIA) Report**

**For**

# CHINOOK INDUSTRIAL PARK AREA STRUCTURE PLAN DEVELOPMENT

**Lethbridge, Alberta**

**Prepared for**

**Hasegawa Consulting Professional Engineers**

**November 3, 2017**
**1st Revision: April 9, 2018**
**2nd Revision: September 6, 2018**
**3rd Revision: October 10, 2018**




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## 1.0 INTRODUCTION

### 1.1 General

Hasegawa Consulting Professional Engineers retained EASL Transportation Consultants, Inc. to undertake a traffic impact assessment (TIA) in support of the proposed Chinook Industrial Park Development to be located within Quarter Sections SW 1/4-10-9-21-4 and NW 1/4-10-9-21-4 in Lethbridge County, Alberta. This traffic impact assessment is being prepared to assess potential transportation impacts of the proposed development and to satisfy Lethbridge County's and City of Lethbridge's requirements for such a study as a result of the proposed development. **Figure 1a** presents a site map that shows the general location of the proposed development, and **Figure 1b** presents a local context aerial map. The proposed development is defined by the following boundaries:

- 43 Street N to the west;
- Greenfield to the east;
- Township Road 92 to the north; and
- 9 Avenue N to the south.

### 1.2 Existing Land Use

The southern portion of project area located at the northeastern corner of 43 Street / 9 Avenue N intersection is occupied by the currently operating Southland International Truck Facility. The remaining portion of the land to the north is a Greenfield unoccupied area.

### 1.3 Proposed Development Plan

The proposed Chinook Industrial Park Development site will consist of the following:

1. **Phase 1:** will be located within the existing Southland International Truck Facility and will include 18.56 acres of General Light Industrial land use and 18.62 acres of Business Park land use. Phase 1 will be completed after 2 years from today.
2. **Phases 2 to 5:** will be located within the Greenfield area north of the existing Southland International Truck Facility and will consist of 95.17 acres of General Light Industrial land use and 40.66 acres of Business Park land use. Phase 2 will be completed within 5 years from today.

The proposed project development site plan and internal roadway plan are included in **Appendix A** of this report.

### 1.4 Purpose of Study

The primary purposes of this traffic impact assessment study are:

- To evaluate the traffic operations and levels of service (LOS) at the following intersections:

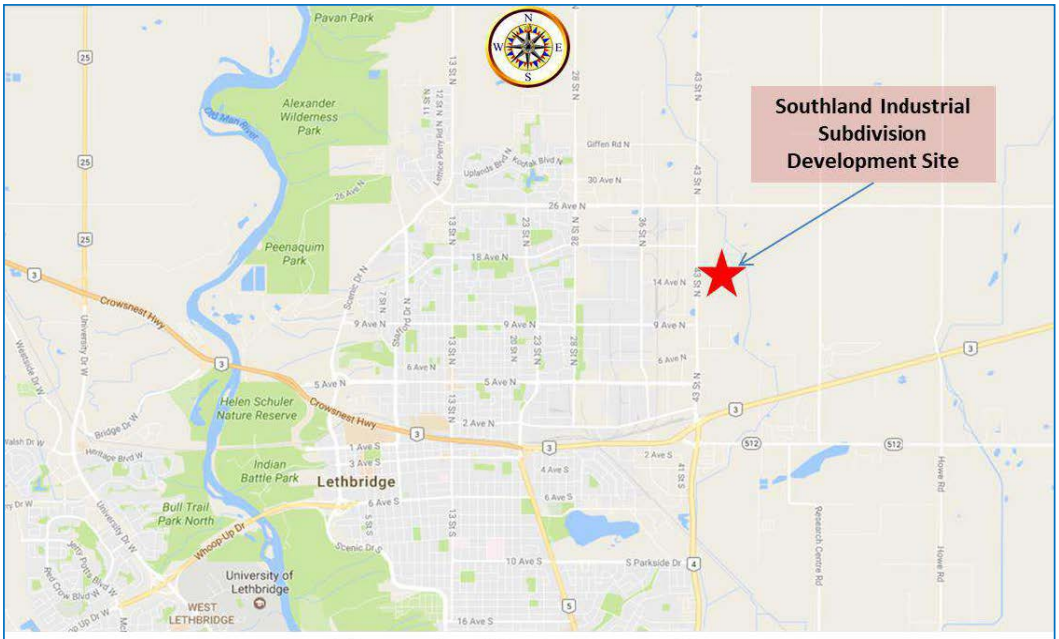



Figure 1a: Site Location Map

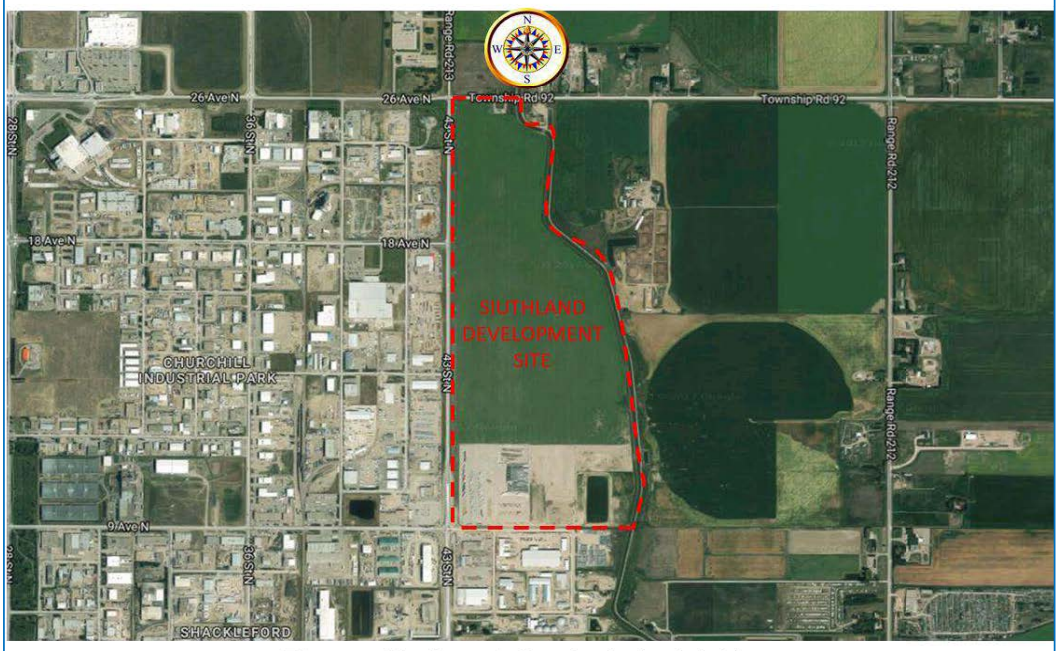



Figure 1b: Local Context Aerial Map

- 43 Street North and 26 Avenue North intersection (Unsignalized);
- 43 Street North and 18 Avenue North intersection (Unsignalized);
- 43 Street North and 14 Avenue North intersection (Unsignalized);
- 43 Street North and 9 Avenue North intersection (Signalized);
- 43 Street North and 5 Avenue North intersection (Signalized); and
- Highway 3 / Crowsnest Highway and 43 Street North intersection (signalized).

- To evaluate any potential project traffic impacts of the proposed development to the surrounding roadway network, and to determine if the roadways, site access and traffic circulations in the project vicinities would be suitable for the intended development and the amount of development traffic volumes anticipated.
- To identify suitable intersection control and geometric configurations that would be required to properly service the proposed development including conducting a signal warrant analyses for any of the study unsignalized intersections, as needed.
- Also, to identify any needed short-term and long-term roadway improvements in the areas to enable acceptable traffic operations that would satisfy both the Lethbridge County and the City of Lethbridge requirements.

### 1.5 Methodologies

This traffic impact assessment utilizes the following evaluation methodologies:

- Data collection including but not limited to existing roadway and intersection geometric characteristic, pavement markings, traffic control types, and intersection turning movement traffic counts.
- The forecast of background peak hour traffic volumes without the site traffic for the 2, 5 and 20-year horizons (2019, 2022 and 2037).
- Trip generation estimate for the proposed development based on appropriate ***Trip Generation*** land use categories and corresponding trip generation rates by the Institute of Transportation Engineers (ITE).
- Distribution of the site generated trips to/from the development site based on population, land uses, roadway network, and existing traffic patterns in the project vicinities.
- Assignment of the project trips to the adjacent roadways based on the proposed project site plan and the estimated roadway trip distribution characteristics.
- Existing, background, and future traffic capacity analysis for the study area intersections and roadways to identify possible capacity constraints and to assess overall traffic impacts of the proposed development, which is based on the ***latest Highway Capacity Manual (HCM)*** methodologies by the Transportation Research Board, the US National Academies of Sciences, Engineering and Medicine.

## 2.0 EXISTING CONDITIONS

### 2.1 Area Road Network

The existing transportation system within the vicinity of the proposed project site consists of the following roadways:

**43 Street North** is within the City of Lethbridge limits and represent the borderline between the City of Lethbridge and Lethbridge County. 43 Street N is a paved arterial two-lane two-way roadway north of 9 Avenue N and a divided 4-lane roadway with two lanes per direction south of 9 Avenue N. 43 Street North is classified as a dangerous goods route with a posted speed limit of 70 km/h. Based on the City of Lethbridge 2016 Traffic Flow Map, the daily traffic volumes on 43 Street N in the vicinity of 9 Avenue N is 8,300 vehicles per day and north of 26 Avenue N is 800 vehicles per day.

**26 Avenue North / Township Road 92:** 26 Avenue N, to the west of 43 Street N is within the City of Lethbridge limits and is a two-lane two-way paved roadway with a posted speed limit of 60km/h. The existing daily traffic volume on 26 Avenue North is 4,800 vehicles per day based on the City of Lethbridge 2016 Traffic Flow Map. This road's name changes to Township Road 92 to the east of 43 Street N and becomes under the jurisdiction of Lethbridge County.

**18 Avenue North** is within the City of Lethbridge limits and is a two-lane two-way paved industrial collector road with a posted speed limit of 50km/h. The existing daily traffic volume on 18 Avenue N is 3.900 vehicles per day based on the City of Lethbridge 2016 Traffic Flow Map.

**14 Avenue North** is within the City of Lethbridge limits and is a two-lane two-way paved roadway paved industrial collector road with a posted speed limit of 50km/h. The existing daily traffic volumes on 14 Avenue North is 1,200 vehicles per day based on the City of Lethbridge 2016 Traffic Flow Map.

**9 Avenue North** west of 43 Street N is within the City of Lethbridge limits and is a paved two-lane two-way industrial collector roadway with allowed parallel parking on both sides of the road. However, 9 Avenue N east of 43 Street N is within the Lethbridge County limits and is a two-lane two-way gravel roadway. The posted speed limit is 50km/h. Access to the existing Southland International Truck Facility as well as the Phase 1 of the proposed development will be off 9 Avenue N at 44 Street North. The existing daily traffic volume on 9 Avenue N west of 43 Street N is 4,400 vehicles per day based on the City of Lethbridge 2016 Traffic Flow Map.

**5 Avenue North** is within the City of Lethbridge limits and is a paved four lane divided roadway with a posted speed limit of 60km/h. The existing daily traffic volume on 5 Avenue N just west of 43 Street N is 4,200 vehicles per day based on the City of Lethbridge 2016 Traffic Flow Map.

**Highway 3 (Crowsnest Highway)** is a provincial paved and divided four lane highway with a posted speed limit of 80 Km/h in the vicinity of 43 Street. The existing daily traffic volume on

Highway 3 west of 43 Street N is 25,100 vehicles per day based on the City of Lethbridge 2016 Traffic Flow Map.

### 2.2 Existing Intersection Conditions

All study area intersections are located along 43 Street North with the northern three intersections at 26 Avenue N, 18 Avenue N, and 14 Avenue N currently unsignalized and controlled by stop signs on the east/west intersecting roads. The remaining three study intersections located at 9 Avenue N, 5 Avenue N, and Highway 3 (Crowsnest Hwy) are signalized intersections. **Figure 2a** has been prepared to present the lane configurations, the channelized movements and the control types at each of the study area intersections.

### 2.3 Existing Traffic Volumes and Conditions

A field reconnaissance of the site and its surroundings was conducted to establish a database of the existing conditions. The peak period for the proposed Chinook Industrial Park Development would typically occur during the weekday morning and the late afternoon periods.

Turning movement traffic count data were collected by Hasegawa Engineering on March 14, 2017 and March 16, 2017 from 7:00 AM to 9:00 AM, and from 4:00 PM to 6:00 PM at the following four study intersections:

- 43 Street North and 18 Avenue North intersection
- 43 Street North and 14 Avenue North intersection
- 43 Street North and 9 Avenue North intersection
- 43 Street North and 5 Avenue North intersection

The City of Lethbridge's 2016 traffic counts were obtained for the intersection of:

- 43 Street North and 26 Avenue North

Also, Alberta Transportation's 2016 traffic count data has been utilized to represent the existing traffic volumes for the intersection of:

- Highway 3/Crowsnest Highway and 43 Street

Analysis of the 15-minute turning movement traffic count data at study intersections indicated that the AM peak hour of traffic occurs between 7:15 AM and 8:15 AM; and the PM peak hour of traffic occurs between 4:15 PM and 5:15 PM. The existing AM and PM peak-hour traffic volumes for all study intersections are illustrated on **Figure 2b**. Details of the collected traffic count data as well as the City of Lethbridge and Alberta Transportation 2016 traffic count data are contained in **Appendix B**.

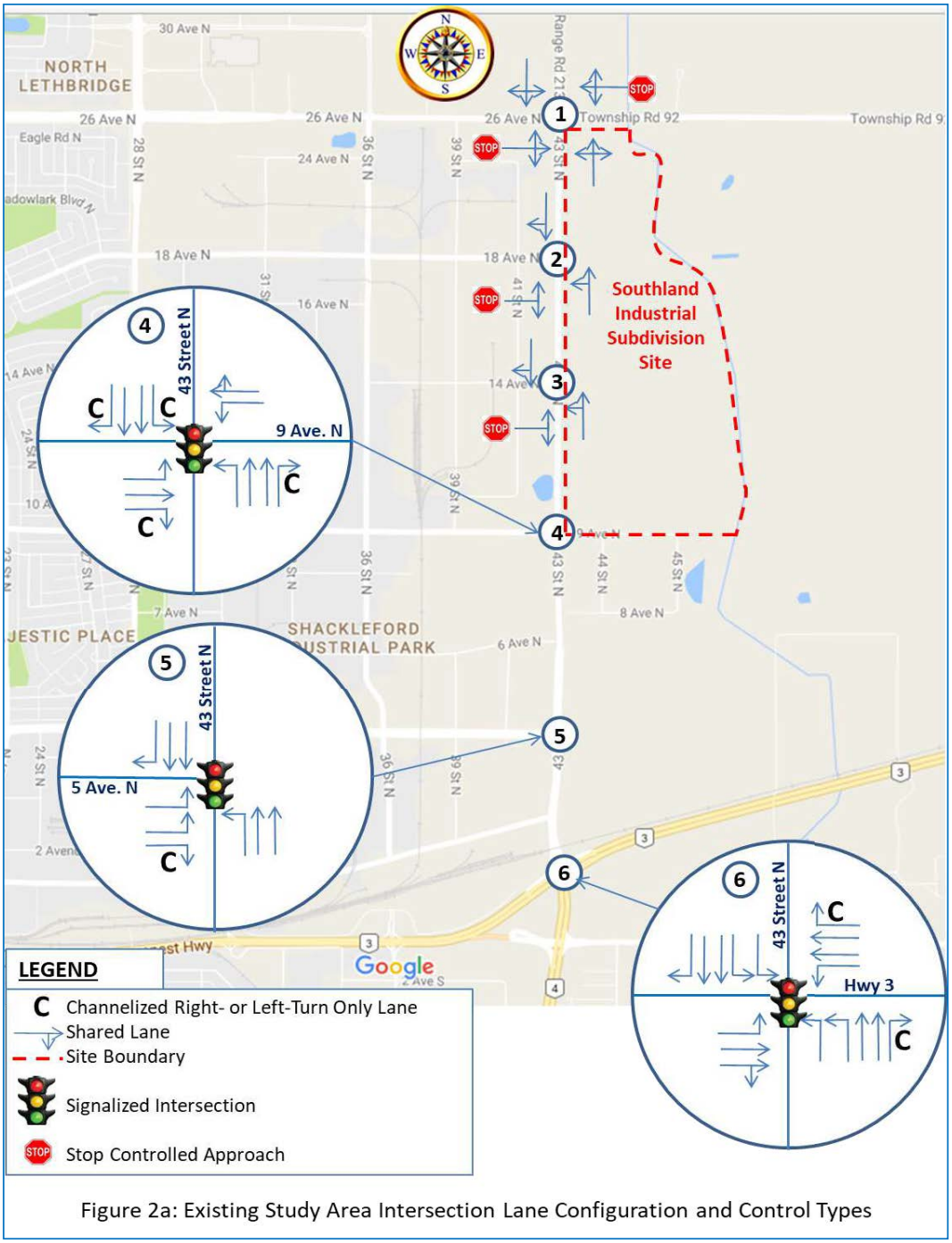



Figure 2a: Existing Study Area Intersection Lane Configuration and Control Types

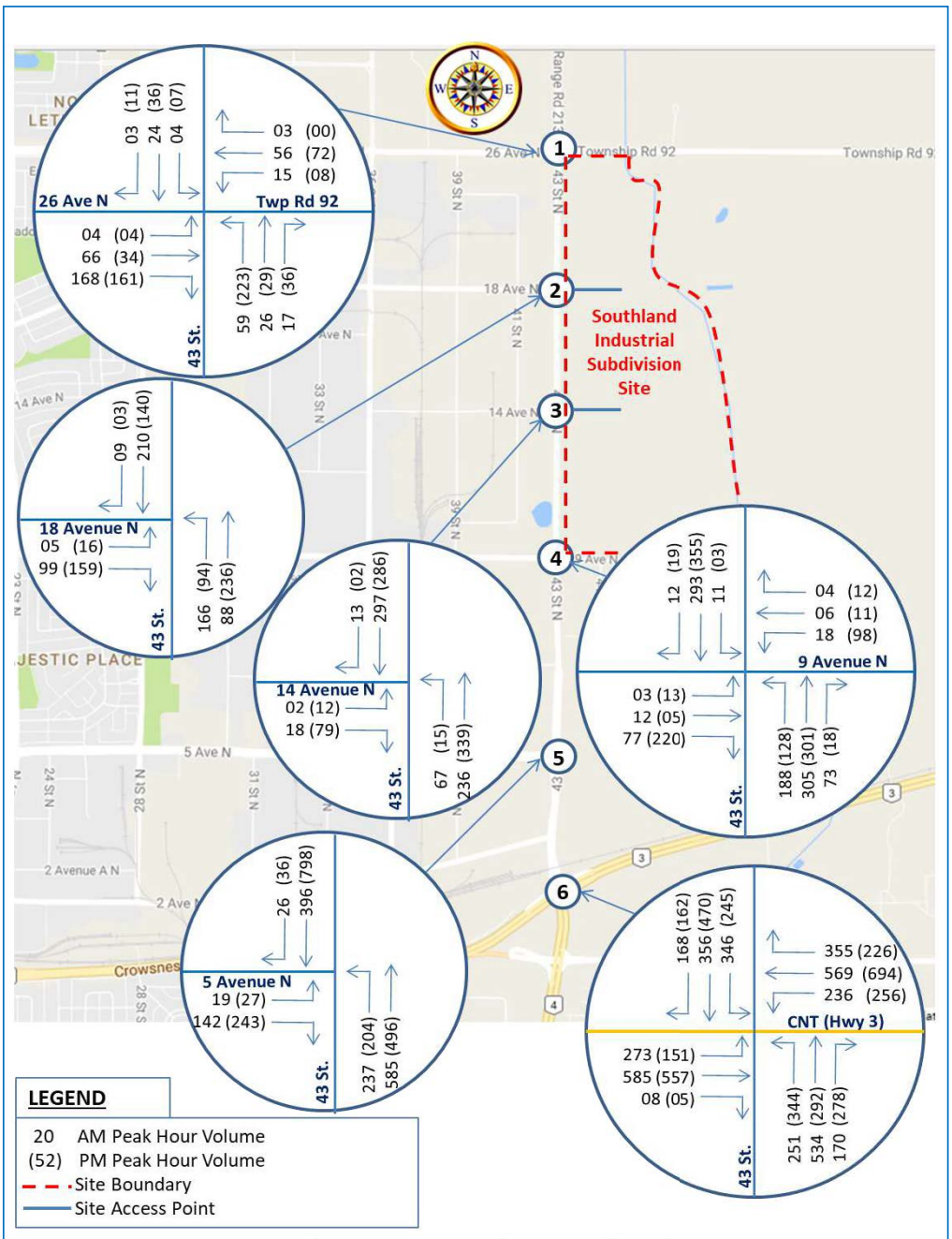



Figure 2b: Existing 2017 Peak Hour Traffic Volumes

## 2.4 Existing Heavy Vehicle Composition

The turning movement traffic count completed for the study intersections as well as the traffic count data obtained from the City of Lethbridge / Alberta Transportation were analyzed and the heavy vehicle percentages were determined at all study intersections. The AM peak hour and the PM peak hour heavy vehicle compositions were determined and are presented in Table 1. Note that heavy vehicle traffic volume considered included trucks, multi-axle vehicles, city buses and school buses.

**Table 1: Adjacent Highway Heavy Vehicle Composition (in %)**

| Intersection Name | Peak Hour Period | 2016 / 2017 Traffic Count Data | | | |
|---|---|---|---|---|---|
| | | EB | WB | NB | SB |
| **43 Street North and 26 Avenue** | **AM and PM** | 4% | 4% | 7% | 16% |
| **43 Street North and 18 Avenue North** | **AM** | 12% | - | 10% | 3% |
| | **PM** | 9% | - | 9% | 8% |
| **43 Street North and 14 Avenue North** | **AM** | 55% | - | 10% | 6% |
| | **PM** | 3% | - | 9% | 10% |
| **43 Street North and 9 Avenue North** | **AM** | 3% | 36% | 9% | 9% |
| | **PM** | 6% | 2% | 13% | 7% |
| **43 Street North and 5 Avenue North** | **AM** | 12% | - | 6% | 16% |
| | **PM** | 7% | - | 12% | 6% |
| **Highway 3 / Crowsnest Highway 43 Street North** | **AM** | 10.7% | 8.7% | 9.7% | 14.8% |
| | **PM** | 9.5% | 6.3% | 6.7% | 11.2% |

Based on the above results, the capacity analysis for study intersections utilized the observed heavy vehicle percentages as noted in Table 1. However, for new approaches, a heavy vehicle percentage of **10%** was utilized in the capacity analysis software for that approach as per the City of Lethbridge TIA standards.

## 2.5 Planned Roadway Improvements

City of Lethbridge has been contacted in order to find out if there are any plans for any roadway improvements within the study area in the near future. The City of Lethbridge development planning staff indicated that 43 Street N, north of 9 Avenue will be upgraded to 4-lane roadway in the future. However, the City of Lethbridge further confirmed that 43 Street N north of 9 Ave N is not anticipated to be twinned by 2037, which is the future horizon design year for this TIA. Therefore, existing layout will be considered in the analysis and needed improvements will be recommended. Additionally, the ***2006 Functional Planning Study completed by Stantec***[(1)] for Highways 3 & 4 in Lethbridge area proposes / recommends new alignments for these highways that would provide external links allowing external traffic to by-pass the City and hence reducing Crowsnest Highway traffic within Lethbridge.

(1) http://www.transportation.alberta.ca/projects/assets/Area_8_South/Hwy%203%20Lethbridge/Executive_Summary.pdf

## 3.0 PROJECTED TRAFFIC VOLUMES

### 3.1 Trip Generation for Background Developments

Background traffic takes into account additional traffic on the roadway systems that will be generated by approved developments in the area that may be completed by the time of the site build-out. The current project is projected to be built-out in the near term. Based on EASL Transportation Consultants' discussion with the City of Lethbridge, there is one approved development, Cavendish Farms within the vicinity of the project site that must be considered. The AM and PM peak hour traffic volumes generated by this background development and would impact the current study area intersections were obtained from the City of Lethbridge and are presented on **Figure 3**. A copy of the original City of Lethbridge's traffic volumes generated by Cavendish Farms is contained in **Appendix B**.

### 3.2 Historical Traffic Growth Rate

To account for inherited growth in traffic and the traffic generated by other unknown developments that may occur at the build-out of the proposed project, a traffic growth factor was applied to the existing traffic volumes to forecast the future traffic conditions. A 2.5% annual growth rate was used to estimate traffic growth for the 2-year, 5-year and 20-year horizons. This 2.5% growth rate was applied to the 2017 existing traffic volumes to derive the 2019, 2022, and 2037 background growth traffic volumes to be used to estimate the total background traffic volumes. Note that the 2.5% annual growth rate is in accordance with the City of Lethbridge / Lethbridge County acceptable medium to long range growth standards. The background growth traffic volumes for the years 2019, 2022, and 2037 are illustrated on **Figures 4, 5,** and **6**, respectively.

### 3.3 Background Traffic

The Cavendish Farms Background traffic volumes presented on Figure 3 were added to the traffic growth due to unknown developments (Figures 4, 5 and 6) then added to the existing 2017 peak hour traffic volumes shown on Figure 2, creating the 2019, 2022 and 2037 background traffic scenario (without site volumes) as illustrated on **Figures 7, 8 and 9.**

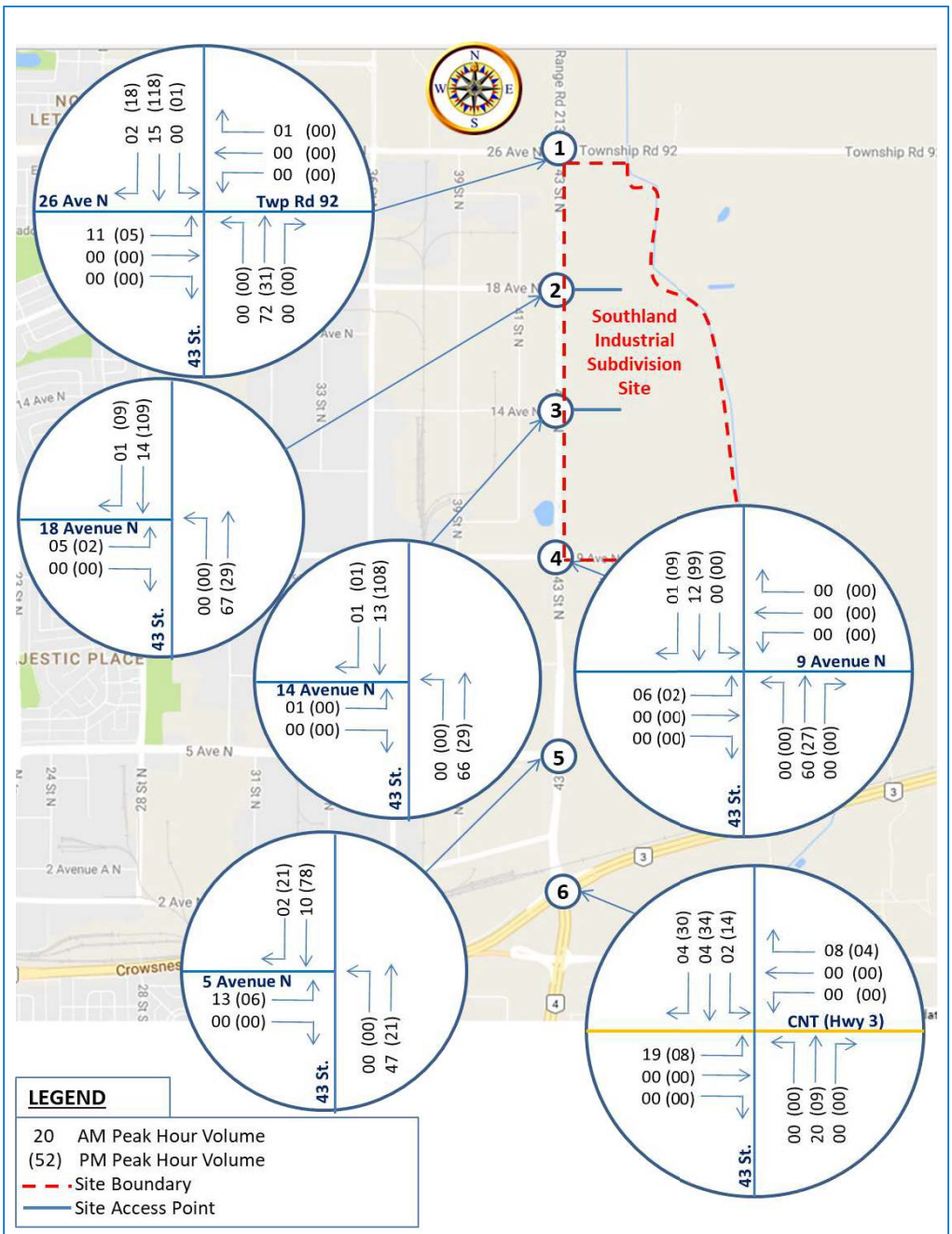



Figure 3: Known Background (Cavendish) Peak Hour Traffic Volumes

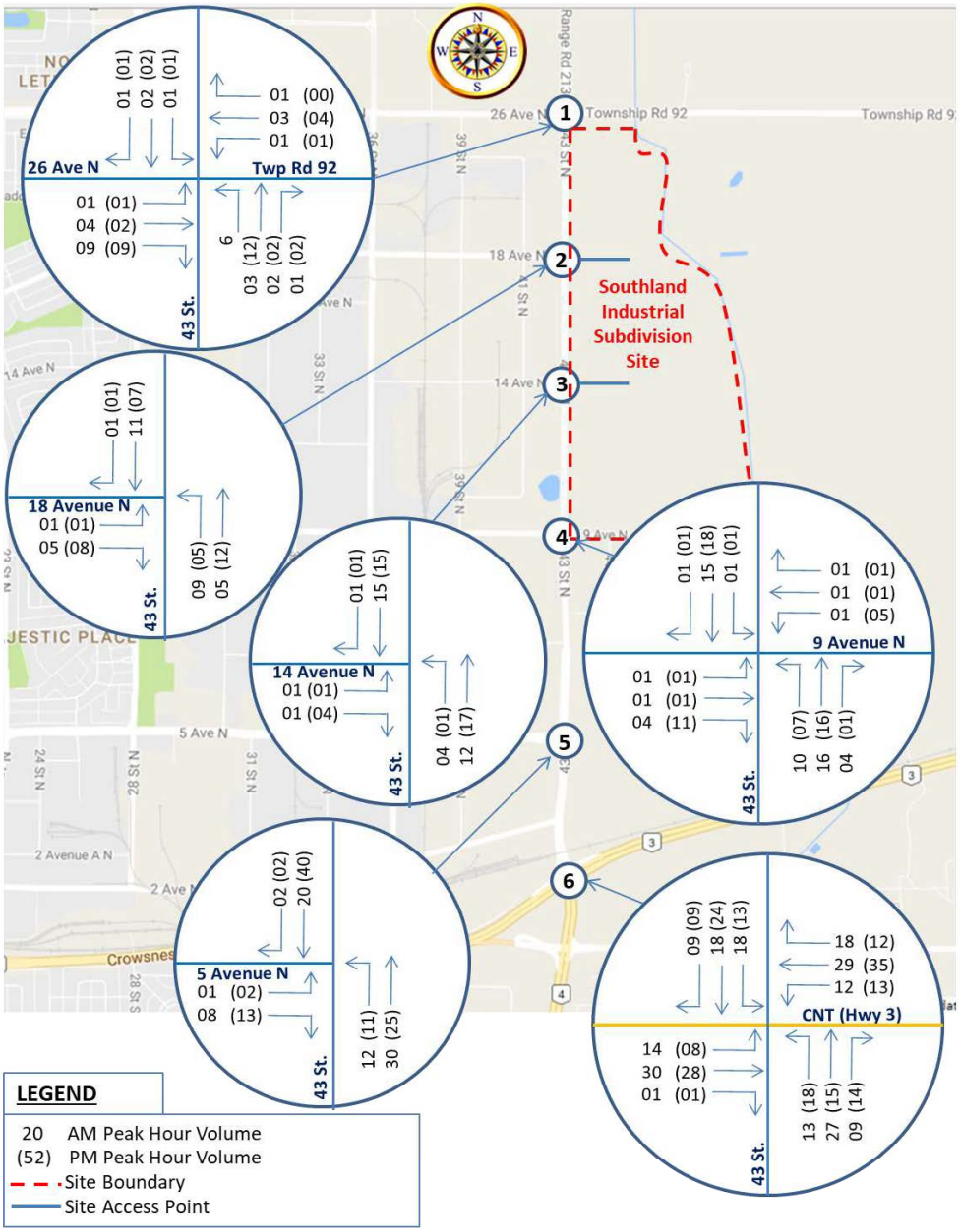



Figure 4: Background 2019 Growth Peak Hour Traffic Volumes
(2.5% Growth Rate Applied for 2 Years on Existing)

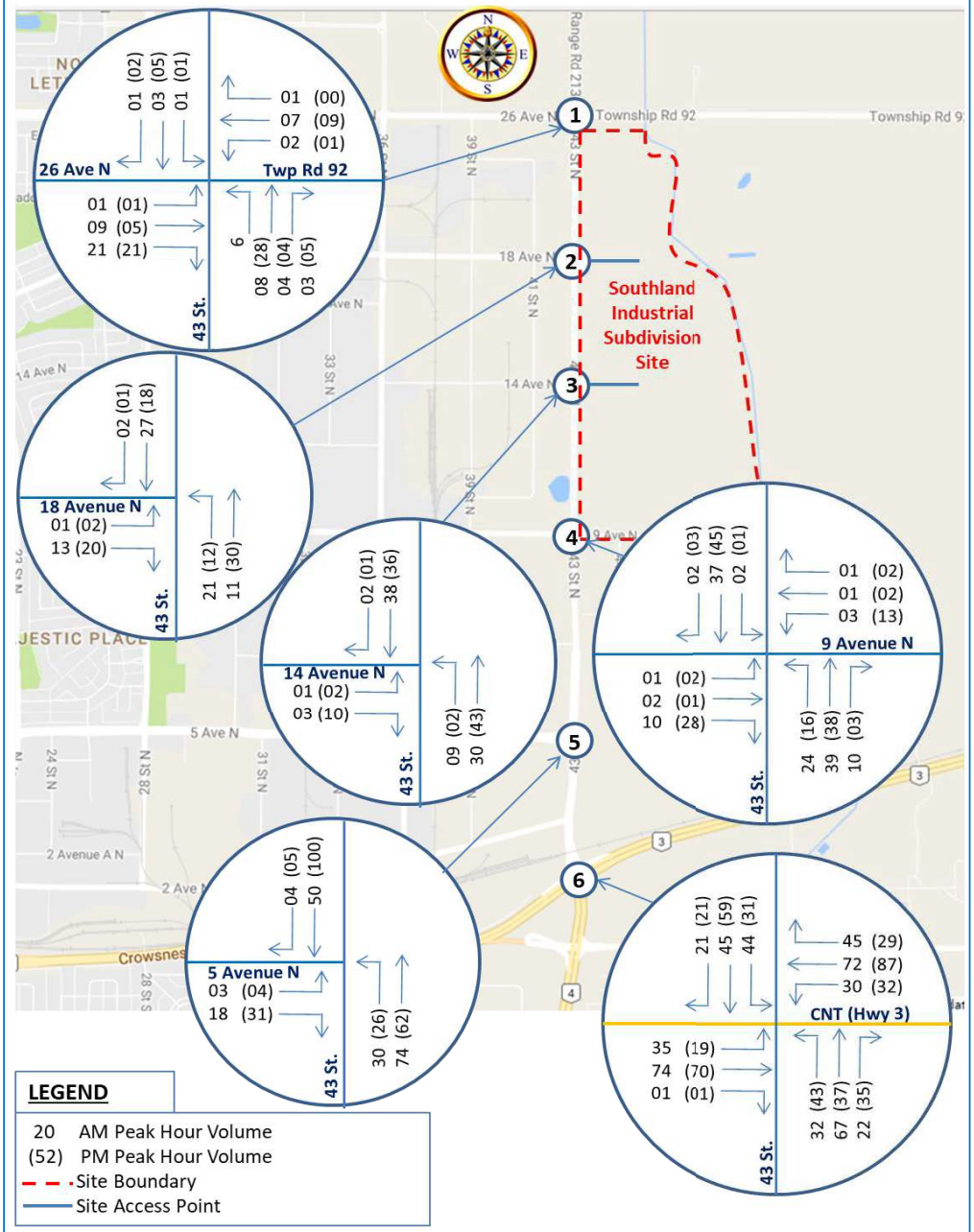



Figure 5: Background 2022 Growth Peak Hour Traffic Volumes
(2.5% Growth Rate Applied for 5 Years on Existing)

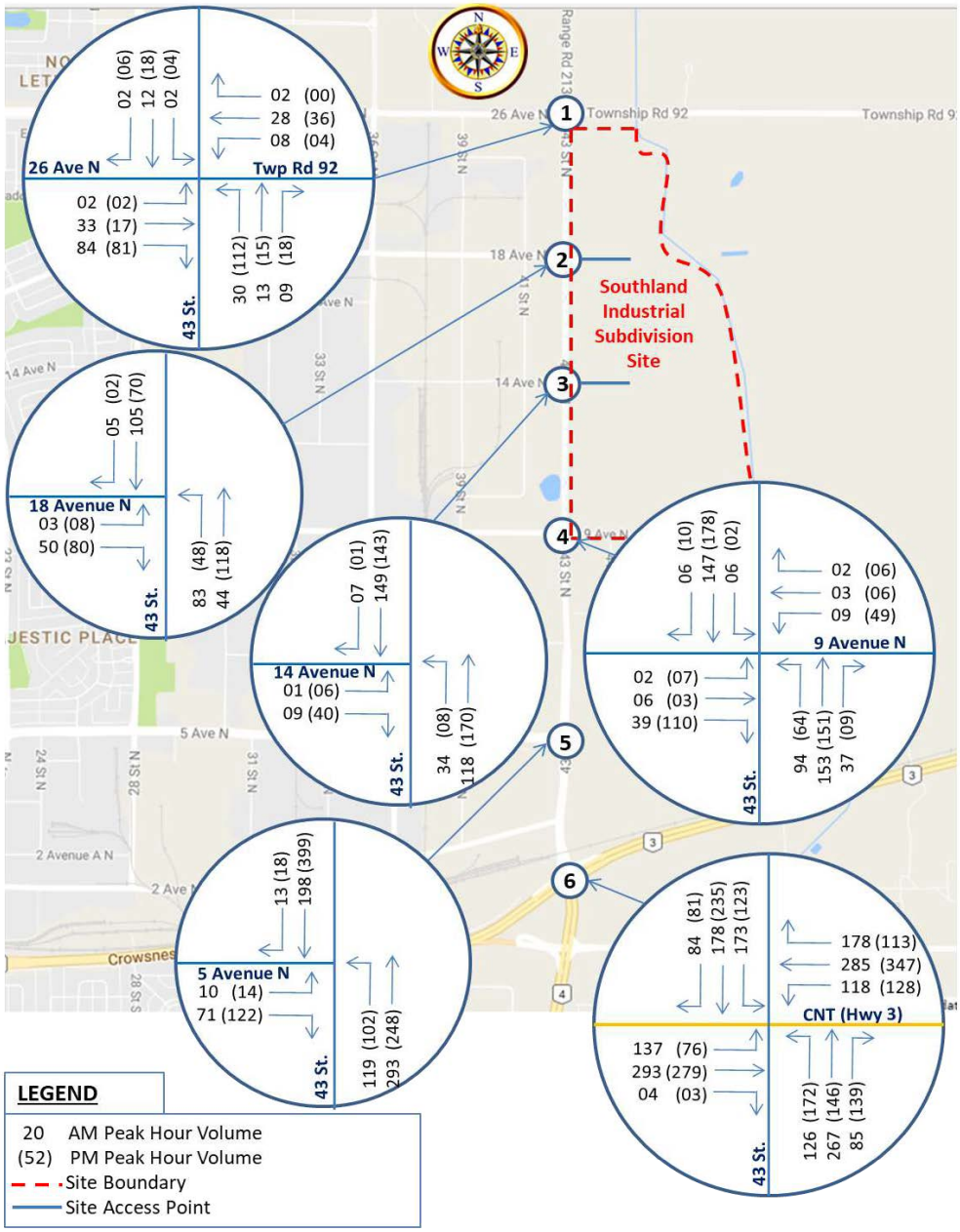



Figure 6: Background Growth Peak Hour Traffic Volumes
(2.5% Growth Rate Applied for 20 Years on Existing)

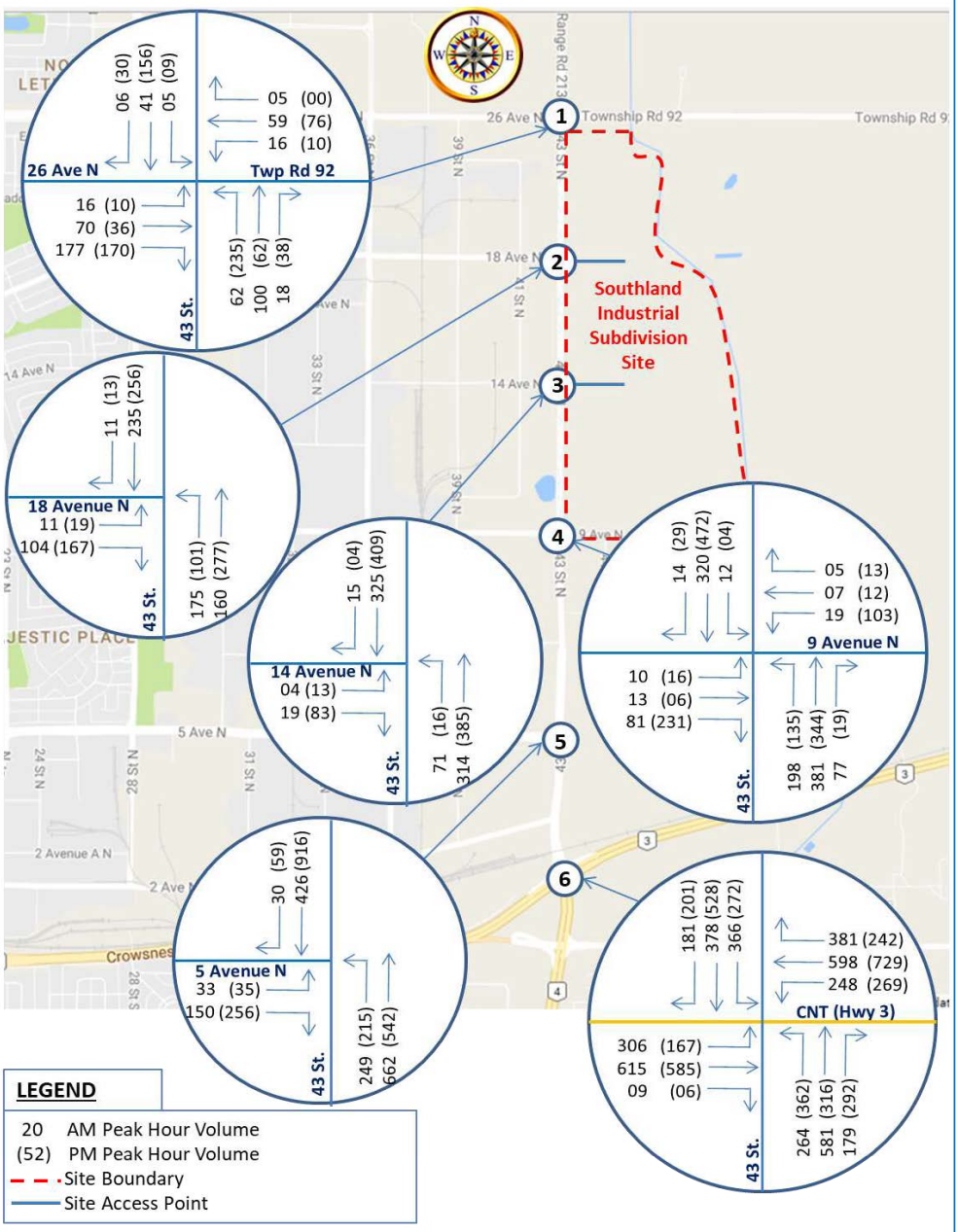



Figure 7: Total 2019 Background Peak Hour Traffic Volumes
(Existing + Known Background Development + 2019 Background Growth)

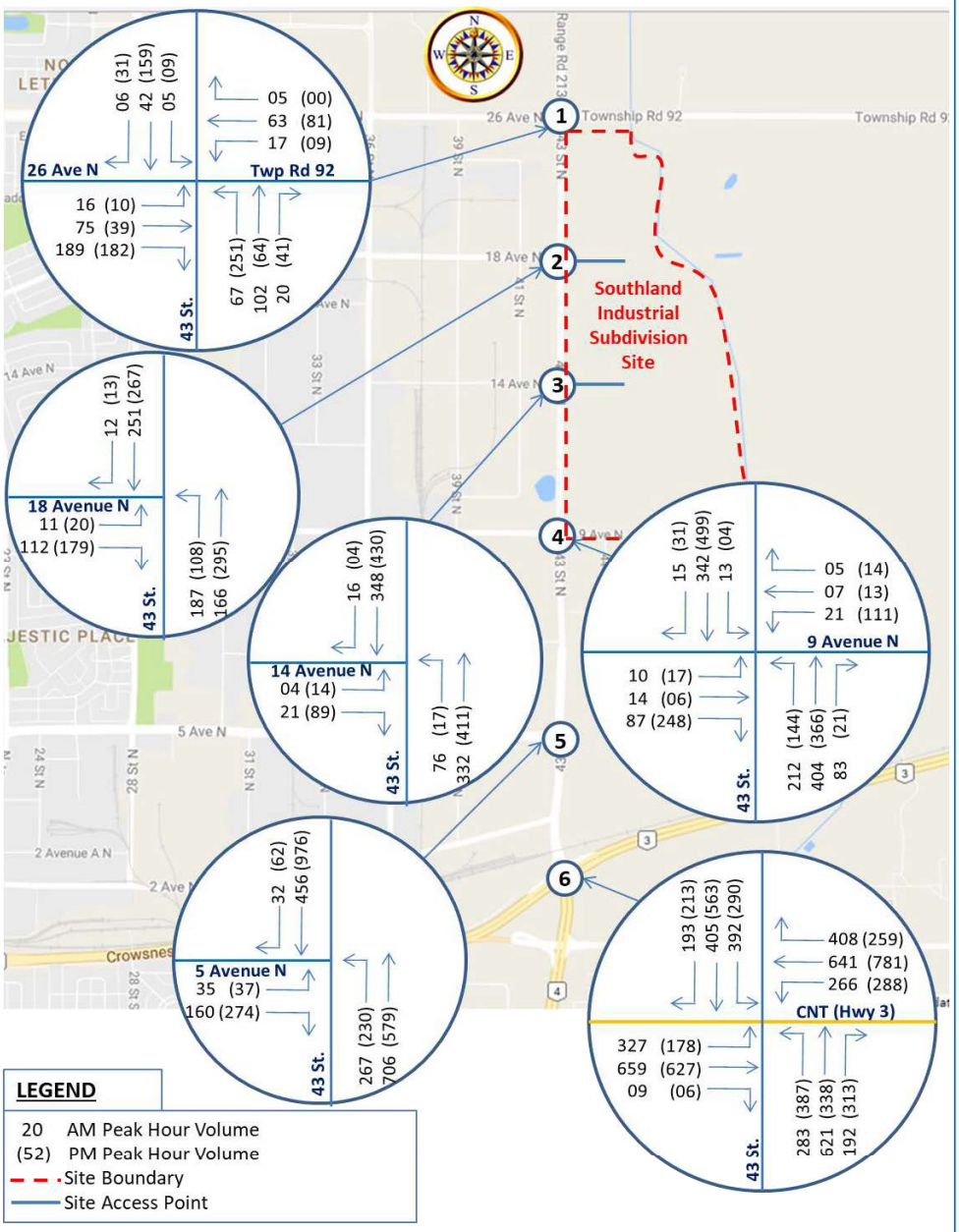



Figure 8: Total 2022 Background Peak Hour Traffic Volumes
(Existing + Known Background Development + 2022 Background Growth)

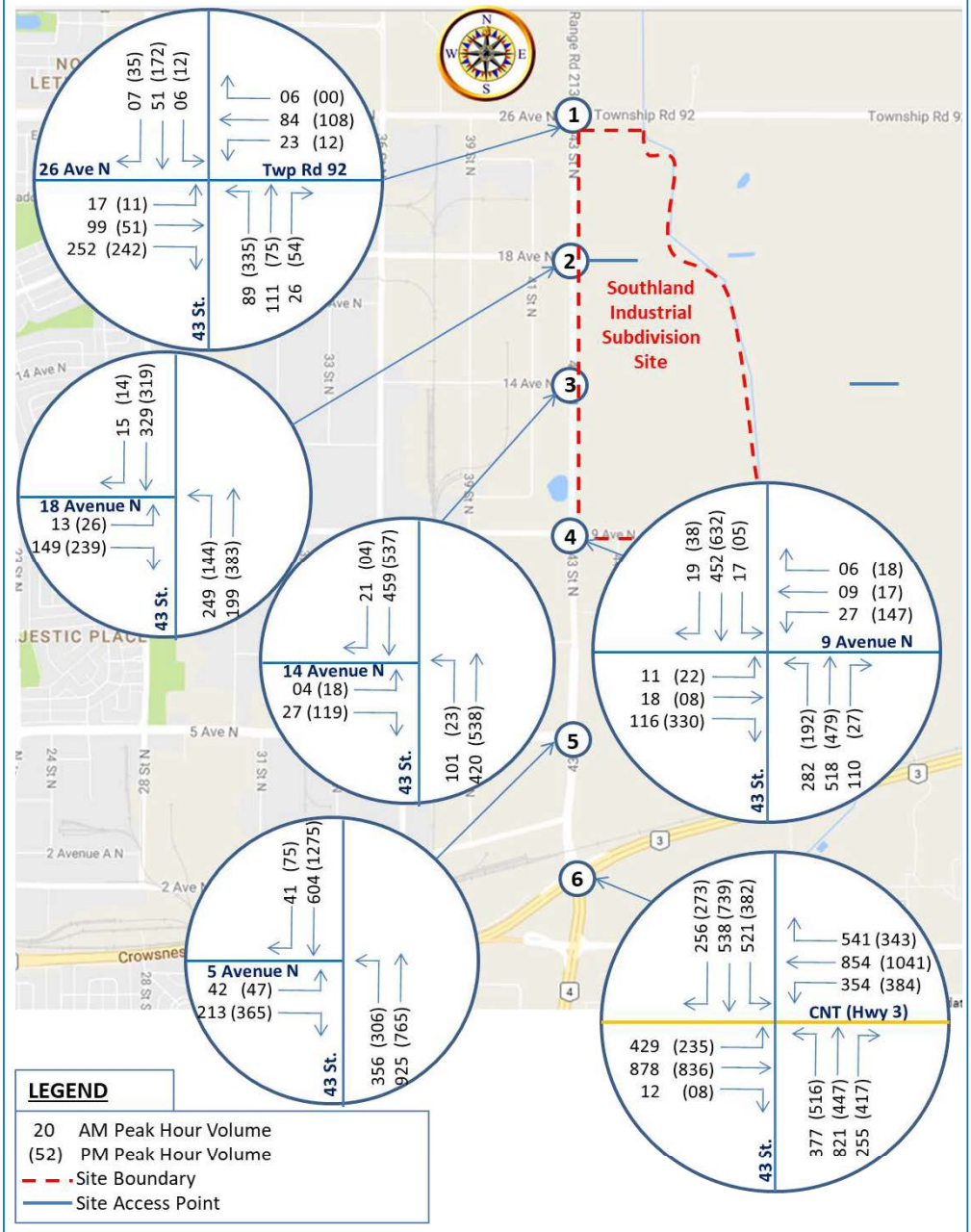



Figure 9: Total 2037 Background Peak Hour Traffic Volumes
(Existing + Known Background Development + 2037 Background Growth)

### 3.4 Site Generated Trips

To estimate the number of vehicle trips expected to be generated by a particular development, trip generation rates are applied based on the proposed land uses and intensity. The number of trips that would be generated by the proposed development was estimated based on the rates published in ***Trip Generation, 10th Edition*** by the Institute of Transportation Engineers (ITE). The trip generation rates along with the proposed land uses and the corresponding ITE land use codes are presented in **Table 2**. The projected Chinook Industrial Park development peak-hours and daily site-generated traffic volumes are presented in **Table 3**.

It should be noted that the proposed site development plan provides land use areas in acres and the ITE 10th Edition Trip Generation manual uses the gross floor area (GFA) as the independent variable. Based on reviewing several near-by, Lethbridge area existing industrial parks, building area ratios to the total acreage area ranged from 6,114 SF per acre to 11,155 SF per acre. We are selecting 8,200 SF per Acre for the proposed development as this is the average planned building areas. All proposed land use areas within each of the planned phases were converted to GFA based on this rate and are presented in the 4th column of **Table 3**.

**Table 2: Trip Generation Rates (ITE Trip Generation Manual 10th Edition)**

| Land Use | ITE Code | Unit | AM Peak Hour | | | PM Peak Hour | | | Daily Trips |
|---|---|---|---|---|---|---|---|---|---|
| | | | in | out | total | in | out | total | |
| General Light Industrial | 110 | KSF | 88% | 12% | 0.70 | 13% | 87% | 0.63 | 4.96 |
| Business Park | 770 | KSF | 61% | 39% | 0.40 | 46% | 54% | 0.42 | 12.44 |

**Table 3: Projected Site-Generated Peak-Hour and Daily Traffic Volumes**

| Land Use | | ITE Code | Intensity (KSF) | AM Peak Hour | | | PM Peak Hour | | | Daily Trips |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | in | out | total | in | out | total | |
| Phase 1 | G. Light Industrial | 110 | 152.2 | 94 | 13 | 107 | 12 | 84 | 96 | 755 |
| | Business Park | 770 | 152.7 | 38 | 24 | 62 | 30 | 35 | 65 | 1,900 |
| | **Phase 1 Total** | | | **132** | **37** | **169** | **42** | **119** | **161** | **2,655** |
| Phases 2 to 5 | G. Light Industrial | 110 | 780.4 | 481 | 66 | 547 | 64 | 428 | 492 | 3,871 |
| | Business Park | 770 | 333.4 | 82 | 52 | 134 | 65 | 76 | 141 | 4,148 |
| | **Phases 2 to 5 Total** | | | 563 | 118 | 681 | 129 | 504 | 633 | 8,019 |
| **Full Development Total Trips** | | | | **695** | **155** | **850** | **171** | **623** | **794** | **10,674** |

### 3.4.1 Pass-by Trips

Pass-by trips are not new trips, but they are the trips that are attracted from the traffic passing the site on adjacent roadways. While pass-by trips are new trips at the access points to the site, they are not new trips on the adjacent roadway systems

### 3.4.2 Internal Trips

An internal trip is a trip that has both its origin and destination within a multi-use development area under investigation, which should be deducted from the total number of trips departing and entering the study site. The appropriate internal trip reduction rates are based on the characteristics of the mixed land uses. The proposed development has a potential for some internal trips but to be conservative in the analysis no internal trips were considered for this development.

## 3.5 Trip Distribution

The directions from which vehicles will approach and depart a site is a function of several variables, including the population and employment distribution within the development's area of influence, the operational characteristics of the road system, and the ease with which drivers can travel over various sections of the roadway network without encountering congestion. The directional distribution of new project trips by the Chinook Industrial Park development was estimated based on the consideration of all the pertinent factors above including existing traffic patterns. The resulting directional distributions are as follows:

- 22% of site generated trips will travel to and from the west on Highway 3;
- 21% of site generated trips will travel to and from the south on 43 Street S;
- 26% of site generated trips will travel to and from the east on Highway 3;
- 08% of site generated trips will travel to and from the west on 5 Avenue N;
- 06% of site generated trips will travel to and from the west on 9 Avenue N;
- 01% of site generated trips will travel to and from the west on 14 Avenue N;
- 05% of site generated trips will travel to and from the west on 18 Avenue N;
- 07% of site generated trips will travel to and from the west on 26 Avenue N;
- 01% of site generated trips will travel to and from the north on 43 Street N; and
- 03% of site generated trips will travel to and from the east on Township Road 92.

Site access distribution percentages were determined based on the above directional distributions coupled with the ability of traffic to perform the needed turns and in relation to the available site accesses during each development phase. The resulting final directions of approaches and site access traffic distributions for Phase 1 and Phase 2 are illustrated on **Figure 10a and Figure 10b,** respectively.

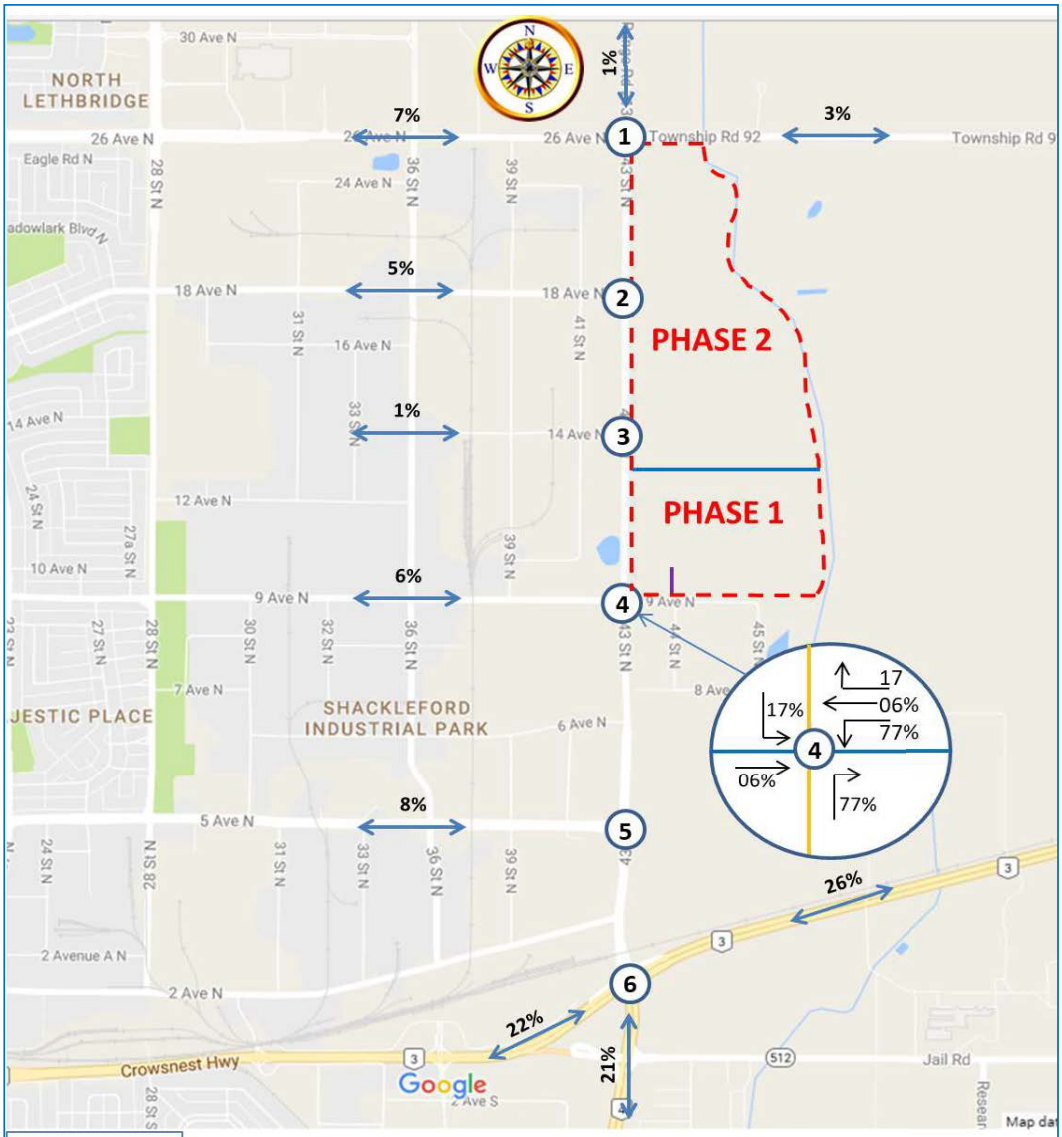



Figure 10a: Direction of Approach and Site Access Distribution
(Phase 1 of Development – Interim 2019)

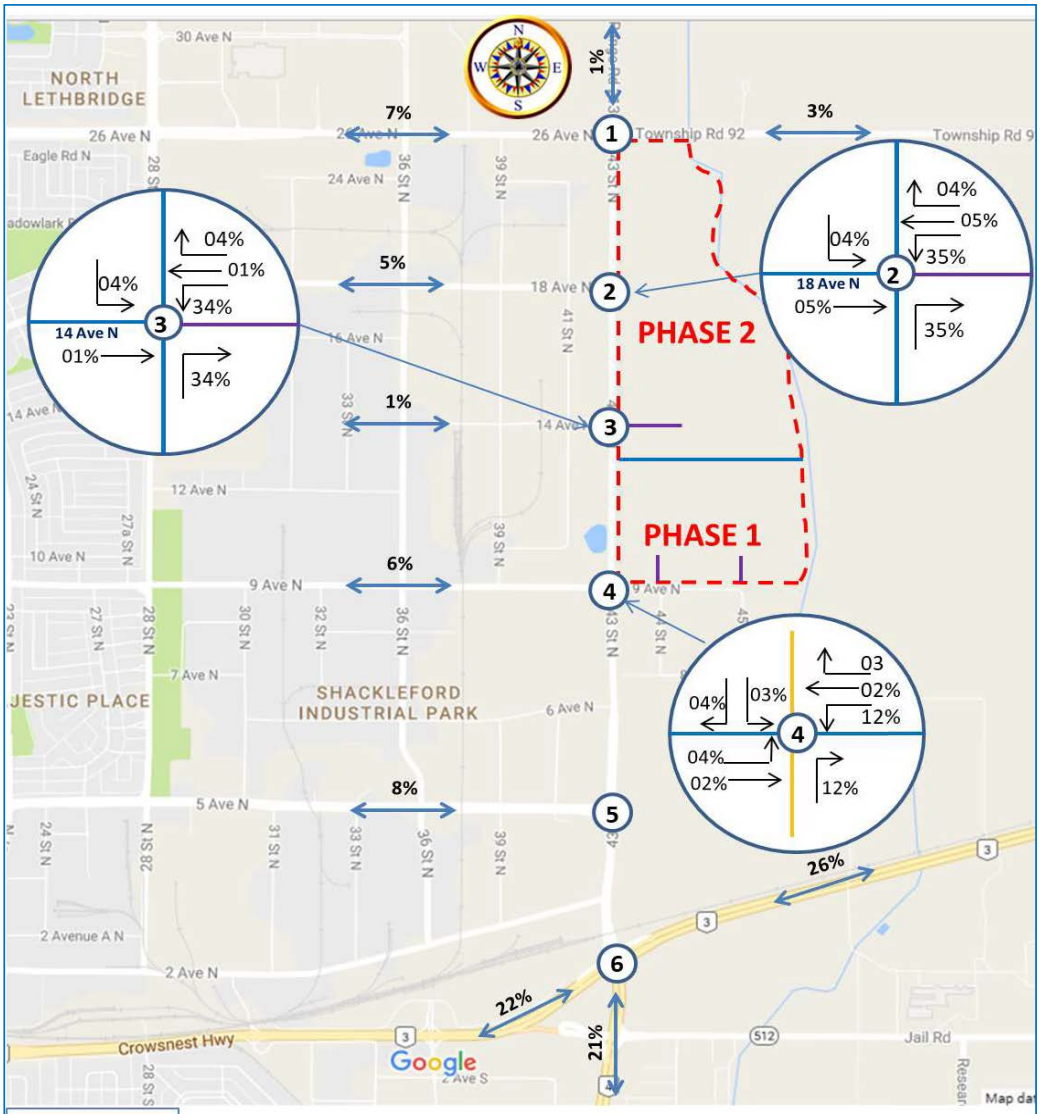



Figure 10b: Direction of Approach and Site Access Distribution
Phase 2: Full Development of Site(2022)

### 3.6 Trip Assignment

#### 3.6.1 Project Built-Out (Opening Year – 2019) Volumes

The projected peak-hour traffic volumes for the Chinook Industrial Park Phase 1 of the development were assigned to the adjacent roadways based on the estimated directional distribution as shown on **Figure 10a**. The resulting site generated AM peak hour and PM peak hour trips are illustrated on **Figure 11.**

The project built-out year traffic volumes (opening year volumes) were prepared by adding the development's Phase 1 site-generated trips shown on Figure 11 to the Total 2019 Background traffic volumes shown on Figure 7. The resulting project built-out 2019 traffic volumes are presented on **Figure 13**.

#### 3.6.2 Future Traffic Volumes

The projected full development (Phase 2) peak-hour traffic volumes for the Chinook Industrial Park were assigned to the adjacent roadways based on the estimated directional distribution as shown on **Figure 10b**. The resulting site generated AM peak hour and PM peak hour trips for the full development of the site are illustrated on **Figure 12.**

The development site-generated trips shown on **Figure 12** were then added to the 2022 and 2037 total background peak-hour traffic volumes shown on **Figure 8 and Figure 9** to arrive at the future 2022 and future 2037 peak-hour total traffic volumes, which are illustrated on **Figure 14 and Figure 15**.

#### 3.6.3 Average Daily Traffic Volumes

The Future 2037 average daily traffic (ADT) volumes for the study area roadway links with the proposed Chinook Industrial Park traffic were estimated from the AM and PM peak hour volumes. As per the City of Lethbridge directions, the following formula was utilized to calculate the ADT volumes:

*ADT = (AM Peak Hour Volume + PM Peak Hour Volume) * 5.6*

The above formula was applied on the turning movement traffic volumes in order to estimate the roadway link ADT volumes. The resulting Future 2037 estimated ADT volumes are illustrated on **Figure 16**.

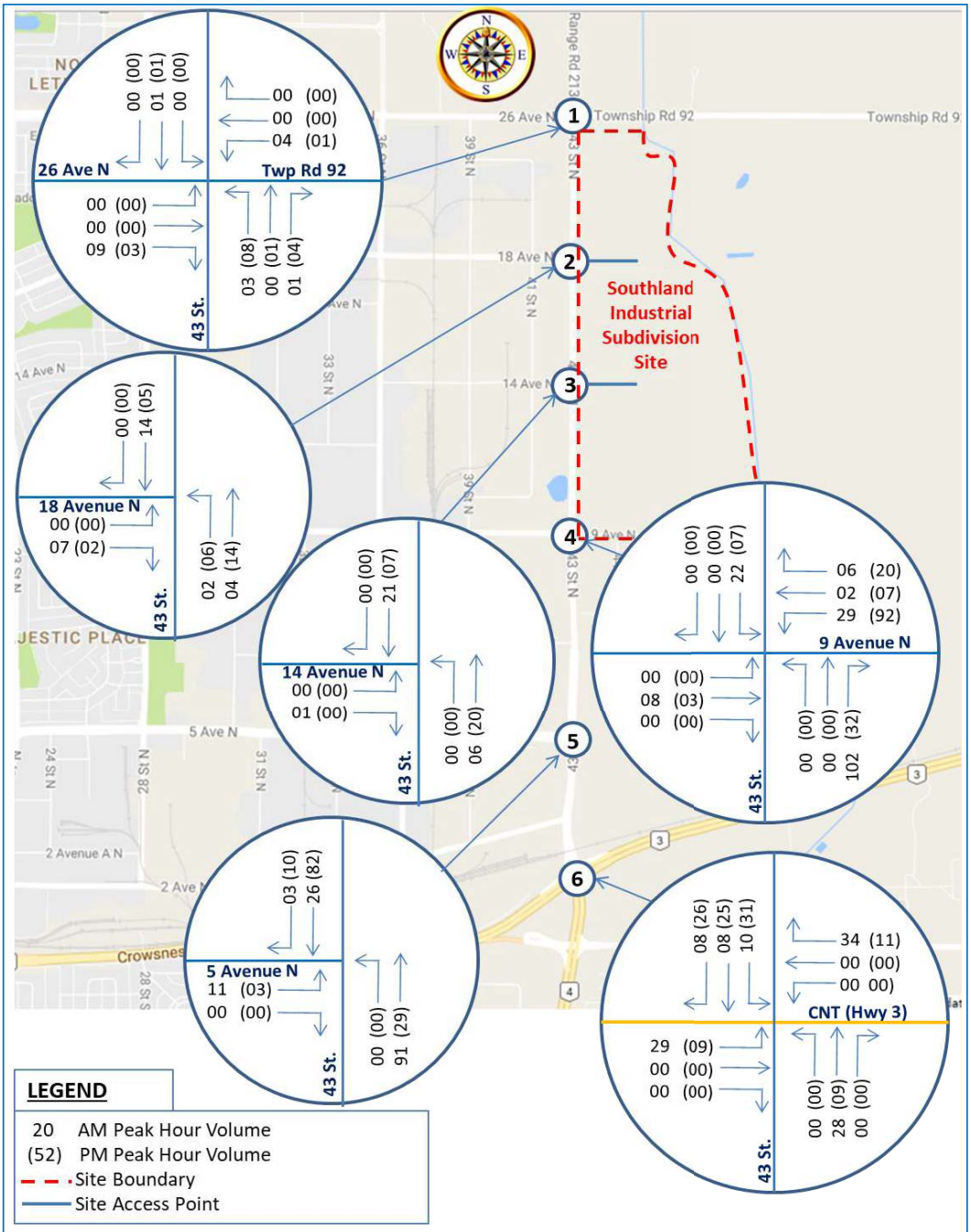



Figure 11: Phase 1 - Site Generated Peak Hour Traffic Volumes (2019)

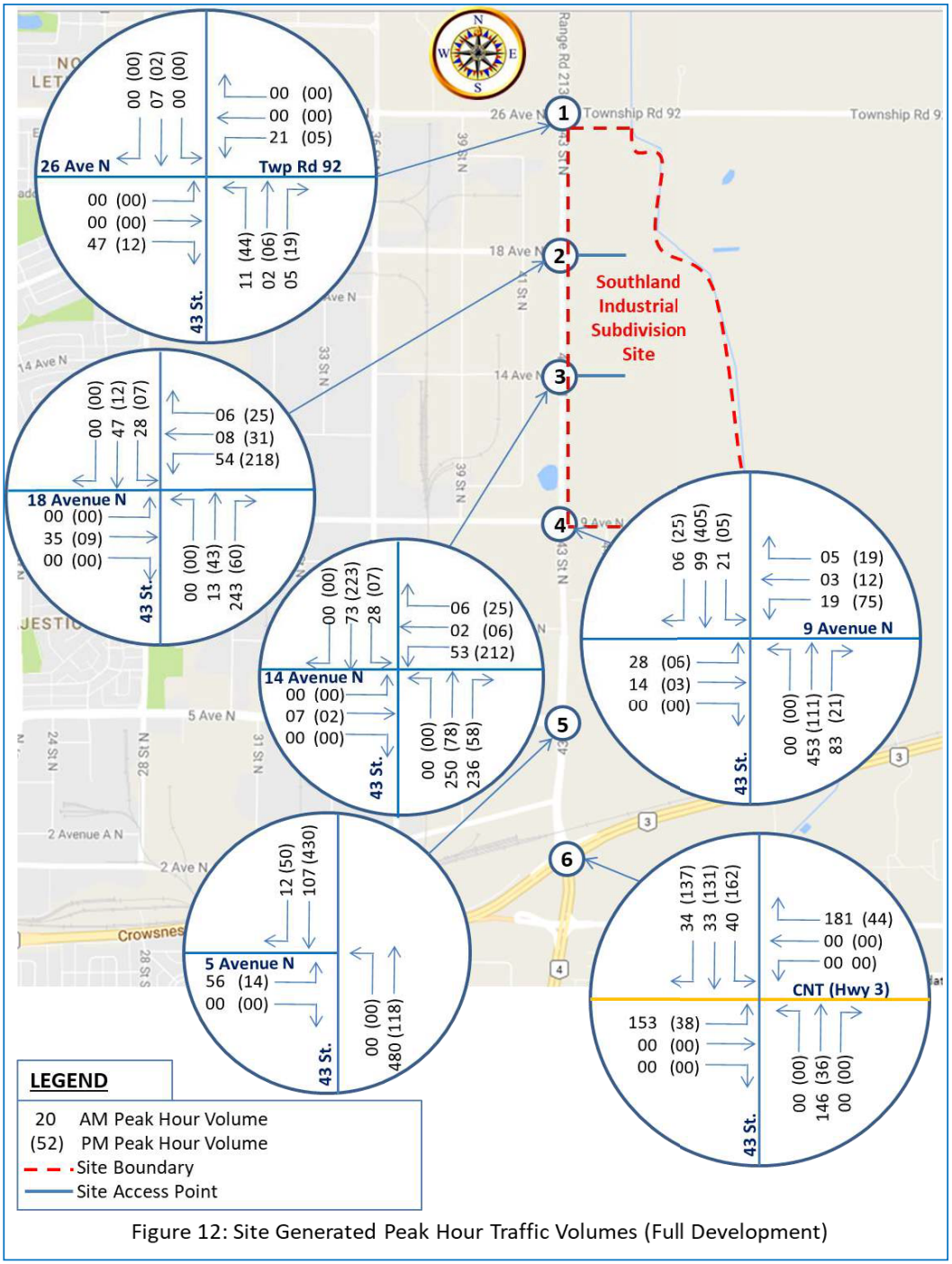



Figure 12: Site Generated Peak Hour Traffic Volumes (Full Development)

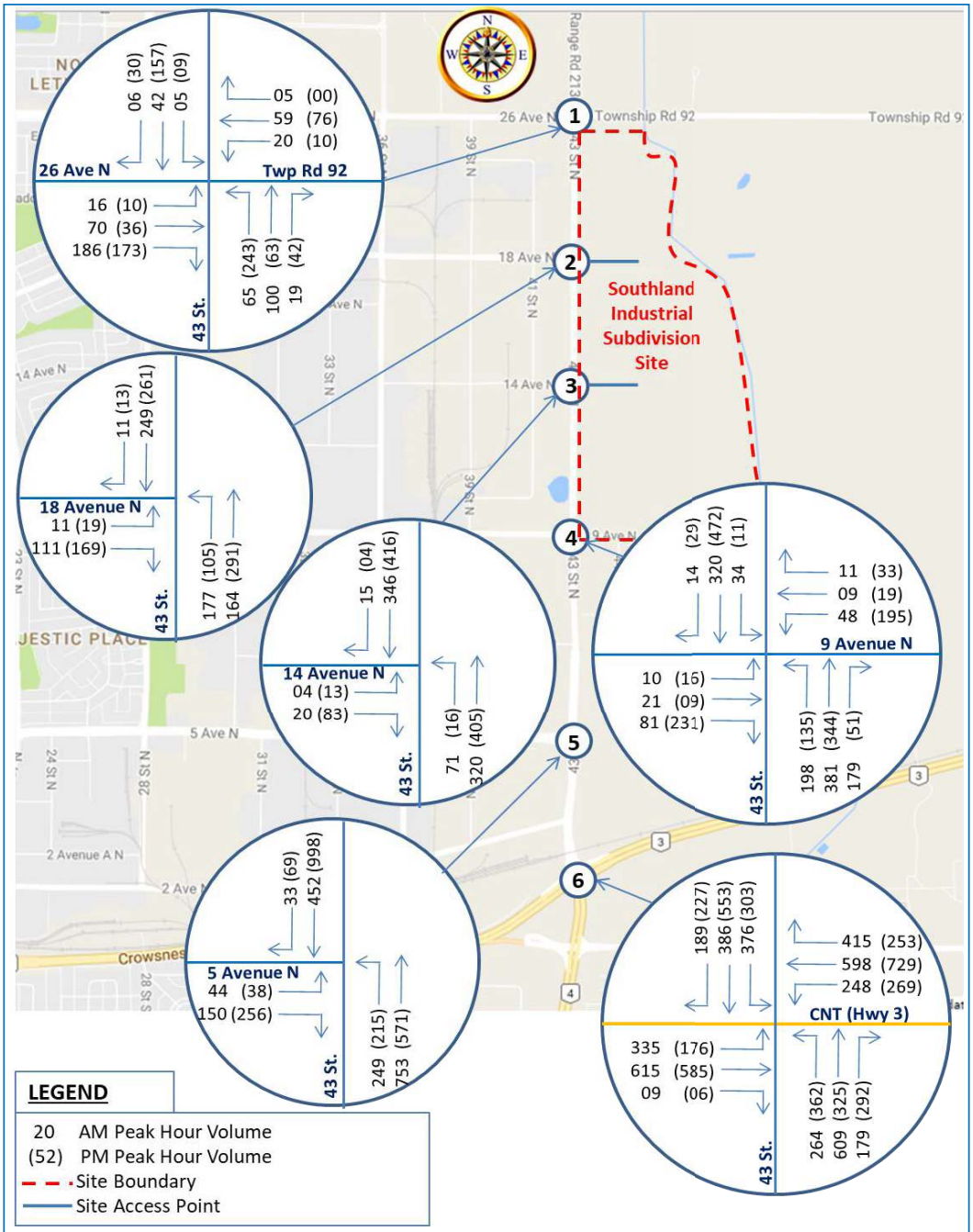



Figure 13: Total Future 2019 Peak Hour Traffic Volumes

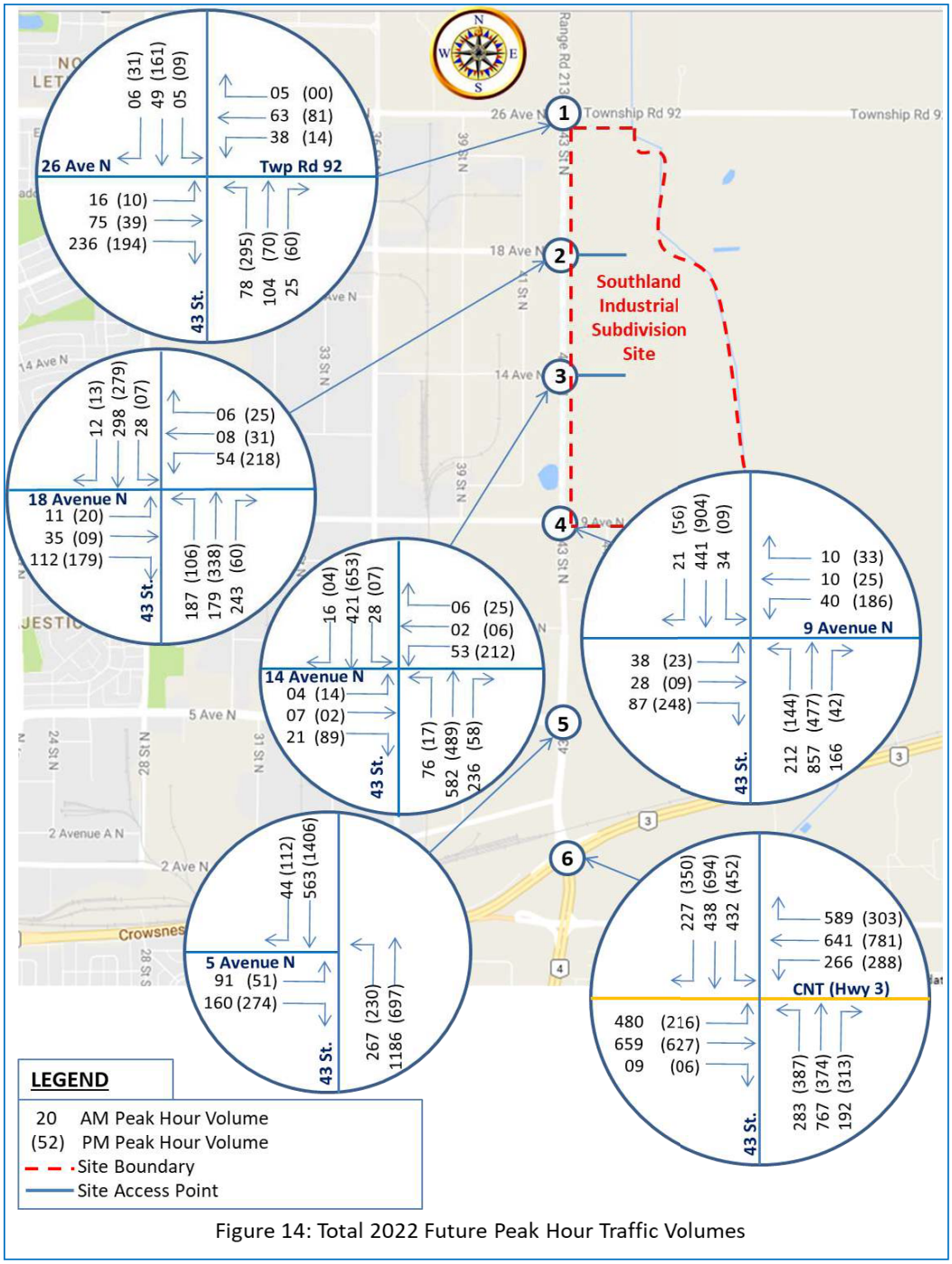



Figure 14: Total 2022 Future Peak Hour Traffic Volumes

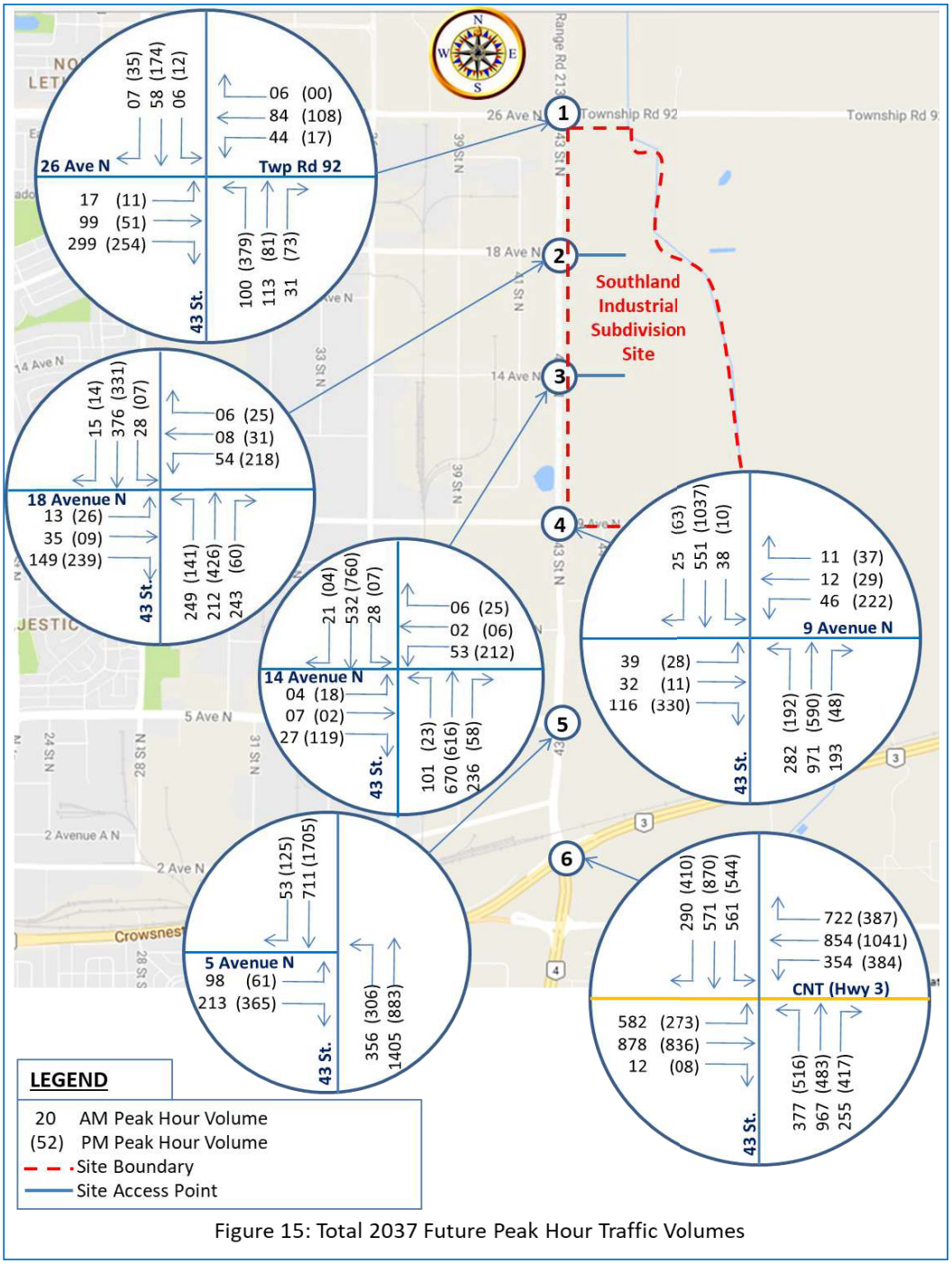



Figure 15: Total 2037 Future Peak Hour Traffic Volumes

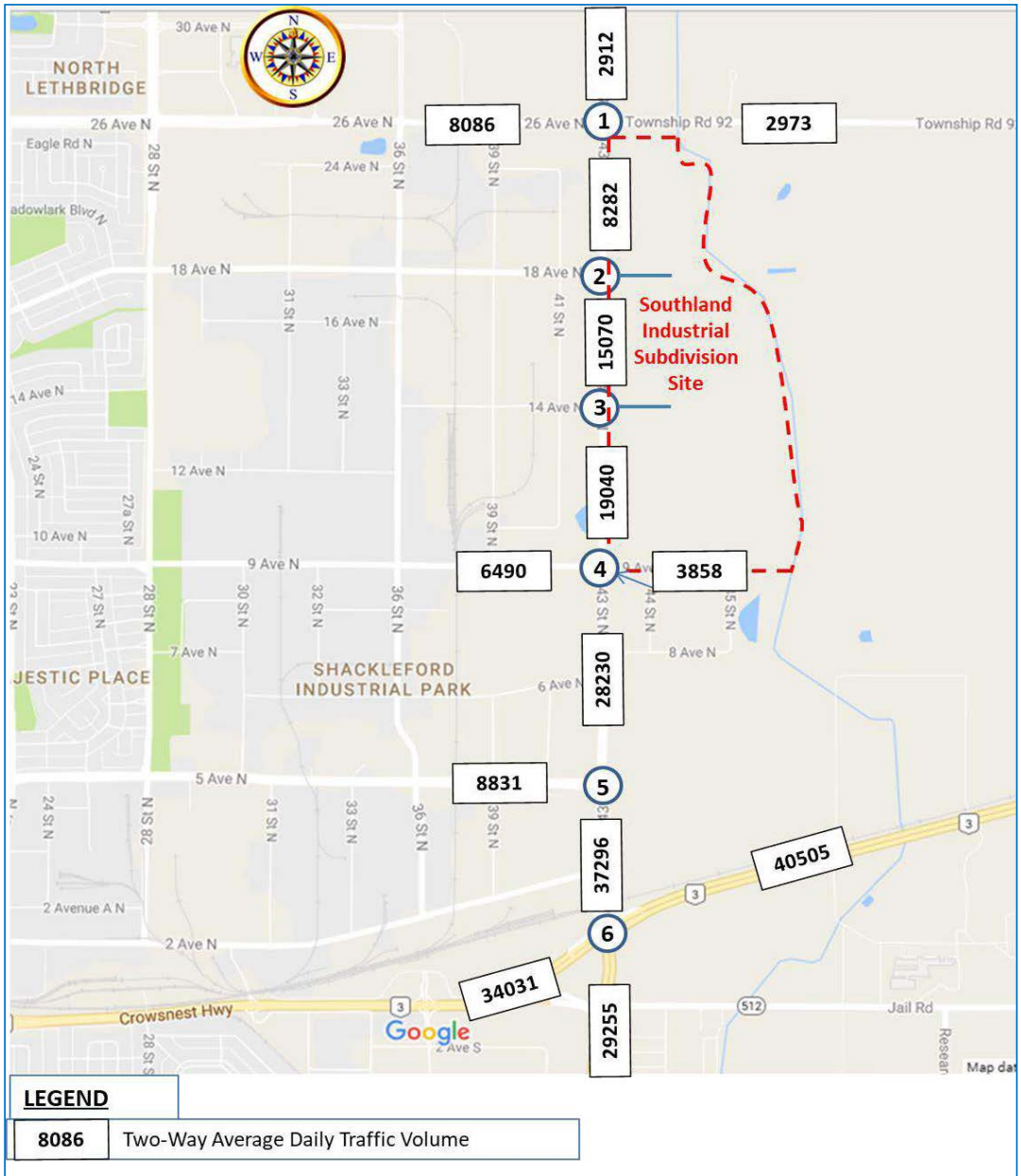



Figure 16: Future 2037 Average Daily Traffic (ADT ) Volumes

## 4.0 EVALUATION AND RECOMMENDED IMPROVEMENTS

### 4.1 Level of Service Criteria for Intersections

The intersections identified for the study were analyzed according to the methodologies presented in the ***2010 Highway Capacity Manual***. The analysis determines the "Level of Service (LOS)" of unsignalized and signalized intersections considering the factors including but not limited to number and types of lanes, traffic volumes, heavy vehicle composition, peak hour factors, pedestrian activities, etc. Levels of service are expressed in a range from "A" through "F," with "A" being the highest level of service, and "F" representing the lowest level of service. **Table 4** shows the thresholds for Levels of Service "A" through "F" for unsignalized intersections and **Table 5** presents the LOS criteria for signalized intersections.

**Table 4: Level of Service Criteria for Unsignalized Intersections ***

| Level of Service | Delay/Vehicle (seconds) | Description |
|---|---|---|
| A | ≤ 10.0 | Little or no delay, very low main street traffic. |
| B | 10.1 to 15.0 | Short traffic delays, many acceptable gaps. |
| C | 15.1 to 25.0 | Average traffic delays, frequent gaps still occur. |
| D | 25.1 to 35.0 | Long traffic delays, limited number of acceptable gaps. |
| E | 35.1 to 50.0 | Very long traffic delays, very small number of acceptable gaps. |
| F | > 50.0 | Extreme traffic delays, virtually no acceptable gaps in traffic. |

* Note: Capacity analysis for two-way stop-controlled intersection provides the LOS for the critical movements, not of the overall intersection.

**Table 5: Level of Service Criteria for Signalized Intersections**

| Level of Service | Delay/Vehicle (seconds) | Description |
|---|---|---|
| A | ≤ 10.0 | Most vehicles do not stop at all. |
| B | 10.1 to 20.0 | Some vehicles stop. |
| C | 20.1 to 35.0 | The number of vehicles stopping is significant, although many pass through without stopping. |
| D | 35.1 to 55.0 | Many vehicles stop. Individual cycle failures are noticeable. |
| E | 55.1 to 80.0 | Considered to be the limit of acceptable delay. Individual cycle failures are frequent. |
| F | > 80.0 | Unacceptable delay. |

### 4.2 Capacity and Level of Service Analyses

Capacity and level of service analyses were conducted for the following conditions:

- Existing 2017 Conditions;
- Background 2019, 2022, and 2037 Conditions (without site traffic); and
- Future 2019, 2022 and 2037 Conditions (with the site traffic);

The software package Synchro 8 was utilized for the capacity analyses of all study intersections and site accesses. The Synchro software utilizes ***Highway Capacity Manual 2010*** methodologies for the evaluations.

Note that the observed heavy vehicle percentages and peak hour factors (PHF) were utilized in the Synchro software capacity analysis. For new approaches, a heavy vehicle percentage of 10% and a PHF of 0.92 were utilized for capacity analysis.

#### 4.2.1 Existing 2017 Conditions

Existing capacity and level of service analysis results for the study intersections are presented in **Table 6**. These results were taken from the HCM 2010 Capacity Analyses Reports produced by Synchro software. Note that all capacity analysis results reported in all results tables that follow were also taken from the **HCM 2010**. The detailed capacity and LOS HCM 2010 analyses reports for all capacity analyses scenarios are contained in **Appendix C** of this report. The detailed capacity and LOS analyses reports, based on Synchro capacity analyses method, for all scenarios are contained in **Appendix D** for comparison purposes. The actual Synchro software capacity analyses files are contained in **Appendix E**.

A review of **Table 6** capacity analysis results indicates that all study area intersections, both signalized and unsignalized, are currently operating at acceptable levels of service during both the AM and the PM peak hours including the stop-controlled intersection approaches. Therefore, no mitigation is needed under existing traffic conditions.

A review of **Table 6** regarding the volume to capacity (V/C) ratios indicates that all existing intersections movements V/C have values below 0.80 except the northbound left-turn movements at the 43 Street N / 9 Avenue N intersection and 43 Street N / 5 Avenue N intersection that have values exceeding 0.80 and reaching 1.00. However, these reported V/C values in the results tables are based on the HCM 2010 analysis method. If these same values were compared with those produced based on the Synchro analysis method, the Synchro method estimated much lower values. For example, HCM estimated **1.00** V/C value for the NB left turn movement at the intersection of 43 Street N and 5 Avenue N; however, the Synchro method estimated **0.68** ratio for the same movement, this is significantly lower. Therefore, it is believed that the HCM analysis method, in general, estimates higher V/C ratios and therefore, these movements should be carefully reviewed before recommending improvements.

**Table 6: HCM Capacity Analysis Results for Existing 2017 Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street N and 26 Avenue N / Twp. Road 92 (Unsignalized) | EB | 0.360 | 11.5 | B | 0.293 | 12.0 | B |
| | WB | 0.173 | 12.8 | B | 0.261 | 19.8 | C |
| | NB | 0.050 | 4.3 | A | 0.157 | 6.0 | A |
| | SB | 0.004 | 1.0 | A | 0.005 | 1.0 | A |
| 43 Street North and 18 Avenue North (Unsignalized) | EB | 0.195 | 11.5 | B | 0.264 | 11.3 | A |
| | WB | - | - | - | - | - | - |
| | NB | 0.172 | 5.6 | A | 0.080 | 2.2 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 14 Avenue North (Unsignalized) | EB | 0.049 | 12.5 | B | 0.178 | 12.1 | A |
| | WB | - | - | - | - | - | - |
| | NB | 0.073 | 1.9 | A | 0.015 | 0.3 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 9 Avenue North (Signalized) | **Overall** | **-** | **27.9** | **C** | **-** | **20.8** | **C** |
| | EB | 0.10 | 43.4 | D | 0.08 | 40.9 | D |
| | WB | 0.15 | 44.3 | D | 0.54 | 44.4 | D |
| | NB | 0.98 | 37.9 | D | 0.85 | 22.0 | C |
| | SB | 0.18 | 9.4 | A | 0.23 | 10.5 | B |
| 43 Street North and 5 Avenue North (Signalized) | **Overall** | **-** | **22.7** | **C** | **-** | **16.9** | **B** |
| | EB | 0.15 | 46.3 | D | 0.16 | 45.3 | D |
| | NB | 1.00 | 28.9 | C | 0.89 | 22.2 | C |
| | SB | 0.24 | 9.4 | A | 0.44 | 11.6 | B |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | **Overall** | **-** | **36.1** | **D** | **-** | **33.1** | **C** |
| | EB | 0.75 | 36.1 | D | 0.59 | 33.4 | C |
| | WB | 0.67 | 34.7 | C | 0.67 | 29.8 | C |
| | NB | 0.78 | 40.2 | D | 0.60 | 31.6 | C |
| | SB | 0.64 | 33.9 | C | 0.73 | 37.4 | D |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

### 4.2.2 Background 2019, 2022 and 2037 Conditions

LOS and capacity analyses results for the background 2019, 2022 and 2037 traffic conditions (without site development generated traffic) for all study area intersections are presented in **Table 7, Table 8 and Table 9,** respectively.

The Background 2037 Mitigated traffic conditions capacity analysis results are presented in **Table 10**.

**Table 7: HCM Capacity Analysis Results for Background 2019 Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street N and 26 Avenue N / Twp. Road 92 (Unsignalized) | EB | 0.452 | 13.6 | B | 0.433 | 16.7 | C |
| | WB | 0.228 | 15.2 | C | 0.404 | 31.0 | D |
| | NB | 0.053 | 2.6 | A | 0.188 | 5.8 | A |
| | SB | 0.005 | 0.7 | A | 0.007 | 0.4 | A |
| 43 Street North and 18 Avenue North (Unsignalized) | EB | 0.254 | 13.3 | B | 0.349 | 13.9 | B |
| | WB | - | - | - | - | - | - |
| | NB | 0.187 | 4.5 | A | 0.097 | 2.2 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 14 Avenue North (Unsignalized) | EB | 0.068 | 14.2 | B | 0.234 | 14.5 | B |
| | WB | - | - | - | - | - | - |
| | NB | 0.080 | 1.6 | A | 0.019 | 0.3 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 9 Avenue North (Signalized) | **Overall** | **-** | **29.5** | **C** | **-** | **20.4** | **C** |
| | EB | 0.10 | 43.0 | D | 0.10 | 40.4 | D |
| | WB | 0.15 | 43.7 | D | 0.55 | 44.0 | D |
| | NB | 1.03 | 39.4 | D | 0.86 | 21.7 | C |
| | SB | 0.20 | 9.9 | A | 0.31 | 11.8 | B |
| 43 Street North and 5 Avenue North (Signalized) | **Overall** | **-** | **25.2** | **C** | **-** | **18.3** | **B** |
| | EB | 0.19 | 44.7 | D | 0.18 | 44.5 | D |
| | NB | 1.05 | 31.8 | C | 0.92 | 23.9 | C |
| | SB | 0.27 | 10.5 | B | 0.51 | 13.0 | B |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | **Overall** | **-** | **40.0** | **D** | **-** | **35.9** | **D** |
| | EB | 0.83 | 40.8 | D | 0.64 | 37.2 | D |
| | WB | 0.71 | 38.4 | D | 0.73 | 33.5 | C |
| | NB | 0.86 | 45.2 | D | 0.65 | 32.5 | C |
| | SB | 0.71 | 35.8 | D | 0.78 | 39.7 | D |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 7** indicates that all study intersections would continue to operate at acceptable levels during both AM peak hour and PM peak hour. Therefore, no mitigation would be needed for any of the study area intersections under background 2019 conditions.

**Table 8: HCM Capacity Analysis Results for Background 2022 Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street N and 26 Avenue N / Twp. Road 92 (Unsignalized) | EB | 0.489 | 14.4 | B | 0.485 | 18.5 | C |
| | WB | 0.253 | 16.0 | C | 0.456 | 35.5 | E |
| | NB | 0.058 | 2.7 | A | 0.202 | 5.9 | A |
| | SB | 0.005 | 0.7 | A | 0.007 | 0.3 | A |
| 43 Street North and 18 Avenue North (Unsignalized) | EB | 0.281 | 13.9 | B | 0.385 | 14.7 | B |
| | WB | - | - | - | - | - | - |
| | NB | 0.203 | 4.7 | A | 0.105 | 2.2 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 14 Avenue North (Unsignalized) | EB | 0.077 | 14.7 | B | 0.263 | 15.4 | C |
| | WB | - | - | - | - | - | - |
| | NB | 0.088 | 1.6 | A | 0.020 | 0.. | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 9 Avenue North (Signalized) | **Overall** | **-** | **18.4** | **B** | **-** | **19.0** | **B** |
| | EB | 0.11 | 42.9 | D | 0.10 | 39.9 | D |
| | WB | 0.16 | 43.7 | D | 0.57 | 43.7 | D |
| | NB | 0.87 | 19.9 | B | 0.84 | 17.3 | B |
| | SB | 0.23 | 11.9 | B | 0.34 | 12.9 | B |
| 43 Street North and 5 Avenue North (Signalized) | **Overall** | **-** | **14.8** | **B** | **-** | **16.5** | **B** |
| | EB | 0.19 | 44.5 | D | 0.18 | 44.4 | D |
| | NB | 0.87 | 14.5 | B | 0.88 | 17.2 | B |
| | SB | 0.31 | 13.2 | B | 0.57 | 15.0 | B |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | **Overall** | **-** | **44.8** | **D** | **-** | **39.3** | **D** |
| | EB | 0.93 | 50.5 | D | 0.71 | 41.8 | D |
| | WB | 0.79 | 42.8 | D | 0.81 | 38.3 | D |
| | NB | 0.91 | 49.4 | D | 0.70 | 33.6 | C |
| | SB | 0.76 | 36.8 | D | 0.82 | 42.3 | D |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 8** indicates that all study intersections would continue to operate at acceptable levels during both AM peak hour and PM peak hour under the 2022 background conditions. Therefore, no mitigation would be needed for any of the study area intersections under background 2022 conditions.

**Table 9: HCM Capacity Analysis Results for Background 2037 Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street N and 26 Avenue N / Twp. Road 92 (Unsignalized) | EB | 0.697 | 21.4 | C | 0.901 | 59.8 | F |
| | WB | 0.438 | 23.9 | C | 0.985 | 139.5 | F |
| | NB | 0.077 | 3.0 | A | 0.274 | 6.3 | A |
| | SB | 0.006 | 0.7 | A | 0.009 | 0.4 | A |
| 43 Street North and 18 Avenue North (Unsignalized) | EB | 0.472 | 20.3 | C | 0.604 | 22.3 | C |
| | WB | - | - | - | - | - | - |
| | NB | 0.296 | 5.4 | A | 0.148 | 2.4 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 14 Avenue North (Unsignalized) | EB | 0.125 | 18.4 | C | 0.445 | 22.3 | C |
| | WB | - | - | - | - | - | - |
| | NB | 0.132 | 1.8 | A | 0.031 | 0.4 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 9 Avenue North (Signalized) | **Overall** | **-** | **20.6** | **C** | **-** | **22.6** | **C** |
| | EB | 0.13 | 42.5 | D | 0.11 | 37.7 | D |
| | WB | 0.21 | 43.7 | D | 0.63 | 41.9 | D |
| | NB | 0.90 | 21.3 | C | 0.88 | 20.2 | C |
| | SB | 0.33 | 15.9 | B | 0.49 | 18.8 | B |
| 43 Street North and 5 Avenue North (Signalized) | **Overall** | **-** | **17.4** | **B** | **-** | **23.4** | **C** |
| | EB | 0.21 | 44.0 | D | 0.21 | 43.7 | D |
| | NB | 0.90 | 15.8 | B | 0.92 | 20.7 | C |
| | SB | 0.47 | 18.9 | B | 0.82 | 24.8 | C |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | **Overall** | **-** | **114.5** | **F** | **-** | **80.2** | **F** |
| | EB | 1.54 | 180.7 | F | 1.15 | 98.9 | F |
| | WB | 1.26 | 121.9 | F | 1.09 | 61.7 | E |
| | NB | 1.18 | 109.8 | F | 1.15 | 85.9 | F |
| | SB | 0.90 | 45.6 | D | 1.07 | 80.6 | F |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 9** indicates that all study area intersections would continue to operate at acceptable levels during both AM peak hour and PM peak hour except for the following two intersections that would operate at unacceptable levels of service:

1. 43 Street N and 26 Avenue N / Township Road 92; and
2. Highway 3/Crowsnest Highway and 43 Street N.

Therefore, mitigations would be needed for these two intersections under the **background 2037 traffic conditions**. The proposed mitigations consist of the following:

43 Street N and 26 Avenue N / Township Road 92 Intersection

- Installation of a two-phase traffic signal

Highway 3/Crowsnest Highway and 43 Street Intersection

- Installation of a second westbound left-turn only lane;
- Installation of a second eastbound left-turn only lane;
- Installation of a third westbound through only lane;
- Installation of a third eastbound through only lane; and
- Optimization of the traffic signal splits.

The background 2037 Synchro traffic capacity analysis models were updated with the above suggested mitigations and the capacity analysis results of the mitigated traffic conditions are presented in **Table 10**.

**Table 10: HCM Capacity Analysis Results for Background 2037 Mitigated Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street N and 26 Avenue N / Twp. Road 92 (Signalized) | **Overall** | **-** | **11.3** | **B** | **-** | **13.1** | **B** |
| | EB | 0.64 | 10.9 | B | 0.66 | 18.0 | B |
| | WB | 0.19 | 7.8 | A | 0.23 | 14.2 | B |
| | NB | 0.54 | 13.8 | B | 0.68 | 12.0 | B |
| | SB | 0.16 | 11.3 | B | 0.29 | 8.2 | A |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | **Overall** | **-** | **47.3** | **D** | **-** | **43.1** | **D** |
| | EB | 0.83 | 39.8 | D | 0.74 | 35.1 | D |
| | WB | 0.72 | 34.3 | C | 0.91 | 39.3 | D |
| | NB | 1.05 | 63.5 | E | 1.05 | 55.7 | E |
| | SB | 1.05 | 52.0 | D | 0.97 | 44.5 | D |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 10** indicates that the operation at these two intersections would improve significantly with the suggested mitigations. The intersection of 43 Street and 26 Avenue N / Township Road 92 would operate at acceptable levels of service during the AM and PM peak hours with the two-phase signal. The intersection of Highway 3 / Crowsnest Highway and 43 Street would improve but the NB would continue to operate at LOS "E", which represents full capacity level of service. Any additional traffic would cause this intersection to perform at unacceptable levels of service and therefore, grade separation would be the most appropriate solution after 20 years.

Also, as discussed earlier, the ***2006 Functional Planning Study completed by Stantec***[(1)] for Highways 3 & 4 in Lethbridge area proposes / recommends new alignments for these highways that would provide external links allowing external traffic to by-pass the City and hence reducing Crowsnest Highway traffic within Lethbridge city. When these external links are built, significant reductions in traffic volumes would occur at the Crowsnest Highway / 43 Street intersection and operation would improve. Therefore, a reevaluation of this intersection operations at that time, should be performed to determine whether intersection improvements would actually be required.

### 4.2.3 Future 2019, 2022 and 2037 Conditions

LOS and capacity analyses results for the future 2019, 2022 and 2037 traffic conditions (with site development generated traffic) for all study area intersections are presented in **Table 11, Table 12 and Table 14,** respectively.

The capacity analysis results for the future 2022 mitigated conditions and future 2037 mitigated conditions are presented in **Table 13 and Table 15,** respectively.

(1) http://www.transportation.alberta.ca/projects/assets/Area_8_South/Hwy%203%20Lethbridge/Executive_Summary.pdf

**Table 11: HCM Capacity Analysis Results for Future 2019 Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street N and 26 Avenue N / Twp. Road 92 (Unsignalized) | EB | 0.468 | 13.9 | B | 0.446 | 17.2 | C |
| | WB | 0.252 | 16.1 | C | 0.420 | 32.7 | D |
| | NB | 0.056 | 2.7 | A | 0.195 | 5.8 | A |
| | SB | 0.005 | 0.7 | A | 0.007 | 0.3 | A |
| 43 Street North and 18 Avenue North (Unsignalized) | EB | 0.274 | 13.7 | B | 0.359 | 14.2 | B |
| | WB | - | - | - | - | - | - |
| | NB | 0.192 | 4.5 | A | 0.102 | 2.2 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 14 Avenue North (Unsignalized) | EB | 0.073 | 14.6 | B | 0.239 | 14.8 | B |
| | WB | - | - | - | - | - | - |
| | NB | 0.082 | 1.6 | A | 0.019 | 0.3 | A |
| | SB | - | 0.0 | A | - | 0.0 | A |
| 43 Street North and 9 Avenue North (Signalized) | **Overall** | **-** | **19.2** | **B** | **-** | **22.9** | **C** |
| | EB | 0.14 | 42.1 | D | 0.070 | 33.8 | C |
| | WB | 0.37 | 44.8 | D | 0.690 | 39.9 | D |
| | NB | 0.86 | 19.6 | B | 0.840 | 19.4 | B |
| | SB | 0.21 | 11.8 | B | 0.30 | 17.0 | B |
| 43 Street North and 5 Avenue North (Signalized) | **Overall** | **-** | **14.4** | **B** | **-** | **16.0** | **B** |
| | EB | 0.21 | 43.9 | D | 0.19 | 44.3 | D |
| | NB | 0.87 | 13.8 | B | 0.87 | 16.6 | B |
| | SB | 0.31 | 13.0 | B | 0.57 | 14.5 | B |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | **Overall** | **-** | **42.2** | **D** | **-** | **36.9** | **D** |
| | EB | 0.91 | 45.2 | D | 0.650 | 37.9 | D |
| | WB | 0.72 | 39.0 | D | 0.740 | 34.6 | C |
| | NB | 0.90 | 48.6 | D | 0.660 | 33.1 | C |
| | SB | 0.74 | 36.1 | D | 0.800 | 40.8 | D |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 11** indicates that all study intersections would continue to operate at acceptable levels during both AM peak hour and PM peak hour under the future 2019 traffic conditions with site generated traffic. Therefore, no mitigations would be needed for any of the study area intersections under future 2019 traffic conditions.

**Table 12: HCM Capacity Analysis Results for Future 2022 Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street N and 26 Avenue N / Twp. Road 92 (Unsignalized) | EB | 0.573 | 16.2 | C | 0.571 | 22.8 | C |
| | WB | 0.416 | 23.6 | C | 0.627 | 58.3 | F |
| | NB | 0.068 | 2.9 | A | 0.237 | 5.9 | A |
| | SB | 0.005 | 0.6 | A | - | 0.0 | A |
| 43 Street North and 18 Avenue North (Unsignalized) | EB | 0.974 | 103.7 | F | 0.517 | 20.6 | C |
| | WB | 1.848 | 619.3 | F | 2.524 | 768.6 | F |
| | NB | 0.214 | 2.8 | A | 0.104 | 1.8 | A |
| | SB | 0.035 | 0.7 | A | 0.008 | 0.2 | A |
| 43 Street North and 14 Avenue North (Unsignalized) | EB | 0.373 | 579 | F | 0.484 | 31.1 | D |
| | WB | 1.300 | 357.2 | F | 3.720 | 1345.6 | F |
| | NB | 0.095 | 0.8 | A | 0.026 | 0.3 | A |
| | SB | 0.052 | 0.6 | A | 0.008 | 0.1 | A |
| 43 Street North and 9 Avenue North (Signalized) | **Overall** | **-** | **16.9** | **B** | **-** | **23.9** | **C** |
| | EB | 0.250 | 43.3 | D | 0.110 | 35.4 | D |
| | WB | 0.310 | 44.3 | D | 0.69 | 41.4 | D |
| | NB | 0.880 | 154 | B | 0.850 | 18.8 | B |
| | SB | 0.300 | 13.1 | B | 0.69 | 22.3 | C |
| 43 Street North and 5 Avenue North (Signalized) | **Overall** | **-** | **15.3** | **B** | **-** | **20.8** | **C** |
| | EB | 0.350 | 43.1 | D | 0.220 | 43.5 | D |
| | NB | 0.880 | 13.5 | B | 0.89 | 17.3 | B |
| | SB | 0.410 | 15.6 | B | 0.83 | 22.1 | C |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | **Overall** | **-** | **85.0** | **F** | **-** | **50.0** | **D** |
| | EB | 1.720 | 188.6 | F | 0.830 | 47.3 | D |
| | WB | 0.860 | 41.4 | D | 0.800 | 36.2 | D |
| | NB | 0.950 | 56.7 | E | 0.860 | 44.7 | D |
| | SB | 0.880 | 39.3 | D | 1.030 | 64.1 | E |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 12** indicates that the following four intersections would operate at unacceptable levels of service and would require mitigations:

1. 43 Street North and 18 Avenue North (Unsignalized);
2. 43 Street North and 14 Avenue North (Unsignalized); and
3. Highway 3 (Crowsnest Hwy) and 43 Street (Signalized)

The intersection of 43 Street N and 26 Avenue N / Twp. Road 92 (Unsignalized) would have the westbound approach, during the PM peak hour only, operate at LOS “F” with an average delay of 58.3 seconds per vehicle and a V/C ratio of 0.627. This amount of delay is usually considered acceptable by the drivers especially noting that the V/C ratio is relatively low. However, to ensure that no such delays are experienced by intersection users the following is recommended:

- Installation of a two-phase traffic signal under future 2022 traffic conditions.

The remaining two signalized intersections located at 9 Avenue North and at 5 Avenue North would continue to operate at acceptable levels of service during both AM peak hour and PM peak hour. Therefore, mitigations would only be needed for the three study intersections listed above under future 2022 conditions (with site traffic).

The proposed mitigations under the future 2022 conditions consist of the following:

43 Street N and 18 Avenue N / Site Access

- Installation of a two-phase traffic signal

43 Street N and 14 Avenue N / Site Access

- Installation of a two-phase traffic signal; and
- Installation of a northbound left-turn only lane.

Highway 3 / Crowsnest Highway and 43 Street Intersection

- Installation of a second eastbound left-turn only lane; and
- Optimization of the traffic signal splits.

The future 2022 Synchro traffic capacity analysis models were updated with the above suggested mitigations and the capacity analysis results for the mitigated traffic conditions are presented in **Table 13**.

**Table 13: HCM Capacity Analysis Results for Future 2022 Mitigated Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street North and 18 Avenue North (Signalized) | **Overall** | **-** | **32.7** | **C** | **-** | **26.3** | **C** |
| | EB | 0.47 | 34.8 | C | 0.39 | 25.7 | C |
| | WB | 0.23 | 31.2 | C | 0.69 | 39.2 | D |
| | NB | 0.96 | 44.1 | D | 0.74 | 25.8 | C |
| | SB | 0.42 | 11.4 | B | 0.38 | 16.6 | B |
| 43 Street North and 14 Avenue North (Signalized) | **Overall** | **-** | **37.1** | **D** | **-** | **23.6** | **C** |
| | EB | 0.14 | 32.2 | C | 0.24 | 28.0 | C |
| | WB | 0.18 | 32.4 | C | 0.62 | 38.8 | D |
| | NB | 0.95 | 34.1 | C | 0.66 | 17.8 | B |
| | SB | 0.93 | 43.6 | D | 0.78 | 22.8 | C |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | Overall | - | 47.4 | D | - | 46.2 | D |
| | EB | 0.89 | 53.4 | D | 0.70 | 43.8 | D |
| | WB | 0.86 | 42.1 | D | 0.82 | 38.8 | D |
| | NB | 0.93 | 53.8 | D | 0.83 | 42.1 | D |
| | SB | 0.88 | 39.4 | D | 0.97 | 54.9 | D |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 13** results indicates that the three intersections that previously failed would operate at acceptable levels of service with the proposed mitigations. Therefore, no further mitigations to any of these intersections would be needed under the future 2022 traffic conditions.

**Table 14: HCM Capacity Analysis Results for Future 2037 Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street N and 26 Avenue N / Twp. Road 92 (Unsignalized) | EB | 0.793 | 27.4 | D | 1.641 | 350.2 | F |
| | WB | 0.440 | 28.6 | D | 0.968 | 143.4 | F |
| | NB | 0.088 | 3.1 | A | 0.31 | 6.4 | A |
| | SB | 0.006 | 0.7 | A | 0.01 | 0.4 | A |
| 43 Street North and 18 Avenue North (Signalized) | **Overall** | **-** | **102.9** | **F** | **-** | **42.5** | **D** |
| | EB | 0.55 | 35.4 | D | 0.63 | 38.2 | D |
| | WB | 0.24 | 30.4 | C | 1.11 | 129.5 | F |
| | NB | 1.32 | 180.8 | F | 0.82 | 25.8 | C |
| | SB | 0.51 | 14.0 | B | 0.39 | 12.3 | B |
| 43 Street North and 14 Avenue North (Signalized) | **Overall** | **-** | **122.3** | **F** | **-** | **25.5** | **c** |
| | EB | 0.17 | 32.7 | C | 0.39 | 36.2 | D |
| | WB | 0.18 | 32.4 | C | 0.88 | 69.0 | E |
| | NB | 1.05 | 58.5 | E | 0.73 | 15.8 | B |
| | SB | 1.45 | 264.4 | F | 0.81 | 20.0 | B |
| 43 Street North and 9 Avenue North (Signalized) | **Overall** | **-** | **21.7** | **C** | **-** | **33.2** | **C** |
| | EB | 0.26 | 43.4 | D | 0.11 | 33.2 | C |
| | WB | 0.36 | 44.9 | D | 0.74 | 42.2 | D |
| | NB | 0.98 | 21.8 | C | 0.89 | 23.0 | C |
| | SB | 0.40 | 16.2 | B | 0.92 | 38.4 | D |
| 43 Street North and 5 Avenue North (Signalized) | **Overall** | **-** | **18.9** | **B** | **-** | **54.0** | **D** |
| | EB | 0.38 | 43.2 | D | 0.24 | 43.2 | D |
| | NB | 0.92 | 16.4 | B | 0.96 | 22.1 | C |
| | SB | 0.58 | 21.5 | C | 1.10 | 75.1 | E |
| Highway 3 (Crowsnest Hwy) and 43 Street (Signalized) | **Overall** | **-** | **78.6** | **E** | **-** | **50.6** | **D** |
| | EB | 1.15 | 77.1 | E | 0.76 | 50.3 | D |
| | WB | 0.67 | 36.5 | D | 0.86 | 48.6 | D |
| | NB | 1.26 | 138.9 | F | 0.91 | 43.7 | D |
| | SB | 1.05 | 59.0 | E | 0.99 | 56.2 | E |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 14** results indicates that four intersections of the total six intersections would operate at unacceptable levels of service. Therefore, mitigations would be required under the future 2037 conditions at these intersections.

The proposed mitigations under the **future 2037** conditions consist of the following:

43 Street N and 26 Avenue N / Township Road 92 Intersection

- Installation of a two-phase traffic signal

43 Street N and 18 Avenue N / Site Access

- Installation of a northbound left-turn only lane; and
- Optimization of the traffic signal splits.

43 Street N and 14 Avenue N / Site Access

- Optimization of the traffic signal splits.

Highway 3 / Crowsnest Highway and 43 Street Intersection

- As mentioned earlier, the **2006 Functional Planning Study completed by Stantec**[(1)] for Highways 3 & 4 in Lethbridge area proposes / recommends new alignments for these two highways that would provide external links allowing external traffic to by-pass the City and hence reducing Crowsnest Highway traffic within Lethbridge city. When these external links are built, significant reductions in traffic volumes would occur at the Crowsnest Highway / 43 Street intersection and operation would improve. Therefore, a reevaluation of this intersection operations at that time, should be performed to determine whether intersection improvements would be required.

The future 2037 Synchro traffic capacity analysis models were updated with the above suggested mitigations (excluding Highway 3 / Crowsnest Highway and 43 Street Intersection) and the capacity analysis results for the mitigated traffic conditions are presented in **Table 15**.

(1) http://www.transportation.alberta.ca/projects/assets/Area_8_South/Hwy%203%20Lethbridge/Executive_Summary.pdf

**Table 15: HCM Capacity Analysis Results for Future 2037 Mitigated Traffic Conditions**

| Intersection | App. | AM Peak Hour | | | PM Peak Hour | | |
|---|---|---|---|---|---|---|---|
| | | V/C[(a)] | Delay "Sec" | LOS | V/C[(a)] | Delay "Sec" | LOS |
| 43 Street North and 26 Avenue North / Township Road 92 (Signalized) | **Overall** | **-** | **19.1** | **B** | **-** | **17.8** | **B** |
| | EB | 0..84 | 26.0 | C | 0.67 | 18.9 | B |
| | WB | 0.33 | 12.0 | B | 0.24 | 14.6 | B |
| | NB | 0.46 | 13.7 | B | 0.80 | 21.5 | C |
| | SB | 0.13 | 10.3 | B | 0.29 | 9.1 | A |
| 43 Street North and 18 Avenue North (Signalized) | **Overall** | **-** | **16.9** | **B** | **-** | **25.3** | **C** |
| | EB | 0.78 | 48.4 | D | 0.48 | 24.3 | C |
| | WB | 0.40 | 38.6 | D | 0.74 | 37.3 | D |
| | NB | 0.54 | 11.5 | B | 0.69 | 24.3 | C |
| | SB | 0.44 | 8.4 | A | 0.47 | 19.3 | B |
| 43 Street North and 14 Avenue North/Site Access (Signalized) | **Overall** | **-** | **12.1** | **B** | **-** | **27.9** | **C** |
| | EB | 0.42 | 47.9 | D | 0.32 | 29.0 | C |
| | WB | 0.40 | 47.0 | D | 0.70 | 37.00 | D |
| | NB | 0.84 | 12.4 | B | 0.80 | 22.4 | C |
| | SB | 0.58 | 6.0 | A | 0.89 | 30.0 | C |

[(a)] The V/C values presented are for the movements with highest V/C within that approach

A review of **Table 15** results indicates that the three mitigated intersections would operate at acceptable levels of service with the proposed mitigations. Therefore, no further mitigations would be needed under the future 2037 traffic conditions.

### 4.2.4 Highway 3 / Crowsnest Highway and 43 Street Intersection

The capacity analysis results for the at grade intersection of Highway 3 / Crowsnest Highway and 43 Street with traffic signal showed unacceptable operations under background 2037 traffic conditions (without proposed site traffic) as well as under future 2037 with proposed site traffic. Therefore, by the year 2037 significant improvements including considering an interchange would be required based on the above capacity analysis results. However, if the proposed / recommended Highway 3 & 4 external links were built, Highway 3 east-west traffic volumes would be reduced significantly. Therefore, a reevaluation of this intersection is recommended.

A review of this intersection's future 2037 AM and PM left turning movement traffic volumes shown on Figure 15 indicates that they range between 287 and 705 vehicles per hour. These amounts of hourly traffic volumes indicate that a single free-flow interchange lane for each left turn movement would be able to accommodate the expected volumes. Merge / diverge capacity analysis has not been performed since there is no information about the future interchange configuration if it were determined needed.

### 4.2.5 Average Daily Traffic Volume Review

Figure 16 presents the Future 2037 ADT volumes for the study area roadway links with the proposed Chinook Industrial Park traffic volumes included. Note that these ADT's were estimated from the AM and PM peak hour volumes based on the City of Lethbridge recommended procedure discussed previously in subsection 3.6.3.

A review of the 43 Street North ADT volumes shown on Figure 16 between 9 Avenue N and 26 Avenue N indicates that they range between 8282 and 19040 vehicles per day these volumes are higher than the acceptable two-lane two-way facilities capacity levels as the City of Lethbridge's roadway design standards indicate 4-lane cross sections are required for ADT volumes above 8,000 vehicles per day. Based on the above, the existing 43 Street North two-lane roadway section between 9 Avenue N and 26 Avenue N would not be able to accommodate the future 2037 estimated traffic volumes. Therefore, under 2037 traffic conditions this section of 43 Street must be upgraded to 4-lane cross section to allow it to accommodate the 2037 expected daily traffic volumes.

A review of the 43 Street and Crowsnest Highway ADT volumes shown on Figure 16 indicates that they range between 28230 and 40505 vehicles per day. These daily traffic volumes are well below the full capacity of a four-lane divide highway capacity. Therefore, the existing four-lane divided highways (43 Street south of 9 Avenue to Crowsnest Highway; and the Crowsnest Highway east and west of 43 Street) would be able to accommodate the estimated ADT through volumes with the proposed site traffic. Note however, that the intersection widening recommended based on the intersection capacity analysis would still be needed at Highway 3 and 43 Street signalized intersection.

## 4.3 Traffic Control Signal Warrants

Traffic signal installation warrants for the unsignalized study intersections were conducted for several traffic volume scenarios as shown in **Table 16**. The purposes of these analyses were to determine if the installation of traffic signal controls would be warranted and when would it be expected to become warranted. Signal warrant analysis was performed in accordance with Transportation Association of Canada (TAC) standards and utilizing TAC warrants table. The 6-hour traffic volumes for each analysis year scenario considered were estimated as follows:

- AM peak hour volumes presented on the corresponding scenario figure were used for the 2 AM hours in TAC warrants table.
- PM peak hour volumes presented on the corresponding scenario figure were used for the 2 PM hours in TAC warrants table.
- To estimate the 2 mid-day hours, 60% of the AM volumes were used for one hour and 60% of the PM volumes were used for the second hour.

**Table 16** presents a summary of the signal warrant analyses results for the three currently unsignalized intersections. The worksheet results for the traffic signal warrant analysis are included in **Appendix F**.

**Table 16: TAC - Traffic Signal Warrant Results**

| Intersection | Scenario / Analyses Year | Warranting Score | Traffic Signal, Warranted? |
|---|---|---|---|
| 43 Street North and 26 Avenue North / Township Road 92 | Future 2022 | 59 | **No** |
| | Future 2037 | 89 | **No** |
| 43 Street North and 18 Avenue North / Site Access | Background 2037 | 61 | **No** |
| | Future 2022 | 131 | **Yes** |
| | Future 2037 | 182 | **Yes** |
| 43 Street North and 14 Avenue North / Site Access | Background 2037 | 34 | **No** |
| | Future 2022 | 133 | **Yes** |
| | Future 2037 | 174 | **Yes** |

A review of **Table 16** indicates that traffic signal installation would NOT be warranted at the intersection of 43 Street North and 26 Avenue North / Township Road 92 by the future 2022 or the future 2037 traffic conditions with proposed site traffic volumes. However, by the year 2037 the TAC warranting score is 89, which is very close to the traffic signal warranting score of 100 breaking point. Also, the high expected delays to be experienced by the eastbound and westbound traffic, indicates a traffic signal installation would probably be required by the future 2037.

Additionally, a review of **Table 16** regarding the following two study intersections:

- 43 Street North and 18 Avenue North / Site Access
- 43 Street North and 14 Avenue North / Site Access

indicates that a traffic signal installation would be warranted under the future 2022 traffic conditions as well as under the future 2037 traffic conditions (with the proposed site traffic).

## 5.0 BICYCLE ROUTE MAP, BUS ROUTES AND STOPS REVIEW

### 5.1 Bicycle Route Map

Per the discussion and consultation with the City of Lethbridge Transportation Department, a review of the Cycling Master Plan should be considered as part of this TIA. Figure 17 presents the city-wide cycling network and infrastructure plan. A review of the cycling infrastructure plan indicated that 43 Street corridor has an existing Multi-use Pathway between 2 Avenue North and just north of 9 Avenue North. Additionally, a proposed Multi-use Pathway is also planned to connect to the existing Pathway along 43 Street south of 2 Avenue N and will continue all the way to the southern border of the City. Similarly, another Multi-use Pathway is planned to connect to the existing one along 43 Street N just north of 9 Avenue N and will extend all the way to the northern border of the City.

In addition to the above, there are four Multi-use Pathways planned along 5 Avenue N, 9 Avenue N, 18 Avenue N, and 26 Avenue N that would connect 43 Street N with the City of Lethbridge internal areas west of 43 Street N. These proposed Multi-use Pathways would connect to the existing facilities along 26 Avenue N and 28 Street N creating an efficient cycling and pedestrian connectivity.

The existing as well as the proposed Multi-use Pathways would allow significant percentages of the proposed development generated trips / customers to utilize active modes to access the proposed development, which would reduce vehicle trips and reduce vehicle traffic congestions. Additionally, it should be noted that the proposed development is proposing to have internal pedestrian infrastructure including sidewalks and/or multi-use pathways that would connect to the external Multi-use Pathways and sidewalks to ensure smooth and easy pedestrian / cyclist movements and access to the proposed development.

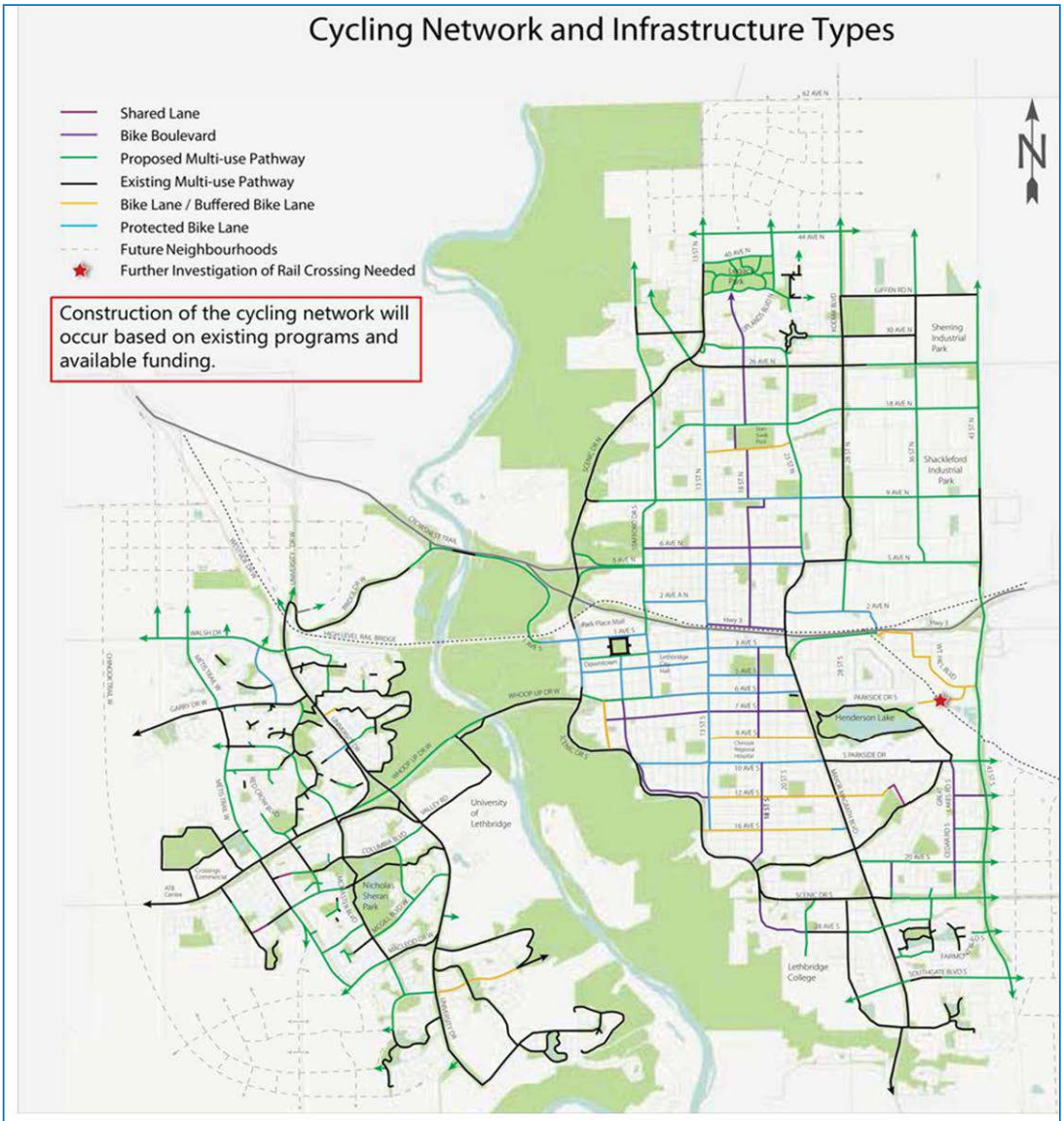



Figure 17: City of Lethbridge Cycling Master Plan

## 5.2 Bus Routes and Stops

As part of this TIA, a review of the Lethbridge Transit System and the available bus routes / stops to serve the project area is required. Figure 18 presents the Lethbridge Transit System Map with all available bus routes within the city shown. Figure 19 presents Route 21 Map as Route 21 with its varieties is the route that serves the vicinity of the proposed project area.

A review of Figure 18 indicates that there are a total of 18 routes, including their different service areas and service time varieties, available to serve the public within Lethbridge. There is a total of four transit terminals that provide connectivity of the service routes to allow full coverage of the city, these terminals are:

- University Terminal;
- North Terminal;
- College Terminal; and
- City Centre Terminal.

These terminals are placed at key locations within the City that allow smooth passenger transfers between the different routes in order to access different areas of the city. Reviewing Figure 18 closely indicates that Route “21S Day” is the route that directly serves the project vicinity as it passes through 43 Street N, north of Crowsnest Highway until it reaches 9 Avenue N where it turns left into the city.

A review of Figure 19 indicates that Route “21S Day” service is only available during the weekdays, Monday through Friday during daytime hours only. There is one bus stop along 9 Avenue N just west of 43 Street N that would be suitable to serve the proposed project site.

Consider modifying Route “21S Day” operation to also cover the weekends and the nights starting from year 2022, which is the opening year of Phase 2 of the proposed Chinook Industrial Park development. Also consider that the service coverage area of this route be modified to cover 43 Street N north of 9 Avenue N until 26 Avenue N and provision of two new bus stops in the vicinity of 14 Avenue and 18 Avenue to help Transit users access the proposed development since the site has an access point at each of these two roads.

Modifying the service area coverage and time / days coverage of Route “21S Day” would encourage reducing private vehicle trips and increasing the utilization of the transit, which in turn reduces traffic congestions.

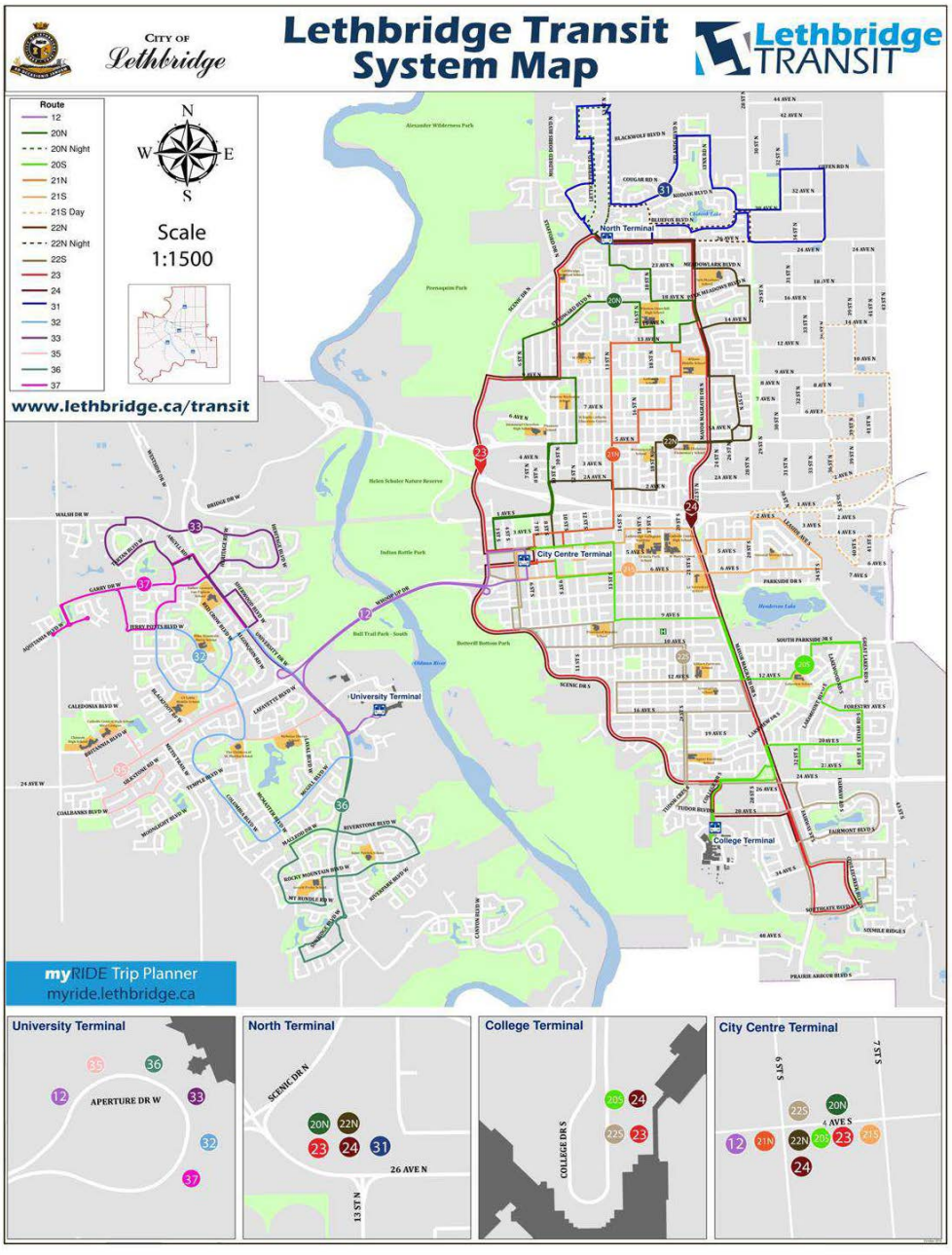



Figure 18: Lethbridge Transit System Map

# Route 21 South - Map




Figure 19: Lethbridge – Transit Route 21 Map

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

This study analyzed the traffic impacts of the proposed Chinook Industrial Park Development project to be located in Lethbridge County, Alberta. The proposed development will have a total of five phases with Phase 1 including 18.56 acres of General Light Industrial land use and 18.62 acres of Business Park land use. Phase 1 will be completed after 2 years from today. Phases 2 to 5 will consist of 95.17 acres of General Light Industrial land use and 40.66 acres of Business Park land use. Phases 2 to 5 will be completed within 5 years from today. The estimated number of total site generated trips entering and exiting the development would be 10,674 trips daily, 850 trips during the AM peak, and 794 trips during the PM peak hour. The following conclusions have been reached by this traffic impact assessment study:

- LOS and capacity analyses indicated that under the **Existing 2017, Background 2019 and Background 2022** traffic conditions (without site traffic), all study area intersections operate at acceptable levels of service with no issues. Therefore, no intersection improvements required for any study intersection under these traffic conditions.

- **Background 2037** without the Project Site Traffic LOS analyses indicated that four study intersections would continue to operate at acceptable levels of service. However, the following two intersections would operate at unacceptable levels of service:

    a. 43 Street N and 26 Avenue N / Township Road 92; and
    b. Highway 3/Crowsnest Highway and 43 Street N.

    Therefore, mitigations would be needed for these two intersections under the background 2037 traffic conditions.

- The proposed mitigations under the Background 2037 conditions include:
  <u>43 Street N and 26 Avenue N / Township Road 92 Intersection</u>
    - Installation of a traffic signal

  <u>Highway 3 / Crowsnest Highway and 43 Street Intersection</u>
    - Installation of a second westbound left-turn only lane;
    - Installation of a second eastbound left-turn only lane;
    - Installation of a third westbound through only lane;
    - Installation of a third eastbound through only lane; and
    - Optimization of the traffic signal splits.

- The above mitigation would improve the operations at the above intersections. However, the intersection of Highway 3 / Crowsnest Highway and 43 Street would have the NB approach continue to operate at LOS “E”, which represents full capacity level of service.

- Any additional traffic would cause this intersection to perform at unacceptable levels of service and therefore, grade separation would be the most appropriate solution after 20 years from today.

- LOS and capacity analyses indicated that under the **Future 2019** traffic conditions (with site traffic), all study area intersections would operate at acceptable levels of service with no issues. Therefore, no intersection improvements would be required for any study intersection under future 2019 traffic conditions.

- **Future 2022** with the Project Site Traffic LOS analyses indicated that the three unsignalized study intersections and one of the signalized intersections would operate with unacceptable levels of service. The remaining two signalized intersections would continue to operate at acceptable levels of service. Therefore, mitigations would be needed for four of the study intersections under future 2022 conditions (with site traffic).

- The proposed mitigations under the future 2022 conditions consist of the following:
  43 Street N and 26 Avenue N / Township Road 92 Intersection
    - Installation of a two-phase traffic signal.

  43 Street N and 18 Avenue N / Site Access
    - Installation of a two-phase traffic signal

  43 Street N and 14 Avenue N / Site Access
    - Installation of a two-phase traffic signal; and
    - Installation of a northbound left-turn only lane.

  Highway 3 / Crowsnest Highway and 43 Street Intersection
    - Installation of a second eastbound left-turn only lane; and
    - Optimization of the traffic signal splits.

- The mitigated Future 2022 capacity analysis results indicate that the four intersections that previously failed would operate at acceptable levels of service with the proposed mitigations. Therefore, no further mitigations to any of these intersections would be needed under the future 2022 traffic conditions.

- **Future 2037** with the Project Site Traffic LOS analyses indicated that four intersections of the total six intersections would operate at unacceptable levels of service. Therefore, mitigations would be required under the Future 2037 conditions at these intersections.

- The proposed mitigations under the Future 2037 conditions consist of the following:
  43 Street N and 26 Avenue N / Township Road 92 Intersection
    - Installation of two-phase traffic signal.

43 Street N and 18 Avenue N / Site Access

- Installation of a northbound left-turn only lane; and
- Optimization of the traffic signal splits.

43 Street N and 14 Avenue N / Site Access

- Optimization of the traffic signal splits.

Highway 3 / Crowsnest Highway and 43 Street Intersection

- If the Stantec 2006 Functional Planning Study's proposed / recommended Highway 3 & 4 external links were built, Highway 3 east-west traffic volumes would be reduced significantly, and this intersection operation would improve. Therefore, a reevaluation of this intersection operation is recommended after the external highway links are built.

- Traffic signal control warrant analyses were performed for three stop-controlled intersections and the results indicated:
  - Traffic signal installation would NOT be warranted at the intersection of 43 Street North and 26 Avenue North / Township Road 92 by the future 2037 traffic conditions. **However, a traffic signal will be required to mitigate delays to traffic.** This is why it is recommended to monitor this intersection starting from year 2022 to determine when the installation of a traffic signal becomes warranted based on actual traffic count data.

- The traffic signal control warrant analyses further indicated that a traffic signal installation would be warranted under the future 2022 and future 2037 traffic conditions at the following two study intersections:
  - 43 Street North and 18 Avenue North / Site Access
  - 43 Street North and 14 Avenue North / Site Access

- A thorough review of the Cycling Master Plan / Infrastructure Plan has been completed and the results of the review indicated that the existing as well as the proposed Multi-use Pathways could allow significant percentages of the proposed development generated trips / customers to utilize active modes to access the proposed development, which would reduce vehicle trips and reduce vehicle traffic congestions.

- A review of the Lethbridge Transit System and the available bus routes / stops to serve the proposed project area was completed, the results indicated the following:

  - Route "21S Day" is the route that directly serves the project vicinity as it passes through 43 Street N, north of Crowsnest Highway until it reaches 9 Avenue N where it turns left into the city.

- Route “21S Day” service is only available during the weekdays, Monday through Friday during daytime hours only. There is one bus stop along 9 Avenue N just west of 43 Street N that would be suitable to serve the proposed project site.

- Consider modifying Route “21S Day” operation to also cover the weekends and the nights starting from year 2022, which is the opening year of Phase 2 of the proposed development.

- It is also recommended to consider that the service coverage area of this route be modified to cover 43 Street N north of 9 Avenue N until 26 Avenue N and provision of two new bus stops in the vicinity of 14 Avenue and 18 Avenue to help Transit users access the proposed development since the site has access points at each of these two roads.

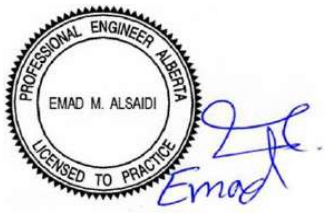
- Modifying the service area coverage and time / days coverage of Route “21S Day” would encourage reducing private vehicle trips and increasing the utilization of the transit, which in turn reduces traffic congestions.

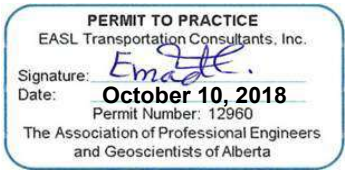
In summary, this traffic impact assessment concludes that the proposed Chinook Industrial Park Development will have impact on the traffic operations of both existing and future road network. However, this impact will be alleviated by implementing the improvements recommended above.

Yours truly,

EASL Transportation Consultants, Inc.

Prepared by:

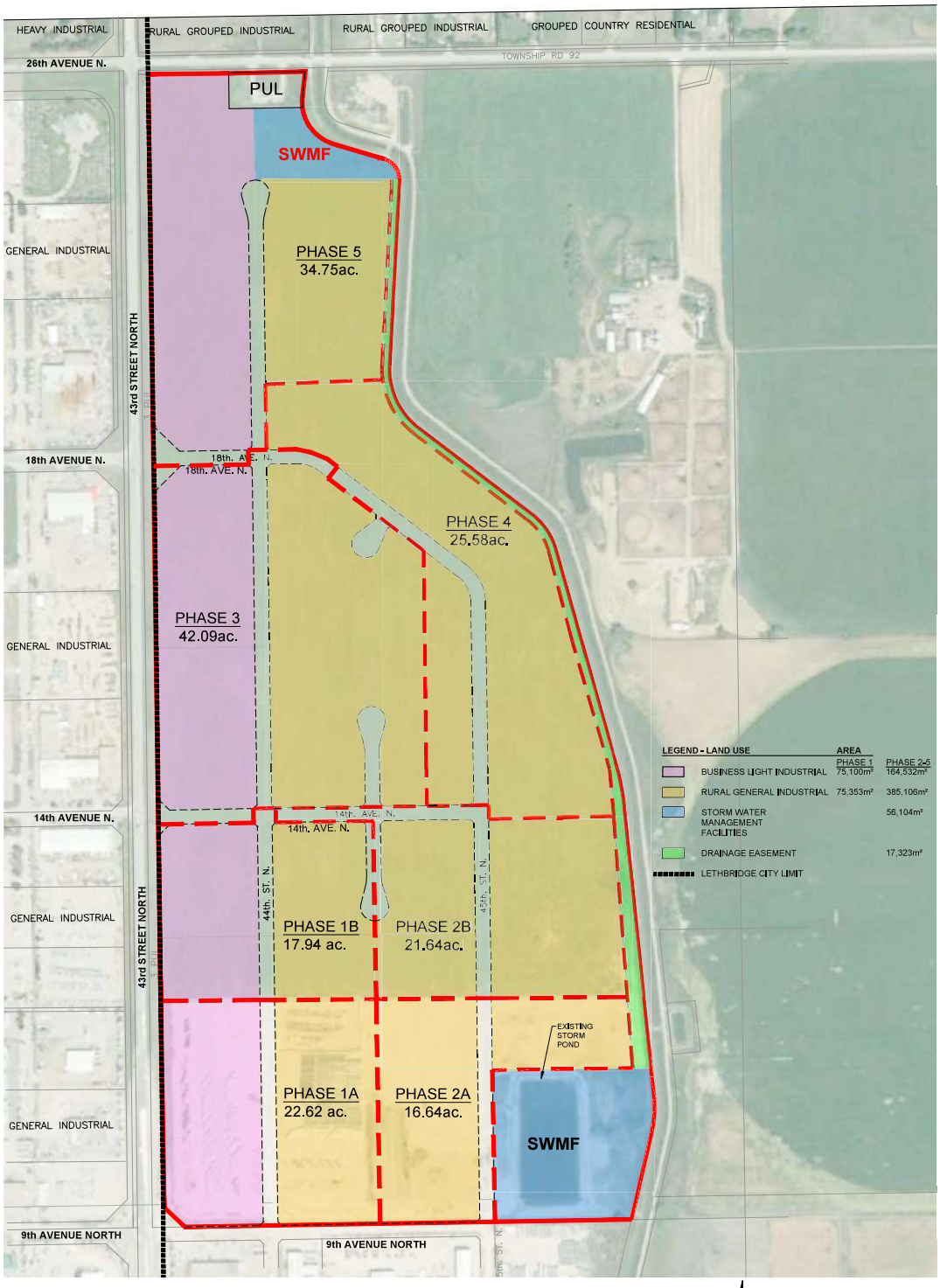



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E-mail: ealsaidi@easltransportation.ca

**Appendix A**

**Proposed Development Site Plan**




**PROPOSED DEVELOPMENT & PHASING PLAN**

0 50 100 150 200 250

SCALE=1:5,000

NOTES

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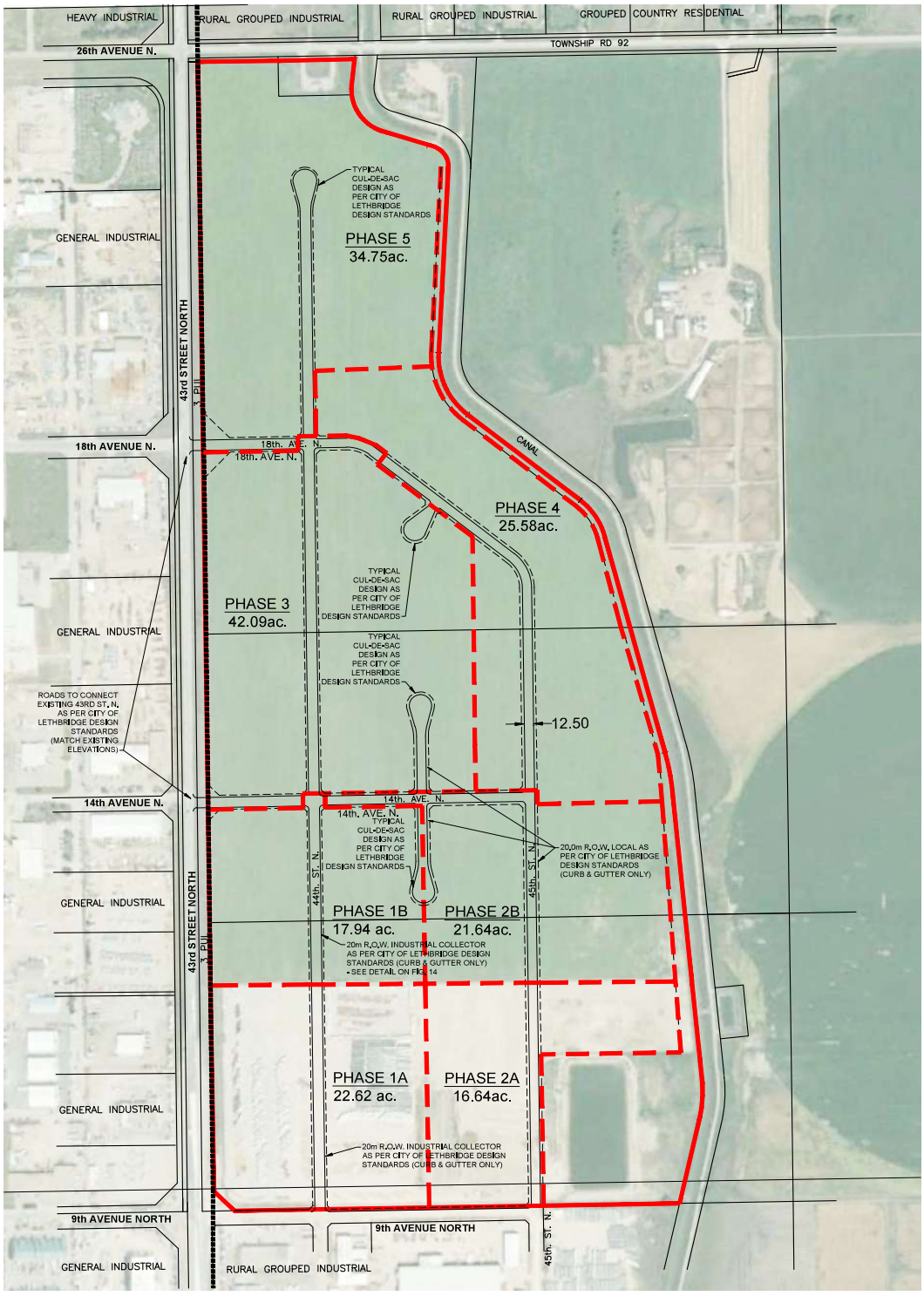
HASEGAWA ENGINEERING & DESIGN LTD.
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EMAIL: office@hasegawa.ca

| | |
|---|---|
| DESIGN | MAH |
| DRAWN | MDO |
| CHECKED | MAH |
| APPROVED | MAH |
| SCALE | AS SHOWN |

PRELIMINARY

| NO. | REVISION | DATE |
|---|---|---|

| | |
|---|---|
| CLIENT | GEORGE KIRKHAM & ED FRIESEN |
| PROJECT | CHINOOK INDUSTRIAL PARK ASP |
| DRAWING TITLE | PROPOSED DEVELOPMENT & PHASING PLAN |
| PROJECT NUMBER | 17-006 |
| DATE ISSUED | Mar 26, 2018 |
| DRAWING NUMBER | FIG.4 |




**PROPOSED ROADS LAYOUT**

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EMAIL: office@hasegawa.ca


| | |
|---|---|
| DESIGN | MAH |
| DRAWN | MDO |
| CHECKED | MAH |
| APPROVED | MAH |
| SCALE | AS SHOWN |

PRELIMINARY

| # | REVISION | DATE (Y/M/D) |
|---|---|---|

GEORGE KIRKHAM & ED FRIESEN

CHINOOK INDUSTRIAL PARK ASP

PROPOSED ROADS LAYOUT

PROJECT NUMBER: 17-006

DRAWING DATE: Mar 26, 2018

FIG.7

**Appendix B**

**Intersection Turning Movement Traffic Counts**

1. **City of Lethbridge 2016 Traffic Count**
2. **Cavendish Farms Background Volumes**
3. **Alberta Transportation 2016 Traffic Count**

# City of Lethbridge: Intersection Summary

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northbound Street: | 43 St N | RTOR | Y | Speed | 70 | Heavy Veh % | 7 | Next Signal | | Median Wth | | Bus Route | N | | |
| Eastbound Street: | 26 Ave N | RTOR | Y | Speed | 60 | Heavy Veh % | 4 | Next Signal | | Median Wth | | Bus Route | N | | |
| Southbound Street: | 43 St N | RTOR | Y | Speed | 80 | Heavy Veh % | 16 | Next Signal | | Median Wth | | Bus Route | N | | |
| Westbound Street: | Twp 92 | RTOR | Y | Speed | 50 | Heavy Veh % | 4 | Next Signal | | Median Wth | | Bus Route | N | | |
| Weather | -16°C | Persons Challenged by Mobility Issues | N | | | | | Adjacent to Elementary School | N | | | Pathway for School | N | | |
| Date: | Thu, Dec 15, 2016 | Counted By | MioVision | | | Intersection | N-451 | Senior Centre or Junior High | N | | | CBD | N | | |
| Notes: | Site Code N-451 | | | | | | | | | | | | | | |

## AM

| | NORTHBOUND | | | SOUTHBOUND | | | EASTBOUND | | | WESTBOUND | | | Crosswalks | | | | | 15 Minute Totals | 60 Minute Totals | Peak Hour |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | North | South | East | West | Total | | | |
| 7:00 - 7:15 | 10 | 5 | 1 | | 2 | | | 8 | 37 | 3 | 8 | 1 | | | | | | 75 | | |
| 7:15 - 7:30 | 10 | 1 | | | 6 | | 1 | 14 | 37 | 4 | 4 | | | | | | | 77 | | |
| 7:30 - 7:45 | 11 | 8 | 2 | | 8 | 1 | | 14 | 48 | 2 | 9 | | | | | | | 103 | | |
| 7:45 - 8:00 | 24 | 12 | 1 | 2 | 6 | | 2 | 21 | 51 | 7 | 17 | 1 | | | | | | 144 | 399 | |
| 8:00 - 8:15 | 17 | 4 | 8 | 1 | 4 | 1 | 1 | 15 | 45 | 1 | 13 | | | | | | | 110 | 434 | |
| 8:15 - 8:30 | 7 | 2 | 6 | 1 | 6 | 1 | 1 | 16 | 24 | 5 | 17 | 2 | | | | | | 88 | 445 | 7:30-8:30 |
| 8:30 - 8:45 | 21 | 4 | 3 | | 6 | 1 | | 10 | 23 | 4 | 19 | 1 | | | | | | 92 | 434 | |
| 8:45 - 9:00 | 17 | 7 | 4 | 1 | 3 | 1 | 1 | 6 | 21 | 3 | 6 | 2 | | | | | | 72 | 362 | |
| *Peak Hour:* | *59* | *26* | *17* | *4* | *24* | *3* | *4* | *66* | *168* | *15* | *56* | *3* | | | | | | | *PHF:* | *0.77* |
| *PHF:* | *0.61* | *0.54* | *0.53* | *0.50* | *0.75* | *0.75* | *0.50* | *0.79* | *0.82* | *0.54* | *0.82* | *0.38* | | | | | | | | |

## MID

| | NORTHBOUND | | | SOUTHBOUND | | | EASTBOUND | | | WESTBOUND | | | Crosswalks | | | | | 15 Minute Totals | 60 Minute Totals | Peak Hour |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | North | South | East | West | Total | | | |
| 11:00 - 11:15 | 17 | 7 | 7 | | 8 | 1 | 1 | 4 | 18 | 3 | 4 | | | | | | | 70 | | |
| 11:15 - 11:30 | 18 | 2 | 7 | | 5 | | | 7 | 29 | 6 | 11 | | | | | | | 85 | | |
| 11:30 - 11:45 | 28 | 4 | 3 | | 6 | 4 | 1 | 8 | 30 | 3 | 12 | | | | | | | 99 | | |
| 11:45 - 12:00 | 35 | 3 | 3 | | 3 | 2 | 4 | 5 | 27 | 7 | 10 | | | | | | | 99 | 353 | |
| 12:00 - 12:15 | 43 | 3 | 4 | 1 | 7 | | | 3 | 30 | 1 | 11 | | | | | | | 103 | 386 | |
| 12:15 - 12:30 | 46 | 1 | 4 | | 11 | 3 | | 10 | 36 | 2 | 6 | | | | | | | 119 | 420 | |
| 12:30 - 12:45 | 27 | 4 | 4 | 1 | 5 | 1 | | 5 | 28 | 2 | 5 | | | | | | | 82 | 403 | |
| 12:45 - 13:00 | 33 | 9 | 2 | | 4 | 1 | 1 | 7 | 50 | 2 | 7 | 1 | | | | | | 117 | 421 | 12:00-13:00 |
| *Peak Hour:* | *149* | *17* | *14* | *2* | *27* | *5* | *1* | *25* | *144* | *7* | *29* | *1* | | | | | | | *PHF:* | *0.88* |
| *PHF:* | *0.81* | *0.47* | *0.88* | *0.50* | *0.61* | *0.42* | *0.25* | *0.63* | *0.72* | *0.88* | *0.66* | *0.25* | | | | | | | | |

## PM

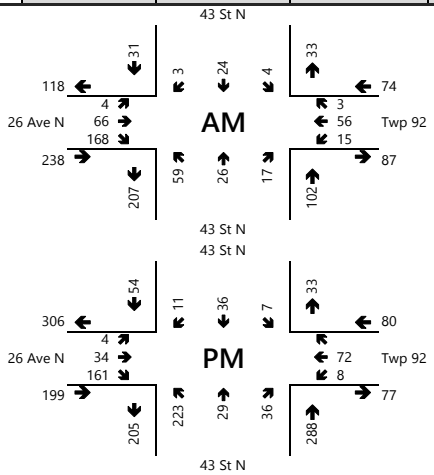
| | NORTHBOUND | | | SOUTHBOUND | | | EASTBOUND | | | WESTBOUND | | | Crosswalks | | | | | 15 Minute Totals | 60 Minute Totals | Peak Hour |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | North | South | East | West | Total | | | |
| 15:00 - 15:15 | 32 | 2 | 7 | | 8 | | 4 | 10 | 31 | 3 | 4 | | | | | | | 101 | | |
| 15:15 - 15:30 | 26 | 1 | 4 | | 10 | 1 | 1 | 22 | 28 | 2 | 10 | 1 | | | | | | 106 | | |
| 15:30 - 15:45 | 47 | 4 | 10 | 3 | 32 | | 1 | 17 | 26 | 1 | 15 | | | | | | | 156 | | |
| 15:45 - 16:00 | 44 | 8 | 4 | 3 | 8 | | | 13 | 21 | 3 | 20 | | | | | | | 124 | 487 | |
| 16:00 - 16:15 | 41 | 8 | 5 | 1 | 10 | 2 | | 11 | 35 | 1 | 12 | 1 | | | | | | 127 | 513 | |
| 16:15 - 16:30 | 54 | 9 | 5 | 1 | 11 | 6 | 1 | 8 | 32 | 2 | 15 | | | | | | | 144 | 551 | |
| 16:30 - 16:45 | 66 | 6 | 4 | 4 | 11 | 1 | 1 | 10 | 45 | 2 | 17 | | | | | | | 167 | 562 | |
| 16:45 - 17:00 | 56 | 7 | 14 | | 6 | 2 | 2 | 12 | 41 | 3 | 21 | | | | | | | 164 | 602 | |
| 17:00 - 17:15 | 47 | 7 | 13 | 2 | 8 | 2 | | 4 | 43 | 1 | 19 | | | | | | | 146 | 621 | 16:15-17:15 |
| 17:15 - 17:30 | 40 | 7 | 14 | | 6 | 2 | | 10 | 28 | 1 | 16 | 1 | | | | | | 125 | 602 | |
| *Peak Hour:* | *223* | *29* | *36* | *7* | *36* | *11* | *4* | *34* | *161* | *8* | *72* | | | | | | | | *PHF:* | *0.93* |
| *PHF:* | *0.84* | *0.81* | *0.64* | *0.44* | *0.82* | *0.46* | *0.50* | *0.71* | *0.89* | *0.67* | *0.86* | | | | | | | | | |

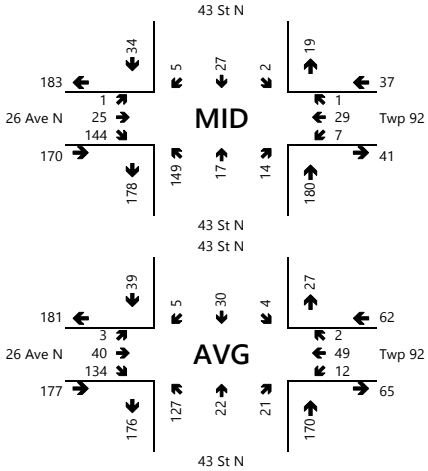
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 Hour Average | 127 | 22 | 21 | 4 | 30 | 5 | 3 | 40 | 134 | 12 | 49 | 2 | | | | |
| Approach Lanes | 0.5 | 1 | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 0.5 | 0.5 | 1 | 0.5 | | | | |
| Departure Lanes | 1 | | | 1 | | | 1 | | | 1 | | | | | | |

2 Hour PM Range Used for Vehicles: 15:30 to 17:30

**Not Warranted**

| | |
|---|---|
| Pedestrian Points: | 0 |
| Vehicle Points: | 21 |
| Total: | 21 |










*2017-03-07 8:34 AM*

*N-451.xlsx*

Intersection: 43 Street N and 18 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

ALL VEHICLES

**AM Peak Hour Traffic Count at 43 Street N and 18 Avenue N Intersection**

| Time Period | 18 Avenue N Eastbound | | | 18 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum | 4-P Total | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | | | |
| 7:00 - 7:15 | 0 | 0 | 25 | 0 | 0 | 0 | 25 | 10 | 0 | 0 | 44 | 0 | 104 | | |
| **7:15 - 7:30** | 0 | 0 | 28 | 0 | 0 | 0 | 25 | 17 | 0 | 0 | 50 | 2 | 122 | | |
| **7:30 - 7:45** | 1 | 0 | 17 | 0 | 0 | 0 | 49 | 18 | 0 | 0 | 58 | 0 | 143 | | |
| **7:45 - 8:00** | 2 | 0 | 33 | 0 | 0 | 0 | 59 | 31 | 0 | 0 | 56 | 5 | 186 | 555 | |
| **8:00 - 8:15** | 2 | 0 | 21 | 0 | 0 | 0 | 33 | 22 | 0 | 0 | 46 | 2 | 126 | **577** | **0.78** |
| 8:15 - 8:30 | 1 | 0 | 28 | 0 | 0 | 0 | 25 | 22 | 0 | 0 | 29 | 2 | 107 | 562 | |
| 8:30 - 8:45 | 0 | 0 | 25 | 0 | 0 | 0 | 22 | 18 | 0 | 0 | 29 | 1 | 95 | 514 | |
| 8:45 - 9:00 | 3 | 0 | 18 | 0 | 0 | 0 | 24 | 29 | 0 | 0 | 44 | 2 | 120 | 448 | |
| **Peak Hour** | **5** | **0** | **99** | **0** | **0** | **0** | **166** | **88** | **0** | **0** | **210** | **9** | **577** | | |
| **App Total** | 104 | | | 0 | | | 254 | | | 219 | | | 577 | | |
| **HV %** | **12%** | | | **#DIV/0!** | | | **10%** | | | **3%** | | | **7%** | | |

ALL VEHICLES

**PM Peak Hour Traffic Count at 43 Street N and 18 Avenue N Intersection**

| Time Period | 18 Avenue N Eastbound | | | 18 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum | 4-P Total | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | | | |
| 4:00 – 4:15 | 2 | 0 | 33 | 0 | 0 | 0 | 19 | 41 | 0 | 0 | 43 | 2 | 140 | | |
| **4:15 – 4:30** | 1 | 0 | 26 | 0 | 0 | 0 | 24 | 55 | 0 | 0 | 29 | 3 | 138 | | |
| **4:30 – 4:45** | 5 | 0 | 53 | 0 | 0 | 0 | 27 | 74 | 0 | 0 | 26 | 0 | 185 | | |
| **4:45 – 5:00** | 5 | 0 | 32 | 0 | 0 | 0 | 25 | 42 | 0 | 0 | 32 | 0 | 136 | 599 | |
| **5:00 – 5:15** | 5 | 0 | 48 | 0 | 0 | 0 | 18 | 65 | 0 | 0 | 53 | 0 | 189 | **648** | **0.86** |
| 5:15 – 5:30 | 1 | 0 | 15 | 0 | 0 | 0 | 29 | 44 | 0 | 0 | 41 | 4 | 134 | 644 | |
| 5:30 – 5:45 | 1 | 0 | 23 | 0 | 0 | 0 | 16 | 54 | 0 | 0 | 31 | 2 | 127 | 586 | |
| 5:45 – 6:00 | 3 | 0 | 15 | 0 | 0 | 0 | 17 | 32 | 0 | 0 | 26 | 1 | 94 | 544 | |
| **Peak Hour** | **16** | **0** | **159** | **0** | **0** | **0** | **94** | **236** | **0** | **0** | **140** | **3** | **648** | | |
| **App Total** | 175 | | | 0 | | | 330 | | | 143 | | | 648 | | |
| **HV %** | **9%** | | | **#DIV/0!** | | | **9%** | | | **8%** | | | **9%** | | |

Intersection: 43 Street N and 18 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

TRUCKS, MULTI-AXLE VEHICLE, CITY BUS OR SCHOOL BUS

**AM Peak Hour Traffic Count at 43 Street N and 18 Avenue N Intersection**

| Time Period | 18 Avenue N Eastbound | | | 18 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 7:00 - 7:15 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 2 | 0 | 8 |
| **7:15 - 7:30** | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 1 | 7 |
| **7:30 - 7:45** | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 3 | 0 | 11 |
| **7:45 - 8:00** | 0 | 0 | 4 | 0 | 0 | 0 | 5 | 4 | 0 | 0 | 0 | 0 | 13 |
| **8:00 - 8:15** | 0 | 0 | 6 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 12 |
| 8:15 - 8:30 | 0 | 0 | 9 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 1 | 1 | 18 |
| 8:30 - 8:45 | 0 | 0 | 6 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 3 | 0 | 16 |
| 8:45 - 9:00 | 2 | 0 | 2 | 0 | 0 | 0 | 4 | 5 | 0 | 0 | 3 | 0 | 16 |
| **Peak Hour** | **0** | **0** | **12** | **0** | **0** | **0** | **15** | **10** | **0** | **0** | **5** | **1** | **43** |
| **App Total** | **12** | | | **0** | | | **25** | | | **6** | | | **43** |

TRUCKS, MULTI-AXLE VEHICLE, CITY BUS OR SCHOOL BUS

**PM Peak Hour Traffic Count at 43 Street N and 18 Avenue N Intersection**

| Time Period | 18 Avenue N Eastbound | | | 18 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 4:00 – 4:15 | 0 | 0 | 3 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 3 | 0 | 10 |
| **4:15 – 4:30** | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 6 | 0 | 17 |
| **4:30 – 4:45** | 0 | 0 | 2 | 0 | 0 | 0 | 4 | 7 | 0 | 0 | 1 | 0 | 14 |
| **4:45 – 5:00** | 0 | 0 | 5 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 0 | 13 |
| **5:00 – 5:15** | 0 | 0 | 4 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 4 | 0 | 13 |
| 5:15 – 5:30 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 4 |
| 5:30 – 5:45 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 5 |
| 5:45 – 6:00 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Peak Hour | 0 | 0 | 15 | 0 | 0 | 0 | 17 | 14 | 0 | 0 | 11 | 0 | 57 |
| **App Total** | **15** | | | **0** | | | **31** | | | **11** | | | **57** |

Intersection: 43 Street N and 18 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

PASSENGER CARS, MINI-VANS, TWO AXLE TRUCKS, MOTOR CYCLES AND STATION WAGONS

**AM Peak Hour Traffic Count at 43 Street N and 18 Avenue N Intersection**

| Time Period | 18 Avenue N Eastbound | | | 18 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 7:00 - 7:15 | 0 | 0 | 24 | 0 | 0 | 0 | 22 | 8 | 0 | 0 | 42 | 0 | 96 |
| **7:15 - 7:30** | 0 | 0 | 27 | 0 | 0 | 0 | 23 | 16 | 0 | 0 | 48 | 1 | 115 |
| **7:30 - 7:45** | 1 | 0 | 16 | 0 | 0 | 0 | 45 | 15 | 0 | 0 | 55 | 0 | 132 |
| **7:45 - 8:00** | 2 | 0 | 29 | 0 | 0 | 0 | 54 | 27 | 0 | 0 | 56 | 5 | 173 |
| **8:00 - 8:15** | 2 | 0 | 15 | 0 | 0 | 0 | 29 | 20 | 0 | 0 | 46 | 2 | 114 |
| 8:15 - 8:30 | 1 | 0 | 19 | 0 | 0 | 0 | 21 | 19 | 0 | 0 | 28 | 1 | 89 |
| 8:30 - 8:45 | 0 | 0 | 19 | 0 | 0 | 0 | 15 | 18 | 0 | 0 | 26 | 1 | 79 |
| 8:45 - 9:00 | 1 | 0 | 16 | 0 | 0 | 0 | 20 | 24 | 0 | 0 | 41 | 2 | 104 |
| **Peak Hour** | **5** | **0** | **87** | **0** | **0** | **0** | **151** | **78** | **0** | **0** | **205** | **8** | **534** |
| **App Total** | **92** | | | **0** | | | **229** | | | **213** | | | **534** |

PASSENGER CARS, MINI-VANS, TWO AXLE TRUCKS, MOTOR CYCLES AND STATION WAGONS

**PM Peak Hour Traffic Count at 43 Street N and 18 Avenue N Intersection**

| Time Period | 18 Avenue N Eastbound | | | 18 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 4:00 – 4:15 | 2 | 0 | 30 | 0 | 0 | 0 | 17 | 39 | 0 | 0 | 40 | 2 | 130 |
| **4:15 – 4:30** | 1 | 0 | 22 | 0 | 0 | 0 | 20 | 52 | 0 | 0 | 23 | 3 | 121 |
| **4:30 – 4:45** | 5 | 0 | 51 | 0 | 0 | 0 | 23 | 67 | 0 | 0 | 25 | 0 | 171 |
| **4:45 – 5:00** | 5 | 0 | 27 | 0 | 0 | 0 | 18 | 41 | 0 | 0 | 32 | 0 | 123 |
| **5:00 – 5:15** | 5 | 0 | 44 | 0 | 0 | 0 | 16 | 62 | 0 | 0 | 49 | 0 | 176 |
| 5:15 – 5:30 | 1 | 0 | 15 | 0 | 0 | 0 | 27 | 44 | 0 | 0 | 40 | 3 | 130 |
| 5:30 – 5:45 | 1 | 0 | 21 | 0 | 0 | 0 | 14 | 53 | 0 | 0 | 31 | 2 | 122 |
| 5:45 – 6:00 | 3 | 0 | 15 | 0 | 0 | 0 | 16 | 32 | 0 | 0 | 26 | 1 | 93 |
| Peak Hour | **16** | **0** | **144** | **0** | **0** | **0** | **77** | **222** | **0** | **0** | **129** | **3** | **591** |
| **App Total** | **160** | | | **0** | | | **299** | | | **132** | | | **591** |

Intersection: 43 Street N and 14 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

ALL VEHICLES

**AM Peak Hour Traffic Count at 43 Street N and 14 Avenue N Intersection**

| Time Period | 14 Avenue N Eastbound | | | 14 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum | 4-P Total | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | | | |
| 7:00 - 7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 32 | 0 | 0 | 60 | 1 | 103 | | |
| **7:15 - 7:30** | 0 | 0 | 2 | 0 | 0 | 0 | 19 | 39 | 0 | 0 | 72 | 4 | 136 | | |
| **7:30 - 7:45** | 0 | 0 | 5 | 0 | 0 | 0 | 22 | 62 | 0 | 0 | 76 | 2 | 167 | | |
| **7:45 - 8:00** | 1 | 0 | 6 | 0 | 0 | 0 | 18 | 86 | 0 | 0 | 80 | 5 | 196 | 602 | |
| **8:00 - 8:15** | 1 | 0 | 5 | 0 | 0 | 0 | 8 | 49 | 0 | 0 | 69 | 2 | 134 | 633 | **0.81** |
| 8:15 - 8:30 | 0 | 0 | 4 | 0 | 0 | 0 | 10 | 51 | 0 | 0 | 60 | 1 | 126 | 623 | |
| 8:30 - 8:45 | 0 | 0 | 7 | 0 | 0 | 0 | 11 | 47 | 0 | 0 | 53 | 1 | 119 | 575 | |
| 8:45 - 9:00 | 1 | 0 | 5 | 0 | 0 | 0 | 10 | 49 | 0 | 0 | 53 | 3 | 121 | 500 | |
| **Peak Hour** | **2** | **0** | **18** | **0** | **0** | **0** | **67** | **236** | **0** | **0** | **297** | **13** | **633** | | |
| **App Total** | 20 | | | 0 | | | 303 | | | 310 | | | 633 | | |
| **HV %** | **55%** | | | **#DIV/0!** | | | **10%** | | | **6%** | | | **10%** | | |

ALL VEHICLES

**PM Peak Hour Traffic Count at 43 Street N and 14 Avenue N Intersection**

| Time Period | 14 Avenue N Eastbound | | | 14 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum | 4-P Total | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | | | |
| 4:00 – 4:15 | 0 | 0 | 20 | 0 | 0 | 0 | 2 | 59 | 0 | 0 | 69 | 1 | 151 | | |
| **4:15 – 4:30** | 3 | 0 | 9 | 0 | 0 | 0 | 4 | 89 | 0 | 0 | 62 | 1 | 168 | | |
| **4:30 – 4:45** | 6 | 0 | 43 | 0 | 0 | 0 | 4 | 99 | 0 | 0 | 69 | 0 | 221 | | |
| **4:45 – 5:00** | 0 | 0 | 17 | 0 | 0 | 0 | 3 | 68 | 0 | 0 | 62 | 0 | 150 | 690 | |
| **5:00 – 5:15** | 3 | 0 | 10 | 0 | 0 | 0 | 4 | 83 | 0 | 0 | 93 | 1 | 194 | **733** | **0.83** |
| 5:15 – 5:30 | 0 | 0 | 7 | 0 | 0 | 0 | 6 | 76 | 0 | 0 | 56 | 0 | 145 | 710 | |
| 5:30 – 5:45 | 1 | 0 | 5 | 0 | 0 | 0 | 3 | 74 | 0 | 0 | 52 | 0 | 135 | 624 | |
| 5:45 – 6:00 | 0 | 0 | 8 | 0 | 0 | 0 | 4 | 51 | 0 | 0 | 48 | 0 | 111 | 585 | |
| **Peak Hour** | **12** | **0** | **79** | **0** | **0** | **0** | **15** | **339** | **0** | **0** | **286** | **2** | **733** | | |
| **App Total** | 91 | | | 0 | | | 354 | | | 288 | | | 733 | | |
| **HV %** | **3%** | | | **#DIV/0!** | | | **9%** | | | **10%** | | | **9%** | | |

Intersection: 43 Street N and 14 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

TRUCKS, MULTI-AXLE VEHICLE, CITY BUS OR SCHOOL BUS

**AM Peak Hour Traffic Count at 43 Street N and 14 Avenue N Intersection**

| Time Period | 14 Avenue N Eastbound | | | 14 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 7:00 - 7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 6 |
| **7:15 - 7:30** | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 4 | 0 | 10 |
| **7:30 - 7:45** | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 4 | 0 | 14 |
| **7:45 - 8:00** | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 3 | 2 | 16 |
| **8:00 - 8:15** | 0 | 1 | 4 | 0 | 0 | 0 | 2 | 7 | 0 | 0 | 7 | 0 | 21 |
| 8:15 - 8:30 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 10 | 1 | 21 |
| 8:30 - 8:45 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 9 | 1 | 22 |
| 8:45 - 9:00 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 7 | 0 | 0 | 4 | 1 | 17 |
| **Peak Hour** | **0** | **1** | **10** | **0** | **0** | **0** | **3** | **27** | **0** | **0** | **18** | **2** | **61** |
| **App Total** | **11** | | | **0** | | | **30** | | | **20** | | | **61** |

TRUCKS, MULTI-AXLE VEHICLE, CITY BUS OR SCHOOL BUS

**PM Peak Hour Traffic Count at 43 Street N and 14 Avenue N Intersection**

| Time Period | 14 Avenue N Eastbound | | | 14 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 4:00 – 4:15 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 7 | 0 | 13 |
| **4:15 – 4:30** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 11 | 1 | 21 |
| **4:30 – 4:45** | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 3 | 0 | 15 |
| **4:45 – 5:00** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 5 | 0 | 14 |
| **5:00 – 5:15** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 7 | 1 | 13 |
| 5:15 – 5:30 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 1 | 0 | 6 |
| 5:30 – 5:45 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 1 | 0 | 7 |
| 5:45 – 6:00 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 3 |
| Peak Hour | 1 | 0 | 2 | 0 | 0 | 0 | 2 | 30 | 0 | 0 | 26 | 2 | 63 |
| **App Total** | **3** | | | **0** | | | **32** | | | **28** | | | **63** |

Intersection: 43 Street N and 14 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

PASSENGER CARS, MINI-VANS, TWO AXLE TRUCKS, MOTOR CYCLES AND STATION WAGONS

**AM Peak Hour Traffic Count at 43 Street N and 14 Avenue N Intersection**

| Time Period | 14 Avenue N Eastbound | | | 14 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 7:00 - 7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 27 | 0 | 0 | 59 | 1 | 97 |
| **7:15 - 7:30** | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 36 | 0 | 0 | 68 | 4 | 126 |
| **7:30 - 7:45** | 0 | 0 | 3 | 0 | 0 | 0 | 22 | 54 | 0 | 0 | 72 | 2 | 153 |
| **7:45 - 8:00** | 1 | 0 | 4 | 0 | 0 | 0 | 18 | 77 | 0 | 0 | 77 | 3 | 180 |
| **8:00 - 8:15** | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 42 | 0 | 0 | 62 | 2 | 113 |
| 8:15 - 8:30 | 0 | 0 | 3 | 0 | 0 | 0 | 9 | 43 | 0 | 0 | 50 | 0 | 105 |
| 8:30 - 8:45 | 0 | 0 | 5 | 0 | 0 | 0 | 10 | 38 | 0 | 0 | 44 | 0 | 97 |
| 8:45 - 9:00 | 0 | 0 | 4 | 0 | 0 | 0 | 7 | 42 | 0 | 0 | 49 | 2 | 104 |
| **Peak Hour** | **1** | **0** | **8** | **0** | **0** | **0** | **64** | **209** | **0** | **0** | **279** | **11** | **572** |
| **App Total** | **9** | | | **0** | | | **273** | | | **290** | | | **572** |

PASSENGER CARS, MINI-VANS, TWO AXLE TRUCKS, MOTOR CYCLES AND STATION WAGONS

**PM Peak Hour Traffic Count at 43 Street N and 14 Avenue N Intersection**

| Time Period | 14 Avenue N Eastbound | | | 14 Avenue N Westbaoun | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 4:00 – 4:15 | 0 | 0 | 18 | 0 | 0 | 0 | 2 | 55 | 0 | 0 | 62 | 1 | 138 |
| **4:15 – 4:30** | 3 | 0 | 9 | 0 | 0 | 0 | 3 | 81 | 0 | 0 | 51 | 0 | 147 |
| **4:30 – 4:45** | 6 | 0 | 41 | 0 | 0 | 0 | 4 | 89 | 0 | 0 | 66 | 0 | 206 |
| **4:45 – 5:00** | 0 | 0 | 17 | 0 | 0 | 0 | 2 | 60 | 0 | 0 | 57 | 0 | 136 |
| **5:00 – 5:15** | 2 | 0 | 10 | 0 | 0 | 0 | 4 | 79 | 0 | 0 | 86 | 0 | 181 |
| 5:15 – 5:30 | 0 | 0 | 7 | 0 | 0 | 0 | 4 | 73 | 0 | 0 | 55 | 0 | 139 |
| 5:30 – 5:45 | 1 | 0 | 4 | 0 | 0 | 0 | 2 | 70 | 0 | 0 | 51 | 0 | 128 |
| 5:45 – 6:00 | 0 | 0 | 8 | 0 | 0 | 0 | 3 | 50 | 0 | 0 | 47 | 0 | 108 |
| Peak Hour | **11** | **0** | **77** | **0** | **0** | **0** | **13** | **309** | **0** | **0** | **260** | **0** | **670** |
| **App Total** | **88** | | | **0** | | | **322** | | | **260** | | | **670** |

Intersection: 43 Street N and 9 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

ALL VEHICLES

**AM Peak Hour Traffic Count at 43 Street N and 9 Avenue N Intersection**

| Time Period | 9 Avenue N Eastbound | | | 9 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum | 4-P Total | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | | | |
| 7:00 - 7:15 | 0 | 4 | 9 | 2 | 0 | 0 | 24 | 36 | 24 | 5 | 52 | 2 | 158 | | |
| **7:15 - 7:30** | 0 | 7 | 13 | 2 | 3 | 2 | 39 | 67 | 20 | 7 | 68 | 2 | 230 | | |
| **7:30 - 7:45** | 1 | 3 | 18 | 8 | 3 | 1 | 35 | 88 | 16 | 2 | 71 | 1 | 247 | | |
| **7:45 - 8:00** | 1 | 2 | 22 | 1 | 0 | 0 | 60 | 101 | 24 | 1 | 85 | 4 | 301 | 936 | |
| **8:00 - 8:15** | 1 | 0 | 24 | 7 | 0 | 1 | 54 | 49 | 13 | 1 | 69 | 5 | 224 | **1002** | **0.83** |
| 8:15 - 8:30 | 2 | 2 | 29 | 7 | 2 | 1 | 39 | 54 | 13 | 4 | 62 | 4 | 219 | 991 | |
| 8:30 - 8:45 | 3 | 4 | 25 | 7 | 1 | 1 | 33 | 58 | 14 | 1 | 55 | 1 | 203 | 947 | |
| 8:45 - 9:00 | 1 | 5 | 27 | 6 | 2 | 2 | 42 | 56 | 11 | 3 | 54 | 3 | 212 | 858 | |
| **Peak Hour** | **3** | **12** | **77** | **18** | **6** | **4** | **188** | **305** | **73** | **11** | **293** | **12** | **1002** | | |
| **App Total** | 92 | | | 28 | | | 566 | | | 316 | | | 1002 | | |
| **HV %** | **3%** | | | **36%** | | | **9%** | | | **9%** | | | **9%** | | |

ALL VEHICLES

**PM Peak Hour Traffic Count at 43 Street N and 9 Avenue N Intersection**

| Time Period | 9 Avenue N Eastbound | | | 9 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum | 4-P Total | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | | | |
| 4:00 – 4:15 | 2 | 1 | 41 | 32 | 14 | 12 | 30 | 39 | 2 | 1 | 69 | 5 | 248 | | |
| **4:15 – 4:30** | 1 | 4 | 46 | 13 | 4 | 2 | 38 | 71 | 3 | 1 | 59 | 5 | 247 | | |
| **4:30 – 4:45** | 7 | 0 | 49 | 53 | 3 | 4 | 26 | 93 | 4 | 0 | 126 | 5 | 370 | | |
| **4:45 – 5:00** | 1 | 1 | 42 | 15 | 1 | 2 | 32 | 63 | 7 | 2 | 67 | 6 | 239 | 1104 | |
| **5:00 – 5:15** | 4 | 0 | 83 | 17 | 3 | 4 | 32 | 74 | 4 | 0 | 103 | 3 | 327 | **1183** | **0.80** |
| 5:15 – 5:30 | 1 | 1 | 38 | 13 | 0 | 0 | 27 | 92 | 1 | 0 | 65 | 3 | 241 | 1177 | |
| 5:30 – 5:45 | 0 | 0 | 27 | 20 | 62 | 2 | 17 | 5 | 1 | 0 | 53 | 1 | 188 | 995 | |
| 5:45 – 6:00 | 0 | 0 | 21 | 5 | 0 | 1 | 14 | 51 | 2 | 0 | 54 | 1 | 149 | 905 | |
| **Peak Hour** | **13** | **5** | **220** | **98** | **11** | **12** | **128** | **301** | **18** | **3** | **355** | **19** | **1183** | | |
| **App Total** | 238 | | | 121 | | | 447 | | | 377 | | | 1183 | | |
| **HV %** | **6%** | | | **2%** | | | **13%** | | | **7%** | | | **9%** | | |

Intersection: 43 Street N and 9 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

TRUCKS, MULTI-AXLE VEHICLE, CITY BUS OR SCHOOL BUS

**AM Peak Hour Traffic Count at 43 Street N and 9 Avenue N Intersection**

| Time Period | 9 Avenue N Eastbound | | | 9 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 7:00 - 7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 5 |
| **7:15 - 7:30** | 0 | 0 | 0 | 1 | 0 | 1 | 3 | 4 | 2 | 0 | 5 | 1 | 17 |
| **7:30 - 7:45** | 0 | 0 | 1 | 2 | 1 | 0 | 2 | 8 | 2 | 0 | 6 | 0 | 22 |
| **7:45 - 8:00** | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 9 | 1 | 0 | 5 | 0 | 20 |
| **8:00 - 8:15** | 0 | 0 | 0 | 3 | 0 | 1 | 9 | 8 | 2 | 1 | 11 | 0 | 35 |
| 8:15 - 8:30 | 1 | 0 | 3 | 2 | 0 | 0 | 2 | 8 | 2 | 1 | 9 | 0 | 28 |
| 8:30 - 8:45 | 1 | 1 | 4 | 5 | 0 | 0 | 3 | 9 | 1 | 0 | 10 | 1 | 35 |
| 8:45 - 9:00 | 0 | 1 | 2 | 3 | 0 | 2 | 3 | 7 | 3 | 1 | 6 | 0 | 28 |
| **Peak Hour** | **0** | **0** | **3** | **7** | **1** | **2** | **16** | **29** | **7** | **1** | **27** | **1** | **94** |
| **App Total** | **3** | | | **10** | | | **52** | | | **29** | | | **94** |

TRUCKS, MULTI-AXLE VEHICLE, CITY BUS OR SCHOOL BUS

**PM Peak Hour Traffic Count at 43 Street N and 9 Avenue N Intersection**

| Time Period | 9 Avenue N Eastbound | | | 9 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 4:00 – 4:15 | 1 | 0 | 2 | 1 | 1 | 0 | 3 | 3 | 0 | 0 | 9 | 1 | 21 |
| **4:15 – 4:30** | 0 | 2 | 4 | 0 | 0 | 0 | 5 | 8 | 0 | 1 | 10 | 0 | 30 |
| **4:30 – 4:45** | 0 | 0 | 4 | 1 | 0 | 0 | 6 | 11 | 0 | 0 | 3 | 1 | 26 |
| **4:45 – 5:00** | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 9 | 2 | 1 | 5 | 0 | 24 |
| **5:00 – 5:15** | 0 | 0 | 5 | 0 | 1 | 0 | 4 | 4 | 1 | 0 | 7 | 0 | 22 |
| 5:15 – 5:30 | 0 | 0 | 3 | 0 | 0 | 0 | 5 | 5 | 1 | 0 | 1 | 0 | 15 |
| 5:30 – 5:45 | 0 | 0 | 5 | 2 | 0 | 0 | 2 | 4 | 0 | 0 | 2 | 0 | 15 |
| 5:45 – 6:00 | 0 | 0 | 5 | 0 | 0 | 0 | 2 | 3 | 1 | 0 | 1 | 0 | 12 |
| Peak Hour | 0 | 2 | 13 | 1 | 2 | 0 | 21 | 32 | 3 | 2 | 25 | 1 | 102 |
| **App Total** | **15** | | | **3** | | | **56** | | | **28** | | | **102** |

Intersection: 43 Street N and 9 Avenue N
Count Date: 14-Mar-17
Count Day: Tuesday
Counted By: Hasegawa Consulting Professional Engineers

PASSENGER CARS, MINI-VANS, TWO AXLE TRUCKS, MOTOR CYCLES AND STATION WAGONS

**AM Peak Hour Traffic Count at 43 Street N and 9 Avenue N Intersection**

| Time Period | 9 Avenue N Eastbound | | | 9 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 7:00 - 7:15 | 0 | 4 | 9 | 2 | 0 | 0 | 24 | 32 | 24 | 5 | 51 | 2 | 153 |
| **7:15 - 7:30** | 0 | 7 | 13 | 1 | 3 | 1 | 36 | 63 | 18 | 7 | 63 | 1 | 213 |
| **7:30 - 7:45** | 1 | 3 | 17 | 6 | 2 | 1 | 33 | 80 | 14 | 2 | 65 | 1 | 225 |
| **7:45 - 8:00** | 1 | 2 | 20 | 0 | 0 | 0 | 58 | 92 | 23 | 1 | 80 | 4 | 281 |
| **8:00 - 8:15** | 1 | 0 | 24 | 4 | 0 | 0 | 45 | 41 | 11 | 0 | 58 | 5 | 189 |
| 8:15 - 8:30 | 1 | 2 | 26 | 5 | 2 | 1 | 37 | 46 | 11 | 3 | 53 | 4 | 191 |
| 8:30 - 8:45 | 2 | 3 | 21 | 2 | 1 | 1 | 30 | 49 | 13 | 1 | 45 | 0 | 168 |
| 8:45 - 9:00 | 1 | 4 | 25 | 3 | 2 | 0 | 39 | 49 | 8 | 2 | 48 | 3 | 184 |
| **Peak Hour** | **3** | **12** | **74** | **11** | **5** | **2** | **172** | **276** | **66** | **10** | **266** | **11** | **908** |
| **App Total** | **89** | | | **18** | | | **514** | | | **287** | | | **908** |

PASSENGER CARS, MINI-VANS, TWO AXLE TRUCKS, MOTOR CYCLES AND STATION WAGONS

**PM Peak Hour Traffic Count at 43 Street N and 9 Avenue N Intersection**

| Time Period | 9 Avenue N Eastbound | | | 9 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 4:00 – 4:15 | 1 | 1 | 39 | 31 | 13 | 12 | 27 | 36 | 2 | 1 | 60 | 4 | 227 |
| **4:15 – 4:30** | 1 | 2 | 42 | 13 | 4 | 2 | 33 | 63 | 3 | 0 | 49 | 5 | 217 |
| **4:30 – 4:45** | 7 | 0 | 45 | 52 | 3 | 4 | 20 | 82 | 4 | 0 | 123 | 4 | 344 |
| **4:45 – 5:00** | 1 | 1 | 42 | 15 | 0 | 2 | 26 | 54 | 5 | 1 | 62 | 6 | 215 |
| **5:00 – 5:15** | 4 | 0 | 78 | 17 | 2 | 4 | 28 | 70 | 3 | 0 | 96 | 3 | 305 |
| 5:15 – 5:30 | 1 | 1 | 35 | 13 | 0 | 0 | 22 | 87 | 0 | 0 | 64 | 3 | 226 |
| 5:30 – 5:45 | 0 | 0 | 22 | 18 | 62 | 2 | 15 | 1 | 1 | 0 | 51 | 1 | 173 |
| 5:45 – 6:00 | 0 | 0 | 16 | 5 | 0 | 1 | 12 | 48 | 1 | 0 | 53 | 1 | 137 |
| Peak Hour | **13** | **3** | **207** | **97** | **9** | **12** | **107** | **269** | **15** | **1** | **330** | **18** | **1081** |
| **App Total** | **223** | | | **118** | | | **391** | | | **349** | | | **1081** |

Intersection: 43 Street N and 5 Avenue N
Count Date: 16-Mar-17
Count Day: Thursday
Counted By: Hasegawa Consulting Professional Engineers

ALL VEHICLES

**AM Peak Hour Traffic Count at 43 Street N and 5 Avenue N Intersection**

| Time Period | 5 Avenue N Eastbound | | | 5 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum | 4-P Total | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | | | |
| 7:00 - 7:15 | 6 | 0 | 23 | 0 | 0 | 0 | 38 | 76 | 0 | 0 | 65 | 4 | 212 | | |
| **7:15 - 7:30** | 5 | 0 | 35 | 0 | 0 | 0 | 64 | 116 | 0 | 0 | 79 | 3 | 302 | | |
| **7:30 - 7:45** | 3 | 0 | 27 | 0 | 0 | 0 | 67 | 136 | 0 | 0 | 101 | 8 | 342 | | |
| **7:45 - 8:00** | 8 | 0 | 44 | 0 | 0 | 0 | 57 | 168 | 0 | 0 | 119 | 10 | 406 | 1262 | |
| **8:00 - 8:15** | 3 | 0 | 36 | 0 | 0 | 0 | 49 | 165 | 0 | 0 | 97 | 5 | 355 | **1405** | **0.87** |
| 8:15 - 8:30 | 3 | 0 | 22 | 0 | 0 | 0 | 45 | 119 | 0 | 0 | 116 | 4 | 309 | 1412 | |
| 8:30 - 8:45 | 4 | 0 | 36 | 0 | 0 | 0 | 32 | 104 | 0 | 0 | 95 | 5 | 276 | 1346 | |
| 8:45 - 9:00 | 5 | 0 | 37 | 0 | 0 | 0 | 50 | 93 | 0 | 0 | 86 | 5 | 276 | 1216 | |
| **Peak Hour** | **19** | **0** | **142** | **0** | **0** | **0** | **237** | **585** | **0** | **0** | **396** | **26** | **1405** | | |
| **App Total** | 161 | | | 0 | | | 822 | | | 422 | | | 1405 | | |
| **HV %** | **12%** | | | **#DIV/0!** | | | **6%** | | | **16%** | | | **10%** | | |

ALL VEHICLES

**PM Peak Hour Traffic Count at 43 Street N and 5 Avenue N Intersection**

| Time Period | 5 Avenue N Eastbound | | | 5 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum | 4-P Total | PHF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | | | |
| 4:00 – 4:15 | 8 | 0 | 45 | 0 | 0 | 0 | 60 | 105 | 0 | 0 | 162 | 4 | 384 | | |
| **4:15 – 4:30** | 6 | 0 | 46 | 0 | 0 | 0 | 53 | 138 | 0 | 0 | 140 | 10 | 393 | | |
| **4:30 – 4:45** | 9 | 0 | 58 | 0 | 0 | 0 | 57 | 128 | 0 | 0 | 235 | 12 | 499 | | |
| **4:45 – 5:00** | 6 | 0 | 59 | 0 | 0 | 0 | 48 | 113 | 0 | 0 | 202 | 3 | 431 | 1707 | |
| **5:00 – 5:15** | 6 | 0 | 80 | 0 | 0 | 0 | 46 | 117 | 0 | 0 | 221 | 11 | 481 | **1804** | **0.90** |
| 5:15 – 5:30 | 3 | 0 | 41 | 0 | 0 | 0 | 37 | 106 | 0 | 0 | 172 | 3 | 362 | 1773 | |
| 5:30 – 5:45 | 1 | 0 | 41 | 0 | 0 | 0 | 35 | 74 | 0 | 0 | 103 | 5 | 259 | 1533 | |
| 5:45 – 6:00 | 1 | 0 | 40 | 0 | 0 | 0 | 24 | 57 | 0 | 0 | 102 | 5 | 229 | 1331 | |
| **Peak Hour** | **27** | **0** | **243** | **0** | **0** | **0** | **204** | **496** | **0** | **0** | **798** | **36** | **1804** | | |
| **App Total** | 270 | | | 0 | | | 700 | | | 834 | | | 1804 | | |
| **HV %** | **7%** | | | **#DIV/0!** | | | **12%** | | | **6%** | | | **8%** | | |

Intersection: 43 Street N and 5 Avenue N
Count Date: 16-Mar-17
Count Day: Thursday
Counted By: Hasegawa Consulting Professional Engineers

TRUCKS, MULTI-AXLE VEHICLE, CITY BUS OR SCHOOL BUS

**AM Peak Hour Traffic Count at 43 Street N and 5 Avenue N Intersection**

| Time Period | 5 Avenue N Eastbound | | | 5 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 7:00 - 7:15 | 0 | 0 | 6 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 17 | 1 | 30 |
| **7:15 - 7:30** | 0 | 0 | 6 | 0 | 0 | 0 | 2 | 8 | 0 | 0 | 9 | 0 | 25 |
| **7:30 - 7:45** | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 7 | 0 | 0 | 11 | 3 | 26 |
| **7:45 - 8:00** | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 18 | 2 | 38 |
| **8:00 - 8:15** | 0 | 0 | 4 | 0 | 0 | 0 | 3 | 14 | 0 | 0 | 24 | 2 | 47 |
| 8:15 - 8:30 | 1 | 0 | 5 | 0 | 0 | 0 | 4 | 7 | 0 | 0 | 19 | 0 | 36 |
| 8:30 - 8:45 | 0 | 0 | 6 | 0 | 0 | 0 | 8 | 16 | 0 | 0 | 26 | 1 | 57 |
| 8:45 - 9:00 | 0 | 0 | 7 | 0 | 0 | 0 | 4 | 13 | 0 | 0 | 16 | 1 | 41 |
| **Peak Hour** | **2** | **0** | **17** | **0** | **0** | **0** | **8** | **40** | **0** | **0** | **62** | **7** | **136** |
| **App Total** | **19** | | | **0** | | | **48** | | | **69** | | | **136** |

TRUCKS, MULTI-AXLE VEHICLE, CITY BUS OR SCHOOL BUS

**PM Peak Hour Traffic Count at 43 Street N and 5 Avenue N Intersection**

| Time Period | 5 Avenue N Eastbound | | | 5 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 4:00 – 4:15 | 1 | 0 | 5 | 0 | 0 | 0 | 13 | 10 | 0 | 0 | 6 | 0 | 35 |
| **4:15 – 4:30** | 1 | 0 | 5 | 0 | 0 | 0 | 15 | 15 | 0 | 0 | 9 | 5 | 50 |
| **4:30 – 4:45** | 1 | 0 | 4 | 0 | 0 | 0 | 9 | 11 | 0 | 0 | 13 | 1 | 39 |
| **4:45 – 5:00** | 4 | 0 | 2 | 0 | 0 | 0 | 7 | 13 | 0 | 0 | 6 | 0 | 32 |
| **5:00 – 5:15** | 0 | 0 | 2 | 0 | 0 | 0 | 5 | 6 | 0 | 0 | 9 | 3 | 25 |
| 5:15 – 5:30 | 1 | 0 | 2 | 0 | 0 | 0 | 3 | 7 | 0 | 0 | 14 | 0 | 27 |
| 5:30 – 5:45 | 1 | 0 | 2 | 0 | 0 | 0 | 11 | 12 | 0 | 0 | 7 | 1 | 34 |
| 5:45 – 6:00 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 4 | 1 | 14 |
| Peak Hour | 6 | 0 | 13 | 0 | 0 | 0 | 36 | 45 | 0 | 0 | 37 | 9 | 146 |
| **App Total** | **19** | | | **0** | | | **81** | | | **46** | | | **146** |

Intersection: 43 Street N and 5 Avenue N
Count Date: 16-Mar-17
Count Day: Thursday
Counted By: Hasegawa Consulting Professional Engineers

PASSENGER CARS, MINI-VANS, TWO AXLE TRUCKS, MOTOR CYCLES AND STATION WAGONS

**AM Peak Hour Traffic Count at 43 Street N and 5 Avenue N Intersection**

| Time Period | 5 Avenue N Eastbound | | | 5 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 7:00 - 7:15 | 6 | 0 | 17 | 0 | 0 | 0 | 35 | 73 | 0 | 0 | 48 | 3 | 182 |
| **7:15 - 7:30** | 5 | 0 | 29 | 0 | 0 | 0 | 62 | 108 | 0 | 0 | 70 | 3 | 277 |
| **7:30 - 7:45** | 3 | 0 | 25 | 0 | 0 | 0 | 64 | 129 | 0 | 0 | 90 | 5 | 316 |
| **7:45 - 8:00** | 6 | 0 | 39 | 0 | 0 | 0 | 57 | 157 | 0 | 0 | 101 | 8 | 368 |
| **8:00 - 8:15** | 3 | 0 | 32 | 0 | 0 | 0 | 46 | 151 | 0 | 0 | 73 | 3 | 308 |
| 8:15 - 8:30 | 2 | 0 | 17 | 0 | 0 | 0 | 41 | 112 | 0 | 0 | 97 | 4 | 273 |
| 8:30 - 8:45 | 4 | 0 | 30 | 0 | 0 | 0 | 24 | 88 | 0 | 0 | 69 | 4 | 219 |
| 8:45 - 9:00 | 5 | 0 | 30 | 0 | 0 | 0 | 46 | 80 | 0 | 0 | 70 | 4 | 235 |
| **Peak Hour** | **17** | **0** | **125** | **0** | **0** | **0** | **229** | **545** | **0** | **0** | **334** | **19** | **1269** |
| **App Total** | **142** | | | **0** | | | **774** | | | **353** | | | **1269** |

PASSENGER CARS, MINI-VANS, TWO AXLE TRUCKS, MOTOR CYCLES AND STATION WAGONS

**PM Peak Hour Traffic Count at 43 Street N and 5 Avenue N Intersection**

| Time Period | 5 Avenue N Eastbound | | | 5 Avenue N Westbound | | | 43 Street N Northbound | | | 43 Street N Southbound | | | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | L | T | R | L | T | R | L | T | R | L | T | R | |
| 4:00 – 4:15 | 7 | 0 | 40 | 0 | 0 | 0 | 47 | 95 | 0 | 0 | 156 | 4 | 349 |
| **4:15 – 4:30** | 5 | 0 | 41 | 0 | 0 | 0 | 38 | 123 | 0 | 0 | 131 | 5 | 343 |
| **4:30 – 4:45** | 8 | 0 | 54 | 0 | 0 | 0 | 48 | 117 | 0 | 0 | 222 | 11 | 460 |
| **4:45 – 5:00** | 2 | 0 | 57 | 0 | 0 | 0 | 41 | 100 | 0 | 0 | 196 | 3 | 399 |
| **5:00 – 5:15** | 6 | 0 | 78 | 0 | 0 | 0 | 41 | 111 | 0 | 0 | 212 | 8 | 456 |
| 5:15 – 5:30 | 2 | 0 | 39 | 0 | 0 | 0 | 34 | 99 | 0 | 0 | 158 | 3 | 335 |
| 5:30 – 5:45 | 0 | 0 | 39 | 0 | 0 | 0 | 24 | 62 | 0 | 0 | 96 | 4 | 225 |
| 5:45 – 6:00 | 1 | 0 | 38 | 0 | 0 | 0 | 22 | 52 | 0 | 0 | 98 | 4 | 215 |
| Peak Hour | **21** | **0** | **230** | **0** | **0** | **0** | **168** | **451** | **0** | **0** | **761** | **27** | **1658** |
| **App Total** | **251** | | | **0** | | | **619** | | | **788** | | | **1658** |

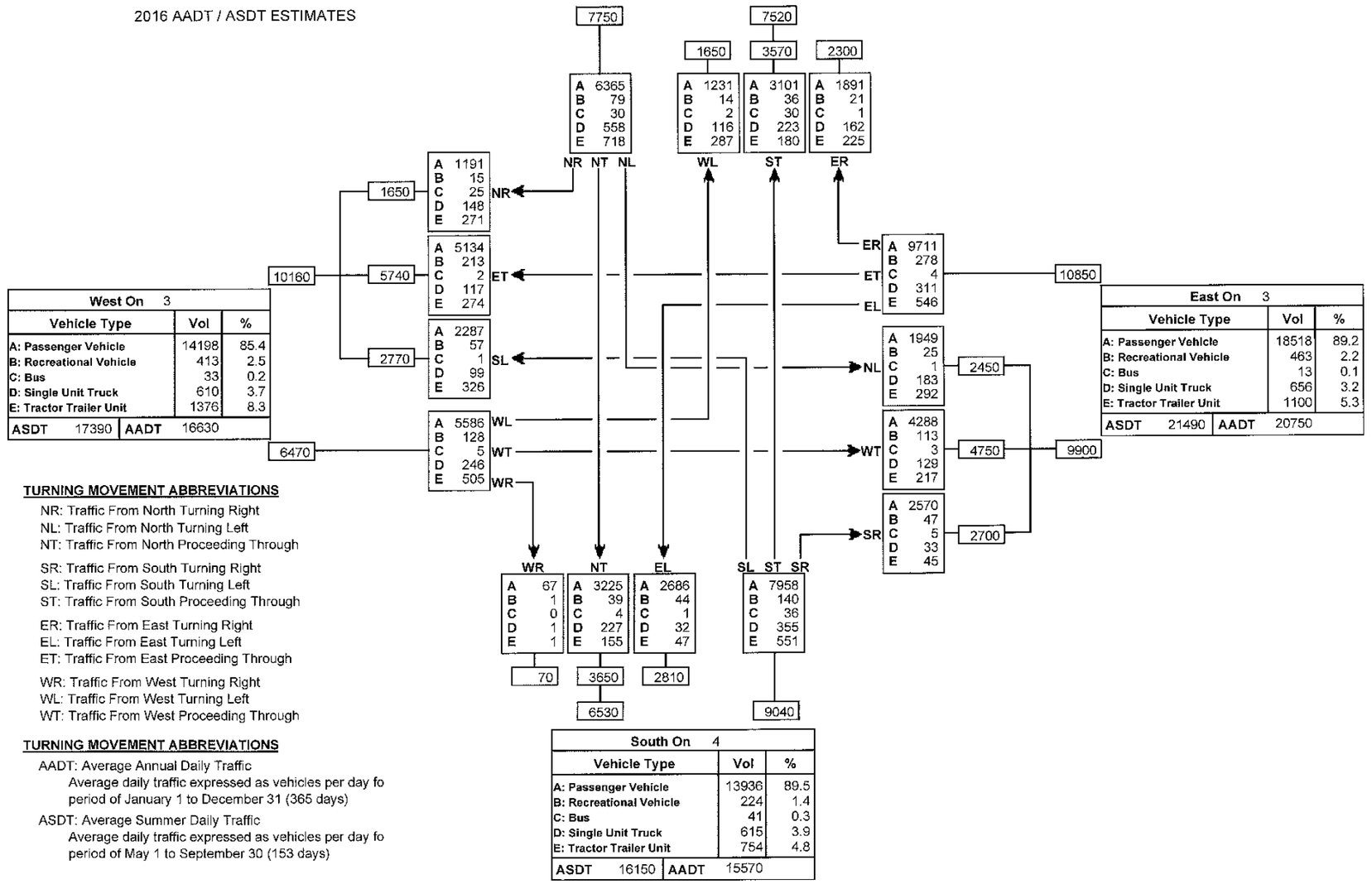
**Reference No.:** 50000010

**Intersection of:**
3 & 4 & 843 IN LETHBRIDGE 4-29-21-400001320

2016 AADT / ASDT ESTIMATES

## Turning Movement Summary Diagram

| North On 843 | | |
|---|---|---|
| **Vehicle Type** | **Vol** | **%** |
| A: Passenger Vehicle | 12588 | 82.4 |
| B: Recreational Vehicle | 150 | 1.0 |
| C: Bus | 63 | 0.4 |
| D: Single Unit Truck | 1059 | 6.9 |
| E: Tractor Trailer Unit | 1410 | 9.2 |
| **ASDT** 15820 | **AADT** 15270 | |




| West On 3 | | |
|---|---|---|
| **Vehicle Type** | **Vol** | **%** |
| A: Passenger Vehicle | 14198 | 85.4 |
| B: Recreational Vehicle | 413 | 2.5 |
| C: Bus | 33 | 0.2 |
| D: Single Unit Truck | 610 | 3.7 |
| E: Tractor Trailer Unit | 1376 | 8.3 |
| **ASDT** 17390 | **AADT** 16630 | |

| East On 3 | | |
|---|---|---|
| **Vehicle Type** | **Vol** | **%** |
| A: Passenger Vehicle | 18518 | 89.2 |
| B: Recreational Vehicle | 463 | 2.2 |
| C: Bus | 13 | 0.1 |
| D: Single Unit Truck | 656 | 3.2 |
| E: Tractor Trailer Unit | 1100 | 5.3 |
| **ASDT** 21490 | **AADT** 20750 | |

| South On 4 | | |
|---|---|---|
| **Vehicle Type** | **Vol** | **%** |
| A: Passenger Vehicle | 13936 | 89.5 |
| B: Recreational Vehicle | 224 | 1.4 |
| C: Bus | 41 | 0.3 |
| D: Single Unit Truck | 615 | 3.9 |
| E: Tractor Trailer Unit | 754 | 4.8 |
| **ASDT** 16150 | **AADT** 15570 | |

**TURNING MOVEMENT ABBREVIATIONS**

NR: Traffic From North Turning Right
NL: Traffic From North Turning Left
NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right
SL: Traffic From South Turning Left
ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right
EL: Traffic From East Turning Left
ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right
WL: Traffic From West Turning Left
WT: Traffic From West Proceeding Through

**TURNING MOVEMENT ABBREVIATIONS**

AADT: Average Annual Daily Traffic
Average daily traffic expressed as vehicles per day fo period of January 1 to December 31 (365 days)

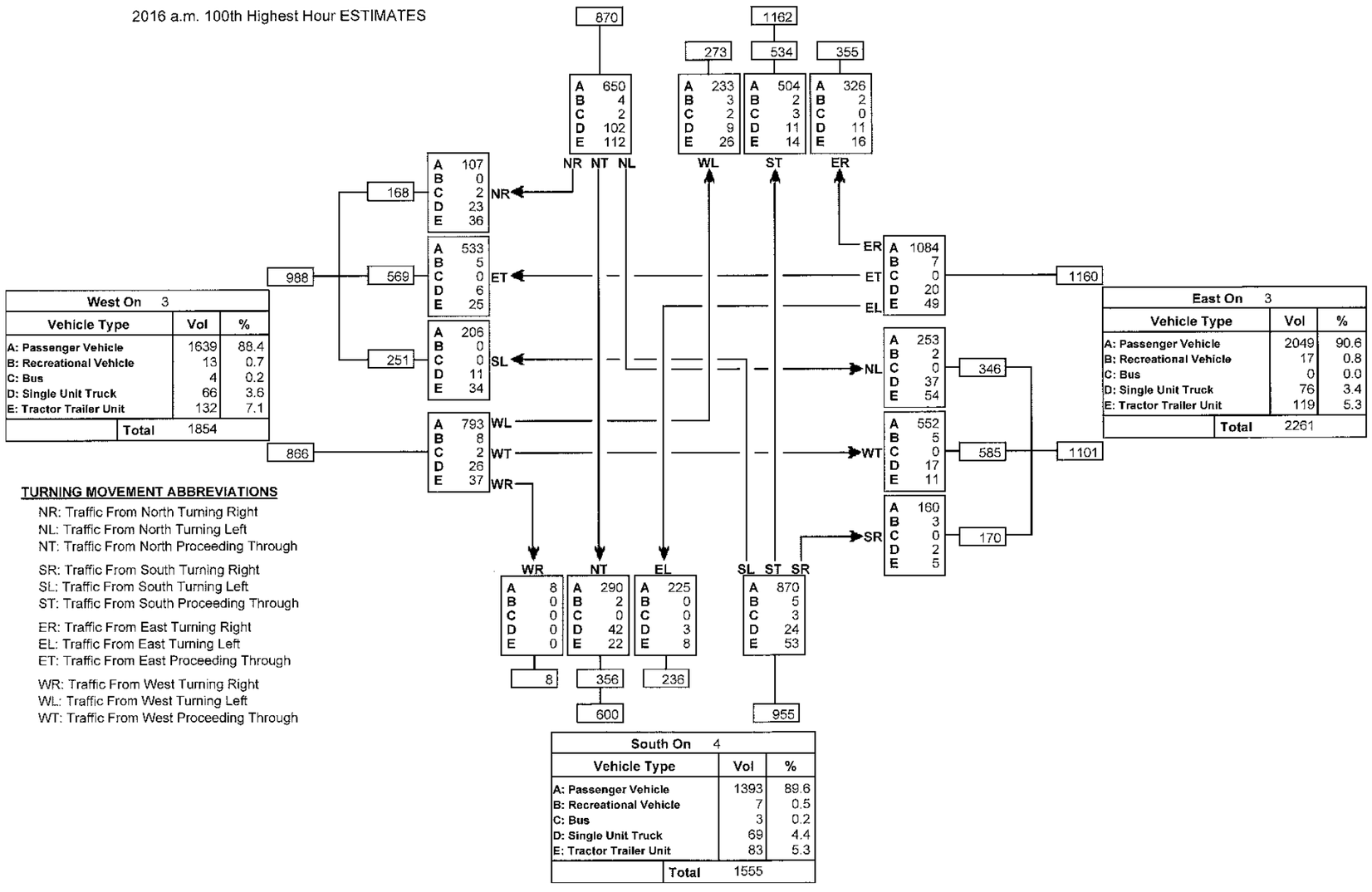
ASDT: Average Summer Daily Traffic
Average daily traffic expressed as vehicles per day fo period of May 1 to September 30 (153 days)

## Turning Movement Summary Diagram

**Reference No.:** 50000010

**Intersection of:**
3 & 4 & 843 IN LETHBRIDGE 4-29-21-400001320

2016 a.m. 100th Highest Hour ESTIMATES




**TURNING MOVEMENT ABBREVIATIONS**

NR: Traffic From North Turning Right
NL: Traffic From North Turning Left
NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right
SL: Traffic From South Turning Left
ST: Traffic From South Proceeding Through

ER: Traffic From East Turning Right
EL: Traffic From East Turning Left
ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right
WL: Traffic From West Turning Left
WT: Traffic From West Proceeding Through

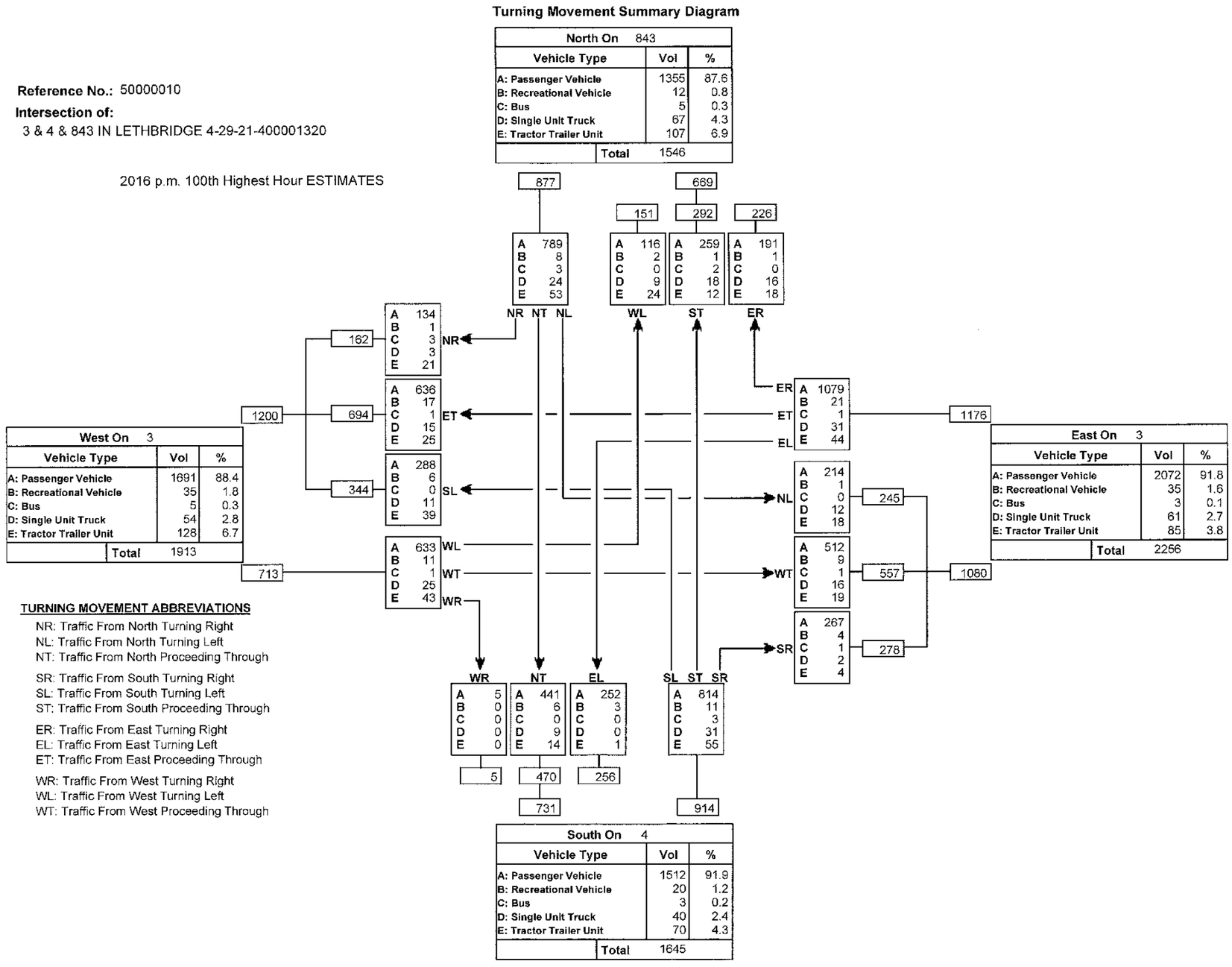
**Reference No.:** 50000010

**Intersection of:**

3 & 4 & 843 IN LETHBRIDGE 4-29-21-400001320

2016 p.m. 100th Highest Hour ESTIMATES

## Turning Movement Summary Diagram




**TURNING MOVEMENT ABBREVIATIONS**

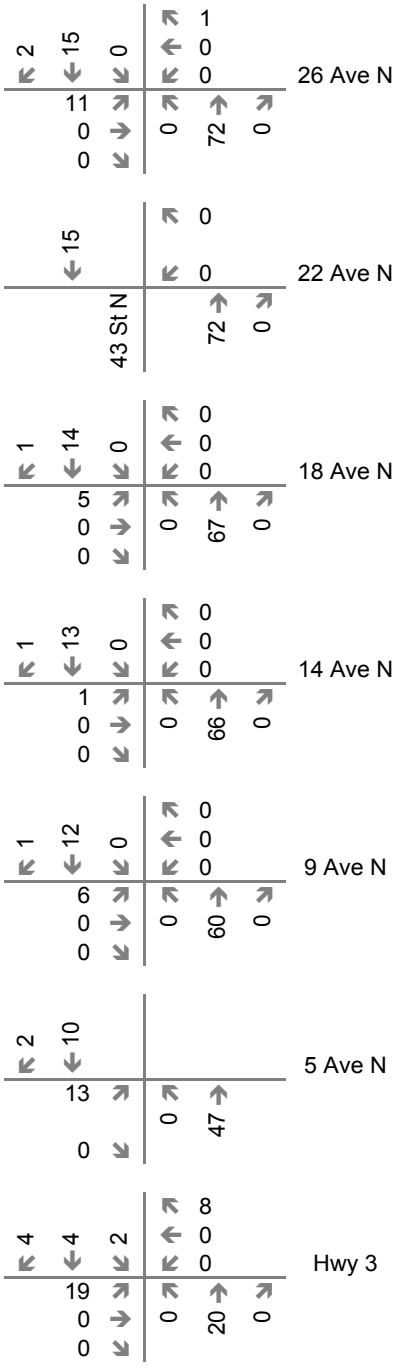
NR: Traffic From North Turning Right
NL: Traffic From North Turning Left
NT: Traffic From North Proceeding Through

SR: Traffic From South Turning Right
SL: Traffic From South Turning Left
ST: Traffic From South Proceeding Through

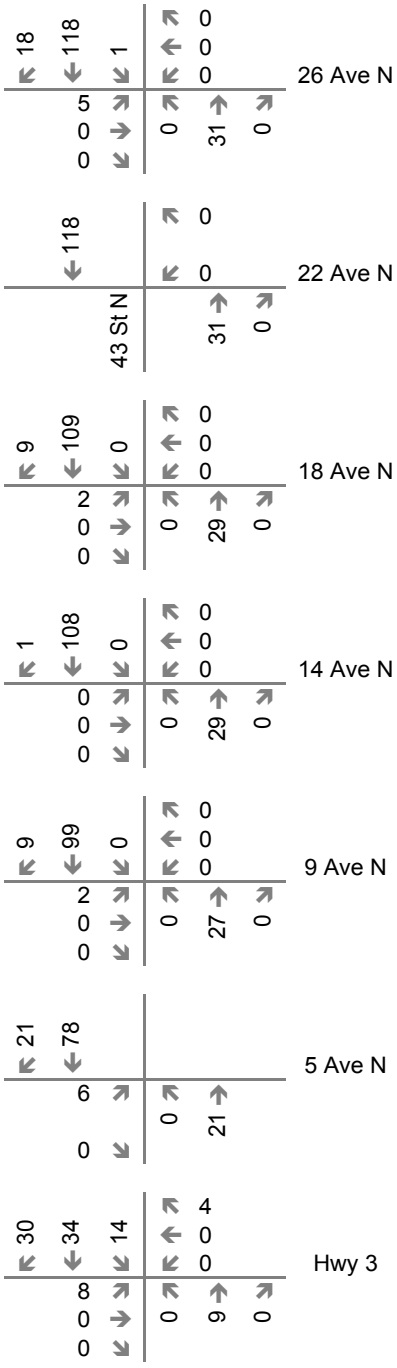
ER: Traffic From East Turning Right
EL: Traffic From East Turning Left
ET: Traffic From East Proceeding Through

WR: Traffic From West Turning Right
WL: Traffic From West Turning Left
WT: Traffic From West Proceeding Through

**AM Peak Hour**




**PM Peak Hour**



**Appendix C**

**HCM Capacity Analysis Results Reports**

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 3 | 12 | 77 | 18 | 6 | 4 | 188 | 305 | 73 | 11 | 293 | 12 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 4 | 14 | 0 | 22 | 7 | 5 | 227 | 367 | 0 | 13 | 353 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 166 | 141 | 120 | 145 | 58 | 41 | 232 | 2628 | 1176 | 634 | 1966 | 879 |
| Arrive On Green | 0.08 | 0.08 | 0.00 | 0.08 | 0.08 | 0.08 | 0.14 | 0.79 | 0.00 | 0.59 | 0.59 | 0.00 |
| Sat Flow, veh/h | 1383 | 1845 | 1568 | 1046 | 759 | 542 | 1660 | 3312 | 1482 | 946 | 3312 | 1482 |
| Grp Volume(v), veh/h | 4 | 14 | 0 | 22 | 0 | 12 | 227 | 367 | 0 | 13 | 353 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1383 | 1845 | 1568 | 1046 | 0 | 1301 | 1660 | 1656 | 1482 | 946 | 1656 | 1482 |
| Q Serve(g_s), s | 0.3 | 0.7 | 0.0 | 2.0 | 0.0 | 0.9 | 13.6 | 2.6 | 0.0 | 0.6 | 4.8 | 0.0 |
| Cycle Q Clear(g_c), s | 1.1 | 0.7 | 0.0 | 2.7 | 0.0 | 0.9 | 13.6 | 2.6 | 0.0 | 0.6 | 4.8 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.42 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 166 | 141 | 120 | 145 | 0 | 99 | 232 | 2628 | 1176 | 634 | 1966 | 879 |
| V/C Ratio(X) | 0.02 | 0.10 | 0.00 | 0.15 | 0.00 | 0.12 | 0.98 | 0.14 | 0.00 | 0.02 | 0.18 | 0.00 |
| Avail Cap(c_a), veh/h | 427 | 489 | 416 | 342 | 0 | 345 | 232 | 2628 | 1176 | 634 | 1966 | 879 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 43.6 | 43.0 | 0.0 | 44.2 | 0.0 | 43.0 | 42.8 | 2.4 | 0.0 | 8.4 | 9.2 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.3 | 0.0 | 0.5 | 0.0 | 0.5 | 52.3 | 0.1 | 0.0 | 0.1 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.4 | 0.0 | 0.6 | 0.0 | 0.3 | 9.6 | 1.2 | 0.0 | 0.2 | 2.3 | 0.0 |
| LnGrp Delay(d),s/veh | 43.6 | 43.3 | 0.0 | 44.7 | 0.0 | 43.6 | 95.1 | 2.5 | 0.0 | 8.4 | 9.4 | 0.0 |
| LnGrp LOS | D | D | | D | | D | F | A | | A | A | |
| Approach Vol, veh/h | | 18 | | | 34 | | | 594 | | | 366 | |
| Approach Delay, s/veh | | 43.4 | | | 44.3 | | | 37.9 | | | 9.4 | |
| Approach LOS | | D | | | D | | | D | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 85.9 | | 14.1 | 20.0 | 65.9 | | 14.1 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 60.5 | | 26.5 | 14.0 | 40.5 | | 26.5 |
| Max Q Clear Time (g_c+I1), s | | 4.6 | | 3.1 | 15.6 | 6.8 | | 4.7 |
| Green Ext Time (p_c), s | | 6.6 | | 0.2 | 0.0 | 6.3 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 27.9 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 19 | 142 | 237 | 585 | 396 | 26 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 22 | 0 | 272 | 672 | 455 | 30 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 143 | 66 | 273 | 2807 | 1881 | 841 |
| Arrive On Green | 0.05 | 0.00 | 0.16 | 0.82 | 0.60 | 0.60 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 22 | 0 | 272 | 672 | 455 | 30 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 0.7 | 0.0 | 15.9 | 4.3 | 6.8 | 0.9 |
| Cycle Q Clear(g_c), s | 0.7 | 0.0 | 15.9 | 4.3 | 6.8 | 0.9 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 143 | 66 | 273 | 2807 | 1881 | 841 |
| V/C Ratio(X) | 0.15 | 0.00 | 1.00 | 0.24 | 0.24 | 0.04 |
| Avail Cap(c_a), veh/h | 580 | 267 | 273 | 2807 | 1881 | 841 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 45.9 | 0.0 | 42.0 | 1.9 | 9.2 | 8.0 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 53.2 | 0.2 | 0.3 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 11.5 | 2.0 | 3.0 | 0.4 |
| LnGrp Delay(d),s/veh | 46.3 | 0.0 | 95.2 | 2.1 | 9.5 | 8.1 |
| LnGrp LOS | D | | F | A | A | A |
| Approach Vol, veh/h | 22 | | | 944 | 485 | |
| Approach Delay, s/veh | 46.3 | | | 28.9 | 9.4 | |
| Approach LOS | D | | | C | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 88.9 | | 11.1 | 22.0 | 66.9 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 68.5 | | 18.5 | 16.0 | 46.5 | | |
| Max Q Clear Time (g_c+I1), s | | 6.3 | | 2.7 | 17.9 | 8.8 | | |
| Green Ext Time (p_c), s | | 12.3 | | 0.0 | 0.0 | 11.3 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 22.7 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 273 | 585 | 8 | 236 | 569 | 355 | 251 | 534 | 170 | 346 | 356 | 168 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 297 | 636 | 9 | 257 | 618 | 0 | 273 | 580 | 0 | 376 | 387 | 183 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 398 | 1022 | 14 | 383 | 971 | 434 | 649 | 741 | 332 | 585 | 804 | 360 |
| Arrive On Green | 0.15 | 0.31 | 0.31 | 0.13 | 0.29 | 0.00 | 0.09 | 0.23 | 0.00 | 0.12 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1630 | 3283 | 46 | 1660 | 3312 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 297 | 315 | 330 | 257 | 618 | 0 | 273 | 580 | 0 | 376 | 387 | 183 |
| Grp Sat Flow(s),veh/h/ln | 1630 | 1626 | 1704 | 1660 | 1656 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 14.1 | 18.6 | 18.6 | 11.9 | 18.3 | 0.0 | 7.2 | 18.7 | 0.0 | 10.3 | 11.8 | 12.5 |
| Cycle Q Clear(g_c), s | 14.1 | 18.6 | 18.6 | 11.9 | 18.3 | 0.0 | 7.2 | 18.7 | 0.0 | 10.3 | 11.8 | 12.5 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 398 | 506 | 530 | 383 | 971 | 434 | 649 | 741 | 332 | 585 | 804 | 360 |
| V/C Ratio(X) | 0.75 | 0.62 | 0.62 | 0.67 | 0.64 | 0.00 | 0.42 | 0.78 | 0.00 | 0.64 | 0.48 | 0.51 |
| Avail Cap(c_a), veh/h | 436 | 506 | 530 | 451 | 971 | 434 | 1065 | 846 | 378 | 891 | 809 | 362 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.1 | 33.1 | 33.1 | 24.2 | 34.6 | 0.0 | 29.1 | 41.0 | 0.0 | 29.2 | 35.5 | 35.8 |
| Incr Delay (d2), s/veh | 6.3 | 5.7 | 5.4 | 3.1 | 3.2 | 0.0 | 0.4 | 4.3 | 0.0 | 1.2 | 0.4 | 1.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.0 | 9.1 | 9.6 | 5.7 | 8.8 | 0.0 | 3.2 | 8.9 | 0.0 | 4.4 | 5.2 | 5.0 |
| LnGrp Delay(d),s/veh | 30.4 | 38.8 | 38.5 | 27.3 | 37.8 | 0.0 | 29.5 | 45.2 | 0.0 | 30.4 | 36.0 | 37.0 |
| LnGrp LOS | C | D | D | C | D | | C | D | | C | D | D |
| Approach Vol, veh/h | | 942 | | | 875 | | | 853 | | | 946 | |
| Approach Delay, s/veh | | 36.1 | | | 34.7 | | | 40.2 | | | 33.9 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 20.4 | 42.0 | 18.7 | 31.4 | 22.4 | 40.0 | 15.3 | 34.8 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 13.9 | 20.6 | 12.3 | 20.7 | 16.1 | 20.3 | 9.2 | 14.5 |
| Green Ext Time (p_c), s | 0.5 | 6.9 | 1.5 | 4.7 | 0.4 | 7.1 | 1.1 | 6.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 36.1 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 4 | 66 | 168 | 15 | 56 | 3 | 59 | 26 | 17 | 4 | 24 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 5 | 86 | 218 | 19 | 73 | 4 | 77 | 34 | 22 | 5 | 31 | 4 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 280 | 253 | 33 | 393 | 243 | 45 | 35 | 0 | 0 | 56 | 0 | 0 |
| Stage 1 | 44 | 44 | - | 198 | 198 | - | - | - | - | - | - | - |
| Stage 2 | 236 | 209 | - | 195 | 45 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 668 | 647 | 1035 | 563 | 655 | 1019 | 1544 | - | - | 1464 | - | - |
| Stage 1 | 965 | 854 | - | 799 | 733 | - | - | - | - | - | - | - |
| Stage 2 | 763 | 725 | - | 802 | 853 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 581 | 612 | 1035 | 380 | 619 | 1019 | 1544 | - | - | 1464 | - | - |
| Mov Cap-2 Maneuver | 581 | 612 | - | 380 | 619 | - | - | - | - | - | - | - |
| Stage 1 | 915 | 851 | - | 757 | 695 | - | - | - | - | - | - | - |
| Stage 2 | 645 | 687 | - | 567 | 850 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 11.5 | 12.8 | 4.3 | 1 |
| HCM LOS | B | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1544 | - | - | 859 | 557 | 1464 | - | - |
| HCM Lane V/C Ratio | 0.05 | - | - | 0.36 | 0.173 | 0.004 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 11.5 | 12.8 | 7.5 | 0 | - |
| HCM Lane LOS | A | A | - | B | B | A | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 1.6 | 0.6 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.5 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 5 | 99 | 166 | 88 | 210 | 9 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 12 | 12 | 10 | 10 | 3 | 3 |
| Mvmt Flow | 6 | 127 | 213 | 113 | 269 | 12 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 813 | 275 | 281 | 0 | - | 0 |
| Stage 1 | 275 | - | - | - | - | - |
| Stage 2 | 538 | - | - | - | - | - |
| Critical Hdwy | 6.52 | 6.32 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.52 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.52 | - | - | - | - | - |
| Follow-up Hdwy | 3.608 | 3.408 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 335 | 740 | 1237 | - | - | - |
| Stage 1 | 749 | - | - | - | - | - |
| Stage 2 | 566 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 273 | 740 | 1237 | - | - | - |
| Mov Cap-2 Maneuver | 273 | - | - | - | - | - |
| Stage 1 | 749 | - | - | - | - | - |
| Stage 2 | 462 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 11.5 | 5.6 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1237 | - | 684 | - | - |
| HCM Lane V/C Ratio | 0.172 | - | 0.195 | - | - |
| HCM Control Delay (s) | 8.5 | 0 | 11.5 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.6 | - | 0.7 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 2 | 18 | 67 | 236 | 297 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 81 | 81 | 81 | 81 | 81 | 81 |
| Heavy Vehicles, % | 55 | 55 | 10 | 10 | 6 | 6 |
| Mvmt Flow | 2 | 22 | 83 | 291 | 367 | 16 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 832 | 375 | 383 | 0 | - | 0 |
| Stage 1 | 375 | - | - | - | - | - |
| Stage 2 | 457 | - | - | - | - | - |
| Critical Hdwy | 6.95 | 6.75 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.95 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.95 | - | - | - | - | - |
| Follow-up Hdwy | 3.995 | 3.795 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 277 | 569 | 1133 | - | - | - |
| Stage 1 | 593 | - | - | - | - | - |
| Stage 2 | 540 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 253 | 569 | 1133 | - | - | - |
| Mov Cap-2 Maneuver | 253 | - | - | - | - | - |
| Stage 1 | 593 | - | - | - | - | - |
| Stage 2 | 493 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 12.5 | 1.9 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1133 | - | 506 | - | - |
| HCM Lane V/C Ratio | 0.073 | - | 0.049 | - | - |
| HCM Control Delay (s) | 8.4 | 0 | 12.5 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.2 | - | 0.2 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 13 | 5 | 220 | 98 | 11 | 12 | 128 | 301 | 18 | 3 | 355 | 19 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 16 | 6 | 0 | 122 | 14 | 15 | 160 | 376 | 0 | 4 | 444 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 201 | 203 | 172 | 227 | 93 | 100 | 188 | 2418 | 1082 | 626 | 1954 | 874 |
| Arrive On Green | 0.11 | 0.11 | 0.00 | 0.11 | 0.11 | 0.11 | 0.12 | 0.76 | 0.00 | 0.58 | 0.58 | 0.00 |
| Sat Flow, veh/h | 1323 | 1792 | 1524 | 1404 | 824 | 883 | 1601 | 3195 | 1429 | 956 | 3374 | 1509 |
| Grp Volume(v), veh/h | 16 | 6 | 0 | 122 | 0 | 29 | 160 | 376 | 0 | 4 | 444 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1323 | 1792 | 1524 | 1404 | 0 | 1707 | 1601 | 1597 | 1429 | 956 | 1687 | 1509 |
| Q Serve(g_s), s | 1.1 | 0.3 | 0.0 | 8.5 | 0.0 | 1.5 | 9.8 | 3.2 | 0.0 | 0.2 | 6.4 | 0.0 |
| Cycle Q Clear(g_c), s | 2.6 | 0.3 | 0.0 | 8.8 | 0.0 | 1.5 | 9.8 | 3.2 | 0.0 | 0.2 | 6.4 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.52 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 201 | 203 | 172 | 227 | 0 | 193 | 188 | 2418 | 1082 | 626 | 1954 | 874 |
| V/C Ratio(X) | 0.08 | 0.03 | 0.00 | 0.54 | 0.00 | 0.15 | 0.85 | 0.16 | 0.00 | 0.01 | 0.23 | 0.00 |
| Avail Cap(c_a), veh/h | 402 | 475 | 404 | 440 | 0 | 452 | 224 | 2418 | 1082 | 626 | 1954 | 874 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 41.2 | 39.5 | 0.0 | 43.4 | 0.0 | 40.0 | 43.2 | 3.3 | 0.0 | 8.9 | 10.2 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.1 | 0.0 | 2.0 | 0.0 | 0.4 | 22.3 | 0.1 | 0.0 | 0.0 | 0.3 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.1 | 0.0 | 3.4 | 0.0 | 0.7 | 5.5 | 1.5 | 0.0 | 0.0 | 3.0 | 0.0 |
| LnGrp Delay(d),s/veh | 41.4 | 39.5 | 0.0 | 45.3 | 0.0 | 40.4 | 65.5 | 3.5 | 0.0 | 8.9 | 10.5 | 0.0 |
| LnGrp LOS | D | D | | D | | D | E | A | | A | B | |
| Approach Vol, veh/h | | 22 | | | 151 | | | 536 | | | 448 | |
| Approach Delay, s/veh | | 40.9 | | | 44.4 | | | 22.0 | | | 10.5 | |
| Approach LOS | | D | | | D | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 82.2 | | 17.8 | 17.8 | 64.4 | | 17.8 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 60.5 | | 26.5 | 14.0 | 40.5 | | 26.5 |
| Max Q Clear Time (g_c+I1), s | | 5.2 | | 4.6 | 11.8 | 8.4 | | 10.8 |
| Green Ext Time (p_c), s | | 7.7 | | 0.7 | 0.1 | 7.1 | | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 20.8 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 27 | 243 | 204 | 496 | 798 | 36 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 30 | 0 | 227 | 551 | 887 | 40 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 185 | 85 | 255 | 2622 | 2029 | 908 |
| Arrive On Green | 0.06 | 0.00 | 0.16 | 0.81 | 0.60 | 0.60 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 30 | 0 | 227 | 551 | 887 | 40 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 0.9 | 0.0 | 13.8 | 3.8 | 14.2 | 1.1 |
| Cycle Q Clear(g_c), s | 0.9 | 0.0 | 13.8 | 3.8 | 14.2 | 1.1 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 185 | 85 | 255 | 2622 | 2029 | 908 |
| V/C Ratio(X) | 0.16 | 0.00 | 0.89 | 0.21 | 0.44 | 0.04 |
| Avail Cap(c_a), veh/h | 607 | 279 | 259 | 2622 | 2029 | 908 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.9 | 0.0 | 41.3 | 2.1 | 11.0 | 8.4 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 29.3 | 0.2 | 0.7 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.0 | 8.2 | 1.8 | 6.8 | 0.5 |
| LnGrp Delay(d),s/veh | 45.3 | 0.0 | 70.6 | 2.3 | 11.7 | 8.5 |
| LnGrp LOS | D | | E | A | B | A |
| Approach Vol, veh/h | 30 | | | 778 | 927 | |
| Approach Delay, s/veh | 45.3 | | | 22.2 | 11.6 | |
| Approach LOS | D | | | C | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 87.8 | | 12.2 | 21.8 | 66.1 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 68.5 | | 18.5 | 16.0 | 46.5 | | |
| Max Q Clear Time (g_c+I1), s | | 5.8 | | 2.9 | 15.8 | 16.2 | | |
| Green Ext Time (p_c), s | | 18.3 | | 0.1 | 0.0 | 14.3 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.9 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 151 | 557 | 5 | 256 | 694 | 226 | 344 | 292 | 278 | 245 | 470 | 162 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 164 | 605 | 5 | 278 | 754 | 0 | 374 | 317 | 0 | 266 | 511 | 176 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 327 | 1032 | 9 | 413 | 1178 | 527 | 619 | 807 | 361 | 734 | 696 | 311 |
| Arrive On Green | 0.09 | 0.31 | 0.31 | 0.13 | 0.35 | 0.00 | 0.12 | 0.24 | 0.00 | 0.09 | 0.21 | 0.21 |
| Sat Flow, veh/h | 1645 | 3336 | 28 | 1691 | 3374 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 164 | 298 | 312 | 278 | 754 | 0 | 374 | 317 | 0 | 266 | 511 | 176 |
| Grp Sat Flow(s),veh/h/ln | 1645 | 1641 | 1722 | 1691 | 1687 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 7.1 | 16.3 | 16.3 | 11.7 | 20.0 | 0.0 | 9.2 | 8.4 | 0.0 | 6.8 | 15.6 | 11.5 |
| Cycle Q Clear(g_c), s | 7.1 | 16.3 | 16.3 | 11.7 | 20.0 | 0.0 | 9.2 | 8.4 | 0.0 | 6.8 | 15.6 | 11.5 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 327 | 507 | 533 | 413 | 1178 | 527 | 619 | 807 | 361 | 734 | 696 | 311 |
| V/C Ratio(X) | 0.50 | 0.59 | 0.59 | 0.67 | 0.64 | 0.00 | 0.60 | 0.39 | 0.00 | 0.36 | 0.73 | 0.57 |
| Avail Cap(c_a), veh/h | 466 | 507 | 533 | 489 | 1178 | 527 | 997 | 917 | 410 | 1178 | 884 | 395 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.7 | 31.1 | 31.1 | 21.7 | 29.1 | 0.0 | 28.4 | 34.1 | 0.0 | 28.1 | 39.1 | 37.5 |
| Incr Delay (d2), s/veh | 1.2 | 4.9 | 4.7 | 2.9 | 2.7 | 0.0 | 1.0 | 0.3 | 0.0 | 0.3 | 2.4 | 1.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.3 | 8.0 | 8.4 | 5.7 | 9.8 | 0.0 | 4.2 | 4.0 | 0.0 | 3.0 | 7.3 | 4.8 |
| LnGrp Delay(d),s/veh | 23.9 | 36.0 | 35.8 | 24.6 | 31.8 | 0.0 | 29.3 | 34.4 | 0.0 | 28.4 | 41.5 | 39.1 |
| LnGrp LOS | C | D | D | C | C | | C | C | | C | D | D |
| Approach Vol, veh/h | | 774 | | | 1032 | | | 691 | | | 953 | |
| Approach Delay, s/veh | | 33.4 | | | 29.8 | | | 31.6 | | | 37.4 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 20.2 | 40.0 | 15.0 | 31.5 | 15.9 | 44.3 | 17.7 | 28.8 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 13.7 | 18.3 | 8.8 | 10.4 | 9.1 | 22.0 | 11.2 | 17.6 |
| Green Ext Time (p_c), s | 0.5 | 8.4 | 1.1 | 6.8 | 0.4 | 6.9 | 1.5 | 5.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 33.1 |
| HCM 2010 LOS | C |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 4 | 34 | 161 | 8 | 72 | 0 | 223 | 29 | 36 | 7 | 36 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 4 | 37 | 173 | 9 | 77 | 0 | 240 | 31 | 39 | 8 | 39 | 12 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 629 | 609 | 45 | 695 | 596 | 51 | 51 | 0 | 0 | 70 | 0 | 0 |
| Stage 1 | 60 | 60 | - | 530 | 530 | - | - | - | - | - | - | - |
| Stage 2 | 569 | 549 | - | 165 | 66 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 392 | 407 | 1019 | 354 | 414 | 1011 | 1524 | - | - | 1446 | - | - |
| Stage 1 | 946 | 841 | - | 529 | 523 | - | - | - | - | - | - | - |
| Stage 2 | 504 | 513 | - | 832 | 836 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 283 | 338 | 1019 | 235 | 344 | 1011 | 1524 | - | - | 1446 | - | - |
| Mov Cap-2 Maneuver | 283 | 338 | - | 235 | 344 | - | - | - | - | - | - | - |
| Stage 1 | 790 | 836 | - | 442 | 437 | - | - | - | - | - | - | - |
| Stage 2 | 346 | 428 | - | 656 | 831 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 12 | 19.8 | 6 | 1 |
| HCM LOS | B | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1524 | - | - | 730 | 329 | 1446 | - | - |
| HCM Lane V/C Ratio | 0.157 | - | - | 0.293 | 0.261 | 0.005 | - | - |
| HCM Control Delay (s) | 7.8 | 0 | - | 12 | 19.8 | 7.5 | 0 | - |
| HCM Lane LOS | A | A | - | B | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.6 | - | - | 1.2 | 1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.2 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 16 | 159 | 94 | 236 | 140 | 3 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 9 | 9 | 9 | 9 | 8 | 8 |
| Mvmt Flow | 19 | 185 | 109 | 274 | 163 | 3 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 658 | 165 | 166 | 0 | - | 0 |
| Stage 1 | 165 | - | - | - | - | - |
| Stage 2 | 493 | - | - | - | - | - |
| Critical Hdwy | 6.49 | 6.29 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.49 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.49 | - | - | - | - | - |
| Follow-up Hdwy | 3.581 | 3.381 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 418 | 862 | 1371 | - | - | - |
| Stage 1 | 848 | - | - | - | - | - |
| Stage 2 | 600 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 379 | 862 | 1371 | - | - | - |
| Mov Cap-2 Maneuver | 379 | - | - | - | - | - |
| Stage 1 | 848 | - | - | - | - | - |
| Stage 2 | 544 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 11.3 | 2.2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1371 | - | 772 | - | - |
| HCM Lane V/C Ratio | 0.08 | - | 0.264 | - | - |
| HCM Control Delay (s) | 7.9 | 0 | 11.3 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 1.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.6 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 12 | 79 | 15 | 339 | 286 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 83 | 83 | 83 | 83 | 83 | 83 |
| Heavy Vehicles, % | 3 | 3 | 9 | 9 | 10 | 10 |
| Mvmt Flow | 14 | 95 | 18 | 408 | 345 | 2 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 791 | 346 | 347 | 0 | - | 0 |
| Stage 1 | 346 | - | - | - | - | - |
| Stage 2 | 445 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 357 | 695 | 1174 | - | - | - |
| Stage 1 | 714 | - | - | - | - | - |
| Stage 2 | 644 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 350 | 695 | 1174 | - | - | - |
| Mov Cap-2 Maneuver | 350 | - | - | - | - | - |
| Stage 1 | 714 | - | - | - | - | - |
| Stage 2 | 631 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 12.1 | 0.3 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1174 | - | 615 | - | - |
| HCM Lane V/C Ratio | 0.015 | - | 0.178 | - | - |
| HCM Control Delay (s) | 8.1 | 0 | 12.1 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.6 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 10 | 13 | 81 | 19 | 7 | 5 | 198 | 381 | 77 | 12 | 320 | 14 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 12 | 16 | 0 | 23 | 8 | 6 | 239 | 459 | 0 | 14 | 386 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 174 | 154 | 131 | 151 | 62 | 47 | 232 | 2605 | 1165 | 582 | 1942 | 869 |
| Arrive On Green | 0.08 | 0.08 | 0.00 | 0.08 | 0.08 | 0.08 | 0.14 | 0.79 | 0.00 | 0.59 | 0.59 | 0.00 |
| Sat Flow, veh/h | 1380 | 1845 | 1568 | 1044 | 742 | 557 | 1660 | 3312 | 1482 | 869 | 3312 | 1482 |
| Grp Volume(v), veh/h | 12 | 16 | 0 | 23 | 0 | 14 | 239 | 459 | 0 | 14 | 386 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1380 | 1845 | 1568 | 1044 | 0 | 1299 | 1660 | 1656 | 1482 | 869 | 1656 | 1482 |
| Q Serve(g_s), s | 0.8 | 0.8 | 0.0 | 2.1 | 0.0 | 1.0 | 14.0 | 3.4 | 0.0 | 0.7 | 5.5 | 0.0 |
| Cycle Q Clear(g_c), s | 1.8 | 0.8 | 0.0 | 2.9 | 0.0 | 1.0 | 14.0 | 3.4 | 0.0 | 0.7 | 5.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.43 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 174 | 154 | 131 | 151 | 0 | 109 | 232 | 2605 | 1165 | 582 | 1942 | 869 |
| V/C Ratio(X) | 0.07 | 0.10 | 0.00 | 0.15 | 0.00 | 0.13 | 1.03 | 0.18 | 0.00 | 0.02 | 0.20 | 0.00 |
| Avail Cap(c_a), veh/h | 424 | 489 | 416 | 340 | 0 | 344 | 232 | 2605 | 1165 | 582 | 1942 | 869 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 43.3 | 42.4 | 0.0 | 43.7 | 0.0 | 42.5 | 43.0 | 2.6 | 0.0 | 8.7 | 9.7 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.3 | 0.0 | 0.5 | 0.0 | 0.5 | 66.6 | 0.1 | 0.0 | 0.1 | 0.2 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.4 | 0.0 | 0.6 | 0.0 | 0.4 | 10.7 | 1.6 | 0.0 | 0.2 | 2.5 | 0.0 |
| LnGrp Delay(d),s/veh | 43.5 | 42.7 | 0.0 | 44.2 | 0.0 | 43.0 | 109.7 | 2.8 | 0.0 | 8.8 | 9.9 | 0.0 |
| LnGrp LOS | D | D | | D | | D | F | A | | A | A | |
| Approach Vol, veh/h | | 28 | | | 37 | | | 698 | | | 400 | |
| Approach Delay, s/veh | | 43.0 | | | 43.7 | | | 39.4 | | | 9.9 | |
| Approach LOS | | D | | | D | | | D | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 85.1 | | 14.9 | 20.0 | 65.1 | | 14.9 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 60.5 | | 26.5 | 14.0 | 40.5 | | 26.5 |
| Max Q Clear Time (g_c+I1), s | | 5.4 | | 3.8 | 16.0 | 7.5 | | 4.9 |
| Green Ext Time (p_c), s | | 8.1 | | 0.3 | 0.0 | 7.6 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 29.5 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 33 | 150 | 249 | 662 | 426 | 30 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 38 | 0 | 286 | 761 | 490 | 34 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 204 | 94 | 273 | 2741 | 1820 | 814 |
| Arrive On Green | 0.07 | 0.00 | 0.16 | 0.80 | 0.58 | 0.58 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 38 | 0 | 286 | 761 | 490 | 34 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 1.1 | 0.0 | 16.0 | 5.6 | 7.8 | 1.0 |
| Cycle Q Clear(g_c), s | 1.1 | 0.0 | 16.0 | 5.6 | 7.8 | 1.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 204 | 94 | 273 | 2741 | 1820 | 814 |
| V/C Ratio(X) | 0.19 | 0.00 | 1.05 | 0.28 | 0.27 | 0.04 |
| Avail Cap(c_a), veh/h | 580 | 267 | 273 | 2741 | 1820 | 814 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.2 | 0.0 | 42.0 | 2.5 | 10.2 | 8.8 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 67.3 | 0.3 | 0.4 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 12.6 | 2.6 | 3.4 | 0.4 |
| LnGrp Delay(d),s/veh | 44.7 | 0.0 | 109.3 | 2.7 | 10.6 | 8.9 |
| LnGrp LOS | D | | F | A | B | A |
| Approach Vol, veh/h | 38 | | | 1047 | 524 | |
| Approach Delay, s/veh | 44.7 | | | 31.8 | 10.5 | |
| Approach LOS | D | | | C | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 87.0 | | 13.0 | 22.0 | 65.0 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 68.5 | | 18.5 | 16.0 | 46.5 | | |
| Max Q Clear Time (g_c+I1), s | | 7.6 | | 3.1 | 18.0 | 9.8 | | |
| Green Ext Time (p_c), s | | 14.4 | | 0.1 | 0.0 | 12.9 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 25.2 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 306 | 615 | 9 | 248 | 598 | 381 | 264 | 581 | 179 | 366 | 378 | 181 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 333 | 668 | 10 | 270 | 650 | 0 | 287 | 632 | 0 | 398 | 411 | 197 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 400 | 1015 | 15 | 378 | 937 | 419 | 635 | 737 | 330 | 563 | 806 | 361 |
| Arrive On Green | 0.16 | 0.31 | 0.31 | 0.13 | 0.28 | 0.00 | 0.09 | 0.22 | 0.00 | 0.13 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1630 | 3280 | 49 | 1660 | 3312 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 333 | 331 | 347 | 270 | 650 | 0 | 287 | 632 | 0 | 398 | 411 | 197 |
| Grp Sat Flow(s),veh/h/ln | 1630 | 1626 | 1703 | 1660 | 1656 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 16.7 | 20.6 | 20.6 | 13.2 | 20.4 | 0.0 | 7.9 | 21.6 | 0.0 | 11.2 | 13.1 | 14.2 |
| Cycle Q Clear(g_c), s | 16.7 | 20.6 | 20.6 | 13.2 | 20.4 | 0.0 | 7.9 | 21.6 | 0.0 | 11.2 | 13.1 | 14.2 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 400 | 503 | 527 | 378 | 937 | 419 | 635 | 737 | 330 | 563 | 806 | 361 |
| V/C Ratio(X) | 0.83 | 0.66 | 0.66 | 0.71 | 0.69 | 0.00 | 0.45 | 0.86 | 0.00 | 0.71 | 0.51 | 0.55 |
| Avail Cap(c_a), veh/h | 404 | 503 | 527 | 426 | 937 | 419 | 1018 | 816 | 365 | 831 | 806 | 361 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.9 | 34.9 | 34.9 | 25.8 | 37.3 | 0.0 | 30.2 | 43.4 | 0.0 | 30.5 | 37.1 | 37.5 |
| Incr Delay (d2), s/veh | 13.6 | 6.6 | 6.3 | 4.9 | 4.2 | 0.0 | 0.5 | 8.4 | 0.0 | 1.6 | 0.5 | 1.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.9 | 10.1 | 10.6 | 6.5 | 9.9 | 0.0 | 3.5 | 10.6 | 0.0 | 4.8 | 5.7 | 5.6 |
| LnGrp Delay(d),s/veh | 39.6 | 41.5 | 41.3 | 30.7 | 41.6 | 0.0 | 30.7 | 51.8 | 0.0 | 32.1 | 37.6 | 39.2 |
| LnGrp LOS | D | D | D | C | D | | C | D | | C | D | D |
| Approach Vol, veh/h | | 1011 | | | 920 | | | 919 | | | 1006 | |
| Approach Delay, s/veh | | 40.8 | | | 38.4 | | | 45.2 | | | 35.8 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 21.6 | 43.1 | 19.7 | 32.2 | 24.7 | 40.0 | 16.0 | 36.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 15.2 | 22.6 | 13.2 | 23.6 | 18.7 | 22.4 | 9.9 | 16.2 |
| Green Ext Time (p_c), s | 0.4 | 6.4 | 1.5 | 2.6 | 0.1 | 6.5 | 1.2 | 6.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 40.0 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 16 | 70 | 177 | 16 | 59 | 5 | 62 | 100 | 18 | 5 | 41 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 21 | 91 | 230 | 21 | 77 | 6 | 81 | 130 | 23 | 6 | 53 | 8 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 414 | 384 | 57 | 534 | 377 | 142 | 61 | 0 | 0 | 153 | 0 | 0 |
| Stage 1 | 70 | 70 | - | 303 | 303 | - | - | - | - | - | - | - |
| Stage 2 | 344 | 314 | - | 231 | 74 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 545 | 546 | 1004 | 454 | 551 | 900 | 1511 | - | - | 1346 | - | - |
| Stage 1 | 935 | 833 | - | 702 | 660 | - | - | - | - | - | - | - |
| Stage 2 | 667 | 653 | - | 767 | 829 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 457 | 511 | 1004 | 288 | 516 | 900 | 1511 | - | - | 1346 | - | - |
| Mov Cap-2 Maneuver | 457 | 511 | - | 288 | 516 | - | - | - | - | - | - | - |
| Stage 1 | 880 | 829 | - | 661 | 621 | - | - | - | - | - | - | - |
| Stage 2 | 546 | 614 | - | 524 | 825 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 13.6 | 15.2 | 2.6 | 0.7 |
| HCM LOS | B | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1511 | - | - | 755 | 456 | 1346 | - | - |
| HCM Lane V/C Ratio | 0.053 | - | - | 0.452 | 0.228 | 0.005 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 13.6 | 15.2 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | B | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 2.4 | 0.9 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.4 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 11 | 104 | 175 | 160 | 235 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 12 | 12 | 10 | 10 | 3 | 3 |
| Mvmt Flow | 14 | 133 | 224 | 205 | 301 | 14 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 962 | 308 | 315 | 0 | - | 0 |
| Stage 1 | 308 | - | - | - | - | - |
| Stage 2 | 654 | - | - | - | - | - |
| Critical Hdwy | 6.52 | 6.32 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.52 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.52 | - | - | - | - | - |
| Follow-up Hdwy | 3.608 | 3.408 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 272 | 709 | 1201 | - | - | - |
| Stage 1 | 723 | - | - | - | - | - |
| Stage 2 | 499 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 215 | 709 | 1201 | - | - | - |
| Mov Cap-2 Maneuver | 215 | - | - | - | - | - |
| Stage 1 | 723 | - | - | - | - | - |
| Stage 2 | 394 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 13.3 | 4.5 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1201 | - | 581 | - | - |
| HCM Lane V/C Ratio | 0.187 | - | 0.254 | - | - |
| HCM Control Delay (s) | 8.7 | 0 | 13.3 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.7 | - | 1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 4 | 19 | 71 | 314 | 325 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 81 | 81 | 81 | 81 | 81 | 81 |
| Heavy Vehicles, % | 55 | 55 | 10 | 10 | 6 | 6 |
| Mvmt Flow | 5 | 23 | 88 | 388 | 401 | 19 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 973 | 410 | 420 | 0 | - | 0 |
| Stage 1 | 410 | - | - | - | - | - |
| Stage 2 | 563 | - | - | - | - | - |
| Critical Hdwy | 6.95 | 6.75 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.95 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.95 | - | - | - | - | - |
| Follow-up Hdwy | 3.995 | 3.795 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 225 | 542 | 1097 | - | - | - |
| Stage 1 | 570 | - | - | - | - | - |
| Stage 2 | 478 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 202 | 542 | 1097 | - | - | - |
| Mov Cap-2 Maneuver | 202 | - | - | - | - | - |
| Stage 1 | 570 | - | - | - | - | - |
| Stage 2 | 429 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.2 | 1.6 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1097 | - | 419 | - | - |
| HCM Lane V/C Ratio | 0.08 | - | 0.068 | - | - |
| HCM Control Delay (s) | 8.6 | 0 | 14.2 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 0.2 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 16 | 6 | 231 | 103 | 12 | 13 | 135 | 344 | 19 | 4 | 472 | 29 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 20 | 8 | 0 | 129 | 15 | 16 | 169 | 430 | 0 | 5 | 590 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 209 | 215 | 183 | 234 | 99 | 106 | 197 | 2396 | 1072 | 588 | 1912 | 856 |
| Arrive On Green | 0.12 | 0.12 | 0.00 | 0.12 | 0.12 | 0.12 | 0.12 | 0.75 | 0.00 | 0.57 | 0.57 | 0.00 |
| Sat Flow, veh/h | 1321 | 1792 | 1524 | 1402 | 826 | 881 | 1601 | 3195 | 1429 | 909 | 3374 | 1509 |
| Grp Volume(v), veh/h | 20 | 8 | 0 | 129 | 0 | 31 | 169 | 430 | 0 | 5 | 590 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1321 | 1792 | 1524 | 1402 | 0 | 1707 | 1601 | 1597 | 1429 | 909 | 1687 | 1509 |
| Q Serve(g_s), s | 1.4 | 0.4 | 0.0 | 9.0 | 0.0 | 1.6 | 10.3 | 3.9 | 0.0 | 0.2 | 9.2 | 0.0 |
| Cycle Q Clear(g_c), s | 3.0 | 0.4 | 0.0 | 9.4 | 0.0 | 1.6 | 10.3 | 3.9 | 0.0 | 0.2 | 9.2 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.52 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 209 | 215 | 183 | 234 | 0 | 205 | 197 | 2396 | 1072 | 588 | 1912 | 856 |
| V/C Ratio(X) | 0.10 | 0.04 | 0.00 | 0.55 | 0.00 | 0.15 | 0.86 | 0.18 | 0.00 | 0.01 | 0.31 | 0.00 |
| Avail Cap(c_a), veh/h | 401 | 475 | 404 | 438 | 0 | 452 | 224 | 2396 | 1072 | 588 | 1912 | 856 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 40.8 | 38.9 | 0.0 | 43.0 | 0.0 | 39.4 | 43.0 | 3.6 | 0.0 | 9.4 | 11.4 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.1 | 0.0 | 2.0 | 0.0 | 0.3 | 24.3 | 0.2 | 0.0 | 0.0 | 0.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.2 | 0.0 | 3.6 | 0.0 | 0.8 | 5.9 | 1.7 | 0.0 | 0.1 | 4.4 | 0.0 |
| LnGrp Delay(d),s/veh | 41.0 | 39.0 | 0.0 | 45.0 | 0.0 | 39.8 | 67.2 | 3.8 | 0.0 | 9.5 | 11.8 | 0.0 |
| LnGrp LOS | D | D | | D | | D | E | A | | A | B | |
| Approach Vol, veh/h | | 28 | | | 160 | | | 599 | | | 595 | |
| Approach Delay, s/veh | | 40.4 | | | 44.0 | | | 21.7 | | | 11.8 | |
| Approach LOS | | D | | | D | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 81.5 | | 18.5 | 18.3 | 63.2 | | 18.5 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 60.5 | | 26.5 | 14.0 | 40.5 | | 26.5 |
| Max Q Clear Time (g_c+I1), s | | 5.9 | | 5.0 | 12.3 | 11.2 | | 11.4 |
| Green Ext Time (p_c), s | | 10.3 | | 0.8 | 0.1 | 9.1 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 20.4 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 35 | 256 | 215 | 542 | 916 | 59 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 39 | 0 | 239 | 602 | 1018 | 66 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 217 | 100 | 259 | 2591 | 1988 | 890 |
| Arrive On Green | 0.07 | 0.00 | 0.16 | 0.80 | 0.58 | 0.58 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 39 | 0 | 239 | 602 | 1018 | 66 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 1.1 | 0.0 | 14.6 | 4.5 | 17.7 | 1.9 |
| Cycle Q Clear(g_c), s | 1.1 | 0.0 | 14.6 | 4.5 | 17.7 | 1.9 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 217 | 100 | 259 | 2591 | 1988 | 890 |
| V/C Ratio(X) | 0.18 | 0.00 | 0.92 | 0.23 | 0.51 | 0.07 |
| Avail Cap(c_a), veh/h | 607 | 279 | 259 | 2591 | 1988 | 890 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.1 | 0.0 | 41.4 | 2.4 | 12.4 | 9.1 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 36.3 | 0.2 | 0.9 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 9.1 | 2.0 | 8.6 | 0.8 |
| LnGrp Delay(d),s/veh | 44.5 | 0.0 | 77.7 | 2.6 | 13.3 | 9.2 |
| LnGrp LOS | D | | E | A | B | A |
| Approach Vol, veh/h | 39 | | | 841 | 1084 | |
| Approach Delay, s/veh | 44.5 | | | 23.9 | 13.0 | |
| Approach LOS | D | | | C | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 86.9 | | 13.1 | 22.0 | 64.9 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 68.5 | | 18.5 | 16.0 | 46.5 | | |
| Max Q Clear Time (g_c+I1), s | | 6.5 | | 3.1 | 16.6 | 19.7 | | |
| Green Ext Time (p_c), s | | 22.7 | | 0.1 | 0.0 | 15.5 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 167 | 585 | 6 | 269 | 729 | 242 | 362 | 316 | 292 | 272 | 528 | 201 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 182 | 636 | 7 | 292 | 792 | 0 | 393 | 343 | 0 | 296 | 574 | 218 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 310 | 989 | 11 | 397 | 1144 | 512 | 604 | 841 | 376 | 744 | 737 | 330 |
| Arrive On Green | 0.10 | 0.30 | 0.30 | 0.14 | 0.34 | 0.00 | 0.12 | 0.25 | 0.00 | 0.10 | 0.23 | 0.23 |
| Sat Flow, veh/h | 1645 | 3325 | 37 | 1691 | 3374 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 182 | 314 | 329 | 292 | 792 | 0 | 393 | 343 | 0 | 296 | 574 | 218 |
| Grp Sat Flow(s),veh/h/ln | 1645 | 1641 | 1721 | 1691 | 1687 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 8.4 | 18.4 | 18.5 | 12.9 | 22.5 | 0.0 | 9.9 | 9.4 | 0.0 | 7.7 | 18.4 | 15.1 |
| Cycle Q Clear(g_c), s | 8.4 | 18.4 | 18.5 | 12.9 | 22.5 | 0.0 | 9.9 | 9.4 | 0.0 | 7.7 | 18.4 | 15.1 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 310 | 488 | 512 | 397 | 1144 | 512 | 604 | 841 | 376 | 744 | 737 | 330 |
| V/C Ratio(X) | 0.59 | 0.64 | 0.64 | 0.73 | 0.69 | 0.00 | 0.65 | 0.41 | 0.00 | 0.40 | 0.78 | 0.66 |
| Avail Cap(c_a), veh/h | 433 | 488 | 512 | 452 | 1144 | 512 | 946 | 881 | 394 | 1145 | 850 | 380 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.9 | 33.9 | 33.9 | 23.6 | 31.7 | 0.0 | 29.0 | 34.8 | 0.0 | 28.1 | 40.3 | 39.0 |
| Incr Delay (d2), s/veh | 1.8 | 6.4 | 6.1 | 5.3 | 3.5 | 0.0 | 1.2 | 0.3 | 0.0 | 0.3 | 4.1 | 3.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.9 | 9.2 | 9.6 | 6.6 | 11.0 | 0.0 | 4.5 | 4.4 | 0.0 | 3.4 | 8.7 | 6.4 |
| LnGrp Delay(d),s/veh | 26.7 | 40.3 | 40.0 | 28.9 | 35.1 | 0.0 | 30.2 | 35.1 | 0.0 | 28.5 | 44.4 | 42.5 |
| LnGrp LOS | C | D | D | C | D | | C | D | | C | D | D |
| Approach Vol, veh/h | | 825 | | | 1084 | | | 736 | | | 1088 | |
| Approach Delay, s/veh | | 37.2 | | | 33.5 | | | 32.5 | | | 39.7 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 21.4 | 40.0 | 15.9 | 33.7 | 16.7 | 44.6 | 18.4 | 31.2 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 14.9 | 20.5 | 9.7 | 11.4 | 10.4 | 24.5 | 11.9 | 20.4 |
| Green Ext Time (p_c), s | 0.5 | 7.9 | 1.2 | 7.5 | 0.4 | 5.8 | 1.6 | 4.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 35.9 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 10 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 10 | 36 | 170 | 10 | 76 | 0 | 235 | 62 | 38 | 9 | 156 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 11 | 39 | 183 | 11 | 82 | 0 | 253 | 67 | 41 | 10 | 168 | 32 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 836 | 816 | 184 | 906 | 811 | 87 | 200 | 0 | 0 | 108 | 0 | 0 |
| Stage 1 | 203 | 203 | - | 592 | 592 | - | - | - | - | - | - | - |
| Stage 2 | 633 | 613 | - | 314 | 219 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 284 | 309 | 853 | 255 | 311 | 966 | 1343 | - | - | 1400 | - | - |
| Stage 1 | 794 | 730 | - | 489 | 491 | - | - | - | - | - | - | - |
| Stage 2 | 464 | 480 | - | 693 | 718 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 179 | 245 | 853 | 149 | 247 | 966 | 1343 | - | - | 1400 | - | - |
| Mov Cap-2 Maneuver | 179 | 245 | - | 149 | 247 | - | - | - | - | - | - | - |
| Stage 1 | 634 | 724 | - | 391 | 392 | - | - | - | - | - | - | - |
| Stage 2 | 293 | 384 | - | 511 | 712 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 16.7 | 31 | 5.8 | 0.4 |
| HCM LOS | C | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1343 | - | - | 537 | 229 | 1400 | - | - |
| HCM Lane V/C Ratio | 0.188 | - | - | 0.433 | 0.404 | 0.007 | - | - |
| HCM Control Delay (s) | 8.3 | 0 | - | 16.7 | 31 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | C | D | A | A | - |
| HCM 95th %tile Q(veh) | 0.7 | - | - | 2.2 | 1.8 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.1 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 19 | 167 | 101 | 277 | 256 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 9 | 9 | 9 | 9 | 8 | 8 |
| Mvmt Flow | 22 | 194 | 117 | 322 | 298 | 15 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 862 | 305 | 313 | 0 | - | 0 |
| Stage 1 | 305 | - | - | - | - | - |
| Stage 2 | 557 | - | - | - | - | - |
| Critical Hdwy | 6.49 | 6.29 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.49 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.49 | - | - | - | - | - |
| Follow-up Hdwy | 3.581 | 3.381 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 317 | 719 | 1209 | - | - | - |
| Stage 1 | 732 | - | - | - | - | - |
| Stage 2 | 560 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 280 | 719 | 1209 | - | - | - |
| Mov Cap-2 Maneuver | 280 | - | - | - | - | - |
| Stage 1 | 732 | - | - | - | - | - |
| Stage 2 | 494 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 13.9 | 2.2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1209 | - | 620 | - | - |
| HCM Lane V/C Ratio | 0.097 | - | 0.349 | - | - |
| HCM Control Delay (s) | 8.3 | 0 | 13.9 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 1.6 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 13 | 83 | 16 | 385 | 409 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 83 | 83 | 83 | 83 | 83 | 83 |
| Heavy Vehicles, % | 3 | 3 | 9 | 9 | 10 | 10 |
| Mvmt Flow | 16 | 100 | 19 | 464 | 493 | 5 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 997 | 495 | 498 | 0 | - | 0 |
| Stage 1 | 495 | - | - | - | - | - |
| Stage 2 | 502 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 269 | 573 | 1031 | - | - | - |
| Stage 1 | 611 | - | - | - | - | - |
| Stage 2 | 606 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 262 | 573 | 1031 | - | - | - |
| Mov Cap-2 Maneuver | 262 | - | - | - | - | - |
| Stage 1 | 611 | - | - | - | - | - |
| Stage 2 | 591 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.5 | 0.3 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1031 | - | 494 | - | - |
| HCM Lane V/C Ratio | 0.019 | - | 0.234 | - | - |
| HCM Control Delay (s) | 8.6 | 0 | 14.5 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.9 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 10 | 14 | 87 | 21 | 7 | 5 | 212 | 404 | 83 | 13 | 342 | 15 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 12 | 17 | 0 | 25 | 8 | 6 | 255 | 487 | 0 | 16 | 412 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 175 | 157 | 133 | 152 | 63 | 47 | 293 | 2600 | 1163 | 537 | 1818 | 813 |
| Arrive On Green | 0.08 | 0.08 | 0.00 | 0.08 | 0.08 | 0.08 | 0.18 | 0.79 | 0.00 | 0.55 | 0.55 | 0.00 |
| Sat Flow, veh/h | 1380 | 1845 | 1568 | 1043 | 742 | 557 | 1660 | 3312 | 1482 | 847 | 3312 | 1482 |
| Grp Volume(v), veh/h | 12 | 17 | 0 | 25 | 0 | 14 | 255 | 487 | 0 | 16 | 412 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1380 | 1845 | 1568 | 1043 | 0 | 1299 | 1660 | 1656 | 1482 | 847 | 1656 | 1482 |
| Q Serve(g_s), s | 0.8 | 0.9 | 0.0 | 2.3 | 0.0 | 1.0 | 15.0 | 3.7 | 0.0 | 0.9 | 6.4 | 0.0 |
| Cycle Q Clear(g_c), s | 1.8 | 0.9 | 0.0 | 3.1 | 0.0 | 1.0 | 15.0 | 3.7 | 0.0 | 0.9 | 6.4 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.43 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 175 | 157 | 133 | 152 | 0 | 110 | 293 | 2600 | 1163 | 537 | 1818 | 813 |
| V/C Ratio(X) | 0.07 | 0.11 | 0.00 | 0.16 | 0.00 | 0.13 | 0.87 | 0.19 | 0.00 | 0.03 | 0.23 | 0.00 |
| Avail Cap(c_a), veh/h | 424 | 489 | 416 | 339 | 0 | 344 | 432 | 2600 | 1163 | 537 | 1818 | 813 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 43.2 | 42.3 | 0.0 | 43.7 | 0.0 | 42.3 | 40.1 | 2.7 | 0.0 | 10.4 | 11.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.3 | 0.0 | 0.5 | 0.0 | 0.5 | 12.3 | 0.2 | 0.0 | 0.1 | 0.3 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.4 | 0.0 | 0.7 | 0.0 | 0.4 | 7.9 | 1.7 | 0.0 | 0.2 | 3.0 | 0.0 |
| LnGrp Delay(d),s/veh | 43.3 | 42.6 | 0.0 | 44.2 | 0.0 | 42.8 | 52.4 | 2.9 | 0.0 | 10.5 | 11.9 | 0.0 |
| LnGrp LOS | D | D | | D | | D | D | A | | B | B | |
| Approach Vol, veh/h | | 29 | | | 39 | | | 742 | | | 428 | |
| Approach Delay, s/veh | | 42.9 | | | 43.7 | | | 19.9 | | | 11.9 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 85.0 | | 15.0 | 23.6 | 61.4 | | 15.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 60.5 | | 26.5 | 26.0 | 28.5 | | 26.5 |
| Max Q Clear Time (g_c+I1), s | | 5.7 | | 3.8 | 17.0 | 8.4 | | 5.1 |
| Green Ext Time (p_c), s | | 8.8 | | 0.3 | 0.7 | 6.9 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.4 |
| HCM 2010 LOS | B |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 35 | 160 | 267 | 706 | 456 | 32 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 40 | 0 | 307 | 811 | 524 | 37 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 210 | 97 | 352 | 2734 | 1671 | 748 |
| Arrive On Green | 0.07 | 0.00 | 0.21 | 0.80 | 0.54 | 0.54 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 40 | 0 | 307 | 811 | 524 | 37 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 1.2 | 0.0 | 17.4 | 6.2 | 9.4 | 1.3 |
| Cycle Q Clear(g_c), s | 1.2 | 0.0 | 17.4 | 6.2 | 9.4 | 1.3 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 210 | 97 | 352 | 2734 | 1671 | 748 |
| V/C Ratio(X) | 0.19 | 0.00 | 0.87 | 0.30 | 0.31 | 0.05 |
| Avail Cap(c_a), veh/h | 360 | 166 | 615 | 2734 | 1671 | 748 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.1 | 0.0 | 38.4 | 2.5 | 12.9 | 11.0 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 6.8 | 0.3 | 0.5 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 8.9 | 2.9 | 4.1 | 0.5 |
| LnGrp Delay(d),s/veh | 44.5 | 0.0 | 45.3 | 2.8 | 13.4 | 11.1 |
| LnGrp LOS | D | | D | A | B | B |
| Approach Vol, veh/h | 40 | | | 1118 | 561 | |
| Approach Delay, s/veh | 44.5 | | | 14.5 | 13.2 | |
| Approach LOS | D | | | B | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 86.8 | | 13.2 | 26.6 | 60.2 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 75.5 | | 11.5 | 36.0 | 33.5 | | |
| Max Q Clear Time (g_c+I1), s | | 8.2 | | 3.2 | 19.4 | 11.4 | | |
| Green Ext Time (p_c), s | | 16.2 | | 0.1 | 1.2 | 11.1 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.8 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 327 | 659 | 9 | 266 | 641 | 408 | 283 | 621 | 192 | 392 | 405 | 193 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 355 | 716 | 10 | 289 | 697 | 0 | 308 | 675 | 0 | 426 | 440 | 210 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 380 | 973 | 14 | 364 | 921 | 412 | 634 | 746 | 334 | 561 | 818 | 366 |
| Arrive On Green | 0.16 | 0.30 | 0.30 | 0.14 | 0.28 | 0.00 | 0.10 | 0.23 | 0.00 | 0.13 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1630 | 3284 | 46 | 1660 | 3312 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 355 | 354 | 372 | 289 | 697 | 0 | 308 | 675 | 0 | 426 | 440 | 210 |
| Grp Sat Flow(s),veh/h/ln | 1630 | 1626 | 1704 | 1660 | 1656 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 18.6 | 23.3 | 23.3 | 14.5 | 22.8 | 0.0 | 8.5 | 23.8 | 0.0 | 12.2 | 14.3 | 15.4 |
| Cycle Q Clear(g_c), s | 18.6 | 23.3 | 23.3 | 14.5 | 22.8 | 0.0 | 8.5 | 23.8 | 0.0 | 12.2 | 14.3 | 15.4 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 380 | 482 | 505 | 364 | 921 | 412 | 634 | 746 | 334 | 561 | 818 | 366 |
| V/C Ratio(X) | 0.93 | 0.74 | 0.74 | 0.79 | 0.76 | 0.00 | 0.49 | 0.91 | 0.00 | 0.76 | 0.54 | 0.57 |
| Avail Cap(c_a), veh/h | 380 | 482 | 505 | 394 | 921 | 412 | 989 | 802 | 359 | 800 | 818 | 366 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.7 | 37.6 | 37.6 | 27.4 | 39.2 | 0.0 | 30.4 | 44.6 | 0.0 | 30.7 | 37.7 | 38.2 |
| Incr Delay (d2), s/veh | 29.9 | 9.6 | 9.2 | 10.0 | 5.8 | 0.0 | 0.6 | 13.2 | 0.0 | 2.6 | 0.7 | 2.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.3 | 11.7 | 12.2 | 7.6 | 11.2 | 0.0 | 3.8 | 12.2 | 0.0 | 5.2 | 6.3 | 6.2 |
| LnGrp Delay(d),s/veh | 57.6 | 47.2 | 46.8 | 37.4 | 45.0 | 0.0 | 31.0 | 57.9 | 0.0 | 33.4 | 38.4 | 40.3 |
| LnGrp LOS | E | D | D | D | D | | C | E | | C | D | D |
| Approach Vol, veh/h | | 1081 | | | 986 | | | 983 | | | 1076 | |
| Approach Delay, s/veh | | 50.5 | | | 42.8 | | | 49.4 | | | 36.8 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 22.8 | 42.2 | 20.7 | 33.0 | 25.0 | 40.0 | 16.8 | 36.9 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 16.5 | 25.3 | 14.2 | 25.8 | 20.6 | 24.8 | 10.5 | 17.4 |
| Green Ext Time (p_c), s | 0.3 | 5.3 | 1.6 | 1.2 | 0.0 | 5.6 | 1.2 | 6.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 44.8 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 16 | 75 | 189 | 17 | 63 | 5 | 67 | 102 | 20 | 5 | 42 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 21 | 97 | 245 | 22 | 82 | 6 | 87 | 132 | 26 | 6 | 55 | 8 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 435 | 403 | 58 | 562 | 394 | 145 | 62 | 0 | 0 | 158 | 0 | 0 |
| Stage 1 | 71 | 71 | - | 319 | 319 | - | - | - | - | - | - | - |
| Stage 2 | 364 | 332 | - | 243 | 75 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 528 | 533 | 1002 | 435 | 539 | 897 | 1510 | - | - | 1341 | - | - |
| Stage 1 | 934 | 832 | - | 688 | 649 | - | - | - | - | - | - | - |
| Stage 2 | 651 | 641 | - | 756 | 829 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 436 | 497 | 1002 | 265 | 503 | 897 | 1510 | - | - | 1341 | - | - |
| Mov Cap-2 Maneuver | 436 | 497 | - | 265 | 503 | - | - | - | - | - | - | - |
| Stage 1 | 875 | 828 | - | 645 | 608 | - | - | - | - | - | - | - |
| Stage 2 | 524 | 601 | - | 501 | 825 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 14.4 | 16 | 2.7 | 0.7 |
| HCM LOS | B | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1510 | - | - | 744 | 436 | 1341 | - | - |
| HCM Lane V/C Ratio | 0.058 | - | - | 0.489 | 0.253 | 0.005 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 14.4 | 16 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | B | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 2.7 | 1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.6 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 11 | 112 | 187 | 166 | 251 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 12 | 12 | 10 | 10 | 3 | 3 |
| Mvmt Flow | 14 | 144 | 240 | 213 | 322 | 15 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1021 | 329 | 337 | 0 | - | 0 |
| Stage 1 | 329 | - | - | - | - | - |
| Stage 2 | 692 | - | - | - | - | - |
| Critical Hdwy | 6.52 | 6.32 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.52 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.52 | - | - | - | - | - |
| Follow-up Hdwy | 3.608 | 3.408 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 251 | 690 | 1179 | - | - | - |
| Stage 1 | 707 | - | - | - | - | - |
| Stage 2 | 479 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 193 | 690 | 1179 | - | - | - |
| Mov Cap-2 Maneuver | 193 | - | - | - | - | - |
| Stage 1 | 707 | - | - | - | - | - |
| Stage 2 | 368 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 13.9 | 4.7 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1179 | - | 561 | - | - |
| HCM Lane V/C Ratio | 0.203 | - | 0.281 | - | - |
| HCM Control Delay (s) | 8.8 | 0 | 13.9 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.8 | - | 1.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 4 | 21 | 76 | 332 | 348 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 81 | 81 | 81 | 81 | 81 | 81 |
| Heavy Vehicles, % | 55 | 55 | 10 | 10 | 6 | 6 |
| Mvmt Flow | 5 | 26 | 94 | 410 | 430 | 20 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1038 | 440 | 449 | 0 | - | 0 |
| Stage 1 | 440 | - | - | - | - | - |
| Stage 2 | 598 | - | - | - | - | - |
| Critical Hdwy | 6.95 | 6.75 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.95 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.95 | - | - | - | - | - |
| Follow-up Hdwy | 3.995 | 3.795 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 205 | 520 | 1070 | - | - | - |
| Stage 1 | 550 | - | - | - | - | - |
| Stage 2 | 459 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 182 | 520 | 1070 | - | - | - |
| Mov Cap-2 Maneuver | 182 | - | - | - | - | - |
| Stage 1 | 550 | - | - | - | - | - |
| Stage 2 | 407 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.7 | 1.6 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1070 | - | 401 | - | - |
| HCM Lane V/C Ratio | 0.088 | - | 0.077 | - | - |
| HCM Control Delay (s) | 8.7 | 0 | 14.7 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 0.2 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 17 | 6 | 248 | 111 | 13 | 14 | 144 | 366 | 21 | 4 | 499 | 31 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 21 | 8 | 0 | 139 | 16 | 18 | 180 | 458 | 0 | 5 | 624 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 216 | 227 | 193 | 244 | 102 | 114 | 214 | 2374 | 1062 | 559 | 1855 | 830 |
| Arrive On Green | 0.13 | 0.13 | 0.00 | 0.13 | 0.13 | 0.13 | 0.13 | 0.74 | 0.00 | 0.55 | 0.55 | 0.00 |
| Sat Flow, veh/h | 1317 | 1792 | 1524 | 1402 | 802 | 902 | 1601 | 3195 | 1429 | 886 | 3374 | 1509 |
| Grp Volume(v), veh/h | 21 | 8 | 0 | 139 | 0 | 34 | 180 | 458 | 0 | 5 | 624 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1317 | 1792 | 1524 | 1402 | 0 | 1704 | 1601 | 1597 | 1429 | 886 | 1687 | 1509 |
| Q Serve(g_s), s | 1.4 | 0.4 | 0.0 | 9.7 | 0.0 | 1.8 | 11.0 | 4.3 | 0.0 | 0.3 | 10.2 | 0.0 |
| Cycle Q Clear(g_c), s | 3.2 | 0.4 | 0.0 | 10.0 | 0.0 | 1.8 | 11.0 | 4.3 | 0.0 | 0.3 | 10.2 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.53 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 216 | 227 | 193 | 244 | 0 | 216 | 214 | 2374 | 1062 | 559 | 1855 | 830 |
| V/C Ratio(X) | 0.10 | 0.04 | 0.00 | 0.57 | 0.00 | 0.16 | 0.84 | 0.19 | 0.00 | 0.01 | 0.34 | 0.00 |
| Avail Cap(c_a), veh/h | 371 | 439 | 373 | 410 | 0 | 417 | 368 | 2374 | 1062 | 559 | 1855 | 830 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 40.3 | 38.3 | 0.0 | 42.7 | 0.0 | 38.9 | 42.3 | 3.9 | 0.0 | 10.2 | 12.4 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.1 | 0.0 | 2.1 | 0.0 | 0.3 | 8.7 | 0.2 | 0.0 | 0.0 | 0.5 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.2 | 0.0 | 3.9 | 0.0 | 0.9 | 5.4 | 1.9 | 0.0 | 0.1 | 4.9 | 0.0 |
| LnGrp Delay(d),s/veh | 40.5 | 38.3 | 0.0 | 44.8 | 0.0 | 39.2 | 51.0 | 4.0 | 0.0 | 10.2 | 12.9 | 0.0 |
| LnGrp LOS | D | D | | D | | D | D | A | | B | B | |
| Approach Vol, veh/h | | 29 | | | 173 | | | 638 | | | 629 | |
| Approach Delay, s/veh | | 39.9 | | | 43.7 | | | 17.3 | | | 12.9 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 80.8 | | 19.2 | 19.3 | 61.5 | | 19.2 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 62.5 | | 24.5 | 23.0 | 33.5 | | 24.5 |
| Max Q Clear Time (g_c+I1), s | | 6.3 | | 5.2 | 13.0 | 12.2 | | 12.0 |
| Green Ext Time (p_c), s | | 11.3 | | 0.8 | 0.5 | 8.6 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 19.0 |
| HCM 2010 LOS | B |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 37 | 274 | 230 | 579 | 976 | 62 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 41 | 0 | 256 | 643 | 1084 | 69 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 223 | 103 | 292 | 2585 | 1912 | 855 |
| Arrive On Green | 0.07 | 0.00 | 0.18 | 0.80 | 0.56 | 0.56 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 41 | 0 | 256 | 643 | 1084 | 69 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 1.2 | 0.0 | 15.4 | 4.9 | 20.5 | 2.1 |
| Cycle Q Clear(g_c), s | 1.2 | 0.0 | 15.4 | 4.9 | 20.5 | 2.1 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 223 | 103 | 292 | 2585 | 1912 | 855 |
| V/C Ratio(X) | 0.18 | 0.00 | 0.88 | 0.25 | 0.57 | 0.08 |
| Avail Cap(c_a), veh/h | 328 | 151 | 420 | 2585 | 1912 | 855 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.0 | 0.0 | 39.9 | 2.4 | 14.1 | 10.1 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 13.6 | 0.2 | 1.2 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 8.0 | 2.2 | 9.8 | 0.9 |
| LnGrp Delay(d),s/veh | 44.4 | 0.0 | 53.5 | 2.7 | 15.3 | 10.3 |
| LnGrp LOS | D | | D | A | B | B |
| Approach Vol, veh/h | 41 | | | 899 | 1153 | |
| Approach Delay, s/veh | 44.4 | | | 17.2 | 15.0 | |
| Approach LOS | D | | | B | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 86.7 | | 13.3 | 24.1 | 62.6 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 26.0 | 45.0 | | |
| Max Q Clear Time (g_c+I1), s | | 6.9 | | 3.2 | 17.4 | 22.5 | | |
| Green Ext Time (p_c), s | | 26.2 | | 0.0 | 0.7 | 14.8 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.5 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 178 | 627 | 6 | 288 | 781 | 259 | 387 | 338 | 313 | 290 | 563 | 213 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 193 | 682 | 7 | 313 | 849 | 0 | 421 | 367 | 0 | 315 | 612 | 232 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 295 | 957 | 10 | 385 | 1120 | 501 | 603 | 859 | 384 | 744 | 749 | 335 |
| Arrive On Green | 0.10 | 0.29 | 0.29 | 0.15 | 0.33 | 0.00 | 0.13 | 0.25 | 0.00 | 0.10 | 0.23 | 0.23 |
| Sat Flow, veh/h | 1645 | 3328 | 34 | 1691 | 3374 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 193 | 336 | 353 | 313 | 849 | 0 | 421 | 367 | 0 | 315 | 612 | 232 |
| Grp Sat Flow(s),veh/h/ln | 1645 | 1641 | 1721 | 1691 | 1687 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 9.3 | 21.1 | 21.1 | 14.5 | 25.8 | 0.0 | 10.9 | 10.4 | 0.0 | 8.5 | 20.5 | 16.8 |
| Cycle Q Clear(g_c), s | 9.3 | 21.1 | 21.1 | 14.5 | 25.8 | 0.0 | 10.9 | 10.4 | 0.0 | 8.5 | 20.5 | 16.8 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 295 | 472 | 495 | 385 | 1120 | 501 | 603 | 859 | 384 | 744 | 749 | 335 |
| V/C Ratio(X) | 0.65 | 0.71 | 0.71 | 0.81 | 0.76 | 0.00 | 0.70 | 0.43 | 0.00 | 0.42 | 0.82 | 0.69 |
| Avail Cap(c_a), veh/h | 399 | 472 | 495 | 417 | 1120 | 501 | 902 | 859 | 384 | 1109 | 822 | 368 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.0 | 36.7 | 36.7 | 25.4 | 34.2 | 0.0 | 29.8 | 35.8 | 0.0 | 28.7 | 41.9 | 40.5 |
| Incr Delay (d2), s/veh | 2.5 | 8.9 | 8.5 | 11.0 | 4.8 | 0.0 | 1.5 | 0.3 | 0.0 | 0.4 | 6.0 | 4.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.4 | 10.7 | 11.2 | 7.9 | 12.8 | 0.0 | 5.0 | 4.9 | 0.0 | 3.7 | 9.8 | 7.2 |
| LnGrp Delay(d),s/veh | 29.4 | 45.5 | 45.1 | 36.4 | 39.0 | 0.0 | 31.3 | 36.1 | 0.0 | 29.1 | 47.9 | 45.4 |
| LnGrp LOS | C | D | D | D | D | | C | D | | C | D | D |
| Approach Vol, veh/h | | 882 | | | 1162 | | | 788 | | | 1159 | |
| Approach Delay, s/veh | | 41.8 | | | 38.3 | | | 33.6 | | | 42.3 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 22.8 | 40.0 | 16.7 | 35.2 | 17.7 | 45.1 | 19.5 | 32.4 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 16.5 | 23.1 | 10.5 | 12.4 | 11.3 | 27.8 | 12.9 | 22.5 |
| Green Ext Time (p_c), s | 0.3 | 6.9 | 1.3 | 7.8 | 0.4 | 4.0 | 1.7 | 4.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 39.3 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 11 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 10 | 39 | 182 | 9 | 81 | 0 | 251 | 64 | 41 | 9 | 159 | 31 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 11 | 42 | 196 | 10 | 87 | 0 | 270 | 69 | 44 | 10 | 171 | 33 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 881 | 860 | 188 | 957 | 855 | 91 | 204 | 0 | 0 | 113 | 0 | 0 |
| Stage 1 | 207 | 207 | - | 631 | 631 | - | - | - | - | - | - | - |
| Stage 2 | 674 | 653 | - | 326 | 224 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 265 | 291 | 849 | 235 | 293 | 961 | 1338 | - | - | 1394 | - | - |
| Stage 1 | 790 | 727 | - | 466 | 471 | - | - | - | - | - | - | - |
| Stage 2 | 441 | 461 | - | 682 | 715 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 156 | 226 | 849 | 129 | 228 | 961 | 1338 | - | - | 1394 | - | - |
| Mov Cap-2 Maneuver | 156 | 226 | - | 129 | 228 | - | - | - | - | - | - | - |
| Stage 1 | 619 | 721 | - | 365 | 369 | - | - | - | - | - | - | - |
| Stage 2 | 264 | 361 | - | 490 | 709 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 18.5 | 35.5 | 5.9 | 0.3 |
| HCM LOS | C | E | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1338 | - | - | 512 | 212 | 1394 | - | - |
| HCM Lane V/C Ratio | 0.202 | - | - | 0.485 | 0.456 | 0.007 | - | - |
| HCM Control Delay (s) | 8.4 | 0 | - | 18.5 | 35.5 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | C | E | A | A | - |
| HCM 95th %tile Q(veh) | 0.8 | - | - | 2.6 | 2.2 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 20 | 179 | 108 | 295 | 267 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 9 | 9 | 9 | 9 | 8 | 8 |
| Mvmt Flow | 23 | 208 | 126 | 343 | 310 | 15 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 912 | 318 | 326 | 0 | - | 0 |
| Stage 1 | 318 | - | - | - | - | - |
| Stage 2 | 594 | - | - | - | - | - |
| Critical Hdwy | 6.49 | 6.29 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.49 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.49 | - | - | - | - | - |
| Follow-up Hdwy | 3.581 | 3.381 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 295 | 707 | 1195 | - | - | - |
| Stage 1 | 722 | - | - | - | - | - |
| Stage 2 | 538 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 257 | 707 | 1195 | - | - | - |
| Mov Cap-2 Maneuver | 257 | - | - | - | - | - |
| Stage 1 | 722 | - | - | - | - | - |
| Stage 2 | 468 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.7 | 2.2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1195 | - | 601 | - | - |
| HCM Lane V/C Ratio | 0.105 | - | 0.385 | - | - |
| HCM Control Delay (s) | 8.4 | 0 | 14.7 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.4 | - | 1.8 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.8 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 14 | 89 | 17 | 411 | 430 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 83 | 83 | 83 | 83 | 83 | 83 |
| Heavy Vehicles, % | 3 | 3 | 9 | 9 | 10 | 10 |
| Mvmt Flow | 17 | 107 | 20 | 495 | 518 | 5 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1056 | 520 | 523 | 0 | - | 0 |
| Stage 1 | 520 | - | - | - | - | - |
| Stage 2 | 536 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 248 | 554 | 1009 | - | - | - |
| Stage 1 | 595 | - | - | - | - | - |
| Stage 2 | 585 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 241 | 554 | 1009 | - | - | - |
| Mov Cap-2 Maneuver | 241 | - | - | - | - | - |
| Stage 1 | 595 | - | - | - | - | - |
| Stage 2 | 569 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 15.4 | 0.3 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1009 | - | 471 | - | - |
| HCM Lane V/C Ratio | 0.02 | - | 0.263 | - | - |
| HCM Control Delay (s) | 8.6 | 0 | 15.4 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 1 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 11 | 18 | 116 | 27 | 9 | 6 | 282 | 518 | 110 | 17 | 452 | 19 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 13 | 22 | 0 | 33 | 11 | 7 | 340 | 624 | 0 | 20 | 545 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 179 | 168 | 142 | 155 | 73 | 46 | 378 | 2581 | 1154 | 439 | 1628 | 728 |
| Arrive On Green | 0.09 | 0.09 | 0.00 | 0.09 | 0.09 | 0.09 | 0.23 | 0.78 | 0.00 | 0.49 | 0.49 | 0.00 |
| Sat Flow, veh/h | 1376 | 1845 | 1568 | 1038 | 799 | 508 | 1660 | 3312 | 1482 | 746 | 3312 | 1482 |
| Grp Volume(v), veh/h | 13 | 22 | 0 | 33 | 0 | 18 | 340 | 624 | 0 | 20 | 545 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1376 | 1845 | 1568 | 1038 | 0 | 1307 | 1660 | 1656 | 1482 | 746 | 1656 | 1482 |
| Q Serve(g_s), s | 0.9 | 1.1 | 0.0 | 3.0 | 0.0 | 1.3 | 19.9 | 5.1 | 0.0 | 1.4 | 10.0 | 0.0 |
| Cycle Q Clear(g_c), s | 2.1 | 1.1 | 0.0 | 4.1 | 0.0 | 1.3 | 19.9 | 5.1 | 0.0 | 1.4 | 10.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.39 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 179 | 168 | 142 | 155 | 0 | 119 | 378 | 2581 | 1154 | 439 | 1628 | 728 |
| V/C Ratio(X) | 0.07 | 0.13 | 0.00 | 0.21 | 0.00 | 0.15 | 0.90 | 0.24 | 0.00 | 0.05 | 0.33 | 0.00 |
| Avail Cap(c_a), veh/h | 412 | 480 | 408 | 330 | 0 | 340 | 481 | 2581 | 1154 | 439 | 1628 | 728 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 42.9 | 41.8 | 0.0 | 43.7 | 0.0 | 41.9 | 37.5 | 3.0 | 0.0 | 13.3 | 15.5 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.4 | 0.0 | 0.7 | 0.0 | 0.6 | 16.9 | 0.2 | 0.0 | 0.2 | 0.6 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.6 | 0.0 | 0.9 | 0.0 | 0.5 | 10.8 | 2.3 | 0.0 | 0.3 | 4.7 | 0.0 |
| LnGrp Delay(d),s/veh | 43.1 | 42.2 | 0.0 | 44.4 | 0.0 | 42.5 | 54.4 | 3.2 | 0.0 | 13.5 | 16.0 | 0.0 |
| LnGrp LOS | D | D | | D | | D | D | A | | B | B | |
| Approach Vol, veh/h | | 35 | | | 51 | | | 964 | | | 565 | |
| Approach Delay, s/veh | | 42.5 | | | 43.7 | | | 21.3 | | | 15.9 | |
| Approach LOS | | D | | | D | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 84.4 | | 15.6 | 28.7 | 55.7 | | 15.6 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 61.0 | | 26.0 | 29.0 | 26.0 | | 26.0 |
| Max Q Clear Time (g_c+I1), s | | 7.1 | | 4.1 | 21.9 | 12.0 | | 6.1 |
| Green Ext Time (p_c), s | | 12.8 | | 0.4 | 0.9 | 7.4 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 20.6 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 42 | 213 | 356 | 925 | 604 | 41 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 48 | 0 | 409 | 1063 | 694 | 47 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 231 | 106 | 454 | 2712 | 1464 | 655 |
| Arrive On Green | 0.07 | 0.00 | 0.27 | 0.80 | 0.47 | 0.47 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 48 | 0 | 409 | 1063 | 694 | 47 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 1.4 | 0.0 | 23.1 | 9.2 | 15.2 | 1.9 |
| Cycle Q Clear(g_c), s | 1.4 | 0.0 | 23.1 | 9.2 | 15.2 | 1.9 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 231 | 106 | 454 | 2712 | 1464 | 655 |
| V/C Ratio(X) | 0.21 | 0.00 | 0.90 | 0.39 | 0.47 | 0.07 |
| Avail Cap(c_a), veh/h | 313 | 144 | 632 | 2712 | 1464 | 655 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.6 | 0.0 | 35.4 | 3.0 | 18.0 | 14.5 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 12.6 | 0.4 | 1.1 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 0.0 | 12.5 | 4.4 | 6.7 | 0.7 |
| LnGrp Delay(d),s/veh | 44.0 | 0.0 | 48.0 | 3.4 | 19.2 | 14.7 |
| LnGrp LOS | D | | D | A | B | B |
| Approach Vol, veh/h | 48 | | | 1472 | 741 | |
| Approach Delay, s/veh | 44.0 | | | 15.8 | 18.9 | |
| Approach LOS | D | | | B | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 86.1 | | 13.9 | 32.6 | 53.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 37.0 | 34.0 | | |
| Max Q Clear Time (g_c+I1), s | | 11.2 | | 3.4 | 25.1 | 17.2 | | |
| Green Ext Time (p_c), s | | 26.0 | | 0.1 | 1.5 | 12.0 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 17.4 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 429 | 878 | 12 | 354 | 854 | 541 | 377 | 821 | 255 | 521 | 538 | 256 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 466 | 954 | 13 | 385 | 928 | 0 | 410 | 892 | 0 | 566 | 585 | 278 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 302 | 858 | 12 | 306 | 865 | 387 | 633 | 753 | 337 | 631 | 865 | 387 |
| Arrive On Green | 0.15 | 0.26 | 0.26 | 0.15 | 0.26 | 0.00 | 0.12 | 0.23 | 0.00 | 0.17 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1630 | 3285 | 45 | 1660 | 3312 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 466 | 472 | 495 | 385 | 928 | 0 | 410 | 892 | 0 | 566 | 585 | 278 |
| Grp Sat Flow(s),veh/h/ln | 1630 | 1626 | 1704 | 1660 | 1656 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 19.0 | 33.0 | 33.0 | 19.0 | 33.0 | 0.0 | 12.1 | 29.0 | 0.0 | 18.1 | 21.0 | 22.6 |
| Cycle Q Clear(g_c), s | 19.0 | 33.0 | 33.0 | 19.0 | 33.0 | 0.0 | 12.1 | 29.0 | 0.0 | 18.1 | 21.0 | 22.6 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 302 | 425 | 445 | 306 | 865 | 387 | 633 | 753 | 337 | 631 | 865 | 387 |
| V/C Ratio(X) | 1.54 | 1.11 | 1.11 | 1.26 | 1.07 | 0.00 | 0.65 | 1.18 | 0.00 | 0.90 | 0.68 | 0.72 |
| Avail Cap(c_a), veh/h | 302 | 425 | 445 | 306 | 865 | 387 | 871 | 753 | 337 | 718 | 865 | 387 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.9 | 46.7 | 46.7 | 38.1 | 46.7 | 0.0 | 31.8 | 48.7 | 0.0 | 34.4 | 40.8 | 41.4 |
| Incr Delay (d2), s/veh | 260.3 | 77.8 | 76.9 | 139.1 | 52.2 | 0.0 | 1.1 | 96.4 | 0.0 | 13.0 | 2.1 | 6.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 32.3 | 23.9 | 24.9 | 22.5 | 21.3 | 0.0 | 5.3 | 23.1 | 0.0 | 10.7 | 9.4 | 9.4 |
| LnGrp Delay(d),s/veh | 298.2 | 124.5 | 123.6 | 177.3 | 99.0 | 0.0 | 32.9 | 145.1 | 0.0 | 47.4 | 42.9 | 47.7 |
| LnGrp LOS | F | F | F | F | F | | C | F | | D | D | D |
| Approach Vol, veh/h | | 1433 | | | 1313 | | | 1302 | | | 1429 | |
| Approach Delay, s/veh | | 180.7 | | | 121.9 | | | 109.8 | | | 45.6 | |
| Approach LOS | | F | | | F | | | F | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 25.0 | 40.0 | 26.4 | 35.0 | 25.0 | 40.0 | 20.6 | 40.8 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 35.0 | 20.1 | 31.0 | 21.0 | 35.0 | 14.1 | 24.6 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 | 0.0 | 1.5 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 114.5 |
| HCM 2010 LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 14.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 17 | 99 | 252 | 23 | 84 | 6 | 89 | 111 | 26 | 6 | 51 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 22 | 129 | 327 | 30 | 109 | 8 | 116 | 144 | 34 | 8 | 66 | 9 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 537 | 495 | 71 | 706 | 483 | 161 | 75 | 0 | 0 | 178 | 0 | 0 |
| Stage 1 | 86 | 86 | - | 392 | 392 | - | - | - | - | - | - | - |
| Stage 2 | 451 | 409 | - | 314 | 91 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 452 | 473 | 986 | 348 | 480 | 879 | 1493 | - | - | 1318 | - | - |
| Stage 1 | 917 | 820 | - | 629 | 603 | - | - | - | - | - | - | - |
| Stage 2 | 584 | 593 | - | 693 | 816 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 337 | 429 | 986 | 167 | 436 | 879 | 1493 | - | - | 1318 | - | - |
| Mov Cap-2 Maneuver | 337 | 429 | - | 167 | 436 | - | - | - | - | - | - | - |
| Stage 1 | 837 | 815 | - | 574 | 551 | - | - | - | - | - | - | - |
| Stage 2 | 424 | 541 | - | 388 | 811 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 21.4 | 23.9 | 3 | 0.7 |
| HCM LOS | C | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1493 | - | - | 686 | 335 | 1318 | - | - |
| HCM Lane V/C Ratio | 0.077 | - | - | 0.697 | 0.438 | 0.006 | - | - |
| HCM Control Delay (s) | 7.6 | 0 | - | 21.4 | 23.9 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | C | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.3 | - | - | 5.7 | 2.1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 6 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 13 | 149 | 249 | 199 | 329 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 12 | 12 | 10 | 10 | 3 | 3 |
| Mvmt Flow | 17 | 191 | 319 | 255 | 422 | 19 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1325 | 431 | 441 | 0 | - | 0 |
| Stage 1 | 431 | - | - | - | - | - |
| Stage 2 | 894 | - | - | - | - | - |
| Critical Hdwy | 6.52 | 6.32 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.52 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.52 | - | - | - | - | - |
| Follow-up Hdwy | 3.608 | 3.408 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 164 | 604 | 1078 | - | - | - |
| Stage 1 | 635 | - | - | - | - | - |
| Stage 2 | 384 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 107 | 604 | 1078 | - | - | - |
| Mov Cap-2 Maneuver | 107 | - | - | - | - | - |
| Stage 1 | 635 | - | - | - | - | - |
| Stage 2 | 252 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 20.3 | 5.4 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1078 | - | 440 | - | - |
| HCM Lane V/C Ratio | 0.296 | - | 0.472 | - | - |
| HCM Control Delay (s) | 9.7 | 0 | 20.3 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 1.2 | - | 2.5 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.5 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 4 | 27 | 101 | 420 | 459 | 21 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 81 | 81 | 81 | 81 | 81 | 81 |
| Heavy Vehicles, % | 55 | 55 | 10 | 10 | 6 | 6 |
| Mvmt Flow | 5 | 33 | 125 | 519 | 567 | 26 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1348 | 580 | 593 | 0 | - | 0 |
| Stage 1 | 580 | - | - | - | - | - |
| Stage 2 | 768 | - | - | - | - | - |
| Critical Hdwy | 6.95 | 6.75 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.95 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.95 | - | - | - | - | - |
| Follow-up Hdwy | 3.995 | 3.795 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 129 | 427 | 945 | - | - | - |
| Stage 1 | 469 | - | - | - | - | - |
| Stage 2 | 376 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 105 | 427 | 945 | - | - | - |
| Mov Cap-2 Maneuver | 105 | - | - | - | - | - |
| Stage 1 | 469 | - | - | - | - | - |
| Stage 2 | 306 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 18.4 | 1.8 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 945 | - | 306 | - | - |
| HCM Lane V/C Ratio | 0.132 | - | 0.125 | - | - |
| HCM Control Delay (s) | 9.4 | 0 | 18.4 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0.5 | - | 0.4 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 17 | 99 | 252 | 23 | 84 | 6 | 89 | 111 | 26 | 6 | 51 | 7 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1827 | 1900 | 1900 | 1827 | 1900 | 1900 | 1776 | 1900 | 1900 | 1638 | 1900 |
| Adj Flow Rate, veh/h | 22 | 129 | 327 | 30 | 109 | 8 | 116 | 144 | 34 | 8 | 66 | 9 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Cap, veh/h | 107 | 193 | 446 | 187 | 566 | 37 | 258 | 238 | 48 | 114 | 366 | 46 |
| Arrive On Green | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 |
| Sat Flow, veh/h | 31 | 480 | 1106 | 194 | 1406 | 92 | 486 | 880 | 179 | 53 | 1355 | 171 |
| Grp Volume(v), veh/h | 478 | 0 | 0 | 147 | 0 | 0 | 294 | 0 | 0 | 83 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1617 | 0 | 0 | 1693 | 0 | 0 | 1544 | 0 | 0 | 1579 | 0 | 0 |
| Q Serve(g_s), s | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 9.9 | 0.0 | 0.0 | 2.1 | 0.0 | 0.0 | 6.7 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 |
| Prop In Lane | 0.05 | | 0.68 | 0.20 | | 0.05 | 0.39 | | 0.12 | 0.10 | | 0.11 |
| Lane Grp Cap(c), veh/h | 746 | 0 | 0 | 791 | 0 | 0 | 543 | 0 | 0 | 526 | 0 | 0 |
| V/C Ratio(X) | 0.64 | 0.00 | 0.00 | 0.19 | 0.00 | 0.00 | 0.54 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1129 | 0 | 0 | 1151 | 0 | 0 | 951 | 0 | 0 | 940 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 10.0 | 0.0 | 0.0 | 7.7 | 0.0 | 0.0 | 12.9 | 0.0 | 0.0 | 11.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.6 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 10.9 | 0.0 | 0.0 | 7.8 | 0.0 | 0.0 | 13.8 | 0.0 | 0.0 | 11.3 | 0.0 | 0.0 |
| LnGrp LOS | B | | | A | | | B | | | B | | |
| Approach Vol, veh/h | | 478 | | | 147 | | | 294 | | | 83 | |
| Approach Delay, s/veh | | 10.9 | | | 7.8 | | | 13.8 | | | 11.3 | |
| Approach LOS | | B | | | A | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 17.2 | | 22.5 | | 17.2 | | 22.5 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 21.5 | | 25.5 | | 21.5 | | 25.5 |
| Max Q Clear Time (g_c+I1), s | | 8.7 | | 11.9 | | 3.6 | | 4.1 |
| Green Ext Time (p_c), s | | 2.0 | | 4.2 | | 2.4 | | 5.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 11.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 429 | 878 | 12 | 354 | 854 | 541 | 377 | 821 | 255 | 521 | 538 | 256 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 466 | 954 | 13 | 385 | 928 | 0 | 410 | 892 | 0 | 566 | 585 | 278 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 560 | 1283 | 17 | 557 | 1285 | 400 | 627 | 853 | 382 | 541 | 879 | 393 |
| Arrive On Green | 0.10 | 0.27 | 0.27 | 0.10 | 0.27 | 0.00 | 0.11 | 0.26 | 0.00 | 0.13 | 0.28 | 0.28 |
| Sat Flow, veh/h | 3163 | 4751 | 65 | 3221 | 4759 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 466 | 625 | 342 | 385 | 928 | 0 | 410 | 892 | 0 | 566 | 585 | 278 |
| Grp Sat Flow(s),veh/h/ln | 1581 | 1558 | 1700 | 1610 | 1586 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 10.0 | 18.3 | 18.4 | 8.6 | 17.7 | 0.0 | 9.3 | 26.0 | 0.0 | 13.0 | 16.5 | 17.8 |
| Cycle Q Clear(g_c), s | 10.0 | 18.3 | 18.4 | 8.6 | 17.7 | 0.0 | 9.3 | 26.0 | 0.0 | 13.0 | 16.5 | 17.8 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 560 | 841 | 459 | 557 | 1285 | 400 | 627 | 853 | 382 | 541 | 879 | 393 |
| V/C Ratio(X) | 0.83 | 0.74 | 0.74 | 0.69 | 0.72 | 0.00 | 0.65 | 1.05 | 0.00 | 1.05 | 0.67 | 0.71 |
| Avail Cap(c_a), veh/h | 560 | 841 | 459 | 557 | 1285 | 400 | 627 | 853 | 382 | 541 | 879 | 393 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.3 | 33.3 | 33.3 | 25.2 | 33.1 | 0.0 | 24.4 | 37.0 | 0.0 | 26.2 | 31.9 | 32.3 |
| Incr Delay (d2), s/veh | 10.3 | 5.9 | 10.5 | 3.6 | 3.5 | 0.0 | 2.4 | 43.3 | 0.0 | 51.4 | 1.9 | 5.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 8.6 | 10.0 | 4.0 | 8.2 | 0.0 | 4.3 | 16.9 | 0.0 | 9.3 | 7.4 | 7.5 |
| LnGrp Delay(d),s/veh | 37.6 | 39.2 | 43.8 | 28.8 | 36.6 | 0.0 | 26.8 | 80.3 | 0.0 | 77.6 | 33.8 | 38.0 |
| LnGrp LOS | D | D | D | C | D | | C | F | | F | C | D |
| Approach Vol, veh/h | | 1433 | | | 1313 | | | 1302 | | | 1429 | |
| Approach Delay, s/veh | | 39.8 | | | 34.3 | | | 63.5 | | | 52.0 | |
| Approach LOS | | D | | | C | | | E | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 16.0 | 34.0 | 18.0 | 32.0 | 16.0 | 34.0 | 16.0 | 34.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 27.0 | 13.0 | 26.0 | 10.0 | 27.0 | 11.0 | 28.0 |
| Max Q Clear Time (g_c+I1), s | 10.6 | 20.4 | 15.0 | 28.0 | 12.0 | 19.7 | 11.3 | 19.8 |
| Green Ext Time (p_c), s | 0.0 | 5.6 | 0.0 | 0.0 | 0.0 | 6.1 | 0.0 | 6.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 47.3 |
| HCM 2010 LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 22 | 8 | 330 | 147 | 17 | 18 | 192 | 479 | 27 | 5 | 632 | 38 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 28 | 10 | 0 | 184 | 21 | 22 | 240 | 599 | 0 | 6 | 790 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 254 | 289 | 246 | 291 | 135 | 141 | 274 | 2264 | 1013 | 444 | 1612 | 721 |
| Arrive On Green | 0.16 | 0.16 | 0.00 | 0.16 | 0.16 | 0.16 | 0.17 | 0.71 | 0.00 | 0.48 | 0.48 | 0.00 |
| Sat Flow, veh/h | 1307 | 1792 | 1524 | 1399 | 834 | 874 | 1601 | 3195 | 1429 | 778 | 3374 | 1509 |
| Grp Volume(v), veh/h | 28 | 10 | 0 | 184 | 0 | 43 | 240 | 599 | 0 | 6 | 790 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1307 | 1792 | 1524 | 1399 | 0 | 1708 | 1601 | 1597 | 1429 | 778 | 1687 | 1509 |
| Q Serve(g_s), s | 1.9 | 0.5 | 0.0 | 12.8 | 0.0 | 2.2 | 14.6 | 6.7 | 0.0 | 0.4 | 16.0 | 0.0 |
| Cycle Q Clear(g_c), s | 4.0 | 0.5 | 0.0 | 13.2 | 0.0 | 2.2 | 14.6 | 6.7 | 0.0 | 0.4 | 16.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.51 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 254 | 289 | 246 | 291 | 0 | 275 | 274 | 2264 | 1013 | 444 | 1612 | 721 |
| V/C Ratio(X) | 0.11 | 0.03 | 0.00 | 0.63 | 0.00 | 0.16 | 0.88 | 0.26 | 0.00 | 0.01 | 0.49 | 0.00 |
| Avail Cap(c_a), veh/h | 383 | 466 | 396 | 429 | 0 | 444 | 368 | 2264 | 1013 | 444 | 1612 | 721 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 37.8 | 35.4 | 0.0 | 41.0 | 0.0 | 36.1 | 40.4 | 5.2 | 0.0 | 13.7 | 17.8 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 2.3 | 0.0 | 0.3 | 16.4 | 0.3 | 0.0 | 0.1 | 1.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.2 | 0.0 | 5.1 | 0.0 | 1.0 | 7.7 | 3.0 | 0.0 | 0.1 | 7.6 | 0.0 |
| LnGrp Delay(d),s/veh | 38.0 | 35.4 | 0.0 | 43.2 | 0.0 | 36.3 | 56.8 | 5.5 | 0.0 | 13.8 | 18.9 | 0.0 |
| LnGrp LOS | D | D | | D | | D | E | A | | B | B | |
| Approach Vol, veh/h | | 38 | | | 227 | | | 839 | | | 796 | |
| Approach Delay, s/veh | | 37.3 | | | 41.9 | | | 20.2 | | | 18.8 | |
| Approach LOS | | D | | | D | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 77.4 | | 22.6 | 23.1 | 54.3 | | 22.6 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 61.0 | | 26.0 | 23.0 | 32.0 | | 26.0 |
| Max Q Clear Time (g_c+I1), s | | 8.7 | | 6.0 | 16.6 | 18.0 | | 15.2 |
| Green Ext Time (p_c), s | | 16.2 | | 1.2 | 0.5 | 8.6 | | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 22.6 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 47 | 365 | 306 | 765 | 1275 | 75 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 52 | 0 | 340 | 850 | 1417 | 83 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 251 | 115 | 368 | 2558 | 1722 | 770 |
| Arrive On Green | 0.08 | 0.00 | 0.23 | 0.79 | 0.51 | 0.51 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 52 | 0 | 340 | 850 | 1417 | 83 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 1.5 | 0.0 | 20.6 | 7.4 | 35.2 | 2.8 |
| Cycle Q Clear(g_c), s | 1.5 | 0.0 | 20.6 | 7.4 | 35.2 | 2.8 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 251 | 115 | 368 | 2558 | 1722 | 770 |
| V/C Ratio(X) | 0.21 | 0.00 | 0.92 | 0.33 | 0.82 | 0.11 |
| Avail Cap(c_a), veh/h | 328 | 151 | 388 | 2558 | 1722 | 770 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.3 | 0.0 | 37.7 | 2.9 | 20.9 | 12.9 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 26.7 | 0.3 | 4.6 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.0 | 11.9 | 3.3 | 17.6 | 1.3 |
| LnGrp Delay(d),s/veh | 43.7 | 0.0 | 64.4 | 3.2 | 25.5 | 13.2 |
| LnGrp LOS | D | | E | A | C | B |
| Approach Vol, veh/h | 52 | | | 1190 | 1500 | |
| Approach Delay, s/veh | 43.7 | | | 20.7 | 24.8 | |
| Approach LOS | D | | | C | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 85.9 | | 14.1 | 28.8 | 57.1 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 24.0 | 47.0 | | |
| Max Q Clear Time (g_c+I1), s | | 9.4 | | 3.5 | 22.6 | 37.2 | | |
| Green Ext Time (p_c), s | | 41.1 | | 0.1 | 0.2 | 8.8 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.4 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 235 | 836 | 8 | 384 | 1041 | 343 | 516 | 447 | 417 | 382 | 739 | 273 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 255 | 909 | 9 | 417 | 1132 | 0 | 561 | 486 | 0 | 415 | 803 | 297 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 221 | 922 | 9 | 384 | 1324 | 592 | 489 | 908 | 406 | 590 | 751 | 336 |
| Arrive On Green | 0.08 | 0.28 | 0.28 | 0.19 | 0.39 | 0.00 | 0.12 | 0.27 | 0.00 | 0.08 | 0.23 | 0.23 |
| Sat Flow, veh/h | 1645 | 3329 | 33 | 1691 | 3374 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 255 | 448 | 470 | 417 | 1132 | 0 | 561 | 486 | 0 | 415 | 803 | 297 |
| Grp Sat Flow(s),veh/h/ln | 1645 | 1641 | 1721 | 1691 | 1687 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 10.0 | 35.3 | 35.3 | 25.0 | 39.9 | 0.0 | 15.0 | 16.0 | 0.0 | 10.0 | 30.0 | 25.6 |
| Cycle Q Clear(g_c), s | 10.0 | 35.3 | 35.3 | 25.0 | 39.9 | 0.0 | 15.0 | 16.0 | 0.0 | 10.0 | 30.0 | 25.6 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 221 | 454 | 477 | 384 | 1324 | 592 | 489 | 908 | 406 | 590 | 751 | 336 |
| V/C Ratio(X) | 1.15 | 0.99 | 0.99 | 1.09 | 0.86 | 0.00 | 1.15 | 0.54 | 0.00 | 0.70 | 1.07 | 0.88 |
| Avail Cap(c_a), veh/h | 221 | 454 | 477 | 384 | 1324 | 592 | 489 | 908 | 406 | 590 | 751 | 336 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 40.6 | 46.7 | 46.7 | 40.4 | 36.1 | 0.0 | 37.0 | 40.6 | 0.0 | 39.6 | 50.0 | 48.3 |
| Incr Delay (d2), s/veh | 108.0 | 38.9 | 37.9 | 71.2 | 7.2 | 0.0 | 87.6 | 0.6 | 0.0 | 3.8 | 53.2 | 23.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.6 | 20.8 | 21.7 | 21.3 | 19.9 | 0.0 | 14.7 | 7.5 | 0.0 | 6.0 | 19.0 | 12.5 |
| LnGrp Delay(d),s/veh | 148.5 | 85.6 | 84.6 | 111.6 | 43.4 | 0.0 | 124.6 | 41.2 | 0.0 | 43.4 | 103.2 | 71.6 |
| LnGrp LOS | F | F | F | F | D | | F | D | | D | F | E |
| Approach Vol, veh/h | | 1173 | | | 1549 | | | 1047 | | | 1515 | |
| Approach Delay, s/veh | | 98.9 | | | 61.7 | | | 85.9 | | | 80.6 | |
| Approach LOS | | F | | | E | | | F | | | F | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 31.0 | 43.0 | 15.0 | 41.0 | 16.0 | 58.0 | 20.0 | 36.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 25.0 | 36.0 | 10.0 | 35.0 | 10.0 | 51.0 | 15.0 | 30.0 |
| Max Q Clear Time (g_c+I1), s | 27.0 | 37.3 | 12.0 | 18.0 | 12.0 | 41.9 | 17.0 | 32.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 10.3 | 0.0 | 7.7 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 80.2 |
| HCM 2010 LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 34.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 11 | 51 | 242 | 12 | 108 | 0 | 335 | 75 | 54 | 12 | 172 | 35 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 12 | 55 | 260 | 13 | 116 | 0 | 360 | 81 | 58 | 13 | 185 | 38 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1118 | 1089 | 204 | 1217 | 1078 | 110 | 223 | 0 | 0 | 139 | 0 | 0 |
| Stage 1 | 230 | 230 | - | 830 | 830 | - | - | - | - | - | - | - |
| Stage 2 | 888 | 859 | - | 387 | 248 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 183 | 214 | 832 | 156 | 217 | 938 | 1317 | - | - | 1363 | - | - |
| Stage 1 | 768 | 710 | - | 361 | 382 | - | - | - | - | - | - | - |
| Stage 2 | 336 | 370 | - | 633 | 698 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 54 | 149 | 832 | 60 | 151 | 938 | 1317 | - | - | 1363 | - | - |
| Mov Cap-2 Maneuver | 54 | 149 | - | 60 | 151 | - | - | - | - | - | - | - |
| Stage 1 | 539 | 702 | - | 253 | 268 | - | - | - | - | - | - | - |
| Stage 2 | 134 | 260 | - | 397 | 690 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 59.8 | 139.5 | 6.3 | 0.4 |
| HCM LOS | F | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1317 | - | - | 363 | 131 | 1363 | - | - |
| HCM Lane V/C Ratio | 0.274 | - | - | 0.901 | 0.985 | 0.009 | - | - |
| HCM Control Delay (s) | 8.8 | 0 | - | 59.8 | 139.5 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | F | F | A | A | - |
| HCM 95th %tile Q(veh) | 1.1 | - | - | 9 | 6.8 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.4 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 26 | 239 | 144 | 383 | 319 | 14 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 9 | 9 | 9 | 9 | 8 | 8 |
| Mvmt Flow | 30 | 278 | 167 | 445 | 371 | 16 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1159 | 379 | 387 | 0 | - | 0 |
| Stage 1 | 379 | - | - | - | - | - |
| Stage 2 | 780 | - | - | - | - | - |
| Critical Hdwy | 6.49 | 6.29 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.49 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.49 | - | - | - | - | - |
| Follow-up Hdwy | 3.581 | 3.381 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 210 | 653 | 1134 | - | - | - |
| Stage 1 | 677 | - | - | - | - | - |
| Stage 2 | 440 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 169 | 653 | 1134 | - | - | - |
| Mov Cap-2 Maneuver | 169 | - | - | - | - | - |
| Stage 1 | 677 | - | - | - | - | - |
| Stage 2 | 354 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 22.3 | 2.4 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1134 | - | 510 | - | - |
| HCM Lane V/C Ratio | 0.148 | - | 0.604 | - | - |
| HCM Control Delay (s) | 8.7 | 0 | 22.3 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0.5 | - | 4 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.6 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 18 | 119 | 23 | 538 | 537 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 83 | 83 | 83 | 83 | 83 | 83 |
| Heavy Vehicles, % | 3 | 3 | 9 | 9 | 10 | 10 |
| Mvmt Flow | 22 | 143 | 28 | 648 | 647 | 5 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1353 | 649 | 652 | 0 | - | 0 |
| Stage 1 | 649 | - | - | - | - | - |
| Stage 2 | 704 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 164 | 468 | 902 | - | - | - |
| Stage 1 | 518 | - | - | - | - | - |
| Stage 2 | 489 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 156 | 468 | 902 | - | - | - |
| Mov Cap-2 Maneuver | 156 | - | - | - | - | - |
| Stage 1 | 518 | - | - | - | - | - |
| Stage 2 | 465 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 22.3 | 0.4 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 902 | - | 371 | - | - |
| HCM Lane V/C Ratio | 0.031 | - | 0.445 | - | - |
| HCM Control Delay (s) | 9.1 | 0 | 22.3 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 2.2 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 11 | 51 | 242 | 12 | 108 | 0 | 335 | 75 | 54 | 12 | 172 | 35 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1827 | 1900 | 1900 | 1827 | 1900 | 1900 | 1776 | 1900 | 1900 | 1638 | 1900 |
| Adj Flow Rate, veh/h | 12 | 55 | 260 | 13 | 116 | 0 | 360 | 81 | 58 | 13 | 185 | 38 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Cap, veh/h | 84 | 80 | 333 | 102 | 452 | 0 | 556 | 103 | 70 | 93 | 603 | 118 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.00 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 | 0.46 |
| Sat Flow, veh/h | 23 | 303 | 1266 | 71 | 1718 | 0 | 917 | 222 | 150 | 29 | 1298 | 255 |
| Grp Volume(v), veh/h | 327 | 0 | 0 | 129 | 0 | 0 | 499 | 0 | 0 | 236 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1593 | 0 | 0 | 1790 | 0 | 0 | 1289 | 0 | 0 | 1582 | 0 | 0 |
| Q Serve(g_s), s | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 9.0 | 0.0 | 0.0 | 2.7 | 0.0 | 0.0 | 15.5 | 0.0 | 0.0 | 4.4 | 0.0 | 0.0 |
| Prop In Lane | 0.04 | | 0.80 | 0.10 | | 0.00 | 0.72 | | 0.12 | 0.06 | | 0.16 |
| Lane Grp Cap(c), veh/h | 497 | 0 | 0 | 554 | 0 | 0 | 729 | 0 | 0 | 814 | 0 | 0 |
| V/C Ratio(X) | 0.66 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.68 | 0.00 | 0.00 | 0.29 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 628 | 0 | 0 | 694 | 0 | 0 | 940 | 0 | 0 | 1085 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 16.3 | 0.0 | 0.0 | 13.9 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 8.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.7 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.1 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 18.0 | 0.0 | 0.0 | 14.2 | 0.0 | 0.0 | 12.0 | 0.0 | 0.0 | 8.2 | 0.0 | 0.0 |
| LnGrp LOS | B | | | B | | | B | | | A | | |
| Approach Vol, veh/h | | 327 | | | 129 | | | 499 | | | 236 | |
| Approach Delay, s/veh | | 18.0 | | | 14.2 | | | 12.0 | | | 8.2 | |
| Approach LOS | | B | | | B | | | B | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 28.7 | | 19.1 | | 28.7 | | 19.1 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 30.5 | | 16.5 | | 30.5 | | 16.5 |
| Max Q Clear Time (g_c+I1), s | | 17.5 | | 11.0 | | 6.4 | | 4.7 |
| Green Ext Time (p_c), s | | 4.7 | | 1.5 | | 6.2 | | 2.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 13.1 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 235 | 836 | 8 | 384 | 1041 | 343 | 516 | 447 | 417 | 382 | 739 | 273 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 255 | 909 | 9 | 417 | 1132 | 0 | 561 | 486 | 0 | 415 | 803 | 297 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 540 | 1230 | 12 | 617 | 1240 | 386 | 535 | 862 | 386 | 722 | 831 | 372 |
| Arrive On Green | 0.11 | 0.26 | 0.26 | 0.11 | 0.26 | 0.00 | 0.11 | 0.26 | 0.00 | 0.11 | 0.26 | 0.26 |
| Sat Flow, veh/h | 3191 | 4815 | 48 | 3281 | 4848 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 255 | 593 | 325 | 417 | 1132 | 0 | 561 | 486 | 0 | 415 | 803 | 297 |
| Grp Sat Flow(s),veh/h/ln | 1596 | 1572 | 1719 | 1640 | 1616 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 5.0 | 15.6 | 15.6 | 8.3 | 20.4 | 0.0 | 10.0 | 11.3 | 0.0 | 8.6 | 22.0 | 17.2 |
| Cycle Q Clear(g_c), s | 5.0 | 15.6 | 15.6 | 8.3 | 20.4 | 0.0 | 10.0 | 11.3 | 0.0 | 8.6 | 22.0 | 17.2 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 540 | 803 | 439 | 617 | 1240 | 386 | 535 | 862 | 386 | 722 | 831 | 372 |
| V/C Ratio(X) | 0.47 | 0.74 | 0.74 | 0.68 | 0.91 | 0.00 | 1.05 | 0.56 | 0.00 | 0.57 | 0.97 | 0.80 |
| Avail Cap(c_a), veh/h | 540 | 803 | 439 | 617 | 1240 | 386 | 535 | 862 | 386 | 722 | 831 | 372 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.4 | 30.7 | 30.7 | 22.8 | 32.5 | 0.0 | 25.9 | 29.1 | 0.0 | 21.7 | 33.1 | 31.3 |
| Incr Delay (d2), s/veh | 0.6 | 6.0 | 10.6 | 2.9 | 11.7 | 0.0 | 52.0 | 0.8 | 0.0 | 1.1 | 23.2 | 11.7 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 7.4 | 8.7 | 4.0 | 10.5 | 0.0 | 3.9 | 5.4 | 0.0 | 3.8 | 12.5 | 8.1 |
| LnGrp Delay(d),s/veh | 23.1 | 36.8 | 41.4 | 25.7 | 44.3 | 0.0 | 77.9 | 30.0 | 0.0 | 22.8 | 56.3 | 43.0 |
| LnGrp LOS | C | D | D | C | D | | F | C | | C | E | D |
| Approach Vol, veh/h | | 1173 | | | 1549 | | | 1047 | | | 1515 | |
| Approach Delay, s/veh | | 35.1 | | | 39.3 | | | 55.7 | | | 44.5 | |
| Approach LOS | | D | | | D | | | E | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 16.0 | 30.0 | 15.0 | 29.0 | 16.0 | 30.0 | 15.0 | 29.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 10.0 | 23.0 | 10.0 | 23.0 | 10.0 | 23.0 | 10.0 | 23.0 |
| Max Q Clear Time (g_c+I1), s | 10.3 | 17.6 | 10.6 | 13.3 | 7.0 | 22.4 | 12.0 | 24.0 |
| Green Ext Time (p_c), s | 0.0 | 4.8 | 0.0 | 6.8 | 0.3 | 0.6 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 43.1 |
| HCM 2010 LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 10 | 21 | 81 | 48 | 9 | 11 | 198 | 381 | 179 | 34 | 320 | 14 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 12 | 25 | 0 | 58 | 11 | 13 | 239 | 459 | 0 | 41 | 386 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 180 | 178 | 151 | 159 | 56 | 67 | 277 | 2562 | 1146 | 548 | 1812 | 811 |
| Arrive On Green | 0.10 | 0.10 | 0.00 | 0.10 | 0.10 | 0.10 | 0.17 | 0.77 | 0.00 | 0.55 | 0.55 | 0.00 |
| Sat Flow, veh/h | 1368 | 1845 | 1568 | 1035 | 584 | 691 | 1660 | 3312 | 1482 | 869 | 3312 | 1482 |
| Grp Volume(v), veh/h | 12 | 25 | 0 | 58 | 0 | 24 | 239 | 459 | 0 | 41 | 386 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1368 | 1845 | 1568 | 1035 | 0 | 1275 | 1660 | 1656 | 1482 | 869 | 1656 | 1482 |
| Q Serve(g_s), s | 0.8 | 1.2 | 0.0 | 5.4 | 0.0 | 1.7 | 14.0 | 3.6 | 0.0 | 2.2 | 6.0 | 0.0 |
| Cycle Q Clear(g_c), s | 2.5 | 1.2 | 0.0 | 6.7 | 0.0 | 1.7 | 14.0 | 3.6 | 0.0 | 2.2 | 6.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.54 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 180 | 178 | 151 | 159 | 0 | 123 | 277 | 2562 | 1146 | 548 | 1812 | 811 |
| V/C Ratio(X) | 0.07 | 0.14 | 0.00 | 0.37 | 0.00 | 0.20 | 0.86 | 0.18 | 0.00 | 0.07 | 0.21 | 0.00 |
| Avail Cap(c_a), veh/h | 411 | 489 | 416 | 333 | 0 | 338 | 432 | 2562 | 1146 | 548 | 1812 | 811 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 42.8 | 41.4 | 0.0 | 44.5 | 0.0 | 41.6 | 40.6 | 3.0 | 0.0 | 10.8 | 11.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.4 | 0.0 | 1.4 | 0.0 | 0.8 | 10.6 | 0.2 | 0.0 | 0.3 | 0.3 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.6 | 0.0 | 1.6 | 0.0 | 0.6 | 7.3 | 1.7 | 0.0 | 0.6 | 2.8 | 0.0 |
| LnGrp Delay(d),s/veh | 42.9 | 41.7 | 0.0 | 45.9 | 0.0 | 42.4 | 51.2 | 3.1 | 0.0 | 11.0 | 11.9 | 0.0 |
| LnGrp LOS | D | D | | D | | D | D | A | | B | B | |
| Approach Vol, veh/h | | 37 | | | 82 | | | 698 | | | 427 | |
| Approach Delay, s/veh | | 42.1 | | | 44.8 | | | 19.6 | | | 11.8 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 83.9 | | 16.1 | 22.7 | 61.2 | | 16.1 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 60.5 | | 26.5 | 26.0 | 28.5 | | 26.5 |
| Max Q Clear Time (g_c+I1), s | | 5.6 | | 4.5 | 16.0 | 8.0 | | 8.7 |
| Green Ext Time (p_c), s | | 8.4 | | 0.6 | 0.7 | 6.7 | | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 19.2 |
| HCM 2010 LOS | B |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 44 | 150 | 249 | 753 | 452 | 33 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 51 | 0 | 286 | 866 | 520 | 38 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 237 | 109 | 330 | 2705 | 1684 | 753 |
| Arrive On Green | 0.08 | 0.00 | 0.19 | 0.79 | 0.54 | 0.54 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 51 | 0 | 286 | 866 | 520 | 38 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 1.5 | 0.0 | 16.2 | 7.0 | 9.2 | 1.3 |
| Cycle Q Clear(g_c), s | 1.5 | 0.0 | 16.2 | 7.0 | 9.2 | 1.3 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 237 | 109 | 330 | 2705 | 1684 | 753 |
| V/C Ratio(X) | 0.21 | 0.00 | 0.87 | 0.32 | 0.31 | 0.05 |
| Avail Cap(c_a), veh/h | 360 | 166 | 597 | 2705 | 1684 | 753 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.4 | 0.0 | 39.1 | 2.8 | 12.6 | 10.8 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 6.9 | 0.3 | 0.5 | 0.1 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.0 | 8.3 | 3.4 | 4.0 | 0.5 |
| LnGrp Delay(d),s/veh | 43.9 | 0.0 | 46.0 | 3.2 | 13.1 | 11.0 |
| LnGrp LOS | D | | D | A | B | B |
| Approach Vol, veh/h | 51 | | | 1152 | 558 | |
| Approach Delay, s/veh | 43.9 | | | 13.8 | 13.0 | |
| Approach LOS | D | | | B | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 85.9 | | 14.1 | 25.3 | 60.6 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 75.5 | | 11.5 | 35.0 | 34.5 | | |
| Max Q Clear Time (g_c+I1), s | | 9.0 | | 3.5 | 18.2 | 11.2 | | |
| Green Ext Time (p_c), s | | 17.3 | | 0.1 | 1.1 | 12.0 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 14.4 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 335 | 615 | 9 | 248 | 598 | 415 | 264 | 609 | 179 | 376 | 386 | 189 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 364 | 668 | 10 | 270 | 650 | 0 | 287 | 662 | 0 | 409 | 420 | 205 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 400 | 1011 | 15 | 377 | 929 | 416 | 631 | 739 | 330 | 554 | 815 | 365 |
| Arrive On Green | 0.16 | 0.31 | 0.31 | 0.13 | 0.28 | 0.00 | 0.09 | 0.23 | 0.00 | 0.13 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1630 | 3280 | 49 | 1660 | 3312 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 364 | 331 | 347 | 270 | 650 | 0 | 287 | 662 | 0 | 409 | 420 | 205 |
| Grp Sat Flow(s),veh/h/ln | 1630 | 1626 | 1703 | 1660 | 1656 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 18.9 | 20.8 | 20.8 | 13.4 | 20.7 | 0.0 | 7.9 | 23.0 | 0.0 | 11.6 | 13.4 | 14.9 |
| Cycle Q Clear(g_c), s | 18.9 | 20.8 | 20.8 | 13.4 | 20.7 | 0.0 | 7.9 | 23.0 | 0.0 | 11.6 | 13.4 | 14.9 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 400 | 501 | 525 | 377 | 929 | 416 | 631 | 739 | 330 | 554 | 815 | 365 |
| V/C Ratio(X) | 0.91 | 0.66 | 0.66 | 0.72 | 0.70 | 0.00 | 0.45 | 0.90 | 0.00 | 0.74 | 0.52 | 0.56 |
| Avail Cap(c_a), veh/h | 400 | 501 | 525 | 423 | 929 | 416 | 1009 | 809 | 362 | 810 | 815 | 365 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.9 | 35.3 | 35.3 | 26.2 | 37.9 | 0.0 | 30.4 | 44.2 | 0.0 | 30.6 | 37.2 | 37.7 |
| Incr Delay (d2), s/veh | 24.5 | 6.7 | 6.4 | 5.0 | 4.4 | 0.0 | 0.5 | 12.0 | 0.0 | 2.0 | 0.6 | 2.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.0 | 10.2 | 10.7 | 6.6 | 10.0 | 0.0 | 3.5 | 11.6 | 0.0 | 5.0 | 5.9 | 6.0 |
| LnGrp Delay(d),s/veh | 51.4 | 42.0 | 41.7 | 31.2 | 42.2 | 0.0 | 30.9 | 56.2 | 0.0 | 32.6 | 37.8 | 39.7 |
| LnGrp LOS | D | D | D | C | D | | C | E | | C | D | D |
| Approach Vol, veh/h | | 1042 | | | 920 | | | 949 | | | 1034 | |
| Approach Delay, s/veh | | 45.2 | | | 39.0 | | | 48.6 | | | 36.1 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 21.7 | 43.3 | 20.1 | 32.5 | 25.0 | 40.0 | 16.1 | 36.5 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 15.4 | 22.8 | 13.6 | 25.0 | 20.9 | 22.7 | 9.9 | 16.9 |
| Green Ext Time (p_c), s | 0.4 | 6.3 | 1.5 | 1.4 | 0.0 | 6.4 | 1.2 | 6.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 42.2 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 16 | 70 | 186 | 20 | 59 | 5 | 65 | 100 | 19 | 5 | 42 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 21 | 91 | 242 | 26 | 77 | 6 | 84 | 130 | 25 | 6 | 55 | 8 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 424 | 394 | 58 | 549 | 386 | 142 | 62 | 0 | 0 | 155 | 0 | 0 |
| Stage 1 | 71 | 71 | - | 311 | 311 | - | - | - | - | - | - | - |
| Stage 2 | 353 | 323 | - | 238 | 75 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 537 | 539 | 1002 | 443 | 545 | 900 | 1510 | - | - | 1344 | - | - |
| Stage 1 | 934 | 832 | - | 695 | 655 | - | - | - | - | - | - | - |
| Stage 2 | 660 | 647 | - | 761 | 829 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 448 | 504 | 1002 | 276 | 509 | 900 | 1510 | - | - | 1344 | - | - |
| Mov Cap-2 Maneuver | 448 | 504 | - | 276 | 509 | - | - | - | - | - | - | - |
| Stage 1 | 877 | 828 | - | 653 | 615 | - | - | - | - | - | - | - |
| Stage 2 | 539 | 608 | - | 512 | 825 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 13.9 | 16.1 | 2.7 | 0.7 |
| HCM LOS | B | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1510 | - | - | 755 | 433 | 1344 | - | - |
| HCM Lane V/C Ratio | 0.056 | - | - | 0.468 | 0.252 | 0.005 | - | - |
| HCM Control Delay (s) | 7.5 | 0 | - | 13.9 | 16.1 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | B | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 2.5 | 1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.4 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 11 | 111 | 177 | 164 | 249 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 12 | 12 | 10 | 10 | 3 | 3 |
| Mvmt Flow | 14 | 142 | 227 | 210 | 319 | 14 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 990 | 326 | 333 | 0 | - | 0 |
| Stage 1 | 326 | - | - | - | - | - |
| Stage 2 | 664 | - | - | - | - | - |
| Critical Hdwy | 6.52 | 6.32 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.52 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.52 | - | - | - | - | - |
| Follow-up Hdwy | 3.608 | 3.408 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 262 | 693 | 1183 | - | - | - |
| Stage 1 | 710 | - | - | - | - | - |
| Stage 2 | 494 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 205 | 693 | 1183 | - | - | - |
| Mov Cap-2 Maneuver | 205 | - | - | - | - | - |
| Stage 1 | 710 | - | - | - | - | - |
| Stage 2 | 387 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 13.7 | 4.5 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1183 | - | 571 | - | - |
| HCM Lane V/C Ratio | 0.192 | - | 0.274 | - | - |
| HCM Control Delay (s) | 8.8 | 0 | 13.7 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.7 | - | 1.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 4 | 20 | 71 | 320 | 346 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 81 | 81 | 81 | 81 | 81 | 81 |
| Heavy Vehicles, % | 55 | 55 | 10 | 10 | 6 | 6 |
| Mvmt Flow | 5 | 25 | 88 | 395 | 427 | 19 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1006 | 436 | 446 | 0 | - | 0 |
| Stage 1 | 436 | - | - | - | - | - |
| Stage 2 | 570 | - | - | - | - | - |
| Critical Hdwy | 6.95 | 6.75 | 4.2 | - | - | - |
| Critical Hdwy Stg 1 | 5.95 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.95 | - | - | - | - | - |
| Follow-up Hdwy | 3.995 | 3.795 | 2.29 | - | - | - |
| Pot Cap-1 Maneuver | 214 | 522 | 1073 | - | - | - |
| Stage 1 | 553 | - | - | - | - | - |
| Stage 2 | 474 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 192 | 522 | 1073 | - | - | - |
| Mov Cap-2 Maneuver | 192 | - | - | - | - | - |
| Stage 1 | 553 | - | - | - | - | - |
| Stage 2 | 424 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.6 | 1.6 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1073 | - | 406 | - | - |
| HCM Lane V/C Ratio | 0.082 | - | 0.073 | - | - |
| HCM Control Delay (s) | 8.7 | 0 | 14.6 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 0.2 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 16 | 9 | 231 | 195 | 19 | 33 | 135 | 344 | 51 | 11 | 472 | 29 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 20 | 11 | 0 | 244 | 24 | 41 | 169 | 430 | 0 | 14 | 590 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 294 | 368 | 313 | 352 | 127 | 217 | 201 | 2124 | 950 | 508 | 1616 | 723 |
| Arrive On Green | 0.21 | 0.21 | 0.00 | 0.21 | 0.21 | 0.21 | 0.13 | 0.66 | 0.00 | 0.48 | 0.48 | 0.00 |
| Sat Flow, veh/h | 1281 | 1792 | 1524 | 1398 | 619 | 1057 | 1601 | 3195 | 1429 | 909 | 3374 | 1509 |
| Grp Volume(v), veh/h | 20 | 11 | 0 | 244 | 0 | 65 | 169 | 430 | 0 | 14 | 590 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1281 | 1792 | 1524 | 1398 | 0 | 1676 | 1601 | 1597 | 1429 | 909 | 1687 | 1509 |
| Q Serve(g_s), s | 1.3 | 0.5 | 0.0 | 16.9 | 0.0 | 3.2 | 10.3 | 5.2 | 0.0 | 0.8 | 11.0 | 0.0 |
| Cycle Q Clear(g_c), s | 4.5 | 0.5 | 0.0 | 17.4 | 0.0 | 3.2 | 10.3 | 5.2 | 0.0 | 0.8 | 11.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.63 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 294 | 368 | 313 | 352 | 0 | 344 | 201 | 2124 | 950 | 508 | 1616 | 723 |
| V/C Ratio(X) | 0.07 | 0.03 | 0.00 | 0.69 | 0.00 | 0.19 | 0.84 | 0.20 | 0.00 | 0.03 | 0.37 | 0.00 |
| Avail Cap(c_a), veh/h | 396 | 511 | 434 | 464 | 0 | 478 | 336 | 2124 | 950 | 508 | 1616 | 723 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 34.7 | 31.8 | 0.0 | 38.7 | 0.0 | 32.9 | 42.7 | 6.5 | 0.0 | 13.8 | 16.4 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 2.9 | 0.0 | 0.3 | 9.1 | 0.2 | 0.0 | 0.1 | 0.6 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.2 | 0.0 | 6.8 | 0.0 | 1.5 | 5.1 | 2.3 | 0.0 | 0.2 | 5.2 | 0.0 |
| LnGrp Delay(d),s/veh | 34.8 | 31.8 | 0.0 | 41.7 | 0.0 | 33.1 | 51.8 | 6.7 | 0.0 | 13.9 | 17.1 | 0.0 |
| LnGrp LOS | C | C | | D | | C | D | A | | B | B | |
| Approach Vol, veh/h | | 31 | | | 309 | | | 599 | | | 604 | |
| Approach Delay, s/veh | | 33.8 | | | 39.9 | | | 19.4 | | | 17.0 | |
| Approach LOS | | C | | | D | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 73.0 | | 27.0 | 18.6 | 54.4 | | 27.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 58.5 | | 28.5 | 21.0 | 31.5 | | 28.5 |
| Max Q Clear Time (g_c+I1), s | | 7.2 | | 6.5 | 12.3 | 13.0 | | 19.4 |
| Green Ext Time (p_c), s | | 10.4 | | 1.7 | 0.4 | 7.5 | | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 22.9 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 38 | 256 | 215 | 571 | 998 | 69 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 42 | 0 | 239 | 634 | 1109 | 77 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 226 | 104 | 275 | 2582 | 1945 | 870 |
| Arrive On Green | 0.07 | 0.00 | 0.17 | 0.80 | 0.57 | 0.57 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 42 | 0 | 239 | 634 | 1109 | 77 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 1.2 | 0.0 | 14.4 | 4.9 | 20.7 | 2.3 |
| Cycle Q Clear(g_c), s | 1.2 | 0.0 | 14.4 | 4.9 | 20.7 | 2.3 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 226 | 104 | 275 | 2582 | 1945 | 870 |
| V/C Ratio(X) | 0.19 | 0.00 | 0.87 | 0.25 | 0.57 | 0.09 |
| Avail Cap(c_a), veh/h | 328 | 151 | 404 | 2582 | 1945 | 870 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.9 | 0.0 | 40.4 | 2.5 | 13.6 | 9.7 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 13.0 | 0.2 | 1.2 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 0.0 | 7.4 | 2.2 | 10.0 | 1.0 |
| LnGrp Delay(d),s/veh | 44.3 | 0.0 | 53.4 | 2.7 | 14.9 | 9.9 |
| LnGrp LOS | D | | D | A | B | A |
| Approach Vol, veh/h | 42 | | | 873 | 1186 | |
| Approach Delay, s/veh | 44.3 | | | 16.6 | 14.5 | |
| Approach LOS | D | | | B | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 86.6 | | 13.4 | 23.0 | 63.6 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 25.0 | 46.0 | | |
| Max Q Clear Time (g_c+I1), s | | 6.9 | | 3.2 | 16.4 | 22.7 | | |
| Green Ext Time (p_c), s | | 26.9 | | 0.0 | 0.6 | 15.4 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.0 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 176 | 585 | 6 | 269 | 729 | 253 | 362 | 325 | 292 | 303 | 553 | 227 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 191 | 636 | 7 | 292 | 792 | 0 | 393 | 353 | 0 | 329 | 601 | 247 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 311 | 979 | 11 | 395 | 1123 | 502 | 592 | 828 | 371 | 753 | 754 | 337 |
| Arrive On Green | 0.10 | 0.29 | 0.29 | 0.14 | 0.33 | 0.00 | 0.12 | 0.25 | 0.00 | 0.11 | 0.23 | 0.23 |
| Sat Flow, veh/h | 1645 | 3325 | 37 | 1691 | 3374 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 191 | 314 | 329 | 292 | 792 | 0 | 393 | 353 | 0 | 329 | 601 | 247 |
| Grp Sat Flow(s),veh/h/ln | 1645 | 1641 | 1721 | 1691 | 1687 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 8.9 | 18.7 | 18.7 | 13.2 | 22.9 | 0.0 | 9.9 | 9.9 | 0.0 | 8.6 | 19.5 | 17.6 |
| Cycle Q Clear(g_c), s | 8.9 | 18.7 | 18.7 | 13.2 | 22.9 | 0.0 | 9.9 | 9.9 | 0.0 | 8.6 | 19.5 | 17.6 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 311 | 483 | 507 | 395 | 1123 | 502 | 592 | 828 | 371 | 753 | 754 | 337 |
| V/C Ratio(X) | 0.61 | 0.65 | 0.65 | 0.74 | 0.71 | 0.00 | 0.66 | 0.43 | 0.00 | 0.44 | 0.80 | 0.73 |
| Avail Cap(c_a), veh/h | 424 | 483 | 507 | 446 | 1123 | 502 | 929 | 873 | 391 | 1121 | 842 | 376 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.4 | 34.5 | 34.5 | 24.2 | 32.6 | 0.0 | 29.2 | 35.6 | 0.0 | 27.8 | 40.6 | 39.8 |
| Incr Delay (d2), s/veh | 2.0 | 6.6 | 6.3 | 5.6 | 3.7 | 0.0 | 1.3 | 0.3 | 0.0 | 0.4 | 4.9 | 6.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.1 | 9.3 | 9.8 | 6.7 | 11.3 | 0.0 | 4.5 | 4.6 | 0.0 | 3.7 | 9.3 | 7.7 |
| LnGrp Delay(d),s/veh | 27.4 | 41.1 | 40.8 | 29.8 | 36.3 | 0.0 | 30.5 | 36.0 | 0.0 | 28.2 | 45.5 | 46.2 |
| LnGrp LOS | C | D | D | C | D | | C | D | | C | D | D |
| Approach Vol, veh/h | | 834 | | | 1084 | | | 746 | | | 1177 | |
| Approach Delay, s/veh | | 37.9 | | | 34.6 | | | 33.1 | | | 40.8 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 21.6 | 40.0 | 16.9 | 33.5 | 17.3 | 44.3 | 18.5 | 32.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 19.0 | 33.0 | 25.0 | 29.0 | 19.0 | 33.0 | 25.0 | 29.0 |
| Max Q Clear Time (g_c+I1), s | 15.2 | 20.7 | 10.6 | 11.9 | 10.9 | 24.9 | 11.9 | 21.5 |
| Green Ext Time (p_c), s | 0.4 | 7.8 | 1.3 | 7.8 | 0.4 | 5.6 | 1.6 | 4.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 36.9 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 10.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 10 | 36 | 173 | 10 | 76 | 0 | 243 | 63 | 42 | 9 | 157 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 11 | 39 | 186 | 11 | 82 | 0 | 261 | 68 | 45 | 10 | 169 | 32 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 858 | 839 | 185 | 930 | 833 | 90 | 201 | 0 | 0 | 113 | 0 | 0 |
| Stage 1 | 204 | 204 | - | 613 | 613 | - | - | - | - | - | - | - |
| Stage 2 | 654 | 635 | - | 317 | 220 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 275 | 300 | 852 | 246 | 302 | 962 | 1342 | - | - | 1394 | - | - |
| Stage 1 | 793 | 729 | - | 476 | 480 | - | - | - | - | - | - | - |
| Stage 2 | 452 | 469 | - | 690 | 717 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 170 | 235 | 852 | 141 | 237 | 962 | 1342 | - | - | 1394 | - | - |
| Mov Cap-2 Maneuver | 170 | 235 | - | 141 | 237 | - | - | - | - | - | - | - |
| Stage 1 | 627 | 723 | - | 377 | 380 | - | - | - | - | - | - | - |
| Stage 2 | 281 | 371 | - | 506 | 711 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 17.2 | 32.7 | 5.8 | 0.3 |
| HCM LOS | C | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1342 | - | - | 528 | 220 | 1394 | - | - |
| HCM Lane V/C Ratio | 0.195 | - | - | 0.446 | 0.42 | 0.007 | - | - |
| HCM Control Delay (s) | 8.3 | 0 | - | 17.2 | 32.7 | 7.6 | 0 | - |
| HCM Lane LOS | A | A | - | C | D | A | A | - |
| HCM 95th %tile Q(veh) | 0.7 | - | - | 2.3 | 1.9 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.1 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 19 | 169 | 105 | 291 | 261 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 9 | 9 | 9 | 9 | 8 | 8 |
| Mvmt Flow | 22 | 197 | 122 | 338 | 303 | 15 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 894 | 311 | 319 | 0 | - | 0 |
| Stage 1 | 311 | - | - | - | - | - |
| Stage 2 | 583 | - | - | - | - | - |
| Critical Hdwy | 6.49 | 6.29 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.49 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.49 | - | - | - | - | - |
| Follow-up Hdwy | 3.581 | 3.381 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 303 | 713 | 1202 | - | - | - |
| Stage 1 | 727 | - | - | - | - | - |
| Stage 2 | 545 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 265 | 713 | 1202 | - | - | - |
| Mov Cap-2 Maneuver | 265 | - | - | - | - | - |
| Stage 1 | 727 | - | - | - | - | - |
| Stage 2 | 477 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.2 | 2.2 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1202 | - | 609 | - | - |
| HCM Lane V/C Ratio | 0.102 | - | 0.359 | - | - |
| HCM Control Delay (s) | 8.3 | 0 | 14.2 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.3 | - | 1.6 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Vol, veh/h | 13 | 83 | 16 | 405 | 416 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 83 | 83 | 83 | 83 | 83 | 83 |
| Heavy Vehicles, % | 3 | 3 | 9 | 9 | 10 | 10 |
| Mvmt Flow | 16 | 100 | 19 | 488 | 501 | 5 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1031 | 504 | 506 | 0 | - | 0 |
| Stage 1 | 504 | - | - | - | - | - |
| Stage 2 | 527 | - | - | - | - | - |
| Critical Hdwy | 6.43 | 6.23 | 4.19 | - | - | - |
| Critical Hdwy Stg 1 | 5.43 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.43 | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 3.327 | 2.281 | - | - | - |
| Pot Cap-1 Maneuver | 257 | 566 | 1024 | - | - | - |
| Stage 1 | 605 | - | - | - | - | - |
| Stage 2 | 590 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 251 | 566 | 1024 | - | - | - |
| Mov Cap-2 Maneuver | 251 | - | - | - | - | - |
| Stage 1 | 605 | - | - | - | - | - |
| Stage 2 | 575 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 14.8 | 0.3 | 0 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1024 | - | 484 | - | - |
| HCM Lane V/C Ratio | 0.019 | - | 0.239 | - | - |
| HCM Control Delay (s) | 8.6 | 0 | 14.8 | - | - |
| HCM Lane LOS | A | A | B | - | - |
| HCM 95th %tile Q(veh) | 0.1 | - | 0.9 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 38 | 28 | 87 | 40 | 10 | 10 | 212 | 857 | 166 | 34 | 441 | 21 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 46 | 34 | 0 | 48 | 12 | 12 | 255 | 1033 | 0 | 41 | 531 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 183 | 182 | 154 | 156 | 63 | 63 | 288 | 2555 | 1143 | 346 | 1781 | 797 |
| Arrive On Green | 0.10 | 0.10 | 0.00 | 0.10 | 0.10 | 0.10 | 0.17 | 0.77 | 0.00 | 0.54 | 0.54 | 0.00 |
| Sat Flow, veh/h | 1368 | 1845 | 1568 | 1027 | 642 | 642 | 1660 | 3312 | 1482 | 509 | 3312 | 1482 |
| Grp Volume(v), veh/h | 46 | 34 | 0 | 48 | 0 | 24 | 255 | 1033 | 0 | 41 | 531 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1368 | 1845 | 1568 | 1027 | 0 | 1284 | 1660 | 1656 | 1482 | 509 | 1656 | 1482 |
| Q Serve(g_s), s | 3.2 | 1.7 | 0.0 | 4.5 | 0.0 | 1.7 | 15.0 | 10.4 | 0.0 | 4.0 | 8.8 | 0.0 |
| Cycle Q Clear(g_c), s | 4.9 | 1.7 | 0.0 | 6.2 | 0.0 | 1.7 | 15.0 | 10.4 | 0.0 | 4.0 | 8.8 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.50 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 183 | 182 | 154 | 156 | 0 | 126 | 288 | 2555 | 1143 | 346 | 1781 | 797 |
| V/C Ratio(X) | 0.25 | 0.19 | 0.00 | 0.31 | 0.00 | 0.19 | 0.88 | 0.40 | 0.00 | 0.12 | 0.30 | 0.00 |
| Avail Cap(c_a), veh/h | 404 | 480 | 408 | 322 | 0 | 334 | 349 | 2555 | 1143 | 346 | 1781 | 797 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 43.7 | 41.4 | 0.0 | 44.2 | 0.0 | 41.4 | 40.3 | 3.8 | 0.0 | 11.6 | 12.7 | 0.0 |
| Incr Delay (d2), s/veh | 0.7 | 0.5 | 0.0 | 1.1 | 0.0 | 0.7 | 20.0 | 0.5 | 0.0 | 0.7 | 0.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.9 | 0.0 | 1.3 | 0.0 | 0.6 | 8.5 | 4.8 | 0.0 | 0.6 | 4.1 | 0.0 |
| LnGrp Delay(d),s/veh | 44.4 | 41.9 | 0.0 | 45.3 | 0.0 | 42.1 | 60.4 | 4.3 | 0.0 | 12.3 | 13.1 | 0.0 |
| LnGrp LOS | D | D | | D | | D | E | A | | B | B | |
| Approach Vol, veh/h | | 80 | | | 72 | | | 1288 | | | 572 | |
| Approach Delay, s/veh | | 43.3 | | | 44.3 | | | 15.4 | | | 13.1 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 83.6 | | 16.4 | 23.4 | 60.3 | | 16.4 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 61.0 | | 26.0 | 21.0 | 34.0 | | 26.0 |
| Max Q Clear Time (g_c+I1), s | | 12.4 | | 6.9 | 17.0 | 10.8 | | 8.2 |
| Green Ext Time (p_c), s | | 20.4 | | 0.7 | 0.4 | 14.0 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.9 |
| HCM 2010 LOS | B |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 91 | 160 | 267 | 1186 | 563 | 44 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 105 | 0 | 307 | 1363 | 647 | 51 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 296 | 136 | 348 | 2641 | 1593 | 713 |
| Arrive On Green | 0.09 | 0.00 | 0.20 | 0.78 | 0.51 | 0.51 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 105 | 0 | 307 | 1363 | 647 | 51 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 3.1 | 0.0 | 17.5 | 15.0 | 12.8 | 1.9 |
| Cycle Q Clear(g_c), s | 3.1 | 0.0 | 17.5 | 15.0 | 12.8 | 1.9 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 296 | 136 | 348 | 2641 | 1593 | 713 |
| V/C Ratio(X) | 0.35 | 0.00 | 0.88 | 0.52 | 0.41 | 0.07 |
| Avail Cap(c_a), veh/h | 313 | 144 | 495 | 2641 | 1593 | 713 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.4 | 0.0 | 38.7 | 4.2 | 15.0 | 12.4 |
| Incr Delay (d2), s/veh | 0.7 | 0.0 | 12.7 | 0.7 | 0.8 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 0.0 | 9.4 | 7.1 | 5.7 | 0.7 |
| LnGrp Delay(d),s/veh | 43.1 | 0.0 | 51.4 | 4.9 | 15.8 | 12.6 |
| LnGrp LOS | D | | D | A | B | B |
| Approach Vol, veh/h | 105 | | | 1670 | 698 | |
| Approach Delay, s/veh | 43.1 | | | 13.5 | 15.6 | |
| Approach LOS | D | | | B | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 84.0 | | 16.0 | 26.4 | 57.7 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 29.0 | 42.0 | | |
| Max Q Clear Time (g_c+I1), s | | 17.0 | | 5.1 | 19.5 | 14.8 | | |
| Green Ext Time (p_c), s | | 32.0 | | 0.1 | 0.9 | 19.5 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 15.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 480 | 659 | 9 | 266 | 641 | 589 | 283 | 750 | 192 | 432 | 438 | 227 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 522 | 716 | 10 | 289 | 697 | 0 | 308 | 815 | 0 | 470 | 476 | 247 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 304 | 934 | 13 | 337 | 1099 | 492 | 614 | 855 | 383 | 533 | 982 | 439 |
| Arrive On Green | 0.09 | 0.28 | 0.28 | 0.13 | 0.33 | 0.00 | 0.08 | 0.26 | 0.00 | 0.13 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1630 | 3284 | 46 | 1660 | 3312 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 522 | 354 | 372 | 289 | 697 | 0 | 308 | 815 | 0 | 470 | 476 | 247 |
| Grp Sat Flow(s),veh/h/ln | 1630 | 1626 | 1704 | 1660 | 1656 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 11.0 | 25.3 | 25.3 | 15.1 | 22.5 | 0.0 | 8.9 | 30.9 | 0.0 | 13.6 | 15.6 | 18.6 |
| Cycle Q Clear(g_c), s | 11.0 | 25.3 | 25.3 | 15.1 | 22.5 | 0.0 | 8.9 | 30.9 | 0.0 | 13.6 | 15.6 | 18.6 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 304 | 462 | 484 | 337 | 1099 | 492 | 614 | 855 | 383 | 533 | 982 | 439 |
| V/C Ratio(X) | 1.72 | 0.77 | 0.77 | 0.86 | 0.63 | 0.00 | 0.50 | 0.95 | 0.00 | 0.88 | 0.48 | 0.56 |
| Avail Cap(c_a), veh/h | 304 | 462 | 484 | 337 | 1099 | 492 | 614 | 855 | 383 | 615 | 1066 | 477 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 40.6 | 41.5 | 41.5 | 29.1 | 35.8 | 0.0 | 31.0 | 46.0 | 0.0 | 31.1 | 35.2 | 36.3 |
| Incr Delay (d2), s/veh | 337.0 | 11.5 | 11.1 | 19.1 | 2.8 | 0.0 | 0.6 | 20.2 | 0.0 | 12.8 | 0.4 | 1.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 28.4 | 12.8 | 13.4 | 8.6 | 10.7 | 0.0 | 3.9 | 16.4 | 0.0 | 6.6 | 6.8 | 7.4 |
| LnGrp Delay(d),s/veh | 377.5 | 53.0 | 52.5 | 48.2 | 38.6 | 0.0 | 31.6 | 66.2 | 0.0 | 43.9 | 35.6 | 37.6 |
| LnGrp LOS | F | D | D | D | D | | C | E | | D | D | D |
| Approach Vol, veh/h | | 1248 | | | 986 | | | 1123 | | | 1193 | |
| Approach Delay, s/veh | | 188.6 | | | 41.4 | | | 56.7 | | | 39.3 | |
| Approach LOS | | F | | | D | | | E | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 23.0 | 43.0 | 21.6 | 39.0 | 17.0 | 49.0 | 15.0 | 45.6 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 17.0 | 36.0 | 20.0 | 33.0 | 11.0 | 42.0 | 10.0 | 43.0 |
| Max Q Clear Time (g_c+I1), s | 17.1 | 27.3 | 15.6 | 32.9 | 13.0 | 24.5 | 10.9 | 20.6 |
| Green Ext Time (p_c), s | 0.0 | 5.9 | 1.0 | 0.1 | 0.0 | 9.7 | 0.0 | 12.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 85.0 |
| HCM 2010 LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 12 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 16 | 75 | 236 | 38 | 63 | 5 | 78 | 104 | 25 | 5 | 49 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 21 | 97 | 306 | 49 | 82 | 6 | 101 | 135 | 32 | 6 | 64 | 8 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 479 | 451 | 68 | 636 | 438 | 151 | 71 | 0 | 0 | 168 | 0 | 0 |
| Stage 1 | 81 | 81 | - | 354 | 354 | - | - | - | - | - | - | - |
| Stage 2 | 398 | 370 | - | 282 | 84 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 494 | 501 | 990 | 388 | 509 | 890 | 1498 | - | - | 1329 | - | - |
| Stage 1 | 922 | 824 | - | 659 | 627 | - | - | - | - | - | - | - |
| Stage 2 | 624 | 617 | - | 721 | 821 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 399 | 461 | 990 | 211 | 468 | 890 | 1498 | - | - | 1329 | - | - |
| Mov Cap-2 Maneuver | 399 | 461 | - | 211 | 468 | - | - | - | - | - | - | - |
| Stage 1 | 853 | 820 | - | 610 | 580 | - | - | - | - | - | - | - |
| Stage 2 | 492 | 571 | - | 436 | 817 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 16.2 | 23.4 | 2.9 | 0.6 |
| HCM LOS | C | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1498 | - | - | 741 | 331 | 1329 | - | - |
| HCM Lane V/C Ratio | 0.068 | - | - | 0.573 | 0.416 | 0.005 | - | - |
| HCM Control Delay (s) | 7.6 | 0 | - | 16.2 | 23.4 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | C | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 3.7 | 2 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 46.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 11 | 35 | 112 | 54 | 8 | 6 | 187 | 179 | 243 | 28 | 298 | 12 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 92 | 92 | 92 | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 3 | 3 | 3 |
| Mvmt Flow | 14 | 45 | 144 | 59 | 9 | 7 | 240 | 229 | 312 | 36 | 382 | 15 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1334 | 1483 | 390 | 1421 | 1334 | 385 | 397 | 0 | 0 | 541 | 0 | 0 |
| Stage 1 | 462 | 462 | - | 865 | 865 | - | - | - | - | - | - | - |
| Stage 2 | 872 | 1021 | - | 556 | 469 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.22 | 6.62 | 6.32 | 7.2 | 6.6 | 6.3 | 4.2 | - | - | 4.13 | - | - |
| Critical Hdwy Stg 1 | 6.22 | 5.62 | - | 6.2 | 5.6 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.22 | 5.62 | - | 6.2 | 5.6 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.608 | 4.108 | 3.408 | 3.59 | 4.09 | 3.39 | 2.29 | - | - | 2.227 | - | - |
| Pot Cap-1 Maneuver | 125 | 119 | 637 | 109 | 148 | 645 | 1119 | - | - | 1023 | - | - |
| Stage 1 | 561 | 548 | - | 337 | 360 | - | - | - | - | - | - | - |
| Stage 2 | 332 | 301 | - | 501 | 547 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 84 | 77 | 637 | ~ 34 | 96 | 645 | 1119 | - | - | 1023 | - | - |
| Mov Cap-2 Maneuver | 84 | 77 | - | ~ 34 | 96 | - | - | - | - | - | - | - |
| Stage 1 | 380 | 523 | - | 228 | 244 | - | - | - | - | - | - | - |
| Stage 2 | 215 | 204 | - | 339 | 522 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 103.7 | $ 619.3 | 2.8 | 0.7 |
| HCM LOS | F | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1119 | - | - | 208 | 40 | 1023 | - | - |
| HCM Lane V/C Ratio | 0.214 | - | - | 0.974 | 1.848 | 0.035 | - | - |
| HCM Control Delay (s) | 9.1 | 0 | - | 103.7 | $ 619.3 | 8.6 | 0 | - |
| HCM Lane LOS | A | A | - | F | F | A | A | - |
| HCM 95th %tile Q(veh) | 0.8 | - | - | 8.4 | 7.8 | 0.1 | - | - |

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 15.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 4 | 7 | 21 | 53 | 2 | 6 | 76 | 582 | 236 | 28 | 421 | 16 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 81 | 81 | 81 | 92 | 92 | 92 | 81 | 81 | 81 | 81 | 81 | 81 |
| Heavy Vehicles, % | 55 | 55 | 55 | 10 | 10 | 10 | 10 | 10 | 10 | 6 | 6 | 6 |
| Mvmt Flow | 5 | 9 | 26 | 58 | 2 | 7 | 94 | 719 | 291 | 35 | 520 | 20 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1655 | 1797 | 530 | 1668 | 1661 | 864 | 540 | 0 | 0 | 1010 | 0 | 0 |
| Stage 1 | 599 | 599 | - | 1052 | 1052 | - | - | - | - | - | - | - |
| Stage 2 | 1056 | 1198 | - | 616 | 609 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.65 | 7.05 | 6.75 | 7.2 | 6.6 | 6.3 | 4.2 | - | - | 4.16 | - | - |
| Critical Hdwy Stg 1 | 6.65 | 6.05 | - | 6.2 | 5.6 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.65 | 6.05 | - | 6.2 | 5.6 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.995 | 4.495 | 3.795 | 3.59 | 4.09 | 3.39 | 2.29 | - | - | 2.254 | - | - |
| Pot Cap-1 Maneuver | 58 | 60 | 458 | 73 | 93 | 342 | 989 | - | - | 671 | - | - |
| Stage 1 | 408 | 416 | - | 265 | 294 | - | - | - | - | - | - | - |
| Stage 2 | 218 | 206 | - | 465 | 473 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 43 | 43 | 458 | ~ 46 | 66 | 342 | 989 | - | - | 671 | - | - |
| Mov Cap-2 Maneuver | 43 | 43 | - | ~ 46 | 66 | - | - | - | - | - | - | - |
| Stage 1 | 313 | 385 | - | 203 | 225 | - | - | - | - | - | - | - |
| Stage 2 | 162 | 158 | - | 397 | 438 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 57.9 | $ 357.2 | 0.8 | 0.6 |
| HCM LOS | F | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 989 | - | - | 106 | 51 | 671 | - | - |
| HCM Lane V/C Ratio | 0.095 | - | - | 0.373 | 1.3 | 0.052 | - | - |
| HCM Control Delay (s) | 9 | 0 | - | 57.9 | $ 357.2 | 10.7 | 0 | - |
| HCM Lane LOS | A | A | - | F | F | B | A | - |
| HCM 95th %tile Q(veh) | 0.3 | - | - | 1.5 | 6 | 0.2 | - | - |

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 11 | 35 | 112 | 54 | 8 | 6 | 187 | 179 | 243 | 28 | 298 | 12 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1696 | 1900 | 1900 | 1727 | 1900 | 1900 | 1727 | 1900 | 1900 | 1845 | 1900 |
| Adj Flow Rate, veh/h | 14 | 45 | 144 | 59 | 9 | 7 | 240 | 229 | 312 | 36 | 382 | 15 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Percent Heavy Veh, % | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 3 | 3 | 3 |
| Cap, veh/h | 51 | 103 | 281 | 265 | 39 | 25 | 275 | 232 | 306 | 91 | 913 | 35 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 |
| Sat Flow, veh/h | 46 | 388 | 1060 | 758 | 147 | 93 | 376 | 384 | 505 | 86 | 1509 | 57 |
| Grp Volume(v), veh/h | 203 | 0 | 0 | 75 | 0 | 0 | 781 | 0 | 0 | 433 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1494 | 0 | 0 | 999 | 0 | 0 | 1265 | 0 | 0 | 1652 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 48.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 11.4 | 0.0 | 0.0 | 7.8 | 0.0 | 0.0 | 60.5 | 0.0 | 0.0 | 12.2 | 0.0 | 0.0 |
| Prop In Lane | 0.07 | | 0.71 | 0.79 | | 0.09 | 0.31 | | 0.40 | 0.08 | | 0.03 |
| Lane Grp Cap(c), veh/h | 434 | 0 | 0 | 329 | 0 | 0 | 812 | 0 | 0 | 1039 | 0 | 0 |
| V/C Ratio(X) | 0.47 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.96 | 0.00 | 0.00 | 0.42 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 434 | 0 | 0 | 329 | 0 | 0 | 812 | 0 | 0 | 1039 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 31.2 | 0.0 | 0.0 | 29.6 | 0.0 | 0.0 | 20.7 | 0.0 | 0.0 | 10.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 3.6 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 23.5 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.2 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 26.8 | 0.0 | 0.0 | 6.5 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 34.8 | 0.0 | 0.0 | 31.2 | 0.0 | 0.0 | 44.1 | 0.0 | 0.0 | 11.4 | 0.0 | 0.0 |
| LnGrp LOS | C | | | C | | | D | | | B | | |
| Approach Vol, veh/h | | 203 | | | 75 | | | 781 | | | 433 | |
| Approach Delay, s/veh | | 34.8 | | | 31.2 | | | 44.1 | | | 11.4 | |
| Approach LOS | | C | | | C | | | D | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 67.0 | | 33.0 | | 67.0 | | 33.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 60.5 | | 26.5 | | 60.5 | | 26.5 |
| Max Q Clear Time (g_c+I1), s | | 62.5 | | 13.4 | | 14.2 | | 9.8 |
| Green Ext Time (p_c), s | | 0.0 | | 1.6 | | 15.6 | | 1.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 32.7 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 4 | 7 | 21 | 53 | 2 | 6 | 76 | 582 | 236 | 28 | 421 | 16 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1226 | 1900 | 1900 | 1727 | 1900 | 1727 | 1727 | 1900 | 1900 | 1792 | 1900 |
| Adj Flow Rate, veh/h | 5 | 9 | 26 | 58 | 2 | 7 | 94 | 719 | 291 | 35 | 520 | 20 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.92 | 0.92 | 0.92 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Percent Heavy Veh, % | 55 | 55 | 55 | 10 | 10 | 10 | 10 | 10 | 10 | 6 | 6 | 6 |
| Cap, veh/h | 56 | 70 | 158 | 324 | 14 | 32 | 172 | 755 | 305 | 46 | 554 | 20 |
| Arrive On Green | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 |
| Sat Flow, veh/h | 68 | 309 | 702 | 1143 | 60 | 140 | 799 | 1170 | 474 | 12 | 859 | 31 |
| Grp Volume(v), veh/h | 40 | 0 | 0 | 67 | 0 | 0 | 94 | 0 | 1010 | 575 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1079 | 0 | 0 | 1344 | 0 | 0 | 799 | 0 | 1644 | 902 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 56.6 | 7.9 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 2.9 | 0.0 | 0.0 | 3.4 | 0.0 | 0.0 | 54.1 | 0.0 | 56.6 | 64.5 | 0.0 | 0.0 |
| Prop In Lane | 0.12 | | 0.65 | 0.87 | | 0.10 | 1.00 | | 0.29 | 0.06 | | 0.03 |
| Lane Grp Cap(c), veh/h | 283 | 0 | 0 | 370 | 0 | 0 | 172 | 0 | 1060 | 620 | 0 | 0 |
| V/C Ratio(X) | 0.14 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.55 | 0.00 | 0.95 | 0.93 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 283 | 0 | 0 | 370 | 0 | 0 | 172 | 0 | 1060 | 620 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 31.2 | 0.0 | 0.0 | 31.3 | 0.0 | 0.0 | 15.9 | 0.0 | 16.3 | 21.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.0 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | 11.8 | 0.0 | 18.4 | 22.2 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 2.9 | 0.0 | 30.7 | 14.6 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 32.2 | 0.0 | 0.0 | 32.4 | 0.0 | 0.0 | 27.7 | 0.0 | 34.7 | 43.6 | 0.0 | 0.0 |
| LnGrp LOS | C | | | C | | | C | | C | D | | |
| Approach Vol, veh/h | | 40 | | | 67 | | | 1104 | | | 575 | |
| Approach Delay, s/veh | | 32.2 | | | 32.4 | | | 34.1 | | | 43.6 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 71.0 | | 29.0 | | 71.0 | | 29.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 64.5 | | 22.5 | | 64.5 | | 22.5 |
| Max Q Clear Time (g_c+I1), s | | 58.6 | | 4.9 | | 66.5 | | 5.4 |
| Green Ext Time (p_c), s | | 5.0 | | 0.5 | | 0.0 | | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 37.1 |
| HCM 2010 LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 38 | 28 | 87 | 40 | 10 | 10 | 212 | 857 | 166 | 34 | 441 | 21 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 46 | 34 | 0 | 48 | 12 | 12 | 255 | 1033 | 0 | 41 | 531 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 183 | 182 | 154 | 156 | 63 | 63 | 292 | 2555 | 1143 | 345 | 1774 | 794 |
| Arrive On Green | 0.10 | 0.10 | 0.00 | 0.10 | 0.10 | 0.10 | 0.18 | 0.77 | 0.00 | 0.54 | 0.54 | 0.00 |
| Sat Flow, veh/h | 1368 | 1845 | 1568 | 1027 | 642 | 642 | 1660 | 3312 | 1482 | 509 | 3312 | 1482 |
| Grp Volume(v), veh/h | 46 | 34 | 0 | 48 | 0 | 24 | 255 | 1033 | 0 | 41 | 531 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1368 | 1845 | 1568 | 1027 | 0 | 1284 | 1660 | 1656 | 1482 | 509 | 1656 | 1482 |
| Q Serve(g_s), s | 3.2 | 1.7 | 0.0 | 4.5 | 0.0 | 1.7 | 15.0 | 10.4 | 0.0 | 4.1 | 8.9 | 0.0 |
| Cycle Q Clear(g_c), s | 4.9 | 1.7 | 0.0 | 6.2 | 0.0 | 1.7 | 15.0 | 10.4 | 0.0 | 4.1 | 8.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.50 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 183 | 182 | 154 | 156 | 0 | 126 | 292 | 2555 | 1143 | 345 | 1774 | 794 |
| V/C Ratio(X) | 0.25 | 0.19 | 0.00 | 0.31 | 0.00 | 0.19 | 0.87 | 0.40 | 0.00 | 0.12 | 0.30 | 0.00 |
| Avail Cap(c_a), veh/h | 404 | 480 | 408 | 322 | 0 | 334 | 415 | 2555 | 1143 | 345 | 1774 | 794 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 43.7 | 41.4 | 0.0 | 44.2 | 0.0 | 41.4 | 40.1 | 3.8 | 0.0 | 11.7 | 12.8 | 0.0 |
| Incr Delay (d2), s/veh | 0.7 | 0.5 | 0.0 | 1.1 | 0.0 | 0.7 | 13.6 | 0.5 | 0.0 | 0.7 | 0.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.9 | 0.0 | 1.3 | 0.0 | 0.6 | 8.0 | 4.8 | 0.0 | 0.6 | 4.2 | 0.0 |
| LnGrp Delay(d),s/veh | 44.4 | 41.9 | 0.0 | 45.3 | 0.0 | 42.1 | 53.8 | 4.3 | 0.0 | 12.4 | 13.3 | 0.0 |
| LnGrp LOS | D | D | | D | | D | D | A | | B | B | |
| Approach Vol, veh/h | | 80 | | | 72 | | | 1288 | | | 572 | |
| Approach Delay, s/veh | | 43.3 | | | 44.3 | | | 14.1 | | | 13.2 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 83.6 | | 16.4 | 23.6 | 60.1 | | 16.4 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 61.0 | | 26.0 | 25.0 | 30.0 | | 26.0 |
| Max Q Clear Time (g_c+I1), s | | 12.4 | | 6.9 | 17.0 | 10.9 | | 8.2 |
| Green Ext Time (p_c), s | | 20.4 | | 0.7 | 0.6 | 12.3 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.1 |
| HCM 2010 LOS | B |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 91 | 160 | 267 | 1186 | 563 | 44 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 105 | 0 | 307 | 1363 | 647 | 51 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 296 | 136 | 348 | 2641 | 1593 | 713 |
| Arrive On Green | 0.09 | 0.00 | 0.20 | 0.78 | 0.51 | 0.51 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 105 | 0 | 307 | 1363 | 647 | 51 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 3.1 | 0.0 | 17.5 | 15.0 | 12.8 | 1.9 |
| Cycle Q Clear(g_c), s | 3.1 | 0.0 | 17.5 | 15.0 | 12.8 | 1.9 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 296 | 136 | 348 | 2641 | 1593 | 713 |
| V/C Ratio(X) | 0.35 | 0.00 | 0.88 | 0.52 | 0.41 | 0.07 |
| Avail Cap(c_a), veh/h | 313 | 144 | 495 | 2641 | 1593 | 713 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.4 | 0.0 | 38.7 | 4.2 | 15.0 | 12.4 |
| Incr Delay (d2), s/veh | 0.7 | 0.0 | 12.7 | 0.7 | 0.8 | 0.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 0.0 | 9.4 | 7.1 | 5.7 | 0.7 |
| LnGrp Delay(d),s/veh | 43.1 | 0.0 | 51.4 | 4.9 | 15.8 | 12.6 |
| LnGrp LOS | D | | D | A | B | B |
| Approach Vol, veh/h | 105 | | | 1670 | 698 | |
| Approach Delay, s/veh | 43.1 | | | 13.5 | 15.6 | |
| Approach LOS | D | | | B | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 84.0 | | 16.0 | 26.4 | 57.7 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 29.0 | 42.0 | | |
| Max Q Clear Time (g_c+I1), s | | 17.0 | | 5.1 | 19.5 | 14.8 | | |
| Green Ext Time (p_c), s | | 32.0 | | 0.1 | 0.9 | 19.5 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 15.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 480 | 659 | 9 | 266 | 641 | 589 | 283 | 750 | 192 | 432 | 438 | 227 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 522 | 716 | 10 | 289 | 697 | 0 | 308 | 815 | 0 | 470 | 476 | 247 |
| Adj No. of Lanes | 2 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 588 | 929 | 13 | 335 | 1093 | 489 | 618 | 872 | 390 | 534 | 993 | 444 |
| Arrive On Green | 0.09 | 0.28 | 0.28 | 0.13 | 0.33 | 0.00 | 0.08 | 0.27 | 0.00 | 0.13 | 0.32 | 0.32 |
| Sat Flow, veh/h | 3163 | 3284 | 46 | 1660 | 3312 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 522 | 354 | 372 | 289 | 697 | 0 | 308 | 815 | 0 | 470 | 476 | 247 |
| Grp Sat Flow(s),veh/h/ln | 1581 | 1626 | 1704 | 1660 | 1656 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 11.0 | 25.4 | 25.4 | 15.2 | 22.7 | 0.0 | 8.9 | 30.9 | 0.0 | 13.6 | 15.6 | 18.6 |
| Cycle Q Clear(g_c), s | 11.0 | 25.4 | 25.4 | 15.2 | 22.7 | 0.0 | 8.9 | 30.9 | 0.0 | 13.6 | 15.6 | 18.6 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 588 | 460 | 482 | 335 | 1093 | 489 | 618 | 872 | 390 | 534 | 993 | 444 |
| V/C Ratio(X) | 0.89 | 0.77 | 0.77 | 0.86 | 0.64 | 0.00 | 0.50 | 0.93 | 0.00 | 0.88 | 0.48 | 0.56 |
| Avail Cap(c_a), veh/h | 588 | 460 | 482 | 335 | 1093 | 489 | 618 | 877 | 392 | 596 | 1061 | 475 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.2 | 41.8 | 41.8 | 29.5 | 36.2 | 0.0 | 30.7 | 45.6 | 0.0 | 31.1 | 35.1 | 36.1 |
| Incr Delay (d2), s/veh | 15.3 | 11.8 | 11.3 | 20.1 | 2.8 | 0.0 | 0.6 | 16.7 | 0.0 | 13.3 | 0.4 | 1.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.6 | 12.9 | 13.5 | 8.8 | 10.8 | 0.0 | 4.0 | 16.1 | 0.0 | 6.7 | 6.8 | 7.4 |
| LnGrp Delay(d),s/veh | 53.5 | 53.6 | 53.1 | 49.6 | 39.0 | 0.0 | 31.3 | 62.4 | 0.0 | 44.4 | 35.4 | 37.3 |
| LnGrp LOS | D | D | D | D | D | | C | E | | D | D | D |
| Approach Vol, veh/h | | 1248 | | | 986 | | | 1123 | | | 1193 | |
| Approach Delay, s/veh | | 53.4 | | | 42.1 | | | 53.8 | | | 39.4 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 23.0 | 43.0 | 21.4 | 39.8 | 17.0 | 49.0 | 15.0 | 46.2 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 17.0 | 36.0 | 19.0 | 34.0 | 11.0 | 42.0 | 10.0 | 43.0 |
| Max Q Clear Time (g_c+I1), s | 17.2 | 27.4 | 15.6 | 32.9 | 13.0 | 24.7 | 10.9 | 20.6 |
| Green Ext Time (p_c), s | 0.0 | 5.8 | 0.8 | 0.9 | 0.0 | 9.7 | 0.0 | 12.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 47.4 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 11.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 16 | 75 | 236 | 38 | 63 | 5 | 78 | 104 | 25 | 5 | 49 | 6 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | 750 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 21 | 97 | 306 | 49 | 82 | 6 | 101 | 135 | 32 | 6 | 64 | 8 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 479 | 451 | 68 | 636 | 438 | 151 | 71 | 0 | 0 | 168 | 0 | 0 |
| Stage 1 | 81 | 81 | - | 354 | 354 | - | - | - | - | - | - | - |
| Stage 2 | 398 | 370 | - | 282 | 84 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 494 | 501 | 990 | 388 | 509 | 890 | 1498 | - | - | 1329 | - | - |
| Stage 1 | 922 | 824 | - | 659 | 627 | - | - | - | - | - | - | - |
| Stage 2 | 624 | 617 | - | 721 | 821 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 399 | 461 | 990 | 211 | 468 | 890 | 1498 | - | - | 1329 | - | - |
| Mov Cap-2 Maneuver | 399 | 461 | - | 211 | 468 | - | - | - | - | - | - | - |
| Stage 1 | 853 | 820 | - | 610 | 580 | - | - | - | - | - | - | - |
| Stage 2 | 492 | 571 | - | 436 | 817 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 16.2 | 18.8 | 2.9 | 0.6 |
| HCM LOS | C | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1498 | - | - | 741 | 211 | 485 | 1329 | - | - |
| HCM Lane V/C Ratio | 0.068 | - | - | 0.573 | 0.234 | 0.182 | 0.005 | - | - |
| HCM Control Delay (s) | 7.6 | 0 | - | 16.2 | 27.2 | 14.1 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | C | D | B | A | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 3.7 | 0.9 | 0.7 | 0 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 23 | 9 | 248 | 186 | 25 | 33 | 144 | 477 | 42 | 9 | 904 | 56 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 29 | 11 | 0 | 232 | 31 | 41 | 180 | 596 | 0 | 11 | 1130 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 273 | 347 | 295 | 336 | 141 | 187 | 211 | 2160 | 966 | 450 | 1634 | 731 |
| Arrive On Green | 0.19 | 0.19 | 0.00 | 0.19 | 0.19 | 0.19 | 0.13 | 0.68 | 0.00 | 0.48 | 0.48 | 0.00 |
| Sat Flow, veh/h | 1273 | 1792 | 1524 | 1398 | 729 | 964 | 1601 | 3195 | 1429 | 780 | 3374 | 1509 |
| Grp Volume(v), veh/h | 29 | 11 | 0 | 232 | 0 | 72 | 180 | 596 | 0 | 11 | 1130 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1273 | 1792 | 1524 | 1398 | 0 | 1693 | 1601 | 1597 | 1429 | 780 | 1687 | 1509 |
| Q Serve(g_s), s | 2.0 | 0.5 | 0.0 | 16.1 | 0.0 | 3.6 | 11.0 | 7.4 | 0.0 | 0.7 | 26.0 | 0.0 |
| Cycle Q Clear(g_c), s | 5.5 | 0.5 | 0.0 | 16.6 | 0.0 | 3.6 | 11.0 | 7.4 | 0.0 | 0.7 | 26.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.57 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 273 | 347 | 295 | 336 | 0 | 328 | 211 | 2160 | 966 | 450 | 1634 | 731 |
| V/C Ratio(X) | 0.11 | 0.03 | 0.00 | 0.69 | 0.00 | 0.22 | 0.85 | 0.28 | 0.00 | 0.02 | 0.69 | 0.00 |
| Avail Cap(c_a), veh/h | 326 | 421 | 358 | 394 | 0 | 398 | 288 | 2160 | 966 | 450 | 1634 | 731 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 36.3 | 32.7 | 0.0 | 39.5 | 0.0 | 33.9 | 42.5 | 6.4 | 0.0 | 13.5 | 20.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 4.1 | 0.0 | 0.3 | 16.3 | 0.3 | 0.0 | 0.1 | 2.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.3 | 0.0 | 6.6 | 0.0 | 1.7 | 5.8 | 3.3 | 0.0 | 0.2 | 12.6 | 0.0 |
| LnGrp Delay(d),s/veh | 36.4 | 32.7 | 0.0 | 43.6 | 0.0 | 34.3 | 58.8 | 6.8 | 0.0 | 13.6 | 22.4 | 0.0 |
| LnGrp LOS | D | C | | D | | C | E | A | | B | C | |
| Approach Vol, veh/h | | 40 | | | 304 | | | 776 | | | 1141 | |
| Approach Delay, s/veh | | 35.4 | | | 41.4 | | | 18.8 | | | 22.3 | |
| Approach LOS | | D | | | D | | | B | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 74.1 | | 25.9 | 19.2 | 54.9 | | 25.9 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 63.5 | | 23.5 | 18.0 | 39.5 | | 23.5 |
| Max Q Clear Time (g_c+I1), s | | 9.4 | | 7.5 | 13.0 | 28.0 | | 18.6 |
| Green Ext Time (p_c), s | | 23.5 | | 1.5 | 0.3 | 8.8 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.9 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 51 | 274 | 230 | 697 | 1406 | 112 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 57 | 0 | 256 | 774 | 1562 | 124 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 261 | 120 | 289 | 2548 | 1879 | 841 |
| Arrive On Green | 0.08 | 0.00 | 0.18 | 0.79 | 0.55 | 0.55 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 57 | 0 | 256 | 774 | 1562 | 124 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 1.6 | 0.0 | 15.5 | 6.6 | 38.0 | 4.0 |
| Cycle Q Clear(g_c), s | 1.6 | 0.0 | 15.5 | 6.6 | 38.0 | 4.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 261 | 120 | 289 | 2548 | 1879 | 841 |
| V/C Ratio(X) | 0.22 | 0.00 | 0.89 | 0.30 | 0.83 | 0.15 |
| Avail Cap(c_a), veh/h | 328 | 151 | 355 | 2548 | 1879 | 841 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.1 | 0.0 | 40.1 | 2.9 | 18.5 | 10.9 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 19.8 | 0.3 | 4.5 | 0.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.0 | 8.5 | 3.0 | 19.0 | 1.7 |
| LnGrp Delay(d),s/veh | 43.5 | 0.0 | 59.8 | 3.2 | 23.0 | 11.3 |
| LnGrp LOS | D | | E | A | C | B |
| Approach Vol, veh/h | 57 | | | 1030 | 1686 | |
| Approach Delay, s/veh | 43.5 | | | 17.3 | 22.1 | |
| Approach LOS | D | | | B | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 85.6 | | 14.4 | 23.9 | 61.7 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 22.0 | 49.0 | | |
| Max Q Clear Time (g_c+I1), s | | 8.6 | | 3.6 | 17.5 | 40.0 | | |
| Green Ext Time (p_c), s | | 44.3 | | 0.1 | 0.4 | 8.3 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 20.8 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 216 | 627 | 6 | 288 | 781 | 303 | 387 | 374 | 313 | 452 | 694 | 350 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 235 | 682 | 7 | 313 | 849 | 0 | 421 | 407 | 0 | 491 | 754 | 380 |
| Adj No. of Lanes | 1 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 282 | 1042 | 11 | 391 | 1272 | 569 | 490 | 882 | 395 | 705 | 826 | 369 |
| Arrive On Green | 0.08 | 0.31 | 0.31 | 0.14 | 0.38 | 0.00 | 0.11 | 0.26 | 0.00 | 0.10 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1645 | 3328 | 34 | 1691 | 3374 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 235 | 336 | 353 | 313 | 849 | 0 | 421 | 407 | 0 | 491 | 754 | 380 |
| Grp Sat Flow(s),veh/h/ln | 1645 | 1641 | 1721 | 1691 | 1687 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 10.0 | 23.0 | 23.0 | 15.7 | 27.2 | 0.0 | 12.2 | 13.2 | 0.0 | 13.0 | 29.3 | 33.0 |
| Cycle Q Clear(g_c), s | 10.0 | 23.0 | 23.0 | 15.7 | 27.2 | 0.0 | 12.2 | 13.2 | 0.0 | 13.0 | 29.3 | 33.0 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 282 | 514 | 539 | 391 | 1272 | 569 | 490 | 882 | 395 | 705 | 826 | 369 |
| V/C Ratio(X) | 0.83 | 0.65 | 0.65 | 0.80 | 0.67 | 0.00 | 0.86 | 0.46 | 0.00 | 0.70 | 0.91 | 1.03 |
| Avail Cap(c_a), veh/h | 282 | 514 | 539 | 452 | 1272 | 569 | 490 | 882 | 395 | 705 | 826 | 369 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.7 | 38.6 | 38.6 | 26.7 | 33.7 | 0.0 | 34.5 | 40.3 | 0.0 | 34.8 | 47.1 | 48.5 |
| Incr Delay (d2), s/veh | 18.7 | 6.4 | 6.1 | 8.7 | 2.8 | 0.0 | 14.2 | 0.4 | 0.0 | 3.0 | 14.5 | 54.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.3 | 11.4 | 11.9 | 8.3 | 13.1 | 0.0 | 6.5 | 6.2 | 0.0 | 6.8 | 14.8 | 18.8 |
| LnGrp Delay(d),s/veh | 54.5 | 44.9 | 44.7 | 35.5 | 36.5 | 0.0 | 48.7 | 40.7 | 0.0 | 37.8 | 61.6 | 102.9 |
| LnGrp LOS | D | D | D | D | D | | D | D | | D | E | F |
| Approach Vol, veh/h | | 924 | | | 1162 | | | 828 | | | 1625 | |
| Approach Delay, s/veh | | 47.3 | | | 36.2 | | | 44.7 | | | 64.1 | |
| Approach LOS | | D | | | D | | | D | | | E | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 24.3 | 47.7 | 18.0 | 40.0 | 16.0 | 56.0 | 19.0 | 39.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 23.0 | 36.0 | 13.0 | 34.0 | 10.0 | 49.0 | 14.0 | 33.0 |
| Max Q Clear Time (g_c+I1), s | 17.7 | 25.0 | 15.0 | 15.2 | 12.0 | 29.2 | 14.2 | 35.0 |
| Green Ext Time (p_c), s | 0.6 | 7.5 | 0.0 | 10.6 | 0.0 | 11.4 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 50.0 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 14.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 10 | 39 | 194 | 14 | 81 | 0 | 295 | 70 | 60 | 9 | 161 | 31 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 11 | 42 | 209 | 15 | 87 | 0 | 317 | 75 | 65 | 10 | 173 | 33 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 994 | 983 | 190 | 1076 | 968 | 108 | 206 | 0 | 0 | 140 | 0 | 0 |
| Stage 1 | 209 | 209 | - | 742 | 742 | - | - | - | - | - | - | - |
| Stage 2 | 785 | 774 | - | 334 | 226 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 222 | 247 | 847 | 195 | 252 | 940 | 1336 | - | - | 1362 | - | - |
| Stage 1 | 788 | 725 | - | 404 | 419 | - | - | - | - | - | - | - |
| Stage 2 | 383 | 405 | - | 676 | 713 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 114 | 182 | 847 | 97 | 185 | 940 | 1336 | - | - | 1362 | - | - |
| Mov Cap-2 Maneuver | 114 | 182 | - | 97 | 185 | - | - | - | - | - | - | - |
| Stage 1 | 584 | 719 | - | 299 | 310 | - | - | - | - | - | - | - |
| Stage 2 | 204 | 300 | - | 476 | 707 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 22.8 | 58.3 | 5.9 | 0.3 |
| HCM LOS | C | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1336 | - | - | 458 | 163 | 1362 | - | - |
| HCM Lane V/C Ratio | 0.237 | - | - | 0.571 | 0.627 | 0.007 | - | - |
| HCM Control Delay (s) | 8.5 | 0 | - | 22.8 | 58.3 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | C | F | A | A | - |
| HCM 95th %tile Q(veh) | 0.9 | - | - | 3.5 | 3.5 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 159.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 20 | 9 | 179 | 218 | 31 | 25 | 106 | 338 | 60 | 7 | 279 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 92 | 92 | 92 | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 9 | 9 | 9 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 |
| Mvmt Flow | 23 | 10 | 208 | 237 | 34 | 27 | 123 | 393 | 70 | 8 | 324 | 15 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1053 | 1057 | 332 | 1132 | 1030 | 428 | 340 | 0 | 0 | 463 | 0 | 0 |
| Stage 1 | 348 | 348 | - | 674 | 674 | - | - | - | - | - | - | - |
| Stage 2 | 705 | 709 | - | 458 | 356 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.19 | 6.59 | 6.29 | 7.2 | 6.6 | 6.3 | 4.19 | - | - | 4.18 | - | - |
| Critical Hdwy Stg 1 | 6.19 | 5.59 | - | 6.2 | 5.6 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.19 | 5.59 | - | 6.2 | 5.6 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.581 | 4.081 | 3.381 | 3.59 | 4.09 | 3.39 | 2.281 | - | - | 2.272 | - | - |
| Pot Cap-1 Maneuver | 198 | 219 | 694 | ~ 174 | 226 | 610 | 1181 | - | - | 1067 | - | - |
| Stage 1 | 654 | 622 | - | 431 | 442 | - | - | - | - | - | - | - |
| Stage 2 | 416 | 427 | - | 568 | 615 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 145 | 186 | 694 | ~ 103 | 192 | 610 | 1181 | - | - | 1067 | - | - |
| Mov Cap-2 Maneuver | 145 | 186 | - | ~ 103 | 192 | - | - | - | - | - | - | - |
| Stage 1 | 561 | 616 | - | 370 | 379 | - | - | - | - | - | - | - |
| Stage 2 | 311 | 366 | - | 387 | 609 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 20.6 | $ 768.6 | 1.8 | 0.2 |
| HCM LOS | C | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1181 | - | - | 468 | 118 | 1067 | - | - |
| HCM Lane V/C Ratio | 0.104 | - | - | 0.517 | 2.524 | 0.008 | - | - |
| HCM Control Delay (s) | 8.4 | 0 | - | 20.6 | $ 768.6 | 8.4 | 0 | - |
| HCM Lane LOS | A | A | - | C | F | A | A | - |
| HCM 95th %tile Q(veh) | 0.3 | - | - | 2.9 | 26.7 | 0 | - | - |

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 193.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 14 | 2 | 89 | 212 | 6 | 25 | 17 | 489 | 58 | 7 | 653 | 4 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 83 | 92 | 83 | 92 | 92 | 92 | 83 | 83 | 92 | 92 | 83 | 83 |
| Heavy Vehicles, % | 3 | 3 | 3 | 10 | 10 | 10 | 9 | 9 | 9 | 10 | 10 | 10 |
| Mvmt Flow | 17 | 2 | 107 | 230 | 7 | 27 | 20 | 589 | 63 | 8 | 787 | 5 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1482 | 1497 | 789 | 1521 | 1469 | 621 | 792 | 0 | 0 | 652 | 0 | 0 |
| Stage 1 | 804 | 804 | - | 662 | 662 | - | - | - | - | - | - | - |
| Stage 2 | 678 | 693 | - | 859 | 807 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.13 | 6.53 | 6.23 | 7.2 | 6.6 | 6.3 | 4.19 | - | - | 4.2 | - | - |
| Critical Hdwy Stg 1 | 6.13 | 5.53 | - | 6.2 | 5.6 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.13 | 5.53 | - | 6.2 | 5.6 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.527 | 4.027 | 3.327 | 3.59 | 4.09 | 3.39 | 2.281 | - | - | 2.29 | - | - |
| Pot Cap-1 Maneuver | 103 | 122 | 389 | ~ 93 | 122 | 473 | 798 | - | - | 898 | - | - |
| Stage 1 | 375 | 394 | - | 438 | 447 | - | - | - | - | - | - | - |
| Stage 2 | 440 | 443 | - | 340 | 383 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 89 | 115 | 389 | ~ 64 | 115 | 473 | 798 | - | - | 898 | - | - |
| Mov Cap-2 Maneuver | 89 | 115 | - | ~ 64 | 115 | - | - | - | - | - | - | - |
| Stage 1 | 360 | 388 | - | 420 | 429 | - | - | - | - | - | - | - |
| Stage 2 | 392 | 425 | - | 241 | 377 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 31.1 | $ 1345.6 | 0.3 | 0.1 |
| HCM LOS | D | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 798 | - | - | 261 | 71 | 898 | - | - |
| HCM Lane V/C Ratio | 0.026 | - | - | 0.484 | 3.72 | 0.008 | - | - |
| HCM Control Delay (s) | 9.6 | 0 | - | 31.3 | $ 1345.6 | 9 | 0 | - |
| HCM Lane LOS | A | A | - | D | F | A | A | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 2.5 | 27.7 | 0 | - | - |

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 20 | 9 | 179 | 218 | 31 | 25 | 106 | 338 | 60 | 7 | 279 | 13 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1743 | 1900 | 1900 | 1727 | 1900 | 1900 | 1743 | 1900 | 1900 | 1759 | 1900 |
| Adj Flow Rate, veh/h | 23 | 10 | 208 | 237 | 34 | 27 | 123 | 393 | 70 | 8 | 324 | 15 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.92 | 0.92 | 0.92 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 9 | 9 | 9 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 |
| Cap, veh/h | 71 | 47 | 496 | 355 | 45 | 33 | 181 | 526 | 90 | 43 | 828 | 38 |
| Arrive On Green | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| Sat Flow, veh/h | 87 | 128 | 1352 | 791 | 122 | 91 | 273 | 1046 | 179 | 13 | 1645 | 75 |
| Grp Volume(v), veh/h | 241 | 0 | 0 | 298 | 0 | 0 | 586 | 0 | 0 | 347 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 0 | 0 | 1003 | 0 | 0 | 1498 | 0 | 0 | 1733 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 16.5 | 0.0 | 0.0 | 18.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 12.0 | 0.0 | 0.0 | 28.5 | 0.0 | 0.0 | 31.3 | 0.0 | 0.0 | 12.3 | 0.0 | 0.0 |
| Prop In Lane | 0.10 | | 0.86 | 0.80 | | 0.09 | 0.21 | | 0.12 | 0.02 | | 0.04 |
| Lane Grp Cap(c), veh/h | 614 | 0 | 0 | 433 | 0 | 0 | 797 | 0 | 0 | 909 | 0 | 0 |
| V/C Ratio(X) | 0.39 | 0.00 | 0.00 | 0.69 | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 614 | 0 | 0 | 433 | 0 | 0 | 797 | 0 | 0 | 909 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 23.8 | 0.0 | 0.0 | 30.5 | 0.0 | 0.0 | 19.8 | 0.0 | 0.0 | 15.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.9 | 0.0 | 0.0 | 8.7 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.3 | 0.0 | 0.0 | 8.6 | 0.0 | 0.0 | 14.3 | 0.0 | 0.0 | 6.2 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 25.7 | 0.0 | 0.0 | 39.2 | 0.0 | 0.0 | 25.8 | 0.0 | 0.0 | 16.6 | 0.0 | 0.0 |
| LnGrp LOS | C | | | D | | | C | | | B | | |
| Approach Vol, veh/h | | 241 | | | 298 | | | 586 | | | 347 | |
| Approach Delay, s/veh | | 25.7 | | | 39.2 | | | 25.8 | | | 16.6 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 56.8 | | 43.2 | | 56.8 | | 43.2 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 50.3 | | 36.7 | | 50.3 | | 36.7 |
| Max Q Clear Time (g_c+I1), s | | 33.3 | | 14.0 | | 14.3 | | 30.5 |
| Green Ext Time (p_c), s | | 6.7 | | 4.4 | | 8.9 | | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 26.3 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 14 | 2 | 89 | 212 | 6 | 25 | 17 | 489 | 58 | 7 | 653 | 4 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1845 | 1900 | 1900 | 1727 | 1900 | 1743 | 1743 | 1900 | 1900 | 1727 | 1900 |
| Adj Flow Rate, veh/h | 17 | 2 | 107 | 230 | 7 | 27 | 20 | 589 | 63 | 8 | 787 | 5 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.83 | 0.92 | 0.83 | 0.92 | 0.92 | 0.92 | 0.83 | 0.83 | 0.92 | 0.92 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 10 | 10 | 10 | 9 | 9 | 9 | 10 | 10 | 10 |
| Cap, veh/h | 82 | 32 | 412 | 377 | 9 | 36 | 270 | 890 | 95 | 39 | 978 | 6 |
| Arrive On Green | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.57 | 0.57 | 0.57 | 0.57 | 0.57 | 0.57 |
| Sat Flow, veh/h | 139 | 109 | 1396 | 1049 | 32 | 123 | 638 | 1548 | 166 | 5 | 1702 | 11 |
| Grp Volume(v), veh/h | 126 | 0 | 0 | 264 | 0 | 0 | 20 | 0 | 652 | 800 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1644 | 0 | 0 | 1204 | 0 | 0 | 638 | 0 | 1714 | 1718 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 14.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26.1 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 6.0 | 0.0 | 0.0 | 20.0 | 0.0 | 0.0 | 5.4 | 0.0 | 26.1 | 36.7 | 0.0 | 0.0 |
| Prop In Lane | 0.13 | | 0.85 | 0.87 | | 0.10 | 1.00 | | 0.10 | 0.01 | | 0.01 |
| Lane Grp Cap(c), veh/h | 526 | 0 | 0 | 422 | 0 | 0 | 270 | 0 | 985 | 1024 | 0 | 0 |
| V/C Ratio(X) | 0.24 | 0.00 | 0.00 | 0.62 | 0.00 | 0.00 | 0.07 | 0.00 | 0.66 | 0.78 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 526 | 0 | 0 | 422 | 0 | 0 | 270 | 0 | 985 | 1024 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 27.0 | 0.0 | 0.0 | 32.0 | 0.0 | 0.0 | 10.2 | 0.0 | 14.6 | 16.8 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.0 | 0.0 | 6.8 | 0.0 | 0.0 | 0.5 | 0.0 | 3.5 | 5.9 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 | 0.0 | 0.0 | 7.4 | 0.0 | 0.0 | 0.3 | 0.0 | 13.1 | 19.0 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 28.0 | 0.0 | 0.0 | 38.8 | 0.0 | 0.0 | 10.7 | 0.0 | 18.1 | 22.8 | 0.0 | 0.0 |
| LnGrp LOS | C | | | D | | | B | | B | C | | |
| Approach Vol, veh/h | | 126 | | | 264 | | | 672 | | | 800 | |
| Approach Delay, s/veh | | 28.0 | | | 38.8 | | | 17.8 | | | 22.8 | |
| Approach LOS | | C | | | D | | | B | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 64.0 | | 36.0 | | 64.0 | | 36.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 57.5 | | 29.5 | | 57.5 | | 29.5 |
| Max Q Clear Time (g_c+I1), s | | 28.1 | | 8.0 | | 38.7 | | 22.0 |
| Green Ext Time (p_c), s | | 15.0 | | 2.9 | | 11.4 | | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.6 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 23 | 9 | 248 | 186 | 25 | 33 | 144 | 477 | 42 | 9 | 904 | 56 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 29 | 11 | 0 | 232 | 31 | 41 | 180 | 596 | 0 | 11 | 1130 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 273 | 347 | 295 | 336 | 141 | 187 | 211 | 2160 | 966 | 450 | 1634 | 731 |
| Arrive On Green | 0.19 | 0.19 | 0.00 | 0.19 | 0.19 | 0.19 | 0.13 | 0.68 | 0.00 | 0.48 | 0.48 | 0.00 |
| Sat Flow, veh/h | 1273 | 1792 | 1524 | 1398 | 729 | 964 | 1601 | 3195 | 1429 | 780 | 3374 | 1509 |
| Grp Volume(v), veh/h | 29 | 11 | 0 | 232 | 0 | 72 | 180 | 596 | 0 | 11 | 1130 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1273 | 1792 | 1524 | 1398 | 0 | 1693 | 1601 | 1597 | 1429 | 780 | 1687 | 1509 |
| Q Serve(g_s), s | 2.0 | 0.5 | 0.0 | 16.1 | 0.0 | 3.6 | 11.0 | 7.4 | 0.0 | 0.7 | 26.0 | 0.0 |
| Cycle Q Clear(g_c), s | 5.5 | 0.5 | 0.0 | 16.6 | 0.0 | 3.6 | 11.0 | 7.4 | 0.0 | 0.7 | 26.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.57 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 273 | 347 | 295 | 336 | 0 | 328 | 211 | 2160 | 966 | 450 | 1634 | 731 |
| V/C Ratio(X) | 0.11 | 0.03 | 0.00 | 0.69 | 0.00 | 0.22 | 0.85 | 0.28 | 0.00 | 0.02 | 0.69 | 0.00 |
| Avail Cap(c_a), veh/h | 326 | 421 | 358 | 394 | 0 | 398 | 288 | 2160 | 966 | 450 | 1634 | 731 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 36.3 | 32.7 | 0.0 | 39.5 | 0.0 | 33.9 | 42.5 | 6.4 | 0.0 | 13.5 | 20.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 4.1 | 0.0 | 0.3 | 16.3 | 0.3 | 0.0 | 0.1 | 2.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.3 | 0.0 | 6.6 | 0.0 | 1.7 | 5.8 | 3.3 | 0.0 | 0.2 | 12.6 | 0.0 |
| LnGrp Delay(d),s/veh | 36.4 | 32.7 | 0.0 | 43.6 | 0.0 | 34.3 | 58.8 | 6.8 | 0.0 | 13.6 | 22.4 | 0.0 |
| LnGrp LOS | D | C | | D | | C | E | A | | B | C | |
| Approach Vol, veh/h | | 40 | | | 304 | | | 776 | | | 1141 | |
| Approach Delay, s/veh | | 35.4 | | | 41.4 | | | 18.8 | | | 22.3 | |
| Approach LOS | | D | | | D | | | B | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 74.1 | | 25.9 | 19.2 | 54.9 | | 25.9 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 63.5 | | 23.5 | 18.0 | 39.5 | | 23.5 |
| Max Q Clear Time (g_c+I1), s | | 9.4 | | 7.5 | 13.0 | 28.0 | | 18.6 |
| Green Ext Time (p_c), s | | 23.5 | | 1.5 | 0.3 | 8.8 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 23.9 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 51 | 274 | 230 | 697 | 1406 | 112 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 57 | 0 | 256 | 774 | 1562 | 124 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 261 | 120 | 289 | 2548 | 1879 | 841 |
| Arrive On Green | 0.08 | 0.00 | 0.18 | 0.79 | 0.55 | 0.55 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 57 | 0 | 256 | 774 | 1562 | 124 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 1.6 | 0.0 | 15.5 | 6.6 | 38.0 | 4.0 |
| Cycle Q Clear(g_c), s | 1.6 | 0.0 | 15.5 | 6.6 | 38.0 | 4.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 261 | 120 | 289 | 2548 | 1879 | 841 |
| V/C Ratio(X) | 0.22 | 0.00 | 0.89 | 0.30 | 0.83 | 0.15 |
| Avail Cap(c_a), veh/h | 328 | 151 | 355 | 2548 | 1879 | 841 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.1 | 0.0 | 40.1 | 2.9 | 18.5 | 10.9 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 19.8 | 0.3 | 4.5 | 0.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.0 | 8.5 | 3.0 | 19.0 | 1.7 |
| LnGrp Delay(d),s/veh | 43.5 | 0.0 | 59.8 | 3.2 | 23.0 | 11.3 |
| LnGrp LOS | D | | E | A | C | B |
| Approach Vol, veh/h | 57 | | | 1030 | 1686 | |
| Approach Delay, s/veh | 43.5 | | | 17.3 | 22.1 | |
| Approach LOS | D | | | B | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 85.6 | | 14.4 | 23.9 | 61.7 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 22.0 | 49.0 | | |
| Max Q Clear Time (g_c+I1), s | | 8.6 | | 3.6 | 17.5 | 40.0 | | |
| Green Ext Time (p_c), s | | 44.3 | | 0.1 | 0.4 | 8.3 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 20.8 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 216 | 627 | 6 | 288 | 781 | 303 | 387 | 374 | 313 | 452 | 694 | 350 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 235 | 682 | 7 | 313 | 849 | 0 | 421 | 407 | 0 | 491 | 754 | 380 |
| Adj No. of Lanes | 2 | 2 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 527 | 981 | 10 | 380 | 1220 | 546 | 508 | 907 | 406 | 745 | 876 | 392 |
| Arrive On Green | 0.08 | 0.29 | 0.29 | 0.14 | 0.36 | 0.00 | 0.11 | 0.27 | 0.00 | 0.11 | 0.27 | 0.27 |
| Sat Flow, veh/h | 3191 | 3328 | 34 | 1691 | 3374 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 235 | 336 | 353 | 313 | 849 | 0 | 421 | 407 | 0 | 491 | 754 | 380 |
| Grp Sat Flow(s),veh/h/ln | 1596 | 1641 | 1721 | 1691 | 1687 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 6.5 | 23.6 | 23.6 | 16.1 | 27.9 | 0.0 | 11.9 | 13.0 | 0.0 | 14.0 | 28.7 | 33.6 |
| Cycle Q Clear(g_c), s | 6.5 | 23.6 | 23.6 | 16.1 | 27.9 | 0.0 | 11.9 | 13.0 | 0.0 | 14.0 | 28.7 | 33.6 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 527 | 484 | 507 | 380 | 1220 | 546 | 508 | 907 | 406 | 745 | 876 | 392 |
| V/C Ratio(X) | 0.45 | 0.70 | 0.70 | 0.82 | 0.70 | 0.00 | 0.83 | 0.45 | 0.00 | 0.66 | 0.86 | 0.97 |
| Avail Cap(c_a), veh/h | 527 | 484 | 507 | 436 | 1220 | 546 | 509 | 909 | 407 | 745 | 876 | 392 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.5 | 40.6 | 40.7 | 28.1 | 35.4 | 0.0 | 33.4 | 39.5 | 0.0 | 31.5 | 45.2 | 46.9 |
| Incr Delay (d2), s/veh | 0.6 | 8.0 | 7.7 | 10.9 | 3.3 | 0.0 | 11.0 | 0.3 | 0.0 | 2.2 | 8.7 | 37.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 11.8 | 12.4 | 8.6 | 13.5 | 0.0 | 6.1 | 6.1 | 0.0 | 6.6 | 13.9 | 17.6 |
| LnGrp Delay(d),s/veh | 30.1 | 48.7 | 48.3 | 39.1 | 38.7 | 0.0 | 44.4 | 39.8 | 0.0 | 33.6 | 53.9 | 84.3 |
| LnGrp LOS | C | D | D | D | D | | D | D | | C | D | F |
| Approach Vol, veh/h | | 924 | | | 1162 | | | 828 | | | 1625 | |
| Approach Delay, s/veh | | 43.8 | | | 38.8 | | | 42.1 | | | 54.9 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 24.7 | 45.3 | 19.0 | 40.9 | 16.0 | 54.0 | 18.9 | 41.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 23.0 | 34.0 | 14.0 | 35.0 | 10.0 | 47.0 | 14.0 | 35.0 |
| Max Q Clear Time (g_c+I1), s | 18.1 | 25.6 | 16.0 | 15.0 | 8.5 | 29.9 | 13.9 | 35.6 |
| Green Ext Time (p_c), s | 0.6 | 6.0 | 0.0 | 10.9 | 0.2 | 10.4 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 46.2 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 12.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 10 | 39 | 194 | 14 | 81 | 0 | 295 | 70 | 60 | 9 | 161 | 31 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | 750 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 11 | 42 | 209 | 15 | 87 | 0 | 317 | 75 | 65 | 10 | 173 | 33 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 994 | 983 | 190 | 1076 | 968 | 108 | 206 | 0 | 0 | 140 | 0 | 0 |
| Stage 1 | 209 | 209 | - | 742 | 742 | - | - | - | - | - | - | - |
| Stage 2 | 785 | 774 | - | 334 | 226 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 222 | 247 | 847 | 195 | 252 | 940 | 1336 | - | - | 1362 | - | - |
| Stage 1 | 788 | 725 | - | 404 | 419 | - | - | - | - | - | - | - |
| Stage 2 | 383 | 405 | - | 676 | 713 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 114 | 182 | 847 | 97 | 185 | 940 | 1336 | - | - | 1362 | - | - |
| Mov Cap-2 Maneuver | 114 | 182 | - | 97 | 185 | - | - | - | - | - | - | - |
| Stage 1 | 584 | 719 | - | 299 | 310 | - | - | - | - | - | - | - |
| Stage 2 | 204 | 300 | - | 476 | 707 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 22.8 | 41.9 | 5.9 | 0.3 |
| HCM LOS | C | E | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1336 | - | - | 458 | 97 | 185 | 1362 | - | - |
| HCM Lane V/C Ratio | 0.237 | - | - | 0.571 | 0.155 | 0.471 | 0.007 | - | - |
| HCM Control Delay (s) | 8.5 | 0 | - | 22.8 | 48.8 | 40.7 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | C | E | E | A | A | - |
| HCM 95th %tile Q(veh) | 0.9 | - | - | 3.5 | 0.5 | 2.3 | 0 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 13 | 35 | 149 | 54 | 8 | 6 | 249 | 212 | 243 | 28 | 376 | 15 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1696 | 1900 | 1900 | 1727 | 1900 | 1900 | 1727 | 1900 | 1900 | 1845 | 1900 |
| Adj Flow Rate, veh/h | 17 | 45 | 191 | 59 | 9 | 7 | 319 | 272 | 312 | 36 | 482 | 19 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Percent Heavy Veh, % | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 3 | 3 | 3 |
| Cap, veh/h | 52 | 90 | 319 | 253 | 37 | 23 | 272 | 191 | 219 | 78 | 931 | 36 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |
| Sat Flow, veh/h | 48 | 315 | 1119 | 662 | 130 | 82 | 382 | 326 | 374 | 67 | 1591 | 61 |
| Grp Volume(v), veh/h | 253 | 0 | 0 | 75 | 0 | 0 | 903 | 0 | 0 | 537 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1483 | 0 | 0 | 874 | 0 | 0 | 1083 | 0 | 0 | 1719 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 41.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.5 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 58.5 | 0.0 | 0.0 | 17.2 | 0.0 | 0.0 |
| Prop In Lane | 0.07 | | 0.75 | 0.79 | | 0.09 | 0.35 | | 0.35 | 0.07 | | 0.04 |
| Lane Grp Cap(c), veh/h | 461 | 0 | 0 | 314 | 0 | 0 | 682 | 0 | 0 | 1044 | 0 | 0 |
| V/C Ratio(X) | 0.55 | 0.00 | 0.00 | 0.24 | 0.00 | 0.00 | 1.32 | 0.00 | 0.00 | 0.51 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 461 | 0 | 0 | 314 | 0 | 0 | 682 | 0 | 0 | 1044 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 30.8 | 0.0 | 0.0 | 28.6 | 0.0 | 0.0 | 24.9 | 0.0 | 0.0 | 12.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 4.6 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 155.9 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.6 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 48.3 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 35.4 | 0.0 | 0.0 | 30.4 | 0.0 | 0.0 | 180.8 | 0.0 | 0.0 | 14.0 | 0.0 | 0.0 |
| LnGrp LOS | D | | | C | | | F | | | B | | |
| Approach Vol, veh/h | | 253 | | | 75 | | | 903 | | | 537 | |
| Approach Delay, s/veh | | 35.4 | | | 30.4 | | | 180.8 | | | 14.0 | |
| Approach LOS | | D | | | C | | | F | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 65.0 | | 35.0 | | 65.0 | | 35.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 58.5 | | 28.5 | | 58.5 | | 28.5 |
| Max Q Clear Time (g_c+I1), s | | 60.5 | | 16.5 | | 19.2 | | 11.5 |
| Green Ext Time (p_c), s | | 0.0 | | 1.8 | | 20.0 | | 2.2 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 102.9 |
| HCM 2010 LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 4 | 7 | 27 | 53 | 2 | 6 | 101 | 670 | 236 | 28 | 532 | 21 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1226 | 1900 | 1900 | 1727 | 1900 | 1727 | 1727 | 1900 | 1900 | 1792 | 1900 |
| Adj Flow Rate, veh/h | 5 | 9 | 33 | 58 | 2 | 7 | 125 | 827 | 291 | 35 | 657 | 26 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.92 | 0.92 | 0.92 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Percent Heavy Veh, % | 55 | 55 | 55 | 10 | 10 | 10 | 10 | 10 | 10 | 6 | 6 | 6 |
| Cap, veh/h | 52 | 60 | 170 | 325 | 14 | 32 | 164 | 788 | 277 | 38 | 441 | 17 |
| Arrive On Green | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 |
| Sat Flow, veh/h | 52 | 268 | 755 | 1146 | 60 | 141 | 700 | 1222 | 430 | 0 | 684 | 26 |
| Grp Volume(v), veh/h | 47 | 0 | 0 | 67 | 0 | 0 | 125 | 0 | 1118 | 718 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1075 | 0 | 0 | 1347 | 0 | 0 | 700 | 0 | 1651 | 710 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 64.5 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 3.5 | 0.0 | 0.0 | 3.3 | 0.0 | 0.0 | 64.5 | 0.0 | 64.5 | 64.5 | 0.0 | 0.0 |
| Prop In Lane | 0.11 | | 0.70 | 0.87 | | 0.10 | 1.00 | | 0.26 | 0.05 | | 0.04 |
| Lane Grp Cap(c), veh/h | 282 | 0 | 0 | 370 | 0 | 0 | 164 | 0 | 1065 | 496 | 0 | 0 |
| V/C Ratio(X) | 0.17 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.76 | 0.00 | 1.05 | 1.45 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 282 | 0 | 0 | 370 | 0 | 0 | 164 | 0 | 1065 | 496 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 31.4 | 0.0 | 0.0 | 31.3 | 0.0 | 0.0 | 26.3 | 0.0 | 17.8 | 33.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | 28.0 | 0.0 | 41.5 | 213.0 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 4.7 | 0.0 | 41.3 | 41.9 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 32.7 | 0.0 | 0.0 | 32.4 | 0.0 | 0.0 | 54.3 | 0.0 | 59.3 | 246.4 | 0.0 | 0.0 |
| LnGrp LOS | C | | | C | | | D | | F | F | | |
| Approach Vol, veh/h | | 47 | | | 67 | | | 1243 | | | 718 | |
| Approach Delay, s/veh | | 32.7 | | | 32.4 | | | 58.8 | | | 246.4 | |
| Approach LOS | | C | | | C | | | E | | | F | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 71.0 | | 29.0 | | 71.0 | | 29.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 64.5 | | 22.5 | | 64.5 | | 22.5 |
| Max Q Clear Time (g_c+I1), s | | 66.5 | | 5.5 | | 66.5 | | 5.3 |
| Green Ext Time (p_c), s | | 0.0 | | 0.5 | | 0.0 | | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 122.3 |
| HCM 2010 LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 39 | 32 | 116 | 46 | 12 | 11 | 282 | 971 | 193 | 38 | 551 | 25 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 47 | 39 | 0 | 55 | 14 | 13 | 340 | 1170 | 0 | 46 | 664 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 181 | 183 | 155 | 153 | 66 | 61 | 349 | 2553 | 1142 | 296 | 1659 | 742 |
| Arrive On Green | 0.10 | 0.10 | 0.00 | 0.10 | 0.10 | 0.10 | 0.21 | 0.77 | 0.00 | 0.50 | 0.50 | 0.00 |
| Sat Flow, veh/h | 1364 | 1845 | 1568 | 1022 | 668 | 620 | 1660 | 3312 | 1482 | 447 | 3312 | 1482 |
| Grp Volume(v), veh/h | 47 | 39 | 0 | 55 | 0 | 27 | 340 | 1170 | 0 | 46 | 664 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1364 | 1845 | 1568 | 1022 | 0 | 1288 | 1660 | 1656 | 1482 | 447 | 1656 | 1482 |
| Q Serve(g_s), s | 3.3 | 1.9 | 0.0 | 5.2 | 0.0 | 1.9 | 20.3 | 12.5 | 0.0 | 5.7 | 12.5 | 0.0 |
| Cycle Q Clear(g_c), s | 5.2 | 1.9 | 0.0 | 7.2 | 0.0 | 1.9 | 20.3 | 12.5 | 0.0 | 5.7 | 12.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.48 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 181 | 183 | 155 | 153 | 0 | 128 | 349 | 2553 | 1142 | 296 | 1659 | 742 |
| V/C Ratio(X) | 0.26 | 0.21 | 0.00 | 0.36 | 0.00 | 0.21 | 0.98 | 0.46 | 0.00 | 0.16 | 0.40 | 0.00 |
| Avail Cap(c_a), veh/h | 400 | 480 | 408 | 318 | 0 | 335 | 349 | 2553 | 1142 | 296 | 1659 | 742 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 43.9 | 41.5 | 0.0 | 44.8 | 0.0 | 41.5 | 39.2 | 4.1 | 0.0 | 13.9 | 15.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.8 | 0.6 | 0.0 | 1.4 | 0.0 | 0.8 | 41.4 | 0.6 | 0.0 | 1.1 | 0.7 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 1.0 | 0.0 | 1.5 | 0.0 | 0.7 | 13.4 | 5.9 | 0.0 | 0.8 | 5.9 | 0.0 |
| LnGrp Delay(d),s/veh | 44.6 | 42.0 | 0.0 | 46.2 | 0.0 | 42.3 | 80.7 | 4.7 | 0.0 | 15.0 | 16.3 | 0.0 |
| LnGrp LOS | D | D | | D | | D | F | A | | B | B | |
| Approach Vol, veh/h | | 86 | | | 82 | | | 1510 | | | 710 | |
| Approach Delay, s/veh | | 43.4 | | | 44.9 | | | 21.8 | | | 16.2 | |
| Approach LOS | | D | | | D | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 83.6 | | 16.4 | 27.0 | 56.6 | | 16.4 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 61.0 | | 26.0 | 21.0 | 34.0 | | 26.0 |
| Max Q Clear Time (g_c+I1), s | | 14.5 | | 7.2 | 22.3 | 14.5 | | 9.2 |
| Green Ext Time (p_c), s | | 25.3 | | 0.8 | 0.0 | 14.3 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 21.7 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 98 | 213 | 356 | 1405 | 711 | 53 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 113 | 0 | 409 | 1615 | 817 | 61 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 300 | 138 | 444 | 2637 | 1414 | 633 |
| Arrive On Green | 0.10 | 0.00 | 0.26 | 0.77 | 0.45 | 0.45 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 113 | 0 | 409 | 1615 | 817 | 61 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 3.4 | 0.0 | 23.3 | 20.4 | 19.4 | 2.5 |
| Cycle Q Clear(g_c), s | 3.4 | 0.0 | 23.3 | 20.4 | 19.4 | 2.5 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 300 | 138 | 444 | 2637 | 1414 | 633 |
| V/C Ratio(X) | 0.38 | 0.00 | 0.92 | 0.61 | 0.58 | 0.10 |
| Avail Cap(c_a), veh/h | 313 | 144 | 495 | 2637 | 1414 | 633 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.4 | 0.0 | 36.0 | 4.8 | 20.2 | 15.6 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 21.6 | 1.1 | 1.7 | 0.3 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 0.0 | 13.7 | 9.8 | 8.6 | 1.0 |
| LnGrp Delay(d),s/veh | 43.2 | 0.0 | 57.6 | 5.9 | 21.9 | 15.9 |
| LnGrp LOS | D | | E | A | C | B |
| Approach Vol, veh/h | 113 | | | 2024 | 878 | |
| Approach Delay, s/veh | 43.2 | | | 16.4 | 21.5 | |
| Approach LOS | D | | | B | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 83.9 | | 16.1 | 32.0 | 51.9 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 29.0 | 42.0 | | |
| Max Q Clear Time (g_c+I1), s | | 22.4 | | 5.4 | 25.3 | 21.4 | | |
| Green Ext Time (p_c), s | | 39.3 | | 0.2 | 0.7 | 17.8 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.9 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 582 | 878 | 12 | 354 | 854 | 722 | 377 | 967 | 255 | 561 | 571 | 290 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 633 | 954 | 13 | 385 | 928 | 0 | 410 | 1051 | 0 | 610 | 621 | 315 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 549 | 1453 | 20 | 577 | 1537 | 479 | 534 | 833 | 373 | 580 | 1038 | 465 |
| Arrive On Green | 0.08 | 0.31 | 0.31 | 0.10 | 0.32 | 0.00 | 0.08 | 0.25 | 0.00 | 0.15 | 0.33 | 0.33 |
| Sat Flow, veh/h | 3163 | 4751 | 65 | 3221 | 4759 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 633 | 625 | 342 | 385 | 928 | 0 | 410 | 1051 | 0 | 610 | 621 | 315 |
| Grp Sat Flow(s),veh/h/ln | 1581 | 1558 | 1700 | 1610 | 1586 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 11.0 | 22.7 | 22.7 | 10.5 | 21.3 | 0.0 | 10.0 | 33.0 | 0.0 | 20.0 | 21.5 | 25.2 |
| Cycle Q Clear(g_c), s | 11.0 | 22.7 | 22.7 | 10.5 | 21.3 | 0.0 | 10.0 | 33.0 | 0.0 | 20.0 | 21.5 | 25.2 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 549 | 953 | 520 | 577 | 1537 | 479 | 534 | 833 | 373 | 580 | 1038 | 465 |
| V/C Ratio(X) | 1.15 | 0.66 | 0.66 | 0.67 | 0.60 | 0.00 | 0.77 | 1.26 | 0.00 | 1.05 | 0.60 | 0.68 |
| Avail Cap(c_a), veh/h | 549 | 953 | 520 | 670 | 1537 | 479 | 534 | 833 | 373 | 580 | 1038 | 465 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.7 | 39.2 | 39.2 | 29.0 | 37.0 | 0.0 | 37.6 | 48.5 | 0.0 | 38.8 | 36.3 | 37.5 |
| Incr Delay (d2), s/veh | 88.4 | 3.5 | 6.4 | 2.1 | 1.8 | 0.0 | 6.7 | 127.3 | 0.0 | 51.5 | 0.9 | 3.9 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.8 | 10.2 | 11.5 | 4.8 | 9.6 | 0.0 | 3.2 | 29.7 | 0.0 | 14.5 | 9.5 | 10.2 |
| LnGrp Delay(d),s/veh | 128.2 | 42.7 | 45.6 | 31.1 | 38.8 | 0.0 | 44.3 | 175.8 | 0.0 | 90.2 | 37.2 | 41.5 |
| LnGrp LOS | F | D | D | C | D | | D | F | | F | D | D |
| Approach Vol, veh/h | | 1600 | | | 1313 | | | 1461 | | | 1546 | |
| Approach Delay, s/veh | | 77.1 | | | 36.5 | | | 138.9 | | | 59.0 | |
| Approach LOS | | E | | | D | | | F | | | E | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 19.2 | 46.8 | 25.0 | 39.0 | 17.0 | 49.0 | 15.0 | 49.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 17.0 | 36.0 | 20.0 | 33.0 | 11.0 | 42.0 | 10.0 | 43.0 |
| Max Q Clear Time (g_c+I1), s | 12.5 | 24.7 | 22.0 | 35.0 | 13.0 | 23.3 | 12.0 | 27.2 |
| Green Ext Time (p_c), s | 0.8 | 8.9 | 0.0 | 0.0 | 0.0 | 13.2 | 0.0 | 11.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 78.6 |
| HCM 2010 LOS | E |

| Intersection | |
|---|---|
| Int Delay, s/veh | 18.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 17 | 99 | 299 | 44 | 84 | 6 | 100 | 113 | 31 | 6 | 58 | 7 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | 0 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 22 | 129 | 388 | 57 | 109 | 8 | 130 | 147 | 40 | 8 | 75 | 9 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 580 | 542 | 80 | 781 | 527 | 167 | 84 | 0 | 0 | 187 | 0 | 0 |
| Stage 1 | 95 | 95 | - | 427 | 427 | - | - | - | - | - | - | - |
| Stage 2 | 485 | 447 | - | 354 | 100 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 423 | 445 | 975 | 310 | 453 | 872 | 1482 | - | - | 1307 | - | - |
| Stage 1 | 907 | 812 | - | 602 | 582 | - | - | - | - | - | - | - |
| Stage 2 | 560 | 570 | - | 659 | 808 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 307 | 399 | 975 | 130 | 406 | 872 | 1482 | - | - | 1307 | - | - |
| Mov Cap-2 Maneuver | 307 | 399 | - | 130 | 406 | - | - | - | - | - | - | - |
| Stage 1 | 818 | 807 | - | 543 | 525 | - | - | - | - | - | - | - |
| Stage 2 | 397 | 514 | - | 331 | 803 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 27.4 | 28.6 | 3.1 | 0.7 |
| HCM LOS | D | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1482 | - | - | 680 | 130 | 421 | 1307 | - | - |
| HCM Lane V/C Ratio | 0.088 | - | - | 0.793 | 0.44 | 0.278 | 0.006 | - | - |
| HCM Control Delay (s) | 7.7 | 0 | - | 27.4 | 52.8 | 16.8 | 7.8 | 0 | - |
| HCM Lane LOS | A | A | - | D | F | C | A | A | - |
| HCM 95th %tile Q(veh) | 0.3 | - | - | 7.9 | 1.9 | 1.1 | 0 | - | - |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 17 | 99 | 299 | 44 | 84 | 6 | 100 | 113 | 31 | 6 | 58 | 7 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1827 | 1900 | 1900 | 1827 | 1900 | 1900 | 1776 | 1900 | 1900 | 1638 | 1900 |
| Adj Flow Rate, veh/h | 22 | 129 | 388 | 57 | 109 | 8 | 130 | 147 | 40 | 8 | 75 | 9 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Cap, veh/h | 85 | 148 | 405 | 191 | 319 | 20 | 304 | 316 | 75 | 97 | 538 | 60 |
| Arrive On Green | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| Sat Flow, veh/h | 29 | 421 | 1158 | 271 | 912 | 57 | 520 | 810 | 192 | 49 | 1379 | 155 |
| Grp Volume(v), veh/h | 539 | 0 | 0 | 174 | 0 | 0 | 317 | 0 | 0 | 92 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1609 | 0 | 0 | 1240 | 0 | 0 | 1522 | 0 | 0 | 1583 | 0 | 0 |
| Q Serve(g_s), s | 6.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 16.4 | 0.0 | 0.0 | 3.5 | 0.0 | 0.0 | 7.7 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 |
| Prop In Lane | 0.04 | | 0.72 | 0.33 | | 0.05 | 0.41 | | 0.13 | 0.09 | | 0.10 |
| Lane Grp Cap(c), veh/h | 638 | 0 | 0 | 530 | 0 | 0 | 695 | 0 | 0 | 696 | 0 | 0 |
| V/C Ratio(X) | 0.84 | 0.00 | 0.00 | 0.33 | 0.00 | 0.00 | 0.46 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 638 | 0 | 0 | 530 | 0 | 0 | 695 | 0 | 0 | 696 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 15.8 | 0.0 | 0.0 | 11.7 | 0.0 | 0.0 | 11.5 | 0.0 | 0.0 | 9.9 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 10.1 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 2.2 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.0 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 3.7 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 26.0 | 0.0 | 0.0 | 12.0 | 0.0 | 0.0 | 13.7 | 0.0 | 0.0 | 10.3 | 0.0 | 0.0 |
| LnGrp LOS | C | | | B | | | B | | | B | | |
| Approach Vol, veh/h | | 539 | | | 174 | | | 317 | | | 92 | |
| Approach Delay, s/veh | | 26.0 | | | 12.0 | | | 13.7 | | | 10.3 | |
| Approach LOS | | C | | | B | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 26.0 | | 24.0 | | 26.0 | | 24.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 19.5 | | 17.5 | | 19.5 | | 17.5 |
| Max Q Clear Time (g_c+I1), s | | 9.7 | | 18.4 | | 3.8 | | 5.5 |
| Green Ext Time (p_c), s | | 1.9 | | 0.0 | | 2.5 | | 4.5 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 19.1 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 13 | 35 | 149 | 54 | 8 | 6 | 249 | 212 | 243 | 28 | 376 | 15 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1696 | 1900 | 1900 | 1727 | 1900 | 1727 | 1727 | 1900 | 1900 | 1845 | 1900 |
| Adj Flow Rate, veh/h | 17 | 45 | 191 | 59 | 9 | 7 | 319 | 272 | 312 | 36 | 482 | 19 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Percent Heavy Veh, % | 12 | 12 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 3 | 3 | 3 |
| Cap, veh/h | 49 | 60 | 217 | 154 | 22 | 12 | 594 | 500 | 574 | 87 | 1097 | 42 |
| Arrive On Green | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 |
| Sat Flow, veh/h | 54 | 318 | 1144 | 476 | 117 | 61 | 829 | 735 | 843 | 71 | 1611 | 62 |
| Grp Volume(v), veh/h | 253 | 0 | 0 | 75 | 0 | 0 | 319 | 0 | 584 | 537 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1516 | 0 | 0 | 654 | 0 | 0 | 829 | 0 | 1578 | 1744 | 0 | 0 |
| Q Serve(g_s), s | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 14.9 | 0.0 | 18.8 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 16.1 | 0.0 | 0.0 | 12.0 | 0.0 | 0.0 | 28.1 | 0.0 | 18.8 | 13.2 | 0.0 | 0.0 |
| Prop In Lane | 0.07 | | 0.75 | 0.79 | | 0.09 | 1.00 | | 0.53 | 0.07 | | 0.04 |
| Lane Grp Cap(c), veh/h | 325 | 0 | 0 | 188 | 0 | 0 | 594 | 0 | 1074 | 1226 | 0 | 0 |
| V/C Ratio(X) | 0.78 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 | 0.54 | 0.00 | 0.54 | 0.44 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 370 | 0 | 0 | 223 | 0 | 0 | 594 | 0 | 1074 | 1226 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 39.4 | 0.0 | 0.0 | 37.2 | 0.0 | 0.0 | 10.6 | 0.0 | 8.1 | 7.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 8.9 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 3.4 | 0.0 | 2.0 | 1.1 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.6 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 5.8 | 0.0 | 8.7 | 7.0 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 48.4 | 0.0 | 0.0 | 38.6 | 0.0 | 0.0 | 14.0 | 0.0 | 10.1 | 8.4 | 0.0 | 0.0 |
| LnGrp LOS | D | | | D | | | B | | B | A | | |
| Approach Vol, veh/h | | 253 | | | 75 | | | 903 | | | 537 | |
| Approach Delay, s/veh | | 48.4 | | | 38.6 | | | 11.5 | | | 8.4 | |
| Approach LOS | | D | | | D | | | B | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 74.6 | | 25.4 | | 74.6 | | 25.4 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 65.0 | | 22.0 | | 65.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | | 30.1 | | 18.1 | | 15.2 | | 14.0 |
| Green Ext Time (p_c), s | | 15.6 | | 0.8 | | 17.8 | | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 16.9 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 4 | 7 | 27 | 53 | 2 | 6 | 101 | 670 | 236 | 28 | 532 | 21 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1226 | 1900 | 1900 | 1727 | 1900 | 1727 | 1727 | 1900 | 1900 | 1792 | 1900 |
| Adj Flow Rate, veh/h | 5 | 9 | 33 | 58 | 2 | 7 | 125 | 827 | 291 | 35 | 657 | 26 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.92 | 0.92 | 0.92 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Percent Heavy Veh, % | 55 | 55 | 55 | 10 | 10 | 10 | 10 | 10 | 10 | 6 | 6 | 6 |
| Cap, veh/h | 44 | 18 | 52 | 151 | 4 | 10 | 377 | 981 | 345 | 68 | 1120 | 43 |
| Arrive On Green | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Sat Flow, veh/h | 61 | 266 | 769 | 1253 | 66 | 154 | 700 | 1222 | 430 | 37 | 1394 | 54 |
| Grp Volume(v), veh/h | 47 | 0 | 0 | 67 | 0 | 0 | 125 | 0 | 1118 | 718 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1095 | 0 | 0 | 1472 | 0 | 0 | 700 | 0 | 1651 | 1485 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 41.3 | 7.4 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 4.1 | 0.0 | 0.0 | 4.1 | 0.0 | 0.0 | 49.0 | 0.0 | 41.3 | 48.7 | 0.0 | 0.0 |
| Prop In Lane | 0.11 | | 0.70 | 0.87 | | 0.10 | 1.00 | | 0.26 | 0.05 | | 0.04 |
| Lane Grp Cap(c), veh/h | 113 | 0 | 0 | 166 | 0 | 0 | 377 | 0 | 1326 | 1230 | 0 | 0 |
| V/C Ratio(X) | 0.42 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 | 0.33 | 0.00 | 0.84 | 0.58 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 502 | 0 | 0 | 640 | 0 | 0 | 377 | 0 | 1326 | 1230 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 45.5 | 0.0 | 0.0 | 45.4 | 0.0 | 0.0 | 7.1 | 0.0 | 6.0 | 4.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.4 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 2.4 | 0.0 | 6.7 | 2.0 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 2.6 | 0.0 | 20.8 | 7.1 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 47.9 | 0.0 | 0.0 | 47.0 | 0.0 | 0.0 | 9.5 | 0.0 | 12.7 | 6.0 | 0.0 | 0.0 |
| LnGrp LOS | D | | | D | | | A | | B | A | | |
| Approach Vol, veh/h | | 47 | | | 67 | | | 1243 | | | 718 | |
| Approach Delay, s/veh | | 47.9 | | | 47.0 | | | 12.4 | | | 6.0 | |
| Approach LOS | | D | | | D | | | B | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 86.8 | | 13.2 | | 86.8 | | 13.2 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 43.5 | | 43.5 | | 43.5 | | 43.5 |
| Max Q Clear Time (g_c+I1), s | | 51.0 | | 6.1 | | 50.7 | | 6.1 |
| Green Ext Time (p_c), s | | 0.0 | | 0.8 | | 0.0 | | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 12.1 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 39 | 32 | 116 | 46 | 12 | 11 | 282 | 971 | 193 | 38 | 551 | 25 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1845 | 1845 | 1845 | 1397 | 1397 | 1900 | 1743 | 1743 | 1743 | 1743 | 1743 | 1743 |
| Adj Flow Rate, veh/h | 47 | 39 | 0 | 55 | 14 | 13 | 340 | 1170 | 0 | 46 | 664 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 36 | 36 | 36 | 9 | 9 | 9 | 9 | 9 | 9 |
| Cap, veh/h | 181 | 183 | 155 | 153 | 66 | 61 | 374 | 2553 | 1142 | 289 | 1609 | 720 |
| Arrive On Green | 0.10 | 0.10 | 0.00 | 0.10 | 0.10 | 0.10 | 0.23 | 0.77 | 0.00 | 0.49 | 0.49 | 0.00 |
| Sat Flow, veh/h | 1364 | 1845 | 1568 | 1022 | 668 | 620 | 1660 | 3312 | 1482 | 447 | 3312 | 1482 |
| Grp Volume(v), veh/h | 47 | 39 | 0 | 55 | 0 | 27 | 340 | 1170 | 0 | 46 | 664 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1364 | 1845 | 1568 | 1022 | 0 | 1288 | 1660 | 1656 | 1482 | 447 | 1656 | 1482 |
| Q Serve(g_s), s | 3.3 | 1.9 | 0.0 | 5.2 | 0.0 | 1.9 | 20.0 | 12.5 | 0.0 | 5.9 | 12.9 | 0.0 |
| Cycle Q Clear(g_c), s | 5.2 | 1.9 | 0.0 | 7.2 | 0.0 | 1.9 | 20.0 | 12.5 | 0.0 | 5.9 | 12.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.48 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 181 | 183 | 155 | 153 | 0 | 128 | 374 | 2553 | 1142 | 289 | 1609 | 720 |
| V/C Ratio(X) | 0.26 | 0.21 | 0.00 | 0.36 | 0.00 | 0.21 | 0.91 | 0.46 | 0.00 | 0.16 | 0.41 | 0.00 |
| Avail Cap(c_a), veh/h | 400 | 480 | 408 | 318 | 0 | 335 | 432 | 2553 | 1142 | 289 | 1609 | 720 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 43.9 | 41.5 | 0.0 | 44.8 | 0.0 | 41.5 | 37.7 | 4.1 | 0.0 | 14.7 | 16.5 | 0.0 |
| Incr Delay (d2), s/veh | 0.8 | 0.6 | 0.0 | 1.4 | 0.0 | 0.8 | 21.2 | 0.6 | 0.0 | 1.2 | 0.8 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 1.0 | 0.0 | 1.5 | 0.0 | 0.7 | 11.4 | 5.9 | 0.0 | 0.8 | 6.1 | 0.0 |
| LnGrp Delay(d),s/veh | 44.6 | 42.0 | 0.0 | 46.2 | 0.0 | 42.3 | 59.0 | 4.7 | 0.0 | 15.9 | 17.3 | 0.0 |
| LnGrp LOS | D | D | | D | | D | E | A | | B | B | |
| Approach Vol, veh/h | | 86 | | | 82 | | | 1510 | | | 710 | |
| Approach Delay, s/veh | | 43.4 | | | 44.9 | | | 16.9 | | | 17.2 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 83.6 | | 16.4 | 28.5 | 55.1 | | 16.4 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 61.0 | | 26.0 | 26.0 | 29.0 | | 26.0 |
| Max Q Clear Time (g_c+I1), s | | 14.5 | | 7.2 | 22.0 | 14.9 | | 9.2 |
| Green Ext Time (p_c), s | | 25.3 | | 0.8 | 0.6 | 11.0 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 18.9 |
| HCM 2010 LOS | B |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 98 | 213 | 356 | 1405 | 711 | 53 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1696 | 1696 | 1792 | 1792 | 1638 | 1638 |
| Adj Flow Rate, veh/h | 113 | 0 | 409 | 1615 | 817 | 61 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 12 | 12 | 6 | 6 | 16 | 16 |
| Cap, veh/h | 398 | 183 | 449 | 2341 | 1054 | 471 |
| Arrive On Green | 0.13 | 0.00 | 0.26 | 0.69 | 0.34 | 0.34 |
| Sat Flow, veh/h | 3134 | 1442 | 1707 | 3495 | 3194 | 1392 |
| Grp Volume(v), veh/h | 113 | 0 | 409 | 1615 | 817 | 61 |
| Grp Sat Flow(s),veh/h/ln | 1567 | 1442 | 1707 | 1703 | 1556 | 1392 |
| Q Serve(g_s), s | 2.3 | 0.0 | 16.3 | 19.7 | 16.5 | 2.1 |
| Cycle Q Clear(g_c), s | 2.3 | 0.0 | 16.3 | 19.7 | 16.5 | 2.1 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 398 | 183 | 449 | 2341 | 1054 | 471 |
| V/C Ratio(X) | 0.28 | 0.00 | 0.91 | 0.69 | 0.78 | 0.13 |
| Avail Cap(c_a), veh/h | 448 | 206 | 463 | 2341 | 1054 | 471 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.7 | 0.0 | 25.0 | 6.5 | 20.8 | 16.0 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 21.7 | 1.7 | 5.6 | 0.6 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.0 | 10.3 | 9.5 | 7.9 | 0.9 |
| LnGrp Delay(d),s/veh | 28.1 | 0.0 | 46.7 | 8.2 | 26.3 | 16.6 |
| LnGrp LOS | C | | D | A | C | B |
| Approach Vol, veh/h | 113 | | | 2024 | 878 | |
| Approach Delay, s/veh | 28.1 | | | 16.0 | 25.7 | |
| Approach LOS | C | | | B | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 54.6 | | 15.4 | 24.4 | 30.2 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 47.0 | | 10.0 | 19.0 | 22.0 | | |
| Max Q Clear Time (g_c+I1), s | | 21.7 | | 4.3 | 18.3 | 18.5 | | |
| Green Ext Time (p_c), s | | 21.3 | | 0.2 | 0.2 | 3.4 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 19.3 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 582 | 878 | 12 | 354 | 854 | 722 | 377 | 967 | 255 | 561 | 571 | 290 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1712 | 1712 | 1900 | 1743 | 1743 | 1743 | 1727 | 1727 | 1727 | 1652 | 1652 | 1652 |
| Adj Flow Rate, veh/h | 633 | 954 | 13 | 385 | 928 | 0 | 410 | 1051 | 0 | 610 | 621 | 315 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 11 | 11 | 11 | 9 | 9 | 9 | 10 | 10 | 10 | 15 | 15 | 15 |
| Cap, veh/h | 473 | 1227 | 17 | 519 | 1354 | 422 | 647 | 1085 | 486 | 501 | 1096 | 490 |
| Arrive On Green | 0.08 | 0.26 | 0.26 | 0.10 | 0.28 | 0.00 | 0.10 | 0.33 | 0.00 | 0.12 | 0.35 | 0.35 |
| Sat Flow, veh/h | 3163 | 4751 | 65 | 3221 | 4759 | 1482 | 3191 | 3282 | 1468 | 3053 | 3139 | 1404 |
| Grp Volume(v), veh/h | 633 | 625 | 342 | 385 | 928 | 0 | 410 | 1051 | 0 | 610 | 621 | 315 |
| Grp Sat Flow(s),veh/h/ln | 1581 | 1558 | 1700 | 1610 | 1586 | 1482 | 1596 | 1641 | 1468 | 1526 | 1570 | 1404 |
| Q Serve(g_s), s | 10.0 | 24.2 | 24.2 | 11.3 | 22.5 | 0.0 | 10.8 | 41.0 | 0.0 | 16.0 | 20.9 | 24.5 |
| Cycle Q Clear(g_c), s | 10.0 | 24.2 | 24.2 | 11.3 | 22.5 | 0.0 | 10.8 | 41.0 | 0.0 | 16.0 | 20.9 | 24.5 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 473 | 805 | 439 | 519 | 1354 | 422 | 647 | 1085 | 486 | 501 | 1096 | 490 |
| V/C Ratio(X) | 1.34 | 0.78 | 0.78 | 0.74 | 0.69 | 0.00 | 0.63 | 0.97 | 0.00 | 1.22 | 0.57 | 0.64 |
| Avail Cap(c_a), veh/h | 473 | 805 | 439 | 533 | 1354 | 422 | 730 | 1086 | 486 | 501 | 1096 | 490 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.3 | 44.7 | 44.7 | 33.5 | 41.3 | 0.0 | 25.9 | 42.8 | 0.0 | 37.3 | 34.3 | 35.5 |
| Incr Delay (d2), s/veh | 165.8 | 7.3 | 12.7 | 5.4 | 2.8 | 0.0 | 1.5 | 20.0 | 0.0 | 115.3 | 0.7 | 2.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 15.0 | 11.2 | 12.9 | 5.4 | 10.2 | 0.0 | 4.9 | 21.6 | 0.0 | 17.0 | 9.2 | 9.9 |
| LnGrp Delay(d),s/veh | 209.1 | 52.0 | 57.5 | 38.9 | 44.2 | 0.0 | 27.4 | 62.8 | 0.0 | 152.6 | 35.0 | 38.3 |
| LnGrp LOS | F | D | E | D | D | | C | E | | F | D | D |
| Approach Vol, veh/h | | 1600 | | | 1313 | | | 1461 | | | 1546 | |
| Approach Delay, s/veh | | 115.3 | | | 42.6 | | | 52.9 | | | 82.1 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 19.4 | 40.6 | 21.0 | 49.0 | 16.0 | 44.0 | 18.6 | 51.4 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 14.0 | 33.0 | 16.0 | 43.0 | 10.0 | 37.0 | 17.0 | 42.0 |
| Max Q Clear Time (g_c+I1), s | 13.3 | 26.2 | 18.0 | 43.0 | 12.0 | 24.5 | 12.8 | 26.5 |
| Green Ext Time (p_c), s | 0.2 | 5.6 | 0.0 | 0.0 | 0.0 | 9.6 | 0.8 | 11.7 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 75.1 |
| HCM 2010 LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 26 | 9 | 239 | 218 | 31 | 25 | 141 | 426 | 60 | 7 | 331 | 14 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1743 | 1900 | 1900 | 1727 | 1900 | 1900 | 1743 | 1900 | 1900 | 1759 | 1900 |
| Adj Flow Rate, veh/h | 30 | 10 | 278 | 237 | 34 | 27 | 164 | 495 | 70 | 8 | 385 | 16 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.92 | 0.92 | 0.92 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 9 | 9 | 9 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 |
| Cap, veh/h | 67 | 31 | 405 | 226 | 23 | 18 | 217 | 588 | 81 | 43 | 970 | 40 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 | 0.58 |
| Sat Flow, veh/h | 97 | 107 | 1422 | 568 | 81 | 65 | 295 | 1005 | 138 | 11 | 1658 | 68 |
| Grp Volume(v), veh/h | 318 | 0 | 0 | 298 | 0 | 0 | 729 | 0 | 0 | 409 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1626 | 0 | 0 | 714 | 0 | 0 | 1438 | 0 | 0 | 1737 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 10.5 | 0.0 | 0.0 | 29.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 18.0 | 0.0 | 0.0 | 28.5 | 0.0 | 0.0 | 42.4 | 0.0 | 0.0 | 12.7 | 0.0 | 0.0 |
| Prop In Lane | 0.09 | | 0.87 | 0.80 | | 0.09 | 0.22 | | 0.10 | 0.02 | | 0.04 |
| Lane Grp Cap(c), veh/h | 503 | 0 | 0 | 268 | 0 | 0 | 885 | 0 | 0 | 1053 | 0 | 0 |
| V/C Ratio(X) | 0.63 | 0.00 | 0.00 | 1.11 | 0.00 | 0.00 | 0.82 | 0.00 | 0.00 | 0.39 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 503 | 0 | 0 | 268 | 0 | 0 | 885 | 0 | 0 | 1053 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 32.2 | 0.0 | 0.0 | 41.3 | 0.0 | 0.0 | 17.2 | 0.0 | 0.0 | 11.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 5.9 | 0.0 | 0.0 | 88.2 | 0.0 | 0.0 | 8.6 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.7 | 0.0 | 0.0 | 13.9 | 0.0 | 0.0 | 18.7 | 0.0 | 0.0 | 6.3 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 38.2 | 0.0 | 0.0 | 129.5 | 0.0 | 0.0 | 25.8 | 0.0 | 0.0 | 12.3 | 0.0 | 0.0 |
| LnGrp LOS | D | | | F | | | C | | | B | | |
| Approach Vol, veh/h | | 318 | | | 298 | | | 729 | | | 409 | |
| Approach Delay, s/veh | | 38.2 | | | 129.5 | | | 25.8 | | | 12.3 | |
| Approach LOS | | D | | | F | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 65.0 | | 35.0 | | 65.0 | | 35.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 58.5 | | 28.5 | | 58.5 | | 28.5 |
| Max Q Clear Time (g_c+I1), s | | 44.4 | | 20.0 | | 14.7 | | 30.5 |
| Green Ext Time (p_c), s | | 7.6 | | 3.1 | | 12.9 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 42.5 |
| HCM 2010 LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 18 | 2 | 119 | 212 | 6 | 25 | 23 | 616 | 58 | 7 | 760 | 4 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1845 | 1900 | 1900 | 1727 | 1900 | 1743 | 1743 | 1900 | 1900 | 1727 | 1900 |
| Adj Flow Rate, veh/h | 22 | 2 | 143 | 230 | 7 | 27 | 28 | 742 | 63 | 8 | 916 | 5 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.83 | 0.92 | 0.83 | 0.92 | 0.92 | 0.92 | 0.83 | 0.83 | 0.92 | 0.92 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 10 | 10 | 10 | 9 | 9 | 9 | 10 | 10 | 10 |
| Cap, veh/h | 71 | 26 | 331 | 271 | 6 | 24 | 268 | 1022 | 87 | 39 | 1099 | 6 |
| Arrive On Green | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 |
| Sat Flow, veh/h | 133 | 114 | 1471 | 906 | 28 | 106 | 566 | 1585 | 135 | 5 | 1704 | 9 |
| Grp Volume(v), veh/h | 167 | 0 | 0 | 264 | 0 | 0 | 28 | 0 | 805 | 929 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1718 | 0 | 0 | 1040 | 0 | 0 | 566 | 0 | 1719 | 1718 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 13.5 | 0.0 | 0.0 | 0.0 | 0.0 | 31.3 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 9.0 | 0.0 | 0.0 | 22.5 | 0.0 | 0.0 | 7.6 | 0.0 | 31.3 | 41.4 | 0.0 | 0.0 |
| Prop In Lane | 0.13 | | 0.86 | 0.87 | | 0.10 | 1.00 | | 0.08 | 0.01 | | 0.01 |
| Lane Grp Cap(c), veh/h | 427 | 0 | 0 | 301 | 0 | 0 | 268 | 0 | 1109 | 1144 | 0 | 0 |
| V/C Ratio(X) | 0.39 | 0.00 | 0.00 | 0.88 | 0.00 | 0.00 | 0.10 | 0.00 | 0.73 | 0.81 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 427 | 0 | 0 | 301 | 0 | 0 | 268 | 0 | 1109 | 1144 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 33.5 | 0.0 | 0.0 | 40.9 | 0.0 | 0.0 | 7.7 | 0.0 | 11.8 | 13.6 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.7 | 0.0 | 0.0 | 28.1 | 0.0 | 0.0 | 0.8 | 0.0 | 4.2 | 6.3 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.3 | 0.0 | 0.0 | 9.6 | 0.0 | 0.0 | 0.4 | 0.0 | 15.8 | 21.4 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 36.2 | 0.0 | 0.0 | 69.0 | 0.0 | 0.0 | 8.4 | 0.0 | 16.0 | 20.0 | 0.0 | 0.0 |
| LnGrp LOS | D | | | E | | | A | | B | B | | |
| Approach Vol, veh/h | | 167 | | | 264 | | | 833 | | | 929 | |
| Approach Delay, s/veh | | 36.2 | | | 69.0 | | | 15.8 | | | 20.0 | |
| Approach LOS | | D | | | E | | | B | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 71.0 | | 29.0 | | 71.0 | | 29.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 64.5 | | 22.5 | | 64.5 | | 22.5 |
| Max Q Clear Time (g_c+I1), s | | 33.3 | | 11.0 | | 43.4 | | 24.5 |
| Green Ext Time (p_c), s | | 19.9 | | 2.5 | | 15.1 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 25.5 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 28 | 11 | 330 | 222 | 29 | 37 | 192 | 590 | 48 | 10 | 1037 | 63 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 35 | 14 | 0 | 278 | 36 | 46 | 240 | 738 | 0 | 12 | 1296 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 305 | 402 | 341 | 376 | 167 | 213 | 269 | 2064 | 923 | 358 | 1411 | 631 |
| Arrive On Green | 0.22 | 0.22 | 0.00 | 0.22 | 0.22 | 0.22 | 0.17 | 0.65 | 0.00 | 0.42 | 0.42 | 0.00 |
| Sat Flow, veh/h | 1261 | 1792 | 1524 | 1394 | 744 | 951 | 1601 | 3195 | 1429 | 684 | 3374 | 1509 |
| Grp Volume(v), veh/h | 35 | 14 | 0 | 278 | 0 | 82 | 240 | 738 | 0 | 12 | 1296 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1261 | 1792 | 1524 | 1394 | 0 | 1695 | 1601 | 1597 | 1429 | 684 | 1687 | 1509 |
| Q Serve(g_s), s | 2.3 | 0.6 | 0.0 | 19.5 | 0.0 | 3.9 | 14.7 | 10.6 | 0.0 | 1.0 | 36.3 | 0.0 |
| Cycle Q Clear(g_c), s | 6.3 | 0.6 | 0.0 | 20.1 | 0.0 | 3.9 | 14.7 | 10.6 | 0.0 | 1.0 | 36.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.56 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 305 | 402 | 341 | 376 | 0 | 380 | 269 | 2064 | 923 | 358 | 1411 | 631 |
| V/C Ratio(X) | 0.11 | 0.03 | 0.00 | 0.74 | 0.00 | 0.22 | 0.89 | 0.36 | 0.00 | 0.03 | 0.92 | 0.00 |
| Avail Cap(c_a), veh/h | 319 | 421 | 358 | 391 | 0 | 398 | 288 | 2064 | 923 | 358 | 1411 | 631 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 34.2 | 30.3 | 0.0 | 38.2 | 0.0 | 31.6 | 40.7 | 8.2 | 0.0 | 17.2 | 27.5 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 7.0 | 0.0 | 0.3 | 26.6 | 0.5 | 0.0 | 0.2 | 11.1 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.3 | 0.0 | 8.2 | 0.0 | 1.9 | 8.5 | 4.8 | 0.0 | 0.2 | 18.9 | 0.0 |
| LnGrp Delay(d),s/veh | 34.4 | 30.4 | 0.0 | 45.2 | 0.0 | 31.9 | 67.3 | 8.6 | 0.0 | 17.4 | 38.6 | 0.0 |
| LnGrp LOS | C | C | | D | | C | E | A | | B | D | |
| Approach Vol, veh/h | | 49 | | | 360 | | | 978 | | | 1308 | |
| Approach Delay, s/veh | | 33.2 | | | 42.2 | | | 23.0 | | | 38.4 | |
| Approach LOS | | C | | | D | | | C | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 71.1 | | 28.9 | 22.8 | 48.3 | | 28.9 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 63.5 | | 23.5 | 18.0 | 39.5 | | 23.5 |
| Max Q Clear Time (g_c+I1), s | | 12.6 | | 8.3 | 16.7 | 38.3 | | 22.1 |
| Green Ext Time (p_c), s | | 29.3 | | 1.8 | 0.1 | 1.1 | | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 33.2 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 61 | 365 | 306 | 883 | 1705 | 125 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 68 | 0 | 340 | 981 | 1894 | 139 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 278 | 128 | 355 | 2531 | 1720 | 770 |
| Arrive On Green | 0.08 | 0.00 | 0.22 | 0.79 | 0.51 | 0.51 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 68 | 0 | 340 | 981 | 1894 | 139 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 1.9 | 0.0 | 20.8 | 9.4 | 50.5 | 5.0 |
| Cycle Q Clear(g_c), s | 1.9 | 0.0 | 20.8 | 9.4 | 50.5 | 5.0 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 278 | 128 | 355 | 2531 | 1720 | 770 |
| V/C Ratio(X) | 0.24 | 0.00 | 0.96 | 0.39 | 1.10 | 0.18 |
| Avail Cap(c_a), veh/h | 328 | 151 | 355 | 2531 | 1720 | 770 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.8 | 0.0 | 38.5 | 3.3 | 24.7 | 13.5 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 36.3 | 0.4 | 54.9 | 0.5 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 0.0 | 12.8 | 4.2 | 36.8 | 2.2 |
| LnGrp Delay(d),s/veh | 43.2 | 0.0 | 74.9 | 3.8 | 79.6 | 14.0 |
| LnGrp LOS | D | | E | A | F | B |
| Approach Vol, veh/h | 68 | | | 1321 | 2033 | |
| Approach Delay, s/veh | 43.2 | | | 22.1 | 75.1 | |
| Approach LOS | D | | | C | E | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 85.0 | | 15.0 | 28.0 | 57.0 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 77.0 | | 10.0 | 22.0 | 49.0 | | |
| Max Q Clear Time (g_c+I1), s | | 11.4 | | 3.9 | 22.8 | 52.5 | | |
| Green Ext Time (p_c), s | | 54.6 | | 0.1 | 0.0 | 0.0 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 54.0 |
| HCM 2010 LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 273 | 836 | 8 | 384 | 1041 | 387 | 516 | 483 | 417 | 544 | 870 | 410 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 297 | 909 | 9 | 417 | 1132 | 0 | 561 | 525 | 0 | 591 | 946 | 446 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 426 | 1195 | 12 | 550 | 1321 | 411 | 613 | 1150 | 514 | 821 | 1009 | 451 |
| Arrive On Green | 0.08 | 0.25 | 0.25 | 0.11 | 0.27 | 0.00 | 0.15 | 0.34 | 0.00 | 0.12 | 0.31 | 0.31 |
| Sat Flow, veh/h | 3191 | 4815 | 48 | 3281 | 4848 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 297 | 593 | 325 | 417 | 1132 | 0 | 561 | 525 | 0 | 591 | 946 | 446 |
| Grp Sat Flow(s),veh/h/ln | 1596 | 1572 | 1719 | 1640 | 1616 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 8.8 | 22.6 | 22.6 | 12.1 | 28.6 | 0.0 | 16.5 | 15.7 | 0.0 | 15.0 | 36.5 | 39.3 |
| Cycle Q Clear(g_c), s | 8.8 | 22.6 | 22.6 | 12.1 | 28.6 | 0.0 | 16.5 | 15.7 | 0.0 | 15.0 | 36.5 | 39.3 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 426 | 780 | 427 | 550 | 1321 | 411 | 613 | 1150 | 514 | 821 | 1009 | 451 |
| V/C Ratio(X) | 0.70 | 0.76 | 0.76 | 0.76 | 0.86 | 0.00 | 0.91 | 0.46 | 0.00 | 0.72 | 0.94 | 0.99 |
| Avail Cap(c_a), veh/h | 429 | 780 | 427 | 550 | 1321 | 411 | 640 | 1177 | 527 | 821 | 1009 | 451 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.2 | 44.9 | 44.9 | 33.6 | 44.5 | 0.0 | 35.8 | 33.2 | 0.0 | 28.3 | 43.3 | 44.2 |
| Incr Delay (d2), s/veh | 4.9 | 6.9 | 12.1 | 6.1 | 7.3 | 0.0 | 17.4 | 0.3 | 0.0 | 3.1 | 15.6 | 39.2 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.1 | 10.6 | 12.2 | 5.8 | 13.7 | 0.0 | 11.3 | 7.3 | 0.0 | 3.0 | 18.6 | 20.6 |
| LnGrp Delay(d),s/veh | 40.0 | 51.8 | 57.0 | 39.7 | 51.9 | 0.0 | 53.2 | 33.5 | 0.0 | 31.4 | 58.9 | 83.4 |
| LnGrp LOS | D | D | E | D | D | | D | C | | C | E | F |
| Approach Vol, veh/h | | 1215 | | | 1549 | | | 1086 | | | 1983 | |
| Approach Delay, s/veh | | 50.3 | | | 48.6 | | | 43.7 | | | 56.2 | |
| Approach LOS | | D | | | D | | | D | | | E | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 20.0 | 39.0 | 20.0 | 50.0 | 16.9 | 42.1 | 24.0 | 46.0 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 14.0 | 32.0 | 15.0 | 45.0 | 11.0 | 35.0 | 20.0 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 14.1 | 24.6 | 17.0 | 17.7 | 10.8 | 30.6 | 18.5 | 41.3 |
| Green Ext Time (p_c), s | 0.0 | 6.4 | 0.0 | 16.7 | 0.0 | 3.9 | 0.5 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 50.6 |
| HCM 2010 LOS | D |

| Intersection | |
|---|---|
| Int Delay, s/veh | 110.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vol, veh/h | 11 | 51 | 254 | 17 | 108 | 0 | 379 | 81 | 73 | 12 | 174 | 35 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | 0 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Mvmt Flow | 12 | 55 | 273 | 18 | 116 | 0 | 408 | 87 | 78 | 13 | 187 | 38 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1231 | 1213 | 206 | 1337 | 1192 | 126 | 225 | 0 | 0 | 166 | 0 | 0 |
| Stage 1 | 232 | 232 | - | 941 | 941 | - | - | - | - | - | - | - |
| Stage 2 | 999 | 981 | - | 396 | 251 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.14 | 6.54 | 6.24 | 7.14 | 6.54 | 6.24 | 4.17 | - | - | 4.26 | - | - |
| Critical Hdwy Stg 1 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.14 | 5.54 | - | 6.14 | 5.54 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.536 | 4.036 | 3.336 | 3.536 | 4.036 | 3.336 | 2.263 | - | - | 2.344 | - | - |
| Pot Cap-1 Maneuver | 153 | 180 | 829 | 129 | 185 | 919 | 1315 | - | - | 1331 | - | - |
| Stage 1 | 766 | 709 | - | 313 | 339 | - | - | - | - | - | - | - |
| Stage 2 | 291 | 325 | - | 625 | 695 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 14 | 117 | 829 | 41 | 120 | 919 | 1315 | - | - | 1331 | - | - |
| Mov Cap-2 Maneuver | 14 | 117 | - | 41 | 120 | - | - | - | - | - | - | - |
| Stage 1 | 502 | 701 | - | 205 | 222 | - | - | - | - | - | - | - |
| Stage 2 | 91 | 213 | - | 382 | 687 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | $ 350.2 | 143.4 | 6.4 | 0.4 |
| HCM LOS | F | F | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | WBLn2 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1315 | - | - | 207 | 41 | 120 | 1331 | - | - |
| HCM Lane V/C Ratio | 0.31 | - | - | 1.641 | 0.446 | 0.968 | 0.01 | - | - |
| HCM Control Delay (s) | 9 | 0 | - | $ 350.2 | 150.2 | 142.3 | 7.7 | 0 | - |
| HCM Lane LOS | A | A | - | F | F | F | A | A | - |
| HCM 95th %tile Q(veh) | 1.3 | - | - | 22.3 | 1.6 | 6.4 | 0 | - | - |

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 11 | 51 | 254 | 17 | 108 | 0 | 379 | 81 | 73 | 12 | 174 | 35 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1827 | 1900 | 1900 | 1827 | 1900 | 1900 | 1776 | 1900 | 1900 | 1638 | 1900 |
| Adj Flow Rate, veh/h | 12 | 55 | 273 | 18 | 116 | 0 | 408 | 87 | 78 | 13 | 187 | 38 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 7 | 7 | 16 | 16 | 16 |
| Cap, veh/h | 80 | 79 | 345 | 110 | 452 | 0 | 547 | 90 | 81 | 90 | 616 | 120 |
| Arrive On Green | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.00 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 | 0.47 |
| Sat Flow, veh/h | 22 | 292 | 1278 | 104 | 1674 | 0 | 901 | 192 | 172 | 30 | 1312 | 255 |
| Grp Volume(v), veh/h | 340 | 0 | 0 | 134 | 0 | 0 | 573 | 0 | 0 | 238 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1591 | 0 | 0 | 1778 | 0 | 0 | 1265 | 0 | 0 | 1596 | 0 | 0 |
| Q Serve(g_s), s | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 17.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 9.9 | 0.0 | 0.0 | 2.9 | 0.0 | 0.0 | 21.8 | 0.0 | 0.0 | 4.7 | 0.0 | 0.0 |
| Prop In Lane | 0.04 | | 0.80 | 0.13 | | 0.00 | 0.71 | | 0.14 | 0.05 | | 0.16 |
| Lane Grp Cap(c), veh/h | 505 | 0 | 0 | 562 | 0 | 0 | 718 | 0 | 0 | 826 | 0 | 0 |
| V/C Ratio(X) | 0.67 | 0.00 | 0.00 | 0.24 | 0.00 | 0.00 | 0.80 | 0.00 | 0.00 | 0.29 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 630 | 0 | 0 | 694 | 0 | 0 | 718 | 0 | 0 | 826 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 16.9 | 0.0 | 0.0 | 14.4 | 0.0 | 0.0 | 12.4 | 0.0 | 0.0 | 8.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 9.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.6 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 9.3 | 0.0 | 0.0 | 2.3 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 18.9 | 0.0 | 0.0 | 14.6 | 0.0 | 0.0 | 21.5 | 0.0 | 0.0 | 9.1 | 0.0 | 0.0 |
| LnGrp LOS | B | | | B | | | C | | | A | | |
| Approach Vol, veh/h | | 340 | | | 134 | | | 573 | | | 238 | |
| Approach Delay, s/veh | | 18.9 | | | 14.6 | | | 21.5 | | | 9.1 | |
| Approach LOS | | B | | | B | | | C | | | A | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 30.0 | | 20.0 | | 30.0 | | 20.0 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 19.5 | | 17.5 | | 19.5 | | 17.5 |
| Max Q Clear Time (g_c+I1), s | | 23.8 | | 11.9 | | 6.7 | | 4.9 |
| Green Ext Time (p_c), s | | 0.0 | | 1.7 | | 5.2 | | 2.9 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 17.8 |
| HCM 2010 LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 26 | 9 | 239 | 218 | 31 | 25 | 141 | 426 | 60 | 7 | 331 | 14 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1743 | 1900 | 1900 | 1727 | 1900 | 1743 | 1743 | 1900 | 1900 | 1759 | 1900 |
| Adj Flow Rate, veh/h | 30 | 10 | 278 | 237 | 34 | 27 | 164 | 495 | 70 | 8 | 385 | 16 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.92 | 0.92 | 0.92 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 9 | 9 | 9 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 |
| Cap, veh/h | 75 | 42 | 539 | 328 | 43 | 30 | 434 | 721 | 102 | 42 | 799 | 33 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 |
| Sat Flow, veh/h | 91 | 109 | 1392 | 679 | 110 | 79 | 917 | 1494 | 211 | 11 | 1655 | 68 |
| Grp Volume(v), veh/h | 318 | 0 | 0 | 298 | 0 | 0 | 164 | 0 | 565 | 409 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1593 | 0 | 0 | 868 | 0 | 0 | 917 | 0 | 1706 | 1734 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 17.6 | 0.0 | 0.0 | 6.1 | 0.0 | 25.6 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 16.3 | 0.0 | 0.0 | 33.9 | 0.0 | 0.0 | 21.9 | 0.0 | 25.6 | 15.8 | 0.0 | 0.0 |
| Prop In Lane | 0.09 | | 0.87 | 0.80 | | 0.09 | 1.00 | | 0.12 | 0.02 | | 0.04 |
| Lane Grp Cap(c), veh/h | 656 | 0 | 0 | 401 | 0 | 0 | 434 | 0 | 823 | 874 | 0 | 0 |
| V/C Ratio(X) | 0.48 | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 | 0.38 | 0.00 | 0.69 | 0.47 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 726 | 0 | 0 | 453 | 0 | 0 | 434 | 0 | 823 | 874 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 23.8 | 0.0 | 0.0 | 31.6 | 0.0 | 0.0 | 20.5 | 0.0 | 20.0 | 17.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 0.0 | 5.7 | 0.0 | 0.0 | 2.5 | 0.0 | 4.6 | 1.8 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.9 | 0.0 | 0.0 | 8.4 | 0.0 | 0.0 | 3.6 | 0.0 | 13.0 | 8.0 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 24.3 | 0.0 | 0.0 | 37.3 | 0.0 | 0.0 | 23.0 | 0.0 | 24.6 | 19.3 | 0.0 | 0.0 |
| LnGrp LOS | C | | | D | | | C | | C | B | | |
| Approach Vol, veh/h | | 318 | | | 298 | | | 729 | | | 409 | |
| Approach Delay, s/veh | | 24.3 | | | 37.3 | | | 24.3 | | | 19.3 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 54.8 | | 45.2 | | 54.8 | | 45.2 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 43.5 | | 43.5 | | 43.5 | | 43.5 |
| Max Q Clear Time (g_c+I1), s | | 27.6 | | 18.3 | | 17.8 | | 35.9 |
| Green Ext Time (p_c), s | | 7.5 | | 5.5 | | 9.6 | | 2.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 25.3 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 18 | 2 | 119 | 212 | 6 | 25 | 23 | 616 | 58 | 7 | 760 | 4 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1900 | 1845 | 1900 | 1900 | 1727 | 1900 | 1743 | 1743 | 1900 | 1900 | 1727 | 1900 |
| Adj Flow Rate, veh/h | 22 | 2 | 143 | 230 | 7 | 27 | 28 | 742 | 63 | 8 | 916 | 5 |
| Adj No. of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| Peak Hour Factor | 0.83 | 0.92 | 0.83 | 0.92 | 0.92 | 0.92 | 0.83 | 0.83 | 0.92 | 0.92 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 3 | 3 | 3 | 10 | 10 | 10 | 9 | 9 | 9 | 10 | 10 | 10 |
| Cap, veh/h | 79 | 30 | 408 | 338 | 8 | 32 | 195 | 928 | 79 | 39 | 998 | 5 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 |
| Sat Flow, veh/h | 136 | 105 | 1437 | 953 | 29 | 112 | 566 | 1585 | 135 | 5 | 1704 | 9 |
| Grp Volume(v), veh/h | 167 | 0 | 0 | 264 | 0 | 0 | 28 | 0 | 805 | 929 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1678 | 0 | 0 | 1094 | 0 | 0 | 566 | 0 | 1719 | 1717 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 15.0 | 0.0 | 0.0 | 0.0 | 0.0 | 36.5 | 8.6 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 8.3 | 0.0 | 0.0 | 23.3 | 0.0 | 0.0 | 10.7 | 0.0 | 36.5 | 48.6 | 0.0 | 0.0 |
| Prop In Lane | 0.13 | | 0.86 | 0.87 | | 0.10 | 1.00 | | 0.08 | 0.01 | | 0.01 |
| Lane Grp Cap(c), veh/h | 518 | 0 | 0 | 378 | 0 | 0 | 195 | 0 | 1007 | 1042 | 0 | 0 |
| V/C Ratio(X) | 0.32 | 0.00 | 0.00 | 0.70 | 0.00 | 0.00 | 0.14 | 0.00 | 0.80 | 0.89 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 750 | 0 | 0 | 557 | 0 | 0 | 195 | 0 | 1007 | 1042 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 28.6 | 0.0 | 0.0 | 34.7 | 0.0 | 0.0 | 10.8 | 0.0 | 16.1 | 18.6 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.4 | 0.0 | 0.0 | 2.3 | 0.0 | 0.0 | 1.5 | 0.0 | 6.6 | 11.5 | 0.0 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.7 | 0.0 | 0.0 | 7.1 | 0.0 | 0.0 | 0.5 | 0.0 | 19.1 | 26.0 | 0.0 | 0.0 |
| LnGrp Delay(d),s/veh | 29.0 | 0.0 | 0.0 | 37.0 | 0.0 | 0.0 | 12.3 | 0.0 | 22.7 | 30.0 | 0.0 | 0.0 |
| LnGrp LOS | C | | | D | | | B | | C | C | | |
| Approach Vol, veh/h | | 167 | | | 264 | | | 833 | | | 929 | |
| Approach Delay, s/veh | | 29.0 | | | 37.0 | | | 22.4 | | | 30.0 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 65.1 | | 34.9 | | 65.1 | | 34.9 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 43.5 | | 43.5 | | 43.5 | | 43.5 |
| Max Q Clear Time (g_c+I1), s | | 38.5 | | 10.3 | | 50.6 | | 25.3 |
| Green Ext Time (p_c), s | | 4.4 | | 3.7 | | 0.0 | | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 27.9 |
| HCM 2010 LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 28 | 11 | 330 | 222 | 29 | 37 | 192 | 590 | 48 | 10 | 1037 | 63 |
| Number | 7 | 4 | 14 | 3 | 8 | 18 | 5 | 2 | 12 | 1 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1792 | 1792 | 1792 | 1863 | 1863 | 1900 | 1681 | 1681 | 1681 | 1776 | 1776 | 1776 |
| Adj Flow Rate, veh/h | 35 | 14 | 0 | 278 | 36 | 46 | 240 | 738 | 0 | 12 | 1296 | 0 |
| Adj No. of Lanes | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Percent Heavy Veh, % | 6 | 6 | 6 | 2 | 2 | 2 | 13 | 13 | 13 | 7 | 7 | 7 |
| Cap, veh/h | 310 | 408 | 347 | 381 | 170 | 217 | 240 | 2052 | 918 | 368 | 1458 | 652 |
| Arrive On Green | 0.23 | 0.23 | 0.00 | 0.23 | 0.23 | 0.23 | 0.15 | 0.64 | 0.00 | 0.43 | 0.43 | 0.00 |
| Sat Flow, veh/h | 1261 | 1792 | 1524 | 1394 | 744 | 951 | 1601 | 3195 | 1429 | 684 | 3374 | 1509 |
| Grp Volume(v), veh/h | 35 | 14 | 0 | 278 | 0 | 82 | 240 | 738 | 0 | 12 | 1296 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1261 | 1792 | 1524 | 1394 | 0 | 1695 | 1601 | 1597 | 1429 | 684 | 1687 | 1509 |
| Q Serve(g_s), s | 2.3 | 0.6 | 0.0 | 19.4 | 0.0 | 3.9 | 15.0 | 10.7 | 0.0 | 1.0 | 35.4 | 0.0 |
| Cycle Q Clear(g_c), s | 6.2 | 0.6 | 0.0 | 20.0 | 0.0 | 3.9 | 15.0 | 10.7 | 0.0 | 1.0 | 35.4 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.56 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 310 | 408 | 347 | 381 | 0 | 386 | 240 | 2052 | 918 | 368 | 1458 | 652 |
| V/C Ratio(X) | 0.11 | 0.03 | 0.00 | 0.73 | 0.00 | 0.21 | 1.00 | 0.36 | 0.00 | 0.03 | 0.89 | 0.00 |
| Avail Cap(c_a), veh/h | 350 | 466 | 396 | 426 | 0 | 441 | 240 | 2052 | 918 | 368 | 1458 | 652 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 33.9 | 30.0 | 0.0 | 37.8 | 0.0 | 31.3 | 42.5 | 8.3 | 0.0 | 16.4 | 26.2 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 5.5 | 0.0 | 0.3 | 57.8 | 0.5 | 0.0 | 0.2 | 8.4 | 0.0 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.3 | 0.0 | 8.1 | 0.0 | 1.9 | 10.5 | 4.9 | 0.0 | 0.2 | 18.1 | 0.0 |
| LnGrp Delay(d),s/veh | 34.0 | 30.1 | 0.0 | 43.4 | 0.0 | 31.6 | 100.3 | 8.8 | 0.0 | 16.6 | 34.6 | 0.0 |
| LnGrp LOS | C | C | | D | | C | F | A | | B | C | |
| Approach Vol, veh/h | | 49 | | | 360 | | | 978 | | | 1308 | |
| Approach Delay, s/veh | | 32.9 | | | 40.7 | | | 31.3 | | | 34.4 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | 8 |
| Phs Duration (G+Y+Rc), s | | 70.7 | | 29.3 | 21.0 | 49.7 | | 29.3 |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | 6.5 |
| Max Green Setting (Gmax), s | | 61.0 | | 26.0 | 15.0 | 40.0 | | 26.0 |
| Max Q Clear Time (g_c+I1), s | | 12.7 | | 8.2 | 17.0 | 37.4 | | 22.0 |
| Green Ext Time (p_c), s | | 28.4 | | 1.9 | 0.0 | 2.4 | | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 34.1 |
| HCM 2010 LOS | C |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (veh/h) | 61 | 365 | 306 | 883 | 1705 | 125 |
| Number | 7 | 14 | 5 | 2 | 6 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1776 | 1776 | 1696 | 1696 | 1792 | 1792 |
| Adj Flow Rate, veh/h | 68 | 0 | 340 | 981 | 1894 | 139 |
| Adj No. of Lanes | 2 | 1 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 7 | 7 | 12 | 12 | 6 | 6 |
| Cap, veh/h | 245 | 113 | 337 | 2633 | 1903 | 851 |
| Arrive On Green | 0.07 | 0.00 | 0.21 | 0.82 | 0.56 | 0.56 |
| Sat Flow, veh/h | 3281 | 1509 | 1616 | 3308 | 3495 | 1524 |
| Grp Volume(v), veh/h | 68 | 0 | 340 | 981 | 1894 | 139 |
| Grp Sat Flow(s),veh/h/ln | 1640 | 1509 | 1616 | 1612 | 1703 | 1524 |
| Q Serve(g_s), s | 2.4 | 0.0 | 25.0 | 9.6 | 66.4 | 5.3 |
| Cycle Q Clear(g_c), s | 2.4 | 0.0 | 25.0 | 9.6 | 66.4 | 5.3 |
| Prop In Lane | 1.00 | 1.00 | 1.00 | | | 1.00 |
| Lane Grp Cap(c), veh/h | 245 | 113 | 337 | 2633 | 1903 | 851 |
| V/C Ratio(X) | 0.28 | 0.00 | 1.01 | 0.37 | 1.00 | 0.16 |
| Avail Cap(c_a), veh/h | 273 | 126 | 337 | 2633 | 1903 | 851 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 52.5 | 0.0 | 47.5 | 2.9 | 26.3 | 12.9 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 51.6 | 0.4 | 19.6 | 0.4 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 0.0 | 16.0 | 4.4 | 36.2 | 2.3 |
| LnGrp Delay(d),s/veh | 53.1 | 0.0 | 99.2 | 3.3 | 45.9 | 13.3 |
| LnGrp LOS | D | | F | A | D | B |
| Approach Vol, veh/h | 68 | | | 1321 | 2033 | |
| Approach Delay, s/veh | 53.1 | | | 28.0 | 43.7 | |
| Approach LOS | D | | | C | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | | 2 | | 4 | 5 | 6 | | |
| Phs Duration (G+Y+Rc), s | | 104.5 | | 15.5 | 31.0 | 73.5 | | |
| Change Period (Y+Rc), s | | 6.5 | | 6.5 | 6.0 | 6.5 | | |
| Max Green Setting (Gmax), s | | 97.0 | | 10.0 | 25.0 | 66.0 | | |
| Max Q Clear Time (g_c+I1), s | | 11.6 | | 4.4 | 27.0 | 68.4 | | |
| Green Ext Time (p_c), s | | 67.6 | | 0.1 | 0.0 | 0.0 | | |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 37.8 |
| HCM 2010 LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (veh/h) | 273 | 836 | 8 | 384 | 1041 | 387 | 516 | 483 | 417 | 544 | 870 | 410 |
| Number | 5 | 2 | 12 | 1 | 6 | 16 | 7 | 4 | 14 | 3 | 8 | 18 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Adj Sat Flow, veh/h/ln | 1727 | 1727 | 1900 | 1776 | 1776 | 1776 | 1776 | 1776 | 1776 | 1712 | 1712 | 1712 |
| Adj Flow Rate, veh/h | 297 | 909 | 9 | 417 | 1132 | 0 | 561 | 525 | 0 | 591 | 946 | 446 |
| Adj No. of Lanes | 2 | 3 | 0 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 10 | 10 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 11 | 11 |
| Cap, veh/h | 398 | 1127 | 11 | 533 | 1286 | 400 | 618 | 1137 | 508 | 866 | 1061 | 474 |
| Arrive On Green | 0.08 | 0.23 | 0.23 | 0.11 | 0.27 | 0.00 | 0.14 | 0.34 | 0.00 | 0.13 | 0.33 | 0.33 |
| Sat Flow, veh/h | 3191 | 4815 | 48 | 3281 | 4848 | 1509 | 3281 | 3374 | 1509 | 3163 | 3252 | 1455 |
| Grp Volume(v), veh/h | 297 | 593 | 325 | 417 | 1132 | 0 | 561 | 525 | 0 | 591 | 946 | 446 |
| Grp Sat Flow(s),veh/h/ln | 1596 | 1572 | 1719 | 1640 | 1616 | 1509 | 1640 | 1687 | 1509 | 1581 | 1626 | 1455 |
| Q Serve(g_s), s | 9.0 | 22.8 | 22.9 | 12.3 | 28.7 | 0.0 | 15.7 | 15.7 | 0.0 | 15.9 | 35.4 | 38.2 |
| Cycle Q Clear(g_c), s | 9.0 | 22.8 | 22.9 | 12.3 | 28.7 | 0.0 | 15.7 | 15.7 | 0.0 | 15.9 | 35.4 | 38.2 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 398 | 736 | 402 | 533 | 1286 | 400 | 618 | 1137 | 508 | 866 | 1061 | 474 |
| V/C Ratio(X) | 0.75 | 0.81 | 0.81 | 0.78 | 0.88 | 0.00 | 0.91 | 0.46 | 0.00 | 0.68 | 0.89 | 0.94 |
| Avail Cap(c_a), veh/h | 398 | 736 | 402 | 533 | 1286 | 400 | 660 | 1184 | 530 | 866 | 1066 | 477 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.6 | 46.4 | 46.4 | 34.6 | 45.1 | 0.0 | 33.6 | 33.4 | 0.0 | 24.4 | 41.0 | 42.0 |
| Incr Delay (d2), s/veh | 7.5 | 9.2 | 15.8 | 7.4 | 8.8 | 0.0 | 15.8 | 0.3 | 0.0 | 2.2 | 9.6 | 26.8 |
| Initial Q Delay(d3),s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.4 | 10.8 | 12.6 | 6.1 | 13.8 | 0.0 | 11.1 | 7.3 | 0.0 | 7.2 | 17.3 | 18.8 |
| LnGrp Delay(d),s/veh | 44.1 | 55.6 | 62.2 | 42.1 | 54.0 | 0.0 | 49.4 | 33.7 | 0.0 | 26.6 | 50.7 | 68.8 |
| LnGrp LOS | D | E | E | D | D | | D | C | | C | D | E |
| Approach Vol, veh/h | | 1215 | | | 1549 | | | 1086 | | | 1983 | |
| Approach Delay, s/veh | | 54.5 | | | 50.8 | | | 41.8 | | | 47.6 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Phs Duration (G+Y+Rc), s | 20.0 | 37.0 | 22.0 | 49.2 | 16.0 | 41.0 | 23.4 | 47.8 |
| Change Period (Y+Rc), s | 6.0 | 7.0 | 5.0 | 6.0 | 6.0 | 7.0 | 5.0 | 6.0 |
| Max Green Setting (Gmax), s | 14.0 | 30.0 | 17.0 | 45.0 | 10.0 | 34.0 | 20.0 | 42.0 |
| Max Q Clear Time (g_c+I1), s | 14.3 | 24.9 | 17.9 | 17.7 | 11.0 | 30.7 | 17.7 | 40.2 |
| Green Ext Time (p_c), s | 0.0 | 4.5 | 0.0 | 16.7 | 0.0 | 3.0 | 0.7 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 2010 Ctrl Delay | 48.8 |
| HCM 2010 LOS | D |

**Appendix D**

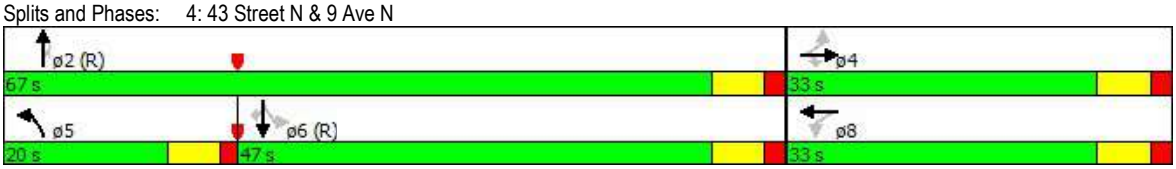
**Synchro Capacity Analysis Results Reports**

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 3 | 12 | 77 | 18 | 6 | 4 | 188 | 305 | 73 | 11 | 293 | 12 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.937 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1309 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.750 | | | 0.748 | | | 0.950 | | | 0.533 | | |
| Satd. Flow (perm) | 1383 | 1845 | 1568 | 1045 | 1309 | 0 | 1656 | 3312 | 1482 | 929 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 104 | | 5 | | | | 88 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 4 | 14 | 93 | 22 | 7 | 5 | 227 | 367 | 88 | 13 | 353 | 14 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 4 | 14 | 93 | 22 | 12 | 0 | 227 | 367 | 88 | 13 | 353 | 14 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | | 20.0 | 67.0 | 67.0 | 47.0 | 47.0 | 47.0 |
| Total Split (%) | 33.0% | 33.0% | 33.0% | 33.0% | 33.0% | | 20.0% | 67.0% | 67.0% | 47.0% | 47.0% | 47.0% |
| Maximum Green (s) | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | | 14.0 | 60.5 | 60.5 | 40.5 | 40.5 | 40.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 10.2 | 10.2 | 10.2 | 10.2 | 10.2 | | 21.6 | 81.4 | 81.4 | 52.6 | 52.6 | 52.6 |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | 0.22 | 0.81 | 0.81 | 0.53 | 0.53 | 0.53 |
| v/c Ratio | 0.03 | 0.07 | 0.37 | 0.21 | 0.09 | | 0.64 | 0.14 | 0.07 | 0.03 | 0.20 | 0.02 |
| Control Delay | 40.7 | 41.6 | 11.4 | 46.2 | 33.4 | | 41.8 | 1.7 | 0.2 | 14.6 | 14.5 | 0.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 40.7 | 41.6 | 11.4 | 46.2 | 33.4 | | 41.8 | 1.7 | 0.2 | 14.6 | 14.5 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | B | B | A |
| Approach Delay | | 16.3 | | | 41.7 | | | 14.9 | | | 14.0 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| Queue Length 50th (m) | 0.8 | 2.6 | 0.0 | 4.2 | 1.3 | | 42.7 | 9.4 | 0.6 | 1.3 | 20.6 | 0.0 |
| Queue Length 95th (m) | 3.8 | 7.9 | 9.9 | 11.0 | 6.3 | | 59.6 | 2.2 | 0.0 | 4.7 | 29.4 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 366 | 488 | 491 | 276 | 350 | | 357 | 2696 | 1223 | 488 | 1740 | 828 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.01 | 0.03 | 0.19 | 0.08 | 0.03 | | 0.64 | 0.14 | 0.07 | 0.03 | 0.20 | 0.02 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.64 | | | |
| Intersection Signal Delay: 15.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 49.6% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 4: 43 Street N & 9 Ave N



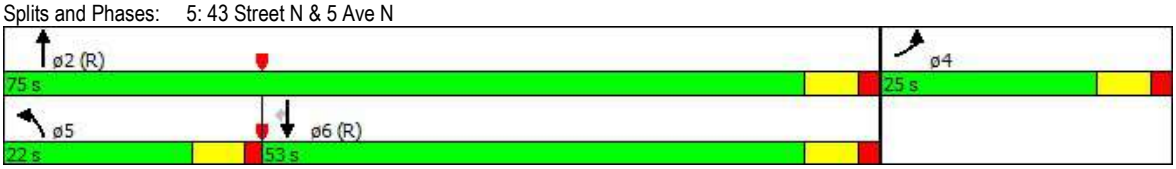
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 19 | 142 | 237 | 585 | 396 | 26 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 163 | | | | 30 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 22 | 163 | 272 | 672 | 455 | 30 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 22 | 163 | 272 | 672 | 455 | 30 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 25.0 | | 22.0 | 75.0 | 53.0 | 53.0 |
| Total Split (%) | 25.0% | | 22.0% | 75.0% | 53.0% | 53.0% |
| Maximum Green (s) | 18.5 | | 16.0 | 68.5 | 46.5 | 46.5 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 23.5 | 90.8 | 57.4 | 57.4 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.24 | 0.91 | 0.57 | 0.57 |
| v/c Ratio | 0.07 | 0.11 | 0.68 | 0.22 | 0.25 | 0.04 |
| Control Delay | 41.5 | 0.2 | 44.3 | 1.8 | 6.7 | 1.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.5 | 0.2 | 44.3 | 1.8 | 6.7 | 1.6 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | A | A |
| Approach Delay | 5.1 | | | 14.1 | 6.3 | |
| Approach LOS | A | | | B | A | |
| Queue Length 50th (m) | 2.1 | 0.0 | 50.3 | 0.0 | 8.3 | 0.2 |
| Queue Length 95th (m) | 5.7 | 0.0 | 75.1 | 21.1 | 15.8 | 0.0 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 578 | 1442 | 399 | 3092 | 1787 | 812 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.11 | 0.68 | 0.22 | 0.25 | 0.04 |

**Intersection Summary**

| | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.68 | | | |
| Intersection Signal Delay: 10.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 49.8% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: 43 Street N & 5 Ave N

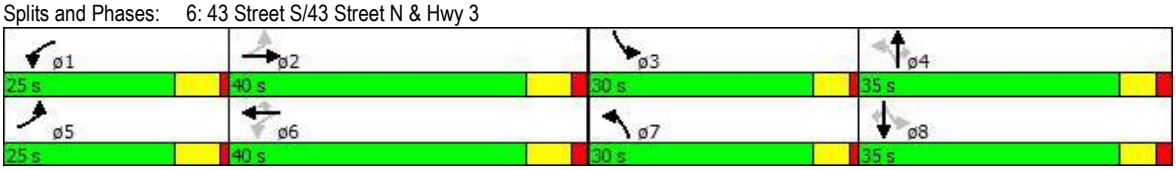


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 273 | 585 | 8 | 236 | 569 | 355 | 251 | 534 | 170 | 346 | 356 | 168 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1626 | 3246 | 0 | 1656 | 3312 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.261 | | | 0.290 | | | 0.478 | | | 0.193 | | |
| Satd. Flow (perm) | 447 | 3246 | 0 | 506 | 3312 | 1482 | 1602 | 3282 | 1468 | 619 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 386 | | | 185 | | | 183 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 297 | 636 | 9 | 257 | 618 | 386 | 273 | 580 | 185 | 376 | 387 | 183 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 297 | 645 | 0 | 257 | 618 | 386 | 273 | 580 | 185 | 376 | 387 | 183 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 54.3 | 35.3 | | 50.1 | 33.2 | 33.2 | 38.2 | 25.0 | 25.0 | 44.1 | 27.9 | 27.9 |
| Actuated g/C Ratio | 0.47 | 0.31 | | 0.43 | 0.29 | 0.29 | 0.33 | 0.22 | 0.22 | 0.38 | 0.24 | 0.24 |
| v/c Ratio | 0.76 | 0.65 | | 0.68 | 0.65 | 0.55 | 0.39 | 0.82 | 0.40 | 0.68 | 0.51 | 0.38 |
| Control Delay | 33.0 | 40.1 | | 28.4 | 41.1 | 6.8 | 24.6 | 53.8 | 8.2 | 30.1 | 40.5 | 7.5 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 33.0 | 40.1 | | 28.4 | 41.1 | 6.8 | 24.6 | 53.8 | 8.2 | 30.1 | 40.5 | 7.5 |
| LOS | C | D | | C | D | A | C | D | A | C | D | A |
| Approach Delay | | 37.9 | | | 28.0 | | | 38.0 | | | 30.0 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Queue Length 50th (m) | 42.8 | 72.6 | | 35.8 | 70.1 | 0.0 | 21.9 | 70.2 | 0.0 | 31.4 | 42.4 | 0.0 |
| Queue Length 95th (m) | #83.6 | 102.9 | | 60.6 | 97.5 | 26.2 | 31.3 | 95.4 | 19.1 | 43.1 | 59.8 | 18.2 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 407 | 992 | | 423 | 951 | 701 | 984 | 829 | 509 | 775 | 838 | 509 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.65 | | 0.61 | 0.65 | 0.55 | 0.28 | 0.70 | 0.36 | 0.49 | 0.46 | 0.36 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 115.5 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.82 | | | |
| Intersection Signal Delay: 33.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 76.4% | | 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: 6: 43 Street S/43 Street N & Hwy 3



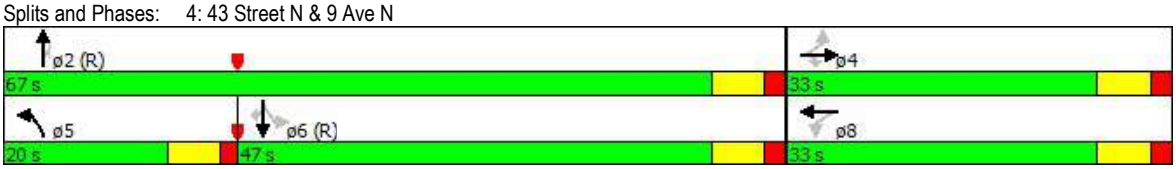
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 13 | 5 | 220 | 98 | 11 | 12 | 128 | 301 | 18 | 3 | 355 | 19 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.922 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1703 | 1792 | 1524 | 1770 | 1717 | 0 | 1597 | 3195 | 1429 | 1687 | 3374 | 1509 |
| Flt Permitted | 0.738 | | | 0.754 | | | 0.950 | | | 0.529 | | |
| Satd. Flow (perm) | 1323 | 1792 | 1524 | 1405 | 1717 | 0 | 1597 | 3195 | 1429 | 939 | 3374 | 1509 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 275 | | 15 | | | | 38 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 13% | 13% | 13% | 7% | 7% | 7% |
| Adj. Flow (vph) | 16 | 6 | 275 | 122 | 14 | 15 | 160 | 376 | 22 | 4 | 444 | 24 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 16 | 6 | 275 | 122 | 29 | 0 | 160 | 376 | 22 | 4 | 444 | 24 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | | 20.0 | 67.0 | 67.0 | 47.0 | 47.0 | 47.0 |
| Total Split (%) | 33.0% | 33.0% | 33.0% | 33.0% | 33.0% | | 20.0% | 67.0% | 67.0% | 47.0% | 47.0% | 47.0% |
| Maximum Green (s) | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | | 14.0 | 60.5 | 60.5 | 40.5 | 40.5 | 40.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 14.4 | 14.4 | 14.4 | 14.4 | 14.4 | | 15.5 | 72.6 | 72.6 | 51.1 | 51.1 | 51.1 |
| Actuated g/C Ratio | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | | 0.16 | 0.73 | 0.73 | 0.51 | 0.51 | 0.51 |
| v/c Ratio | 0.08 | 0.02 | 0.61 | 0.61 | 0.11 | | 0.65 | 0.16 | 0.02 | 0.01 | 0.26 | 0.03 |
| Control Delay | 35.8 | 34.2 | 10.6 | 52.2 | 22.8 | | 48.4 | 3.5 | 1.1 | 16.3 | 15.7 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 35.8 | 34.2 | 10.6 | 52.2 | 22.8 | | 48.4 | 3.5 | 1.1 | 16.3 | 15.7 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | C | B | D | C | | D | A | A | B | B | A |
| Approach Delay | | 12.4 | | | 46.6 | | | 16.3 | | | 15.0 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| 90th %ile Green (s) | 19.9 | 19.9 | 19.9 | 19.9 | 19.9 | | 20.6 | 67.1 | 67.1 | 40.5 | 40.5 | 40.5 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Max | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | | 18.1 | 70.5 | 70.5 | 46.4 | 46.4 | 46.4 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 15.7 | 73.0 | 73.0 | 51.3 | 51.3 | 51.3 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 11.5 | 11.5 | 11.5 | 11.5 | 11.5 | | 13.3 | 75.5 | 75.5 | 56.2 | 56.2 | 56.2 |
| 30th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 9.8 | 77.0 | 77.0 | 61.2 | 61.2 | 61.2 |
| 10th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 14 | 6 | 28 | 89 | 13 | | 117 | 98 | 3 | 2 | 199 | 0 |
| Fuel Used(l) | 2 | 1 | 18 | 12 | 2 | | 18 | 27 | 1 | 0 | 29 | 1 |
| CO Emissions (g/hr) | 30 | 12 | 337 | 223 | 39 | | 341 | 503 | 28 | 5 | 545 | 19 |
| NOx Emissions (g/hr) | 6 | 2 | 65 | 43 | 8 | | 66 | 97 | 5 | 1 | 105 | 4 |
| VOC Emissions (g/hr) | 7 | 3 | 78 | 51 | 9 | | 79 | 116 | 6 | 1 | 126 | 4 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 10 | 0 | 0 | 18 | 0 |
| Queue Length 50th (m) | 2.9 | 1.1 | 0.0 | 23.8 | 2.5 | | 31.3 | 2.7 | 0.2 | 0.4 | 25.5 | 0.0 |
| Queue Length 95th (m) | 7.5 | 4.0 | 13.2 | 35.1 | 8.7 | | 43.9 | 18.7 | 1.5 | 2.3 | 38.6 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 350 | 474 | 605 | 372 | 466 | | 263 | 2320 | 1048 | 479 | 1724 | 822 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.05 | 0.01 | 0.45 | 0.33 | 0.06 | | 0.61 | 0.16 | 0.02 | 0.01 | 0.26 | 0.03 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 18.2 Intersection LOS: B
Intersection Capacity Utilization 53.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: 43 Street N & 9 Ave N



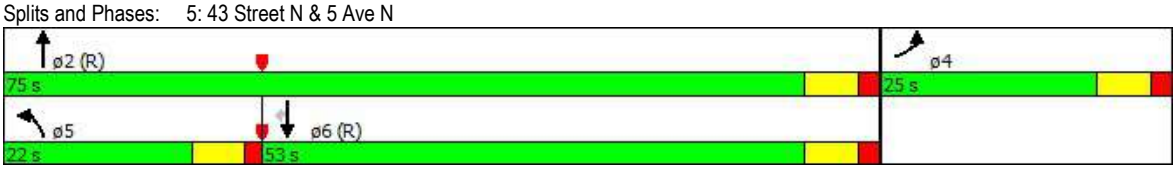
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 27 | 243 | 204 | 496 | 798 | 36 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 270 | | | | 40 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 240.1 | 882.4 | |
| Travel Time (s) | 52.4 | | | 14.4 | 52.9 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 7% | 7% | 12% | 12% | 6% | 6% |
| Adj. Flow (vph) | 30 | 270 | 227 | 551 | 887 | 40 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 30 | 270 | 227 | 551 | 887 | 40 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 25.0 | | 22.0 | 75.0 | 53.0 | 53.0 |
| Total Split (%) | 25.0% | | 22.0% | 75.0% | 53.0% | 53.0% |
| Maximum Green (s) | 18.5 | | 16.0 | 68.5 | 46.5 | 46.5 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 20.3 | 86.2 | 57.3 | 57.3 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.20 | 0.86 | 0.57 | 0.57 |
| v/c Ratio | 0.09 | 0.18 | 0.69 | 0.20 | 0.45 | 0.04 |
| Control Delay | 41.7 | 0.3 | 48.1 | 2.4 | 13.4 | 4.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.7 | 0.3 | 48.1 | 2.4 | 13.4 | 4.4 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | B | A |
| Approach Delay | 4.4 | | | 15.8 | 13.0 | |
| Approach LOS | A | | | B | B | |
| 90th %ile Green (s) | 10.0 | | 24.5 | 77.0 | 46.5 | 46.5 |
| 90th %ile Term Code | Min | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 23.0 | 77.0 | 48.0 | 48.0 |
| 70th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 21.1 | 77.0 | 49.9 | 49.9 |
| 50th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 0.0 | | 18.5 | 93.5 | 69.0 | 69.0 |
| 30th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 14.4 | 93.5 | 73.1 | 73.1 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 25 | 0 | 184 | 86 | 458 | 5 |
| Fuel Used(l) | 3 | 17 | 25 | 31 | 84 | 3 |
| CO Emissions (g/hr) | 61 | 314 | 462 | 583 | 1565 | 57 |
| NOx Emissions (g/hr) | 12 | 61 | 89 | 113 | 302 | 11 |
| VOC Emissions (g/hr) | 14 | 72 | 107 | 134 | 361 | 13 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 17 | 33 | 0 |
| Queue Length 50th (m) | 2.9 | 0.0 | 42.8 | 13.2 | 68.9 | 0.2 |
| Queue Length 95th (m) | 7.5 | 0.0 | 66.1 | 17.9 | 53.4 | m4.0 |
| Internal Link Dist (m) | 704.0 | | | 216.1 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 605 | 1509 | 332 | 2778 | 1951 | 890 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.05 | 0.18 | 0.68 | 0.20 | 0.45 | 0.04 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 57.5% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: 43 Street N & 5 Ave N

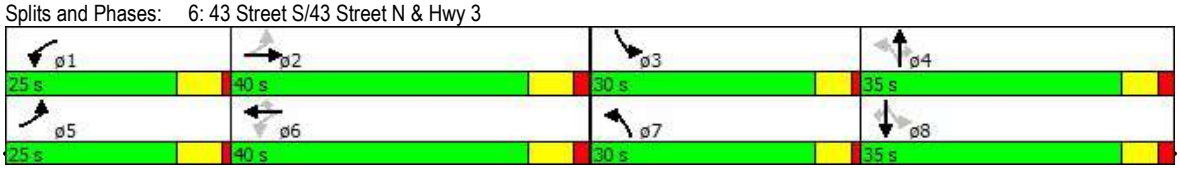


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 151 | 557 | 5 | 256 | 694 | 226 | 344 | 292 | 278 | 245 | 470 | 162 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.999 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1641 | 3279 | 0 | 1687 | 3374 | 1509 | 3273 | 3374 | 1509 | 3155 | 3252 | 1455 |
| Flt Permitted | 0.242 | | | 0.269 | | | 0.228 | | | 0.560 | | |
| Satd. Flow (perm) | 418 | 3279 | 0 | 478 | 3374 | 1509 | 785 | 3374 | 1509 | 1860 | 3252 | 1455 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 246 | | | 302 | | | 176 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 401.6 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 24.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 7% | 7% | 7% | 7% | 7% | 7% | 11% | 11% | 11% |
| Adj. Flow (vph) | 164 | 605 | 5 | 278 | 754 | 246 | 374 | 317 | 302 | 266 | 511 | 176 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 164 | 610 | 0 | 278 | 754 | 246 | 374 | 317 | 302 | 266 | 511 | 176 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 47.2 | 33.3 | | 53.4 | 36.4 | 36.4 | 43.3 | 26.5 | 26.5 | 35.6 | 22.6 | 22.6 |
| Actuated g/C Ratio | 0.42 | 0.30 | | 0.48 | 0.32 | 0.32 | 0.39 | 0.24 | 0.24 | 0.32 | 0.20 | 0.20 |
| v/c Ratio | 0.52 | 0.63 | | 0.69 | 0.69 | 0.38 | 0.57 | 0.40 | 0.51 | 0.36 | 0.78 | 0.41 |
| Control Delay | 23.6 | 39.1 | | 28.2 | 38.5 | 6.0 | 26.5 | 37.7 | 7.3 | 24.0 | 51.8 | 8.7 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 23.6 | 39.1 | | 28.2 | 38.5 | 6.0 | 26.5 | 37.7 | 7.3 | 24.0 | 51.8 | 8.7 |
| LOS | C | D | | C | D | A | C | D | A | C | D | A |
| Approach Delay | | 35.8 | | | 30.0 | | | 24.2 | | | 36.1 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 18.8 | 33.0 | | 19.0 | 33.2 | 33.2 | 20.4 | 34.5 | 34.5 | 14.9 | 29.0 | 29.0 |
| 90th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Max | Max |
| 70th %ile Green (s) | 14.6 | 33.0 | | 19.0 | 37.4 | 37.4 | 18.0 | 31.6 | 31.6 | 13.1 | 26.7 | 26.7 |
| 70th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Gap | Gap |
| 50th %ile Green (s) | 11.9 | 33.0 | | 17.3 | 38.4 | 38.4 | 16.1 | 27.2 | 27.2 | 11.7 | 22.8 | 22.8 |
| 50th %ile Term Code | Gap | MaxR | | Gap | Hold | Hold | Gap | Hold | Hold | Gap | Gap | Gap |
| 30th %ile Green (s) | 10.1 | 33.0 | | 14.4 | 37.3 | 37.3 | 14.1 | 23.6 | 23.6 | 10.4 | 19.9 | 19.9 |
| 30th %ile Term Code | Gap | MaxR | | Gap | Hold | Hold | Gap | Hold | Hold | Gap | Gap | Gap |
| 10th %ile Green (s) | 10.0 | 33.0 | | 11.1 | 34.1 | 34.1 | 11.4 | 17.3 | 17.3 | 10.0 | 15.9 | 15.9 |
| 10th %ile Term Code | Min | MaxR | | Gap | Hold | Hold | Gap | Hold | Hold | Min | Gap | Gap |
| Stops (vph) | 89 | 472 | | 151 | 575 | 23 | 221 | 232 | 27 | 166 | 430 | 20 |
| Fuel Used(l) | 13 | 64 | | 30 | 96 | 16 | 28 | 27 | 13 | 24 | 59 | 11 |
| CO Emissions (g/hr) | 245 | 1186 | | 556 | 1786 | 301 | 516 | 511 | 249 | 438 | 1094 | 200 |
| NOx Emissions (g/hr) | 47 | 229 | | 107 | 345 | 58 | 100 | 99 | 48 | 85 | 211 | 39 |
| VOC Emissions (g/hr) | 57 | 274 | | 128 | 412 | 69 | 119 | 118 | 57 | 101 | 252 | 46 |
| Dilemma Vehicles (#) | 0 | 25 | | 0 | 30 | 0 | 0 | 13 | 0 | 0 | 20 | 0 |
| Queue Length 50th (m) | 20.2 | 64.8 | | 36.9 | 78.2 | 0.0 | 30.1 | 32.7 | 0.0 | 20.7 | 59.8 | 0.0 |
| Queue Length 95th (m) | 39.4 | 97.3 | | 66.6 | #123.5 | 20.6 | 42.2 | 48.5 | 22.5 | 30.6 | 84.1 | 18.8 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 377.6 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 407 | 975 | | 441 | 1096 | 656 | 872 | 926 | 633 | 1029 | 850 | 510 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.40 | 0.63 | | 0.63 | 0.69 | 0.38 | 0.43 | 0.34 | 0.48 | 0.26 | 0.60 | 0.35 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 112 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay: 31.2 | | Intersection LOS: C | |
| Intersection Capacity Utilization 73.7% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 125.4 | | | |
| 70th %ile Actuated Cycle: 120.7 | | | |
| 50th %ile Actuated Cycle: 113.2 | | | |
| 30th %ile Actuated Cycle: 105.4 | | | |
| 10th %ile Actuated Cycle: 95.4 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: 43 Street S/43 Street N & Hwy 3



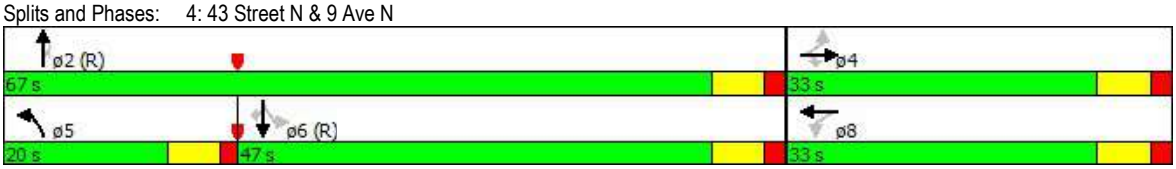
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 10 | 13 | 81 | 19 | 7 | 5 | 198 | 381 | 77 | 12 | 320 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.936 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1308 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.748 | | | 0.747 | | | 0.950 | | | 0.488 | | |
| Satd. Flow (perm) | 1380 | 1845 | 1568 | 1044 | 1308 | 0 | 1656 | 3312 | 1482 | 851 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 104 | | 6 | | | | 93 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 12 | 16 | 98 | 23 | 8 | 6 | 239 | 459 | 93 | 14 | 386 | 17 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 12 | 16 | 98 | 23 | 14 | 0 | 239 | 459 | 93 | 14 | 386 | 17 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | | 20.0 | 67.0 | 67.0 | 47.0 | 47.0 | 47.0 |
| Total Split (%) | 33.0% | 33.0% | 33.0% | 33.0% | 33.0% | | 20.0% | 67.0% | 67.0% | 47.0% | 47.0% | 47.0% |
| Maximum Green (s) | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | | 14.0 | 60.5 | 60.5 | 40.5 | 40.5 | 40.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 10.2 | 10.2 | 10.2 | 10.2 | 10.2 | | 23.2 | 81.4 | 81.4 | 50.9 | 50.9 | 50.9 |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | 0.23 | 0.81 | 0.81 | 0.51 | 0.51 | 0.51 |
| v/c Ratio | 0.09 | 0.09 | 0.39 | 0.22 | 0.10 | | 0.62 | 0.17 | 0.08 | 0.03 | 0.23 | 0.02 |
| Control Delay | 42.0 | 41.7 | 12.4 | 46.4 | 32.7 | | 39.1 | 1.4 | 0.2 | 15.3 | 15.4 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.0 | 41.7 | 12.4 | 46.4 | 32.7 | | 39.1 | 1.4 | 0.2 | 15.3 | 15.4 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | B | B | A |
| Approach Delay | | 19.0 | | | 41.2 | | | 12.7 | | | 14.8 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| 90th %ile Green (s) | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 | | 25.5 | 75.9 | 75.9 | 44.4 | 44.4 | 44.4 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 23.8 | 77.0 | 77.0 | 47.2 | 47.2 | 47.2 |
| 70th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 22.9 | 77.0 | 77.0 | 48.1 | 48.1 | 48.1 |
| 50th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 22.2 | 77.0 | 77.0 | 48.8 | 48.8 | 48.8 |
| 30th %ile Term Code | Min | Min | Min | Hold | Hold | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 21.6 | 93.5 | 93.5 | 65.9 | 65.9 | 65.9 |
| 10th %ile Term Code | Skip | Skip | Skip | Skip | Skip | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 11 | 14 | 14 | 19 | 10 | | 176 | 40 | 0 | 8 | 177 | 0 |
| Fuel Used(l) | 1 | 2 | 7 | 2 | 1 | | 27 | 31 | 6 | 1 | 26 | 1 |
| CO Emissions (g/hr) | 24 | 31 | 128 | 42 | 24 | | 499 | 575 | 110 | 19 | 489 | 14 |
| NOx Emissions (g/hr) | 5 | 6 | 25 | 8 | 5 | | 96 | 111 | 21 | 4 | 94 | 3 |
| VOC Emissions (g/hr) | 6 | 7 | 29 | 10 | 5 | | 115 | 133 | 25 | 4 | 113 | 3 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 11 | 0 | 0 | 16 | 0 |
| Queue Length 50th (m) | 2.3 | 3.0 | 0.0 | 4.4 | 1.5 | | 39.0 | 3.0 | 0.0 | 1.5 | 23.4 | 0.0 |
| Queue Length 95th (m) | 7.2 | 8.7 | 11.3 | 11.3 | 6.8 | | 62.1 | 3.6 | 0.2 | 4.9 | 32.6 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 365 | 488 | 491 | 276 | 351 | | 384 | 2695 | 1223 | 432 | 1685 | 805 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.03 | 0.20 | 0.08 | 0.04 | | 0.62 | 0.17 | 0.08 | 0.03 | 0.23 | 0.02 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 14.7 Intersection LOS: B
Intersection Capacity Utilization 49.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: 43 Street N & 9 Ave N



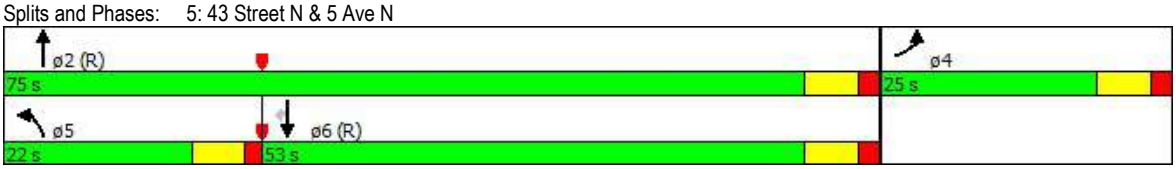
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 33 | 150 | 249 | 662 | 426 | 30 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 172 | | | | 34 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 38 | 172 | 286 | 761 | 490 | 34 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 38 | 172 | 286 | 761 | 490 | 34 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 25.0 | | 22.0 | 75.0 | 53.0 | 53.0 |
| Total Split (%) | 25.0% | | 22.0% | 75.0% | 53.0% | 53.0% |
| Maximum Green (s) | 18.5 | | 16.0 | 68.5 | 46.5 | 46.5 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 24.8 | 86.2 | 52.8 | 52.8 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.25 | 0.86 | 0.53 | 0.53 |
| v/c Ratio | 0.12 | 0.12 | 0.68 | 0.26 | 0.30 | 0.05 |
| Control Delay | 42.1 | 0.2 | 43.4 | 2.6 | 7.4 | 1.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.1 | 0.2 | 43.4 | 2.6 | 7.4 | 1.4 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | A | A |
| Approach Delay | 7.8 | | | 13.8 | 7.0 | |
| Approach LOS | A | | | B | A | |
| 90th %ile Green (s) | 10.0 | | 24.5 | 77.0 | 46.5 | 46.5 |
| 90th %ile Term Code | Min | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 24.5 | 77.0 | 46.5 | 46.5 |
| 70th %ile Term Code | Min | | Max | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 24.5 | 77.0 | 46.5 | 46.5 |
| 50th %ile Term Code | Min | | Max | Coord | Coord | Coord |
| 30th %ile Green (s) | 0.0 | | 25.1 | 93.5 | 62.4 | 62.4 |
| 30th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 25.2 | 93.5 | 62.3 | 62.3 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 30 | 0 | 223 | 121 | 89 | 1 |
| Fuel Used(l) | 4 | 10 | 29 | 42 | 38 | 2 |
| CO Emissions (g/hr) | 75 | 193 | 547 | 784 | 706 | 44 |
| NOx Emissions (g/hr) | 14 | 37 | 106 | 151 | 136 | 8 |
| VOC Emissions (g/hr) | 17 | 45 | 126 | 181 | 163 | 10 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 22 | 20 | 0 |
| Queue Length 50th (m) | 3.7 | 0.0 | 53.1 | 19.5 | 11.0 | 0.2 |
| Queue Length 95th (m) | 8.5 | 0.0 | 79.2 | 24.3 | 16.6 | 0.0 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 578 | 1442 | 421 | 2936 | 1644 | 751 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.07 | 0.12 | 0.68 | 0.26 | 0.30 | 0.05 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 11.1 Intersection LOS: B
Intersection Capacity Utilization 50.5% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: 43 Street N & 5 Ave N

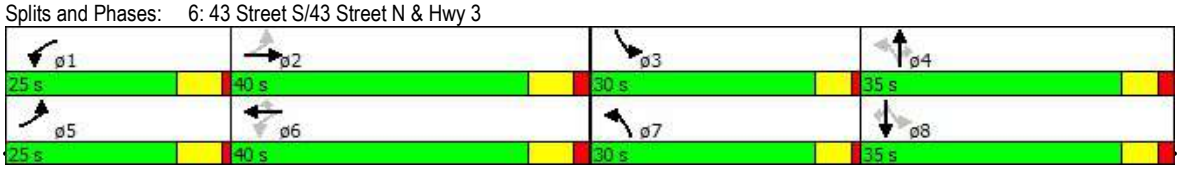


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 306 | 615 | 9 | 248 | 598 | 381 | 264 | 581 | 179 | 366 | 378 | 181 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1626 | 3246 | 0 | 1656 | 3312 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.229 | | | 0.256 | | | 0.459 | | | 0.163 | | |
| Satd. Flow (perm) | 392 | 3246 | 0 | 446 | 3312 | 1482 | 1538 | 3282 | 1468 | 522 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 414 | | | 195 | | | 197 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 333 | 668 | 10 | 270 | 650 | 414 | 287 | 632 | 195 | 398 | 411 | 197 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 333 | 678 | 0 | 270 | 650 | 414 | 287 | 632 | 195 | 398 | 411 | 197 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 55.0 | 35.2 | | 51.0 | 33.1 | 33.1 | 40.4 | 26.8 | 26.8 | 47.3 | 30.3 | 30.3 |
| Actuated g/C Ratio | 0.46 | 0.30 | | 0.43 | 0.28 | 0.28 | 0.34 | 0.23 | 0.23 | 0.40 | 0.25 | 0.25 |
| v/c Ratio | 0.88 | 0.71 | | 0.74 | 0.71 | 0.58 | 0.41 | 0.85 | 0.41 | 0.73 | 0.52 | 0.39 |
| Control Delay | 48.4 | 43.5 | | 33.2 | 44.3 | 7.1 | 24.7 | 56.7 | 8.0 | 32.3 | 40.7 | 7.2 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 48.4 | 43.5 | | 33.2 | 44.3 | 7.1 | 24.7 | 56.7 | 8.0 | 32.3 | 40.7 | 7.2 |
| LOS | D | D | | C | D | A | C | E | A | C | D | A |
| Approach Delay | | 45.1 | | | 30.5 | | | 40.0 | | | 30.8 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 15.7 | 29.0 | 29.0 | 20.3 | 33.6 | 33.6 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 70th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 13.7 | 29.0 | 29.0 | 17.7 | 33.0 | 33.0 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 50th %ile Green (s) | 19.0 | 33.1 | | 18.9 | 33.0 | 33.0 | 12.4 | 29.0 | 29.0 | 16.0 | 32.6 | 32.6 |
| 50th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 30th %ile Green (s) | 19.0 | 35.9 | | 16.1 | 33.0 | 33.0 | 11.3 | 26.5 | 26.5 | 14.3 | 29.5 | 29.5 |
| 30th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Gap | Gap | Gap | Gap | Hold | Hold |
| 10th %ile Green (s) | 19.0 | 39.9 | | 12.1 | 33.0 | 33.0 | 10.0 | 21.1 | 21.1 | 12.1 | 23.2 | 23.2 |
| 10th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Min | Gap | Gap | Gap | Hold | Hold |
| Stops (vph) | 181 | 544 | | 156 | 526 | 37 | 176 | 532 | 21 | 239 | 312 | 20 |
| Fuel Used(l) | 33 | 74 | | 30 | 87 | 28 | 21 | 65 | 9 | 37 | 43 | 12 |
| CO Emissions (g/hr) | 606 | 1379 | | 566 | 1621 | 512 | 393 | 1217 | 165 | 692 | 799 | 218 |
| NOx Emissions (g/hr) | 117 | 266 | | 109 | 313 | 99 | 76 | 235 | 32 | 134 | 154 | 42 |
| VOC Emissions (g/hr) | 140 | 318 | | 131 | 374 | 118 | 91 | 281 | 38 | 160 | 184 | 50 |
| Dilemma Vehicles (#) | 0 | 26 | | 0 | 25 | 0 | 0 | 24 | 0 | 0 | 16 | 0 |
| Queue Length 50th (m) | 52.1 | 81.9 | | 40.2 | 77.5 | 0.0 | 23.1 | 78.7 | 0.0 | 33.6 | 45.5 | 0.0 |
| Queue Length 95th (m) | #116.0 | 110.1 | | #64.8 | 104.3 | 27.4 | 32.7 | #107.8 | 19.5 | 45.7 | 64.0 | 18.8 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 378 | 960 | | 392 | 920 | 710 | 976 | 801 | 506 | 745 | 831 | 516 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.88 | 0.71 | | 0.69 | 0.71 | 0.58 | 0.29 | 0.79 | 0.39 | 0.53 | 0.49 | 0.38 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 119 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.88 | | | |
| Intersection Signal Delay: 36.2 | | Intersection LOS: D | |
| Intersection Capacity Utilization 80.1% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 125.3 | | | |
| 70th %ile Actuated Cycle: 122.7 | | | |
| 50th %ile Actuated Cycle: 121 | | | |
| 30th %ile Actuated Cycle: 116.8 | | | |
| 10th %ile Actuated Cycle: 109.2 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: 43 Street S/43 Street N & Hwy 3



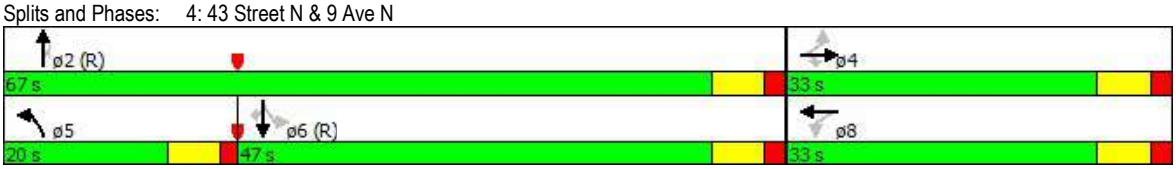
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 16 | 6 | 231 | 103 | 12 | 13 | 135 | 344 | 19 | 4 | 472 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.923 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1703 | 1792 | 1524 | 1770 | 1719 | 0 | 1597 | 3195 | 1429 | 1687 | 3374 | 1509 |
| Flt Permitted | 0.737 | | | 0.752 | | | 0.950 | | | 0.502 | | |
| Satd. Flow (perm) | 1321 | 1792 | 1524 | 1401 | 1719 | 0 | 1597 | 3195 | 1429 | 891 | 3374 | 1509 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 289 | | 16 | | | | 38 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 13% | 13% | 13% | 7% | 7% | 7% |
| Adj. Flow (vph) | 20 | 8 | 289 | 129 | 15 | 16 | 169 | 430 | 24 | 5 | 590 | 36 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 20 | 8 | 289 | 129 | 31 | 0 | 169 | 430 | 24 | 5 | 590 | 36 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | | 12.0 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | | 20.0 | 67.0 | 67.0 | 47.0 | 47.0 | 47.0 |
| Total Split (%) | 33.0% | 33.0% | 33.0% | 33.0% | 33.0% | | 20.0% | 67.0% | 67.0% | 47.0% | 47.0% | 47.0% |
| Maximum Green (s) | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | | 14.0 | 60.5 | 60.5 | 40.5 | 40.5 | 40.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | | | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 14.8 | 14.8 | 14.8 | 14.8 | 14.8 | | 15.9 | 72.2 | 72.2 | 50.3 | 50.3 | 50.3 |
| Actuated g/C Ratio | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | | 0.16 | 0.72 | 0.72 | 0.50 | 0.50 | 0.50 |
| v/c Ratio | 0.10 | 0.03 | 0.61 | 0.62 | 0.12 | | 0.67 | 0.19 | 0.02 | 0.01 | 0.35 | 0.04 |
| Control Delay | 35.7 | 33.7 | 10.4 | 52.4 | 22.4 | | 49.1 | 4.0 | 1.2 | 16.5 | 17.2 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 35.7 | 33.7 | 10.4 | 52.4 | 22.4 | | 49.1 | 4.0 | 1.2 | 16.5 | 17.2 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | C | B | D | C | | D | A | A | B | B | A |
| Approach Delay | | 12.5 | | | 46.6 | | | 16.1 | | | 16.2 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| 90th %ile Green (s) | 20.6 | 20.6 | 20.6 | 20.6 | 20.6 | | 19.9 | 66.4 | 66.4 | 40.5 | 40.5 | 40.5 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Max | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 17.1 | 17.1 | 17.1 | 17.1 | 17.1 | | 18.8 | 69.9 | 69.9 | 45.1 | 45.1 | 45.1 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 14.5 | 14.5 | 14.5 | 14.5 | 14.5 | | 16.4 | 72.5 | 72.5 | 50.1 | 50.1 | 50.1 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 14.0 | 75.0 | 75.0 | 55.0 | 55.0 | 55.0 |
| 30th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.4 | 77.0 | 77.0 | 60.6 | 60.6 | 60.6 |
| 10th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 15 | 7 | 29 | 94 | 14 | | 125 | 118 | 3 | 3 | 281 | 0 |
| Fuel Used(l) | 2 | 1 | 19 | 13 | 2 | | 19 | 31 | 2 | 0 | 40 | 2 |
| CO Emissions (g/hr) | 36 | 14 | 353 | 235 | 43 | | 362 | 581 | 29 | 7 | 745 | 28 |
| NOx Emissions (g/hr) | 7 | 3 | 68 | 45 | 8 | | 70 | 112 | 6 | 1 | 144 | 5 |
| VOC Emissions (g/hr) | 8 | 3 | 81 | 54 | 10 | | 84 | 134 | 7 | 2 | 172 | 7 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 12 | 0 | 0 | 24 | 0 |
| Queue Length 50th (m) | 3.6 | 1.4 | 0.0 | 25.1 | 2.7 | | 33.0 | 3.5 | 0.2 | 0.5 | 36.6 | 0.0 |
| Queue Length 95th (m) | 8.7 | 4.8 | 13.2 | 36.5 | 8.9 | | 46.5 | 22.3 | 1.8 | 2.7 | 51.7 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 350 | 474 | 616 | 371 | 467 | | 265 | 2305 | 1041 | 447 | 1695 | 810 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.06 | 0.02 | 0.47 | 0.35 | 0.07 | | 0.64 | 0.19 | 0.02 | 0.01 | 0.35 | 0.04 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 18.3 Intersection LOS: B
Intersection Capacity Utilization 53.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: 43 Street N & 9 Ave N



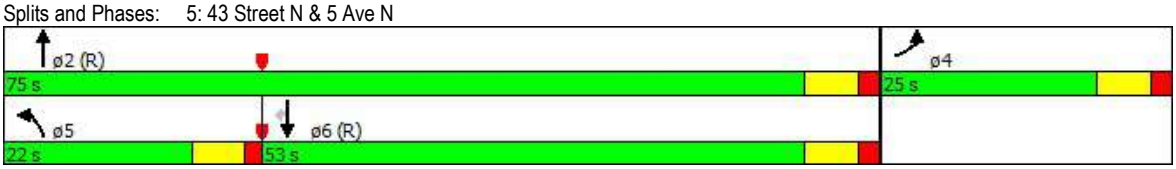
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 35 | 256 | 215 | 542 | 916 | 59 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 284 | | | | 66 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 240.1 | 882.4 | |
| Travel Time (s) | 52.4 | | | 14.4 | 52.9 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 7% | 7% | 12% | 12% | 6% | 6% |
| Adj. Flow (vph) | 39 | 284 | 239 | 602 | 1018 | 66 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 39 | 284 | 239 | 602 | 1018 | 66 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 25.0 | | 22.0 | 75.0 | 53.0 | 53.0 |
| Total Split (%) | 25.0% | | 22.0% | 75.0% | 53.0% | 53.0% |
| Maximum Green (s) | 18.5 | | 16.0 | 68.5 | 46.5 | 46.5 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 21.5 | 86.2 | 56.1 | 56.1 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.22 | 0.86 | 0.56 | 0.56 |
| v/c Ratio | 0.12 | 0.19 | 0.69 | 0.22 | 0.53 | 0.07 |
| Control Delay | 42.0 | 0.3 | 46.7 | 2.5 | 13.2 | 2.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.0 | 0.3 | 46.7 | 2.5 | 13.2 | 2.8 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | B | A |
| Approach Delay | 5.3 | | | 15.1 | 12.6 | |
| Approach LOS | A | | | B | B | |
| 90th %ile Green (s) | 10.0 | | 24.5 | 77.0 | 46.5 | 46.5 |
| 90th %ile Term Code | Min | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 24.3 | 77.0 | 46.7 | 46.7 |
| 70th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 22.4 | 77.0 | 48.6 | 48.6 |
| 50th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 0.0 | | 20.3 | 93.5 | 67.2 | 67.2 |
| 30th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 16.2 | 93.5 | 71.3 | 71.3 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 32 | 0 | 193 | 96 | 462 | 6 |
| Fuel Used(l) | 4 | 18 | 26 | 34 | 94 | 5 |
| CO Emissions (g/hr) | 79 | 330 | 482 | 639 | 1756 | 90 |
| NOx Emissions (g/hr) | 15 | 64 | 93 | 123 | 339 | 17 |
| VOC Emissions (g/hr) | 18 | 76 | 111 | 147 | 405 | 21 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 19 | 39 | 0 |
| Queue Length 50th (m) | 3.8 | 0.0 | 44.7 | 14.7 | 83.8 | 0.3 |
| Queue Length 95th (m) | 9.0 | 0.0 | 69.8 | 19.7 | 53.9 | 3.6 |
| Internal Link Dist (m) | 704.0 | | | 216.1 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 605 | 1509 | 347 | 2778 | 1909 | 883 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.06 | 0.19 | 0.69 | 0.22 | 0.53 | 0.07 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 12.5 Intersection LOS: B
Intersection Capacity Utilization 61.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: 43 Street N & 5 Ave N

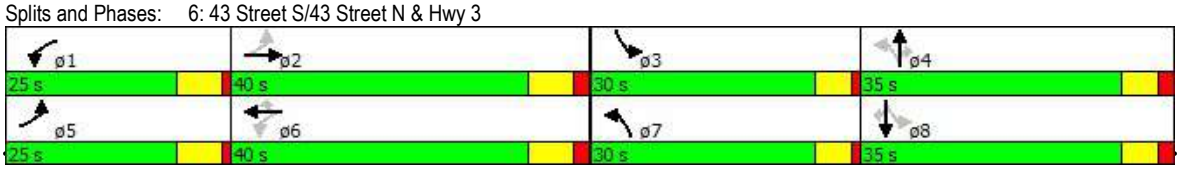


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 167 | 585 | 6 | 269 | 729 | 242 | 362 | 316 | 292 | 272 | 528 | 201 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1641 | 3275 | 0 | 1687 | 3374 | 1509 | 3273 | 3374 | 1509 | 3155 | 3252 | 1455 |
| Flt Permitted | 0.206 | | | 0.237 | | | 0.190 | | | 0.546 | | |
| Satd. Flow (perm) | 356 | 3275 | 0 | 421 | 3374 | 1509 | 655 | 3374 | 1509 | 1813 | 3252 | 1455 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 263 | | | 317 | | | 218 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 401.6 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 24.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 7% | 7% | 7% | 7% | 7% | 7% | 11% | 11% | 11% |
| Adj. Flow (vph) | 182 | 636 | 7 | 292 | 792 | 263 | 393 | 343 | 317 | 296 | 574 | 218 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 182 | 643 | 0 | 292 | 792 | 263 | 393 | 343 | 317 | 296 | 574 | 218 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 48.3 | 33.3 | | 54.5 | 36.4 | 36.4 | 46.3 | 28.7 | 28.7 | 38.6 | 24.9 | 24.9 |
| Actuated g/C Ratio | 0.42 | 0.29 | | 0.47 | 0.31 | 0.31 | 0.40 | 0.25 | 0.25 | 0.33 | 0.21 | 0.21 |
| v/c Ratio | 0.60 | 0.68 | | 0.76 | 0.75 | 0.40 | 0.62 | 0.41 | 0.52 | 0.40 | 0.82 | 0.45 |
| Control Delay | 27.4 | 42.6 | | 34.0 | 42.7 | 6.2 | 27.4 | 38.3 | 7.1 | 24.2 | 54.7 | 8.3 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 27.4 | 42.6 | | 34.0 | 42.7 | 6.2 | 27.4 | 38.3 | 7.1 | 24.2 | 54.7 | 8.3 |
| LOS | C | D | | C | D | A | C | D | A | C | D | A |
| Approach Delay | | 39.2 | | | 33.7 | | | 24.9 | | | 37.1 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 20.8 | 33.8 | 33.8 | 16.0 | 29.0 | 29.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Hold | Hold | Gap | Max | Max |
| 70th %ile Green (s) | 16.8 | 33.0 | | 19.0 | 35.2 | 35.2 | 18.6 | 33.6 | 33.6 | 14.0 | 29.0 | 29.0 |
| 70th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Max | Max |
| 50th %ile Green (s) | 14.0 | 33.0 | | 19.0 | 38.0 | 38.0 | 17.1 | 31.0 | 31.0 | 12.7 | 26.6 | 26.6 |
| 50th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Gap | Gap |
| 30th %ile Green (s) | 11.1 | 33.0 | | 16.4 | 38.3 | 38.3 | 15.0 | 26.4 | 26.4 | 11.2 | 22.6 | 22.6 |
| 30th %ile Term Code | Gap | MaxR | | Gap | Hold | Hold | Gap | Hold | Hold | Gap | Gap | Gap |
| 10th %ile Green (s) | 10.0 | 33.0 | | 12.7 | 35.7 | 35.7 | 12.0 | 20.0 | 20.0 | 10.0 | 18.0 | 18.0 |
| 10th %ile Term Code | Min | MaxR | | Gap | Hold | Hold | Gap | Hold | Hold | Min | Gap | Gap |
| Stops (vph) | 103 | 513 | | 158 | 617 | 25 | 230 | 252 | 28 | 182 | 488 | 23 |
| Fuel Used(l) | 15 | 70 | | 33 | 104 | 17 | 29 | 30 | 14 | 26 | 67 | 13 |
| CO Emissions (g/hr) | 285 | 1297 | | 605 | 1933 | 323 | 546 | 556 | 261 | 486 | 1254 | 246 |
| NOx Emissions (g/hr) | 55 | 250 | | 117 | 373 | 62 | 105 | 107 | 50 | 94 | 242 | 47 |
| VOC Emissions (g/hr) | 66 | 299 | | 140 | 446 | 75 | 126 | 128 | 60 | 112 | 289 | 57 |
| Dilemma Vehicles (#) | 0 | 25 | | 0 | 30 | 0 | 0 | 13 | 0 | 0 | 22 | 0 |
| Queue Length 50th (m) | 24.9 | 75.4 | | 43.0 | 91.6 | 0.0 | 32.7 | 36.9 | 0.0 | 23.9 | 71.0 | 0.0 |
| Queue Length 95th (m) | 43.9 | 103.7 | | #83.7 | #140.6 | 21.3 | 44.3 | 52.9 | 23.5 | 33.7 | 95.8 | 20.8 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 377.6 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 375 | 939 | | 409 | 1058 | 653 | 836 | 912 | 639 | 1031 | 819 | 529 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.49 | 0.68 | | 0.71 | 0.75 | 0.40 | 0.47 | 0.38 | 0.50 | 0.29 | 0.70 | 0.41 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 116 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.82 | | | |
| Intersection Signal Delay: 33.5 | | Intersection LOS: C | |
| Intersection Capacity Utilization 76.5% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 125.8 | | | |
| 70th %ile Actuated Cycle: 123.6 | | | |
| 50th %ile Actuated Cycle: 119.7 | | | |
| 30th %ile Actuated Cycle: 111 | | | |
| 10th %ile Actuated Cycle: 99.7 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: 43 Street S/43 Street N & Hwy 3

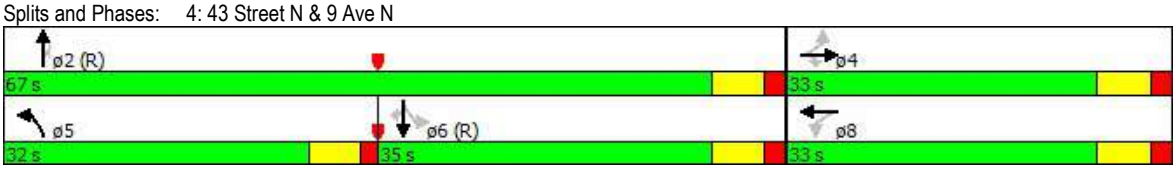


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 10 | 14 | 87 | 21 | 7 | 5 | 212 | 404 | 83 | 13 | 342 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.936 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1308 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.748 | | | 0.746 | | | 0.950 | | | 0.475 | | |
| Satd. Flow (perm) | 1380 | 1845 | 1568 | 1042 | 1308 | 0 | 1656 | 3312 | 1482 | 828 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 105 | | 6 | | | | 100 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 12 | 17 | 105 | 25 | 8 | 6 | 255 | 487 | 100 | 16 | 412 | 18 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 12 | 17 | 105 | 25 | 14 | 0 | 255 | 487 | 100 | 16 | 412 | 18 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | | 32.0 | 67.0 | 67.0 | 35.0 | 35.0 | 35.0 |
| Total Split (%) | 33.0% | 33.0% | 33.0% | 33.0% | 33.0% | | 32.0% | 67.0% | 67.0% | 35.0% | 35.0% | 35.0% |
| Maximum Green (s) | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | | 26.0 | 60.5 | 60.5 | 28.5 | 28.5 | 28.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 10.3 | 10.3 | 10.3 | 10.3 | 10.3 | | 20.5 | 81.3 | 81.3 | 53.5 | 53.5 | 53.5 |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | | 0.20 | 0.81 | 0.81 | 0.54 | 0.54 | 0.54 |
| v/c Ratio | 0.08 | 0.09 | 0.41 | 0.23 | 0.10 | | 0.75 | 0.18 | 0.08 | 0.04 | 0.23 | 0.02 |
| Control Delay | 41.9 | 41.6 | 13.6 | 46.9 | 32.5 | | 47.6 | 1.4 | 0.3 | 15.8 | 14.9 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.9 | 41.6 | 13.6 | 46.9 | 32.5 | | 47.6 | 1.4 | 0.3 | 15.8 | 14.9 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | B | B | A |
| Approach Delay | | 19.7 | | | 41.7 | | | 15.3 | | | 14.3 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| 90th %ile Green (s) | 11.4 | 11.4 | 11.4 | 11.4 | 11.4 | | 27.5 | 75.6 | 75.6 | 42.1 | 42.1 | 42.1 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 23.5 | 77.0 | 77.0 | 47.5 | 47.5 | 47.5 |
| 70th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 20.6 | 77.0 | 77.0 | 50.4 | 50.4 | 50.4 |
| 50th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 17.6 | 77.0 | 77.0 | 53.4 | 53.4 | 53.4 |
| 30th %ile Term Code | Min | Min | Min | Hold | Hold | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 13.3 | 93.5 | 93.5 | 74.2 | 74.2 | 74.2 |
| 10th %ile Term Code | Skip | Skip | Skip | Skip | Skip | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 11 | 15 | 17 | 20 | 10 | | 194 | 56 | 1 | 8 | 183 | 0 |
| Fuel Used(l) | 1 | 2 | 7 | 3 | 1 | | 30 | 33 | 6 | 1 | 28 | 1 |
| CO Emissions (g/hr) | 24 | 33 | 139 | 47 | 24 | | 563 | 618 | 119 | 20 | 516 | 15 |
| NOx Emissions (g/hr) | 5 | 6 | 27 | 9 | 5 | | 109 | 119 | 23 | 4 | 100 | 3 |
| VOC Emissions (g/hr) | 5 | 8 | 32 | 11 | 5 | | 130 | 142 | 27 | 5 | 119 | 3 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 8 | 0 | 0 | 17 | 0 |
| Queue Length 50th (m) | 2.3 | 3.2 | 0.0 | 4.8 | 1.5 | | 49.7 | 2.7 | 0.1 | 1.6 | 24.0 | 0.0 |
| Queue Length 95th (m) | 7.2 | 9.0 | 12.7 | 11.9 | 6.8 | | 64.7 | 3.2 | 0.0 | 5.6 | 36.3 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 365 | 488 | 492 | 276 | 351 | | 435 | 2693 | 1224 | 443 | 1772 | 841 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.03 | 0.21 | 0.09 | 0.04 | | 0.59 | 0.18 | 0.08 | 0.04 | 0.23 | 0.02 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.75 | | | |
| Intersection Signal Delay: 16.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 49.6% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 4: 43 Street N & 9 Ave N

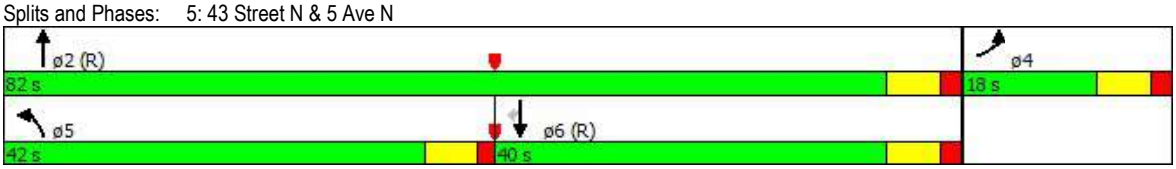


| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 35 | 160 | 267 | 706 | 456 | 32 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 184 | | | | 37 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 40 | 184 | 307 | 811 | 524 | 37 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 40 | 184 | 307 | 811 | 524 | 37 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 18.0 | | 42.0 | 82.0 | 40.0 | 40.0 |
| Total Split (%) | 18.0% | | 42.0% | 82.0% | 40.0% | 40.0% |
| Maximum Green (s) | 11.5 | | 36.0 | 75.5 | 33.5 | 33.5 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 23.5 | 86.2 | 54.1 | 54.1 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.24 | 0.86 | 0.54 | 0.54 |
| v/c Ratio | 0.13 | 0.13 | 0.77 | 0.28 | 0.31 | 0.05 |
| Control Delay | 42.2 | 0.2 | 48.1 | 2.7 | 8.7 | 1.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.2 | 0.2 | 48.1 | 2.7 | 8.7 | 1.5 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | A | A |
| Approach Delay | 7.7 | | | 15.2 | 8.2 | |
| Approach LOS | A | | | B | A | |
| 90th %ile Green (s) | 10.0 | | 31.3 | 77.0 | 39.7 | 39.7 |
| 90th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 26.8 | 77.0 | 44.2 | 44.2 |
| 70th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 23.6 | 77.0 | 47.4 | 47.4 |
| 50th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 0.0 | | 20.3 | 93.5 | 67.2 | 67.2 |
| 30th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 15.5 | 93.5 | 72.0 | 72.0 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 33 | 0 | 241 | 131 | 112 | 1 |
| Fuel Used(l) | 4 | 11 | 33 | 45 | 42 | 3 |
| CO Emissions (g/hr) | 80 | 206 | 605 | 838 | 774 | 47 |
| NOx Emissions (g/hr) | 15 | 40 | 117 | 162 | 149 | 9 |
| VOC Emissions (g/hr) | 18 | 48 | 140 | 193 | 178 | 11 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 24 | 21 | 0 |
| Queue Length 50th (m) | 3.9 | 0.0 | 58.6 | 21.2 | 12.3 | 0.2 |
| Queue Length 95th (m) | 8.8 | 0.0 | 77.2 | 26.1 | 19.3 | 0.0 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 359 | 1442 | 613 | 2936 | 1683 | 769 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.13 | 0.50 | 0.28 | 0.31 | 0.05 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.77 | | | |
| Intersection Signal Delay: 12.2 | | Intersection LOS: B | |
| Intersection Capacity Utilization 51.6% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: 43 Street N & 5 Ave N

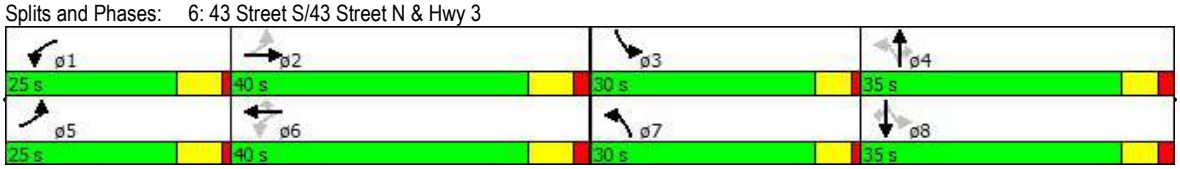


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 327 | 659 | 9 | 266 | 641 | 408 | 283 | 621 | 192 | 392 | 405 | 193 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1626 | 3246 | 0 | 1656 | 3312 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.200 | | | 0.193 | | | 0.446 | | | 0.135 | | |
| Satd. Flow (perm) | 342 | 3246 | 0 | 336 | 3312 | 1482 | 1495 | 3282 | 1468 | 433 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 408 | | | 209 | | | 210 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 355 | 716 | 10 | 289 | 697 | 443 | 308 | 675 | 209 | 426 | 440 | 210 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 355 | 726 | 0 | 289 | 697 | 443 | 308 | 675 | 209 | 426 | 440 | 210 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 53.8 | 33.7 | | 52.4 | 33.1 | 33.1 | 42.0 | 28.0 | 28.0 | 50.3 | 32.3 | 32.3 |
| Actuated g/C Ratio | 0.44 | 0.28 | | 0.43 | 0.27 | 0.27 | 0.35 | 0.23 | 0.23 | 0.41 | 0.27 | 0.27 |
| v/c Ratio | 1.01 | 0.81 | | 0.84 | 0.77 | 0.63 | 0.44 | 0.89 | 0.42 | 0.77 | 0.53 | 0.40 |
| Control Delay | 78.8 | 49.7 | | 46.4 | 48.3 | 9.9 | 24.8 | 61.2 | 8.0 | 36.0 | 40.8 | 7.0 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 78.8 | 49.7 | | 46.4 | 48.3 | 9.9 | 24.8 | 61.2 | 8.0 | 36.0 | 40.8 | 7.0 |
| LOS | E | D | | D | D | A | C | E | A | D | D | A |
| Approach Delay | | 59.3 | | | 36.0 | | | 42.5 | | | 32.3 | |
| Approach LOS | | E | | | D | | | D | | | C | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 16.5 | 29.0 | 29.0 | 23.3 | 35.8 | 35.8 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 70th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 14.4 | 29.0 | 29.0 | 19.5 | 34.1 | 34.1 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 50th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 13.0 | 29.0 | 29.0 | 17.0 | 33.0 | 33.0 |
| 50th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 30th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 11.7 | 29.0 | 29.0 | 15.1 | 32.4 | 32.4 |
| 30th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 10th %ile Green (s) | 19.0 | 36.1 | | 15.9 | 33.0 | 33.0 | 10.0 | 23.9 | 23.9 | 12.7 | 26.6 | 26.6 |
| 10th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Min | Gap | Gap | Gap | Hold | Hold |
| Stops (vph) | 198 | 593 | | 168 | 573 | 58 | 189 | 563 | 22 | 264 | 334 | 20 |
| Fuel Used(l) | 43 | 83 | | 35 | 96 | 31 | 23 | 72 | 9 | 41 | 46 | 12 |
| CO Emissions (g/hr) | 795 | 1547 | | 658 | 1784 | 583 | 421 | 1337 | 176 | 767 | 857 | 231 |
| NOx Emissions (g/hr) | 153 | 299 | | 127 | 344 | 113 | 81 | 258 | 34 | 148 | 165 | 45 |
| VOC Emissions (g/hr) | 183 | 357 | | 152 | 411 | 135 | 97 | 308 | 41 | 177 | 198 | 53 |
| Dilemma Vehicles (#) | 0 | 27 | | 0 | 26 | 0 | 0 | 25 | 0 | 0 | 16 | 0 |
| Queue Length 50th (m) | ~67.2 | 90.7 | | 44.7 | 85.7 | 6.6 | 25.0 | 86.4 | 0.0 | 36.5 | 49.6 | 0.0 |
| Queue Length 95th (m) | #141.9 | #130.1 | | #100.0 | 116.4 | 40.9 | 34.9 | #128.0 | 20.8 | 54.1 | 69.1 | 19.0 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 352 | 901 | | 353 | 901 | 700 | 972 | 784 | 510 | 721 | 847 | 532 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.01 | 0.81 | | 0.82 | 0.77 | 0.63 | 0.32 | 0.86 | 0.41 | 0.59 | 0.52 | 0.39 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 121.5 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 1.01 | | | |
| Intersection Signal Delay: 42.0 | | Intersection LOS: D | |
| Intersection Capacity Utilization 84.2% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 128.3 | | | |
| 70th %ile Actuated Cycle: 124.5 | | | |
| 50th %ile Actuated Cycle: 122 | | | |
| 30th %ile Actuated Cycle: 120.1 | | | |
| 10th %ile Actuated Cycle: 112.6 | | | |
| ~ 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: 6: 43 Street S/43 Street N & Hwy 3

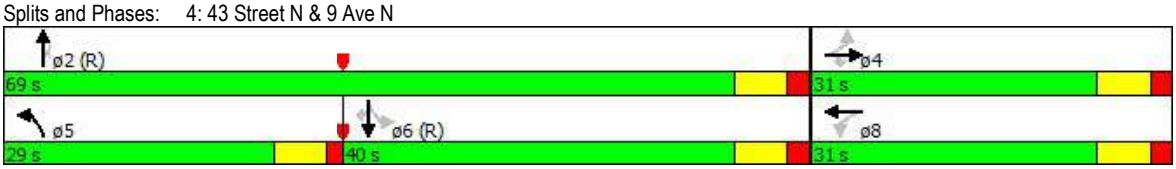


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 17 | 6 | 248 | 111 | 13 | 14 | 144 | 366 | 21 | 4 | 499 | 31 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.921 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1703 | 1792 | 1524 | 1770 | 1716 | 0 | 1597 | 3195 | 1429 | 1687 | 3374 | 1509 |
| Flt Permitted | 0.735 | | | 0.752 | | | 0.950 | | | 0.488 | | |
| Satd. Flow (perm) | 1317 | 1792 | 1524 | 1401 | 1716 | 0 | 1597 | 3195 | 1429 | 867 | 3374 | 1509 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 310 | | 18 | | | | 38 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 13% | 13% | 13% | 7% | 7% | 7% |
| Adj. Flow (vph) | 21 | 8 | 310 | 139 | 16 | 18 | 180 | 458 | 26 | 5 | 624 | 39 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 21 | 8 | 310 | 139 | 34 | 0 | 180 | 458 | 26 | 5 | 624 | 39 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | | 12.0 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 31.0 | 31.0 | 31.0 | 31.0 | 31.0 | | 29.0 | 69.0 | 69.0 | 40.0 | 40.0 | 40.0 |
| Total Split (%) | 31.0% | 31.0% | 31.0% | 31.0% | 31.0% | | 29.0% | 69.0% | 69.0% | 40.0% | 40.0% | 40.0% |
| Maximum Green (s) | 24.5 | 24.5 | 24.5 | 24.5 | 24.5 | | 23.0 | 62.5 | 62.5 | 33.5 | 33.5 | 33.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | | | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 15.4 | 15.4 | 15.4 | 15.4 | 15.4 | | 16.5 | 71.6 | 71.6 | 49.1 | 49.1 | 49.1 |
| Actuated g/C Ratio | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | | 0.16 | 0.72 | 0.72 | 0.49 | 0.49 | 0.49 |
| v/c Ratio | 0.10 | 0.03 | 0.62 | 0.64 | 0.12 | | 0.69 | 0.20 | 0.03 | 0.01 | 0.38 | 0.05 |
| Control Delay | 35.1 | 33.0 | 10.1 | 52.8 | 21.3 | | 48.9 | 4.0 | 0.5 | 18.0 | 18.5 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 35.1 | 33.0 | 10.1 | 52.8 | 21.3 | | 48.9 | 4.0 | 0.5 | 18.0 | 18.5 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | C | B | D | C | | D | A | A | B | B | A |
| Approach Delay | | 12.2 | | | 46.6 | | | 16.0 | | | 17.4 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| 90th %ile Green (s) | 21.5 | 21.5 | 21.5 | 21.5 | 21.5 | | 22.7 | 65.5 | 65.5 | 36.8 | 36.8 | 36.8 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 17.8 | 17.8 | 17.8 | 17.8 | 17.8 | | 19.0 | 69.2 | 69.2 | 44.2 | 44.2 | 44.2 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 15.2 | 15.2 | 15.2 | 15.2 | 15.2 | | 16.5 | 71.8 | 71.8 | 49.3 | 49.3 | 49.3 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 12.6 | 12.6 | 12.6 | 12.6 | 12.6 | | 13.9 | 74.4 | 74.4 | 54.5 | 54.5 | 54.5 |
| 30th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 10.2 | 77.0 | 77.0 | 60.8 | 60.8 | 60.8 |
| 10th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 15 | 7 | 30 | 102 | 15 | | 131 | 113 | 1 | 3 | 310 | 0 |
| Fuel Used(l) | 2 | 1 | 20 | 14 | 2 | | 21 | 33 | 2 | 0 | 43 | 2 |
| CO Emissions (g/hr) | 37 | 14 | 377 | 254 | 46 | | 385 | 611 | 31 | 7 | 804 | 30 |
| NOx Emissions (g/hr) | 7 | 3 | 73 | 49 | 9 | | 74 | 118 | 6 | 1 | 155 | 6 |
| VOC Emissions (g/hr) | 9 | 3 | 87 | 59 | 11 | | 89 | 141 | 7 | 2 | 186 | 7 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 17 | 0 | 0 | 25 | 0 |
| Queue Length 50th (m) | 3.7 | 1.4 | 0.0 | 27.0 | 2.8 | | 25.7 | 6.4 | 0.2 | 0.5 | 40.1 | 0.0 |
| Queue Length 95th (m) | 8.9 | 4.8 | 13.1 | 38.5 | 9.3 | | 47.6 | 14.4 | 0.3 | 2.9 | 58.8 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 322 | 439 | 607 | 343 | 434 | | 367 | 2287 | 1033 | 426 | 1657 | 794 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.07 | 0.02 | 0.51 | 0.41 | 0.08 | | 0.49 | 0.20 | 0.03 | 0.01 | 0.38 | 0.05 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.69 | | | |
| Intersection Signal Delay: 18.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 54.1% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 4: 43 Street N & 9 Ave N



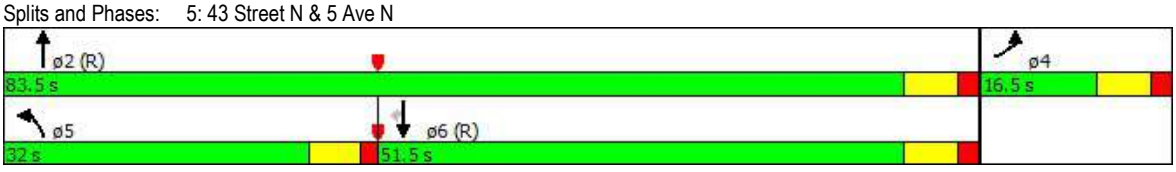
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 37 | 274 | 230 | 579 | 976 | 62 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 304 | | | | 69 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 240.1 | 882.4 | |
| Travel Time (s) | 52.4 | | | 14.4 | 52.9 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 7% | 7% | 12% | 12% | 6% | 6% |
| Adj. Flow (vph) | 41 | 304 | 256 | 643 | 1084 | 69 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 41 | 304 | 256 | 643 | 1084 | 69 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 32.0 | 83.5 | 51.5 | 51.5 |
| Total Split (%) | 16.5% | | 32.0% | 83.5% | 51.5% | 51.5% |
| Maximum Green (s) | 10.0 | | 26.0 | 77.0 | 45.0 | 45.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 20.5 | 86.2 | 57.1 | 57.1 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.20 | 0.86 | 0.57 | 0.57 |
| v/c Ratio | 0.13 | 0.20 | 0.78 | 0.23 | 0.56 | 0.08 |
| Control Delay | 42.1 | 0.3 | 53.1 | 2.5 | 13.8 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.1 | 0.3 | 53.1 | 2.5 | 13.8 | 2.9 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | B | A |
| Approach Delay | 5.3 | | | 17.0 | 13.1 | |
| Approach LOS | A | | | B | B | |
| 90th %ile Green (s) | 10.0 | | 26.0 | 77.0 | 45.0 | 45.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 70th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 21.0 | 77.0 | 50.0 | 50.0 |
| 50th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 0.0 | | 18.0 | 93.5 | 69.5 | 69.5 |
| 30th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 13.6 | 93.5 | 73.9 | 73.9 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 34 | 0 | 210 | 103 | 610 | 6 |
| Fuel Used(l) | 5 | 19 | 29 | 37 | 105 | 5 |
| CO Emissions (g/hr) | 84 | 354 | 539 | 683 | 1950 | 95 |
| NOx Emissions (g/hr) | 16 | 68 | 104 | 132 | 376 | 18 |
| VOC Emissions (g/hr) | 19 | 82 | 124 | 158 | 450 | 22 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 20 | 22 | 0 |
| Queue Length 50th (m) | 4.0 | 0.0 | 49.4 | 16.0 | 90.0 | 0.3 |
| Queue Length 95th (m) | 9.3 | 0.0 | 73.3 | 21.3 | 53.8 | m3.7 |
| Internal Link Dist (m) | 704.0 | | | 216.1 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 327 | 1509 | 419 | 2778 | 1944 | 899 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.20 | 0.61 | 0.23 | 0.56 | 0.08 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 13.4 Intersection LOS: B
Intersection Capacity Utilization 63.9% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: 43 Street N & 5 Ave N

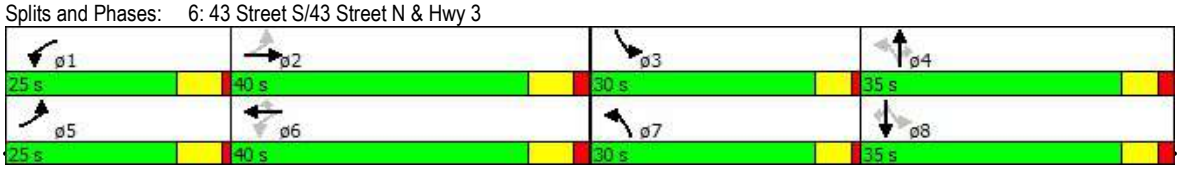


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 178 | 627 | 6 | 288 | 781 | 259 | 387 | 338 | 313 | 290 | 563 | 213 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1641 | 3275 | 0 | 1687 | 3374 | 1509 | 3273 | 3374 | 1509 | 3155 | 3252 | 1455 |
| Flt Permitted | 0.169 | | | 0.192 | | | 0.165 | | | 0.527 | | |
| Satd. Flow (perm) | 292 | 3275 | 0 | 341 | 3374 | 1509 | 568 | 3374 | 1509 | 1750 | 3252 | 1455 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 282 | | | 340 | | | 232 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 401.6 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 24.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 7% | 7% | 7% | 7% | 7% | 7% | 11% | 11% | 11% |
| Adj. Flow (vph) | 193 | 682 | 7 | 313 | 849 | 282 | 421 | 367 | 340 | 315 | 612 | 232 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 193 | 689 | 0 | 313 | 849 | 282 | 421 | 367 | 340 | 315 | 612 | 232 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 48.7 | 33.1 | | 56.3 | 37.2 | 37.2 | 49.4 | 30.9 | 30.9 | 40.7 | 26.5 | 26.5 |
| Actuated g/C Ratio | 0.41 | 0.28 | | 0.47 | 0.31 | 0.31 | 0.41 | 0.26 | 0.26 | 0.34 | 0.22 | 0.22 |
| v/c Ratio | 0.68 | 0.76 | | 0.85 | 0.81 | 0.43 | 0.67 | 0.42 | 0.53 | 0.42 | 0.85 | 0.46 |
| Control Delay | 34.1 | 47.1 | | 46.0 | 46.9 | 6.3 | 28.8 | 38.9 | 7.0 | 24.6 | 57.5 | 8.2 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 34.1 | 47.1 | | 46.0 | 46.9 | 6.3 | 28.8 | 38.9 | 7.0 | 24.6 | 57.5 | 8.2 |
| LOS | C | D | | D | D | A | C | D | A | C | E | A |
| Approach Delay | | 44.3 | | | 38.8 | | | 25.5 | | | 38.7 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 21.7 | 34.1 | 34.1 | 16.6 | 29.0 | 29.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Hold | Hold | Gap | Max | Max |
| 70th %ile Green (s) | 17.8 | 33.0 | | 19.0 | 34.2 | 34.2 | 19.5 | 33.9 | 33.9 | 14.6 | 29.0 | 29.0 |
| 70th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Max | Max |
| 50th %ile Green (s) | 14.9 | 33.0 | | 19.0 | 37.1 | 37.1 | 17.8 | 33.6 | 33.6 | 13.2 | 29.0 | 29.0 |
| 50th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Max | Max |
| 30th %ile Green (s) | 11.9 | 33.0 | | 19.0 | 40.1 | 40.1 | 16.1 | 29.9 | 29.9 | 11.9 | 25.7 | 25.7 |
| 30th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Gap | Gap |
| 10th %ile Green (s) | 10.0 | 33.0 | | 17.1 | 40.1 | 40.1 | 13.2 | 23.6 | 23.6 | 10.0 | 20.4 | 20.4 |
| 10th %ile Term Code | Min | MaxR | | Gap | Hold | Hold | Gap | Hold | Hold | Min | Gap | Gap |
| Stops (vph) | 113 | 564 | | 170 | 665 | 26 | 247 | 271 | 29 | 194 | 517 | 24 |
| Fuel Used(l) | 17 | 78 | | 38 | 114 | 19 | 32 | 32 | 15 | 28 | 73 | 14 |
| CO Emissions (g/hr) | 325 | 1446 | | 699 | 2122 | 346 | 592 | 599 | 279 | 519 | 1357 | 260 |
| NOx Emissions (g/hr) | 63 | 279 | | 135 | 410 | 67 | 114 | 116 | 54 | 100 | 262 | 50 |
| VOC Emissions (g/hr) | 75 | 334 | | 161 | 489 | 80 | 136 | 138 | 64 | 120 | 313 | 60 |
| Dilemma Vehicles (#) | 0 | 26 | | 0 | 31 | 0 | 0 | 14 | 0 | 0 | 23 | 0 |
| Queue Length 50th (m) | 28.1 | 85.3 | | 49.3 | 105.7 | 0.0 | 35.4 | 40.0 | 0.0 | 25.6 | 77.4 | 0.0 |
| Queue Length 95th (m) | 50.7 | 113.4 | | #110.6 | #159.2 | 22.2 | 47.5 | 57.0 | 24.4 | 35.9 | #104.2 | 21.6 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 377.6 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 343 | 905 | | 374 | 1045 | 662 | 802 | 903 | 652 | 1020 | 789 | 528 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.56 | 0.76 | | 0.84 | 0.81 | 0.43 | 0.52 | 0.41 | 0.52 | 0.31 | 0.78 | 0.44 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 119.9 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.85 | | | |
| Intersection Signal Delay: 36.6 | | Intersection LOS: D | |
| Intersection Capacity Utilization 80.1% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 126.7 | | | |
| 70th %ile Actuated Cycle: 124.5 | | | |
| 50th %ile Actuated Cycle: 122.8 | | | |
| 30th %ile Actuated Cycle: 117.8 | | | |
| 10th %ile Actuated Cycle: 107.7 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: 43 Street S/43 Street N & Hwy 3



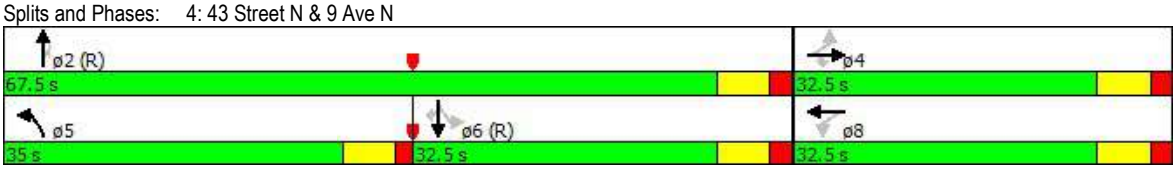
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 11 | 18 | 116 | 27 | 9 | 6 | 282 | 518 | 110 | 17 | 452 | 19 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.942 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1316 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.746 | | | 0.743 | | | 0.950 | | | 0.415 | | |
| Satd. Flow (perm) | 1376 | 1845 | 1568 | 1038 | 1316 | 0 | 1656 | 3312 | 1482 | 723 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 140 | | 7 | | | | 133 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 13 | 22 | 140 | 33 | 11 | 7 | 340 | 624 | 133 | 20 | 545 | 23 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 13 | 22 | 140 | 33 | 18 | 0 | 340 | 624 | 133 | 20 | 545 | 23 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 35.0 | 67.5 | 67.5 | 32.5 | 32.5 | 32.5 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 32.5% | | 35.0% | 67.5% | 67.5% | 32.5% | 32.5% | 32.5% |
| Maximum Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 29.0 | 61.0 | 61.0 | 26.0 | 26.0 | 26.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 10.6 | 10.6 | 10.6 | 10.6 | 10.6 | | 25.4 | 76.4 | 76.4 | 45.0 | 45.0 | 45.0 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | | 0.25 | 0.76 | 0.76 | 0.45 | 0.45 | 0.45 |
| v/c Ratio | 0.09 | 0.11 | 0.48 | 0.30 | 0.12 | | 0.81 | 0.25 | 0.11 | 0.06 | 0.37 | 0.03 |
| Control Delay | 41.3 | 41.4 | 13.1 | 48.6 | 31.9 | | 46.1 | 2.2 | 0.3 | 19.7 | 20.3 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.3 | 41.4 | 13.1 | 48.6 | 31.9 | | 46.1 | 2.2 | 0.3 | 19.7 | 20.3 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | B | C | A |
| Approach Delay | | 18.8 | | | 42.7 | | | 15.6 | | | 19.5 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| 90th %ile Green (s) | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | | 32.9 | 74.3 | 74.3 | 35.4 | 35.4 | 35.4 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.2 | 10.2 | 10.2 | 10.2 | 10.2 | | 28.8 | 76.8 | 76.8 | 42.0 | 42.0 | 42.0 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 25.6 | 77.0 | 77.0 | 45.4 | 45.4 | 45.4 |
| 50th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 22.3 | 77.0 | 77.0 | 48.7 | 48.7 | 48.7 |
| 30th %ile Term Code | Min | Min | Min | Hold | Hold | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 17.3 | 77.0 | 77.0 | 53.7 | 53.7 | 53.7 |
| 10th %ile Term Code | Min | Min | Min | Hold | Hold | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 11 | 18 | 20 | 26 | 12 | | 257 | 76 | 0 | 12 | 294 | 0 |
| Fuel Used(l) | 1 | 2 | 10 | 3 | 2 | | 40 | 43 | 8 | 2 | 40 | 1 |
| CO Emissions (g/hr) | 26 | 42 | 184 | 61 | 29 | | 742 | 800 | 157 | 29 | 749 | 19 |
| NOx Emissions (g/hr) | 5 | 8 | 35 | 12 | 6 | | 143 | 154 | 30 | 6 | 144 | 4 |
| VOC Emissions (g/hr) | 6 | 10 | 42 | 14 | 7 | | 171 | 185 | 36 | 7 | 173 | 4 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 25 | 0 | 0 | 23 | 0 |
| Queue Length 50th (m) | 2.5 | 4.2 | 0.0 | 6.4 | 2.1 | | 59.9 | 5.2 | 0.0 | 2.2 | 37.0 | 0.0 |
| Queue Length 95th (m) | 7.6 | 10.4 | 13.9 | 14.6 | 8.0 | | 80.7 | 6.0 | 0.0 | 7.5 | 54.7 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 357 | 479 | 511 | 269 | 347 | | 493 | 2531 | 1163 | 325 | 1491 | 724 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.05 | 0.27 | 0.12 | 0.05 | | 0.69 | 0.25 | 0.11 | 0.06 | 0.37 | 0.03 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 17.8 Intersection LOS: B
Intersection Capacity Utilization 52.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: 43 Street N & 9 Ave N



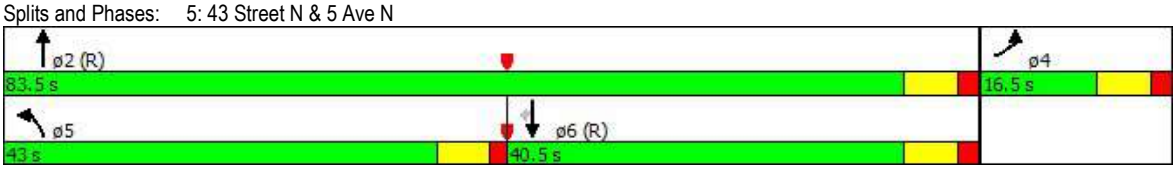
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 42 | 213 | 356 | 925 | 604 | 41 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 245 | | | | 47 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 48 | 245 | 409 | 1063 | 694 | 47 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 48 | 245 | 409 | 1063 | 694 | 47 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 43.0 | 83.5 | 40.5 | 40.5 |
| Total Split (%) | 16.5% | | 43.0% | 83.5% | 40.5% | 40.5% |
| Maximum Green (s) | 10.0 | | 37.0 | 77.0 | 34.0 | 34.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 29.2 | 86.2 | 48.4 | 48.4 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.29 | 0.86 | 0.48 | 0.48 |
| v/c Ratio | 0.15 | 0.17 | 0.82 | 0.36 | 0.46 | 0.07 |
| Control Delay | 42.5 | 0.3 | 46.6 | 3.1 | 11.2 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.5 | 0.3 | 46.6 | 3.1 | 11.2 | 1.1 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | B | A |
| Approach Delay | 7.2 | | | 15.1 | 10.5 | |
| Approach LOS | A | | | B | B | |
| 90th %ile Green (s) | 10.0 | | 37.0 | 77.0 | 34.0 | 34.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 33.1 | 77.0 | 37.9 | 37.9 |
| 70th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 29.6 | 77.0 | 41.4 | 41.4 |
| 50th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 0.0 | | 25.9 | 93.5 | 61.6 | 61.6 |
| 30th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 20.4 | 93.5 | 67.1 | 67.1 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 38 | 0 | 322 | 191 | 345 | 2 |
| Fuel Used(l) | 5 | 15 | 43 | 60 | 63 | 3 |
| CO Emissions (g/hr) | 95 | 275 | 800 | 1114 | 1164 | 60 |
| NOx Emissions (g/hr) | 18 | 53 | 154 | 215 | 225 | 12 |
| VOC Emissions (g/hr) | 22 | 63 | 184 | 257 | 269 | 14 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 31 | 28 | 0 |
| Queue Length 50th (m) | 4.6 | 0.0 | 77.0 | 30.7 | 15.5 | 0.2 |
| Queue Length 95th (m) | 10.0 | 0.0 | 97.5 | 37.1 | 23.0 | 0.4 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 312 | 1442 | 630 | 2936 | 1506 | 697 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.15 | 0.17 | 0.65 | 0.36 | 0.46 | 0.07 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 60.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: 43 Street N & 5 Ave N

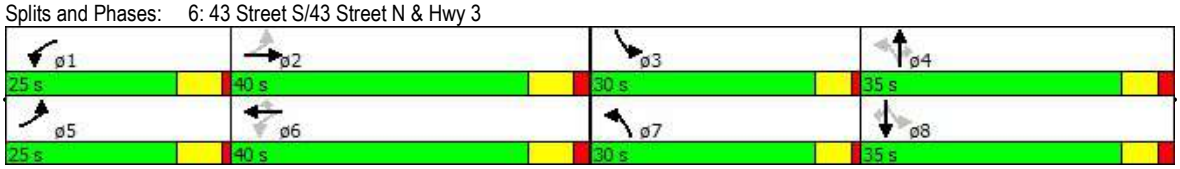


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 429 | 878 | 12 | 354 | 854 | 541 | 377 | 821 | 255 | 521 | 538 | 256 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1626 | 3246 | 0 | 1656 | 3312 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.121 | | | 0.121 | | | 0.329 | | | 0.118 | | |
| Satd. Flow (perm) | 207 | 3246 | 0 | 211 | 3312 | 1482 | 1102 | 3282 | 1468 | 378 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 384 | | | 232 | | | 278 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 466 | 954 | 13 | 385 | 928 | 588 | 410 | 892 | 277 | 566 | 585 | 278 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 466 | 967 | 0 | 385 | 928 | 588 | 410 | 892 | 277 | 566 | 585 | 278 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 53.0 | 33.0 | | 53.0 | 33.0 | 33.0 | 46.1 | 29.0 | 29.0 | 56.9 | 35.1 | 35.1 |
| Actuated g/C Ratio | 0.42 | 0.26 | | 0.42 | 0.26 | 0.26 | 0.36 | 0.23 | 0.23 | 0.45 | 0.28 | 0.28 |
| v/c Ratio | 1.56 | 1.15 | | 1.27 | 1.08 | 0.88 | 0.62 | 1.19 | 0.54 | 0.89 | 0.68 | 0.47 |
| Control Delay | 298.6 | 122.6 | | 177.1 | 99.2 | 31.5 | 27.3 | 142.1 | 13.2 | 51.0 | 46.0 | 7.1 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 298.6 | 122.6 | | 177.1 | 99.2 | 31.5 | 27.3 | 142.1 | 13.2 | 51.0 | 46.0 | 7.1 |
| LOS | F | F | | F | F | C | C | F | B | D | D | A |
| Approach Delay | | 179.9 | | | 94.0 | | | 89.7 | | | 40.4 | |
| Approach LOS | | F | | | F | | | F | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 20.7 | 29.0 | 29.0 | 25.0 | 33.3 | 33.3 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Max | Hold | Hold |
| 70th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 17.5 | 29.0 | 29.0 | 25.0 | 36.5 | 36.5 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Max | Hold | Hold |
| 50th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 16.0 | 29.0 | 29.0 | 23.8 | 36.8 | 36.8 |
| 50th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 30th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 14.4 | 29.0 | 29.0 | 20.6 | 35.2 | 35.2 |
| 30th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 10th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 12.1 | 29.0 | 29.0 | 16.7 | 33.6 | 33.6 |
| 10th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| Stops (vph) | 258 | 746 | | 223 | 734 | 201 | 257 | 676 | 50 | 393 | 469 | 26 |
| Fuel Used(l) | 129 | 158 | | 83 | 160 | 58 | 31 | 144 | 14 | 62 | 64 | 17 |
| CO Emissions (g/hr) | 2391 | 2944 | | 1538 | 2967 | 1073 | 578 | 2678 | 265 | 1156 | 1194 | 307 |
| NOx Emissions (g/hr) | 462 | 568 | | 297 | 573 | 207 | 112 | 517 | 51 | 223 | 230 | 59 |
| VOC Emissions (g/hr) | 552 | 679 | | 355 | 684 | 248 | 133 | 618 | 61 | 267 | 275 | 71 |
| Dilemma Vehicles (#) | 0 | 30 | | 0 | 29 | 0 | 0 | 26 | 0 | 0 | 21 | 0 |
| Queue Length 50th (m) | ~162.7 | ~161.3 | | ~115.2 | ~147.1 | 59.0 | 34.4 | ~152.6 | 9.7 | 60.2 | 72.3 | 0.0 |
| Queue Length 95th (m) | #234.6 | #207.5 | | #182.7 | #192.4 | #134.3 | 46.2 | #197.5 | 37.7 | #84.7 | 98.2 | 23.2 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 298 | 843 | | 303 | 859 | 668 | 879 | 748 | 513 | 694 | 865 | 588 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.56 | 1.15 | | 1.27 | 1.08 | 0.88 | 0.47 | 1.19 | 0.54 | 0.82 | 0.68 | 0.47 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 127.2 | | | |
| Natural Cycle: 130 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 1.56 | | | |
| Intersection Signal Delay: 100.3 | | Intersection LOS: F | |
| Intersection Capacity Utilization 104.9% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 130 | | | |
| 70th %ile Actuated Cycle: 130 | | | |
| 50th %ile Actuated Cycle: 128.8 | | | |
| 30th %ile Actuated Cycle: 125.6 | | | |
| 10th %ile Actuated Cycle: 121.7 | | | |
| ~ 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: 6: 43 Street S/43 Street N & Hwy 3

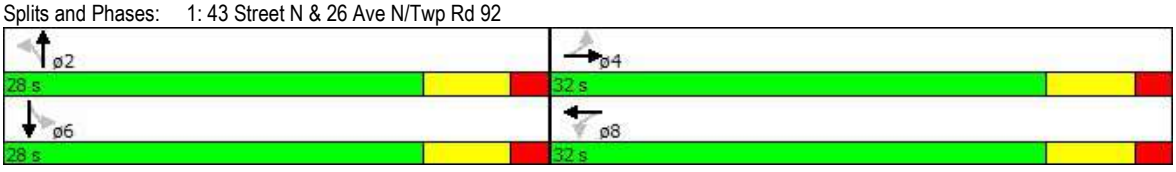


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 17 | 99 | 252 | 23 | 84 | 6 | 89 | 111 | 26 | 6 | 51 | 7 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.908 | | | 0.993 | | | 0.984 | | | 0.985 | |
| Flt Protected | | 0.998 | | | 0.990 | | | 0.981 | | | 0.995 | |
| Satd. Flow (prot) | 0 | 1656 | 0 | 0 | 1796 | 0 | 0 | 1714 | 0 | 0 | 1605 | 0 |
| Flt Permitted | | 0.979 | | | 0.864 | | | 0.835 | | | 0.950 | |
| Satd. Flow (perm) | 0 | 1624 | 0 | 0 | 1567 | 0 | 0 | 1459 | 0 | 0 | 1533 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 226 | | | 6 | | | 12 | | | 9 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 697.6 | | | 744.1 | | | 520.4 | | | 321.7 | |
| Travel Time (s) | | 50.2 | | | 53.6 | | | 26.8 | | | 16.5 | |
| Peak Hour Factor | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 4% | 4% | 7% | 7% | 7% | 16% | 16% | 16% |
| Adj. Flow (vph) | 22 | 129 | 327 | 30 | 109 | 8 | 116 | 144 | 34 | 8 | 66 | 9 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 478 | 0 | 0 | 147 | 0 | 0 | 294 | 0 | 0 | 83 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (s) | 32.0 | 32.0 | | 32.0 | 32.0 | | 28.0 | 28.0 | | 28.0 | 28.0 | |
| Total Split (%) | 53.3% | 53.3% | | 53.3% | 53.3% | | 46.7% | 46.7% | | 46.7% | 46.7% | |
| Maximum Green (s) | 25.5 | 25.5 | | 25.5 | 25.5 | | 21.5 | 21.5 | | 21.5 | 21.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 14.3 | | | 14.3 | | | 13.8 | | | 13.8 | |
| Actuated g/C Ratio | | 0.34 | | | 0.34 | | | 0.33 | | | 0.33 | |
| v/c Ratio | | 0.68 | | | 0.27 | | | 0.60 | | | 0.16 | |
| Control Delay | | 11.8 | | | 11.5 | | | 18.0 | | | 11.0 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 11.8 | | | 11.5 | | | 18.0 | | | 11.0 | |
| LOS | | B | | | B | | | B | | | B | |
| Approach Delay | | 11.8 | | | 11.5 | | | 18.0 | | | 11.0 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 25.0 | 25.0 | | 25.0 | 25.0 | | 21.5 | 21.5 | | 21.5 | 21.5 | |
| 90th %ile Term Code | Gap | Gap | | Hold | Hold | | Max | Max | | Hold | Hold | |
| 70th %ile Green (s) | 16.4 | 16.4 | | 16.4 | 16.4 | | 16.0 | 16.0 | | 16.0 | 16.0 | |
| 70th %ile Term Code | Gap | Gap | | Hold | Hold | | Gap | Gap | | Hold | Hold | |
| 50th %ile Green (s) | 12.2 | 12.2 | | 12.2 | 12.2 | | 12.5 | 12.5 | | 12.5 | 12.5 | |
| 50th %ile Term Code | Gap | Gap | | Hold | Hold | | Gap | Gap | | Hold | Hold | |
| 30th %ile Green (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| 30th %ile Term Code | Min | Min | | Min | Min | | Min | Min | | Min | Min | |
| 10th %ile Green (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| 10th %ile Term Code | Min | Min | | Hold | Hold | | Min | Min | | Min | Min | |
| Stops (vph) | | 157 | | | 68 | | | 165 | | | 39 | |
| Fuel Used(l) | | 31 | | | 11 | | | 20 | | | 4 | |
| CO Emissions (g/hr) | | 581 | | | 196 | | | 371 | | | 73 | |
| NOx Emissions (g/hr) | | 112 | | | 38 | | | 72 | | | 14 | |
| VOC Emissions (g/hr) | | 134 | | | 45 | | | 86 | | | 17 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 26 | | | 7 | |
| Queue Length 50th (m) | | 13.0 | | | 6.7 | | | 14.9 | | | 3.3 | |
| Queue Length 95th (m) | | 30.8 | | | 16.8 | | | 37.1 | | | 11.4 | |
| Internal Link Dist (m) | | 673.6 | | | 720.1 | | | 496.4 | | | 297.7 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 1124 | | | 1008 | | | 795 | | | 834 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.43 | | | 0.15 | | | 0.37 | | | 0.10 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 60 | | | |
| Actuated Cycle Length: 41.7 | | | |
| Natural Cycle: 45 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.68 | | | |
| Intersection Signal Delay: 13.5 | | Intersection LOS: B | |
| Intersection Capacity Utilization 52.7% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 59.5 | | | |
| 70th %ile Actuated Cycle: 45.4 | | | |
| 50th %ile Actuated Cycle: 37.7 | | | |
| 30th %ile Actuated Cycle: 33 | | | |
| 10th %ile Actuated Cycle: 33 | | | |

Splits and Phases: 1: 43 Street N & 26 Ave N/Twp Rd 92



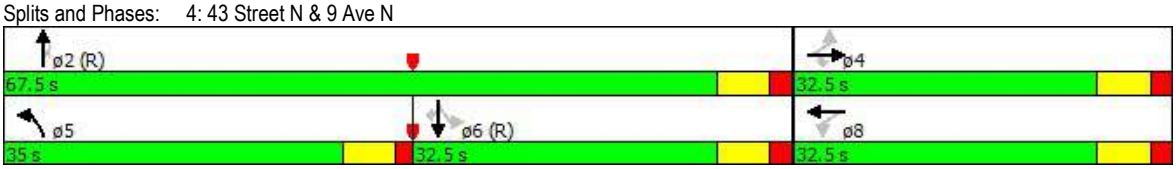
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 11 | 18 | 116 | 27 | 9 | 6 | 282 | 518 | 110 | 17 | 452 | 19 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.942 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1316 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.746 | | | 0.743 | | | 0.950 | | | 0.415 | | |
| Satd. Flow (perm) | 1376 | 1845 | 1568 | 1038 | 1316 | 0 | 1656 | 3312 | 1482 | 723 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 140 | | 7 | | | | 133 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 13 | 22 | 140 | 33 | 11 | 7 | 340 | 624 | 133 | 20 | 545 | 23 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 13 | 22 | 140 | 33 | 18 | 0 | 340 | 624 | 133 | 20 | 545 | 23 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 35.0 | 67.5 | 67.5 | 32.5 | 32.5 | 32.5 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 32.5% | | 35.0% | 67.5% | 67.5% | 32.5% | 32.5% | 32.5% |
| Maximum Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 29.0 | 61.0 | 61.0 | 26.0 | 26.0 | 26.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 10.6 | 10.6 | 10.6 | 10.6 | 10.6 | | 25.4 | 76.4 | 76.4 | 45.0 | 45.0 | 45.0 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | | 0.25 | 0.76 | 0.76 | 0.45 | 0.45 | 0.45 |
| v/c Ratio | 0.09 | 0.11 | 0.48 | 0.30 | 0.12 | | 0.81 | 0.25 | 0.11 | 0.06 | 0.37 | 0.03 |
| Control Delay | 41.3 | 41.4 | 13.1 | 48.6 | 31.9 | | 46.1 | 2.2 | 0.3 | 19.7 | 20.3 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 41.3 | 41.4 | 13.1 | 48.6 | 31.9 | | 46.1 | 2.2 | 0.3 | 19.7 | 20.3 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | B | C | A |
| Approach Delay | | 18.8 | | | 42.7 | | | 15.6 | | | 19.5 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| 90th %ile Green (s) | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | | 32.9 | 74.3 | 74.3 | 35.4 | 35.4 | 35.4 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.2 | 10.2 | 10.2 | 10.2 | 10.2 | | 28.8 | 76.8 | 76.8 | 42.0 | 42.0 | 42.0 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 25.6 | 77.0 | 77.0 | 45.4 | 45.4 | 45.4 |
| 50th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 22.3 | 77.0 | 77.0 | 48.7 | 48.7 | 48.7 |
| 30th %ile Term Code | Min | Min | Min | Hold | Hold | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 17.3 | 77.0 | 77.0 | 53.7 | 53.7 | 53.7 |
| 10th %ile Term Code | Min | Min | Min | Hold | Hold | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 11 | 18 | 20 | 26 | 12 | | 257 | 76 | 0 | 12 | 294 | 0 |
| Fuel Used(l) | 1 | 2 | 10 | 3 | 2 | | 40 | 43 | 8 | 2 | 40 | 1 |
| CO Emissions (g/hr) | 26 | 42 | 184 | 61 | 29 | | 742 | 800 | 157 | 29 | 749 | 19 |
| NOx Emissions (g/hr) | 5 | 8 | 35 | 12 | 6 | | 143 | 154 | 30 | 6 | 144 | 4 |
| VOC Emissions (g/hr) | 6 | 10 | 42 | 14 | 7 | | 171 | 185 | 36 | 7 | 173 | 4 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 25 | 0 | 0 | 23 | 0 |
| Queue Length 50th (m) | 2.5 | 4.2 | 0.0 | 6.4 | 2.1 | | 59.9 | 5.2 | 0.0 | 2.2 | 37.0 | 0.0 |
| Queue Length 95th (m) | 7.6 | 10.4 | 13.9 | 14.6 | 8.0 | | 80.7 | 6.0 | 0.0 | 7.5 | 54.7 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 357 | 479 | 511 | 269 | 347 | | 493 | 2531 | 1163 | 325 | 1491 | 724 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.04 | 0.05 | 0.27 | 0.12 | 0.05 | | 0.69 | 0.25 | 0.11 | 0.06 | 0.37 | 0.03 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 17.8 Intersection LOS: B
Intersection Capacity Utilization 52.3% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: 43 Street N & 9 Ave N



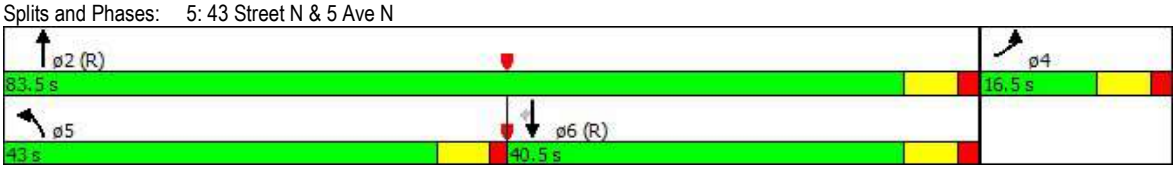
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 42 | 213 | 356 | 925 | 604 | 41 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 245 | | | | 47 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 48 | 245 | 409 | 1063 | 694 | 47 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 48 | 245 | 409 | 1063 | 694 | 47 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 43.0 | 83.5 | 40.5 | 40.5 |
| Total Split (%) | 16.5% | | 43.0% | 83.5% | 40.5% | 40.5% |
| Maximum Green (s) | 10.0 | | 37.0 | 77.0 | 34.0 | 34.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 29.2 | 86.2 | 48.4 | 48.4 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.29 | 0.86 | 0.48 | 0.48 |
| v/c Ratio | 0.15 | 0.17 | 0.82 | 0.36 | 0.46 | 0.07 |
| Control Delay | 42.5 | 0.3 | 46.6 | 3.1 | 11.2 | 1.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.5 | 0.3 | 46.6 | 3.1 | 11.2 | 1.1 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | B | A |
| Approach Delay | 7.2 | | | 15.1 | 10.5 | |
| Approach LOS | A | | | B | B | |
| 90th %ile Green (s) | 10.0 | | 37.0 | 77.0 | 34.0 | 34.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 33.1 | 77.0 | 37.9 | 37.9 |
| 70th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 29.6 | 77.0 | 41.4 | 41.4 |
| 50th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 0.0 | | 25.9 | 93.5 | 61.6 | 61.6 |
| 30th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 20.4 | 93.5 | 67.1 | 67.1 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 38 | 0 | 322 | 191 | 345 | 2 |
| Fuel Used(l) | 5 | 15 | 43 | 60 | 63 | 3 |
| CO Emissions (g/hr) | 95 | 275 | 800 | 1114 | 1164 | 60 |
| NOx Emissions (g/hr) | 18 | 53 | 154 | 215 | 225 | 12 |
| VOC Emissions (g/hr) | 22 | 63 | 184 | 257 | 269 | 14 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 31 | 28 | 0 |
| Queue Length 50th (m) | 4.6 | 0.0 | 77.0 | 30.7 | 15.5 | 0.2 |
| Queue Length 95th (m) | 10.0 | 0.0 | 97.5 | 37.1 | 23.0 | 0.4 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 312 | 1442 | 630 | 2936 | 1506 | 697 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.15 | 0.17 | 0.65 | 0.36 | 0.46 | 0.07 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 60.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: 43 Street N & 5 Ave N



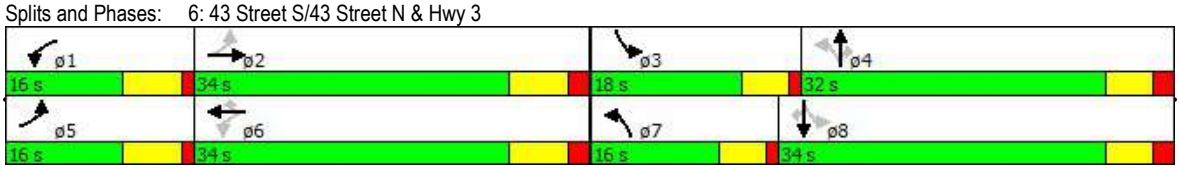
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 429 | 878 | 12 | 354 | 854 | 541 | 377 | 821 | 255 | 521 | 538 | 256 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 2 | | 0 | 2 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3155 | 4664 | 0 | 3213 | 4759 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.186 | | | 0.169 | | | 0.322 | | | 0.142 | | |
| Satd. Flow (perm) | 618 | 4664 | 0 | 571 | 4759 | 1482 | 1079 | 3282 | 1468 | 455 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 2 | | | | 265 | | | 235 | | | 249 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 466 | 954 | 13 | 385 | 928 | 588 | 410 | 892 | 277 | 566 | 585 | 278 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 466 | 967 | 0 | 385 | 928 | 588 | 410 | 892 | 277 | 566 | 585 | 278 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 16.0 | 34.0 | | 16.0 | 34.0 | 34.0 | 16.0 | 32.0 | 32.0 | 18.0 | 34.0 | 34.0 |
| Total Split (%) | 16.0% | 34.0% | | 16.0% | 34.0% | 34.0% | 16.0% | 32.0% | 32.0% | 18.0% | 34.0% | 34.0% |
| Maximum Green (s) | 10.0 | 27.0 | | 10.0 | 27.0 | 27.0 | 11.0 | 26.0 | 26.0 | 13.0 | 28.0 | 28.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 38.0 | 27.0 | | 38.0 | 27.0 | 27.0 | 37.8 | 26.0 | 26.0 | 42.2 | 28.2 | 28.2 |
| Actuated g/C Ratio | 0.38 | 0.27 | | 0.38 | 0.27 | 0.27 | 0.38 | 0.26 | 0.26 | 0.42 | 0.28 | 0.28 |
| v/c Ratio | 0.95 | 0.77 | | 0.80 | 0.72 | 0.99 | 0.64 | 1.05 | 0.50 | 1.07 | 0.66 | 0.48 |
| Control Delay | 53.4 | 38.3 | | 33.0 | 36.9 | 56.4 | 23.2 | 80.4 | 10.0 | 86.0 | 36.1 | 8.5 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 53.4 | 38.3 | | 33.0 | 36.9 | 56.4 | 23.2 | 80.4 | 10.0 | 86.0 | 36.1 | 8.5 |
| LOS | D | D | | C | D | E | C | F | A | F | D | A |
| Approach Delay | | 43.2 | | | 42.2 | | | 53.2 | | | 50.5 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 10.0 | 27.0 | | 10.0 | 27.0 | 27.0 | 11.0 | 26.0 | 26.0 | 13.0 | 28.0 | 28.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Max | Max |
| 70th %ile Green (s) | 10.0 | 27.0 | | 10.0 | 27.0 | 27.0 | 11.0 | 26.0 | 26.0 | 13.0 | 28.0 | 28.0 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 50th %ile Green (s) | 10.0 | 27.0 | | 10.0 | 27.0 | 27.0 | 11.0 | 26.0 | 26.0 | 13.0 | 28.0 | 28.0 |
| 50th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 30th %ile Green (s) | 10.0 | 27.0 | | 10.0 | 27.0 | 27.0 | 11.0 | 26.0 | 26.0 | 13.0 | 28.0 | 28.0 |
| 30th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 10th %ile Green (s) | 10.0 | 27.0 | | 10.0 | 27.0 | 27.0 | 10.2 | 26.0 | 26.0 | 13.0 | 28.8 | 28.8 |
| 10th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Max | Hold | Hold |
| Stops (vph) | 265 | 795 | | 223 | 750 | 279 | 251 | 715 | 50 | 326 | 463 | 42 |
| Fuel Used(l) | 48 | 103 | | 43 | 120 | 73 | 30 | 106 | 14 | 74 | 60 | 17 |
| CO Emissions (g/hr) | 893 | 1922 | | 808 | 2223 | 1350 | 552 | 1977 | 253 | 1377 | 1113 | 322 |
| NOx Emissions (g/hr) | 172 | 371 | | 156 | 429 | 261 | 107 | 382 | 49 | 266 | 215 | 62 |
| VOC Emissions (g/hr) | 206 | 443 | | 186 | 513 | 311 | 127 | 456 | 58 | 318 | 257 | 74 |
| Dilemma Vehicles (#) | 0 | 44 | | 0 | 43 | 0 | 0 | 37 | 0 | 0 | 27 | 0 |
| Queue Length 50th (m) | 31.3 | 66.3 | | 25.1 | 62.8 | 73.9 | 26.4 | ~104.5 | 6.6 | ~51.5 | 55.5 | 4.4 |
| Queue Length 95th (m) | #60.3 | 82.8 | | #43.1 | 78.6 | #149.3 | 37.2 | #144.1 | 29.3 | #86.3 | 75.0 | 26.2 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 488 | 1260 | | 481 | 1284 | 593 | 641 | 853 | 555 | 528 | 883 | 574 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.95 | 0.77 | | 0.80 | 0.72 | 0.99 | 0.64 | 1.05 | 0.50 | 1.07 | 0.66 | 0.48 |

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 47.0 Intersection LOS: D
Intersection Capacity Utilization 86.5% ICU Level of Service E
Analysis Period (min) 15
90th %ile Actuated Cycle: 100
70th %ile Actuated Cycle: 100
50th %ile Actuated Cycle: 100
30th %ile Actuated Cycle: 100
10th %ile Actuated Cycle: 100
~ 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: 6: 43 Street S/43 Street N & Hwy 3



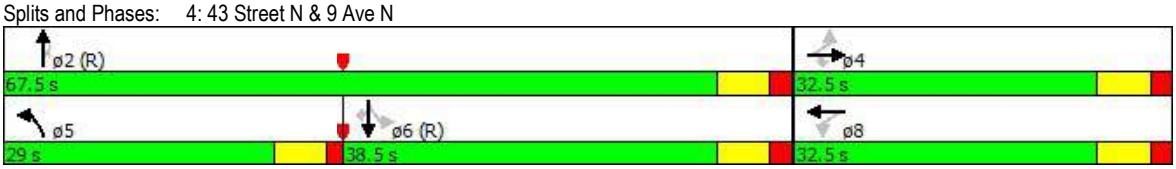
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 22 | 8 | 330 | 147 | 17 | 18 | 192 | 479 | 27 | 5 | 632 | 38 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.923 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1703 | 1792 | 1524 | 1770 | 1719 | 0 | 1597 | 3195 | 1429 | 1687 | 3374 | 1509 |
| Flt Permitted | 0.729 | | | 0.751 | | | 0.950 | | | 0.426 | | |
| Satd. Flow (perm) | 1307 | 1792 | 1524 | 1399 | 1719 | 0 | 1597 | 3195 | 1429 | 756 | 3374 | 1509 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 412 | | 22 | | | | 38 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 13% | 13% | 13% | 7% | 7% | 7% |
| Adj. Flow (vph) | 28 | 10 | 412 | 184 | 21 | 22 | 240 | 599 | 34 | 6 | 790 | 48 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 28 | 10 | 412 | 184 | 43 | 0 | 240 | 599 | 34 | 6 | 790 | 48 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 29.0 | 67.5 | 67.5 | 38.5 | 38.5 | 38.5 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 32.5% | | 29.0% | 67.5% | 67.5% | 38.5% | 38.5% | 38.5% |
| Maximum Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 23.0 | 61.0 | 61.0 | 32.0 | 32.0 | 32.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | | 19.3 | 68.6 | 68.6 | 43.3 | 43.3 | 43.3 |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | | 0.19 | 0.69 | 0.69 | 0.43 | 0.43 | 0.43 |
| v/c Ratio | 0.12 | 0.03 | 0.67 | 0.72 | 0.13 | | 0.78 | 0.27 | 0.03 | 0.02 | 0.54 | 0.07 |
| Control Delay | 32.4 | 30.1 | 9.2 | 53.3 | 19.2 | | 51.1 | 5.0 | 0.7 | 22.0 | 24.8 | 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 |
| Total Delay | 32.4 | 30.1 | 9.2 | 53.3 | 19.2 | | 51.1 | 5.0 | 0.7 | 22.0 | 24.8 | 0.2 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | C | C | A | D | B | | D | A | A | C | C | A |
| Approach Delay | | 11.1 | | | 46.8 | | | 17.5 | | | 23.4 | |
| Approach LOS | | B | | | D | | | B | | | C | |
| 90th %ile Green (s) | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 | | 23.5 | 61.5 | 61.5 | 32.0 | 32.0 | 32.0 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Max | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 21.4 | 21.4 | 21.4 | 21.4 | 21.4 | | 23.0 | 65.6 | 65.6 | 36.6 | 36.6 | 36.6 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | | 20.1 | 68.6 | 68.6 | 42.5 | 42.5 | 42.5 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 15.4 | 15.4 | 15.4 | 15.4 | 15.4 | | 17.2 | 71.6 | 71.6 | 48.4 | 48.4 | 48.4 |
| 30th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 | | 12.9 | 75.9 | 75.9 | 57.0 | 57.0 | 57.0 |
| 10th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 18 | 8 | 35 | 134 | 17 | | 177 | 161 | 2 | 5 | 468 | 0 |
| Fuel Used(l) | 3 | 1 | 27 | 18 | 3 | | 28 | 44 | 2 | 1 | 60 | 2 |
| CO Emissions (g/hr) | 47 | 17 | 495 | 337 | 56 | | 520 | 814 | 40 | 9 | 1121 | 37 |
| NOx Emissions (g/hr) | 9 | 3 | 96 | 65 | 11 | | 100 | 157 | 8 | 2 | 216 | 7 |
| VOC Emissions (g/hr) | 11 | 4 | 114 | 78 | 13 | | 120 | 188 | 9 | 2 | 259 | 9 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 23 | 0 | 0 | 32 | 0 |
| Queue Length 50th (m) | 4.8 | 1.7 | 0.0 | 35.6 | 3.6 | | 39.2 | 10.5 | 0.3 | 0.7 | 62.1 | 0.0 |
| Queue Length 95th (m) | 10.3 | 5.1 | 12.5 | 47.3 | 10.1 | | 62.0 | 27.4 | 0.3 | 3.4 | 82.9 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 339 | 465 | 701 | 363 | 463 | | 369 | 2192 | 992 | 327 | 1460 | 712 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.08 | 0.02 | 0.59 | 0.51 | 0.09 | | 0.65 | 0.27 | 0.03 | 0.02 | 0.54 | 0.07 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 21.1 Intersection LOS: C
Intersection Capacity Utilization 62.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: 43 Street N & 9 Ave N



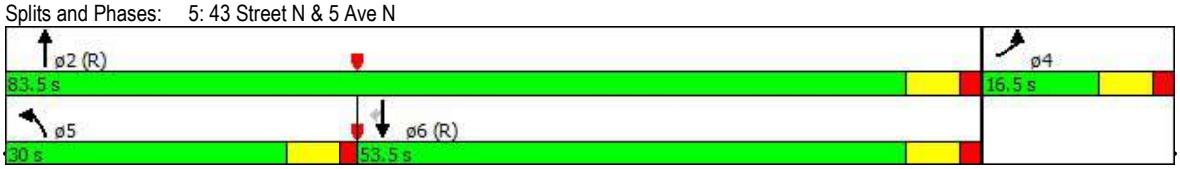
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 47 | 365 | 306 | 765 | 1275 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 406 | | | | 83 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 240.1 | 882.4 | |
| Travel Time (s) | 52.4 | | | 14.4 | 52.9 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 7% | 7% | 12% | 12% | 6% | 6% |
| Adj. Flow (vph) | 52 | 406 | 340 | 850 | 1417 | 83 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 52 | 406 | 340 | 850 | 1417 | 83 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 30.0 | 83.5 | 53.5 | 53.5 |
| Total Split (%) | 16.5% | | 30.0% | 83.5% | 53.5% | 53.5% |
| Maximum Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 23.1 | 81.6 | 51.2 | 51.2 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.23 | 0.82 | 0.51 | 0.51 |
| v/c Ratio | 0.16 | 0.27 | 0.91 | 0.32 | 0.81 | 0.10 |
| Control Delay | 42.5 | 0.4 | 67.6 | 3.5 | 22.1 | 2.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.5 | 0.4 | 67.6 | 3.5 | 22.1 | 2.6 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | E | A | C | A |
| Approach Delay | 5.2 | | | 21.8 | 21.1 | |
| Approach LOS | A | | | C | C | |
| 90th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 70th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 50th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 30th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 19.7 | 93.5 | 67.8 | 67.8 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 42 | 0 | 270 | 184 | 1064 | 5 |
| Fuel Used(l) | 6 | 25 | 42 | 51 | 154 | 6 |
| CO Emissions (g/hr) | 107 | 472 | 775 | 942 | 2860 | 113 |
| NOx Emissions (g/hr) | 21 | 91 | 150 | 182 | 552 | 22 |
| VOC Emissions (g/hr) | 25 | 109 | 179 | 217 | 660 | 26 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 33 | 31 | 0 |
| Queue Length 50th (m) | 5.1 | 0.0 | 67.1 | 23.0 | 145.5 | 0.4 |
| Queue Length 95th (m) | 11.0 | 0.0 | #118.1 | 29.8 | #187.6 | m3.8 |
| Internal Link Dist (m) | 704.0 | | | 216.1 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 327 | 1509 | 386 | 2629 | 1742 | 820 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.16 | 0.27 | 0.88 | 0.32 | 0.81 | 0.10 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 76.4% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: 43 Street N & 5 Ave N



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 235 | 836 | 8 | 384 | 1041 | 343 | 516 | 447 | 417 | 382 | 739 | 273 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.999 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1641 | 3279 | 0 | 1687 | 3374 | 1509 | 3273 | 3374 | 1509 | 3155 | 3252 | 1455 |
| Flt Permitted | 0.132 | | | 0.095 | | | 0.114 | | | 0.400 | | |
| Satd. Flow (perm) | 228 | 3279 | 0 | 169 | 3374 | 1509 | 393 | 3374 | 1509 | 1328 | 3252 | 1455 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 290 | | | 333 | | | 184 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 401.6 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 24.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 7% | 7% | 7% | 7% | 7% | 7% | 11% | 11% | 11% |
| Adj. Flow (vph) | 255 | 909 | 9 | 417 | 1132 | 373 | 561 | 486 | 453 | 415 | 803 | 297 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 255 | 918 | 0 | 417 | 1132 | 373 | 561 | 486 | 453 | 415 | 803 | 297 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 16.0 | 43.0 | | 31.0 | 58.0 | 58.0 | 20.0 | 41.0 | 41.0 | 15.0 | 36.0 | 36.0 |
| Total Split (%) | 12.3% | 33.1% | | 23.8% | 44.6% | 44.6% | 15.4% | 31.5% | 31.5% | 11.5% | 27.7% | 27.7% |
| Maximum Green (s) | 10.0 | 36.0 | | 25.0 | 51.0 | 51.0 | 15.0 | 35.0 | 35.0 | 10.0 | 30.0 | 30.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 47.0 | 36.0 | | 68.0 | 51.0 | 51.0 | 51.0 | 35.0 | 35.0 | 41.0 | 30.0 | 30.0 |
| Actuated g/C Ratio | 0.36 | 0.28 | | 0.52 | 0.39 | 0.39 | 0.39 | 0.27 | 0.27 | 0.32 | 0.23 | 0.23 |
| v/c Ratio | 1.34 | 1.01 | | 1.10 | 0.86 | 0.49 | 1.15 | 0.54 | 0.70 | 0.74 | 1.07 | 0.62 |
| Control Delay | 210.5 | 79.1 | | 111.7 | 43.8 | 9.0 | 123.1 | 43.1 | 17.6 | 39.8 | 100.6 | 23.0 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 210.5 | 79.1 | | 111.7 | 43.8 | 9.0 | 123.1 | 43.1 | 17.6 | 39.8 | 100.6 | 23.0 |
| LOS | F | E | | F | D | A | F | D | B | D | F | C |
| Approach Delay | | 107.7 | | | 51.8 | | | 65.3 | | | 68.8 | |
| Approach LOS | | F | | | D | | | E | | | E | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 10.0 | 36.0 | | 25.0 | 51.0 | 51.0 | 15.0 | 35.0 | 35.0 | 10.0 | 30.0 | 30.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Max | Max |
| 70th %ile Green (s) | 10.0 | 36.0 | | 25.0 | 51.0 | 51.0 | 15.0 | 35.0 | 35.0 | 10.0 | 30.0 | 30.0 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 50th %ile Green (s) | 10.0 | 36.0 | | 25.0 | 51.0 | 51.0 | 15.0 | 35.0 | 35.0 | 10.0 | 30.0 | 30.0 |
| 50th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 30th %ile Green (s) | 10.0 | 36.0 | | 25.0 | 51.0 | 51.0 | 15.0 | 35.0 | 35.0 | 10.0 | 30.0 | 30.0 |
| 30th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 10th %ile Green (s) | 10.0 | 36.0 | | 25.0 | 51.0 | 51.0 | 15.0 | 35.0 | 35.0 | 10.0 | 30.0 | 30.0 |
| 10th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| Stops (vph) | 143 | 758 | | 273 | 922 | 64 | 335 | 373 | 118 | 325 | 649 | 100 |
| Fuel Used(l) | 55 | 125 | | 72 | 152 | 27 | 80 | 45 | 26 | 43 | 119 | 23 |
| CO Emissions (g/hr) | 1015 | 2321 | | 1342 | 2821 | 503 | 1489 | 828 | 482 | 809 | 2220 | 433 |
| NOx Emissions (g/hr) | 196 | 448 | | 259 | 544 | 97 | 287 | 160 | 93 | 156 | 429 | 84 |
| VOC Emissions (g/hr) | 234 | 535 | | 309 | 651 | 116 | 343 | 191 | 111 | 187 | 512 | 100 |
| Dilemma Vehicles (#) | 0 | 30 | | 0 | 40 | 0 | 0 | 17 | 0 | 0 | 26 | 0 |
| Queue Length 50th (m) | ~71.2 | ~133.1 | | ~111.3 | 145.4 | 14.3 | ~75.8 | 59.1 | 27.6 | 39.9 | ~126.1 | 26.6 |
| Queue Length 95th (m) | #127.5 | #179.7 | | #178.4 | 176.4 | 41.3 | #113.4 | 77.4 | 69.5 | 53.5 | #167.4 | 59.2 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 377.6 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 191 | 908 | | 380 | 1323 | 768 | 486 | 908 | 649 | 559 | 750 | 477 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.34 | 1.01 | | 1.10 | 0.86 | 0.49 | 1.15 | 0.54 | 0.70 | 0.74 | 1.07 | 0.62 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 130 | | | |
| Natural Cycle: 120 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 1.34 | | | |
| Intersection Signal Delay: 70.1 | | Intersection LOS: E | |
| Intersection Capacity Utilization 99.8% | | ICU Level of Service F | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 130 | | | |
| 70th %ile Actuated Cycle: 130 | | | |
| 50th %ile Actuated Cycle: 130 | | | |
| 30th %ile Actuated Cycle: 130 | | | |
| 10th %ile Actuated Cycle: 130 | | | |
| ~ 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: 6: 43 Street S/43 Street N & Hwy 3



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 11 | 51 | 242 | 12 | 108 | 0 | 335 | 75 | 54 | 12 | 172 | 35 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.893 | | | | | | 0.984 | | | 0.978 | |
| Flt Protected | | 0.998 | | | 0.995 | | | 0.965 | | | 0.997 | |
| Satd. Flow (prot) | 0 | 1628 | 0 | 0 | 1818 | 0 | 0 | 1686 | 0 | 0 | 1597 | 0 |
| Flt Permitted | | 0.983 | | | 0.935 | | | 0.645 | | | 0.966 | |
| Satd. Flow (perm) | 0 | 1604 | 0 | 0 | 1708 | 0 | 0 | 1127 | 0 | 0 | 1547 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 260 | | | | | | 16 | | | 23 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 697.6 | | | 744.1 | | | 520.4 | | | 321.7 | |
| Travel Time (s) | | 50.2 | | | 53.6 | | | 26.8 | | | 16.5 | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 4% | 4% | 7% | 7% | 7% | 16% | 16% | 16% |
| Adj. Flow (vph) | 12 | 55 | 260 | 13 | 116 | 0 | 360 | 81 | 58 | 13 | 185 | 38 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 327 | 0 | 0 | 129 | 0 | 0 | 499 | 0 | 0 | 236 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (s) | 23.0 | 23.0 | | 23.0 | 23.0 | | 37.0 | 37.0 | | 37.0 | 37.0 | |
| Total Split (%) | 38.3% | 38.3% | | 38.3% | 38.3% | | 61.7% | 61.7% | | 61.7% | 61.7% | |
| Maximum Green (s) | 16.5 | 16.5 | | 16.5 | 16.5 | | 30.5 | 30.5 | | 30.5 | 30.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | Min | Min | | Min | Min | |
| Walk Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 11.3 | | | 11.3 | | | 25.5 | | | 25.5 | |
| Actuated g/C Ratio | | 0.23 | | | 0.23 | | | 0.51 | | | 0.51 | |
| v/c Ratio | | 0.58 | | | 0.33 | | | 0.86 | | | 0.30 | |
| Control Delay | | 9.9 | | | 20.6 | | | 28.4 | | | 7.5 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 9.9 | | | 20.6 | | | 28.4 | | | 7.5 | |
| LOS | | A | | | C | | | C | | | A | |
| Approach Delay | | 9.9 | | | 20.6 | | | 28.4 | | | 7.5 | |
| Approach LOS | | A | | | C | | | C | | | A | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 15.8 | 15.8 | | 15.8 | 15.8 | | 30.5 | 30.5 | | 30.5 | 30.5 | |
| 90th %ile Term Code | Gap | Gap | | Hold | Hold | | Max | Max | | Hold | Hold | |
| 70th %ile Green (s) | 10.8 | 10.8 | | 10.8 | 10.8 | | 30.5 | 30.5 | | 30.5 | 30.5 | |
| 70th %ile Term Code | Gap | Gap | | Hold | Hold | | Max | Max | | Hold | Hold | |
| 50th %ile Green (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 28.8 | 28.8 | | 28.8 | 28.8 | |
| 50th %ile Term Code | Min | Min | | Min | Min | | Gap | Gap | | Hold | Hold | |
| 30th %ile Green (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 22.7 | 22.7 | | 22.7 | 22.7 | |
| 30th %ile Term Code | Min | Min | | Min | Min | | Gap | Gap | | Hold | Hold | |
| 10th %ile Green (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 16.3 | 16.3 | | 16.3 | 16.3 | |
| 10th %ile Term Code | Min | Min | | Hold | Hold | | Gap | Gap | | Hold | Hold | |
| Stops (vph) | | 78 | | | 94 | | | 325 | | | 97 | |
| Fuel Used(l) | | 24 | | | 12 | | | 44 | | | 11 | |
| CO Emissions (g/hr) | | 450 | | | 232 | | | 820 | | | 209 | |
| NOx Emissions (g/hr) | | 87 | | | 45 | | | 158 | | | 40 | |
| VOC Emissions (g/hr) | | 104 | | | 54 | | | 189 | | | 48 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 43 | | | 21 | |
| Queue Length 50th (m) | | 5.6 | | | 11.1 | | | 32.4 | | | 9.4 | |
| Queue Length 95th (m) | | 24.6 | | | 24.2 | | | #101.7 | | | 24.5 | |
| Internal Link Dist (m) | | 673.6 | | | 720.1 | | | 496.4 | | | 297.7 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 712 | | | 574 | | | 706 | | | 970 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.46 | | | 0.22 | | | 0.71 | | | 0.24 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 60 | | | |
| Actuated Cycle Length: 50.1 | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.86 | | | |
| Intersection Signal Delay: 18.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 74.0% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 59.3 | | | |
| 70th %ile Actuated Cycle: 54.3 | | | |
| 50th %ile Actuated Cycle: 51.8 | | | |
| 30th %ile Actuated Cycle: 45.7 | | | |
| 10th %ile Actuated Cycle: 39.3 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 1: 43 Street N & 26 Ave N/Twp Rd 92

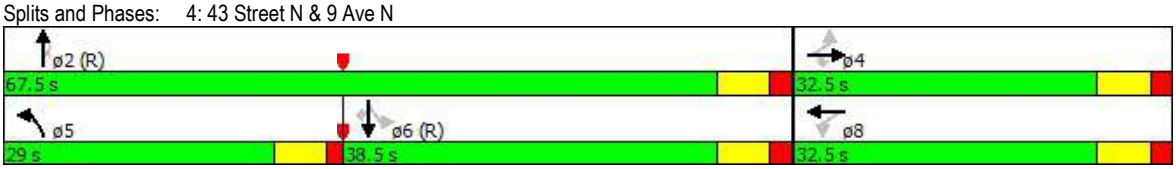


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 22 | 8 | 330 | 147 | 17 | 18 | 192 | 479 | 27 | 5 | 632 | 38 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.923 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1703 | 1792 | 1524 | 1770 | 1719 | 0 | 1597 | 3195 | 1429 | 1687 | 3374 | 1509 |
| Flt Permitted | 0.729 | | | 0.751 | | | 0.950 | | | 0.426 | | |
| Satd. Flow (perm) | 1307 | 1792 | 1524 | 1399 | 1719 | 0 | 1597 | 3195 | 1429 | 756 | 3374 | 1509 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 412 | | 22 | | | | 38 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 13% | 13% | 13% | 7% | 7% | 7% |
| Adj. Flow (vph) | 28 | 10 | 412 | 184 | 21 | 22 | 240 | 599 | 34 | 6 | 790 | 48 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 28 | 10 | 412 | 184 | 43 | 0 | 240 | 599 | 34 | 6 | 790 | 48 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 29.0 | 67.5 | 67.5 | 38.5 | 38.5 | 38.5 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 32.5% | | 29.0% | 67.5% | 67.5% | 38.5% | 38.5% | 38.5% |
| Maximum Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 23.0 | 61.0 | 61.0 | 32.0 | 32.0 | 32.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | | 19.3 | 68.6 | 68.6 | 43.3 | 43.3 | 43.3 |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | | 0.19 | 0.69 | 0.69 | 0.43 | 0.43 | 0.43 |
| v/c Ratio | 0.12 | 0.03 | 0.67 | 0.72 | 0.13 | | 0.78 | 0.27 | 0.03 | 0.02 | 0.54 | 0.07 |
| Control Delay | 32.4 | 30.1 | 9.2 | 53.3 | 19.2 | | 51.1 | 5.0 | 0.7 | 22.0 | 24.8 | 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 |
| Total Delay | 32.4 | 30.1 | 9.2 | 53.3 | 19.2 | | 51.1 | 5.0 | 0.7 | 22.0 | 24.8 | 0.2 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | C | C | A | D | B | | D | A | A | C | C | A |
| Approach Delay | | 11.1 | | | 46.8 | | | 17.5 | | | 23.4 | |
| Approach LOS | | B | | | D | | | B | | | C | |
| 90th %ile Green (s) | 25.5 | 25.5 | 25.5 | 25.5 | 25.5 | | 23.5 | 61.5 | 61.5 | 32.0 | 32.0 | 32.0 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Max | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 21.4 | 21.4 | 21.4 | 21.4 | 21.4 | | 23.0 | 65.6 | 65.6 | 36.6 | 36.6 | 36.6 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 18.4 | 18.4 | 18.4 | 18.4 | 18.4 | | 20.1 | 68.6 | 68.6 | 42.5 | 42.5 | 42.5 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 15.4 | 15.4 | 15.4 | 15.4 | 15.4 | | 17.2 | 71.6 | 71.6 | 48.4 | 48.4 | 48.4 |
| 30th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 | | 12.9 | 75.9 | 75.9 | 57.0 | 57.0 | 57.0 |
| 10th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 18 | 8 | 35 | 134 | 17 | | 177 | 161 | 2 | 5 | 468 | 0 |
| Fuel Used(l) | 3 | 1 | 27 | 18 | 3 | | 28 | 44 | 2 | 1 | 60 | 2 |
| CO Emissions (g/hr) | 47 | 17 | 495 | 337 | 56 | | 520 | 814 | 40 | 9 | 1121 | 37 |
| NOx Emissions (g/hr) | 9 | 3 | 96 | 65 | 11 | | 100 | 157 | 8 | 2 | 216 | 7 |
| VOC Emissions (g/hr) | 11 | 4 | 114 | 78 | 13 | | 120 | 188 | 9 | 2 | 259 | 9 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 23 | 0 | 0 | 32 | 0 |
| Queue Length 50th (m) | 4.8 | 1.7 | 0.0 | 35.6 | 3.6 | | 39.2 | 10.5 | 0.3 | 0.7 | 62.1 | 0.0 |
| Queue Length 95th (m) | 10.3 | 5.1 | 12.5 | 47.3 | 10.1 | | 62.0 | 27.4 | 0.3 | 3.4 | 82.9 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 339 | 465 | 701 | 363 | 463 | | 369 | 2192 | 992 | 327 | 1460 | 712 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.08 | 0.02 | 0.59 | 0.51 | 0.09 | | 0.65 | 0.27 | 0.03 | 0.02 | 0.54 | 0.07 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.78 | | | |
| Intersection Signal Delay: 21.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 62.5% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 4: 43 Street N & 9 Ave N



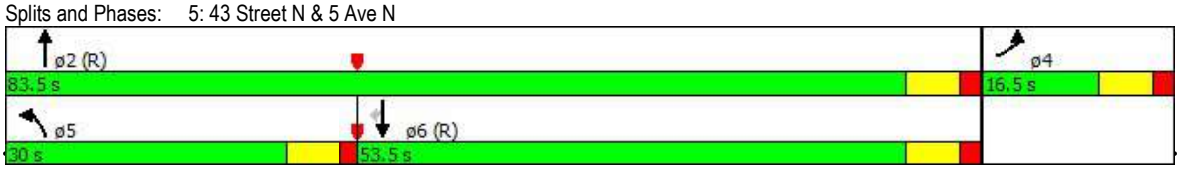
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 47 | 365 | 306 | 765 | 1275 | 75 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 406 | | | | 83 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 240.1 | 882.4 | |
| Travel Time (s) | 52.4 | | | 14.4 | 52.9 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 7% | 7% | 12% | 12% | 6% | 6% |
| Adj. Flow (vph) | 52 | 406 | 340 | 850 | 1417 | 83 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 52 | 406 | 340 | 850 | 1417 | 83 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 30.0 | 83.5 | 53.5 | 53.5 |
| Total Split (%) | 16.5% | | 30.0% | 83.5% | 53.5% | 53.5% |
| Maximum Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 23.1 | 81.6 | 51.2 | 51.2 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.23 | 0.82 | 0.51 | 0.51 |
| v/c Ratio | 0.16 | 0.27 | 0.91 | 0.32 | 0.81 | 0.10 |
| Control Delay | 42.5 | 0.4 | 67.6 | 3.5 | 22.1 | 2.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.5 | 0.4 | 67.6 | 3.5 | 22.1 | 2.6 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | E | A | C | A |
| Approach Delay | 5.2 | | | 21.8 | 21.1 | |
| Approach LOS | A | | | C | C | |
| 90th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 70th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 50th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | | 24.0 | 77.0 | 47.0 | 47.0 |
| 30th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 19.7 | 93.5 | 67.8 | 67.8 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 42 | 0 | 270 | 184 | 1064 | 5 |
| Fuel Used(l) | 6 | 25 | 42 | 51 | 154 | 6 |
| CO Emissions (g/hr) | 107 | 472 | 775 | 942 | 2860 | 113 |
| NOx Emissions (g/hr) | 21 | 91 | 150 | 182 | 552 | 22 |
| VOC Emissions (g/hr) | 25 | 109 | 179 | 217 | 660 | 26 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 33 | 31 | 0 |
| Queue Length 50th (m) | 5.1 | 0.0 | 67.1 | 23.0 | 145.5 | 0.4 |
| Queue Length 95th (m) | 11.0 | 0.0 | #118.1 | 29.8 | #187.6 | m3.8 |
| Internal Link Dist (m) | 704.0 | | | 216.1 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 327 | 1509 | 386 | 2629 | 1742 | 820 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.16 | 0.27 | 0.88 | 0.32 | 0.81 | 0.10 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 76.4% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: 43 Street N & 5 Ave N



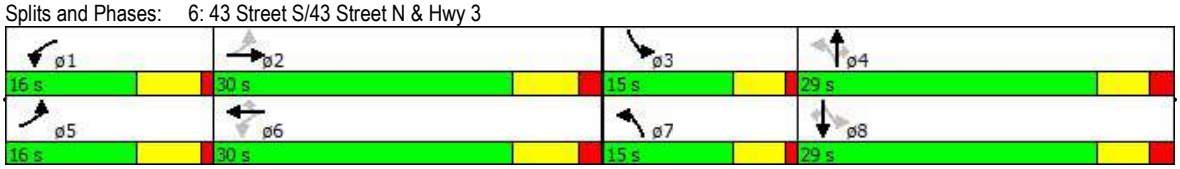
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 235 | 836 | 8 | 384 | 1041 | 343 | 516 | 447 | 417 | 382 | 739 | 273 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 2 | | 0 | 2 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.999 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3183 | 4711 | 0 | 3273 | 4848 | 1509 | 3273 | 3374 | 1509 | 3155 | 3252 | 1455 |
| Flt Permitted | 0.174 | | | 0.190 | | | 0.174 | | | 0.370 | | |
| Satd. Flow (perm) | 583 | 4711 | 0 | 655 | 4848 | 1509 | 599 | 3374 | 1509 | 1229 | 3252 | 1455 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 331 | | | 277 | | | 257 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 401.6 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 24.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 7% | 7% | 7% | 7% | 7% | 7% | 11% | 11% | 11% |
| Adj. Flow (vph) | 255 | 909 | 9 | 417 | 1132 | 373 | 561 | 486 | 453 | 415 | 803 | 297 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 255 | 918 | 0 | 417 | 1132 | 373 | 561 | 486 | 453 | 415 | 803 | 297 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 16.0 | 30.0 | | 16.0 | 30.0 | 30.0 | 15.0 | 29.0 | 29.0 | 15.0 | 29.0 | 29.0 |
| Total Split (%) | 17.8% | 33.3% | | 17.8% | 33.3% | 33.3% | 16.7% | 32.2% | 32.2% | 16.7% | 32.2% | 32.2% |
| Maximum Green (s) | 10.0 | 23.0 | | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 34.0 | 23.0 | | 34.0 | 23.0 | 23.0 | 34.0 | 23.0 | 23.0 | 34.0 | 23.0 | 23.0 |
| Actuated g/C Ratio | 0.38 | 0.26 | | 0.38 | 0.26 | 0.26 | 0.38 | 0.26 | 0.26 | 0.38 | 0.26 | 0.26 |
| v/c Ratio | 0.50 | 0.76 | | 0.78 | 0.91 | 0.59 | 1.07 | 0.56 | 0.77 | 0.61 | 0.97 | 0.53 |
| Control Delay | 19.2 | 35.8 | | 28.2 | 45.1 | 9.4 | 82.8 | 32.1 | 21.7 | 21.4 | 58.5 | 9.5 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 19.2 | 35.8 | | 28.2 | 45.1 | 9.4 | 82.8 | 32.1 | 21.7 | 21.4 | 58.5 | 9.5 |
| LOS | B | D | | C | D | A | F | C | C | C | E | A |
| Approach Delay | | 32.2 | | | 34.5 | | | 47.9 | | | 38.7 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 10.0 | 23.0 | | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Max | Max |
| 70th %ile Green (s) | 10.0 | 23.0 | | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Max | Max |
| 50th %ile Green (s) | 10.0 | 23.0 | | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 |
| 50th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 30th %ile Green (s) | 10.0 | 23.0 | | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 |
| 30th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 10th %ile Green (s) | 10.0 | 23.0 | | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 | 10.0 | 23.0 | 23.0 |
| 10th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| Stops (vph) | 145 | 756 | | 245 | 942 | 61 | 315 | 377 | 161 | 256 | 652 | 52 |
| Fuel Used(l) | 20 | 97 | | 46 | 154 | 27 | 63 | 41 | 29 | 36 | 95 | 19 |
| CO Emissions (g/hr) | 374 | 1796 | | 853 | 2862 | 501 | 1179 | 760 | 532 | 667 | 1776 | 351 |
| NOx Emissions (g/hr) | 72 | 347 | | 165 | 552 | 97 | 228 | 147 | 103 | 129 | 343 | 68 |
| VOC Emissions (g/hr) | 86 | 414 | | 197 | 660 | 116 | 272 | 175 | 123 | 154 | 410 | 81 |
| Dilemma Vehicles (#) | 0 | 47 | | 0 | 56 | 0 | 0 | 24 | 0 | 0 | 38 | 0 |
| Queue Length 50th (m) | 13.9 | 56.5 | | 24.1 | 73.4 | 5.9 | ~42.3 | 40.5 | 28.9 | 24.6 | 76.1 | 5.6 |
| Queue Length 95th (m) | 21.7 | 72.0 | | #40.3 | #100.1 | 31.7 | #75.9 | 56.8 | #77.9 | 35.4 | #115.2 | 28.0 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 377.6 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 509 | 1204 | | 538 | 1238 | 632 | 523 | 862 | 591 | 678 | 831 | 563 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.50 | 0.76 | | 0.78 | 0.91 | 0.59 | 1.07 | 0.56 | 0.77 | 0.61 | 0.97 | 0.53 |

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 38.4 Intersection LOS: D
Intersection Capacity Utilization 83.6% ICU Level of Service E
Analysis Period (min) 15
90th %ile Actuated Cycle: 90
70th %ile Actuated Cycle: 90
50th %ile Actuated Cycle: 90
30th %ile Actuated Cycle: 90
10th %ile Actuated Cycle: 90
~ 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: 6: 43 Street S/43 Street N & Hwy 3

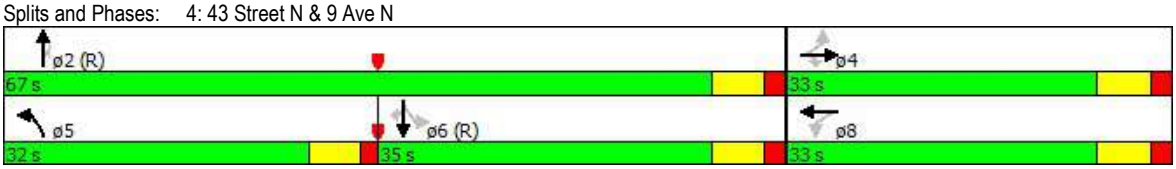


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 10 | 21 | 81 | 48 | 9 | 11 | 198 | 381 | 179 | 34 | 320 | 14 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.919 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1284 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.742 | | | 0.741 | | | 0.950 | | | 0.488 | | |
| Satd. Flow (perm) | 1369 | 1845 | 1568 | 1035 | 1284 | 0 | 1656 | 3312 | 1482 | 851 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 104 | | 13 | | | | 216 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 12 | 25 | 98 | 58 | 11 | 13 | 239 | 459 | 216 | 41 | 386 | 17 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 12 | 25 | 98 | 58 | 24 | 0 | 239 | 459 | 216 | 41 | 386 | 17 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 33.0 | 33.0 | 33.0 | 33.0 | 33.0 | | 32.0 | 67.0 | 67.0 | 35.0 | 35.0 | 35.0 |
| Total Split (%) | 33.0% | 33.0% | 33.0% | 33.0% | 33.0% | | 32.0% | 67.0% | 67.0% | 35.0% | 35.0% | 35.0% |
| Maximum Green (s) | 26.5 | 26.5 | 26.5 | 26.5 | 26.5 | | 26.0 | 60.5 | 60.5 | 28.5 | 28.5 | 28.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 12.1 | 12.1 | 12.1 | 12.1 | 12.1 | | 19.6 | 79.5 | 79.5 | 52.6 | 52.6 | 52.6 |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | | 0.20 | 0.80 | 0.80 | 0.53 | 0.53 | 0.53 |
| v/c Ratio | 0.07 | 0.11 | 0.35 | 0.46 | 0.14 | | 0.74 | 0.17 | 0.18 | 0.09 | 0.22 | 0.02 |
| Control Delay | 38.1 | 38.8 | 10.5 | 52.4 | 25.8 | | 47.1 | 1.7 | 0.7 | 17.6 | 15.8 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 38.1 | 38.8 | 10.5 | 52.4 | 25.8 | | 47.1 | 1.7 | 0.7 | 17.6 | 15.8 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | B | B | A |
| Approach Delay | | 18.2 | | | 44.6 | | | 13.3 | | | 15.4 | |
| Approach LOS | | B | | | D | | | B | | | B | |
| 90th %ile Green (s) | 16.6 | 16.6 | 16.6 | 16.6 | 16.6 | | 26.4 | 70.4 | 70.4 | 38.0 | 38.0 | 38.0 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 13.2 | 13.2 | 13.2 | 13.2 | 13.2 | | 22.5 | 73.8 | 73.8 | 45.3 | 45.3 | 45.3 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.9 | 10.9 | 10.9 | 10.9 | 10.9 | | 19.6 | 76.1 | 76.1 | 50.5 | 50.5 | 50.5 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 16.7 | 77.0 | 77.0 | 54.3 | 54.3 | 54.3 |
| 30th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 12.6 | 93.5 | 93.5 | 74.9 | 74.9 | 74.9 |
| 10th %ile Term Code | Skip | Skip | Skip | Skip | Skip | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 10 | 20 | 13 | 44 | 12 | | 180 | 69 | 12 | 21 | 177 | 0 |
| Fuel Used(l) | 1 | 3 | 7 | 6 | 2 | | 28 | 32 | 14 | 3 | 26 | 1 |
| CO Emissions (g/hr) | 23 | 48 | 125 | 110 | 35 | | 524 | 594 | 264 | 54 | 491 | 14 |
| NOx Emissions (g/hr) | 4 | 9 | 24 | 21 | 7 | | 101 | 115 | 51 | 10 | 95 | 3 |
| VOC Emissions (g/hr) | 5 | 11 | 29 | 25 | 8 | | 121 | 137 | 61 | 13 | 113 | 3 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 9 | 0 | 0 | 16 | 0 |
| Queue Length 50th (m) | 2.2 | 4.7 | 0.0 | 11.4 | 2.1 | | 43.4 | 3.4 | 0.0 | 4.2 | 22.2 | 0.0 |
| Queue Length 95th (m) | 6.7 | 10.9 | 10.6 | 21.2 | 8.4 | | 61.5 | 7.3 | 0.1 | 11.9 | 36.8 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 362 | 488 | 491 | 274 | 349 | | 431 | 2631 | 1222 | 447 | 1742 | 828 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.03 | 0.05 | 0.20 | 0.21 | 0.07 | | 0.55 | 0.17 | 0.18 | 0.09 | 0.22 | 0.02 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.74 | | | |
| Intersection Signal Delay: 16.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 50.6% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 4: 43 Street N & 9 Ave N

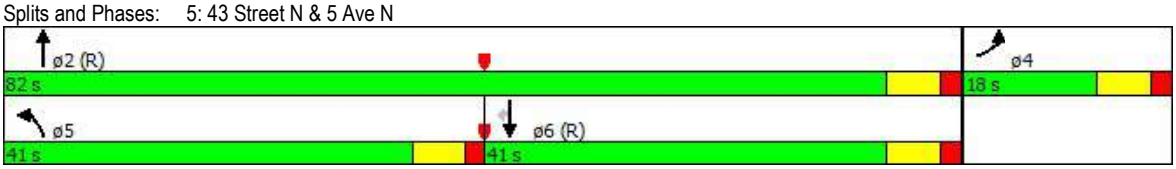


| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 44 | 150 | 249 | 753 | 452 | 33 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 172 | | | | 38 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 51 | 172 | 286 | 866 | 520 | 38 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 51 | 172 | 286 | 866 | 520 | 38 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 18.0 | | 41.0 | 82.0 | 41.0 | 41.0 |
| Total Split (%) | 18.0% | | 41.0% | 82.0% | 41.0% | 41.0% |
| Maximum Green (s) | 11.5 | | 35.0 | 75.5 | 34.5 | 34.5 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 22.2 | 81.6 | 52.1 | 52.1 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.22 | 0.82 | 0.52 | 0.52 |
| v/c Ratio | 0.16 | 0.12 | 0.76 | 0.31 | 0.32 | 0.05 |
| Control Delay | 42.6 | 0.2 | 48.8 | 3.4 | 9.8 | 2.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.6 | 0.2 | 48.8 | 3.4 | 9.8 | 2.4 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | A | A |
| Approach Delay | 9.9 | | | 14.7 | 9.3 | |
| Approach LOS | A | | | B | A | |
| 90th %ile Green (s) | 10.0 | | 29.8 | 77.0 | 41.2 | 41.2 |
| 90th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 25.4 | 77.0 | 45.6 | 45.6 |
| 70th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 22.3 | 77.0 | 48.7 | 48.7 |
| 50th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | | 19.1 | 77.0 | 51.9 | 51.9 |
| 30th %ile Term Code | Min | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 14.5 | 93.5 | 73.0 | 73.0 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 40 | 0 | 225 | 179 | 131 | 3 |
| Fuel Used(l) | 5 | 10 | 30 | 50 | 42 | 3 |
| CO Emissions (g/hr) | 100 | 193 | 567 | 925 | 787 | 50 |
| NOx Emissions (g/hr) | 19 | 37 | 109 | 178 | 152 | 10 |
| VOC Emissions (g/hr) | 23 | 45 | 131 | 213 | 181 | 12 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 32 | 20 | 0 |
| Queue Length 50th (m) | 5.0 | 0.0 | 54.8 | 23.1 | 14.5 | 0.0 |
| Queue Length 95th (m) | 10.4 | 0.0 | 73.2 | 28.4 | 21.8 | 1.8 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 359 | 1442 | 596 | 2779 | 1620 | 743 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.12 | 0.48 | 0.31 | 0.32 | 0.05 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.76 | | | |
| Intersection Signal Delay: 12.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 50.5% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: 43 Street N & 5 Ave N

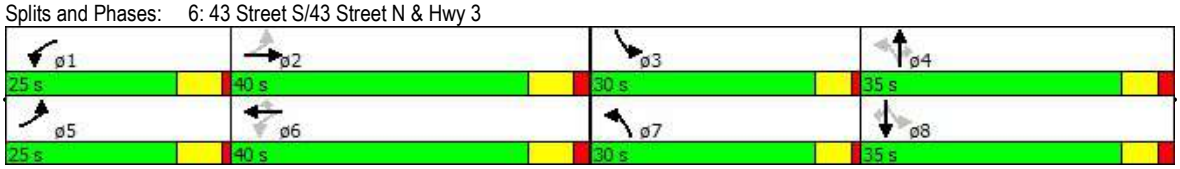


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 335 | 615 | 9 | 248 | 598 | 415 | 264 | 609 | 179 | 376 | 386 | 189 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1626 | 3246 | 0 | 1656 | 3312 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.226 | | | 0.250 | | | 0.462 | | | 0.145 | | |
| Satd. Flow (perm) | 387 | 3246 | 0 | 436 | 3312 | 1482 | 1548 | 3282 | 1468 | 465 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 409 | | | 195 | | | 205 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 364 | 668 | 10 | 270 | 650 | 451 | 287 | 662 | 195 | 409 | 420 | 205 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 364 | 678 | 0 | 270 | 650 | 451 | 287 | 662 | 195 | 409 | 420 | 205 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 55.0 | 35.1 | | 51.1 | 33.1 | 33.1 | 41.2 | 27.7 | 27.7 | 49.0 | 31.7 | 31.7 |
| Actuated g/C Ratio | 0.46 | 0.29 | | 0.42 | 0.27 | 0.27 | 0.34 | 0.23 | 0.23 | 0.41 | 0.26 | 0.26 |
| v/c Ratio | 0.98 | 0.72 | | 0.76 | 0.72 | 0.64 | 0.41 | 0.88 | 0.40 | 0.75 | 0.51 | 0.39 |
| Control Delay | 68.0 | 44.5 | | 34.8 | 45.3 | 10.2 | 24.5 | 59.1 | 8.0 | 34.1 | 40.3 | 7.1 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 68.0 | 44.5 | | 34.8 | 45.3 | 10.2 | 24.5 | 59.1 | 8.0 | 34.1 | 40.3 | 7.1 |
| LOS | E | D | | C | D | B | C | E | A | C | D | A |
| Approach Delay | | 52.7 | | | 31.7 | | | 41.7 | | | 31.2 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 15.7 | 29.0 | 29.0 | 21.8 | 35.1 | 35.1 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 70th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 13.8 | 29.0 | 29.0 | 18.3 | 33.5 | 33.5 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 50th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 12.4 | 29.0 | 29.0 | 16.3 | 32.9 | 32.9 |
| 50th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Gap | Hold | Hold |
| 30th %ile Green (s) | 19.0 | 35.8 | | 16.2 | 33.0 | 33.0 | 11.2 | 28.6 | 28.6 | 14.6 | 32.0 | 32.0 |
| 30th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Gap | Gap | Gap | Gap | Hold | Hold |
| 10th %ile Green (s) | 19.0 | 39.6 | | 12.4 | 33.0 | 33.0 | 10.0 | 22.9 | 22.9 | 12.3 | 25.2 | 25.2 |
| 10th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Min | Gap | Gap | Gap | Hold | Hold |
| Stops (vph) | 199 | 547 | | 156 | 527 | 63 | 176 | 553 | 21 | 247 | 316 | 20 |
| Fuel Used(l) | 41 | 75 | | 31 | 88 | 32 | 21 | 70 | 9 | 39 | 44 | 12 |
| CO Emissions (g/hr) | 759 | 1392 | | 572 | 1630 | 600 | 392 | 1294 | 164 | 721 | 812 | 227 |
| NOx Emissions (g/hr) | 146 | 269 | | 110 | 315 | 116 | 76 | 250 | 32 | 139 | 157 | 44 |
| VOC Emissions (g/hr) | 175 | 321 | | 132 | 376 | 138 | 90 | 298 | 38 | 166 | 187 | 52 |
| Dilemma Vehicles (#) | 0 | 25 | | 0 | 25 | 0 | 0 | 24 | 0 | 0 | 16 | 0 |
| Queue Length 50th (m) | ~62.6 | 82.3 | | 40.4 | 77.8 | 7.9 | 23.1 | 83.7 | 0.0 | 34.6 | 46.7 | 0.0 |
| Queue Length 95th (m) | #138.1 | 111.6 | | #71.0 | 105.8 | 43.4 | 32.7 | #121.7 | 19.6 | 49.7 | 65.4 | 18.8 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 372 | 946 | | 385 | 909 | 703 | 981 | 792 | 502 | 731 | 846 | 528 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.98 | 0.72 | | 0.70 | 0.72 | 0.64 | 0.29 | 0.84 | 0.39 | 0.56 | 0.50 | 0.39 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 120.4 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.98 | | | |
| Intersection Signal Delay: 38.9 | | Intersection LOS: D | |
| Intersection Capacity Utilization 82.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 126.8 | | | |
| 70th %ile Actuated Cycle: 123.3 | | | |
| 50th %ile Actuated Cycle: 121.3 | | | |
| 30th %ile Actuated Cycle: 119.2 | | | |
| 10th %ile Actuated Cycle: 111.2 | | | |
| ~ 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: 6: 43 Street S/43 Street N & Hwy 3



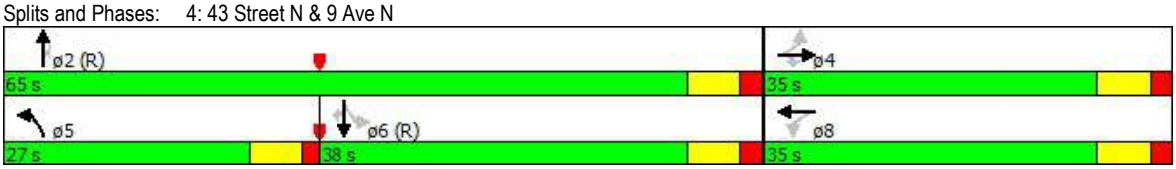
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 16 | 9 | 231 | 195 | 19 | 33 | 135 | 344 | 51 | 11 | 472 | 29 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.905 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1703 | 1792 | 1524 | 1770 | 1686 | 0 | 1597 | 3195 | 1429 | 1687 | 3374 | 1509 |
| Flt Permitted | 0.715 | | | 0.750 | | | 0.950 | | | 0.502 | | |
| Satd. Flow (perm) | 1282 | 1792 | 1524 | 1397 | 1686 | 0 | 1597 | 3195 | 1429 | 891 | 3374 | 1509 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 289 | | 41 | | | | 64 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 13% | 13% | 13% | 7% | 7% | 7% |
| Adj. Flow (vph) | 20 | 11 | 289 | 244 | 24 | 41 | 169 | 430 | 64 | 14 | 590 | 36 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 20 | 11 | 289 | 244 | 65 | 0 | 169 | 430 | 64 | 14 | 590 | 36 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | | 12.0 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 35.0 | | 27.0 | 65.0 | 65.0 | 38.0 | 38.0 | 38.0 |
| Total Split (%) | 35.0% | 35.0% | 35.0% | 35.0% | 35.0% | | 27.0% | 65.0% | 65.0% | 38.0% | 38.0% | 38.0% |
| Maximum Green (s) | 28.5 | 28.5 | 28.5 | 28.5 | 28.5 | | 21.0 | 58.5 | 58.5 | 31.5 | 31.5 | 31.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | | | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 22.1 | 22.1 | 22.1 | 22.1 | 22.1 | | 15.6 | 64.9 | 64.9 | 43.3 | 43.3 | 43.3 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | | 0.16 | 0.65 | 0.65 | 0.43 | 0.43 | 0.43 |
| v/c Ratio | 0.07 | 0.03 | 0.51 | 0.79 | 0.16 | | 0.68 | 0.21 | 0.07 | 0.04 | 0.40 | 0.05 |
| Control Delay | 28.6 | 27.4 | 7.0 | 54.4 | 14.5 | | 49.8 | 6.9 | 1.5 | 22.0 | 22.6 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 28.6 | 27.4 | 7.0 | 54.4 | 14.5 | | 49.8 | 6.9 | 1.5 | 22.0 | 22.6 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | C | C | A | D | B | | D | A | A | C | C | A |
| Approach Delay | | 9.1 | | | 46.0 | | | 17.3 | | | 21.4 | |
| Approach LOS | | A | | | D | | | B | | | C | |
| 90th %ile Green (s) | 28.5 | 28.5 | 28.5 | 28.5 | 28.5 | | 21.0 | 58.5 | 58.5 | 31.5 | 31.5 | 31.5 |
| 90th %ile Term Code | Hold | Hold | Hold | Max | Max | | Max | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 18.3 | 61.0 | 61.0 | 36.7 | 36.7 | 36.7 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 22.7 | 22.7 | 22.7 | 22.7 | 22.7 | | 15.8 | 64.3 | 64.3 | 42.5 | 42.5 | 42.5 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 19.2 | 19.2 | 19.2 | 19.2 | 19.2 | | 13.3 | 67.8 | 67.8 | 48.5 | 48.5 | 48.5 |
| 30th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 14.2 | 14.2 | 14.2 | 14.2 | 14.2 | | 9.7 | 72.8 | 72.8 | 57.1 | 57.1 | 57.1 |
| 10th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 14 | 8 | 25 | 179 | 19 | | 125 | 146 | 9 | 9 | 325 | 0 |
| Fuel Used(l) | 2 | 1 | 18 | 24 | 4 | | 20 | 33 | 4 | 1 | 43 | 2 |
| CO Emissions (g/hr) | 34 | 19 | 340 | 451 | 79 | | 364 | 612 | 79 | 20 | 808 | 28 |
| NOx Emissions (g/hr) | 6 | 4 | 66 | 87 | 15 | | 70 | 118 | 15 | 4 | 156 | 5 |
| VOC Emissions (g/hr) | 8 | 4 | 78 | 104 | 18 | | 84 | 141 | 18 | 5 | 186 | 7 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 16 | 0 | 0 | 24 | 0 |
| Queue Length 50th (m) | 3.2 | 1.8 | 0.0 | 46.9 | 3.9 | | 33.3 | 7.6 | 0.0 | 1.6 | 43.0 | 0.0 |
| Queue Length 95th (m) | 7.7 | 5.2 | 11.8 | 60.0 | 11.4 | | 46.0 | 27.6 | 3.3 | 6.0 | 60.4 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 365 | 510 | 640 | 398 | 509 | | 335 | 2072 | 949 | 385 | 1459 | 711 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.05 | 0.02 | 0.45 | 0.61 | 0.13 | | 0.50 | 0.21 | 0.07 | 0.04 | 0.40 | 0.05 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 21.9 Intersection LOS: C
Intersection Capacity Utilization 58.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: 43 Street N & 9 Ave N



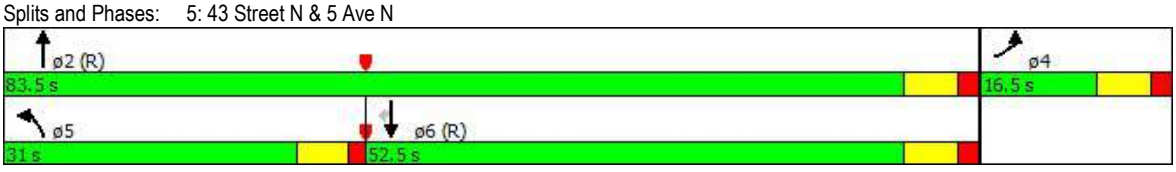
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 38 | 256 | 215 | 571 | 998 | 69 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 284 | | | | 77 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 240.1 | 882.4 | |
| Travel Time (s) | 52.4 | | | 14.4 | 52.9 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 7% | 7% | 12% | 12% | 6% | 6% |
| Adj. Flow (vph) | 42 | 284 | 239 | 634 | 1109 | 77 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 42 | 284 | 239 | 634 | 1109 | 77 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 31.0 | 83.5 | 52.5 | 52.5 |
| Total Split (%) | 16.5% | | 31.0% | 83.5% | 52.5% | 52.5% |
| Maximum Green (s) | 10.0 | | 25.0 | 77.0 | 46.0 | 46.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 19.5 | 86.2 | 58.1 | 58.1 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.20 | 0.86 | 0.58 | 0.58 |
| v/c Ratio | 0.13 | 0.19 | 0.76 | 0.23 | 0.56 | 0.08 |
| Control Delay | 42.1 | 0.3 | 53.1 | 2.5 | 15.7 | 4.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.1 | 0.3 | 53.1 | 2.5 | 15.7 | 4.2 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | B | A |
| Approach Delay | 5.7 | | | 16.4 | 14.9 | |
| Approach LOS | A | | | B | B | |
| 90th %ile Green (s) | 10.0 | | 25.0 | 77.0 | 46.0 | 46.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 22.9 | 77.0 | 48.1 | 48.1 |
| 70th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 20.0 | 77.0 | 51.0 | 51.0 |
| 50th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 0.0 | | 17.0 | 93.5 | 70.5 | 70.5 |
| 30th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 12.8 | 93.5 | 74.7 | 74.7 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 34 | 0 | 197 | 103 | 661 | 8 |
| Fuel Used(l) | 5 | 18 | 27 | 36 | 110 | 6 |
| CO Emissions (g/hr) | 86 | 330 | 505 | 674 | 2043 | 107 |
| NOx Emissions (g/hr) | 17 | 64 | 97 | 130 | 394 | 21 |
| VOC Emissions (g/hr) | 20 | 76 | 116 | 156 | 471 | 25 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 20 | 15 | 0 |
| Queue Length 50th (m) | 4.0 | 0.0 | 46.2 | 15.6 | 98.8 | 0.9 |
| Queue Length 95th (m) | 9.4 | 0.0 | 69.3 | 21.0 | 64.1 | m5.4 |
| Internal Link Dist (m) | 704.0 | | | 216.1 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 327 | 1509 | 403 | 2778 | 1977 | 917 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.19 | 0.59 | 0.23 | 0.56 | 0.08 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 63.7% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: 43 Street N & 5 Ave N

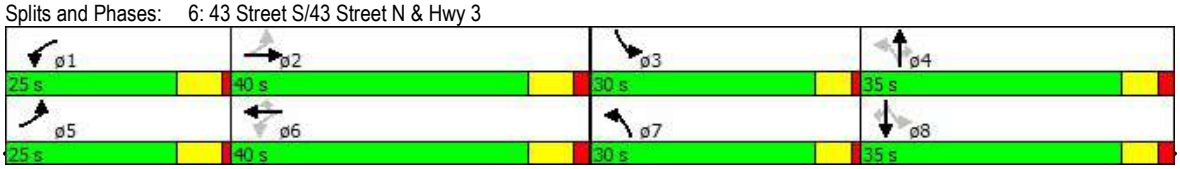


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 176 | 585 | 6 | 269 | 729 | 253 | 362 | 325 | 292 | 303 | 553 | 227 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1641 | 3275 | 0 | 1687 | 3374 | 1509 | 3273 | 3374 | 1509 | 3155 | 3252 | 1455 |
| Flt Permitted | 0.198 | | | 0.236 | | | 0.183 | | | 0.519 | | |
| Satd. Flow (perm) | 342 | 3275 | 0 | 419 | 3374 | 1509 | 630 | 3374 | 1509 | 1723 | 3252 | 1455 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 275 | | | 317 | | | 247 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 401.6 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 24.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 7% | 7% | 7% | 7% | 7% | 7% | 11% | 11% | 11% |
| Adj. Flow (vph) | 191 | 636 | 7 | 292 | 792 | 275 | 393 | 353 | 317 | 329 | 601 | 247 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 191 | 643 | 0 | 292 | 792 | 275 | 393 | 353 | 317 | 329 | 601 | 247 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 25.0 | 40.0 | | 25.0 | 40.0 | 40.0 | 30.0 | 35.0 | 35.0 | 30.0 | 35.0 | 35.0 |
| Total Split (%) | 19.2% | 30.8% | | 19.2% | 30.8% | 30.8% | 23.1% | 26.9% | 26.9% | 23.1% | 26.9% | 26.9% |
| Maximum Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 25.0 | 29.0 | 29.0 | 25.0 | 29.0 | 29.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 48.6 | 33.2 | | 54.3 | 36.1 | 36.1 | 46.5 | 29.0 | 29.0 | 40.4 | 25.9 | 25.9 |
| Actuated g/C Ratio | 0.42 | 0.28 | | 0.46 | 0.31 | 0.31 | 0.40 | 0.25 | 0.25 | 0.35 | 0.22 | 0.22 |
| v/c Ratio | 0.63 | 0.69 | | 0.77 | 0.76 | 0.42 | 0.63 | 0.42 | 0.52 | 0.43 | 0.83 | 0.48 |
| Control Delay | 29.1 | 43.2 | | 34.9 | 43.8 | 6.3 | 27.7 | 39.1 | 7.2 | 24.6 | 55.2 | 8.2 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 29.1 | 43.2 | | 34.9 | 43.8 | 6.3 | 27.7 | 39.1 | 7.2 | 24.6 | 55.2 | 8.2 |
| LOS | C | D | | C | D | A | C | D | A | C | E | A |
| Approach Delay | | 40.0 | | | 34.3 | | | 25.4 | | | 36.7 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 19.0 | 33.0 | | 19.0 | 33.0 | 33.0 | 20.5 | 32.4 | 32.4 | 17.1 | 29.0 | 29.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Hold | Hold | Gap | Max | Max |
| 70th %ile Green (s) | 17.5 | 33.0 | | 19.0 | 34.5 | 34.5 | 18.4 | 32.4 | 32.4 | 15.0 | 29.0 | 29.0 |
| 70th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Max | Max |
| 50th %ile Green (s) | 14.6 | 33.0 | | 19.0 | 37.4 | 37.4 | 16.9 | 31.4 | 31.4 | 13.6 | 28.1 | 28.1 |
| 50th %ile Term Code | Gap | MaxR | | Max | Hold | Hold | Gap | Hold | Hold | Gap | Gap | Gap |
| 30th %ile Green (s) | 11.6 | 33.0 | | 16.8 | 38.2 | 38.2 | 15.2 | 28.2 | 28.2 | 12.0 | 25.0 | 25.0 |
| 30th %ile Term Code | Gap | MaxR | | Gap | Hold | Hold | Gap | Hold | Hold | Gap | Gap | Gap |
| 10th %ile Green (s) | 10.0 | 33.0 | | 12.8 | 35.8 | 35.8 | 12.1 | 21.3 | 21.3 | 10.0 | 19.2 | 19.2 |
| 10th %ile Term Code | Min | MaxR | | Gap | Hold | Hold | Gap | Hold | Hold | Min | Gap | Gap |
| Stops (vph) | 109 | 515 | | 161 | 623 | 25 | 231 | 262 | 29 | 202 | 509 | 25 |
| Fuel Used(l) | 16 | 70 | | 33 | 105 | 18 | 29 | 31 | 14 | 29 | 71 | 15 |
| CO Emissions (g/hr) | 305 | 1305 | | 612 | 1951 | 337 | 548 | 577 | 262 | 542 | 1315 | 277 |
| NOx Emissions (g/hr) | 59 | 252 | | 118 | 377 | 65 | 106 | 111 | 51 | 105 | 254 | 53 |
| VOC Emissions (g/hr) | 70 | 301 | | 141 | 450 | 78 | 126 | 133 | 60 | 125 | 303 | 64 |
| Dilemma Vehicles (#) | 0 | 25 | | 0 | 30 | 0 | 0 | 13 | 0 | 0 | 23 | 0 |
| Queue Length 50th (m) | 26.9 | 76.6 | | 44.0 | 94.0 | 0.0 | 32.7 | 38.5 | 0.0 | 26.9 | 75.0 | 0.0 |
| Queue Length 95th (m) | 45.8 | 103.3 | | #84.0 | #140.0 | 21.8 | 44.3 | 55.2 | 23.9 | 37.4 | 100.5 | 22.1 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 377.6 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 367 | 929 | | 404 | 1039 | 655 | 829 | 891 | 631 | 1020 | 811 | 548 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.52 | 0.69 | | 0.72 | 0.76 | 0.42 | 0.47 | 0.40 | 0.50 | 0.32 | 0.74 | 0.45 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 117 | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.83 | | | |
| Intersection Signal Delay: 33.9 | | Intersection LOS: C | |
| Intersection Capacity Utilization 77.2% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 125.5 | | | |
| 70th %ile Actuated Cycle: 123.4 | | | |
| 50th %ile Actuated Cycle: 121 | | | |
| 30th %ile Actuated Cycle: 114 | | | |
| 10th %ile Actuated Cycle: 101.1 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: 43 Street S/43 Street N & Hwy 3



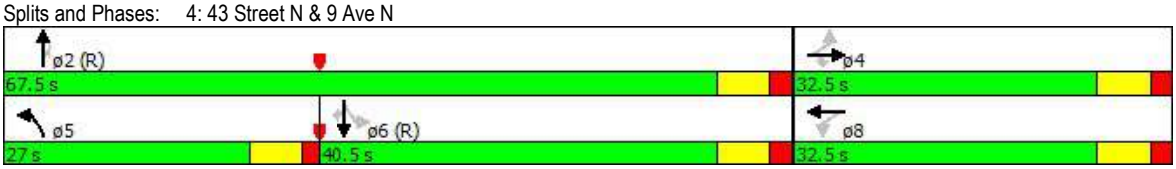
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 38 | 28 | 87 | 40 | 10 | 10 | 212 | 857 | 166 | 34 | 441 | 21 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.925 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1292 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.742 | | | 0.735 | | | 0.950 | | | 0.277 | | |
| Satd. Flow (perm) | 1369 | 1845 | 1568 | 1027 | 1292 | 0 | 1656 | 3312 | 1482 | 483 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 105 | | 12 | | | | 200 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 46 | 34 | 105 | 48 | 12 | 12 | 255 | 1033 | 200 | 41 | 531 | 25 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 46 | 34 | 105 | 48 | 24 | 0 | 255 | 1033 | 200 | 41 | 531 | 25 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 27.0 | 67.5 | 67.5 | 40.5 | 40.5 | 40.5 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 32.5% | | 27.0% | 67.5% | 67.5% | 40.5% | 40.5% | 40.5% |
| Maximum Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 21.0 | 61.0 | 61.0 | 34.0 | 34.0 | 34.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 11.4 | 11.4 | 11.4 | 11.4 | 11.4 | | 20.7 | 80.2 | 80.2 | 52.2 | 52.2 | 52.2 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | | 0.21 | 0.80 | 0.80 | 0.52 | 0.52 | 0.52 |
| v/c Ratio | 0.29 | 0.16 | 0.39 | 0.41 | 0.15 | | 0.75 | 0.39 | 0.16 | 0.16 | 0.31 | 0.03 |
| Control Delay | 44.9 | 40.8 | 12.2 | 51.4 | 27.6 | | 44.2 | 2.3 | 0.4 | 19.7 | 16.7 | 0.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 44.9 | 40.8 | 12.2 | 51.4 | 27.6 | | 44.2 | 2.3 | 0.4 | 19.7 | 16.7 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | B | B | A |
| Approach Delay | | 25.6 | | | 43.4 | | | 9.2 | | | 16.2 | |
| Approach LOS | | C | | | D | | | A | | | B | |
| 90th %ile Green (s) | 15.1 | 15.1 | 15.1 | 15.1 | 15.1 | | 27.0 | 71.9 | 71.9 | 38.9 | 38.9 | 38.9 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 12.1 | 12.1 | 12.1 | 12.1 | 12.1 | | 23.7 | 74.9 | 74.9 | 45.2 | 45.2 | 45.2 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 20.9 | 77.0 | 77.0 | 50.1 | 50.1 | 50.1 |
| 50th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 18.0 | 77.0 | 77.0 | 53.0 | 53.0 | 53.0 |
| 30th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 13.7 | 93.5 | 93.5 | 73.8 | 73.8 | 73.8 |
| 10th %ile Term Code | Skip | Skip | Skip | Skip | Skip | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 34 | 26 | 17 | 38 | 13 | | 175 | 136 | 2 | 22 | 254 | 0 |
| Fuel Used(l) | 5 | 3 | 7 | 5 | 2 | | 29 | 72 | 13 | 3 | 37 | 1 |
| CO Emissions (g/hr) | 89 | 64 | 138 | 91 | 36 | | 541 | 1331 | 239 | 56 | 687 | 20 |
| NOx Emissions (g/hr) | 17 | 12 | 27 | 18 | 7 | | 104 | 257 | 46 | 11 | 133 | 4 |
| VOC Emissions (g/hr) | 21 | 15 | 32 | 21 | 8 | | 125 | 307 | 55 | 13 | 159 | 5 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 33 | 0 | 0 | 22 | 0 |
| Queue Length 50th (m) | 8.9 | 6.5 | 0.0 | 9.4 | 2.3 | | 36.6 | 12.1 | 0.0 | 4.4 | 32.5 | 0.0 |
| Queue Length 95th (m) | 17.7 | 13.9 | 12.1 | 18.6 | 8.8 | | 56.3 | 13.2 | 0.0 | 12.8 | 50.0 | 0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 355 | 479 | 485 | 267 | 344 | | 376 | 2655 | 1227 | 251 | 1729 | 823 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.07 | 0.22 | 0.18 | 0.07 | | 0.68 | 0.39 | 0.16 | 0.16 | 0.31 | 0.03 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 13.3 Intersection LOS: B
Intersection Capacity Utilization 61.3% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: 43 Street N & 9 Ave N

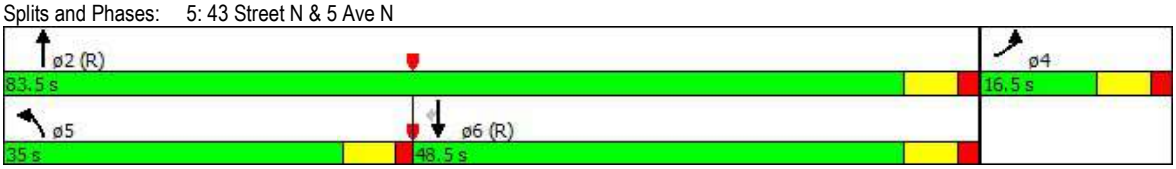


| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 160 | 267 | 1186 | 563 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 184 | | | | 51 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 105 | 184 | 307 | 1363 | 647 | 51 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 105 | 184 | 307 | 1363 | 647 | 51 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 35.0 | 83.5 | 48.5 | 48.5 |
| Total Split (%) | 16.5% | | 35.0% | 83.5% | 48.5% | 48.5% |
| Maximum Green (s) | 10.0 | | 29.0 | 77.0 | 42.0 | 42.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 22.8 | 81.6 | 51.5 | 51.5 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.23 | 0.82 | 0.52 | 0.52 |
| v/c Ratio | 0.34 | 0.13 | 0.79 | 0.49 | 0.40 | 0.07 |
| Control Delay | 45.2 | 0.2 | 50.9 | 4.5 | 8.5 | 1.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 45.2 | 0.2 | 50.9 | 4.5 | 8.5 | 1.2 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | D | A | A | A |
| Approach Delay | 16.5 | | | 13.0 | 8.0 | |
| Approach LOS | B | | | B | A | |
| 90th %ile Green (s) | 10.0 | | 29.0 | 77.0 | 42.0 | 42.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 26.3 | 77.0 | 44.7 | 44.7 |
| 70th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 23.2 | 77.0 | 47.8 | 47.8 |
| 50th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | | 20.1 | 77.0 | 50.9 | 50.9 |
| 30th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 15.4 | 93.5 | 72.1 | 72.1 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 83 | 0 | 244 | 351 | 211 | 3 |
| Fuel Used(l) | 11 | 11 | 33 | 82 | 54 | 4 |
| CO Emissions (g/hr) | 211 | 206 | 618 | 1517 | 998 | 65 |
| NOx Emissions (g/hr) | 41 | 40 | 119 | 293 | 193 | 13 |
| VOC Emissions (g/hr) | 49 | 48 | 142 | 350 | 230 | 15 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 50 | 25 | 0 |
| Queue Length 50th (m) | 10.4 | 0.0 | 58.9 | 45.3 | 13.4 | 0.0 |
| Queue Length 95th (m) | 18.2 | 0.0 | 80.0 | 53.6 | 19.7 | 1.3 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 312 | 1442 | 493 | 2779 | 1602 | 741 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.34 | 0.13 | 0.62 | 0.49 | 0.40 | 0.07 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.79 | | | |
| Intersection Signal Delay: 12.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 54.5% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: 43 Street N & 5 Ave N



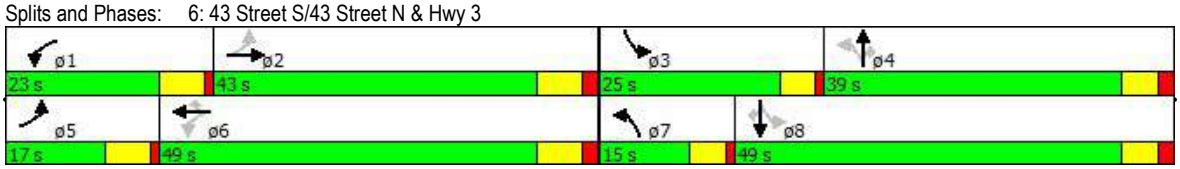
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 480 | 659 | 9 | 266 | 641 | 589 | 283 | 750 | 192 | 432 | 438 | 227 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1626 | 3246 | 0 | 1656 | 3312 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.288 | | | 0.162 | | | 0.480 | | | 0.105 | | |
| Satd. Flow (perm) | 493 | 3246 | 0 | 282 | 3312 | 1482 | 1608 | 3282 | 1468 | 337 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 288 | | | 199 | | | 247 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 522 | 716 | 10 | 289 | 697 | 640 | 308 | 815 | 209 | 470 | 476 | 247 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 522 | 726 | 0 | 289 | 697 | 640 | 308 | 815 | 209 | 470 | 476 | 247 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 17.0 | 43.0 | | 23.0 | 49.0 | 49.0 | 15.0 | 39.0 | 39.0 | 25.0 | 49.0 | 49.0 |
| Total Split (%) | 13.1% | 33.1% | | 17.7% | 37.7% | 37.7% | 11.5% | 30.0% | 30.0% | 19.2% | 37.7% | 37.7% |
| Maximum Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 48.0 | 36.0 | | 60.0 | 42.0 | 42.0 | 44.0 | 33.0 | 33.0 | 57.5 | 41.5 | 41.5 |
| Actuated g/C Ratio | 0.37 | 0.28 | | 0.47 | 0.33 | 0.33 | 0.34 | 0.26 | 0.26 | 0.45 | 0.32 | 0.32 |
| v/c Ratio | 1.86 | 0.80 | | 0.92 | 0.64 | 0.94 | 0.46 | 0.97 | 0.40 | 0.87 | 0.47 | 0.40 |
| Control Delay | 424.7 | 50.8 | | 61.6 | 40.4 | 47.0 | 25.3 | 71.5 | 8.5 | 49.7 | 36.5 | 5.7 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 424.7 | 50.8 | | 61.6 | 40.4 | 47.0 | 25.3 | 71.5 | 8.5 | 49.7 | 36.5 | 5.7 |
| LOS | F | D | | E | D | D | C | E | A | D | D | A |
| Approach Delay | | 207.2 | | | 46.8 | | | 50.9 | | | 35.3 | |
| Approach LOS | | F | | | D | | | D | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 70th %ile Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 50th %ile Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| 50th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 30th %ile Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 18.2 | 41.2 | 41.2 |
| 30th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Gap | Hold | Hold |
| 10th %ile Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 14.6 | 37.6 | 37.6 |
| 10th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Gap | Hold | Hold |
| Stops (vph) | 279 | 605 | | 158 | 535 | 324 | 196 | 675 | 26 | 309 | 340 | 21 |
| Fuel Used(l) | 190 | 84 | | 38 | 90 | 76 | 23 | 93 | 10 | 51 | 48 | 14 |
| CO Emissions (g/hr) | 3531 | 1570 | | 705 | 1671 | 1412 | 428 | 1723 | 180 | 941 | 887 | 266 |
| NOx Emissions (g/hr) | 682 | 303 | | 136 | 323 | 273 | 83 | 333 | 35 | 182 | 171 | 51 |
| VOC Emissions (g/hr) | 814 | 362 | | 163 | 385 | 326 | 99 | 397 | 41 | 217 | 204 | 61 |
| Dilemma Vehicles (#) | 0 | 26 | | 0 | 25 | 0 | 0 | 27 | 0 | 0 | 17 | 0 |
| Queue Length 50th (m) | ~206.3 | 96.1 | | 50.7 | 84.6 | 106.2 | 25.4 | 115.4 | 2.1 | 48.4 | 53.1 | 0.0 |
| Queue Length 95th (m) | #285.2 | 120.8 | | #106.6 | 106.7 | #188.9 | 35.4 | #159.0 | 22.6 | #73.7 | 70.1 | 19.1 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 280 | 909 | | 313 | 1082 | 678 | 673 | 842 | 525 | 572 | 1050 | 634 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.86 | 0.80 | | 0.92 | 0.64 | 0.94 | 0.46 | 0.97 | 0.40 | 0.82 | 0.45 | 0.39 |

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 128.6
Natural Cycle: 110
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.86
Intersection Signal Delay: 82.3 Intersection LOS: F
Intersection Capacity Utilization 99.6% ICU Level of Service F
Analysis Period (min) 15
90th %ile Actuated Cycle: 130
70th %ile Actuated Cycle: 130
50th %ile Actuated Cycle: 130
30th %ile Actuated Cycle: 128.2
10th %ile Actuated Cycle: 124.6
~ 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: 6: 43 Street S/43 Street N & Hwy 3

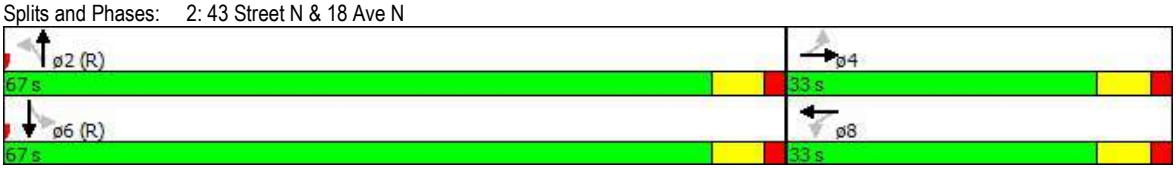


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 11 | 35 | 112 | 54 | 8 | 6 | 187 | 179 | 243 | 28 | 298 | 12 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| Grade (%) | | 0% | | | 0% | | | 0% | | | 0% | |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.904 | | | 0.987 | | | 0.946 | | | 0.995 | |
| Flt Protected | | 0.997 | | | 0.962 | | | 0.985 | | | 0.996 | |
| Satd. Flow (prot) | 0 | 1529 | 0 | 0 | 1640 | 0 | 0 | 1609 | 0 | 0 | 1828 | 0 |
| Flt Permitted | | 0.980 | | | 0.633 | | | 0.731 | | | 0.901 | |
| Satd. Flow (perm) | 0 | 1503 | 0 | 0 | 1079 | 0 | 0 | 1194 | 0 | 0 | 1654 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 120 | | | 5 | | | 61 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 716.1 | | | 196.5 | | | 496.3 | | | 520.4 | |
| Travel Time (s) | | 51.6 | | | 14.1 | | | 25.5 | | | 26.8 | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 12% | 12% | 12% | 10% | 10% | 10% | 10% | 10% | 10% | 3% | 3% | 3% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | | 0% | | | 0% | | | 0% | | | 0% | |
| Adj. Flow (vph) | 14 | 45 | 144 | 59 | 9 | 7 | 240 | 229 | 312 | 36 | 382 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 203 | 0 | 0 | 75 | 0 | 0 | 781 | 0 | 0 | 433 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 26.5 | 26.5 | | 22.5 | 22.5 | |
| Total Split (s) | 33.0 | 33.0 | | 33.0 | 33.0 | | 67.0 | 67.0 | | 67.0 | 67.0 | |
| Total Split (%) | 33.0% | 33.0% | | 33.0% | 33.0% | | 67.0% | 67.0% | | 67.0% | 67.0% | |
| Maximum Green (s) | 26.5 | 26.5 | | 26.5 | 26.5 | | 60.5 | 60.5 | | 60.5 | 60.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Minimum Gap (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Before Reduce (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Time To Reduce (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Recall Mode | Max | Max | | Max | Max | | Max | Max | | Max | Max | |
| Walk Time (s) | | | | | | | | | | | | |
| Flash Dont Walk (s) | | | | | | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | | | | | |
| Act Effct Green (s) | | 26.5 | | | 26.5 | | | 60.5 | | | 60.5 | |
| Actuated g/C Ratio | | 0.26 | | | 0.26 | | | 0.60 | | | 0.60 | |
| v/c Ratio | | 0.42 | | | 0.26 | | | 1.05 | | | 0.43 | |
| Control Delay | | 15.7 | | | 30.0 | | | 45.8 | | | 12.2 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 15.7 | | | 30.0 | | | 45.8 | | | 12.2 | |
| LOS | | B | | | C | | | D | | | B | |
| Approach Delay | | 15.7 | | | 30.0 | | | 45.8 | | | 12.2 | |
| Approach LOS | | B | | | C | | | D | | | B | |
| Queue Length 50th (m) | | 13.2 | | | 11.3 | | | ~168.4 | | | 43.4 | |
| Queue Length 95th (m) | | 25.1 | | | 24.0 | | | #184.1 | | | 52.7 | |
| Internal Link Dist (m) | | 692.1 | | | 172.5 | | | 472.3 | | | 496.4 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 486 | | | 289 | | | 746 | | | 1001 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.42 | | | 0.26 | | | 1.05 | | | 0.43 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 86 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 1.05 | | | |
| Intersection Signal Delay: 31.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 91.5% | | 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: 2: 43 Street N & 18 Ave N

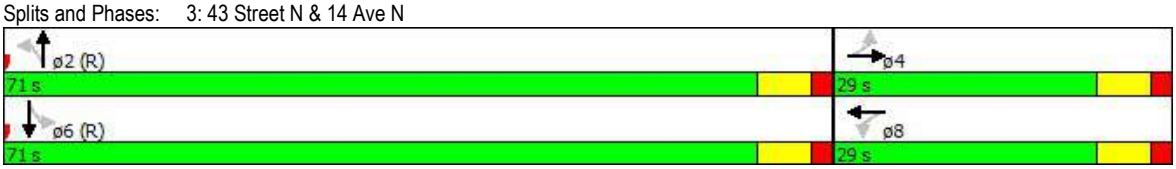


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 4 | 7 | 21 | 53 | 2 | 6 | 76 | 582 | 236 | 28 | 421 | 16 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| Grade (%) | | 0% | | | 0% | | | 0% | | | 0% | |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 75.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.912 | | | 0.986 | | | 0.957 | | | 0.995 | |
| Flt Protected | | 0.994 | | | 0.959 | | 0.950 | | | | 0.997 | |
| Satd. Flow (prot) | 0 | 1111 | 0 | 0 | 1633 | 0 | 1641 | 1653 | 0 | 0 | 1778 | 0 |
| Flt Permitted | | 0.971 | | | 0.733 | | 0.432 | | | | 0.669 | |
| Satd. Flow (perm) | 0 | 1086 | 0 | 0 | 1248 | 0 | 746 | 1653 | 0 | 0 | 1193 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 26 | | | 5 | | | 41 | | | 4 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 748.5 | | | 168.6 | | | 405.2 | | | 496.3 | |
| Travel Time (s) | | 53.9 | | | 12.1 | | | 20.8 | | | 25.5 | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.92 | 0.92 | 0.92 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 55% | 55% | 55% | 10% | 10% | 10% | 10% | 10% | 10% | 6% | 6% | 6% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | | 0% | | | 0% | | | 0% | | | 0% | |
| Adj. Flow (vph) | 5 | 9 | 26 | 58 | 2 | 7 | 94 | 719 | 291 | 35 | 520 | 20 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 40 | 0 | 0 | 67 | 0 | 94 | 1010 | 0 | 0 | 575 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (s) | 29.0 | 29.0 | | 29.0 | 29.0 | | 71.0 | 71.0 | | 71.0 | 71.0 | |
| Total Split (%) | 29.0% | 29.0% | | 29.0% | 29.0% | | 71.0% | 71.0% | | 71.0% | 71.0% | |
| Maximum Green (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 64.5 | 64.5 | | 64.5 | 64.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | 6.5 | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Minimum Gap (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Before Reduce (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Time To Reduce (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | | 0.0 | 0.0 | |
| Recall Mode | Max | Max | | Max | Max | | Max | Max | | Max | Max | |
| Walk Time (s) | | | | | | | | | | | | |
| Flash Dont Walk (s) | | | | | | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | | | | | |
| Act Effct Green (s) | | 22.5 | | | 22.5 | | 64.5 | 64.5 | | | 64.5 | |
| Actuated g/C Ratio | | 0.22 | | | 0.22 | | 0.64 | 0.64 | | | 0.64 | |
| v/c Ratio | | 0.15 | | | 0.24 | | 0.20 | 0.94 | | | 0.75 | |
| Control Delay | | 17.9 | | | 32.0 | | 6.3 | 27.9 | | | 20.3 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 17.9 | | | 32.0 | | 6.3 | 27.9 | | | 20.3 | |
| LOS | | B | | | C | | A | C | | | C | |
| Approach Delay | | 17.9 | | | 32.0 | | | 26.0 | | | 20.3 | |
| Approach LOS | | B | | | C | | | C | | | C | |
| Queue Length 50th (m) | | 2.3 | | | 10.4 | | 4.8 | 177.3 | | | 75.4 | |
| Queue Length 95th (m) | | 9.6 | | | 22.7 | | 7.9 | 203.9 | | | 96.6 | |
| Internal Link Dist (m) | | 724.5 | | | 144.6 | | | 381.2 | | | 472.3 | |
| Turn Bay Length (m) | | | | | | | 75.0 | | | | | |
| Base Capacity (vph) | | 264 | | | 284 | | 481 | 1080 | | | 770 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.15 | | | 0.24 | | 0.20 | 0.94 | | | 0.75 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 63 (63%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.94 | | | |
| Intersection Signal Delay: 24.2 | | Intersection LOS: C | |
| Intersection Capacity Utilization 67.1% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: 43 Street N & 14 Ave N





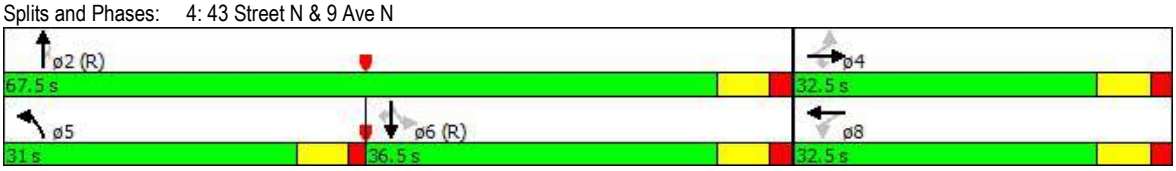
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 38 | 28 | 87 | 40 | 10 | 10 | 212 | 857 | 166 | 34 | 441 | 21 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| Grade (%) | | 0% | | | 0% | | | 0% | | | 0% | |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | | 0.850 | | 0.925 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1292 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.742 | | | 0.735 | | | 0.950 | | | 0.277 | | |
| Satd. Flow (perm) | 1369 | 1845 | 1568 | 1027 | 1292 | 0 | 1656 | 3312 | 1482 | 483 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 105 | | 12 | | | | 200 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | | 0% | | | 0% | | | 0% | | | 0% | |
| Adj. Flow (vph) | 46 | 34 | 105 | 48 | 12 | 12 | 255 | 1033 | 200 | 41 | 531 | 25 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 46 | 34 | 105 | 48 | 24 | 0 | 255 | 1033 | 200 | 41 | 531 | 25 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 31.0 | 67.5 | 67.5 | 36.5 | 36.5 | 36.5 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 32.5% | | 31.0% | 67.5% | 67.5% | 36.5% | 36.5% | 36.5% |
| Maximum Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 25.0 | 61.0 | 61.0 | 30.0 | 30.0 | 30.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Minimum Gap (s) | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Before Reduce (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Time To Reduce (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 11.4 | 11.4 | 11.4 | 11.4 | 11.4 | | 20.4 | 80.2 | 80.2 | 52.4 | 52.4 | 52.4 |
| Actuated g/C Ratio | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | | 0.20 | 0.80 | 0.80 | 0.52 | 0.52 | 0.52 |
| v/c Ratio | 0.29 | 0.16 | 0.39 | 0.41 | 0.15 | | 0.75 | 0.39 | 0.16 | 0.16 | 0.31 | 0.03 |
| Control Delay | 44.9 | 40.8 | 12.2 | 51.4 | 27.6 | | 47.9 | 2.8 | 0.5 | 24.0 | 19.2 | 0.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 44.9 | 40.8 | 12.2 | 51.4 | 27.6 | | 47.9 | 2.8 | 0.5 | 24.0 | 19.2 | 0.0 |
| LOS | D | D | B | D | C | | D | A | A | C | B | A |
| Approach Delay | | 25.6 | | | 43.4 | | | 10.2 | | | 18.8 | |
| Approach LOS | | C | | | D | | | B | | | B | |
| Queue Length 50th (m) | 8.9 | 6.5 | 0.0 | 9.4 | 2.3 | | 42.8 | 19.5 | 0.0 | 5.1 | 34.8 | 0.0 |
| Queue Length 95th (m) | 17.7 | 13.9 | 12.1 | 18.6 | 8.8 | | 47.2 | 21.6 | 0.6 | m9.7 | 54.9 | m0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 355 | 479 | 485 | 267 | 344 | | 422 | 2655 | 1227 | 252 | 1736 | 826 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.07 | 0.22 | 0.18 | 0.07 | | 0.60 | 0.39 | 0.16 | 0.16 | 0.31 | 0.03 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 87 (87%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.75 | | | |
| Intersection Signal Delay: 14.6 | | Intersection LOS: B | |
| Intersection Capacity Utilization 61.3% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

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

Splits and Phases: 4: 43 Street N & 9 Ave N

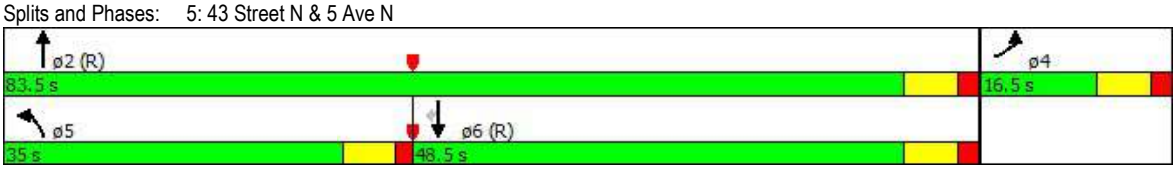


| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 91 | 160 | 267 | 1186 | 563 | 44 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| Grade (%) | 0% | | | 0% | 0% | |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Ped Bike Factor | | | | | | |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 184 | | | | 51 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Confl. Peds. (#/hr) | | | | | | |
| Confl. Bikes (#/hr) | | | | | | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | |
| Mid-Block Traffic (%) | 0% | | | 0% | 0% | |
| Adj. Flow (vph) | 105 | 184 | 307 | 1363 | 647 | 51 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 105 | 184 | 307 | 1363 | 647 | 51 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 35.0 | 83.5 | 48.5 | 48.5 |
| Total Split (%) | 16.5% | | 35.0% | 83.5% | 48.5% | 48.5% |
| Maximum Green (s) | 10.0 | | 29.0 | 77.0 | 42.0 | 42.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Minimum Gap (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Time Before Reduce (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Time To Reduce (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 22.8 | 81.6 | 51.5 | 51.5 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.23 | 0.82 | 0.52 | 0.52 |
| v/c Ratio | 0.34 | 0.13 | 0.79 | 0.49 | 0.40 | 0.07 |
| Control Delay | 45.2 | 0.2 | 50.9 | 4.5 | 11.1 | 1.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 45.2 | 0.2 | 50.9 | 4.5 | 11.1 | 1.6 |
| LOS | D | A | D | A | B | A |
| Approach Delay | 16.5 | | | 13.0 | 10.4 | |
| Approach LOS | B | | | B | B | |
| Queue Length 50th (m) | 10.4 | 0.0 | 58.9 | 45.3 | 50.8 | 0.4 |
| Queue Length 95th (m) | 18.2 | 0.0 | 80.0 | 53.6 | 17.7 | 1.3 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 312 | 1442 | 493 | 2779 | 1602 | 741 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.34 | 0.13 | 0.62 | 0.49 | 0.40 | 0.07 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 32 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 60 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.79 | | | |
| Intersection Signal Delay: 12.7 | | Intersection LOS: B | |
| Intersection Capacity Utilization 54.5% | | ICU Level of Service A | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 5: 43 Street N & 5 Ave N



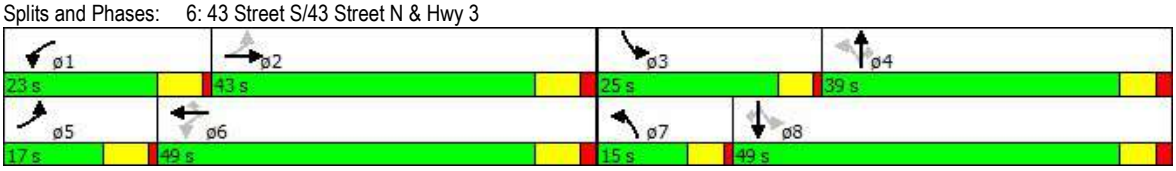
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 480 | 659 | 9 | 266 | 641 | 589 | 283 | 750 | 192 | 432 | 438 | 227 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Width (m) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| Grade (%) | | 0% | | | 0% | | | 0% | | | 0% | |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Ped Bike Factor | | | | | | | | | | | | |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3155 | 3246 | 0 | 1656 | 3312 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.288 | | | 0.162 | | | 0.480 | | | 0.105 | | |
| Satd. Flow (perm) | 956 | 3246 | 0 | 282 | 3312 | 1482 | 1608 | 3282 | 1468 | 337 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 288 | | | 199 | | | 247 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Confl. Peds. (#/hr) | | | | | | | | | | | | |
| Confl. Bikes (#/hr) | | | | | | | | | | | | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Growth Factor | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Bus Blockages (#/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Parking (#/hr) | | | | | | | | | | | | |
| Mid-Block Traffic (%) | | 0% | | | 0% | | | 0% | | | 0% | |
| Adj. Flow (vph) | 522 | 716 | 10 | 289 | 697 | 640 | 308 | 815 | 209 | 470 | 476 | 247 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 522 | 726 | 0 | 289 | 697 | 640 | 308 | 815 | 209 | 470 | 476 | 247 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 17.0 | 43.0 | | 23.0 | 49.0 | 49.0 | 15.0 | 39.0 | 39.0 | 25.0 | 49.0 | 49.0 |
| Total Split (%) | 13.1% | 33.1% | | 17.7% | 37.7% | 37.7% | 11.5% | 30.0% | 30.0% | 19.2% | 37.7% | 37.7% |
| Maximum Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Minimum Gap (s) | 3.0 | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time Before Reduce (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Time To Reduce (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Walk Time (s) | | | | | | | | | | | | |
| Flash Dont Walk (s) | | | | | | | | | | | | |
| Pedestrian Calls (#/hr) | | | | | | | | | | | | |
| Act Effct Green (s) | 48.0 | 36.0 | | 60.0 | 42.0 | 42.0 | 44.0 | 33.0 | 33.0 | 57.5 | 41.5 | 41.5 |
| Actuated g/C Ratio | 0.37 | 0.28 | | 0.47 | 0.33 | 0.33 | 0.34 | 0.26 | 0.26 | 0.45 | 0.32 | 0.32 |
| v/c Ratio | 0.96 | 0.80 | | 0.92 | 0.64 | 0.94 | 0.46 | 0.97 | 0.40 | 0.87 | 0.47 | 0.40 |
| Control Delay | 57.8 | 50.8 | | 61.6 | 40.4 | 47.0 | 25.3 | 71.5 | 8.5 | 49.7 | 36.5 | 5.7 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 57.8 | 50.8 | | 61.6 | 40.4 | 47.0 | 25.3 | 71.5 | 8.5 | 49.7 | 36.5 | 5.7 |
| LOS | E | D | | E | D | D | C | E | A | D | D | A |
| Approach Delay | | 53.7 | | | 46.8 | | | 50.9 | | | 35.3 | |
| Approach LOS | | D | | | D | | | D | | | D | |
| Queue Length 50th (m) | 45.8 | 96.1 | | 50.7 | 84.6 | 106.2 | 25.4 | 115.4 | 2.1 | 48.4 | 53.1 | 0.0 |
| Queue Length 95th (m) | #78.5 | 120.8 | | #106.6 | 106.7 | #188.9 | 35.4 | #159.0 | 22.6 | #73.7 | 70.1 | 19.1 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 545 | 909 | | 313 | 1082 | 678 | 673 | 842 | 525 | 572 | 1050 | 634 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.96 | 0.80 | | 0.92 | 0.64 | 0.94 | 0.46 | 0.97 | 0.40 | 0.82 | 0.45 | 0.39 |

**Intersection Summary**

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 128.6
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 46.9 Intersection LOS: D
Intersection Capacity Utilization 86.7% ICU Level of Service E
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: 43 Street S/43 Street N & Hwy 3

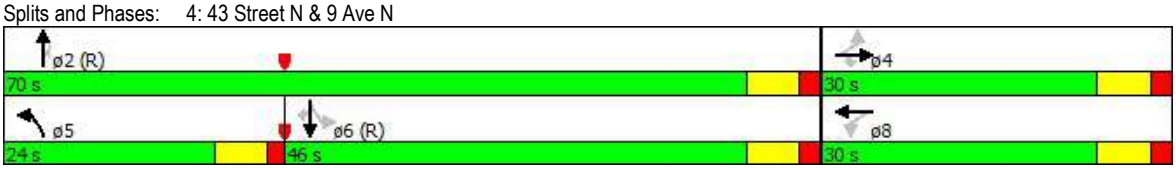


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 23 | 9 | 248 | 186 | 25 | 33 | 144 | 477 | 42 | 9 | 904 | 56 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.915 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1703 | 1792 | 1524 | 1770 | 1704 | 0 | 1597 | 3195 | 1429 | 1687 | 3374 | 1509 |
| Flt Permitted | 0.710 | | | 0.750 | | | 0.950 | | | 0.427 | | |
| Satd. Flow (perm) | 1273 | 1792 | 1524 | 1397 | 1704 | 0 | 1597 | 3195 | 1429 | 758 | 3374 | 1509 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 310 | | 41 | | | | 52 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 13% | 13% | 13% | 7% | 7% | 7% |
| Adj. Flow (vph) | 29 | 11 | 310 | 232 | 31 | 41 | 180 | 596 | 52 | 11 | 1130 | 70 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 29 | 11 | 310 | 232 | 72 | 0 | 180 | 596 | 52 | 11 | 1130 | 70 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | | 12.0 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | | 24.0 | 70.0 | 70.0 | 46.0 | 46.0 | 46.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 30.0% | 30.0% | | 24.0% | 70.0% | 70.0% | 46.0% | 46.0% | 46.0% |
| Maximum Green (s) | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | | 18.0 | 63.5 | 63.5 | 39.5 | 39.5 | 39.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | | | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | | 15.3 | 66.7 | 66.7 | 45.4 | 45.4 | 45.4 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | | 0.15 | 0.67 | 0.67 | 0.45 | 0.45 | 0.45 |
| v/c Ratio | 0.11 | 0.03 | 0.56 | 0.82 | 0.19 | | 0.74 | 0.28 | 0.05 | 0.03 | 0.74 | 0.09 |
| Control Delay | 31.9 | 30.1 | 7.9 | 60.5 | 17.3 | | 54.3 | 6.1 | 1.5 | 18.8 | 27.6 | 1.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.9 | 30.1 | 7.9 | 60.5 | 17.3 | | 54.3 | 6.1 | 1.5 | 18.8 | 27.6 | 1.9 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | C | C | A | E | B | | D | A | A | B | C | A |
| Approach Delay | | 10.6 | | | 50.2 | | | 16.3 | | | 26.0 | |
| Approach LOS | | B | | | D | | | B | | | C | |
| 90th %ile Green (s) | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | | 18.0 | 63.5 | 63.5 | 39.5 | 39.5 | 39.5 |
| 90th %ile Term Code | Hold | Hold | Hold | Max | Max | | Max | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | | 18.0 | 63.5 | 63.5 | 39.5 | 39.5 | 39.5 |
| 70th %ile Term Code | Hold | Hold | Hold | Max | Max | | Max | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | | 16.4 | 65.0 | 65.0 | 42.6 | 42.6 | 42.6 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 18.7 | 18.7 | 18.7 | 18.7 | 18.7 | | 13.9 | 68.3 | 68.3 | 48.4 | 48.4 | 48.4 |
| 30th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 13.9 | 13.9 | 13.9 | 13.9 | 13.9 | | 10.2 | 73.1 | 73.1 | 56.9 | 56.9 | 56.9 |
| 10th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 19 | 9 | 29 | 171 | 24 | | 135 | 205 | 8 | 6 | 722 | 3 |
| Fuel Used(l) | 3 | 1 | 20 | 24 | 5 | | 21 | 45 | 4 | 1 | 90 | 3 |
| CO Emissions (g/hr) | 49 | 20 | 369 | 446 | 91 | | 398 | 845 | 66 | 15 | 1672 | 58 |
| NOx Emissions (g/hr) | 9 | 4 | 71 | 86 | 18 | | 77 | 163 | 13 | 3 | 323 | 11 |
| VOC Emissions (g/hr) | 11 | 5 | 85 | 103 | 21 | | 92 | 195 | 15 | 3 | 386 | 13 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 22 | 0 | 0 | 45 | 0 |
| Queue Length 50th (m) | 4.8 | 1.8 | 0.0 | 44.5 | 5.1 | | 35.4 | 28.5 | 0.5 | 1.3 | 102.2 | 0.0 |
| Queue Length 95th (m) | 10.9 | 5.6 | 12.7 | 61.4 | 13.9 | | 50.5 | 34.3 | 2.1 | 4.5 | 114.3 | 2.2 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 299 | 421 | 595 | 328 | 431 | | 287 | 2130 | 970 | 343 | 1531 | 741 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.03 | 0.52 | 0.71 | 0.17 | | 0.63 | 0.28 | 0.05 | 0.03 | 0.74 | 0.09 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 75 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.82 | | | |
| Intersection Signal Delay: 23.8 | | Intersection LOS: C | |
| Intersection Capacity Utilization 66.9% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 4: 43 Street N & 9 Ave N



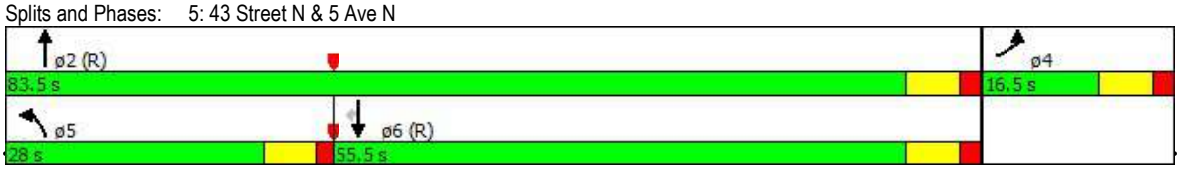
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 51 | 274 | 230 | 697 | 1406 | 112 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 304 | | | | 124 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 240.1 | 882.4 | |
| Travel Time (s) | 52.4 | | | 14.4 | 52.9 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 7% | 7% | 12% | 12% | 6% | 6% |
| Adj. Flow (vph) | 57 | 304 | 256 | 774 | 1562 | 124 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 57 | 304 | 256 | 774 | 1562 | 124 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 28.0 | 83.5 | 55.5 | 55.5 |
| Total Split (%) | 16.5% | | 28.0% | 83.5% | 55.5% | 55.5% |
| Maximum Green (s) | 10.0 | | 22.0 | 77.0 | 49.0 | 49.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 19.5 | 81.6 | 54.8 | 54.8 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.20 | 0.82 | 0.55 | 0.55 |
| v/c Ratio | 0.17 | 0.20 | 0.82 | 0.29 | 0.84 | 0.14 |
| Control Delay | 42.7 | 0.3 | 59.0 | 3.3 | 15.2 | 1.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.7 | 0.3 | 59.0 | 3.3 | 15.2 | 1.2 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | E | A | B | A |
| Approach Delay | 7.0 | | | 17.2 | 14.2 | |
| Approach LOS | A | | | B | B | |
| 90th %ile Green (s) | 10.0 | | 22.0 | 77.0 | 49.0 | 49.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 22.0 | 77.0 | 49.0 | 49.0 |
| 70th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 21.3 | 77.0 | 49.7 | 49.7 |
| 50th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | | 18.3 | 77.0 | 52.7 | 52.7 |
| 30th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 13.9 | 93.5 | 73.6 | 73.6 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 46 | 0 | 210 | 162 | 804 | 5 |
| Fuel Used(l) | 6 | 19 | 30 | 46 | 150 | 9 |
| CO Emissions (g/hr) | 116 | 354 | 559 | 853 | 2793 | 165 |
| NOx Emissions (g/hr) | 22 | 68 | 108 | 165 | 539 | 32 |
| VOC Emissions (g/hr) | 27 | 82 | 129 | 197 | 644 | 38 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 30 | 54 | 0 |
| Queue Length 50th (m) | 5.5 | 0.0 | 49.2 | 20.3 | 46.5 | 0.1 |
| Queue Length 95th (m) | 11.8 | 0.0 | #83.5 | 26.6 | #201.4 | m2.3 |
| Internal Link Dist (m) | 704.0 | | | 216.1 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 327 | 1509 | 354 | 2629 | 1866 | 891 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.17 | 0.20 | 0.72 | 0.29 | 0.84 | 0.14 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 14.4 Intersection LOS: B
Intersection Capacity Utilization 75.8% ICU Level of Service D
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: 43 Street N & 5 Ave N



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 216 | 627 | 6 | 288 | 781 | 303 | 387 | 374 | 313 | 452 | 694 | 350 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 1 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1641 | 3275 | 0 | 1687 | 3374 | 1509 | 3273 | 3374 | 1509 | 3155 | 3252 | 1455 |
| Flt Permitted | 0.250 | | | 0.203 | | | 0.120 | | | 0.418 | | |
| Satd. Flow (perm) | 432 | 3275 | 0 | 360 | 3374 | 1509 | 413 | 3374 | 1509 | 1388 | 3252 | 1455 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 329 | | | 313 | | | 204 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 401.6 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 24.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 7% | 7% | 7% | 7% | 7% | 7% | 11% | 11% | 11% |
| Adj. Flow (vph) | 235 | 682 | 7 | 313 | 849 | 329 | 421 | 407 | 340 | 491 | 754 | 380 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 235 | 689 | 0 | 313 | 849 | 329 | 421 | 407 | 340 | 491 | 754 | 380 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 16.0 | 43.0 | | 29.0 | 56.0 | 56.0 | 19.0 | 40.0 | 40.0 | 18.0 | 39.0 | 39.0 |
| Total Split (%) | 12.3% | 33.1% | | 22.3% | 43.1% | 43.1% | 14.6% | 30.8% | 30.8% | 13.8% | 30.0% | 30.0% |
| Maximum Green (s) | 10.0 | 36.0 | | 23.0 | 49.0 | 49.0 | 14.0 | 34.0 | 34.0 | 13.0 | 33.0 | 33.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 50.3 | 39.3 | | 65.6 | 49.0 | 49.0 | 48.3 | 33.3 | 33.3 | 46.3 | 32.3 | 32.3 |
| Actuated g/C Ratio | 0.39 | 0.30 | | 0.51 | 0.38 | 0.38 | 0.37 | 0.26 | 0.26 | 0.36 | 0.25 | 0.25 |
| v/c Ratio | 0.90 | 0.69 | | 0.82 | 0.66 | 0.42 | 0.91 | 0.47 | 0.55 | 0.73 | 0.93 | 0.74 |
| Control Delay | 60.8 | 44.8 | | 38.3 | 36.5 | 4.6 | 56.3 | 42.6 | 9.4 | 35.8 | 65.9 | 29.6 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 60.8 | 44.8 | | 38.3 | 36.5 | 4.6 | 56.3 | 42.6 | 9.4 | 35.8 | 65.9 | 29.6 |
| LOS | E | D | | D | D | A | E | D | A | D | E | C |
| Approach Delay | | 48.9 | | | 29.8 | | | 37.9 | | | 48.3 | |
| Approach LOS | | D | | | C | | | D | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 10.0 | 36.0 | | 23.0 | 49.0 | 49.0 | 14.0 | 34.0 | 34.0 | 13.0 | 33.0 | 33.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 70th %ile Green (s) | 10.0 | 36.0 | | 23.0 | 49.0 | 49.0 | 14.0 | 34.0 | 34.0 | 13.0 | 33.0 | 33.0 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 50th %ile Green (s) | 10.0 | 38.3 | | 20.7 | 49.0 | 49.0 | 14.0 | 34.0 | 34.0 | 13.0 | 33.0 | 33.0 |
| 50th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 30th %ile Green (s) | 10.0 | 41.0 | | 18.0 | 49.0 | 49.0 | 14.0 | 34.0 | 34.0 | 13.0 | 33.0 | 33.0 |
| 30th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 10th %ile Green (s) | 10.0 | 45.1 | | 13.9 | 49.0 | 49.0 | 14.0 | 30.5 | 30.5 | 13.0 | 29.5 | 29.5 |
| 10th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Hold | Hold | Max | Gap | Gap |
| Stops (vph) | 138 | 551 | | 172 | 633 | 24 | 261 | 308 | 42 | 350 | 638 | 162 |
| Fuel Used(l) | 26 | 76 | | 36 | 106 | 21 | 40 | 37 | 16 | 49 | 94 | 33 |
| CO Emissions (g/hr) | 477 | 1411 | | 669 | 1972 | 390 | 753 | 687 | 297 | 910 | 1757 | 608 |
| NOx Emissions (g/hr) | 92 | 272 | | 129 | 381 | 75 | 145 | 133 | 57 | 176 | 339 | 117 |
| VOC Emissions (g/hr) | 110 | 326 | | 154 | 455 | 90 | 174 | 159 | 68 | 210 | 405 | 140 |
| Dilemma Vehicles (#) | 0 | 24 | | 0 | 30 | 0 | 0 | 14 | 0 | 0 | 26 | 0 |
| Queue Length 50th (m) | 35.4 | 87.2 | | 49.5 | 99.5 | 0.0 | 41.8 | 48.7 | 5.5 | 47.3 | 104.4 | 44.5 |
| Queue Length 95th (m) | #79.3 | 113.1 | | #80.0 | 123.0 | 19.4 | #72.4 | 65.3 | 33.2 | 62.1 | #141.6 | 84.6 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 377.6 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 261 | 996 | | 419 | 1278 | 776 | 463 | 887 | 627 | 674 | 830 | 523 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.90 | 0.69 | | 0.75 | 0.66 | 0.42 | 0.91 | 0.46 | 0.54 | 0.73 | 0.91 | 0.73 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 129.3 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.93 | | | |
| Intersection Signal Delay: 40.8 | | Intersection LOS: D | |
| Intersection Capacity Utilization 83.8% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 130 | | | |
| 70th %ile Actuated Cycle: 130 | | | |
| 50th %ile Actuated Cycle: 130 | | | |
| 30th %ile Actuated Cycle: 130 | | | |
| 10th %ile Actuated Cycle: 126.5 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: 43 Street S/43 Street N & Hwy 3



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 20 | 9 | 179 | 218 | 31 | 25 | 106 | 338 | 60 | 7 | 279 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.883 | | | 0.988 | | | 0.984 | | | 0.994 | |
| Flt Protected | | 0.995 | | | 0.962 | | | 0.990 | | | 0.999 | |
| Satd. Flow (prot) | 0 | 1531 | 0 | 0 | 1642 | 0 | 0 | 1698 | 0 | 0 | 1747 | 0 |
| Flt Permitted | | 0.949 | | | 0.581 | | | 0.825 | | | 0.986 | |
| Satd. Flow (perm) | 0 | 1461 | 0 | 0 | 992 | 0 | 0 | 1415 | 0 | 0 | 1724 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 208 | | | 6 | | | 10 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 716.1 | | | 264.9 | | | 496.3 | | | 520.4 | |
| Travel Time (s) | | 51.6 | | | 19.1 | | | 25.5 | | | 26.8 | |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.92 | 0.92 | 0.92 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles (%) | 9% | 9% | 9% | 10% | 10% | 10% | 9% | 9% | 9% | 8% | 8% | 8% |
| Adj. Flow (vph) | 23 | 10 | 208 | 237 | 34 | 27 | 123 | 393 | 70 | 8 | 324 | 15 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 241 | 0 | 0 | 298 | 0 | 0 | 586 | 0 | 0 | 347 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 26.5 | 26.5 | | 22.5 | 22.5 | |
| Total Split (s) | 43.2 | 43.2 | | 43.2 | 43.2 | | 56.8 | 56.8 | | 56.8 | 56.8 | |
| Total Split (%) | 43.2% | 43.2% | | 43.2% | 43.2% | | 56.8% | 56.8% | | 56.8% | 56.8% | |
| Maximum Green (s) | 36.7 | 36.7 | | 36.7 | 36.7 | | 50.3 | 50.3 | | 50.3 | 50.3 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | | 36.7 | | | 36.7 | | | 50.3 | | | 50.3 | |
| Actuated g/C Ratio | | 0.37 | | | 0.37 | | | 0.50 | | | 0.50 | |
| v/c Ratio | | 0.36 | | | 0.81 | | | 0.82 | | | 0.40 | |
| Control Delay | | 6.4 | | | 47.3 | | | 18.8 | | | 17.1 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 6.4 | | | 47.3 | | | 18.8 | | | 17.1 | |
| LOS | | A | | | D | | | B | | | B | |
| Approach Delay | | 6.4 | | | 47.3 | | | 18.8 | | | 17.1 | |
| Approach LOS | | A | | | D | | | B | | | B | |
| Stops (vph) | | 33 | | | 227 | | | 228 | | | 177 | |
| Fuel Used(l) | | 16 | | | 22 | | | 38 | | | 24 | |
| CO Emissions (g/hr) | | 295 | | | 408 | | | 700 | | | 452 | |
| NOx Emissions (g/hr) | | 57 | | | 79 | | | 135 | | | 87 | |
| VOC Emissions (g/hr) | | 68 | | | 94 | | | 162 | | | 104 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 38 | | | 15 | |
| Queue Length 50th (m) | | 4.3 | | | 53.1 | | | 17.8 | | | 41.8 | |
| Queue Length 95th (m) | | 18.3 | | | #100.8 | | | 100.1 | | | 60.1 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Internal Link Dist (m) | | 692.1 | | | 240.9 | | | 472.3 | | | 496.4 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 667 | | | 367 | | | 716 | | | 868 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.36 | | | 0.81 | | | 0.82 | | | 0.40 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 86 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 65 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 0.82 | | | |
| Intersection Signal Delay: 22.1 | | Intersection LOS: C | |
| Intersection Capacity Utilization 92.7% | | 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: 2: 43 Street N & 18 Ave N



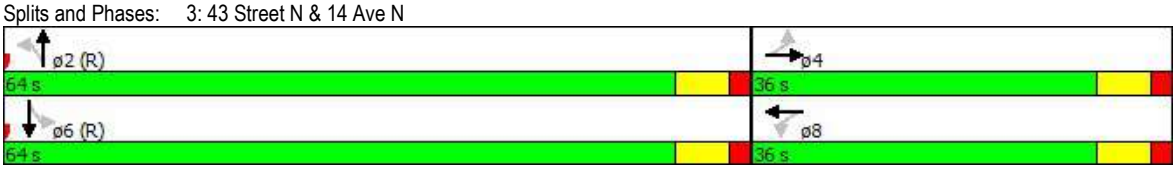
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 14 | 2 | 89 | 212 | 6 | 25 | 17 | 489 | 58 | 7 | 653 | 4 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 75.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.885 | | | 0.986 | | | 0.986 | | | 0.999 | |
| Flt Protected | | 0.993 | | | 0.958 | | 0.950 | | | | | |
| Satd. Flow (prot) | 0 | 1621 | 0 | 0 | 1632 | 0 | 1656 | 1719 | 0 | 0 | 1726 | 0 |
| Flt Permitted | | 0.937 | | | 0.684 | | 0.307 | | | | 0.993 | |
| Satd. Flow (perm) | 0 | 1530 | 0 | 0 | 1165 | 0 | 535 | 1719 | 0 | 0 | 1713 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 107 | | | 6 | | | 9 | | | 1 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 748.5 | | | 244.9 | | | 405.2 | | | 496.3 | |
| Travel Time (s) | | 53.9 | | | 17.6 | | | 20.8 | | | 25.5 | |
| Peak Hour Factor | 0.83 | 0.92 | 0.83 | 0.92 | 0.92 | 0.92 | 0.83 | 0.83 | 0.92 | 0.92 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 10% | 10% | 10% | 9% | 9% | 9% | 10% | 10% | 10% |
| Adj. Flow (vph) | 17 | 2 | 107 | 230 | 7 | 27 | 20 | 589 | 63 | 8 | 787 | 5 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 126 | 0 | 0 | 264 | 0 | 20 | 652 | 0 | 0 | 800 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (s) | 36.0 | 36.0 | | 36.0 | 36.0 | | 64.0 | 64.0 | | 64.0 | 64.0 | |
| Total Split (%) | 36.0% | 36.0% | | 36.0% | 36.0% | | 64.0% | 64.0% | | 64.0% | 64.0% | |
| Maximum Green (s) | 29.5 | 29.5 | | 29.5 | 29.5 | | 57.5 | 57.5 | | 57.5 | 57.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | 6.5 | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | | 29.5 | | | 29.5 | | 57.5 | 57.5 | | | 57.5 | |
| Actuated g/C Ratio | | 0.30 | | | 0.30 | | 0.58 | 0.58 | | | 0.58 | |
| v/c Ratio | | 0.24 | | | 0.76 | | 0.07 | 0.66 | | | 0.81 | |
| Control Delay | | 8.5 | | | 47.3 | | 8.6 | 16.2 | | | 22.1 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 8.5 | | | 47.3 | | 8.6 | 16.2 | | | 22.1 | |
| LOS | | A | | | D | | A | B | | | C | |
| Approach Delay | | 8.5 | | | 47.3 | | | 15.9 | | | 22.1 | |
| Approach LOS | | A | | | D | | | B | | | C | |
| Stops (vph) | | 23 | | | 206 | | 6 | 342 | | | 473 | |
| Fuel Used(l) | | 9 | | | 19 | | 1 | 49 | | | 59 | |
| CO Emissions (g/hr) | | 161 | | | 355 | | 23 | 906 | | | 1096 | |
| NOx Emissions (g/hr) | | 31 | | | 69 | | 4 | 175 | | | 212 | |
| VOC Emissions (g/hr) | | 37 | | | 82 | | 5 | 209 | | | 253 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dilemma Vehicles (#) | | 0 | | | 0 | | 0 | 24 | | | 57 | |
| Queue Length 50th (m) | | 2.8 | | | 47.7 | | 1.4 | 53.2 | | | 108.0 | |
| Queue Length 95th (m) | | 16.3 | | | #88.2 | | 3.4 | 62.7 | | | 147.7 | |
| Internal Link Dist (m) | | 724.5 | | | 220.9 | | | 381.2 | | | 472.3 | |
| Turn Bay Length (m) | | | | | | | 75.0 | | | | | |
| Base Capacity (vph) | | 526 | | | 347 | | 307 | 992 | | | 985 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.24 | | | 0.76 | | 0.07 | 0.66 | | | 0.81 | |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 63 (63%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Pretimed
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 22.5 Intersection LOS: C
Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: 43 Street N & 14 Ave N





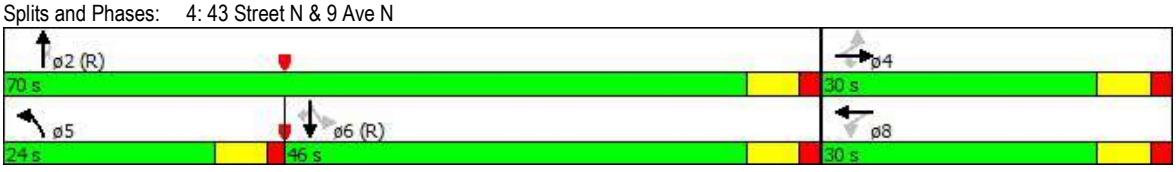
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 23 | 9 | 248 | 186 | 25 | 33 | 144 | 477 | 42 | 9 | 904 | 56 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.915 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1703 | 1792 | 1524 | 1770 | 1704 | 0 | 1597 | 3195 | 1429 | 1687 | 3374 | 1509 |
| Flt Permitted | 0.710 | | | 0.750 | | | 0.950 | | | 0.427 | | |
| Satd. Flow (perm) | 1273 | 1792 | 1524 | 1397 | 1704 | 0 | 1597 | 3195 | 1429 | 758 | 3374 | 1509 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 310 | | 41 | | | | 52 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 |
| Heavy Vehicles (%) | 6% | 6% | 6% | 2% | 2% | 2% | 13% | 13% | 13% | 7% | 7% | 7% |
| Adj. Flow (vph) | 29 | 11 | 310 | 232 | 31 | 41 | 180 | 596 | 52 | 11 | 1130 | 70 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 29 | 11 | 310 | 232 | 72 | 0 | 180 | 596 | 52 | 11 | 1130 | 70 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | | 12.0 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | | 24.0 | 70.0 | 70.0 | 46.0 | 46.0 | 46.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 30.0% | 30.0% | | 24.0% | 70.0% | 70.0% | 46.0% | 46.0% | 46.0% |
| Maximum Green (s) | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | | 18.0 | 63.5 | 63.5 | 39.5 | 39.5 | 39.5 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | | | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Flash Dont Walk (s) | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | | | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 20.3 | 20.3 | 20.3 | 20.3 | 20.3 | | 15.3 | 66.7 | 66.7 | 45.4 | 45.4 | 45.4 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | | 0.15 | 0.67 | 0.67 | 0.45 | 0.45 | 0.45 |
| v/c Ratio | 0.11 | 0.03 | 0.56 | 0.82 | 0.19 | | 0.74 | 0.28 | 0.05 | 0.03 | 0.74 | 0.09 |
| Control Delay | 31.9 | 30.1 | 7.9 | 60.5 | 17.3 | | 54.3 | 6.1 | 1.5 | 20.8 | 25.4 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 31.9 | 30.1 | 7.9 | 60.5 | 17.3 | | 54.3 | 6.1 | 1.5 | 20.8 | 25.4 | 2.9 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | C | C | A | E | B | | D | A | A | C | C | A |
| Approach Delay | | 10.6 | | | 50.2 | | | 16.3 | | | 24.1 | |
| Approach LOS | | B | | | D | | | B | | | C | |
| 90th %ile Green (s) | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | | 18.0 | 63.5 | 63.5 | 39.5 | 39.5 | 39.5 |
| 90th %ile Term Code | Hold | Hold | Hold | Max | Max | | Max | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 23.5 | 23.5 | 23.5 | 23.5 | 23.5 | | 18.0 | 63.5 | 63.5 | 39.5 | 39.5 | 39.5 |
| 70th %ile Term Code | Hold | Hold | Hold | Max | Max | | Max | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 22.0 | 22.0 | 22.0 | 22.0 | 22.0 | | 16.4 | 65.0 | 65.0 | 42.6 | 42.6 | 42.6 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 18.7 | 18.7 | 18.7 | 18.7 | 18.7 | | 13.9 | 68.3 | 68.3 | 48.4 | 48.4 | 48.4 |
| 30th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 13.9 | 13.9 | 13.9 | 13.9 | 13.9 | | 10.2 | 73.1 | 73.1 | 56.9 | 56.9 | 56.9 |
| 10th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 19 | 9 | 29 | 171 | 24 | | 135 | 205 | 8 | 7 | 638 | 7 |
| Fuel Used(l) | 3 | 1 | 20 | 24 | 5 | | 21 | 45 | 4 | 1 | 86 | 3 |
| CO Emissions (g/hr) | 49 | 20 | 369 | 446 | 91 | | 398 | 845 | 66 | 16 | 1593 | 61 |
| NOx Emissions (g/hr) | 9 | 4 | 71 | 86 | 18 | | 77 | 163 | 13 | 3 | 307 | 12 |
| VOC Emissions (g/hr) | 11 | 5 | 85 | 103 | 21 | | 92 | 195 | 15 | 4 | 367 | 14 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 22 | 0 | 0 | 59 | 0 |
| Queue Length 50th (m) | 4.8 | 1.8 | 0.0 | 44.5 | 5.1 | | 35.4 | 28.5 | 0.5 | 1.2 | 80.1 | 0.1 |
| Queue Length 95th (m) | 10.9 | 5.6 | 12.7 | 61.4 | 13.9 | | 50.5 | 34.3 | 2.1 | m2.3 | 104.1 | m0.8 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 299 | 421 | 595 | 328 | 431 | | 287 | 2130 | 970 | 343 | 1531 | 741 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.10 | 0.03 | 0.52 | 0.71 | 0.17 | | 0.63 | 0.28 | 0.05 | 0.03 | 0.74 | 0.09 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 85 (85%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 22.9 Intersection LOS: C
Intersection Capacity Utilization 66.9% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: 43 Street N & 9 Ave N



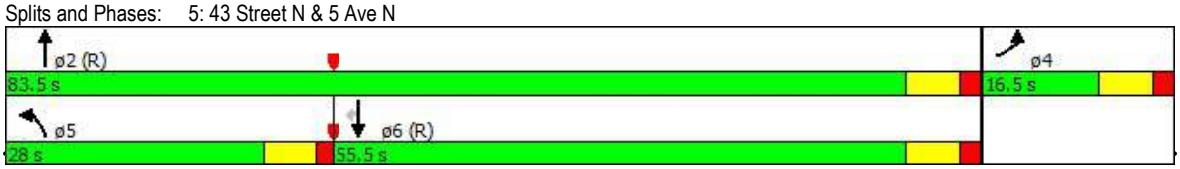
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 51 | 274 | 230 | 697 | 1406 | 112 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3273 | 1509 | 1612 | 3223 | 3406 | 1524 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 304 | | | | 124 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 240.1 | 882.4 | |
| Travel Time (s) | 52.4 | | | 14.4 | 52.9 | |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles (%) | 7% | 7% | 12% | 12% | 6% | 6% |
| Adj. Flow (vph) | 57 | 304 | 256 | 774 | 1562 | 124 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 57 | 304 | 256 | 774 | 1562 | 124 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 28.0 | 83.5 | 55.5 | 55.5 |
| Total Split (%) | 16.5% | | 28.0% | 83.5% | 55.5% | 55.5% |
| Maximum Green (s) | 10.0 | | 22.0 | 77.0 | 49.0 | 49.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 19.5 | 81.6 | 54.8 | 54.8 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.20 | 0.82 | 0.55 | 0.55 |
| v/c Ratio | 0.17 | 0.20 | 0.82 | 0.29 | 0.84 | 0.14 |
| Control Delay | 42.7 | 0.3 | 59.0 | 3.3 | 15.2 | 1.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 42.7 | 0.3 | 59.0 | 3.3 | 15.2 | 1.2 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | E | A | B | A |
| Approach Delay | 7.0 | | | 17.2 | 14.2 | |
| Approach LOS | A | | | B | B | |
| 90th %ile Green (s) | 10.0 | | 22.0 | 77.0 | 49.0 | 49.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 22.0 | 77.0 | 49.0 | 49.0 |
| 70th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 21.3 | 77.0 | 49.7 | 49.7 |
| 50th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | | 18.3 | 77.0 | 52.7 | 52.7 |
| 30th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 13.9 | 93.5 | 73.6 | 73.6 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Stops (vph) | 46 | 0 | 210 | 162 | 770 | 5 |
| Fuel Used(l) | 6 | 19 | 30 | 46 | 149 | 9 |
| CO Emissions (g/hr) | 116 | 354 | 559 | 853 | 2773 | 165 |
| NOx Emissions (g/hr) | 22 | 68 | 108 | 165 | 535 | 32 |
| VOC Emissions (g/hr) | 27 | 82 | 129 | 197 | 639 | 38 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 30 | 61 | 0 |
| Queue Length 50th (m) | 5.5 | 0.0 | 49.2 | 20.3 | 47.5 | 0.1 |
| Queue Length 95th (m) | 11.8 | 0.0 | #83.5 | 26.6 | #201.3 | m2.3 |
| Internal Link Dist (m) | 704.0 | | | 216.1 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 327 | 1509 | 354 | 2629 | 1866 | 891 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.17 | 0.20 | 0.72 | 0.29 | 0.84 | 0.14 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 27 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 75.8% ICU Level of Service D
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: 43 Street N & 5 Ave N

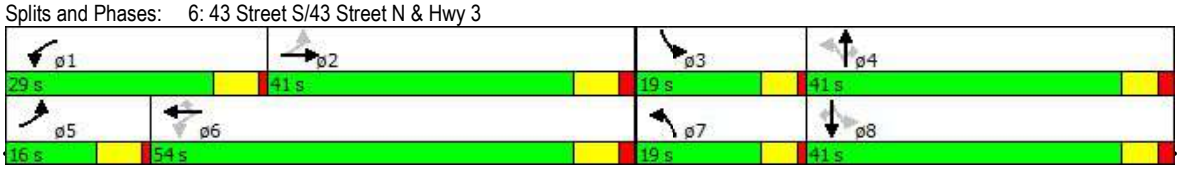


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 216 | 627 | 6 | 288 | 781 | 303 | 387 | 374 | 313 | 452 | 694 | 350 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 2 | | 0 | 1 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3183 | 3275 | 0 | 1687 | 3374 | 1509 | 3273 | 3374 | 1509 | 3155 | 3252 | 1455 |
| Flt Permitted | 0.245 | | | 0.190 | | | 0.136 | | | 0.407 | | |
| Satd. Flow (perm) | 821 | 3275 | 0 | 337 | 3374 | 1509 | 469 | 3374 | 1509 | 1352 | 3252 | 1455 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 329 | | | 315 | | | 202 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 401.6 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 24.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 10% | 10% | 10% | 7% | 7% | 7% | 7% | 7% | 7% | 11% | 11% | 11% |
| Adj. Flow (vph) | 235 | 682 | 7 | 313 | 849 | 329 | 421 | 407 | 340 | 491 | 754 | 380 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 235 | 689 | 0 | 313 | 849 | 329 | 421 | 407 | 340 | 491 | 754 | 380 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 16.0 | 41.0 | | 29.0 | 54.0 | 54.0 | 19.0 | 41.0 | 41.0 | 19.0 | 41.0 | 41.0 |
| Total Split (%) | 12.3% | 31.5% | | 22.3% | 41.5% | 41.5% | 14.6% | 31.5% | 31.5% | 14.6% | 31.5% | 31.5% |
| Maximum Green (s) | 10.0 | 34.0 | | 23.0 | 47.0 | 47.0 | 14.0 | 35.0 | 35.0 | 14.0 | 35.0 | 35.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 47.9 | 36.9 | | 63.6 | 47.0 | 47.0 | 48.3 | 33.3 | 33.3 | 48.3 | 33.3 | 33.3 |
| Actuated g/C Ratio | 0.37 | 0.29 | | 0.50 | 0.37 | 0.37 | 0.38 | 0.26 | 0.26 | 0.38 | 0.26 | 0.26 |
| v/c Ratio | 0.48 | 0.73 | | 0.83 | 0.69 | 0.43 | 0.87 | 0.47 | 0.54 | 0.70 | 0.89 | 0.72 |
| Control Delay | 22.9 | 47.6 | | 41.7 | 38.2 | 4.8 | 48.5 | 41.9 | 9.1 | 32.7 | 59.9 | 28.2 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 22.9 | 47.6 | | 41.7 | 38.2 | 4.8 | 48.5 | 41.9 | 9.1 | 32.7 | 59.9 | 28.2 |
| LOS | C | D | | D | D | A | D | D | A | C | E | C |
| Approach Delay | | 41.3 | | | 31.6 | | | 34.7 | | | 44.3 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 10.0 | 34.0 | | 23.0 | 47.0 | 47.0 | 14.0 | 35.0 | 35.0 | 14.0 | 35.0 | 35.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 70th %ile Green (s) | 10.0 | 34.0 | | 23.0 | 47.0 | 47.0 | 14.0 | 35.0 | 35.0 | 14.0 | 35.0 | 35.0 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 50th %ile Green (s) | 10.0 | 34.7 | | 22.3 | 47.0 | 47.0 | 14.0 | 35.0 | 35.0 | 14.0 | 35.0 | 35.0 |
| 50th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Hold | Hold | Max | Max | Max |
| 30th %ile Green (s) | 10.0 | 38.5 | | 18.5 | 47.0 | 47.0 | 14.0 | 33.9 | 33.9 | 14.0 | 33.9 | 33.9 |
| 30th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Hold | Hold | Max | Gap | Gap |
| 10th %ile Green (s) | 10.0 | 43.1 | | 13.9 | 47.0 | 47.0 | 14.0 | 27.8 | 27.8 | 14.0 | 27.8 | 27.8 |
| 10th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Hold | Hold | Max | Gap | Gap |
| Stops (vph) | 139 | 562 | | 178 | 647 | 24 | 256 | 306 | 41 | 329 | 640 | 161 |
| Fuel Used(l) | 19 | 78 | | 37 | 108 | 21 | 38 | 37 | 16 | 47 | 91 | 32 |
| CO Emissions (g/hr) | 361 | 1448 | | 689 | 2006 | 391 | 706 | 682 | 295 | 877 | 1699 | 601 |
| NOx Emissions (g/hr) | 70 | 280 | | 133 | 387 | 75 | 136 | 132 | 57 | 169 | 328 | 116 |
| VOC Emissions (g/hr) | 83 | 334 | | 159 | 463 | 90 | 163 | 157 | 68 | 202 | 392 | 139 |
| Dilemma Vehicles (#) | 0 | 25 | | 0 | 30 | 0 | 0 | 14 | 0 | 0 | 26 | 0 |
| Queue Length 50th (m) | 17.4 | 91.0 | | 51.2 | 102.2 | 0.0 | 38.6 | 48.2 | 5.0 | 45.9 | 102.1 | 44.1 |
| Queue Length 95th (m) | 25.3 | 115.7 | | #90.8 | 126.4 | 19.9 | #66.9 | 64.5 | 32.2 | 60.4 | #134.2 | 83.3 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 377.6 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 490 | 943 | | 410 | 1236 | 761 | 482 | 920 | 640 | 705 | 887 | 544 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.73 | | 0.76 | 0.69 | 0.43 | 0.87 | 0.44 | 0.53 | 0.70 | 0.85 | 0.70 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 128.3 | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 0.89 | | | |
| Intersection Signal Delay: 38.0 | | Intersection LOS: D | |
| Intersection Capacity Utilization 83.7% | | ICU Level of Service E | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 130 | | | |
| 70th %ile Actuated Cycle: 130 | | | |
| 50th %ile Actuated Cycle: 130 | | | |
| 30th %ile Actuated Cycle: 128.9 | | | |
| 10th %ile Actuated Cycle: 122.8 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 6: 43 Street S/43 Street N & Hwy 3

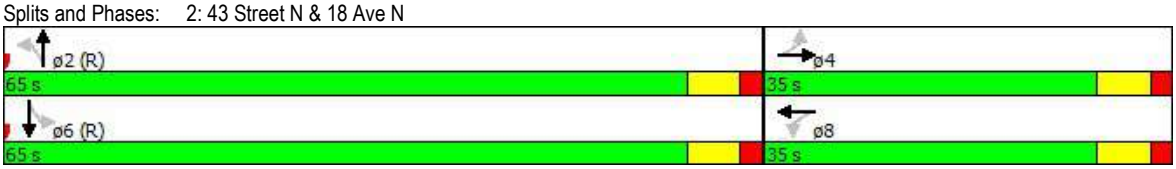


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 13 | 35 | 149 | 54 | 8 | 6 | 249 | 212 | 243 | 28 | 376 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.898 | | | 0.987 | | | 0.953 | | | 0.995 | |
| Flt Protected | | 0.997 | | | 0.962 | | | 0.983 | | | 0.997 | |
| Satd. Flow (prot) | 0 | 1519 | 0 | 0 | 1640 | 0 | 0 | 1618 | 0 | 0 | 1830 | 0 |
| Flt Permitted | | 0.980 | | | 0.595 | | | 0.645 | | | 0.905 | |
| Satd. Flow (perm) | 0 | 1493 | 0 | 0 | 1014 | 0 | 0 | 1062 | 0 | 0 | 1661 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 155 | | | 5 | | | 46 | | | 3 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 716.1 | | | 196.5 | | | 496.3 | | | 520.4 | |
| Travel Time (s) | | 51.6 | | | 14.1 | | | 25.5 | | | 26.8 | |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Heavy Vehicles (%) | 12% | 12% | 12% | 10% | 10% | 10% | 10% | 10% | 10% | 3% | 3% | 3% |
| Adj. Flow (vph) | 17 | 45 | 191 | 59 | 9 | 7 | 319 | 272 | 312 | 36 | 482 | 19 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 253 | 0 | 0 | 75 | 0 | 0 | 903 | 0 | 0 | 537 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 26.5 | 26.5 | | 22.5 | 22.5 | |
| Total Split (s) | 35.0 | 35.0 | | 35.0 | 35.0 | | 65.0 | 65.0 | | 65.0 | 65.0 | |
| Total Split (%) | 35.0% | 35.0% | | 35.0% | 35.0% | | 65.0% | 65.0% | | 65.0% | 65.0% | |
| Maximum Green (s) | 28.5 | 28.5 | | 28.5 | 28.5 | | 58.5 | 58.5 | | 58.5 | 58.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | | 28.5 | | | 28.5 | | | 58.5 | | | 58.5 | |
| Actuated g/C Ratio | | 0.28 | | | 0.28 | | | 0.58 | | | 0.58 | |
| v/c Ratio | | 0.47 | | | 0.26 | | | 1.41 | | | 0.55 | |
| Control Delay | | 14.8 | | | 28.6 | | | 204.0 | | | 15.4 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 14.8 | | | 28.6 | | | 204.0 | | | 15.4 | |
| LOS | | B | | | C | | | F | | | B | |
| Approach Delay | | 14.8 | | | 28.6 | | | 204.0 | | | 15.4 | |
| Approach LOS | | B | | | C | | | F | | | B | |
| Stops (vph) | | 66 | | | 49 | | | 351 | | | 247 | |
| Fuel Used(l) | | 17 | | | 4 | | | 154 | | | 34 | |
| CO Emissions (g/hr) | | 318 | | | 73 | | | 2871 | | | 624 | |
| NOx Emissions (g/hr) | | 61 | | | 14 | | | 554 | | | 120 | |
| VOC Emissions (g/hr) | | 73 | | | 17 | | | 662 | | | 144 | |
| Dilemma Vehicles (#) | | 0 | | | 0 | | | 33 | | | 21 | |
| Queue Length 50th (m) | | 15.3 | | | 11.0 | | | ~243.2 | | | 62.3 | |
| Queue Length 95th (m) | | 28.0 | | | 23.5 | | | m#233.4 | | | 73.2 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Internal Link Dist (m) | | 692.1 | | | 172.5 | | | 472.3 | | | 496.4 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 536 | | | 292 | | | 640 | | | 972 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.47 | | | 0.26 | | | 1.41 | | | 0.55 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 86 (86%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 110 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 1.41 | | | |
| Intersection Signal Delay: 112.2 | | Intersection LOS: F | |
| Intersection Capacity Utilization 101.6% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |
| ~ Volume exceeds capacity, queue is theoretically infinite. | | | |
| Queue shown is maximum after two cycles. | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |
| m Volume for 95th percentile queue is metered by upstream signal. | | | |

Splits and Phases: 2: 43 Street N & 18 Ave N

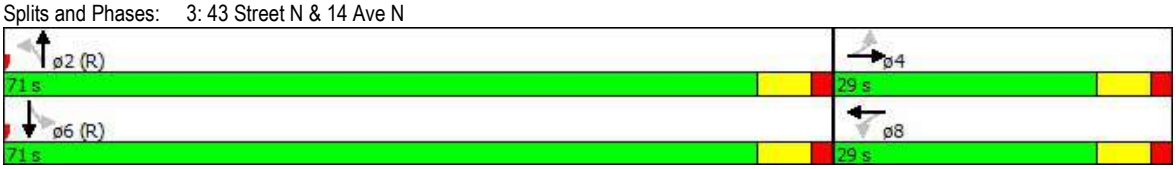


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 4 | 7 | 27 | 53 | 2 | 6 | 101 | 670 | 236 | 28 | 532 | 21 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 75.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.905 | | | 0.986 | | | 0.961 | | | 0.995 | |
| Flt Protected | | 0.995 | | | 0.959 | | 0.950 | | | | 0.998 | |
| Satd. Flow (prot) | 0 | 1104 | 0 | 0 | 1633 | 0 | 1641 | 1660 | 0 | 0 | 1780 | 0 |
| Flt Permitted | | 0.975 | | | 0.728 | | 0.368 | | | | 0.501 | |
| Satd. Flow (perm) | 0 | 1082 | 0 | 0 | 1240 | 0 | 636 | 1660 | 0 | 0 | 894 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 33 | | | 5 | | | 36 | | | 4 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 748.5 | | | 168.6 | | | 405.2 | | | 496.3 | |
| Travel Time (s) | | 53.9 | | | 12.1 | | | 20.8 | | | 25.5 | |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.92 | 0.92 | 0.92 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Heavy Vehicles (%) | 55% | 55% | 55% | 10% | 10% | 10% | 10% | 10% | 10% | 6% | 6% | 6% |
| Adj. Flow (vph) | 5 | 9 | 33 | 58 | 2 | 7 | 125 | 827 | 291 | 35 | 657 | 26 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 47 | 0 | 0 | 67 | 0 | 125 | 1118 | 0 | 0 | 718 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (s) | 29.0 | 29.0 | | 29.0 | 29.0 | | 71.0 | 71.0 | | 71.0 | 71.0 | |
| Total Split (%) | 29.0% | 29.0% | | 29.0% | 29.0% | | 71.0% | 71.0% | | 71.0% | 71.0% | |
| Maximum Green (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 64.5 | 64.5 | | 64.5 | 64.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | 6.5 | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Act Effct Green (s) | | 22.5 | | | 22.5 | | 64.5 | 64.5 | | | 64.5 | |
| Actuated g/C Ratio | | 0.22 | | | 0.22 | | 0.64 | 0.64 | | | 0.64 | |
| v/c Ratio | | 0.17 | | | 0.24 | | 0.30 | 1.03 | | | 1.24 | |
| Control Delay | | 16.7 | | | 32.1 | | 7.8 | 49.3 | | | 146.6 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 16.7 | | | 32.1 | | 7.8 | 49.3 | | | 146.6 | |
| LOS | | B | | | C | | A | D | | | F | |
| Approach Delay | | 16.7 | | | 32.1 | | | 45.2 | | | 146.6 | |
| Approach LOS | | B | | | C | | | D | | | F | |
| Stops (vph) | | 15 | | | 47 | | 27 | 613 | | | 428 | |
| Fuel Used(l) | | 4 | | | 4 | | 7 | 106 | | | 108 | |
| CO Emissions (g/hr) | | 66 | | | 67 | | 126 | 1968 | | | 2008 | |
| NOx Emissions (g/hr) | | 13 | | | 13 | | 24 | 380 | | | 388 | |
| VOC Emissions (g/hr) | | 15 | | | 15 | | 29 | 454 | | | 463 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dilemma Vehicles (#) | | 0 | | | 0 | | 0 | 37 | | | 38 | |
| Queue Length 50th (m) | | 2.3 | | | 10.4 | | 7.3 | ~182.5 | | | ~177.2 | |
| Queue Length 95th (m) | | 10.1 | | | 22.7 | | 11.0 | #130.1 | | | #213.5 | |
| Internal Link Dist (m) | | 724.5 | | | 144.6 | | | 381.2 | | | 472.3 | |
| Turn Bay Length (m) | | | | | | | 75.0 | | | | | |
| Base Capacity (vph) | | 269 | | | 282 | | 410 | 1083 | | | 578 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.17 | | | 0.24 | | 0.30 | 1.03 | | | 1.24 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 63 (63%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Pretimed | | | |
| Maximum v/c Ratio: 1.24 | | | |
| Intersection Signal Delay: 79.2 | | Intersection LOS: E | |
| Intersection Capacity Utilization 73.1% | | ICU Level of Service D | |
| 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: 3: 43 Street N & 14 Ave N



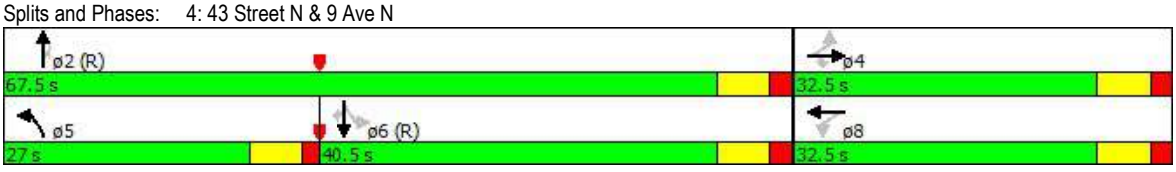
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 39 | 32 | 116 | 46 | 12 | 11 | 282 | 971 | 193 | 38 | 551 | 25 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.928 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1296 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.740 | | | 0.732 | | | 0.950 | | | 0.242 | | |
| Satd. Flow (perm) | 1365 | 1845 | 1568 | 1023 | 1296 | 0 | 1656 | 3312 | 1482 | 422 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 140 | | 13 | | | | 233 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 47 | 39 | 140 | 55 | 14 | 13 | 340 | 1170 | 233 | 46 | 664 | 30 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 47 | 39 | 140 | 55 | 27 | 0 | 340 | 1170 | 233 | 46 | 664 | 30 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 27.0 | 67.5 | 67.5 | 40.5 | 40.5 | 40.5 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 32.5% | | 27.0% | 67.5% | 67.5% | 40.5% | 40.5% | 40.5% |
| Maximum Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 21.0 | 61.0 | 61.0 | 34.0 | 34.0 | 34.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 28.0 | 75.0 | 75.0 | 41.0 | 41.0 | 41.0 |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | | 0.28 | 0.75 | 0.75 | 0.41 | 0.41 | 0.41 |
| v/c Ratio | 0.29 | 0.18 | 0.45 | 0.45 | 0.16 | | 0.73 | 0.47 | 0.20 | 0.27 | 0.49 | 0.04 |
| Control Delay | 43.9 | 40.4 | 11.6 | 52.3 | 27.1 | | 35.5 | 3.0 | 0.4 | 29.8 | 28.7 | 0.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.9 | 40.4 | 11.6 | 52.3 | 27.1 | | 35.5 | 3.0 | 0.4 | 29.8 | 28.7 | 0.0 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | C | C | A |
| Approach Delay | | 23.3 | | | 44.0 | | | 9.0 | | | 27.6 | |
| Approach LOS | | C | | | D | | | A | | | C | |
| 90th %ile Green (s) | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | | 30.8 | 70.8 | 70.8 | 34.0 | 34.0 | 34.0 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Max | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | | 29.8 | 74.1 | 74.1 | 38.3 | 38.3 | 38.3 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.7 | 10.7 | 10.7 | 10.7 | 10.7 | | 28.6 | 76.3 | 76.3 | 41.7 | 41.7 | 41.7 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 27.1 | 77.0 | 77.0 | 43.9 | 43.9 | 43.9 |
| 30th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 23.9 | 77.0 | 77.0 | 47.1 | 47.1 | 47.1 |
| 10th %ile Term Code | Min | Min | Min | Hold | Hold | | Gap | Coord | Coord | Coord | Coord | Coord |
| Stops (vph) | 34 | 29 | 18 | 42 | 13 | | 211 | 162 | 2 | 26 | 387 | 0 |
| Fuel Used(l) | 5 | 4 | 10 | 6 | 2 | | 36 | 82 | 15 | 4 | 54 | 1 |
| CO Emissions (g/hr) | 90 | 73 | 181 | 105 | 39 | | 672 | 1523 | 277 | 69 | 996 | 24 |
| NOx Emissions (g/hr) | 17 | 14 | 35 | 20 | 8 | | 130 | 294 | 54 | 13 | 192 | 5 |
| VOC Emissions (g/hr) | 21 | 17 | 42 | 24 | 9 | | 155 | 351 | 64 | 16 | 230 | 6 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 0 | 0 | | 0 | 45 | 0 | 0 | 39 | 0 |
| Queue Length 50th (m) | 9.0 | 7.4 | 0.0 | 10.8 | 2.6 | | 44.2 | 16.6 | 0.0 | 6.9 | 53.3 | 0.0 |
| Queue Length 95th (m) | 17.7 | 15.2 | 13.3 | 20.4 | 9.4 | | 68.2 | 17.8 | 0.2 | m6.8 | m45.8 | m0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 354 | 479 | 511 | 265 | 346 | | 464 | 2485 | 1170 | 172 | 1357 | 668 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.08 | 0.27 | 0.21 | 0.08 | | 0.73 | 0.47 | 0.20 | 0.27 | 0.49 | 0.04 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 87 (87%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.73 | | | |
| Intersection Signal Delay: 16.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 64.8% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

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

Splits and Phases: 4: 43 Street N & 9 Ave N



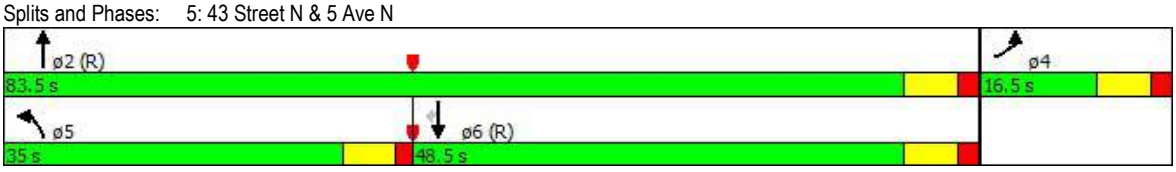
| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 98 | 213 | 356 | 1405 | 711 | 53 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 245 | | | | 61 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 113 | 245 | 409 | 1615 | 817 | 61 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 113 | 245 | 409 | 1615 | 817 | 61 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 35.0 | 83.5 | 48.5 | 48.5 |
| Total Split (%) | 16.5% | | 35.0% | 83.5% | 48.5% | 48.5% |
| Maximum Green (s) | 10.0 | | 29.0 | 77.0 | 42.0 | 42.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 100.0 | 26.9 | 77.0 | 44.1 | 44.1 |
| Actuated g/C Ratio | 0.10 | 1.00 | 0.27 | 0.77 | 0.44 | 0.44 |
| v/c Ratio | 0.36 | 0.17 | 0.89 | 0.62 | 0.60 | 0.09 |
| Control Delay | 45.6 | 0.3 | 58.0 | 6.3 | 9.6 | 1.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 45.6 | 0.3 | 58.0 | 6.3 | 9.6 | 1.0 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | D | A | E | A | A | A |
| Approach Delay | 14.6 | | | 16.7 | 9.0 | |
| Approach LOS | B | | | B | A | |
| 90th %ile Green (s) | 10.0 | | 29.0 | 77.0 | 42.0 | 42.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 29.0 | 77.0 | 42.0 | 42.0 |
| 70th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 29.0 | 77.0 | 42.0 | 42.0 |
| 50th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | | 26.4 | 77.0 | 44.6 | 44.6 |
| 30th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| 10th %ile Green (s) | 10.0 | | 21.2 | 77.0 | 49.8 | 49.8 |
| 10th %ile Term Code | Max | | Gap | Coord | Coord | Coord |
| Stops (vph) | 88 | 0 | 319 | 553 | 283 | 3 |
| Fuel Used(l) | 12 | 15 | 46 | 103 | 69 | 4 |
| CO Emissions (g/hr) | 227 | 275 | 856 | 1914 | 1281 | 78 |
| NOx Emissions (g/hr) | 44 | 53 | 165 | 369 | 247 | 15 |
| VOC Emissions (g/hr) | 52 | 63 | 197 | 442 | 296 | 18 |
| Dilemma Vehicles (#) | 0 | 0 | 0 | 70 | 21 | 0 |
| Queue Length 50th (m) | 11.2 | 0.0 | 77.8 | 61.3 | 15.7 | 0.2 |
| Queue Length 95th (m) | 19.4 | 0.0 | #120.9 | 71.7 | 21.8 | 1.6 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 312 | 1442 | 493 | 2622 | 1371 | 647 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.36 | 0.17 | 0.83 | 0.62 | 0.60 | 0.09 |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 32 (32%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 14.4 Intersection LOS: B
Intersection Capacity Utilization 63.5% ICU Level of Service B
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: 43 Street N & 5 Ave N

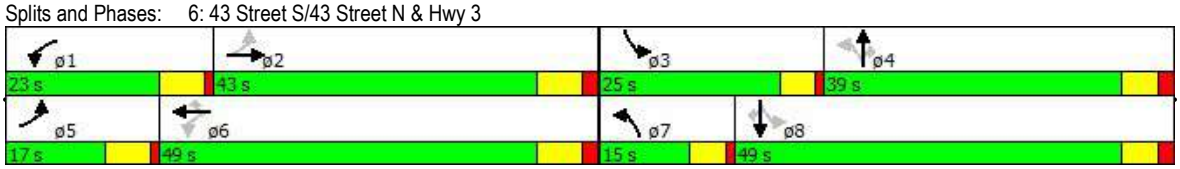


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 582 | 878 | 12 | 354 | 854 | 722 | 377 | 967 | 255 | 561 | 571 | 290 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 2 | | 0 | 2 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3155 | 4664 | 0 | 3213 | 4759 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.220 | | | 0.154 | | | 0.375 | | | 0.105 | | |
| Satd. Flow (perm) | 731 | 4664 | 0 | 521 | 4759 | 1482 | 1257 | 3282 | 1468 | 337 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 280 | | | 202 | | | 233 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 633 | 954 | 13 | 385 | 928 | 785 | 410 | 1051 | 277 | 610 | 621 | 315 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 633 | 967 | 0 | 385 | 928 | 785 | 410 | 1051 | 277 | 610 | 621 | 315 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 17.0 | 43.0 | | 23.0 | 49.0 | 49.0 | 15.0 | 39.0 | 39.0 | 25.0 | 49.0 | 49.0 |
| Total Split (%) | 13.1% | 33.1% | | 17.7% | 37.7% | 37.7% | 11.5% | 30.0% | 30.0% | 19.2% | 37.7% | 37.7% |
| Maximum Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 50.3 | 38.3 | | 57.7 | 42.0 | 42.0 | 44.0 | 33.0 | 33.0 | 59.0 | 43.0 | 43.0 |
| Actuated g/C Ratio | 0.39 | 0.29 | | 0.44 | 0.32 | 0.32 | 0.34 | 0.25 | 0.25 | 0.45 | 0.33 | 0.33 |
| v/c Ratio | 1.30 | 0.70 | | 0.72 | 0.60 | 1.18 | 0.72 | 1.26 | 0.53 | 1.07 | 0.60 | 0.51 |
| Control Delay | 175.2 | 44.5 | | 29.7 | 39.0 | 120.1 | 33.5 | 167.7 | 15.9 | 94.5 | 39.2 | 12.4 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 175.2 | 44.5 | | 29.7 | 39.0 | 120.1 | 33.5 | 167.7 | 15.9 | 94.5 | 39.2 | 12.4 |
| LOS | F | D | | C | D | F | C | F | B | F | D | B |
| Approach Delay | | 96.2 | | | 67.6 | | | 111.8 | | | 55.6 | |
| Approach LOS | | F | | | E | | | F | | | E | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 11.0 | 36.0 | | 17.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 70th %ile Green (s) | 11.0 | 36.3 | | 16.7 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| 70th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 50th %ile Green (s) | 11.0 | 38.0 | | 15.0 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| 50th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 30th %ile Green (s) | 11.0 | 39.5 | | 13.5 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| 30th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 10th %ile Green (s) | 11.0 | 41.6 | | 11.4 | 42.0 | 42.0 | 10.0 | 33.0 | 33.0 | 20.0 | 43.0 | 43.0 |
| 10th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| Stops (vph) | 350 | 776 | | 212 | 699 | 418 | 297 | 787 | 67 | 395 | 465 | 68 |
| Fuel Used(l) | 119 | 106 | | 42 | 118 | 135 | 34 | 188 | 15 | 85 | 64 | 21 |
| CO Emissions (g/hr) | 2215 | 1980 | | 779 | 2194 | 2508 | 636 | 3503 | 285 | 1577 | 1191 | 393 |
| NOx Emissions (g/hr) | 428 | 382 | | 150 | 423 | 484 | 123 | 676 | 55 | 304 | 230 | 76 |
| VOC Emissions (g/hr) | 511 | 457 | | 180 | 506 | 578 | 147 | 808 | 66 | 364 | 275 | 91 |
| Dilemma Vehicles (#) | 0 | 34 | | 0 | 33 | 0 | 0 | 29 | 0 | 0 | 22 | 0 |
| Queue Length 50th (m) | ~79.3 | 85.2 | | 32.1 | 76.9 | ~198.8 | 35.0 | ~187.0 | 16.0 | ~79.0 | 73.3 | 15.7 |
| Queue Length 95th (m) | #122.9 | 104.5 | | 43.4 | 92.5 | #278.5 | 47.0 | #230.6 | 44.6 | #117.7 | 93.8 | 44.2 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 487 | 1374 | | 592 | 1537 | 668 | 573 | 833 | 523 | 569 | 1038 | 620 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.30 | 0.70 | | 0.65 | 0.60 | 1.18 | 0.72 | 1.26 | 0.53 | 1.07 | 0.60 | 0.51 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 130 | | | |
| Natural Cycle: 140 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 1.30 | | | |
| Intersection Signal Delay: 82.5 | | Intersection LOS: F | |
| Intersection Capacity Utilization 103.9% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 130 | | | |
| 70th %ile Actuated Cycle: 130 | | | |
| 50th %ile Actuated Cycle: 130 | | | |
| 30th %ile Actuated Cycle: 130 | | | |
| 10th %ile Actuated Cycle: 130 | | | |
| ~ 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: 6: 43 Street S/43 Street N & Hwy 3

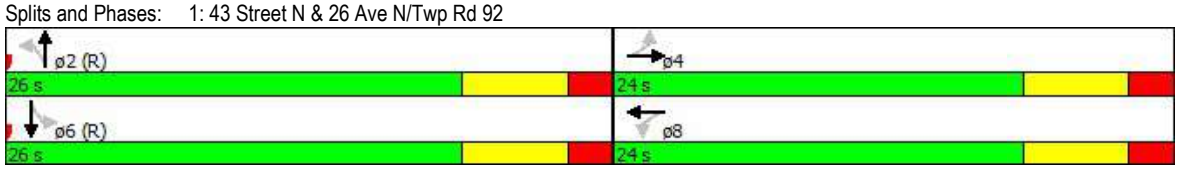


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 17 | 99 | 299 | 44 | 84 | 6 | 100 | 113 | 31 | 6 | 58 | 7 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.903 | | | 0.994 | | | 0.983 | | | 0.987 | |
| Flt Protected | | 0.998 | | | 0.984 | | | 0.980 | | | 0.996 | |
| Satd. Flow (prot) | 0 | 1646 | 0 | 0 | 1787 | 0 | 0 | 1711 | 0 | 0 | 1610 | 0 |
| Flt Permitted | | 0.980 | | | 0.567 | | | 0.825 | | | 0.965 | |
| Satd. Flow (perm) | 0 | 1617 | 0 | 0 | 1030 | 0 | 0 | 1440 | 0 | 0 | 1560 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 285 | | | 5 | | | 17 | | | 9 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 697.6 | | | 744.1 | | | 520.4 | | | 321.7 | |
| Travel Time (s) | | 50.2 | | | 53.6 | | | 26.8 | | | 16.5 | |
| Peak Hour Factor | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 | 0.77 |
| Heavy Vehicles (%) | 4% | 4% | 4% | 4% | 4% | 4% | 7% | 7% | 7% | 16% | 16% | 16% |
| Adj. Flow (vph) | 22 | 129 | 388 | 57 | 109 | 8 | 130 | 147 | 40 | 8 | 75 | 9 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 539 | 0 | 0 | 174 | 0 | 0 | 317 | 0 | 0 | 92 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | | 22.5 | 22.5 | |
| Total Split (s) | 24.0 | 24.0 | | 24.0 | 24.0 | | 26.0 | 26.0 | | 26.0 | 26.0 | |
| Total Split (%) | 48.0% | 48.0% | | 48.0% | 48.0% | | 52.0% | 52.0% | | 52.0% | 52.0% | |
| Maximum Green (s) | 17.5 | 17.5 | | 17.5 | 17.5 | | 19.5 | 19.5 | | 19.5 | 19.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Min | C-Min | | C-Min | C-Min | |
| Walk Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | | 5.0 | 5.0 | |
| Flash Dont Walk (s) | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | | 11.0 | 11.0 | |
| Pedestrian Calls (#/hr) | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | |
| Act Effct Green (s) | | 14.4 | | | 14.4 | | | 22.6 | | | 22.6 | |
| Actuated g/C Ratio | | 0.29 | | | 0.29 | | | 0.45 | | | 0.45 | |
| v/c Ratio | | 0.81 | | | 0.58 | | | 0.48 | | | 0.13 | |
| Control Delay | | 18.0 | | | 22.3 | | | 12.2 | | | 9.4 | |
| Queue Delay | | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | |
| Total Delay | | 18.0 | | | 22.3 | | | 12.2 | | | 9.4 | |
| LOS | | B | | | C | | | B | | | A | |
| Approach Delay | | 18.0 | | | 22.3 | | | 12.2 | | | 9.4 | |
| Approach LOS | | B | | | C | | | B | | | A | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 17.5 | 17.5 | | 17.5 | 17.5 | | 19.5 | 19.5 | | 19.5 | 19.5 | |
| 90th %ile Term Code | Max | Max | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 18.3 | 18.3 | | 18.3 | 18.3 | | 18.7 | 18.7 | | 18.7 | 18.7 | |
| 70th %ile Term Code | Gap | Gap | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 14.9 | 14.9 | | 14.9 | 14.9 | | 22.1 | 22.1 | | 22.1 | 22.1 | |
| 50th %ile Term Code | Gap | Gap | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 11.3 | 11.3 | | 11.3 | 11.3 | | 25.7 | 25.7 | | 25.7 | 25.7 | |
| 30th %ile Term Code | Gap | Gap | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 27.0 | 27.0 | | 27.0 | 27.0 | |
| 10th %ile Term Code | Min | Min | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| Queue Length 50th (m) | | 19.5 | | | 13.1 | | | 19.2 | | | 4.3 | |
| Queue Length 95th (m) | | 31.7 | | | 21.7 | | | 28.3 | | | 10.1 | |
| Internal Link Dist (m) | | 673.6 | | | 720.1 | | | 496.4 | | | 297.7 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 755 | | | 366 | | | 664 | | | 714 | |
| Starvation Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.71 | | | 0.48 | | | 0.48 | | | 0.13 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 50 | | | |
| Actuated Cycle Length: 50 | | | |
| Offset: 35 (70%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 45 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.81 | | | |
| Intersection Signal Delay: 16.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 56.0% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 1: 43 Street N & 26 Ave N/Twp Rd 92



| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 13 | 35 | 149 | 54 | 8 | 6 | 249 | 212 | 243 | 28 | 376 | 15 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.898 | | | 0.987 | | | 0.920 | | | 0.995 | |
| Flt Protected | | 0.997 | | | 0.962 | | 0.950 | | | | 0.997 | |
| Satd. Flow (prot) | 0 | 1519 | 0 | 0 | 1640 | 0 | 1641 | 1589 | 0 | 0 | 1830 | 0 |
| Flt Permitted | | 0.973 | | | 0.315 | | 0.470 | | | | 0.939 | |
| Satd. Flow (perm) | 0 | 1482 | 0 | 0 | 537 | 0 | 812 | 1589 | 0 | 0 | 1723 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 142 | | | 5 | | | 118 | | | 4 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 716.1 | | | 196.5 | | | 496.3 | | | 520.4 | |
| Travel Time (s) | | 51.6 | | | 14.1 | | | 25.5 | | | 26.8 | |
| Peak Hour Factor | 0.78 | 0.78 | 0.78 | 0.92 | 0.92 | 0.92 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 |
| Heavy Vehicles (%) | 12% | 12% | 12% | 10% | 10% | 10% | 10% | 10% | 10% | 3% | 3% | 3% |
| Adj. Flow (vph) | 17 | 45 | 191 | 59 | 9 | 7 | 319 | 272 | 312 | 36 | 482 | 19 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 253 | 0 | 0 | 75 | 0 | 319 | 584 | 0 | 0 | 537 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | | 26.5 | 26.5 | | 22.5 | 22.5 | |
| Total Split (s) | 28.5 | 28.5 | | 28.5 | 28.5 | | 71.5 | 71.5 | | 71.5 | 71.5 | |
| Total Split (%) | 28.5% | 28.5% | | 28.5% | 28.5% | | 71.5% | 71.5% | | 71.5% | 71.5% | |
| Maximum Green (s) | 22.0 | 22.0 | | 22.0 | 22.0 | | 65.0 | 65.0 | | 65.0 | 65.0 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | 6.5 | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Act Effct Green (s) | | 14.9 | | | 14.9 | | 72.1 | 72.1 | | | 72.1 | |
| Actuated g/C Ratio | | 0.15 | | | 0.15 | | 0.72 | 0.72 | | | 0.72 | |
| v/c Ratio | | 0.74 | | | 0.89 | | 0.55 | 0.50 | | | 0.43 | |
| Control Delay | | 30.9 | | | 111.2 | | 13.9 | 8.6 | | | 6.7 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 30.9 | | | 111.2 | | 13.9 | 8.6 | | | 6.7 | |
| LOS | | C | | | F | | B | A | | | A | |
| Approach Delay | | 30.9 | | | 111.2 | | | 10.4 | | | 6.7 | |
| Approach LOS | | C | | | F | | | B | | | A | |
| 90th %ile Green (s) | 22.0 | 22.0 | | 22.0 | 22.0 | | 65.0 | 65.0 | | 65.0 | 65.0 | |
| 90th %ile Term Code | Max | Max | | Max | Max | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 17.5 | 17.5 | | 17.5 | 17.5 | | 69.5 | 69.5 | | 69.5 | 69.5 | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 14.1 | 14.1 | | 14.1 | 14.1 | | 72.9 | 72.9 | | 72.9 | 72.9 | |
| 50th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 10.8 | 10.8 | | 10.8 | 10.8 | | 76.2 | 76.2 | | 76.2 | 76.2 | |
| 30th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 77.0 | 77.0 | | 77.0 | 77.0 | |
| 10th %ile Term Code | Min | Min | | Hold | Hold | | Coord | Coord | | Coord | Coord | |
| Queue Length 50th (m) | | 21.5 | | | 14.4 | | 27.8 | 37.8 | | | 44.8 | |
| Queue Length 95th (m) | | 34.0 | | | #34.8 | | m74.6 | 80.7 | | | 59.0 | |
| Internal Link Dist (m) | | 692.1 | | | 172.5 | | | 472.3 | | | 496.4 | |
| Turn Bay Length (m) | | | | | | | | | | | | |
| Base Capacity (vph) | | 436 | | | 122 | | 585 | 1178 | | | 1243 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.58 | | | 0.61 | | 0.55 | 0.50 | | | 0.43 | |

**Intersection Summary**

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 16.5 Intersection LOS: B
Intersection Capacity Utilization 87.9% ICU Level of Service E
Analysis Period (min) 15
# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: 43 Street N & 18 Ave N

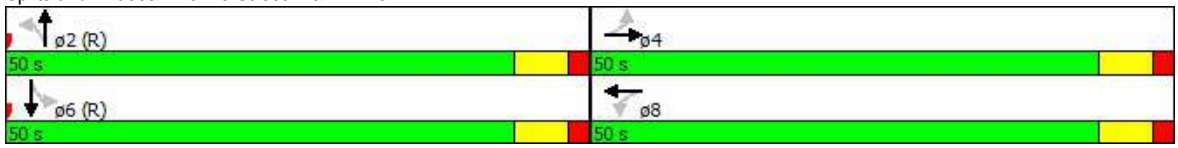


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 4 | 7 | 27 | 53 | 2 | 6 | 101 | 670 | 236 | 28 | 532 | 21 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 0.0 | 0.0 | | 0.0 | 75.0 | | 0.0 | 0.0 | | 0.0 |
| Storage Lanes | 0 | | 0 | 0 | | 0 | 1 | | 0 | 0 | | 0 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Frt | | 0.905 | | | 0.986 | | | 0.961 | | | 0.995 | |
| Flt Protected | | 0.995 | | | 0.959 | | 0.950 | | | | 0.998 | |
| Satd. Flow (prot) | 0 | 1104 | 0 | 0 | 1633 | 0 | 1641 | 1660 | 0 | 0 | 1780 | 0 |
| Flt Permitted | | 0.957 | | | 0.721 | | 0.402 | | | | 0.884 | |
| Satd. Flow (perm) | 0 | 1062 | 0 | 0 | 1228 | 0 | 694 | 1660 | 0 | 0 | 1577 | 0 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 33 | | | 7 | | | 22 | | | 2 | |
| Link Speed (k/h) | | 50 | | | 50 | | | 70 | | | 70 | |
| Link Distance (m) | | 748.5 | | | 168.6 | | | 405.2 | | | 496.3 | |
| Travel Time (s) | | 53.9 | | | 12.1 | | | 20.8 | | | 25.5 | |
| Peak Hour Factor | 0.81 | 0.81 | 0.81 | 0.92 | 0.92 | 0.92 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 | 0.81 |
| Heavy Vehicles (%) | 55% | 55% | 55% | 10% | 10% | 10% | 10% | 10% | 10% | 6% | 6% | 6% |
| Adj. Flow (vph) | 5 | 9 | 33 | 58 | 2 | 7 | 125 | 827 | 291 | 35 | 657 | 26 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 0 | 47 | 0 | 0 | 67 | 0 | 125 | 1118 | 0 | 0 | 718 | 0 |
| Turn Type | Perm | NA | | Perm | NA | | Perm | NA | | Perm | NA | |
| Protected Phases | | 4 | | | 8 | | | 2 | | | 6 | |
| Permitted Phases | 4 | | | 8 | | | 2 | | | 6 | | |
| Detector Phase | 4 | 4 | | 8 | 8 | | 2 | 2 | | 6 | 6 | |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 7.0 | 7.0 | | 7.0 | 7.0 | | 10.0 | 10.0 | | 10.0 | 10.0 | |
| Minimum Split (s) | 13.5 | 13.5 | | 13.5 | 13.5 | | 16.5 | 16.5 | | 16.5 | 16.5 | |
| Total Split (s) | 50.0 | 50.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | | 50.0 | 50.0 | |
| Total Split (%) | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | | 50.0% | 50.0% | |
| Maximum Green (s) | 43.5 | 43.5 | | 43.5 | 43.5 | | 43.5 | 43.5 | | 43.5 | 43.5 | |
| Yellow Time (s) | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | | 4.5 | 4.5 | |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | | 2.0 | 2.0 | |
| Lost Time Adjust (s) | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Lost Time (s) | | 6.5 | | | 6.5 | | 6.5 | 6.5 | | | 6.5 | |
| Lead/Lag | | | | | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | | | | | |
| Vehicle Extension (s) | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | | 3.0 | 3.0 | |
| Recall Mode | None | None | | None | None | | C-Max | C-Max | | C-Max | C-Max | |
| Act Effct Green (s) | | 10.4 | | | 10.4 | | 80.6 | 80.6 | | | 80.6 | |
| Actuated g/C Ratio | | 0.10 | | | 0.10 | | 0.81 | 0.81 | | | 0.81 | |
| v/c Ratio | | 0.34 | | | 0.50 | | 0.22 | 0.83 | | | 0.56 | |
| Control Delay | | 25.5 | | | 50.3 | | 4.5 | 17.8 | | | 9.5 | |
| Queue Delay | | 0.0 | | | 0.0 | | 0.0 | 0.0 | | | 0.0 | |
| Total Delay | | 25.5 | | | 50.3 | | 4.5 | 17.8 | | | 9.5 | |
| LOS | | C | | | D | | A | B | | | A | |
| Approach Delay | | 25.5 | | | 50.3 | | | 16.4 | | | 9.5 | |
| Approach LOS | | C | | | D | | | B | | | A | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 15.0 | 15.0 | | 15.0 | 15.0 | | 72.0 | 72.0 | | 72.0 | 72.0 | |
| 90th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 70th %ile Green (s) | 12.0 | 12.0 | | 12.0 | 12.0 | | 75.0 | 75.0 | | 75.0 | 75.0 | |
| 70th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 50th %ile Green (s) | 10.0 | 10.0 | | 10.0 | 10.0 | | 77.0 | 77.0 | | 77.0 | 77.0 | |
| 50th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 30th %ile Green (s) | 8.0 | 8.0 | | 8.0 | 8.0 | | 79.0 | 79.0 | | 79.0 | 79.0 | |
| 30th %ile Term Code | Hold | Hold | | Gap | Gap | | Coord | Coord | | Coord | Coord | |
| 10th %ile Green (s) | 0.0 | 0.0 | | 0.0 | 0.0 | | 93.5 | 93.5 | | 93.5 | 93.5 | |
| 10th %ile Term Code | Skip | Skip | | Skip | Skip | | Coord | Coord | | Coord | Coord | |
| Queue Length 50th (m) | | 2.7 | | | 11.8 | | 5.5 | 74.1 | | | 68.8 | |
| Queue Length 95th (m) | | 11.2 | | | 24.7 | | 12.0 | 113.8 | | | 78.7 | |
| Internal Link Dist (m) | | 724.5 | | | 144.6 | | | 381.2 | | | 472.3 | |
| Turn Bay Length (m) | | | | | | | 75.0 | | | | | |
| Base Capacity (vph) | | 480 | | | 538 | | 559 | 1342 | | | 1271 | |
| Starvation Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Spillback Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Storage Cap Reductn | | 0 | | | 0 | | 0 | 0 | | | 0 | |
| Reduced v/c Ratio | | 0.10 | | | 0.12 | | 0.22 | 0.83 | | | 0.56 | |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 74 (74%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green | | | |
| Natural Cycle: 80 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.83 | | | |
| Intersection Signal Delay: 15.3 | | Intersection LOS: B | |
| Intersection Capacity Utilization 73.1% | | ICU Level of Service D | |
| Analysis Period (min) 15 | | | |

Splits and Phases: 3: 43 Street N & 14 Ave N





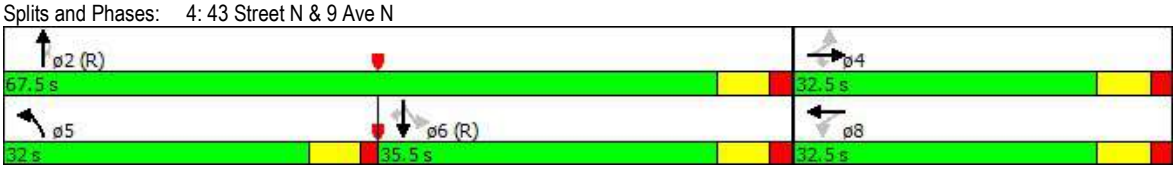
| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 39 | 32 | 116 | 46 | 12 | 11 | 282 | 971 | 193 | 38 | 551 | 25 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | | 50.0 | 100.0 | | 0.0 | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Storage Lanes | 1 | | 1 | 1 | | 0 | 1 | | 1 | 1 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 |
| Frt | | | 0.850 | | 0.928 | | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 1752 | 1845 | 1568 | 1327 | 1296 | 0 | 1656 | 3312 | 1482 | 1656 | 3312 | 1482 |
| Flt Permitted | 0.740 | | | 0.732 | | | 0.950 | | | 0.242 | | |
| Satd. Flow (perm) | 1365 | 1845 | 1568 | 1023 | 1296 | 0 | 1656 | 3312 | 1482 | 422 | 3312 | 1482 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | | 140 | | 13 | | | | 233 | | | 104 |
| Link Speed (k/h) | | 50 | | | 50 | | | 60 | | | 60 | |
| Link Distance (m) | | 750.2 | | | 651.0 | | | 882.4 | | | 198.2 | |
| Travel Time (s) | | 54.0 | | | 46.9 | | | 52.9 | | | 11.9 | |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Heavy Vehicles (%) | 3% | 3% | 3% | 36% | 36% | 36% | 9% | 9% | 9% | 9% | 9% | 9% |
| Adj. Flow (vph) | 47 | 39 | 140 | 55 | 14 | 13 | 340 | 1170 | 233 | 46 | 664 | 30 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 47 | 39 | 140 | 55 | 27 | 0 | 340 | 1170 | 233 | 46 | 664 | 30 |
| Turn Type | Perm | NA | Perm | Perm | NA | | Prot | NA | Perm | Perm | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | | 2 | 6 | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | | 5 | 2 | 2 | 6 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 12.0 | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 |
| Total Split (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | | 32.0 | 67.5 | 67.5 | 35.5 | 35.5 | 35.5 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 32.5% | | 32.0% | 67.5% | 67.5% | 35.5% | 35.5% | 35.5% |
| Maximum Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | | 26.0 | 61.0 | 61.0 | 29.0 | 29.0 | 29.0 |
| Yellow Time (s) | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | | | Lag | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | 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 | 3.0 | 3.0 |
| Recall Mode | None | None | None | None | None | | None | C-Max | C-Max | C-Max | C-Max | C-Max |
| Walk Time (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Flash Dont Walk (s) | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | | | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| Pedestrian Calls (#/hr) | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 |
| Act Effct Green (s) | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 | | 25.7 | 75.0 | 75.0 | 43.3 | 43.3 | 43.3 |
| Actuated g/C Ratio | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | | 0.26 | 0.75 | 0.75 | 0.43 | 0.43 | 0.43 |
| v/c Ratio | 0.29 | 0.18 | 0.45 | 0.45 | 0.16 | | 0.80 | 0.47 | 0.20 | 0.25 | 0.46 | 0.04 |
| Control Delay | 43.9 | 40.4 | 11.6 | 52.3 | 27.1 | | 48.5 | 5.8 | 1.0 | 20.6 | 17.2 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 43.9 | 40.4 | 11.6 | 52.3 | 27.1 | | 48.5 | 5.8 | 1.0 | 20.6 | 17.2 | 0.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOS | D | D | B | D | C | | D | A | A | C | B | A |
| Approach Delay | | 23.3 | | | 44.0 | | | 13.5 | | | 16.7 | |
| Approach LOS | | C | | | D | | | B | | | B | |
| 90th %ile Green (s) | 16.2 | 16.2 | 16.2 | 16.2 | 16.2 | | 32.4 | 70.8 | 70.8 | 32.4 | 32.4 | 32.4 |
| 90th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 70th %ile Green (s) | 12.9 | 12.9 | 12.9 | 12.9 | 12.9 | | 29.2 | 74.1 | 74.1 | 38.9 | 38.9 | 38.9 |
| 70th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.7 | 10.7 | 10.7 | 10.7 | 10.7 | | 26.2 | 76.3 | 76.3 | 44.1 | 44.1 | 44.1 |
| 50th %ile Term Code | Hold | Hold | Hold | Gap | Gap | | Gap | Coord | Coord | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 22.9 | 77.0 | 77.0 | 48.1 | 48.1 | 48.1 |
| 30th %ile Term Code | Min | Min | Min | Min | Min | | Gap | Coord | Coord | Coord | Coord | Coord |
| 10th %ile Green (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | | 18.0 | 77.0 | 77.0 | 53.0 | 53.0 | 53.0 |
| 10th %ile Term Code | Min | Min | Min | Hold | Hold | | Gap | Coord | Coord | Coord | Coord | Coord |
| Queue Length 50th (m) | 9.0 | 7.4 | 0.0 | 10.8 | 2.6 | | 64.5 | 37.4 | 0.0 | 3.4 | 27.1 | 0.0 |
| Queue Length 95th (m) | 17.7 | 15.2 | 13.3 | 20.4 | 9.4 | | 80.3 | 54.6 | 4.7 | m10.9 | 57.2 | m0.0 |
| Internal Link Dist (m) | | 726.2 | | | 627.0 | | | 858.4 | | | 174.2 | |
| Turn Bay Length (m) | | | 50.0 | 100.0 | | | 100.0 | | 50.0 | 125.0 | | 50.0 |
| Base Capacity (vph) | 354 | 479 | 511 | 265 | 346 | | 462 | 2485 | 1170 | 182 | 1434 | 700 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.13 | 0.08 | 0.27 | 0.21 | 0.08 | | 0.74 | 0.47 | 0.20 | 0.25 | 0.46 | 0.04 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 100 | | | |
| Actuated Cycle Length: 100 | | | |
| Offset: 89 (89%), Referenced to phase 2:NBT and 6:SBTL, Start of Green | | | |
| Natural Cycle: 90 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.80 | | | |
| Intersection Signal Delay: 16.1 | | Intersection LOS: B | |
| Intersection Capacity Utilization 64.8% | | ICU Level of Service C | |
| Analysis Period (min) 15 | | | |

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

Splits and Phases: 4: 43 Street N & 9 Ave N

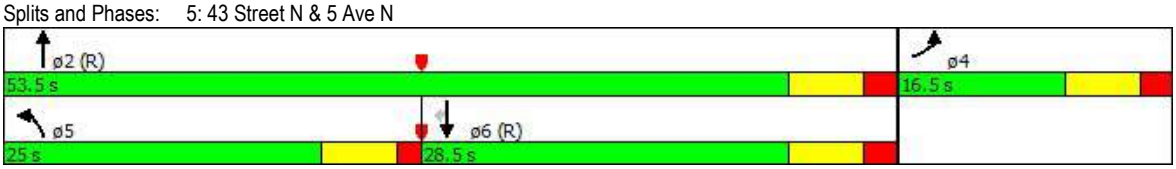


| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Volume (vph) | 98 | 213 | 356 | 1405 | 711 | 53 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 0.0 | 100.0 | 140.0 | | | 100.0 |
| Storage Lanes | 2 | 1 | 1 | | | 1 |
| Taper Length (m) | 7.5 | | 7.5 | | | |
| Lane Util. Factor | 0.97 | 1.00 | 1.00 | 0.95 | 0.95 | 1.00 |
| Frt | | 0.850 | | | | 0.850 |
| Flt Protected | 0.950 | | 0.950 | | | |
| Satd. Flow (prot) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Flt Permitted | 0.950 | | 0.950 | | | |
| Satd. Flow (perm) | 3127 | 1442 | 1703 | 3406 | 3112 | 1392 |
| Right Turn on Red | | Yes | | | | Yes |
| Satd. Flow (RTOR) | | 245 | | | | 61 |
| Link Speed (k/h) | 50 | | | 60 | 60 | |
| Link Distance (m) | 728.0 | | | 340.2 | 882.4 | |
| Travel Time (s) | 52.4 | | | 20.4 | 52.9 | |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles (%) | 12% | 12% | 6% | 6% | 16% | 16% |
| Adj. Flow (vph) | 113 | 245 | 409 | 1615 | 817 | 61 |
| Shared Lane Traffic (%) | | | | | | |
| Lane Group Flow (vph) | 113 | 245 | 409 | 1615 | 817 | 61 |
| Turn Type | Prot | Free | Prot | NA | NA | Perm |
| Protected Phases | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | Free | | | | 6 |
| Detector Phase | 4 | | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | | 6.0 | 15.0 | 15.0 | 15.0 |
| Minimum Split (s) | 16.5 | | 12.0 | 28.5 | 21.5 | 21.5 |
| Total Split (s) | 16.5 | | 25.0 | 53.5 | 28.5 | 28.5 |
| Total Split (%) | 23.6% | | 35.7% | 76.4% | 40.7% | 40.7% |
| Maximum Green (s) | 10.0 | | 19.0 | 47.0 | 22.0 | 22.0 |
| Yellow Time (s) | 4.5 | | 4.5 | 4.5 | 4.5 | 4.5 |
| All-Red Time (s) | 2.0 | | 1.5 | 2.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | | 6.0 | 6.5 | 6.5 | 6.5 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Vehicle Extension (s) | 3.0 | | 3.0 | 3.0 | 3.0 | 3.0 |
| Recall Mode | None | | None | C-Max | C-Max | C-Max |
| Walk Time (s) | | | | 8.0 | | |
| Flash Dont Walk (s) | | | | 14.0 | | |
| Pedestrian Calls (#/hr) | | | | 0 | | |
| Act Effct Green (s) | 10.0 | 70.0 | 18.5 | 51.6 | 25.8 | 25.8 |
| Actuated g/C Ratio | 0.14 | 1.00 | 0.26 | 0.74 | 0.37 | 0.37 |
| v/c Ratio | 0.25 | 0.17 | 0.91 | 0.64 | 0.71 | 0.11 |
| Control Delay | 28.4 | 0.3 | 52.4 | 7.9 | 25.4 | 5.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 28.4 | 0.3 | 52.4 | 7.9 | 25.4 | 5.9 |

| Lane Group | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| LOS | C | A | D | A | C | A |
| Approach Delay | 9.1 | | | 16.9 | 24.1 | |
| Approach LOS | A | | | B | C | |
| 90th %ile Green (s) | 10.0 | | 19.0 | 47.0 | 22.0 | 22.0 |
| 90th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 70th %ile Green (s) | 10.0 | | 19.0 | 47.0 | 22.0 | 22.0 |
| 70th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 50th %ile Green (s) | 10.0 | | 19.0 | 47.0 | 22.0 | 22.0 |
| 50th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 30th %ile Green (s) | 10.0 | | 19.0 | 47.0 | 22.0 | 22.0 |
| 30th %ile Term Code | Max | | Max | Coord | Coord | Coord |
| 10th %ile Green (s) | 0.0 | | 16.4 | 63.5 | 41.1 | 41.1 |
| 10th %ile Term Code | Skip | | Gap | Coord | Coord | Coord |
| Queue Length 50th (m) | 7.2 | 0.0 | 53.9 | 61.3 | 54.4 | 0.0 |
| Queue Length 95th (m) | 13.7 | 0.0 | #97.7 | 77.6 | #75.7 | 7.1 |
| Internal Link Dist (m) | 704.0 | | | 316.2 | 858.4 | |
| Turn Bay Length (m) | | 100.0 | 140.0 | | | 100.0 |
| Base Capacity (vph) | 446 | 1442 | 462 | 2510 | 1148 | 552 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.25 | 0.17 | 0.89 | 0.64 | 0.71 | 0.11 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 70 | | | |
| Actuated Cycle Length: 70 | | | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green | | | |
| Natural Cycle: 70 | | | |
| Control Type: Actuated-Coordinated | | | |
| Maximum v/c Ratio: 0.91 | | | |
| Intersection Signal Delay: 18.0 | | Intersection LOS: B | |
| Intersection Capacity Utilization 63.5% | | ICU Level of Service B | |
| Analysis Period (min) 15 | | | |
| # 95th percentile volume exceeds capacity, queue may be longer. | | | |
| Queue shown is maximum after two cycles. | | | |

Splits and Phases: 5: 43 Street N & 5 Ave N

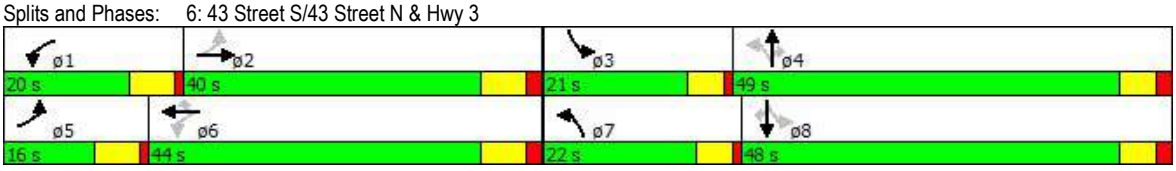


| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Volume (vph) | 582 | 878 | 12 | 354 | 854 | 722 | 377 | 967 | 255 | 561 | 571 | 290 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Storage Length (m) | 140.0 | | 0.0 | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Storage Lanes | 2 | | 0 | 2 | | 1 | 2 | | 1 | 2 | | 1 |
| Taper Length (m) | 7.5 | | | 7.5 | | | 7.5 | | | 7.5 | | |
| Lane Util. Factor | 0.97 | 0.91 | 0.91 | 0.97 | 0.91 | 1.00 | 0.97 | 0.95 | 1.00 | 0.97 | 0.95 | 1.00 |
| Frt | | 0.998 | | | | 0.850 | | | 0.850 | | | 0.850 |
| Flt Protected | 0.950 | | | 0.950 | | | 0.950 | | | 0.950 | | |
| Satd. Flow (prot) | 3155 | 4664 | 0 | 3213 | 4759 | 1482 | 3183 | 3282 | 1468 | 3045 | 3139 | 1404 |
| Flt Permitted | 0.198 | | | 0.127 | | | 0.302 | | | 0.090 | | |
| Satd. Flow (perm) | 658 | 4664 | 0 | 429 | 4759 | 1482 | 1012 | 3282 | 1468 | 288 | 3139 | 1404 |
| Right Turn on Red | | | Yes | | | Yes | | | Yes | | | Yes |
| Satd. Flow (RTOR) | | 1 | | | | 266 | | | 189 | | | 222 |
| Link Speed (k/h) | | 80 | | | 80 | | | 60 | | | 60 | |
| Link Distance (m) | | 449.3 | | | 776.8 | | | 454.3 | | | 301.5 | |
| Travel Time (s) | | 20.2 | | | 35.0 | | | 27.3 | | | 18.1 | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles (%) | 11% | 11% | 11% | 9% | 9% | 9% | 10% | 10% | 10% | 15% | 15% | 15% |
| Adj. Flow (vph) | 633 | 954 | 13 | 385 | 928 | 785 | 410 | 1051 | 277 | 610 | 621 | 315 |
| Shared Lane Traffic (%) | | | | | | | | | | | | |
| Lane Group Flow (vph) | 633 | 967 | 0 | 385 | 928 | 785 | 410 | 1051 | 277 | 610 | 621 | 315 |
| Turn Type | pm+pt | NA | | pm+pt | NA | Perm | pm+pt | NA | Perm | pm+pt | NA | Perm |
| Protected Phases | 5 | 2 | | 1 | 6 | | 7 | 4 | | 3 | 8 | |
| Permitted Phases | 2 | | | 6 | | 6 | 4 | | 4 | 8 | | 8 |
| Detector Phase | 5 | 2 | | 1 | 6 | 6 | 7 | 4 | 4 | 3 | 8 | 8 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 20.0 | | 10.0 | 20.0 | 20.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.0 | 27.0 | | 16.0 | 27.0 | 27.0 | 15.0 | 16.0 | 16.0 | 15.0 | 22.0 | 22.0 |
| Total Split (s) | 16.0 | 40.0 | | 20.0 | 44.0 | 44.0 | 22.0 | 49.0 | 49.0 | 21.0 | 48.0 | 48.0 |
| Total Split (%) | 12.3% | 30.8% | | 15.4% | 33.8% | 33.8% | 16.9% | 37.7% | 37.7% | 16.2% | 36.9% | 36.9% |
| Maximum Green (s) | 10.0 | 33.0 | | 14.0 | 37.0 | 37.0 | 17.0 | 43.0 | 43.0 | 16.0 | 42.0 | 42.0 |
| Yellow Time (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| All-Red Time (s) | 1.0 | 2.0 | | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.0 | 7.0 | | 6.0 | 7.0 | 7.0 | 5.0 | 6.0 | 6.0 | 5.0 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | 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 | 3.0 | 3.0 |
| Recall Mode | None | Max | | None | Max | Max | None | None | None | None | None | None |
| Act Effct Green (s) | 44.3 | 33.3 | | 51.7 | 37.0 | 37.0 | 58.8 | 43.0 | 43.0 | 61.2 | 44.2 | 44.2 |
| Actuated g/C Ratio | 0.34 | 0.26 | | 0.40 | 0.28 | 0.28 | 0.45 | 0.33 | 0.33 | 0.47 | 0.34 | 0.34 |
| v/c Ratio | 1.52 | 0.81 | | 0.83 | 0.69 | 1.28 | 0.58 | 0.97 | 0.45 | 1.28 | 0.58 | 0.50 |
| Control Delay | 273.5 | 51.7 | | 43.7 | 44.4 | 165.6 | 22.5 | 63.7 | 13.4 | 176.2 | 38.3 | 13.5 |
| Queue Delay | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay | 273.5 | 51.7 | | 43.7 | 44.4 | 165.6 | 22.5 | 63.7 | 13.4 | 176.2 | 38.3 | 13.5 |
| LOS | F | D | | D | D | F | C | E | B | F | D | B |
| Approach Delay | | 139.4 | | | 89.7 | | | 46.0 | | | 87.7 | |
| Approach LOS | | F | | | F | | | D | | | F | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90th %ile Green (s) | 10.0 | 33.0 | | 14.0 | 37.0 | 37.0 | 17.0 | 43.0 | 43.0 | 16.0 | 42.0 | 42.0 |
| 90th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Max | Max | Max | Max | Hold | Hold |
| 70th %ile Green (s) | 10.0 | 33.0 | | 14.0 | 37.0 | 37.0 | 16.6 | 43.0 | 43.0 | 16.0 | 42.4 | 42.4 |
| 70th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Max | Hold | Hold |
| 50th %ile Green (s) | 10.0 | 33.0 | | 14.0 | 37.0 | 37.0 | 15.1 | 43.0 | 43.0 | 16.0 | 43.9 | 43.9 |
| 50th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Max | Hold | Hold |
| 30th %ile Green (s) | 10.0 | 33.0 | | 14.0 | 37.0 | 37.0 | 13.6 | 43.0 | 43.0 | 16.0 | 45.4 | 45.4 |
| 30th %ile Term Code | Max | MaxR | | Max | MaxR | MaxR | Gap | Max | Max | Max | Hold | Hold |
| 10th %ile Green (s) | 10.0 | 34.5 | | 12.5 | 37.0 | 37.0 | 11.5 | 43.0 | 43.0 | 16.0 | 47.5 | 47.5 |
| 10th %ile Term Code | Max | Hold | | Gap | MaxR | MaxR | Gap | Max | Max | Max | Hold | Hold |
| Queue Length 50th (m) | ~96.4 | 90.2 | | 35.1 | 81.6 | ~214.9 | 31.8 | 146.4 | 16.9 | ~93.5 | 72.5 | 17.7 |
| Queue Length 95th (m) | #137.2 | 108.0 | | #57.7 | 98.1 | #294.5 | 42.6 | #193.4 | 42.7 | #133.4 | 95.0 | 47.9 |
| Internal Link Dist (m) | | 425.3 | | | 752.8 | | | 430.3 | | | 277.5 | |
| Turn Bay Length (m) | 140.0 | | | 125.0 | | 150.0 | 100.0 | | 80.0 | 80.0 | | 80.0 |
| Base Capacity (vph) | 416 | 1195 | | 471 | 1354 | 612 | 758 | 1085 | 612 | 475 | 1068 | 624 |
| Starvation Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.52 | 0.81 | | 0.82 | 0.69 | 1.28 | 0.54 | 0.97 | 0.45 | 1.28 | 0.58 | 0.50 |

| Intersection Summary | | | |
|---|---|---|---|
| Area Type: | Other | | |
| Cycle Length: 130 | | | |
| Actuated Cycle Length: 130 | | | |
| Natural Cycle: 140 | | | |
| Control Type: Actuated-Uncoordinated | | | |
| Maximum v/c Ratio: 1.52 | | | |
| Intersection Signal Delay: 89.8 | | Intersection LOS: F | |
| Intersection Capacity Utilization 103.9% | | ICU Level of Service G | |
| Analysis Period (min) 15 | | | |
| 90th %ile Actuated Cycle: 130 | | | |
| 70th %ile Actuated Cycle: 130 | | | |
| 50th %ile Actuated Cycle: 130 | | | |
| 30th %ile Actuated Cycle: 130 | | | |
| 10th %ile Actuated Cycle: 130 | | | |
| ~ 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: 6: 43 Street S/43 Street N & Hwy 3



**Appendix E**

**Synchro Software Capacity Analyses Files**

**Appendix F**

**TAC – Traffic Signal Warrant Worksheets**

# City of Lethbridge/Lethbridge County - Traffic Signal Warrant Analysis

| | | | |
|---|---|---|---|
| Main Street (name) | 43 Street North | Direction (EW or NS) | NS |
| Side Street (name) | 26 Avenue/Twp Rd 92 | Direction (EW or NS) | EW |
| Quadrant / Int # | 3 | Comments | 60% of AM peak hour utilized for the period from 11:00 AM to 12:00 PM and 60% of PM peak hour utilized for the period from 12:00 PM to 01:00 PM |

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

| | |
|---|---|
| Road Authority: | City of Lethbridge/Lethbridge County |
| City: | Lethbridge |
| Analysis Date: | 2018 Aug 12, Sun |
| Count Date: | Future 2037 with Site Traffic |
| Date Entry Format: | (yyyy-mm-dd) |

| Lane Configuration | | Excl LT | Th & LT | Through | Th+RT+LT | Th & RT | Excl RT | UpStream Signal (m) | # of Thru Lanes |
|---|---|---|---|---|---|---|---|---|---|
| 43 Street North | NB | 0 | 0 | 0 | 1 | 0 | 0 | 1,650 | 1 |
| 43 Street North | SB | 0 | 0 | 0 | 1 | 0 | 0 | 5,000 | 1 |
| 26 Avenue/Twp Rd 92 | WB | 1 | 0 | 0 | 0 | 1 | 0 | | |
| 26 Avenue/Twp Rd 92 | EB | 0 | 1 | 0 | 0 | 0 | 1 | | |

Are the 26 Avenue/Twp Rd 92 WB right turns significantly impeded by through movements? (y/n) n

| Demographics | | |
|---|---|---|
| Elem. School/Mobility Challenged | (y/n) | n |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | n |
| Metro Area Population | (#) | 90,000 |
| Central Business District | (y/n) | n |

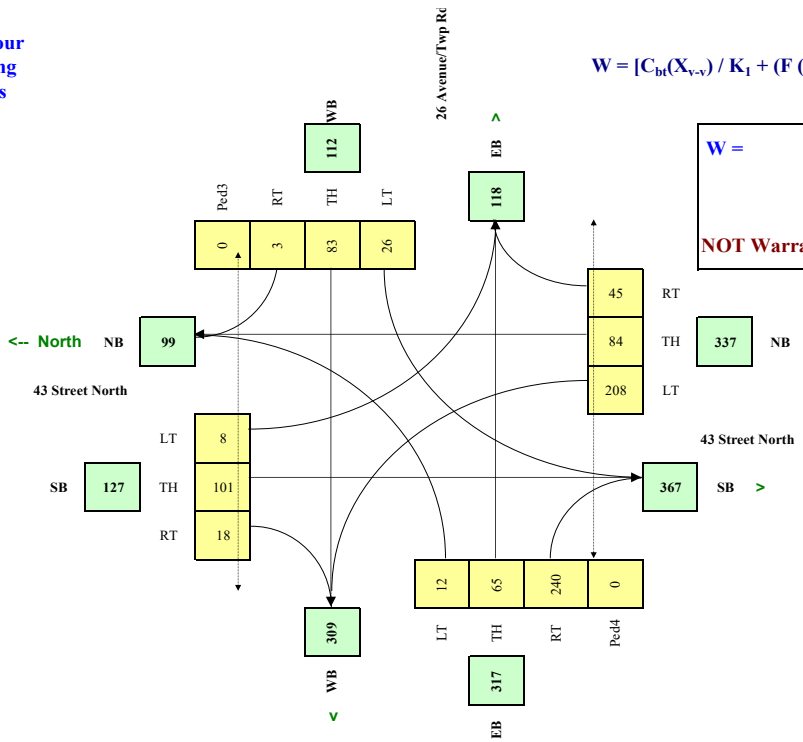
| Other input | | Speed (Km/h) | Truck % | Bus Rt (y/n) | Median (m) |
|---|---|---|---|---|---|
| 43 Street North | NS | 70 | 12.0% | n | 0.0 |
| 26 Avenue/Twp Rd 92 | EW | 60 | 4.0% | n | 0.0 |

Set Peak Hours

| Traffic Input | NB | | | SB | | | WB | | | EB | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | E Side | N Side | S Side |
| 7:00 - 8:00 | 100 | 113 | 31 | 6 | 58 | 7 | 44 | 84 | 6 | 17 | 99 | 299 | | | | |
| 8:00 - 9:00 | 100 | 113 | 31 | 6 | 58 | 7 | 44 | 84 | 6 | 17 | 99 | 299 | | | | |
| 11:00 - 12:00 | 60 | 68 | 19 | 4 | 35 | 4 | 26 | 50 | 4 | 10 | 59 | 180 | | | | |
| 12:00 - 13:00 | 227 | 49 | 44 | 7 | 104 | 21 | 10 | 65 | 0 | 7 | 31 | 152 | | | | |
| 16:00 - 17:00 | 379 | 81 | 73 | 12 | 174 | 35 | 17 | 108 | 0 | 11 | 51 | 254 | | | | |
| 17:00 - 18:00 | 379 | 81 | 73 | 12 | 174 | 35 | 17 | 108 | 0 | 11 | 51 | 254 | | | | |
| **Total (6-hour peak)** | **1,245** | **505** | **271** | **47** | **603** | **109** | **158** | **499** | **16** | **73** | **390** | **1,438** | **0** | **0** | **0** | **0** |
| **Average (6-hour peak)** | **208** | **84** | **45** | **8** | **101** | **18** | **26** | **83** | **3** | **12** | **65** | **240** | **0** | **0** | **0** | **0** |

**Average 6-hour Peak Turning Movements**

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$




| W = | 89 | 89 | 0 |
|---|---|---|---|
| | | *Veh* | *Ped* |

**NOT Warranted**

RESET SHEET

*Traffic Signal Warrant Spreadsheet - v3H © 2007 Transportation Association of Canada*

# City of Lethbridge/Lethbridge County - Traffic Signal Warrant Analysis

| | | | |
|---|---|---|---|
| Main Street (name) | 43 Street North | Direction (EW or NS) | NS |
| Side Street (name) | 26 Avenue/Twp Rd 92 | Direction (EW or NS) | EW |
| Quadrant / Int # | 3 | Comments | 60% of AM peak hour utilized for the period from 11:00 AM to 12:00 PM and 60% of PM peak hour utilized for the period from 12:00 PM to 01:00 PM |

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

| | |
|---|---|
| Road Authority: | City of Lethbridge/Lethbridge County |
| City: | Lethbridge |
| Analysis Date: | 2018 Aug 12, Sun |
| Count Date: | Future 2022 wth Site Traffic |
| Date Entry Format: | (yyyy-mm-dd) |

| Lane Configuration | | Excl LT | Th & LT | Through | Th+RT+LT | Th & RT | Excl RT | UpStream Signal (m) | # of Thru Lanes |
|---|---|---|---|---|---|---|---|---|---|
| 43 Street North | NB | 0 | 0 | 0 | 1 | 0 | 0 | 1,650 | 1 |
| 43 Street North | SB | 0 | 0 | 0 | 1 | 0 | 0 | 5,000 | 1 |
| 26 Avenue/Twp Rd 92 | WB | 1 | 0 | 0 | 0 | 1 | 0 | | |
| 26 Avenue/Twp Rd 92 | EB | 0 | 1 | 0 | 0 | 0 | 1 | | |

Are the 26 Avenue/Twp Rd 92 WB right turns significantly impeded by through movements? (y/n) n

| Demographics | | |
|---|---|---|
| Elem. School/Mobility Challenged | (y/n) | n |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | n |
| Metro Area Population | (#) | 90,000 |
| Central Business District | (y/n) | n |

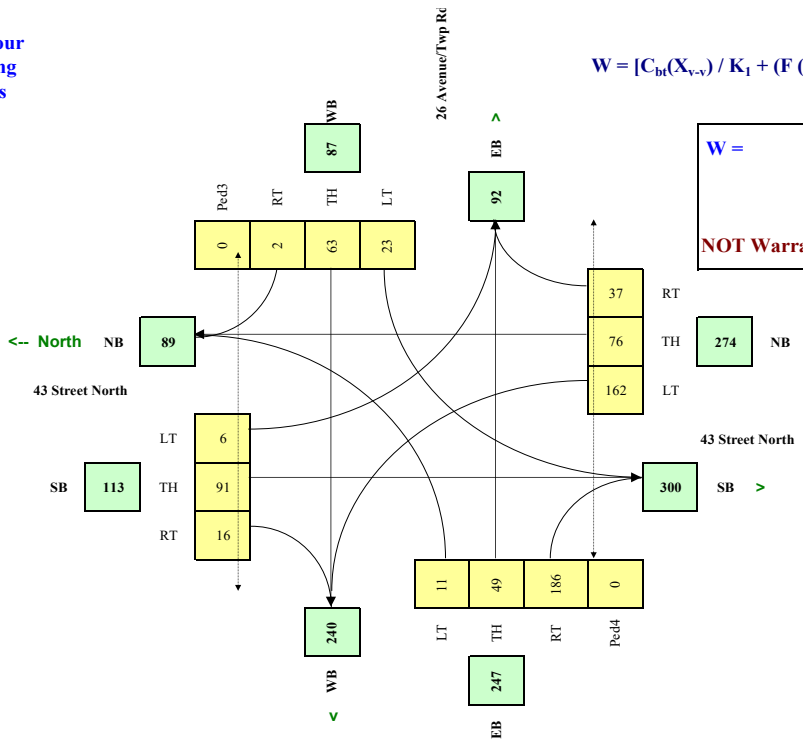
| Other input | | Speed (Km/h) | Truck % | Bus Rt (y/n) | Median (m) |
|---|---|---|---|---|---|
| 43 Street North | NS | 70 | 12.0% | n | 0.0 |
| 26 Avenue/Twp Rd 92 | EW | 60 | 4.0% | n | 0.0 |

Set Peak Hours

| Traffic Input | NB | | | SB | | | WB | | | EB | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | E Side | N Side | S Side |
| 7:00 - 8:00 | 78 | 104 | 25 | 5 | 49 | 6 | 38 | 63 | 5 | 16 | 75 | 236 | | | | |
| 8:00 - 9:00 | 78 | 104 | 25 | 5 | 49 | 6 | 38 | 63 | 5 | 16 | 75 | 236 | | | | |
| 11:00 - 12:00 | 47 | 63 | 15 | 3 | 29 | 4 | 23 | 38 | 3 | 10 | 45 | 142 | | | | |
| 12:00 - 13:00 | 177 | 42 | 36 | 5 | 97 | 19 | 8 | 49 | 0 | 6 | 23 | 116 | | | | |
| 16:00 - 17:00 | 295 | 70 | 60 | 9 | 161 | 31 | 14 | 81 | 0 | 10 | 39 | 194 | | | | |
| 17:00 - 18:00 | 295 | 70 | 60 | 9 | 161 | 31 | 14 | 81 | 0 | 10 | 39 | 194 | | | | |
| **Total (6-hour peak)** | **970** | **453** | **221** | **36** | **546** | **97** | **135** | **375** | **13** | **68** | **296** | **1,118** | **0** | **0** | **0** | **0** |
| **Average (6-hour peak)** | **162** | **76** | **37** | **6** | **91** | **16** | **23** | **63** | **2** | **11** | **49** | **186** | **0** | **0** | **0** | **0** |

**Average 6-hour Peak Turning Movements**

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$




| W = | 59 | 59 | 0 |
|---|---|---|---|
| | | *Veh* | *Ped* |

**NOT Warranted**

RESET SHEET

*Traffic Signal Warrant Spreadsheet - v3H © 2007 Transportation Association of Canada*

# City of Lethbridge/Lethbridge County - Traffic Signal Warrant Analysis

| | | | |
|---|---|---|---|
| Main Street (name) | 43 Street North | Direction (EW or NS) | NS |
| Side Street (name) | 18 Avenue/Site Access | Direction (EW or NS) | EW |
| Quadrant / Int # | 3 | Comments | 60% of AM peak hour utilized for the period from 11:00 AM to 12:00 PM and 60% of PM peak hour utilized for the period from 12:00 PM to 01:00 PM |

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

| | |
|---|---|
| Road Authority: | City of Lethbridge/Lethbridge County |
| City: | Lethbridge |
| Analysis Date: | 2017 Nov 02, Thu |
| Count Date: | Background 2037 (Without Site Traffic) |
| Date Entry Format: | (yyyy-mm-dd) |

| Lane Configuration | | Excl LT | Th & LT | Through | Th+RT+LT | Th & RT | Excl RT | UpStream Signal (m) | # of Thru Lanes |
|---|---|---|---|---|---|---|---|---|---|
| 43 Street North | NB | 0 | 0 | 0 | 1 | 0 | 0 | 1,350 | 1 |
| 43 Street North | SB | 0 | 0 | 0 | 1 | 0 | 0 | 5,200 | 1 |
| 18 Avenue/Site Access | WB | 1 | 0 | 0 | 0 | 1 | 0 | | |
| 18 Avenue/Site Access | EB | 0 | 1 | 0 | 0 | 0 | 1 | | |

Are the 18 Avenue/Site Access WB right turns significantly impeded by through movements? (y/n) n

| Demographics | | |
|---|---|---|
| Elem. School/Mobility Challenged | (y/n) | n |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | n |
| Metro Area Population | (#) | 90,000 |
| Central Business District | (y/n) | n |

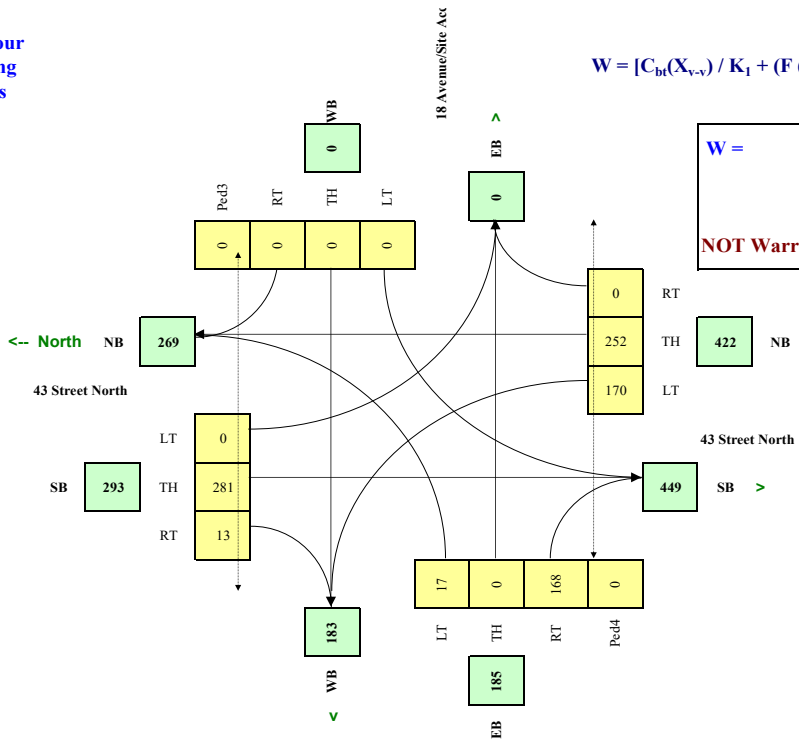
| Other input | | Speed (Km/h) | Truck % | Bus Rt (y/n) | Median (m) |
|---|---|---|---|---|---|
| 43 Street North | NS | 70 | 10.0% | n | 0.0 |
| 18 Avenue/Site Access | EW | 50 | 10.0% | n | 0.0 |

Set Peak Hours

| Traffic Input | NB | | | SB | | | WB | | | EB | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | E Side | N Side | S Side |
| 7:00 - 8:00 | 249 | 199 | 0 | 0 | 329 | 15 | 0 | 0 | 0 | 13 | 0 | 149 | | | | |
| 8:00 - 9:00 | 249 | 199 | 0 | 0 | 329 | 15 | 0 | 0 | 0 | 13 | 0 | 149 | | | | |
| 11:00 - 12:00 | 149 | 119 | 0 | 0 | 197 | 9 | 0 | 0 | 0 | 8 | 0 | 89 | | | | |
| 12:00 - 13:00 | 86 | 230 | 0 | 0 | 191 | 8 | 0 | 0 | 0 | 16 | 0 | 143 | | | | |
| 16:00 - 17:00 | 144 | 383 | 0 | 0 | 319 | 14 | 0 | 0 | 0 | 26 | 0 | 239 | | | | |
| 17:00 - 18:00 | 144 | 383 | 0 | 0 | 319 | 14 | 0 | 0 | 0 | 26 | 0 | 239 | | | | |
| **Total (6-hour peak)** | **1,021** | **1,513** | **0** | **0** | **1,684** | **75** | **0** | **0** | **0** | **102** | **0** | **1,008** | **0** | **0** | **0** | **0** |
| **Average (6-hour peak)** | **170** | **252** | **0** | **0** | **281** | **13** | **0** | **0** | **0** | **17** | **0** | **168** | **0** | **0** | **0** | **0** |

**Average 6-hour Peak Turning Movements**

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$




| | | | |
|---|---|---|---|
| W = | 61 | 61 | 0 |
| | | *Veh* | *Ped* |

NOT Warranted

RESET SHEET

*Traffic Signal Warrant Spreadsheet - v3H © 2007 Transportation Association of Canada*

# City of Lethbridge/Lethbridge County - Traffic Signal Warrant Analysis

| | | | |
|---|---|---|---|
| Main Street (name) | 43 Street North | Direction (EW or NS) | NS |
| Side Street (name) | 18 Avenue/Site Access | Direction (EW or NS) | EW |
| Quadrant / Int # | 3 | Comments | 60% of AM peak hour utilized for the period from 11:00 AM to 12:00 PM and 60% of PM peak hour utilized for the period from 12:00 PM to 01:00 PM |
| for Warrant Calculation Results, please hit 'Page Down' | CHECK SHEET | | |

| | |
|---|---|
| Road Authority: | City of Lethbridge/Lethbridge County |
| City: | Lethbridge |
| Analysis Date: | 2018 Aug 12, Sun |
| Count Date: | Future 2022 with Site Traffic |
| Date Entry Format: | (yyyy-mm-dd) |

| Lane Configuration | | Excl LT | Th & LT | Through | Th+RT+LT | Th & RT | Excl RT | UpStream Signal (m) | # of Thru Lanes |
|---|---|---|---|---|---|---|---|---|---|
| 43 Street North | NB | 0 | 0 | 0 | 1 | 0 | 0 | 1,350 | 1 |
| 43 Street North | SB | 0 | 0 | 0 | 1 | 0 | 0 | 5,200 | 1 |
| 18 Avenue/Site Access | WB | 1 | 0 | 0 | 0 | 1 | 0 | | |
| 18 Avenue/Site Access | EB | 0 | 1 | 0 | 0 | 0 | 1 | | |

Are the 18 Avenue/Site Access WB right turns significantly impeded by through movements? (y/n) n

| Demographics | | |
|---|---|---|
| Elem. School/Mobility Challenged | (y/n) | n |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | n |
| Metro Area Population | (#) | 90,000 |
| Central Business District | (y/n) | n |

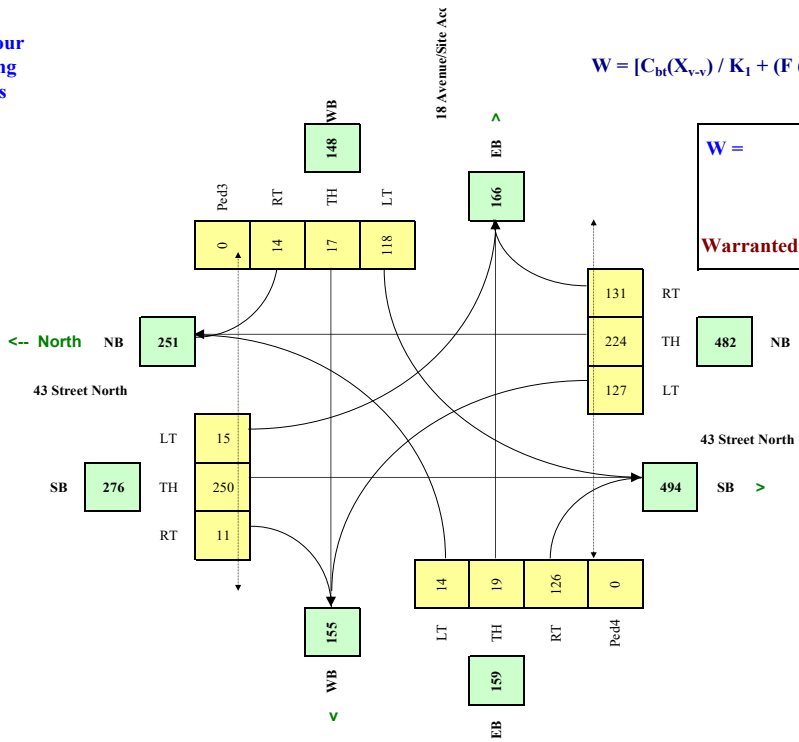
| Other input | | Speed (Km/h) | Truck % | Bus Rt (y/n) | Median (m) |
|---|---|---|---|---|---|
| 43 Street North | NS | 70 | 10.0% | n | 0.0 |
| 18 Avenue/Site Access | EW | 50 | 10.0% | n | 0.0 |

Set Peak Hours

| Traffic Input | NB | | | SB | | | WB | | | EB | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | E Side | N Side | S Side |
| 7:00 - 8:00 | 187 | 179 | 243 | 28 | 298 | 12 | 54 | 8 | 6 | 11 | 35 | 112 | | | | |
| 8:00 - 9:00 | 187 | 179 | 243 | 28 | 298 | 12 | 54 | 8 | 6 | 11 | 35 | 112 | | | | |
| 11:00 - 12:00 | 112 | 107 | 146 | 17 | 179 | 7 | 32 | 5 | 4 | 7 | 21 | 67 | | | | |
| 12:00 - 13:00 | 64 | 203 | 36 | 4 | 167 | 8 | 131 | 19 | 15 | 12 | 5 | 107 | | | | |
| 16:00 - 17:00 | 106 | 338 | 60 | 7 | 279 | 13 | 218 | 31 | 25 | 20 | 9 | 179 | | | | |
| 17:00 - 18:00 | 106 | 338 | 60 | 7 | 279 | 13 | 218 | 31 | 25 | 20 | 9 | 179 | | | | |
| **Total (6-hour peak)** | **762** | **1,344** | **788** | **91** | **1,500** | **65** | **707** | **102** | **81** | **81** | **114** | **756** | **0** | **0** | **0** | **0** |
| **Average (6-hour peak)** | **127** | **224** | **131** | **15** | **250** | **11** | **118** | **17** | **14** | **14** | **19** | **126** | **0** | **0** | **0** | **0** |

**Average 6-hour Peak Turning Movements**

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$




| W = | 131 | 131 | 0 |
|---|---|---|---|
| | | *Veh* | *Ped* |

**Warranted**

RESET SHEET

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# City of Lethbridge/Lethbridge County - Traffic Signal Warrant Analysis

| | | | |
|---|---|---|---|
| Main Street (name) | 43 Street North | Direction (EW or NS) | NS |
| Side Street (name) | 18 Avenue/Site Access | Direction (EW or NS) | EW |
| Quadrant / Int # | 3 | Comments | 60% of AM peak hour utilized for the period from 11:00 AM to 12:00 PM and 60% of PM peak hour utilized for the period from 12:00 PM to 01:00 PM |
| for Warrant Calculation Results, please hit 'Page Down' | CHECK SHEET | | |

| | |
|---|---|
| Road Authority: | City of Lethbridge/Lethbridge County |
| City: | Lethbridge |
| Analysis Date: | 2018 Aug 12, Sun |
| Count Date: | Future 2037 with Site Traffic |
| Date Entry Format: | (yyyy-mm-dd) |

| Lane Configuration | | Excl LT | Th & LT | Through | Th+RT+LT | Th & RT | Excl RT | UpStream Signal (m) | # of Thru Lanes |
|---|---|---|---|---|---|---|---|---|---|
| 43 Street North | NB | 0 | 0 | 0 | 1 | 0 | 0 | 1,350 | 1 |
| 43 Street North | SB | 0 | 0 | 0 | 1 | 0 | 0 | 5,200 | 1 |
| 18 Avenue/Site Access | WB | 1 | 0 | 0 | 0 | 1 | 0 | | |
| 18 Avenue/Site Access | EB | 0 | 1 | 0 | 0 | 0 | 1 | | |

Are the 18 Avenue/Site Access WB right turns significantly impeded by through movements? (y/n) n

| Demographics | | |
|---|---|---|
| Elem. School/Mobility Challenged | (y/n) | n |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | n |
| Metro Area Population | (#) | 90,000 |
| Central Business District | (y/n) | n |

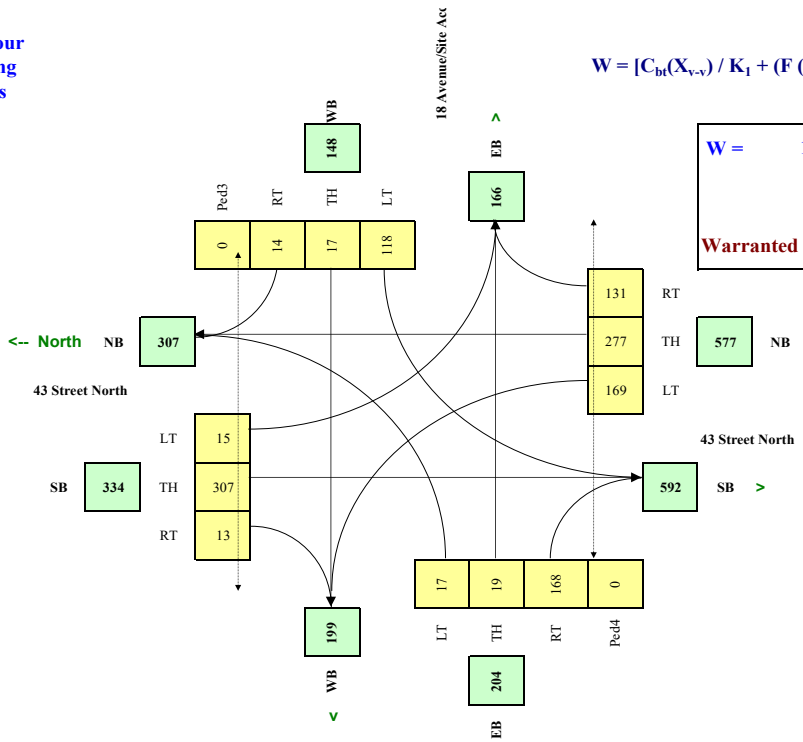
| Other input | | Speed (Km/h) | Truck % | Bus Rt (y/n) | Median (m) |
|---|---|---|---|---|---|
| 43 Street North | NS | 70 | 10.0% | n | 0.0 |
| 18 Avenue/Site Access | EW | 50 | 10.0% | n | 0.0 |

Set Peak Hours

| Traffic Input | NB | | | SB | | | WB | | | EB | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | E Side | N Side | S Side |
| 7:00 - 8:00 | 249 | 212 | 243 | 28 | 376 | 15 | 54 | 8 | 6 | 13 | 35 | 149 | | | | |
| 8:00 - 9:00 | 249 | 212 | 243 | 28 | 376 | 15 | 54 | 8 | 6 | 13 | 35 | 149 | | | | |
| 11:00 - 12:00 | 149 | 127 | 146 | 17 | 226 | 9 | 32 | 5 | 4 | 8 | 21 | 89 | | | | |
| 12:00 - 13:00 | 85 | 256 | 36 | 4 | 199 | 8 | 131 | 19 | 15 | 16 | 5 | 143 | | | | |
| 16:00 - 17:00 | 141 | 426 | 60 | 7 | 331 | 14 | 218 | 31 | 25 | 26 | 9 | 239 | | | | |
| 17:00 - 18:00 | 141 | 426 | 60 | 7 | 331 | 14 | 218 | 31 | 25 | 26 | 9 | 239 | | | | |
| **Total (6-hour peak)** | **1,014** | **1,659** | **788** | **91** | **1,839** | **75** | **707** | **102** | **81** | **102** | **114** | **1,008** | **0** | **0** | **0** | **0** |
| **Average (6-hour peak)** | **169** | **277** | **131** | **15** | **307** | **13** | **118** | **17** | **14** | **17** | **19** | **168** | **0** | **0** | **0** | **0** |

**Average 6-hour Peak Turning Movements**

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$




| W = | 182 | 182 | 0 |
|---|---|---|---|
| | | *Veh* | *Ped* |

**Warranted**

RESET SHEET

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# City of Lethbridge/Lethbridge County - Traffic Signal Warrant Analysis

| | | | |
|---|---|---|---|
| Main Street (name) | 43 Street North | Direction (EW or NS) | NS |
| Side Street (name) | 14 Avenue/Site Access | Direction (EW or NS) | EW |
| Quadrant / Int # | 3 | Comments | 60% of AM peak hour utilized for the period from 11:00 AM to 12:00 PM and 60% of PM peak hour utilized for the period from 12:00 PM to 01:00 PM |
| for Warrant Calculation Results, please hit 'Page Down' | CHECK SHEET | | |

| | |
|---|---|
| Road Authority: | City of Lethbridge/Lethbridge County |
| City: | Lethbridge |
| Analysis Date: | 2017 Nov 02, Thu |
| Count Date: | Background 2037 (Without Site Traffic) |
| Date Entry Format: | (yyyy-mm-dd) |

| Lane Configuration | | Excl LT | Th & LT | Through | Th+RT+LT | Th & RT | Excl RT | UpStream Signal (m) | # of Thru Lanes |
|---|---|---|---|---|---|---|---|---|---|
| 43 Street North | NB | 0 | 0 | 0 | 1 | 0 | 0 | 1,350 | 1 |
| 43 Street North | SB | 0 | 0 | 0 | 1 | 0 | 0 | 5,200 | 1 |
| 14 Avenue/Site Access | WB | 1 | 0 | 0 | 0 | 1 | 0 | | |
| 14 Avenue/Site Access | EB | 0 | 1 | 0 | 0 | 0 | 1 | | |

Are the 14 Avenue/Site Access WB right turns significantly impeded by through movements? (y/n) n

| Demographics | | |
|---|---|---|
| Elem. School/Mobility Challenged | (y/n) | n |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | n |
| Metro Area Population | (#) | 90,000 |
| Central Business District | (y/n) | n |

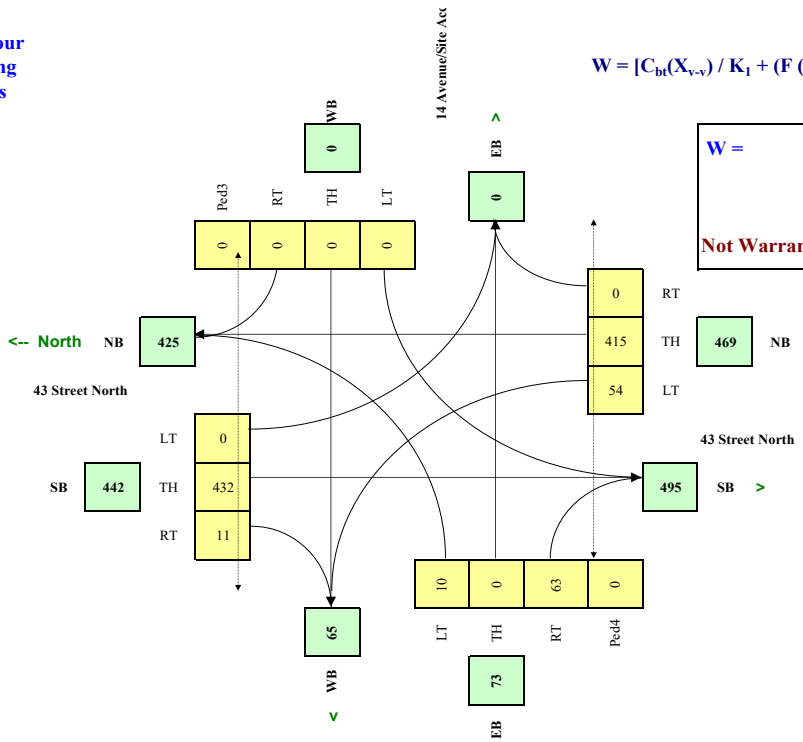
| Other input | | Speed (Km/h) | Truck % | Bus Rt (y/n) | Median (m) |
|---|---|---|---|---|---|
| 43 Street North | NS | 70 | 10.0% | n | 0.0 |
| 14 Avenue/Site Access | EW | 50 | 10.0% | n | 0.0 |

Set Peak Hours

| Traffic Input | NB | | | SB | | | WB | | | EB | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | E Side | N Side | S Side |
| 7:00 - 8:00 | 101 | 420 | 0 | 0 | 459 | 21 | 0 | 0 | 0 | 4 | 0 | 27 | | | | |
| 8:00 - 9:00 | 101 | 420 | 0 | 0 | 459 | 21 | 0 | 0 | 0 | 4 | 0 | 27 | | | | |
| 11:00 - 12:00 | 61 | 252 | 0 | 0 | 275 | 13 | 0 | 0 | 0 | 2 | 0 | 16 | | | | |
| 12:00 - 13:00 | 14 | 323 | 0 | 0 | 322 | 2 | 0 | 0 | 0 | 11 | 0 | 71 | | | | |
| 16:00 - 17:00 | 23 | 538 | 0 | 0 | 537 | 4 | 0 | 0 | 0 | 18 | 0 | 119 | | | | |
| 17:00 - 18:00 | 23 | 538 | 0 | 0 | 537 | 4 | 0 | 0 | 0 | 18 | 0 | 119 | | | | |
| **Total (6-hour peak)** | **323** | **2,491** | **0** | **0** | **2,589** | **65** | **0** | **0** | **0** | **57** | **0** | **379** | **0** | **0** | **0** | **0** |
| **Average (6-hour peak)** | **54** | **415** | **0** | **0** | **432** | **11** | **0** | **0** | **0** | **10** | **0** | **63** | **0** | **0** | **0** | **0** |

**Average 6-hour Peak Turning Movements**

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$




| W = | 34 | 34 | 0 |
|---|---|---|---|
| | | *Veh* | *Ped* |

**Not Warranted - Vs<75**

RESET SHEET

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# City of Lethbridge/Lethbridge County - Traffic Signal Warrant Analysis

| | |
|---|---|
| Main Street (name) | 43 Street North |
| Side Street (name) | 14 Avenue/Site Access |
| Quadrant / Int # | 3 |
| | CHECK SHEET |

for Warrant Calculation Results, please hit 'Page Down'

| | |
|---|---|
| Direction (EW or NS) | NS |
| Direction (EW or NS) | EW |
| Comments | 60% of AM peak hour utilized for the period from 11:00 AM to 12:00 PM and 60% of PM peak hour utilized for the period from 12:00 PM to 01:00 PM |

| | |
|---|---|
| Road Authority: | City of Lethbridge/Lethbridge County |
| City: | Lethbridge |
| Analysis Date: | 2018 Aug 12, Sun |
| Count Date: | Future 2022 (With Site Traffic) |
| Date Entry Format: | (yyyy-mm-dd) |

| Lane Configuration | | Excl LT | Th & LT | Through | Th+RT+LT | Th & RT | Excl RT | UpStream Signal (m) | # of Thru Lanes |
|---|---|---|---|---|---|---|---|---|---|
| 43 Street North | NB | 0 | 0 | 0 | 1 | 0 | 0 | 1,350 | 1 |
| 43 Street North | SB | 0 | 0 | 0 | 1 | 0 | 0 | 5,200 | 1 |
| 14 Avenue/Site Access | WB | 1 | 0 | 0 | 0 | 1 | 0 | | |
| 14 Avenue/Site Access | EB | 0 | 1 | 0 | 0 | 0 | 1 | | |

Are the 14 Avenue/Site Access WB right turns significantly impeded by through movements? (y/n) n

| Demographics | | |
|---|---|---|
| Elem. School/Mobility Challenged | (y/n) | n |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | n |
| Metro Area Population | (#) | 90,000 |
| Central Business District | (y/n) | n |

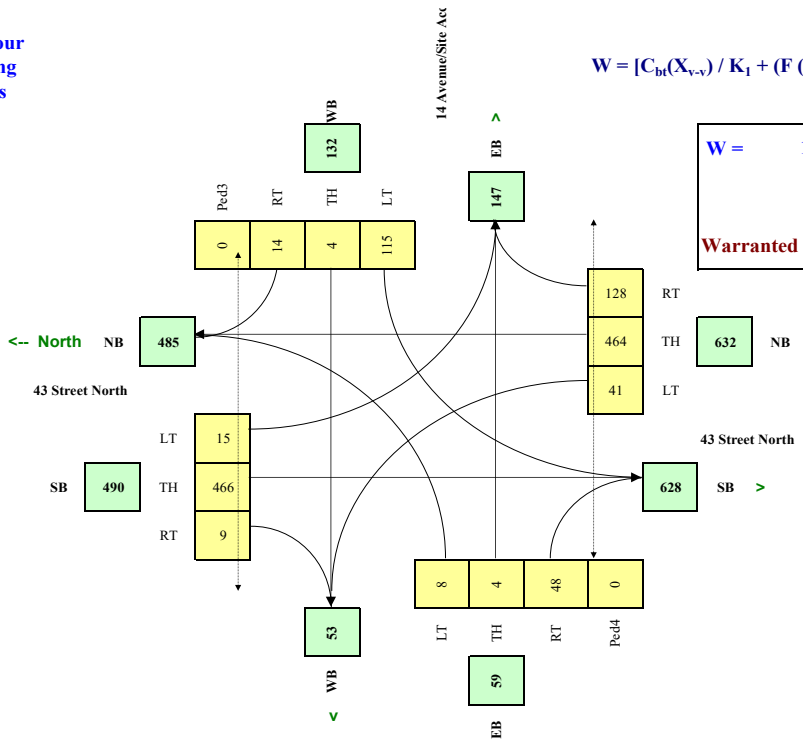
| Other input | | Speed (Km/h) | Truck % | Bus Rt (y/n) | Median (m) |
|---|---|---|---|---|---|
| 43 Street North | NS | 70 | 10.0% | n | 0.0 |
| 14 Avenue/Site Access | EW | 50 | 10.0% | n | 0.0 |

Set Peak Hours

| Traffic Input | NB | | | SB | | | WB | | | EB | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | E Side | N Side | S Side |
| 7:00 - 8:00 | 76 | 582 | 236 | 28 | 421 | 16 | 53 | 2 | 6 | 4 | 7 | 21 | | | | |
| 8:00 - 9:00 | 76 | 582 | 236 | 28 | 421 | 16 | 53 | 2 | 6 | 4 | 7 | 21 | | | | |
| 11:00 - 12:00 | 46 | 349 | 142 | 17 | 253 | 10 | 32 | 1 | 4 | 2 | 4 | 13 | | | | |
| 12:00 - 13:00 | 11 | 293 | 35 | 4 | 392 | 3 | 127 | 4 | 15 | 9 | 1 | 53 | | | | |
| 16:00 - 17:00 | 17 | 489 | 58 | 7 | 653 | 4 | 212 | 6 | 25 | 14 | 2 | 89 | | | | |
| 17:00 - 18:00 | 17 | 489 | 58 | 7 | 653 | 4 | 212 | 6 | 25 | 14 | 2 | 89 | | | | |
| Total (6-hour peak) | 243 | 2,784 | 765 | 91 | 2,793 | 53 | 689 | 21 | 81 | 47 | 23 | 286 | 0 | 0 | 0 | 0 |
| Average (6-hour peak) | 41 | 464 | 128 | 15 | 466 | 9 | 115 | 4 | 14 | 8 | 4 | 48 | 0 | 0 | 0 | 0 |

**Average 6-hour Peak Turning Movements**

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$




| W = | 133 | 133 | 0 |
|---|---|---|---|
| | | *Veh* | *Ped* |

**Warranted**

RESET SHEET

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# City of Lethbridge/Lethbridge County - Traffic Signal Warrant Analysis

| | | | |
|---|---|---|---|
| Main Street (name) | 43 Street North | Direction (EW or NS) | NS |
| Side Street (name) | 14 Avenue/Site Access | Direction (EW or NS) | EW |
| Quadrant / Int # | 3 | Comments | 60% of AM peak hour utilized for the period from 11:00 AM to 12:00 PM and 60% of PM peak hour utilized for the period from 12:00 PM to 01:00 PM |

for Warrant Calculation Results, please hit 'Page Down'

CHECK SHEET

| | |
|---|---|
| Road Authority: | City of Lethbridge/Lethbridge County |
| City: | Lethbridge |
| Analysis Date: | 2018 Aug 12, Sun |
| Count Date: | Future 2037 (With Site Traffic) |
| Date Entry Format: | (yyyy-mm-dd) |

| Lane Configuration | | Excl LT | Th & LT | Through | Th+RT+LT | Th & RT | Excl RT | UpStream Signal (m) | # of Thru Lanes |
|---|---|---|---|---|---|---|---|---|---|
| 43 Street North | NB | 0 | 0 | 0 | 1 | 0 | 0 | 1,350 | 1 |
| 43 Street North | SB | 0 | 0 | 0 | 1 | 0 | 0 | 5,200 | 1 |
| 14 Avenue/Site Access | WB | 1 | 0 | 0 | 0 | 1 | 0 | | |
| 14 Avenue/Site Access | EB | 0 | 1 | 0 | 0 | 0 | 1 | | |

Are the 14 Avenue/Site Access WB right turns significantly impeded by through movements? (y/n) n

| Demographics | | |
|---|---|---|
| Elem. School/Mobility Challenged | (y/n) | n |
| Senior's Complex | (y/n) | n |
| Pathway to School | (y/n) | n |
| Metro Area Population | (#) | 90,000 |
| Central Business District | (y/n) | n |

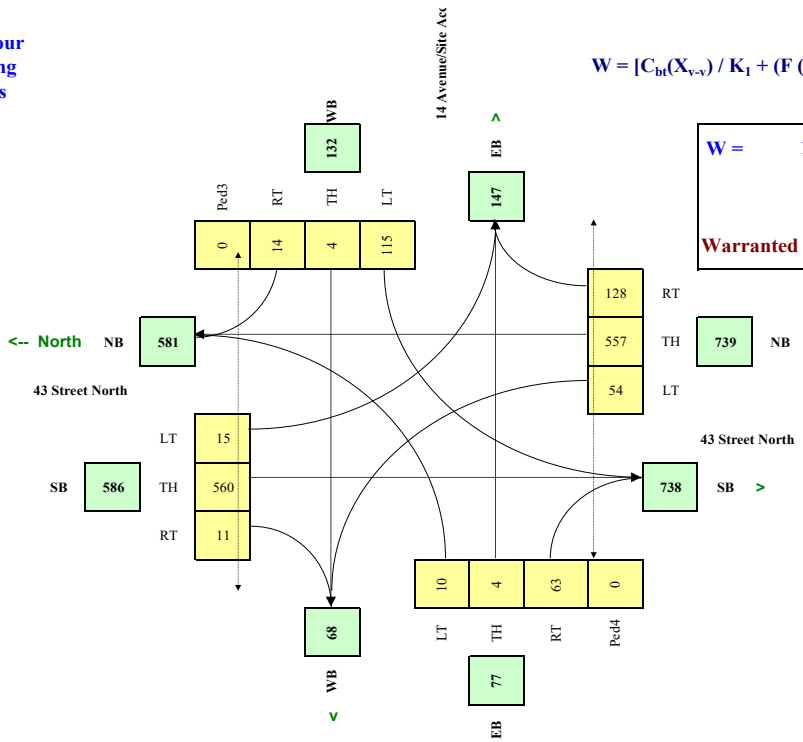
| Other input | | Speed (Km/h) | Truck % | Bus Rt (y/n) | Median (m) |
|---|---|---|---|---|---|
| 43 Street North | NS | 70 | 10.0% | n | 0.0 |
| 14 Avenue/Site Access | EW | 50 | 10.0% | n | 0.0 |

Set Peak Hours

| Traffic Input | NB | | | SB | | | WB | | | EB | | | Ped1 NS | Ped2 NS | Ped3 EW | Ped4 EW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LT | Th | RT | LT | Th | RT | LT | Th | RT | LT | Th | RT | W Side | E Side | N Side | S Side |
| 7:00 - 8:00 | 101 | 670 | 236 | 28 | 532 | 21 | 53 | 2 | 6 | 4 | 7 | 27 | | | | |
| 8:00 - 9:00 | 101 | 670 | 236 | 28 | 532 | 21 | 53 | 2 | 6 | 4 | 7 | 27 | | | | |
| 11:00 - 12:00 | 61 | 402 | 142 | 17 | 319 | 13 | 32 | 1 | 4 | 3 | 4 | 16 | | | | |
| 12:00 - 13:00 | 14 | 370 | 35 | 4 | 456 | 3 | 127 | 4 | 15 | 11 | 1 | 71 | | | | |
| 16:00 - 17:00 | 23 | 616 | 58 | 7 | 760 | 4 | 212 | 6 | 25 | 18 | 2 | 119 | | | | |
| 17:00 - 18:00 | 23 | 616 | 58 | 7 | 760 | 4 | 212 | 6 | 25 | 18 | 2 | 119 | | | | |
| **Total (6-hour peak)** | **323** | **3,344** | **765** | **91** | **3,359** | **66** | **689** | **21** | **81** | **58** | **23** | **379** | **0** | **0** | **0** | **0** |
| **Average (6-hour peak)** | **54** | **557** | **128** | **15** | **560** | **11** | **115** | **4** | **14** | **10** | **4** | **63** | **0** | **0** | **0** | **0** |

**Average 6-hour Peak Turning Movements**

$$W = [C_{bt}(X_{v\text{-}v}) / K_1 + (F\,(X_{v\text{-}p})\,L) / K_2] \times C_i$$




| W = | 174 | 174 | 0 |
|---|---|---|---|
| | | *Veh* | *Ped* |

**Warranted**

RESET SHEET

*Traffic Signal Warrant Spreadsheet - v3H © 2007 Transportation Association of Canada*

# APPENDIX B

# CHINOOK INDUSTRIAL PARK ASP - STORMWATER MANAGEMENT PLAN

February 3, 2023

Prepared for:
Sumus Property Group Ltd.

Prepared by:
Stantec Consulting Ltd.

Project Number:
116549063

This document entitled Chinook Industrial Park ASP - Stormwater Management Plan was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Sumus Property Group Ltd. (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by: Emilie Hewko

Emilie Hewko

Reviewed by: _____

Ted Larson, P.Eng

Approved by: _____

Alan Ashcroft, P.Eng

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# Introduction

Stantec Consulting Ltd. (Stantec) was retained by Sumus Property Group Ltd. (Sumus) to provide stormwater management planning services for the Chinook Industrial Park Area Structure Plan (ASP).

This document provides the design basis for the proposed stormwater management plan, including analysis details and summaries of hydraulic modeling performed to support the Chinook Industrial Park Area Structure Plan.

# 1 SITE DESCRIPTION

## 1.1 Study Area

The Chinook Industrial Park (study area) is in the County of Lethbridge. The study area is bound by Township Road 92 to the north, 43rd Street N (City of Lethbridge boundary) to the west, the St. Mary River Irrigation District (SMRID) canal to the east, and the Rave Industrial Park to the south. The study area boundary is shown on **Figure 1** for reference.

There is an existing Stormwater Management Facility (SWMF), Pond 100, located in the southeast corner of the study area which receives drainage from the existing southern stormwater catchment area. A current agreement between the County and SMRID exists for Pond 100 which requires the following before a pumped discharge of stormwater into the canal will be permitted:

1. Water must be sampled, tested, and meet SMRID water quality standards.
2. Available conveyance capacity within the canal must be confirmed prior to operation of pump system.

Based on the above, ponds will need to operate as zero-release facilities, storing an entire 1:100-year storm event until permission is granted by SMRID to discharge into the canal. A conveyance agreement between Lethbridge County and St. Mary River Irrigation District (SMRID) will be required to manage stormwater in the post-development condition.

## 1.2 Site Topography

The study area topography was determined using Altalis 7.5m LiDAR data. In general, there is a high point in the site topography which divides the study area into two major stormwater subcatchment areas (north and south). The north catchment area drains northeast towards the SMRID canal and Township Road 92. The south catchment area drains to Pond 100. **Figure 2** shows the topography throughout the study area.

# 2 Existing Drainage Conditions

Within the project boundary, the north subcatchment, N1, has an area of 62.3 ha, and can be characterized as an undeveloped parcel with overland sheet flow directed generally towards the SMRID canal. The southern subcatchment, S1, has an area of 44.3 ha, is substantially developed, and contains the Rave Industrial Park. For S1, the existing runoff is conveyed via ditches and drains into the existing detention pond (Pond 100). The existing SWMF (Pond 100) currently has a storage capacity of 37,270 m³ according to the *Rave Industrial Stormwater Management Plan* (Martin Geomatics, 2013). The existing stormwater infrastructure and drainage patterns are shown on **Figure 3** for reference.

# 3 Proposed Drainage Conditions

In the post-development condition, the Chinook Industrial Park will straddle two major subcatchment areas, each draining to a dedicated detention pond, Pond 100 or Pond 200. The proposed stormwater infrastructure and drainage patterns can be seen on **Figure 4**.

The proposed drainage system in the post-development condition will utilize a dual drainage approach, which is comprised of a minor system and a major system. The minor system, which consists of catch basins, storm sewers, and manholes has been designed to accommodate the runoff resulting from the 1:5-year design storm. In general, each private development within the study area will require onsite storage and will be restricted to a 40 L/s/ha release rate (during a 1:5-year design storm). The release rate restriction will benefit the project by reducing sewer pipe sizes in the minor system. However, a few areas along the east edge of the study area boundary will not be restricted and will be serviced via swales instead, conveying runoff to the proposed ponds.

The major system includes overland flow paths, swales, ditches, and stormwater detention ponds. The major system has been designed to manage runoff resulting from the 1:100-year design storm.

The ponds are designed to contain the entire 1:100-year design storm and will only discharge into the SMRID canal after all the requirements noted in **Section 1.1** have been met. Each of the ponds are also expected to require a dedicated lift station to pump into the SMRID canal, based on topographic constraints.

# 4 HYDROLOGIC ASSESSMENTS

## 4.1 Computer Model Analysis (Major System)

A hydrologic model was developed for the post-development condition using PCSWMM computer modelling software. Intensity-duration-frequency (IDF) storm data for the City of Lethbridge was used as the basis for the design storms used in the analysis. The hydrologic model was evaluated using 1:5-year 24-hour and 1:100-year 24-hour design storms, with a simulation duration of 48 hours, using the Chicago Distribution. The Chicago Distribution is commonly used for stormwater analysis of urban areas. Subcatchment boundaries were determined based on the proposed grading concept for the development.

The hydrologic models take into consideration the site topography, soil characteristics, surface imperviousness, surface depression storage, and precipitation. Soil infiltration is accounted for by using the Green Ampt Infiltration method. The infiltration parameters in the models are those associated with topsoil/loam. The hydrologic parameters of the models are shown below in **Table 1**, which are typical values used for the City of Lethbridge. The post development model used 80% imperviousness for all catchments, except for roadways/easements, which are assumed 50% impervious. It has been assumed that each private parcel will be required to have onsite storage and will be restricted to a maximum release rate of 40 L/s/ha during the 1:5-year design storm.

**Table 1 - Model Design Parameters**

| Description – Design Parameters | Value |
|---|---|
| Soil Suction (Loam, mm) | 88.9 |
| Hydraulic Conductivity (mm/hr) | 3.4 |
| Initial Deficit | 0.2 |
| Depression Storage – Impervious Surfaces (mm) | 1.57 |
| Depression Storage – Pervious Surfaces (mm) | 4.67 |
| Manning’s n Roughness – Impervious Surfaces | 0.015 |
| Manning’s n Roughness – Pervious Surfaces | 0.15 |

## 4.2 Computer Model Analysis Results (Major System)

All the runoff flows from the Chinook Industrial Park will be directed to one of two stormwater detention ponds, which will provide the storage required to retain an entire 1:100-year design storm.

The south catchment has a contributing area of approximately 75.5 ha. The existing storm pond in the southeast corner of the study area (Pond 100) will be upgraded to an approximate storage volume of 82,000 $m^3$, accommodating the larger catchment and increased runoff flows.

The north catchment has a contributing area of approximately 31.8 ha. The north catchment will have a new dedicated detention pond (Pond 200), with an approximate storage capacity of 30,000 $m^3$, constructed in the northeastern corner of the study area.

**Table 2** summarizes the model results for estimated temporary storage volumes required per private parcel, due to the 40 L/s/ha release rate restriction.

**Table 2 - Parcel Storage Summary**

| Drainage Area | Subcatchment | | Private Parcel Storage 1-100-year Storm ($m^3$) |
|---|---|---|---|
| | ID | Area (ha) | |
| South - Pond 100 | **Phase 1 Area** | 15.4 | 6,758 |
| | **AP110-1** | 5.8 | 2,699 |
| | **AP110-2** | 2.0 | 1,014 |
| | **AP120-1** | 5.2 | 2,427 |
| | **AP120-2** | 1.3 | 687 |
| | **AP120-3** | 2.8 | 1,359 |
| | **AP130-1** | 2.9 | 1,256 |
| | **AP130-2** | 2.4 | 1,053 |
| North - Pond 200 | **AP210-1** | 7.0 | 3,474 |
| | **AP210-2** | 2.2 | 1,156 |
| | **AP220-1** | 0.6 | 276 |
| | **AP220-2** | 2.1 | 942 |
| | **AP220-3** | 1.1 | 527 |
| | **AP230-1** | 1.3 | 558 |
| | **AP230-2** | 2.0 | 907 |
| | **AP230-3** | 1.7 | 802 |

## 4.3 Minor System Design

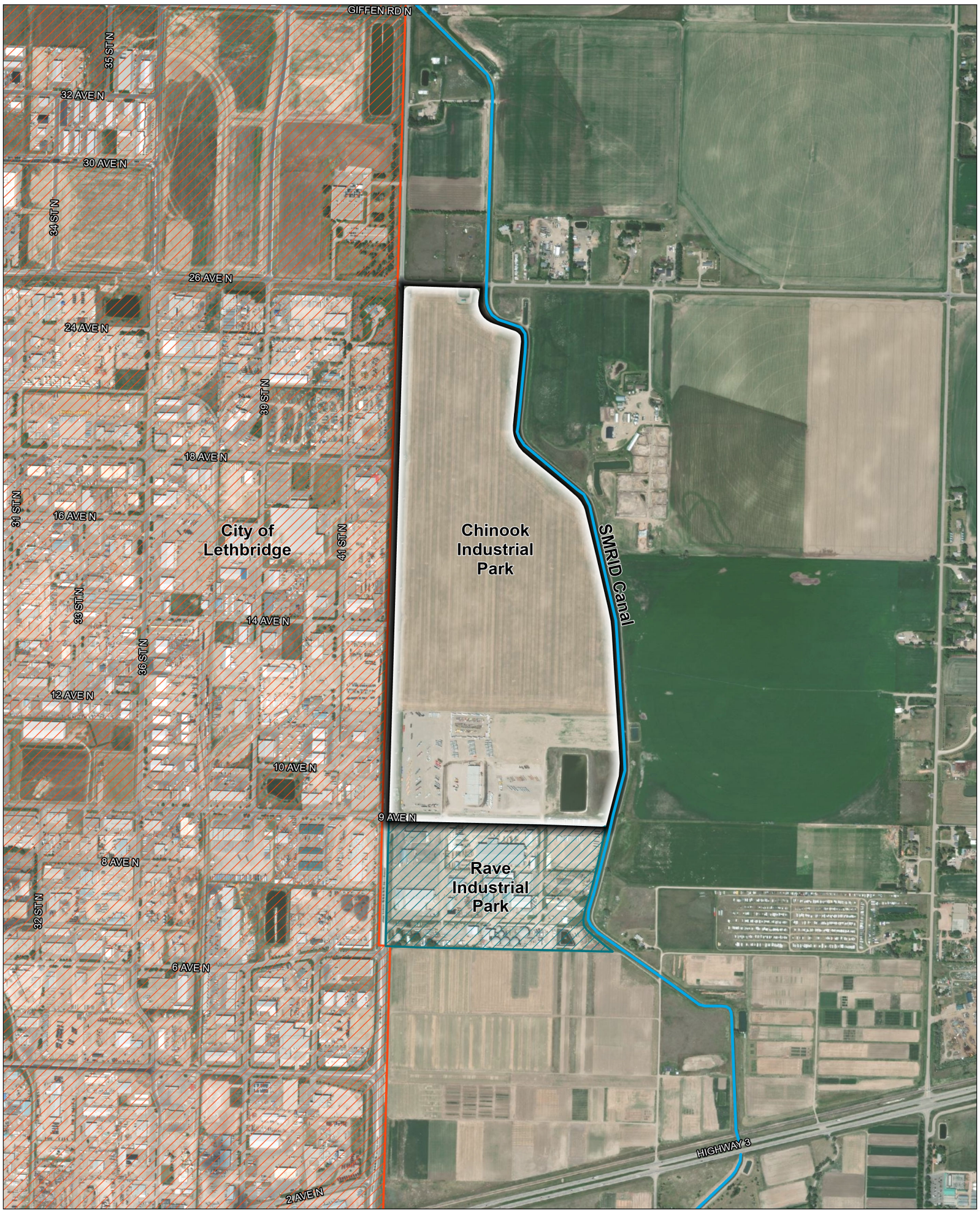
A minor storm sewer system has been designed for a 1:5 year rainfall event using the following unit rates as outlined in this report and the City of Lethbridge Design Standards:

- Roadways: 90L/s/Ha
- Private Parcels: 40L/s/Ha (Restricted 1:5 Year Outflow)

Given the parcel coverage (by buildings) in general industrial areas is typically quite small, large parking and storage areas can be utilized to reduce flows, minimizing the size of downstream infrastructure. For private parcels, this will require that future parcel designs provide some stormwater attenuation and outflow control structures as part of permitting process. Sediment control through the implementation of sumps and or other control measures to collect pollutants should be reviewed at detailed design.

# *5* Conclusion

The stormwater management concept for the proposed Chinook Industrial Park development provides functional stormwater servicing that can contain a 1:100-year storm, using two detention ponds, without draining into the SMRID canal until conditions meet SMRID requirements. Each of the ponds will require a dedicated lift station to pump into the SMRID canal. A conveyance agreement between Lethbridge County and St. Mary River Irrigation District (SMRID) will be required to manage stormwater in the post-development condition. Restricting private parcels to a 40 L/s/ha release rate will reduce the size of underground sewer infrastructure. The preceding stormwater management plan has been developed to support the overall Chinook Industrial Park Area Structure Plan. The calculated storage volumes and sewer pipe sizes are preliminary at this stage and will be revisited during detailed design.







Legend

- Chinook Industrial Park Boundary
- Rave Industrial Park Boundary
- City of Lethbridge Boundary
- SMRID Canal

0 200 400 Meters

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***Notes***

**1.** Coordinate System: NAD 1983 UTM Zone 12N
**2.** Data Sources: City of Lethbridge
**3.** Background: Lethbridge County, Maxar, Esri Canada, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NRCan, Parks Canada

*Project Location*
County of Lethbridge,
Alberta

Prepared by EH on 2/3/2023
TR by MA on 2/3/2023
IR by BS on 2/3/2023

*Client/Project* 116549063

Sumus
Chinook Industrial Park ASP
Stormwater Management

*Figure No.*

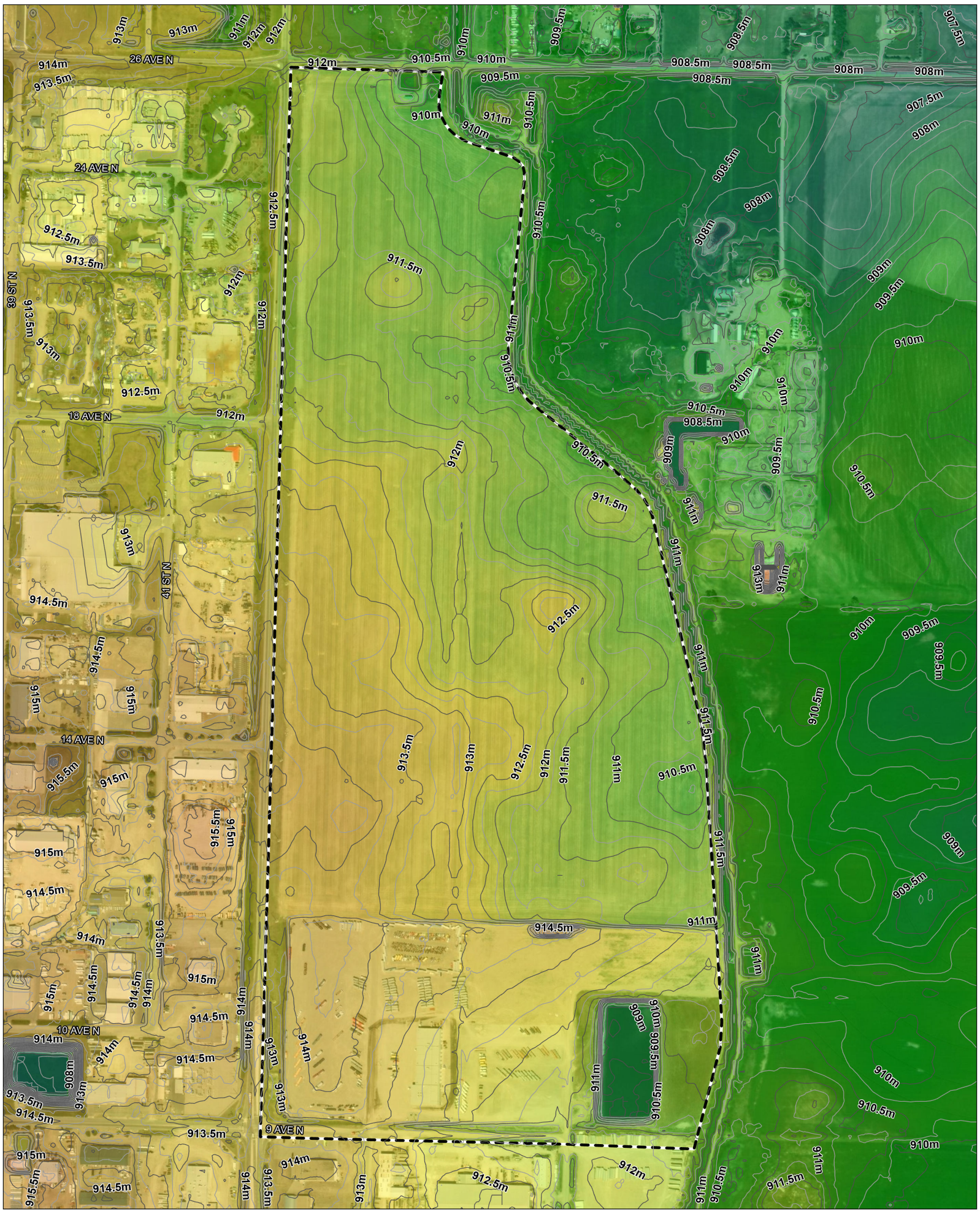
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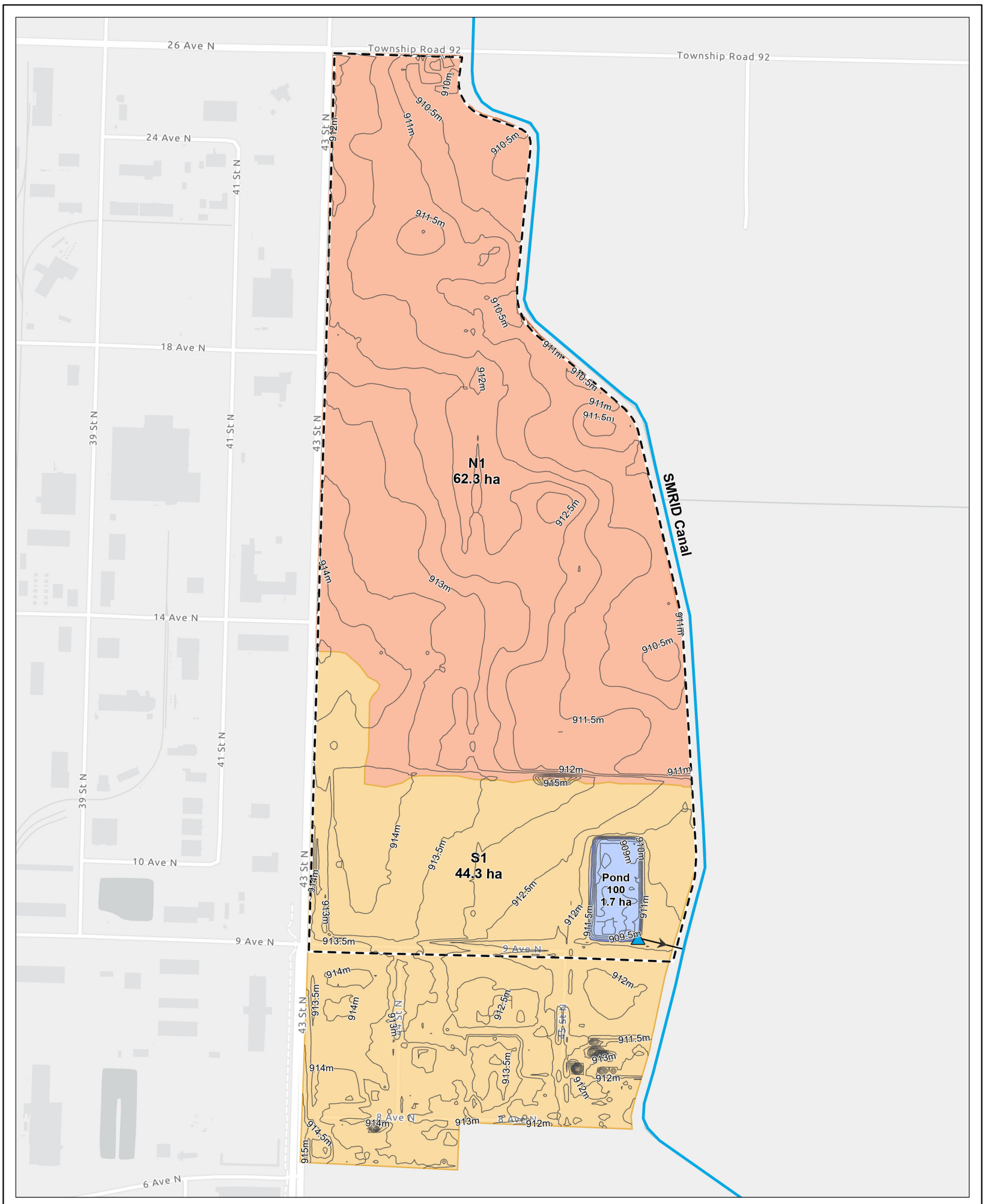
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**Project Location**

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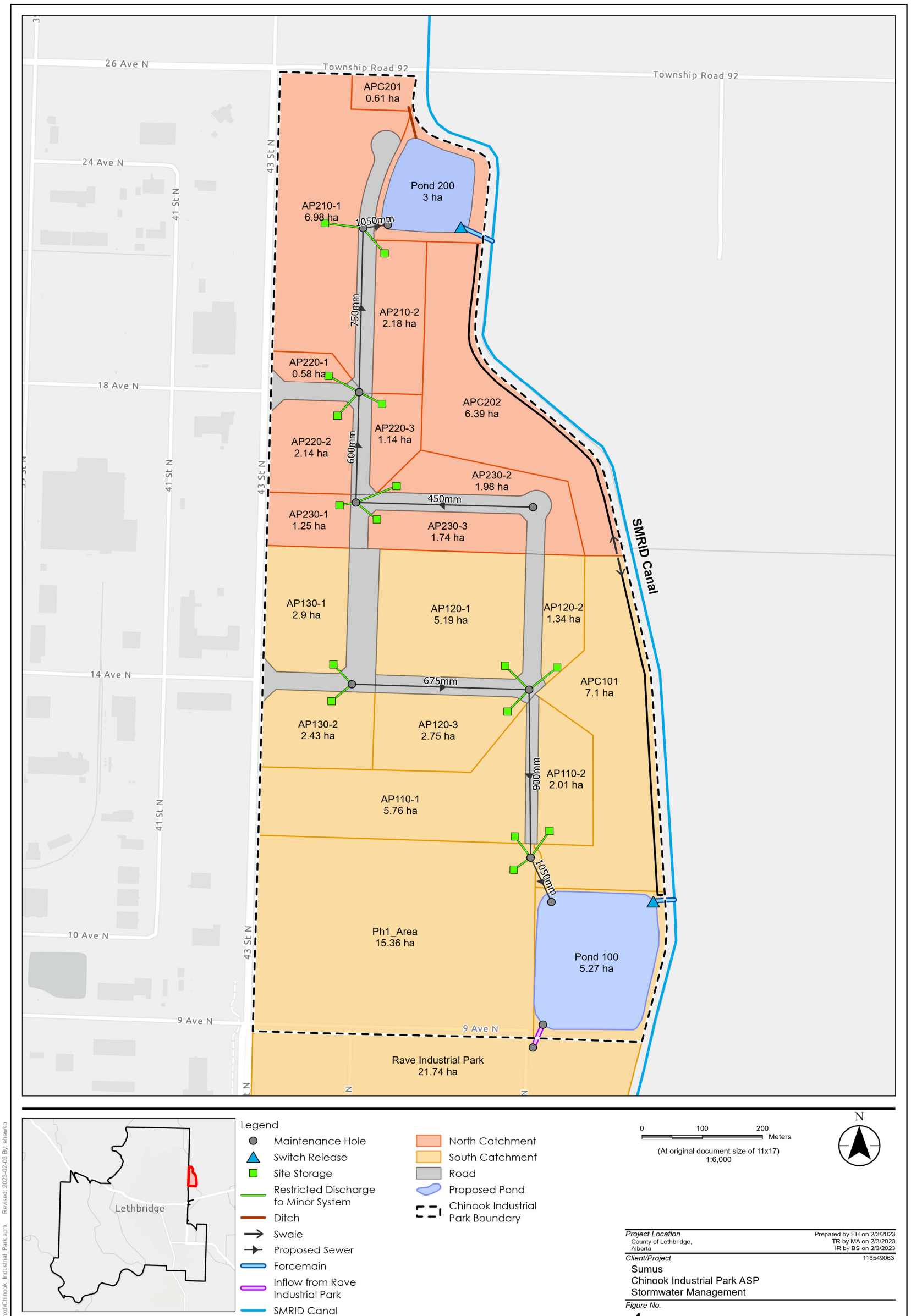
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Sumus
Chinook Industrial Park ASP
Stormwater Management

*Figure No.*
**3**

*Title*
**Existing Stormwater**

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*Project Location*
County of Lethbridge,
Alberta

Prepared by EH on 2/3/2023
TR by MA on 2/3/2023
IR by BS on 2/3/2023

*Client/Project*
116549063
Sumus
Chinook Industrial Park ASP
Stormwater Management

*Figure No.*
**4**

*Title*
**Proposed Stormwater Management**

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# APPENDIX C

# Geotechnical Evaluation
# Chinook Industrial Park Area Structure Plan
# Within W ½ of Section 10 TWP 9 RGE 21 W4M
# Lethbridge County, Alberta



PRESENTED TO
**Sumus Property Group Ltd.**

APRIL 2023
ISSUED FOR USE
FILE: ENG.LGEO04625-01.001

Tetra Tech Canada Inc.
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Lethbridge, AB T1H 2C7 CANADA
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Appendix C Laboratory Results
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## LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Sumus Property Group Ltd., and his agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Sumus Property Group Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Tetra Tech's Limitations on Use of this Document are provided in Appendix A of this report.

# 1.0 INTRODUCTION

This report presents the results of a geotechnical evaluation conducted by Tetra Tech Canada Inc. (Tetra Tech) for the proposed Phase 2 and Phase 3 development of the Chinook Industrial Park Area Structure Plan (ASP) to be located in the Lethbridge County, Alberta (Figure 1).

The objective of this evaluation was to determine the general subsurface stratigraphy and groundwater conditions in the area of the proposed development and to provide general recommendations for the geotechnical aspects of the development. This evaluation has been conducted with limited project details available at this stage and with an understanding that a site-specific geotechnical evaluation will be conducted after further project details become available for each of the proposed building structures.

The scope of work for the geotechnical evaluation was set out in Tetra Tech's proposal (PENG.LGEO04625-01) dated January 17, 2023. The scope of work for this evaluation comprised the drilling of 15 boreholes, a laboratory program to assist in classification of the subsurface soils, and provision of this geotechnical report with the following design and construction recommendations:

- Design parameters for shallow foundations and below-grade structures.
- Design parameters for deep foundation systems.
- Design and installation of floor slabs-on-grade.
- Design and construction of stormwater facilities.
- Site classification for seismic site response.
- Trench excavation and backfill.
- General site grading.
- Volumetric changes of soil due to changes in moisture content and/or frost.
- Mitigation for high water table, if encountered.
- Construction of subgrades, backfill materials, and compaction.
- Concrete type for structured elements in contact with soil.
- Asphalt pavement structure as per the Lethbridge County Engineering Guidelines and Minimum Servicing Standards.

Tetra Tech has also conducted a Phase I Environmental Site Assessment (ESA) for the proposed development. The findings of the Phase I ESA have been provided in a separate report.

Authorization to proceed with the evaluation was provided by Mr. Michael Kelly, of MSK Developments, on behalf of Sumus Property Group Ltd. (Sumus), via a signed Services Agreement dated January 23, 2023.

# 2.0 PROJECT DESCRIPTION AND SCOPE OF WORK

The proposed Phase 2 and Phase 3 development will be located within the west half of Section 10 TWP 9 RGE 21 W4M. Tetra Tech understands that Phase 2 and Phase 3 are adjacent and to the north of Phase 1A and 1B of the Chinook Industrial Park, which is currently developed and serviced.

Based on the information provided by the client, it is understood that the proposed Phase 2 and Phase 3 project will comprise an industrial/commercial business park with major development including industrial lots, utilities and street infrastructure, as well as stormwater management facilities. The total planned area of Phase 2 and Phase 3 is approximately 60.12 hectares.

It is understood that the proposed development will be designed and constructed to the Lethbridge County Engineering Guidelines and Minimum Servicing Standards.

Further details of the proposed development, including building locations, foundation loads, floor elevations, and locations of the other facilities such as roadways and stormwater management facilities, are not available at the time of preparation of this report.

# 3.0 GEOLOGY

Based on Tetra Tech's previous experience near the project site and available surficial geological map by Shetsen[1], the native soil at the project site is expected to consist of lacustrine silts and clays which were deposited in the proglacial Lethbridge Lake, underlain by glacial upper till unit that forms the Lethbridge Moraine. The glacial upper till is of even thickness, consisting of unsorted mixture of clay, silt, sand, and gravel with local water-sorted material overlying bedrock. The site assessment results reported herein are generally consistent with the published data; however, bedrock was not encountered in the boreholes up to their termination depths.

# 4.0 FIELD AND LABORATORY WORK

## 4.1 Geotechnical Fieldwork

The fieldwork for this evaluation was carried out on February 2 and 3, 2023, using a truck-mounted drilling rig, contracted from Chilako Drilling Services Ltd. of Coaldale, Alberta. The rig was equipped with 150 mm diameter solid stem continuous flight augers. Tetra Tech's field representative was Mr. Syed Alam, E.I.T. Buried utility locating was carried out through Alberta One-Call and a private utility locator, contracted by Tetra Tech (LandScan Locating Ltd.).

During the fieldwork, a total of 15 boreholes, designated as 23BH001 through 23BH015, were drilled within the proposed development footprint to depths varying from 6.6 m to 9.6 m below the existing ground surface. The borehole locations are shown on Figure 2.

The borehole locations were laid out on site by Tetra Tech using a handheld GPS. The borehole ground elevations were surveyed by Tetra Tech via a laser level and a rod. The south side of a survey stake denoted as 'FD.1', located on the southwest corner of the site (and shown on Figure 2), was used as a benchmark; with an assumed elevation of 1000.00 m. The borehole coordinates (with accuracy of ±2 m) and the surveyed ground elevations are presented on the borehole logs in Appendix B and summarized in Table A.

[1] Shetsen 1989. Quaternary Geology, Southern Alberta. Alberta Research Council, Bulletin No. 53.

**Table A: Summary of Borehole Depths**

| Borehole No. | Existing Ground Elevation (m)[2] | Easting (m)[1] | Northing (m)[1] | Borehole Depth Below Existing Ground Surface (m) | Standpipe Depth Below Existing Ground Surface (m) |
|---|---|---|---|---|---|
| 23BH001 | 999.61 | 371849 | 5508582 | 9.6 | 9.6 |
| 23BH002 | 997.44 | 372128 | 5508641 | 6.6 | 6.6 |
| 23BH003 | 996.71 | 372397 | 5508601 | 9.6 | 9.6 |
| 23BH004 | 996.60 | 372340 | 5508804 | 6.6 | 6.6 |
| 23BH005 | 998.40 | 372087 | 5508832 | 6.6 | 6.6 |
| 23BH006 | 999.49 | 371894 | 5508792 | 6.6 | 6.6 |
| 23BH007 | 999.13 | 371835 | 5509001 | 6.6 | 6.6 |
| 23BH008 | 997.70 | 372126 | 5509018 | 9.6 | 9.6 |
| 23BH009 | 996.20 | 372360 | 5508990 | 6.6 | 6.6 |
| 23BH010 | 996.93 | 372159 | 5509196 | 6.6 | 6.6 |
| 23BH011 | 998.04 | 371906 | 5509221 | 6.6 | 6.6 |
| 23BH012 | 997.26 | 371849 | 5509493 | 6.6 | 6.6 |
| 23BH013 | 997.22 | 372083 | 5509440 | 9.6 | 9.6 |
| 23BH014 | 995.95 | 372080 | 5509659 | 6.6 | 6.6 |
| 23BH015 | 996.41 | 371926 | 5509752 | 9.6 | 9.6 |

Notes: [1] Coordinates are based on UTM System Zone 12.
[2] Elevations are not geodetic. They are referenced to a site benchmark.

In all the boreholes drilled, disturbed grab samples were obtained at depth intervals of approximately 600 mm. Standard Penetration Tests (SPT) using an automatic SPT hammer (with an approximate efficiency of 90%) were completed at intervals of 1.5 m. All soil samples were visually classified in the field, and the individual soil strata and the interfaces between them were noted. The borehole logs are presented in Appendix B. An explanation of the terms and symbols used on the borehole logs is also included in Appendix B.

Slotted 25 mm diameter polyvinyl chloride (PVC) standpipes were installed in all the boreholes to monitor the short-term groundwater levels. Auger cuttings were used to backfill around the standpipes and the boreholes were sealed at the ground surface with bentonite chips.

### 4.2 Laboratory Program

Soil classification tests, including natural moisture content, Atterberg Limits, grain size distribution (hydrometer), soluble sulphate content, moisture-density relationship (proctor), and constant head hydraulic conductivity (also referred to as permeability) tests were subsequently performed in the laboratory on selected samples collected from the boreholes to aid in the determination of engineering properties. The results of the laboratory tests are presented on the borehole logs and the test reports for hydrometer, proctor and permeability are included as Appendix C.

## 5.0 SITE CONDITIONS

### 5.1 Location and Surface Features

The project site for Phase 2 and Phase 3 of the Chinook Industrial Park is located within the west half of Section 10 TWP 9 RGE 21 W4M and is bounded by 43 Street North to the west; 9 Avenue North to the south; the St. Mary River Irrigation District (SMRID) Canal to the east; and Township Road 92 to the north.

According to information provided by the client, the proposed Phase 2 and Phase 3 site comprises of two (2) lots in the northern portion of the Chinook Industrial: Lot 5 Block 1 Plan 1113171, and Lot 1 Block 1 Plan 0013201.

Lot 5 Block 1 Plan 1113171 is the larger half, comprising of 59.56 hectares of undeveloped farmland.

The remaining portion is Lot 1 Block 1 Plan 0013201, which is a 0.56-hectare portion of land (i.e., Lethbridge Regional Water Services commission lot) with a small building that primarily houses a water filling station.

The project site is relatively flat with drainage generally tending to the southeast except for the northern portion where there is an existing break in topography with the natural drainage tending in the northeast direction.

At the time of the geotechnical fieldwork, the site was sparsely covered with snow with the upper 0.3 m of the ground estimated to be frozen. This thickness of the frozen ground is expected to vary across the site.

## 5.2 Historical Aerial Photograph Review

As part of the evaluation, Tetra Tech reviewed historical aerial photographs and Google Earth Pro images of the proposed development site and surrounding area from 1950 to 2023. The following observations were noted:

- The proposed Phase 2 and Phase 3 project site has remained as undeveloped farmland since 1950 to date except for the construction of the water filling station in the northeast corner; estimated to have been constructed between 1999 and 2011.
- A winding irrigation channel exists at the eastern boundary with agricultural lands to the east and north.
- The existing 43 Street North was observed in all of the reviewed aerial photographs; thus, its construction is expected to have undertaken prior to 1950. 43 Street North borders the western boundary of the project site with undeveloped agricultural lands to its west in the 1950s; however, from 1979, industrial/commercial developments were observed in the reviewed photographs on the west side of 43 Street North.
- Additional industrial/commercial developments were observed in aerial photographs after 1979, most notably the Rave Industrial Park located at the south boundary, which was likely developed sometime between 1985 and 1991.
- Between 2012 and 2022, development of industrial lots comprising Phase 1A and 1B of the ASP was observed in the aerial photographs to the south of the Phase 2 and Phase 3 project site, with a stormwater pond in the southeast corner.

## 5.3 Mining Activity

Tetra Tech reviewed the possible existence of mine workings within the boundary of the proposed development area, including a review of the Alberta Energy Regulator (AER) coal mine mapping archive and other literature contained in Tetra Tech's library. The review indicated that no mine workings exist within the proposed development area.

## 5.4 Background Geotechnical Review

As part of the site assessment, Tetra Tech reviewed the subsurface conditions of boreholes within 450 m of the project site, available in Tetra Tech's library. The review indicates that subsurface conditions encountered on site, are generally consistent with those encountered earlier in the surrounding areas.

# 6.0 SUBSURFACE CONDITIONS

The general subsurface stratigraphy of the site comprised of a surficial layer of topsoil underlain by native clay and clay till deposits. The following subsections provide a summary of the stratigraphic units encountered at the specific borehole locations across the site. A more detailed description is provided on the borehole logs attached in Appendix B.

All noted depths in the following subsections refer to depth below the ground surface that existed at the time of the fieldwork.

## 6.1 Soils

### 6.1.1 Topsoil

A surficial layer of topsoil was encountered at all the borehole locations, with a thickness ranging from 20 mm to 130 mm. The topsoil was generally described as clay, silty, sandy, frozen to moist, and dark brown with trace rootlets and organics. Due to previous grading activities (agricultural practices) and depositional processes (i.e., wind), the thickness of the topsoil layer is expected to vary across the project site.

### 6.1.2 Clay

Native clay was encountered in all the boreholes underlying the topsoil and extending to depths ranging from 0.4 m and 2.0 m below ground surface. The clay was generally described as silty, some sand to sandy, damp to very moist, low to medium plastic, firm to very stiff, and brown. Silt and sand lenses/pockets, precipitates, and occasional high plastic clay inclusions were noted in the clay. Moisture contents of the selected clay samples varied from 7.7% to 23.0%. Two (2) Atterberg Limits tests conducted on clay samples indicated Plastic Limits of 14% and 15%; and Liquid Limits of 31% and 35%; indicative of low to medium plasticity. One (1) hydrometer test indicated a particle size distribution of the sand, silt, and clay size as 31%, 48%, and 21%, respectively.

SPT “N” values indicated between 5 and 10 blows per 300 mm of penetration, indicative of firm to stiff consistency.

### 6.1.3 Clay Till

Clay till was encountered beneath the native clay at depths varying from 0.4 m to 2.0 m below the existing ground surface in all the boreholes and extended to the borehole termination depths. The clay till was generally described as silty, some sand to sandy, trace gravel, damp to very moist, firm to very stiff, low to high plastic, and brown to dark brown with grey mottling. Silt and sand pockets up to 100 mm thick, precipitates, coal and oxide specks/staining or coal fragments were encountered within the clay till. Moisture contents of the selected samples of the clay till varied from 9.9% to 32.0%. Five (5) Atterberg Limits tests conducted on the clay till samples indicated Liquid Limits of 36%, 37%, 36%, 61%, and 29%; and Plastic Limits of 14%, 15%, 15%, 23%, and 12%; indicative of low to high plastic. High plasticity was observed only in sample D6 recovered from an approximate depth of 9.0 m from 23BH013. One (1) hydrometer test indicated a particle size distribution of the sand, silt, and clay size as 31%, 48%, and clay fraction as 21%, respectively.

SPT “N” values in the clay till ranged between 4 and 22 blows per 300 mm of penetration, indicative of firm to very stiff consistency.

Although not encountered in the boreholes, till deposits commonly contain cobbles and occasional boulders, which may be encountered during construction excavation, if any, and during installation of pile foundation.

## 6.2 Borehole Sloughing and Groundwater Conditions

During the field drilling, minor sloughing was encountered in 23BH009 and 23BH014 at depths of 6.1 m and 6.0 m respectively, below the existing ground. At the time of drilling, groundwater seepage was encountered in 23BH009, 23BH013, and 23BH015 at depths of 1.5 m, 7.8 m, and 6.3 m below the existing ground surface, respectively. Standpipes were installed in all the boreholes after completion of drilling. The groundwater levels were measured in the installed standpipes 7 to 8 days after completion of drilling on February 10, 2023. Table B summarizes the groundwater monitoring data.

**Table B: Groundwater Monitoring Data – February 10, 2023**

| Borehole Number | Depth of Standpipe (m) | Borehole Elevation** (m) | Depth to Groundwater on February 10, 2023* (m) | Groundwater Elevation** (m) |
|---|---|---|---|---|
| 23BH001 | 9.6 | 999.61 | 8.26 | 991.35 |
| 23BH002 | 6.6 | 997.44 | 6.37 | 991.07 |
| 23BH003 | 9.6 | 996.71 | 2.97 | 993.74 |
| 23BH004 | 6.6 | 996.60 | 5.83 | 990.77 |
| 23BH005 | 6.6 | 998.40 | 5.70 | 992.70 |
| 23BH006 | 6.6 | 999.49 | 6.42 | 993.07 |
| 23BH007 | 6.6 | 999.13 | 4.92 | 994.21 |
| 23BH008 | 9.6 | 997.70 | 5.20 | 992.50 |
| 23BH009 | 6.6 | 996.20 | 1.54 | 994.66 |
| 23BH010 | 6.6 | 996.93 | 3.65 | 993.28 |
| 23BH011 | 6.6 | 998.04 | 5.72 | 992.32 |
| 23BH012 | 6.6 | 997.26 | Dry | - |
| 23BH013 | 9.6 | 997.22 | 3.19 | 994.03 |
| 23BH014 | 6.6 | 995.95 | 2.05 | 993.90 |
| 23BH015 | 9.6 | 996.41 | 4.54 | 991.87 |

* February 10, 2023, is approximately 7 to 8 days after the completion of the borehole drilling
**Elevations are not geodetic and are referenced to a site benchmark

Based on the available groundwater information, groundwater levels were measured at depths varying from 1.54 m to 8.26 m below the existing ground surface. Groundwater levels within 3.0 m of the existing ground surface were measured in a total of three boreholes (23BH003, 23BH009, and 23BH014) located along the east boundary of the project site.

The water levels measured in the standpipes may not have stabilized at the time of the last measurement reported above. Groundwater levels may fluctuate seasonally (seasonally high in the late spring and early summer) and in response to climatic conditions; thus, they may be encountered at different depths when construction commences. Higher groundwater levels may be considered in the event construction is to occur during the late spring season and early summer. some of the observed groundwater level/seepage and sloughing noted in the boreholes is expected to be due to the presence of wet/saturated sand or silt seams within the clay or clay till.

# 7.0 GEOTECHNICAL RECOMMENDATIONS

The following geotechnical recommendations provided in this report are valid for the project details discussed in Section 2.0. The recommendations that follow provide varying options intended to aid in the development of project concepts and specifications.

The following recommendations are based on subsurface conditions encountered in the boreholes drilled at the project site. Note that geological conditions are innately variable. At the time of preparation of this report, information on the subsurface stratigraphy was available only at discreet borehole locations. In order to develop design recommendations from this information, it is necessary to make some assumptions concerning conditions other than those present at the borehole locations.

The recommendations are based on the understanding and condition that Tetra Tech will be retained to review the relevant aspects of the final design (drawings and specifications) and to conduct such field reviews as are necessary to ensure compliance with the geotechnical aspects of the 2019 National Building Code – Alberta Edition (Building Code), Lethbridge County Engineering Guidelines and Minimum Servicing Standards, this report, and the final plans and specifications. Tetra Tech accepts no liability for any use of this report in the event that Tetra Tech is not retained to provide these review services.

Pursuant to Sections 2.2 and 2.4 of the Building Code, the proposed project will require compliance with the professional design and review requirements set out in Section 2.4 of the Building Code. These require that a geotechnical engineer be retained as a Registered Professional of Record to provide such field reviews as are necessary to certify compliance with the Building Code and to ensure that the geotechnical aspects of the project are constructed so as to substantially comply with the plans and specifications, as well as the requirements of this report.

Given that this geotechnical evaluation was completed with a limited number of boreholes and limited project details, it is advised that the recommendations presented in this report be confirmed and/or updated, as required, by conducting a site-specific geotechnical evaluation prior to design and construction of each building/development.

## 7.1 General

Based on the subsurface conditions encountered in the boreholes, potential geotechnical constraints exist within the site that could impact the proposed design and construction, including:

- The presence of a shallow groundwater table (as shallow as 1.54 m, 2.05 m, 2.97 m, and 3.19 m below the existing ground surface in 23HB009, 23BH014, 23BH003, and 23BH013, respectively).
- The presence of frost-susceptible soils.
- The presence of low to medium plastic clay/clay till (with occasional high plastic) below the topsoil, with firm to very stiff consistency.

On the premise of subsurface conditions encountered in the boreholes, the potential for methane generation is not expected, provided the topsoil containing organics is completely removed from potential building footprint areas and approximately 5.0 m beyond potential building footprint areas.

Considering the groundwater levels measured in the standpipes, temporary and permanent dewatering measures would be required, depending on the depth of excavation, and particularly in areas of shallow groundwater along the east boundary of the project site.

Clay till with high plasticity (i.e., Liquid Limit of 61% and Plasticity Index of 38%) was encountered in 23BH013 at a depth of 9.1 m below the existing ground surface. The high plastic clay typically has relatively higher potential of swelling and shrinkage upon wetting and drying; thus, the performance of settlement-sensitive structures may be impacted if the high plastic clay is present immediately beneath them. The presence of high plastic clay, if any, should be assessed during the site-specific geotechnical evaluation within the footprint of the settlement-sensitive structures.

All foundation design recommendations presented in this report are based on the assumption that an adequate level of monitoring by Tetra Tech will be provided during construction and that all construction will be carried out by suitably qualified contractors, experienced in foundation and earthworks construction. An adequate level of monitoring is considered to be:

- For shallow foundations; inspection of bearing surfaces prior to placement of concrete or mudslab, and design review during construction.
- For deep foundations; full-time monitoring and design review during construction.
- For earthworks; full-time monitoring and compaction testing.

Suitably qualified persons, independent of the contractor, should carry out all such monitoring. One of the purposes of providing an adequate level of monitoring is to check that recommendations, based on data obtained at discrete borehole locations, are relevant to other areas of the site.

## 7.2 Site Development

### 7.2.1 Topsoil Depth

The initial topsoil stripping depth should be considered as being of particular importance with regard to site subgrade grading design elevations. Based on the findings of the field drilling program, the surficial topsoil (A Horizon) layer thickness generally varies from 20 mm to 130 mm; however, may be variable in thickness due to historical cultivation practices of the land surface and/or depositional processes (i.e., wind). However, consideration can be given to incorporating the underlying B Horizon layer (organic content <5%) into the fill mass to be removed during general site grading. Full-time monitoring by experienced personnel is recommended in order to avoid over-stripping and to ensure appropriate material mixing and placement. To accurately estimate the topsoil stripping volume (if required), it is recommended that a site-specific field drilling program be conducted.

### 7.2.2 Lot Grading

The lot grading should be designed and carried out to the current Lethbridge County Engineering Guidelines and Minimum Servicing Standards.

All lots should be graded for drainage at a minimum gradient of 3.0%. Backfill materials and compaction requirements, as to be discussed in Section 7.2.3, should be followed. Where encountered, all organics, localized soft and/or wet soils, or deleterious material must be removed to expose the underlying suitable clay soil. The excavated areas must be backfilled with general engineered fill.

If the development is to consider a raised site grading, additional settlement due to consolidation of the fill and the native soil should be expected and should be considered in the design. After the completion of the raised site grading, the construction of structures supported on raised grade should be delayed to allow for the majority of the consolidation settlement to occur prior to construction.

### 7.2.3 Backfill Materials and Compaction

The existing site soils comprising the predominantly low to medium plastic clay and clay till are considered suitable for use as both landscape fill and general engineered fill materials, as defined in Appendix D. Any soil containing deleterious materials should be removed from site. Sand, silt, and high plastic clay soils, if any, should be separated and used for landscape fill. The final decision on approved backfill materials should be made during site construction.

The moisture content of the site soil materials is expected to be variable with respect to the optimum moisture content (OMC); therefore, it is anticipated that moisture conditioning will be required at the site for proper backfill placement. The earthworks contractor should make their own estimate of the requirements for moisture conditioning to the recommended standards and should consider such factors as weather and construction procedures. A contingency for importation of general engineered fill is recommended in the event that the site soils cannot be moisture conditioned.

General engineered fill materials should be moisture conditioned to within a range of OMC to +2% of the OMC prior to compaction and compacted to a minimum of 98% Standard Proctor Density (SPD). The compacted thickness of each lift of backfill shall not exceed 150 mm.

Further recommendations regarding backfill materials and compaction are contained in Appendix D.

### 7.2.4 Construction Excavations

Excavations should be carried out in accordance with Alberta Occupational Health and Safety Regulations. The depth for the trench excavations is unknown at this time and is anticipated to be less than 6 m below existing ground surface for below-grade structures and/or utility infrastructure. The following recommendations notwithstanding, the responsibility of all excavation cutslopes resides with the Contractor, who should take into consideration site-specific conditions concerning soil stratigraphy and groundwater. All excavations should be reviewed by the Contractor and experienced geotechnical personnel prior to working within the base of the excavation.

Based on the findings of the drilling program, firm to very stiff clay soils, in moist to very moist conditions, are generally anticipated to be encountered within 6.0 m below grade during excavation. All excavations which are to be deeper than 1.5 m should have the sides shored and braced or the slopes should be cut back no steeper than 1.0 horizontal to 1.0 vertical (1.0H:1.0V). In areas where seepage is encountered, the cutslope would need to be flattened to 1.5H:1V and dewatering equipment should be on hand. When excavations are open for longer than one month or where the excavation is required deeper than 6.0 m, the slopes should be cut back flatter than 1.0H:1.0V and should be assessed during construction by a qualified geotechnical engineer.

Any encountered groundwater seepage should be directed towards sumps for removal. Conventional construction sump pumps should be capable of groundwater control.

Spoil piles or temporary surcharge loads should not be allowed within a distance equal to the depth of the excavation from an unsupported excavation face, while mobile equipment should be kept back at least 3.0 m. All excavations should be checked regularly for signs of sloughing, especially after rainfall periods. Small earth falls from the sideslopes are a potential danger to workers and must be guarded against by the contractor.

General recommendations regarding construction excavations are contained in Appendix D.

### 7.2.5 Trench Backfill and Compaction

Trenches must be backfilled in such a way as to minimize the potential differential settlement and/or frost heave movements. A minimum compaction level of 95% of Standard Proctor Maximum Dry Density (SPMDD) is recommended for backfill within the pipe zone of the trench (to 300 mm above the top of pipe). For the remainder of the trench backfill, a minimum compaction standard of 98% of SPMDD should be utilized in all areas. The compacted thickness of each lift of backfill shall not exceed 150 mm. Moisture conditioning to OMC and 2% over OMC of the soils should be specified for general trench backfill. The upper 1.5 m of service trenches should be cut back at a maximum slope of 1.0H:1.0V to avoid an abrupt transition between backfill and in situ soil.

It should be noted that the ultimate performance of the trench backfill is directly related to the uniformity of the backfill compaction. In order to achieve the uniformity, the lift thickness and compaction criteria should be strictly enforced.

General recommendations regarding backfill materials and compaction are contained in Appendix D.

## 7.3 Foundations

The following foundation recommendations have been provided assuming that no significant site grading would be undertaken at the project and foundation design recommendations would be confirmed/updated by conducting a site-specific geotechnical evaluation.

Based on the available borehole logs, firm to very stiff clay or clay till (with SPT blow count varying from 4 to 10 in the majority of the boreholes) was generally encountered at/near the anticipated depth of shallow foundation (i.e., within the upper 2.1 m below the existing ground surface). Considering the soil conditions encountered in the boreholes, shallow foundations are considered suitable to support only lightly loaded structures. Further recommendations and parameters for the design of shallow foundations are provided in Section 7.3.2.

Alternatively, deep foundation systems consisting of bored cast-in-place (CIP) concrete piles or Continuous Flight Auger (CFA) concrete piles founded in stiff to very stiff clay/clay till may be used to support the proposed development. Helical piles may also be considered to support the structures of the proposed developed; however, helical piles should be used to support only static loads (i.e., no dynamic loads). Further recommendations for bored CIP piles and CFA piles are provided in Sections 7.3.3 and 7.3.4, respectively.

### 7.3.1 Limit States Design

For the Limit States Design (LSD) methodology, in order to calculate the factored load capacity, the appropriate Soil Resistance Factors must be applied to each loading condition as follows:

Factored Capacity = Ultimate Capacity x Soil Resistance Factors

In general, the following soil resistance factors must be incorporated into the foundation design. These factors are considered to be in accordance with the Canadian Foundation Engineering Manual (CFEM) (2006) as well as the Building Code.

**Table C: Soil Resistance Factors**

| Description | | Resistance Factor |
|---|---|---|
| **Shallow Foundations** | | |
| Bearing resistance | | 0.5 |
| Passive resistance | | 0.5 |
| Horizontal resistance (sliding) | | 0.8 |
| **Deep Foundations** | | |
| Resistance to Axial Compressive Load | From Semi-Empirical Analysis | 0.4 |
| | From Static Loading Test Results | 0.6 |
| | From Dynamic Monitoring Results (i.e., Pile Driver Analyzer Testing) | 0.5 |
| Uplift Resistance | From Semi-Empirical Analysis | 0.3 |
| | From Loading Test Results | 0.4 |
| Horizontal Load Resistance | | 0.5 |

Under LSD methodology, foundations are to be designed with consideration to both the factored Ultimate Limit State (ULS) and Serviceability Limit States (SLS).

### 7.3.2 Shallow Foundations

Shallow foundations consisting of strip, spread, or mat foundations bearing on firm to stiff clay may be used to support lightly loaded structures, provided other recommendations of this report are followed. Shallow footings should be constructed to a minimum of 1.4 m below the final design ground surface (frost protection requirement for footings under heated structures). For unheated structures, the footings should be constructed a minimum of 2.1 m below grade. All footings should be founded on firm to stiff native soils only. Any fill (except for the general engineered fill) and deleterious materials must be removed from the building footprint areas to expose native subgrade soils.

The future site grading plan is unknown at this time which may require footings to be placed within general engineered fill. It is noted that placement of foundations on engineered fill with thicknesses greater than 2.0 m requires special consideration regarding long-term consolidation of the fill and underlying native soils and subsequent performance issues with the foundations/floor slabs-on-grade. Recommendations and parameters for the design of the shallow foundations within the engineered fill, if any, should be assessed during site-specific geotechnical evaluation considering the grading details.

Footings should be founded on native firm to stiff native soils only. The ultimate and factored static bearing resistance may be taken as 150 kPa and 75 kPa, respectively, subject to other recommendations in this report and confirmation/update during the site-specific geotechnical evaluation. Footing dimensions should be in accordance with the minimum requirements of the Building Code.

Specific bearing certification by a geotechnical engineer in conjunction with a site-specific geotechnical evaluation is recommended for each industrial structure to ensure that the shallow foundations are placed on competent native soils. Any soft/wet/loose/weak soils encountered at footing level, should be replaced with low strength lean mix concrete. Alternatively, it may be possible to lower the footing elevation to more competent native soils, but this should be looked at on a case-by-case basis.

It is recommended to use a smooth edge-trimming bucket or Grade-All for final excavation to the foundation subgrade elevation to minimize disturbance of the founding soils. A minimum 50 mm concrete mudslab should be placed immediately following excavation and inspection, to protect the bearing surface from disturbance and inclement weather.

Gradients of 1H:1V or flatter should be maintained between the bases of adjacent footings at different elevations to avoid load transfer from one to the other.

Foundations subjected to significantly inclined, eccentric, or dynamic loading require special considerations and should be geotechnically assessed on an individual basis.

Considering the groundwater levels measured in the standpipes, groundwater seepage may be encountered during foundation excavation in some areas of the project site.

Recommendations for minimum depth of cover for footings are presented under the heading 'Frost Protection' in Section 7.10. Further recommendations regarding shallow foundations are given in Appendix D.

### 7.3.3 Bored Cast-in-Place Piles

As an alternative to shallow foundation, bored CIP piles may be considered to support the proposed structures.

Bored CIP piles, founded in stiff to very stiff native clay till, may be designed to resist axial compressive loads on the basis of the shaft and the base resistance parameters provided in Table D. The parameters provided in Table D should be confirmed/updated based on the site-specific geotechnical evaluation.

**Table D: Bored Cast-in-Place Concrete Pile Design Parameters (for Compressive Loads)**

| Depth Below Existing Ground Surface (m) | Ultimate Shaft Resistance (kPa) | Factored Shaft Resistance (kPa) | Ultimate Base Resistance (kPa) | Factored Base Resistance (kPa) |
|---|---|---|---|---|
| 0.0 to 2.0 | 0 | 0 | N/A | N/A |
| 2.0 to 6.0 (Native Clay / Clay Till) | 40 | 16 | N/A | N/A |
| 6.0 to 9.6 (Clay till) | 60 | 24 | 900 | 360 |

Straight shaft piles should have an overall concreted pile length not less than 6.0 m below final grade and a minimum shaft diameter of 400 mm. Longitudinal reinforcement in straight shaft piles should extend a minimum of 6.0 m below final grade to provide adequate uplift resistance against frost jacking.

Bored CIP piles should be spaced no closer than 2.5 times the base diameter (measured centre-to-centre). Bells of the CIP piles, where chosen to be constructed, should also be spaced 2.5 times the bell diameter (measured centre-to-centre).

The shaft and base resistances presented in Table D are based on the assumption that mechanical cleaning of the pile sides and bases will be undertaken during installation. Soft, loose, or wet soils, and accumulated water, if any, should be removed from the base and the side of the pile bore immediately prior to the placement of concrete. Base resistance should only be considered in the design where base cleaning can be verified during construction.

Under-reaming or belling of bored CIP piles in clay till should only be considered if a pile bell free of groundwater seepage can be constructed, and if sloughing of the pile bell is not encountered. The feasibility of construction of bell piles in clay till should be assessed and confirmed by the piling contractor prior to construction. Difficulty in bell

construction may occur where silty, sandy, or gravelly clay till is encountered at the bell elevation or where groundwater seepage is encountered at the bell elevation. Accordingly, an alternate design option should also be prepared and implemented where belled piles cannot be constructed.

Bell diameters should be two to three times the shaft diameter. End-bearing should not be used for small diameter (less than 760 mm base diameter) piles because of the difficulties associated with ensuring a clean base. For bored CIP belled piles, shaft resistance should be neglected over the height of the bell and for a height of one shaft diameter above the top of the bell. A minimum depth of cover of 2.5 times the base or bell diameter has been assumed to determine the base resistances provided in Table D. Should less cover be provided, the base resistance would have to be reduced.

Pile bells cannot be formed within sloughing layers such as silt, sand, gravel, and gravelly layers of the clay till. To provide adequate support for the roof of a bell where wet sloughing layers are encountered, the minimum distance from the underside of a sloughing layer to the top of the roof of a bell should be 0.6 m.

It is noted that the clay till will require confirmation of soil conditions at pile bottom elevations for piles with base resistance consideration, as local weaker layers may be encountered during pile installation. Where weaker layers are encountered at the pile bases, additional measures considering the design details of the piles would be required.

Groundwater seepage is expected to be encountered during pile installation at the project site, primarily where wet/saturated sand/silt seams or perched groundwater are intercepted.

Temporary casing should be on hand before drilling starts and used to seal off groundwater and to prevent sloughing of the pile bore. The piling contractor should make their own estimate of temporary casing requirements and should consider such factors as construction procedures and bore diameter.

The piling contractor selected should be experienced in the placement of concrete below water using tremie pipes in light of the potential for groundwater inflows to be encountered during pile installation. The contractor should have all required and/or reasonably anticipated equipment on site prior to the construction of any pile.

Difficult drilling conditions of the bored CIP piles and bell formation in the clay till, if chosen, may be encountered due to potential presence of cobbles and/or boulders. Such drilling difficulties should be assessed by the piling contractor.

Field adjustments of pile dimensions (i.e., length and/or diameter) based on the encountered subsurface conditions may be required and should be included in contract documents.

General recommendations for the design and construction of bored CIP piles are provided in Appendix D.

### 7.3.4 Continuous Flight Auger Concrete Piles

As an alternative to bored CIP piles, CFA concrete piles, also known as auger-cast piles, are considered feasible for the proposed development. CFA piles are formed by drilling a continuous flight hollow stem auger into the ground, followed by pressure injection of concrete and simultaneous extraction of the auger. The sides of the hole are supported at all times by the auger, eliminating the need for temporary casing or drilling slurry. Reinforcement is placed immediately after withdrawal of the auger.

CFA piles may be designed on the basis of shaft resistance and base resistance provided in Table E.

**Table E: Continuous Flight Auger Pile Design Parameters (for Compressive Loads)**

| Depth Below Existing Ground Surface (m) | ULS Ultimate Shaft Resistance (kPa) | ULS Factored Shaft Resistance (kPa) | ULS Ultimate Base Resistance (kPa) | ULS Factored Base Resistance (kPa) |
|---|---|---|---|---|
| 0 to 2.0 | 0 | 0 | N/A | N/A |
| 2.0 to 6.0 (Native Clay / Clay Till) | 40 | 16 | N/A | N/A |
| 6.0 to 9.6 (Clay till) | 60 | 24 | 900 | 360 |

The base resistances provided in Table E are based on the assumption that stiff to very stiff clay till soils and a clean base are to be expected. It is impractical to confirm the base soil conditions with a clean base during pile installation, due to the CFA installation method; therefore, precautions, including, but not limited to, those discussed below, would need to be taken and should be included in the contract documents. Additional boreholes or trial CFA piles may be required prior to, or during, construction to further delineate the subsurface conditions.

Prior to design and construction, the suitability of CFA piles should also be confirmed by the designer and the contractor for the project site, considering the subsurface conditions and the potential variations. Installation records of CFA piles, such as concrete volume, concrete pressure, installation depth, pile profile, etc., should be provided by the piling contractor during construction monitoring for review. Based on the review of installation records, Pile Integrity Tests and/or Pile Driving Analyzer (PDA) tests may be required on selected CFA piles to confirm their capacities or integrities.

Pile reinforcement must be adequate to withstand all vertical, lateral, and tensile forces within the pile. A minimum pile diameter of 400 mm is recommended.

A minimum centre-to-centre pile spacing of 2.5 pile diameters is recommended. Short length (up to 10.0 m) reinforcing cages can be installed by the manual means of pushing the cage into the wet concrete, but longer cages will require the use of a vibrator, in which case it is essential that the reinforcement cages are welded. Centralizers are recommended to ensure adequate concrete cover of the reinforcing steel cages.

An important feature in the formation of CFA piles is the use of comprehensive instrumentation to monitor the performance of the rig at the time of boring. The piling rig must be capable of continuous pile monitoring using computerized technology (i.e., Pile Installation Recorder) to verify the pile cross-sectional area, concrete injection pressures, auger rotation per unit depth, boring rate, and the pressure in the rig hydraulic system. The capacity of CFA piles is highly dependent on the concrete injection pressure and on the properties of the soil into which the concrete is being injected. Continuous monitoring during pile installation is recommended to document the details of each CFA pile installed.

### 7.3.5 Serviceability Limit State Design for Cast-in-Place and Continuous Flight Auger Piles

The SLS must be addressed in addition to analyzing the ULS resistance of a foundation. The SLS is an analysis of the amount of settlement that a foundation element would undergo using unfactored structural loads.

Elastic compression of the pile shaft must be considered, regardless of whether the pile is designed on the basis of shaft resistance and/or base resistance. Note that the elastic compression of the pile shaft is typically small compared to the amount of compression of the soil at the base of the pile that is required to fully mobilize either the shaft resistance or base resistance.

For piles designed primarily on the basis of shaft resistance, the ultimate shaft resistance is typically mobilized after a relatively small pile displacement (approximately 5 mm to 10 mm). Full mobilization of the shaft resistance occurs prior to full mobilization of the base resistance (i.e., additional settlement is required to mobilize the base resistance).

The following expression should be used to estimate the settlement of a pile under SLS conditions, using unfactored structural loads:

$$S = (K)x\ (P/B\ E)$$

Where:

S = Foundation settlement (m).

K = 0.91.

P = Unfactored structural load (live load plus dead load, kN) applied at the pile base.

B = Pile base diameter (m).

E = Elastic modulus of the foundation soil, use 26,000 kPa at depths 6.0 m to 9.6 m below the existing ground surface.

The pile base diameter used in the above expression should be determined from the analysis of factored (ULS) structural loads and factored (ULS) base resistance for each loading case. If the calculated settlement is higher than tolerable for the structure, SLS may govern the pile design. Under such conditions, Tetra Tech should be contacted to provide further direction regarding suitable methods of settlement control. The above expression is anticipated to provide an estimate of the settlement, excluding the elastic compression of the pile.

### 7.3.6 Helical Piles

Helical piles are considered as an alternative option for this development, particularly preferred for lightly loaded structures. It is recommended that helical piles be considered only for statically loaded foundations (i.e., no dynamic load component). Design and construction recommendations for helical piles are provided in this section; however, it is noted that for the final design of this type of pile consideration should be given to the installation methodology of the specialty contractor, as the design capacity of helical piles is a function of the pile installation methodology.

Tetra Tech recommends using the CFEM (2006) design method for helical piles (CFEM Section 18.2.1.4). Using this methodology, the geotechnical parameters required to calculate the ultimate foundation capacity are provided in Table F. A minimum recommended depth for the upper helix is 2.1 m below the existing grade.

**Table F: Geotechnical Parameters for Helical Piles**

| Depth (m) | Bulk Unit Weight (kN/m³) | Avg. Undrained Shear Strength Cu (kPa) | Drained Friction Angle* (Degrees) |
|---|---|---|---|
| 0 to 2.0 | 19 | - | - |
| 2.0 to 6.0 | 19 | 50 | 26 |
| 6.0 to 9.6 | 19 | 100 | 28 |

*Only for long-term strength consideration with zero cohesion; friction angle should not be used together with undrained shear strength.

The total helical pile capacity is presented in the CFEM (Equation 18.10) as follows:

$$R = Q_t + Q_f$$

Where:

R = Total ultimate capacity of the pile (kN).

$Q_t$ = Total ultimate multi-helix pile capacity (kN).

$Q_f$ = Ultimate capacity due to pile shaft skin friction (kN) (for pile shafts greater than 100 mm diameter only).

To calculate the multi-helix bearing capacity, the individual bearing method presented in CFEM Equations 18.11 and 18.12 should be used, provided the helical bearing plates are spaced a minimum of three times the diameter of the largest helix. Otherwise, the cylinder shear method should be used, with consideration of overlapping stress zones between helices. This method sums up the bearing capacity of the bottom plate and the cylindrical shear capacity developed between the upper and lower plate(s).

The factored geotechnical capacity for each pile may be determined as follows, using the soil resistance factors presented in Section 7.3.1:

- Factored Pile Compression Capacity = 0.4R
- Factored Pile Uplift Capacity = 0.3R

For helical piles, the helix or helices should be founded in competent clay till and below the depth of frost penetration. Vertically installed helical piles generally require an enlarged shaft diameter in order to adequately resist lateral loads, where applicable. For bottom helices with load influence depths lower than the maximum borehole termination depth of 9.6 m, a field drill program should be conducted to confirm the soil conditions in depth. Should any of these parameters become limiting factors in the design, Tetra Tech should be contacted for more detailed review and analysis.

Construction of helical piles should consider, but not be limited to, the following recommendations:

- As the helical piles are installed, the rate of rotation and advancement should match the pitch of the helix plate. This will help to avoid “churning” of the foundation soils. It is critical that the foundation bearing soil is not excessively disturbed in order to minimize the risk of excessive foundation settlement.
- An estimate of pile capacity may be obtained by correlating capacity to installation torque. This method requires that an appropriate torque factor be selected by the pile designer (in consultation with the piling contractor). Torque factors are selected based on soil type as well as pile shaft size and shape. This method of estimating pile capacity should be used as a quality control check only and is not suitable to replace proper design procedures. Installation torque should be recorded using calibrated equipment, and the piling contractor should provide a recent calibration certificate (conducted a maximum of 1 year from pile installation) for each piling setup used on site.
- It should be noted that a high torque value can sometimes mislead estimation of bearing capacity. The occurrence of soft zones beneath the final pile depth are not represented in the recorded torque value but may adversely impact the load carrying capacity of the helical pile.
- Pile load testing is recommended. The results of the pile load tests can be correlated to the measured installation torque to develop site-specific installation criteria. In addition, a higher geotechnical resistance factor for compressive loading of 0.6 can be used if pile load testing is conducted prior to construction.

If lateral loading is considered critical to the pile performance, care must be taken during pile installation to identify voids developing around the pile shaft. Due to the nature of the pile installation process, it is common to develop

voids that can significantly influence lateral loading on a pile. If voids develop, they should be backfilled with granular fill, sand, fillcrete, or grout depending on the size of the voids.

### 7.3.7 Laterally-Loaded Piles (Modulus of Horizontal Subgrade Reaction)

The resistance of vertical piles to horizontal load involves soil-structure interaction and is commonly analyzed using computer structural analysis software. If required, detailed lateral analysis can be carried out by Tetra Tech using commercially available software to confirm the results of structural analysis. Additional information pertaining to foundations (including but not limited to loading conditions, size, depth, and spacing) would be required prior to completing the detailed lateral analysis. Alternatively, lateral pile performance may be analyzed using a modulus of horizontal subgrade reaction ($k_s$) and spring constant (K).

In the event that the soil conditions do not provide adequate lateral foundation capacity for a vertical pile, battered piles may be considered. Battering or inclining piles significantly increases the resistance of a laterally-loaded pile; however, the potential impacts of ground deformation should be considered in the decision to use battered piles.

The modulus of the horizontal subgrade reaction has been estimated based on the soil properties at the project site. It is recommended that the design $k_s$ value increase linearly from zero at the ground surface to the value calculated from the formula provided at a depth of 2.0 m below the ground surface. Below this depth, the modulus of horizontal subgrade reaction may be assumed to be constant for a given soil layer.

The SLS modulus of horizontal subgrade reaction for a pile diameter 'B' is calculated as follows:

$$k_s = k'_s/B \ (\mathrm{Mpa/m})$$

Where:

| | | |
|---|---|---|
| $k'_s$ | = | Coefficient of horizontal subgrade reaction (MPa). |
| | = | 10 MPa for the native soil from 2.0 m to 6.0 m below the existing grade. |
| | = | 20 MPa for the native soil from 6.0 m to 9.6 m below the existing grade. |
| B | = | Pile diameter (m). |

The spring constant (K) for use in modelling lateral pile capacity may be obtained as follows:

$$K = k'_s L \ (\mathrm{MN/m})$$

Where:

| | | |
|---|---|---|
| L | = | Length of pile segment (m). |

## 7.4 Foundation Perimeter Drainage Requirements

It is recommended that a weeping tile and sump system be constructed around the outside perimeter of the buildings (at the base of the footings or grade beam to maintain a relatively consistent moisture profile of the subgrade soils beneath the floor slabs). The weeping tile system should comprise a perforated weeping tile, in turn surrounded with a minimum of 150 mm thick blanket of washed rock (maximum size 20 mm) with the granular layer wrapped in non-woven geotextile. The weeping tile should have a minimum 0.5% slope leading to a sump.

## 7.5 Surface Grading and Drainage

Drainage of surface water away from proposed structures should be maintained during and after construction. The finished grade of the proposed development should be designed so that surface water is drained away from structures by the shortest route. All drains should discharge well clear of structures. For construction of roof drains, caution should be taken where downspouts discharge due to the high probability of ice forming in the winter. Downspouts may be discharged onto landscaped areas, provided the water is carried, by means of a concrete splash pad or extendable section so the point of discharge of the water is at least 2 m from the structures. Landscaped surfaces adjacent to buildings should be graded to slope away from the building at a gradient of at least 5% within 2 m of the building structures' perimeter. General landscaped areas should have grades of no less than 2% to minimize ponding.

## 7.6 Floor Slab System

### 7.6.1 Floor Slabs-on-Grade

Construction of slabs-on-grade (not including basements) must consider the following precautions and construction recommendations.

In native soil areas, following removal of topsoil, soft, loose, wet, or disturbed portions of the native soils the subgrade should be scarified to a minimum depth of 300 mm, and moisture conditioned to a range of optimum to 2% over OMC and re-compacted to minimum 98% of SPMDD. High plastic clay, if any, observed on the subgrade should be removed and replaced with low to medium plastic clay, compacted to minimum 98% of SPMDD. In areas of general engineered fill placed during site grading, a minimum depth of 150 mm subgrade preparation is recommended; if weathering is evident, 300 mm subgrade preparation is required. In areas where general engineered fill is placed during site grading, a waiting period (dependent on fill thickness) prior to installation of floor slabs should be provided to reduce the potential settlement after construction. The minimum compaction should be 98% of SPMDD. The prepared subgrade should be proof-rolled and any soft or loose pockets detected should be reconditioned as recommended above or over-excavated and replaced with general engineered fill.

A levelling course of clean well-graded crushed gravel, at least 150 mm in compacted thickness, is recommended directly beneath the slabs-on-grade, unless a thicker course is required for structural purposes. The subgrade beneath slabs-on-grade should be protected at all times from moisture, frost or exposure which may cause softening or disturbance of the subgrade soils. This applies during and after the construction period (and before and after replacement of the required general engineered fill). Should the exposed surface become saturated or disturbed, it should be reworked to achieve the above standards.

If the subgrade is properly prepared as noted above, floor slab movements should be limited to less than approximately 25 mm. Slabs-on-grade should be separated from bearing members to allow some differential movement. If this range of differential movement is unacceptable, the owner should consider a structurally supported floor.

Recommended procedures for backfill materials, and further recommendations for slabs-on-grade construction are included in Appendix D.

### 7.6.2 Structural Slabs

If slab movements cannot be tolerated, a structurally supported floor slab system is recommended as the preferred option for this development; however, with a structurally supported floor slab system, there is a risk of ground movement relative to the slab. This relative movement can lead to problems if piping and other utilities that are connected to the slab are embedded within the ground beneath the slab. Utilities beneath the structurally supported

floor slabs should be protected from differential movement by placing utilities within boxes suspended from the structural slab. In addition, a void form is recommended below the floor slab in order to prevent transfer of uplift pressures due to swelling clay soil

## 7.7 Below-Grade Walls

All below-grade walls, if any, should be designed to resist lateral earth pressures in an “at-rest” condition. This condition assumes a triangular pressure distribution and may be calculated using the following expression:

$$P_o = K_o (\gamma H+Q)$$

Where:

$P_o$ = Lateral earth pressure “at-rest” condition (no wall movement occurs at a given depth).

$K_o$ = Coefficient of earth pressure “at-rest” condition (use 0.5 for cohesive backfill and 0.45 for sand and gravel backfill).

$\gamma$ = Bulk unit weight of backfill soil (use 19 or 21 kN/m³ for cohesive or granular backfill, respectively).

H = Depth below final grade (m).

Q = Surcharge pressure at ground level (kPa).

Installation of a weeping tile system along the base of the below-grade walls is recommended to avoid build-up of hydrostatic pressures. The weeping tile should have a minimum 0.5% slope leading to a sump. The preferred method would be to have provision to tie the sump into the property’s on-site drainage system.

Backfill around concrete walls should not commence before the concrete has reached a minimum two-thirds of its design strength and first floor framing is in place or the walls are laterally braced. Only hand-operated compaction equipment should be employed within 600 mm of the concrete walls. Caution should be used when compacting backfill to avoid high lateral loads caused by excessive compactive effort. A compaction standard of 95% of SPMDD is recommended. To avoid differential wall pressures, the backfill should be brought up evenly around the walls. A minimum 600 mm thick clay cap should be placed at the ground surface to reduce the infiltration of surface water.

## 7.8 Pavement Structures

### 7.8.1 Subgrade Preparation

Subgrade preparation should be undertaken prior to pavement construction. In native soil areas, topsoil, soft, loose, wet, or disturbed portions of the existing soils, and soils containing organics should be removed from the subgrade areas. The recommended compaction standard for subgrade preparation is a minimum of 98% of SPMDD. Cohesive soils should be compacted at optimum to 2% over the OMC. Granular soils (granular base and sub-base layers) should be compacted with moisture content within ±1% of the OMC. A minimum depth of subgrade preparation of 600 mm within clay fill (subject to a proof-roll) or 300 mm within the native clay is recommended for all paved areas.

Backfill to raise these areas to subgrade level should be general engineered cohesive fill materials, as defined in this report, moisture conditioned and compacted as noted previously. Proof-rolling of the prepared surface is recommended to identify localized soft areas and for an indication of overall subgrade support characteristics. Where soft subgrade conditions exist below the design subgrade elevation, these materials should be subexcavated and replaced with general engineered fill.

Depending on the construction scheduling for placement of the granular sub-base and base layers, and the asphalt concrete pavement surface, further subgrade preparation may be required if the placed subgrade materials dry out or weather. This should be determined prior to the placement of the pavement structure. Should the subgrade materials be shown to deteriorate from construction completion, a minimum 300 mm of subgrade preparation is recommended prior to pavement structure placement.

It is recommended to include a contingency for woven geotextile, should localized areas of subgrade instability be encountered. Use of a woven geotextile should not be considered as a substitute for subgrade preparation, but as an option for improvement should subgrade instability exist after subgrade preparation. The woven geotextile should have a minimum grab tensile strength of 890 N.

The subgrade should be prepared and graded to allow drainage towards stormwater facilities. It is imperative that positive surface drainage be provided to prevent ponding of water within the pavement structure and subsequent softening and loss of strength of the subgrade materials. Surrounding landscaping should be such that runoff water is prevented from ponding beside paved areas in order to avoid softening and premature failure of the pavement surface.

### 7.8.2 Pavement Design and Construction

The minimum materials required for the pavement structures of roadways for this project should meet the Lethbridge County Engineering Guidelines and Minimum Servicing Standards. Specific roadway pavement structures should be reviewed by the Transportation Business Unit based on the following: roadway use, traffic volumes, heavy vehicles, and equivalent single-axle loads. This information was not available at the time of writing this report.

For asphalt pavement structure, all asphalt paving lifts should be compacted to a minimum of Marshall Design Density, as per current Lethbridge County Engineering Guidelines and Minimum Servicing Standards.

The pavement design should include provisions for subsurface drainage of the pavement granular layers. Subdrains will provide a means of evacuating water that infiltrates the pavement structure, either through cracks and vertical details (i.e., face of gutter), or from peripheral surface runoff. The subdrain should comprise a perforated flexible plastic drainpipe (100 mm diameter), complete with filter sock. The drain should be placed along the edge of the pavement section in a recessed area of the prepared subgrade.

## 7.9 Concrete Type

For this development, two (2) tests were conducted to determine the water-soluble sulphate content of the soil samples recovered from the project site. The test results indicated sulphate concentrations of 0.008% and 0.075% in the soil samples recovered from 23BH005 and 23BH013, respectively. These results indicate the potential degree of a sulphate attack on the concrete as “negligible”.

Accordingly, there are no specific requirements for the concrete related to the sulphate exposure from the site soils.

A more stringent exposure classification may be required due to structural requirements of other exposure considerations (Refer to CSA A23.1-19, Table 1).

Imported fill, if placed in contact with concrete should be tested for water-soluble sulphate content and the above recommendations should be re-evaluated.

## 7.10 Frost Protection

For protection against frost action, all perimeter footings must be placed a minimum of 1.4 m below final grade for heated structures. All the footings for unheated structures should be placed at a depth minimum depth 2.1 m below surrounding final grade.

Deep foundation system including CIP concrete piles, CFA piles, and helical piles, if considered and exposed to frost action, should be drilled to a minimum depth of 6.0 m and should have full-length steel reinforcement. Grade beams spanning concrete piles should have a minimum 100 mm void space on the underside of the grade beam and around the pile caps to reduce the risk of interaction with the underlying soil.

It is also preferable to backfill the final 600 mm of the exterior of the grade beam with a medium-plastic clay in order to prevent infiltration of excessive moisture and softening of the soils adjacent to the grade beam.

Pipes buried with less than 2.1 m of soil cover should be protected with insulation to avoid frost effects that might cause damage to, or breakage of, the pipes. Rigid insulation placed under areas subject to vehicular wheel loadings should be provided with a minimum thickness of 600 mm of compacted granular base.

## 7.11 Seismic Design

In accordance with the Building Code and based on soil stratigraphy, the project site can generally be classified as Class D for seismic site response.

## 7.12 Stormwater Pond Development

### 7.12.1 General

In the preparation of the recommendations provided in this report for the geotechnical aspects of design and construction of the stormwater management facility, Tetra Tech reviewed pertinent sections of "*Design and Construction of Liners for Municipal Wastewater Stabilization Ponds*" prepared by Komex Consultants Ltd. for the Municipal Engineering Branch of Alberta Environmental Protection (AEP), and the "*Stormwater Management Guidelines for the Province of Alberta*", dated March 2013, prepared by the Municipal Program Development Branch of AEP.

It is understood that a wet pond is being considered for this development, to be located in the northeast corner of the site, in the vicinity of 23BH014. Such facilities are normally constructed as an excavation below ground surface to provide overland stormwater storage, in accordance with the applicable municipal regulations/guidelines. Further details of the wet pond including its base elevation, normal water elevation, and high water elevation have not been provided.

### 7.12.2 Availability of Suitable Clay Liner Materials

As discussed in the previous sections, the subsurface stratigraphy of the site generally comprises lacustrine clay overlying glacial clay till.

Constant head hydraulic conductivity (permeability) testing was conducted on one (1) remoulded sample recovered from 23BH014, representing the clay till material at 1.5 m to 3.0 m below ground surface, within the proposed pond area. The test sample was compacted to 98% of SPMDD with a moisture content between OMC and +2% of OMC. The test result indicates a hydraulic conductivity (K Value) of 1.6 x $10^{-8}$ cm/sec. The laboratory test reports are included in Appendix C.

Based on the AEP publications (referenced above) and assuming a minimum liner thickness of 1.0 m, the maximum hydraulic conductivity of compacted clay liners soils should be 1.7 x $10^{-7}$ cm/sec or less permeable. As recommended by the AEP publications, the liner design should be based on a K value (in situ or design) that is one order of magnitude greater than the average K value (laboratory). Based on the one (1) test result, the design hydraulic conductivity value of 1.6 x $10^{-7}$ cm/sec is slightly lower than the minimum K value of 1.7 x $10^{-7}$ cm/sec. Given that the result of hydraulic conductivity test barely meets the design requirement, additional testing is recommended to be conducted during the site-specific geotechnical evaluation, considering the design details of the pond.

Any localized silts, sands, or low plastic clay soils encountered, should be removed and cannot be use as clay liner materials. Additional hydraulic conductivity testing should be completed on the potential clay liner material prior to, and during, construction to confirm their suitability as clay liner material.

Alternate liner types, such as geosynthetics, may be used but are expected to be substantially more expensive.

### 7.12.3 Stormwater Management Facility Concept and Design

Based on Tetra Tech's understanding of a typical stormwater management facility design, a typical wet pond might have a base elevation ranging between 3 m and 5 m below final ground surface.

Once the operational water level elevation of the wet pond is designed, it is recommended that the proposed interior sideslopes be between 5.0H:1.0V to 7.0H:1.0V for the pond in the active storage zone and 4.0H:1.0V to 5.0H:1.0V for above the active storage zone. The maximum exterior sideslopes should be 3.0H:1.0V. All the interior and the exterior sideslope should also follow the applicable municipal guidelines. Slope stability of the pond's sideslope should be confirmed prior to construction, once pond design become available.

Based on the site soil conditions, laboratory test results, and Tetra Tech's experience with the permeability of local clay till soils, it is recommended that a preliminary thickness for the remoulded compacted clay liner be 0.6 m along the base of the wet pond and 1.2 m along the sidewalls of the pond, up to design highwater elevation (minimum recommended).

Assuming the embankment between the normal water level and high water level is constructed with an engineered clay liner, the potential for erosion from wave action should be considered. Slope protection comprising rip-rap designed for potential wave erosion or other means of erosion control should be given consideration for the sideslope. The use of a filter fabric median between the native soils and rip-rap is also recommended. Design recommendations for this type of protection are beyond the scope of this report.

Given that shallow groundwater was encountered in 23BH014 at a depth of 2.05 m below ground surface, dewatering may be necessary during construction. Groundwater seepage, where encountered during construction, should be directed towards sumps for removal from the excavation. Conventional construction sump pumps should be capable of providing groundwater control.

Considering the groundwater levels measured in 23BH014 (i.e., at a depth of 2.05 m below the existing ground surface), installation of a permanent perimeter drainage below the pond's liner may be required to avoid damage to liner from groundwater's hydrostatic pressure, particularly when the pond is emptied for maintenance/cleaning or for other reasons.

The liner material should typically comprise remoulded medium- to high-plastic clay till soil. Care should be taken to reject all significant silty, low to non-plastic, local sand layers, gravel with particle size greater than 50 mm, and other deleterious materials from the liner material source. Full-time on-site construction monitoring is required to identify and reject pockets of unsuitable material if the initial liner lift comprises clay till soil that is reworked in situ.

Large pockets of silt or sand soils exhibiting seepage may be encountered during pond sideslope excavation, resulting in short-term cutslope instabilities that may require localized drainage and re-grading during construction. As well, additional temporary and permanent drainage control may also be required if vigorous seepage characteristics are observed within the exposed pond sideslopes prior to liner construction.

The liner should be placed in lifts with maximum compacted thickness of 150 mm. If compacted lift surfaces become too smooth to facilitate a good bond with the subsequent lift, they should be scarified to a minimum depth of 50 mm and moisture conditioned, as necessary, prior to placement of the subsequent lift.

The feasibility of liner placement considering the proposed pond sideslope should be confirmed by the contractor prior to construction.

The liner material should be compacted to a minimum of 98% of SPMDD at moisture content varying from 1% to 3% of the OMC.

Liner materials that freeze, dry out, or become excessively wet during construction should be rejected and removed.

The liner should be protected from construction activities and post-construction damages, as necessary. Placement of a gravel layer with a minimum thickness of 250 mm is recommended to protect the liner after its placement.

All penetrating structures into the liner should be sealed with bentonite chips or powder. Pinholes from nuclear densometer tests in the liner should be filled with bentonite powder.

Field and laboratory testing is recommended to confirm the hydraulic conductivity of the liner during and after construction. Conformance testing of on-site soils excavated within the pond area and selected for use as clay liner material must be confirmed by further laboratory testing to verify acceptable hydraulic conductivities at the time of construction.

Pipe connections to the pond including all the inlets and the outlets should be provided with clay plug to control exfiltration from the pond.

# 8.0 DESIGN AND CONSTRUCTION GUIDELINES

General design and construction guidelines are provided in Appendix D, under the following supplemental headings:

- Shallow Foundations
- Bored Cast-in-Place Concrete Piles
- Floor Slabs-on-Grade
- Construction Excavations
- Backfill Materials and Compaction

These guidelines are intended to present standards of good practice. Although supplemental to the main text of this report, they should be interpreted as part of the report. Design recommendations presented herein are based on the premise that these guidelines will be followed. The design and construction guidelines are not intended to represent detailed specifications for the works although they may prove useful in the preparation of such specifications. In the event of any discrepancy between the main text of this report and Appendix D, the main text should govern.

## 9.0 REVIEW OF DESIGN AND CONSTRUCTION

Tetra Tech should be given the opportunity to review details of the design and specifications related to geotechnical aspects for the project site prior to construction.

Full-time monitoring and compaction testing should be undertaken during subgrade preparation and fill placement to ensure that suitable subgrade conditions are prepared and that suitable fill materials are placed and properly compacted. Qualified persons, independent of the contractor, should undertake this monitoring.

## 10.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully Submitted,
Tetra Tech Canada Inc.

PROFESSIONAL ENGINEER ALBERTA
DEEPAK KUMAR
M86686
2023-04-14

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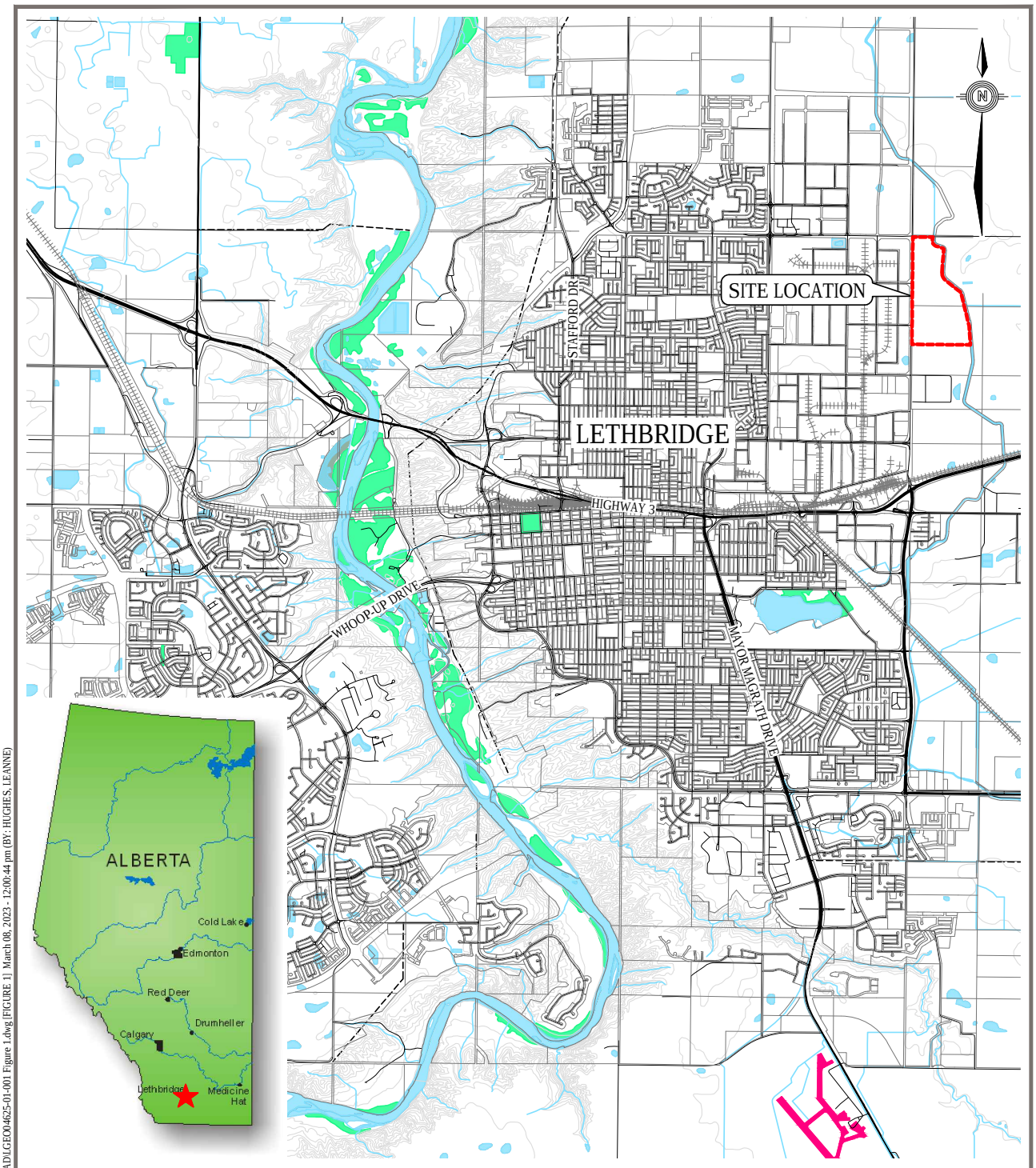
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# FIGURES

Figure 1 Site Location Plan
Figure 2 Borehole Location Plan




NOTES
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0 3,000m

Scale: 1:60,000 @ 8.5"x11"

CLIENT

Sumus Property Group Ltd.

GEOTECHNICAL EVALUATION
CHINOOK INDUSTRIAL PARK ASP
W1/2 10-009-21 W4M LETHBRIDGE COUNTY

SITE LOCATION PLAN

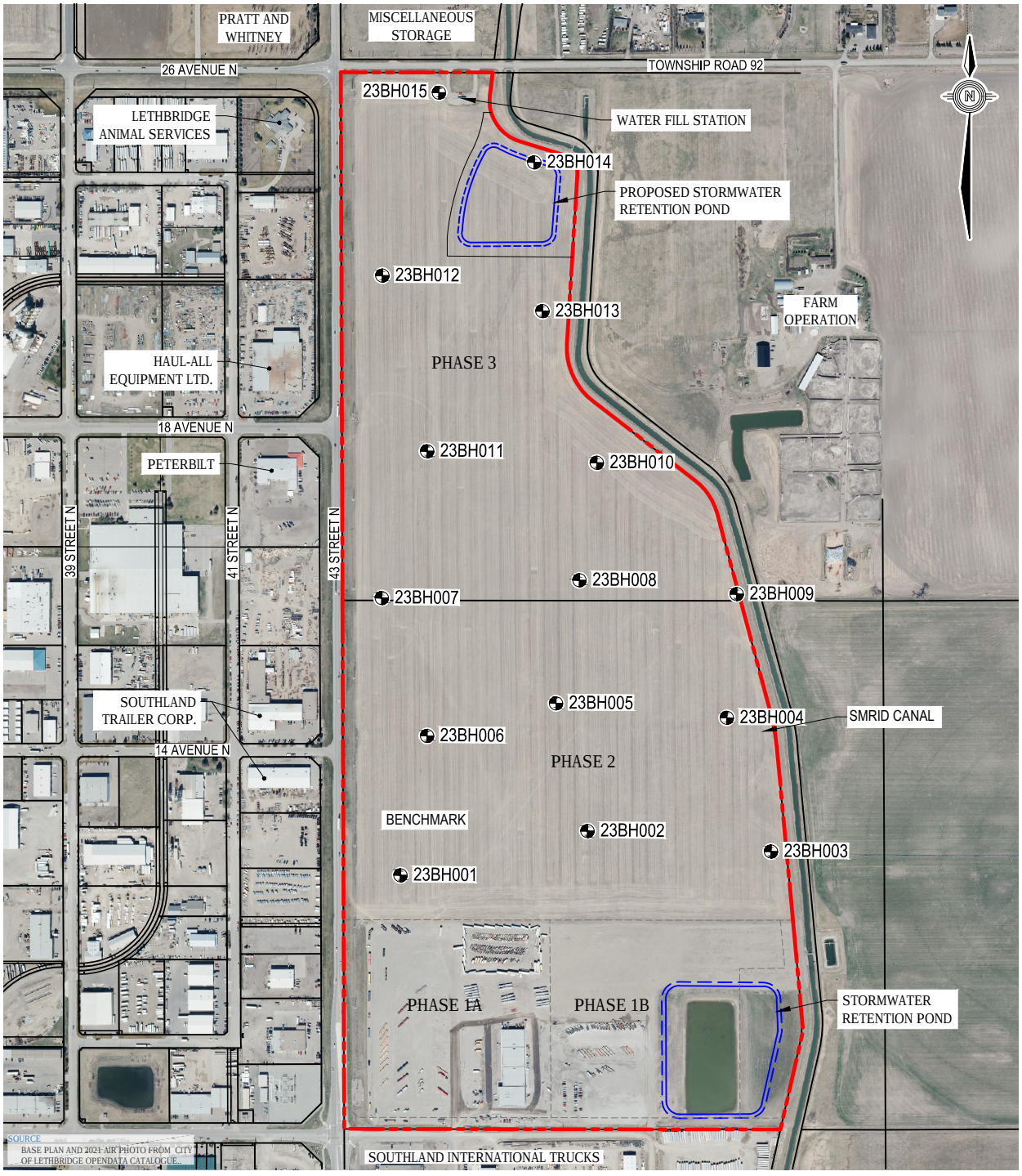
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Figure 1

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LEGEND

SITE BOUNDARY

BOREHOLE LOCATION

0 500m

Scale: 1:10,000 @ 8.5"x11"

CLIENT

Sumus Property Group Ltd.

GEOTECHNICAL EVALUATION
CHINOOK INDUSTRIAL PARK ASP
W1/2 10-009-21 W4M LETHBRIDGE COUNTY

BOREHOLE LOCATION PLAN

TETRA TECH

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Figure 2

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# APPENDIX A
## LIMITATIONS ON USE OF THIS DOCUMENT

# LIMITATIONS ON USE OF THIS DOCUMENT

## GEOTECHNICAL

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The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

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The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this document, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

### 1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to explore, address or consider and has not explored, addressed or considered any environmental or regulatory issues associated with development on the subject site.

### 1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems, methods and standards employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

### 1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

### 1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historical environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional exploration and review may be necessary.

### 1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

### 1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

### 1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

Construction activity can impact structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques, and construction sequence are known.

### 1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, and the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

### 1.15 DRAINAGE SYSTEMS

Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function. Where temporary or permanent drainage systems are installed within or around a structure, these systems must protect the structure from loss of ground due to mechanisms such as internal erosion and must be designed so as to assure continued satisfactory performance of the drains. Specific design details regarding the geotechnical aspects of such systems (e.g. bedding material, surrounding soil, soil cover, geotextile type) should be reviewed by the geotechnical engineer to confirm the performance of the system is consistent with the conditions used in the geotechnical design.

### 1.16 DESIGN PARAMETERS

Bearing capacities for Limit States or Allowable Stress Design, strength/stiffness properties and similar geotechnical design parameters quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition used in this report. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions considered in this report in fact exist at the site.

### 1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

### 1.18 APPLICABLE CODES, STANDARDS, GUIDELINES & BEST PRACTICE

This document has been prepared based on the applicable codes, standards, guidelines or best practice as identified in the report. Some mandated codes, standards and guidelines (such as ASTM, AASHTO Bridge Design/Construction Codes, Canadian Highway Bridge Design Code, National/Provincial Building Codes) are routinely updated and corrections made. TETRA TECH cannot predict nor be held liable for any such future changes, amendments, errors or omissions in these documents that may have a bearing on the assessment, design or analyses included in this report.

# APPENDIX B
## BOREHOLE LOGS

# TERMS USED ON BOREHOLE LOGS

## TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE GRAINED SOILS (major portion retained on 0.075mm sieve): Includes (1) clean gravels and sands, and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as inferred from laboratory or in situ tests.

| DESCRIPTIVE TERM | RELATIVE DENSITY | N (blows per 0.3m) |
|---|---|---|
| Very Loose | 0 TO 20% | 0 to 4 |
| Loose | 20 TO 40% | 4 to 10 |
| Compact | 40 TO 75% | 10 to 30 |
| Dense | 75 TO 90% | 30 to 50 |
| Very Dense | 90 TO 100% | greater than 50 |

The number of blows, N, on a 51mm O.D. split spoon sampler of a 63.5kg weight falling 0.76m, required to drive the sampler a distance of 0.3m from 0.15m to 0.45m.

---

FINE GRAINED SOILS (major portion passing 0.075mm sieve): Includes (1) inorganic and organic silts and clays, (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as estimated from laboratory or in situ tests.

| DESCRIPTIVE TERM | UNCONFINED COMPRESSIVE STRENGTH (KPA) |
|---|---|
| Very Soft | Less than 25 |
| Soft | 25 to 50 |
| Firm | 50 to 100 |
| Stiff | 100 to 200 |
| Very Stiff | 200 to 400 |
| Hard | Greater than 400 |

NOTE: Slickensided and fissured clays may have lower unconfined compressive strengths than shown above, because of planes of weakness or cracks in the soil.

---

## GENERAL DESCRIPTIVE TERMS

Slickensided - having inclined planes of weakness that are slick and glossy in appearance.
Fissured - containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated - composed of thin layers of varying colour and texture.
Interbedded - composed of alternate layers of different soil types.
Calcareous - containing appreciable quantities of calcium carbonate.;
Well graded - having wide range in grain sizes and substantial amounts of intermediate particle sizes.
Poorly graded - predominantly of one grain size, or having a range of sizes with some intermediate size missing.

Data presented hereon is for the sole use of the stipulated client. Tetra Tech EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of EBA. The testing services reported herein have been performed to recognized industry standards, unless noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, EBA will provide it upon written request.

# MODIFIED UNIFIED SOIL CLASSIFICATION

| MAJOR DIVISION | | | GROUP SYMBOL | TYPICAL DESCRIPTION |
|---|---|---|---|---|
| COARSE-GRAINED SOILS More than 50% retained on 75 µm sieve* | GRAVELS 50% or more of coarse fraction retained on 4.75 mm sieve | CLEAN GRAVELS | GW | Well-graded gravels and gravel-sand mixtures, little or no fines |
| | | | GP | Poorly graded gravels and gravel-sand mixtures, little or no fines |
| | | GRAVELS WITH FINES | GM | Silty gravels, gravel-sand-silt mixtures |
| | | | GC | Clayey gravels, gravel-sand-clay mixtures |
| | SANDS More than 50% of coarse fraction passes 4.75 mm sieve | CLEAN SANDS | SW | Well-graded sands and gravelly sands, little or no fines |
| | | | SP | Poorly graded sands and gravelly sands, little or no fines |
| | | SANDS WITH FINES | SM | Silty sands, sand-silt mixtures |
| | | | SC | Clayey sands, sand-clay mixtures |
| FINE-GRAINED SOILS (by behavior) 50% or more passes 75 µm sieve* | SILTS Liquid limit <50 | | ML | Inorganic silts, very fine sands, rock flour, silty or clayey fine sands of slight plasticity |
| | SILTS Liquid limit >50 | | MH | Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts |
| | CLAYS Above "A" line on plasticity chart negligible organic content Liquid limit <30 | | CL | Inorganic clays of low plasticity, gravelly clays, sandy clays, silty clays, lean clays |
| | CLAYS Above "A" line on plasticity chart negligible organic content Liquid limit 30-50 | | CI | Inorganic clays of medium plasticity, silty clays |
| | CLAYS Above "A" line on plasticity chart negligible organic content Liquid limit >50 | | CH | Inorganic clays of high plasticity, fat clays |
| | ORGANIC SILTS AND CLAYS Liquid limit <50 | | OL | Organic silts and organic silty clays of low plasticity |
| | ORGANIC SILTS AND CLAYS Liquid limit >50 | | OH | Organic clays of medium to high plasticity |
| HIGHLY ORGANIC SOILS | | | PT | Peat and other highly organic soils |

## LABORATORY CLASSIFICATION CRITERIA

Classification on basis of percentage of fines

GW, GP, SW, SP
GM, GC, SM, SC
Borderline Classification requiring use of dual symbols

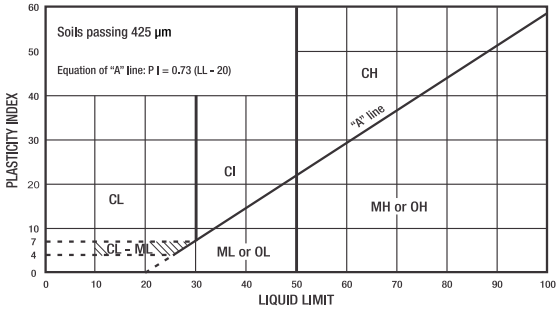
| | | |
|---|---|---|
| $C_U = D_{60} / D_{10}$ <br> $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ | Greater than 4 <br> Between 1 and 3 | |
| Not meeting both criteria for GW | | |
| Atterberg limits plot below "A" line or plasticity index less than 4 | | Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols |
| Atterberg limits plot above "A" line or plasticity index greater than 7 | | |

Less than 5% Pass 75 µm sieve
More than 12% Pass 75 µm sieve
5% to 12% Pass 75 µm sieve

| | | |
|---|---|---|
| $C_U = D_{60}/D_{10}$ <br> $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ | Greater than 6 <br> Between 1 and 3 | |
| Not meeting both criteria for SW | | |
| Atterberg limits plot below "A" line or plasticity index less than 4 | | Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols |
| Atterberg limits plot above "A" line or plasticity index greater than 7 | | |

For classification of fine-grained soils and fine fraction of coarse-grained soils.

PLASTICITY CHART




*Based on the material passing the 75 mm sieve
Reference: ASTM Designation D2487, for identification procedure see D2488. USC as modified by PFRA

## SOIL COMPONENTS

| FRACTION | SIEVE SIZE PASSING | SIEVE SIZE RETAINED | DEFINING RANGES OF PERCENTAGE BY MASS OF MINOR COMPONENTS PERCENTAGE | DESCRIPTOR |
|---|---|---|---|---|
| GRAVEL | | | >35 % | "and" |
| coarse | 75 mm | 19 mm | | |
| fine | 19 mm | 4.75 mm | 21 to 35 % | "y-adjective" |
| SAND | | | | |
| coarse | 4.75 mm | 2.00 mm | 10 to 20 % | "some" |
| medium | 2.00 mm | 425 µm | | |
| fine | 425 µm | 75 µm | >0 to 10 % | "trace" |
| SILT (non plastic) or CLAY (plastic) | 75 µm | | as above but by behavior | |

## OVERSIZE MATERIAL

Rounded or subrounded

| | |
|---|---|
| COBBLES | 75 mm to 300 mm |
| BOULDERS | > 300 mm |

Not rounded

| | |
|---|---|
| ROCK FRAGMENTS | >75 mm |
| ROCKS | > 0.76 cubic metre in volume |

Tt_Modified Unified Soil Classification.cdr

TETRA TECH

# BOREHOLE KEYSHEET

## Water Level Measurement

 Measured in standpipe, piezometer or well

 Inferred

## Sample Types

 A-Casing

 Core

 Disturbed, Bag, Grab

 HQ Core

 Jar

 Jar and Bag

 NQ Core

 No Recovery

 Split Spoon/SPT

 Tube

## Backfill Materials

 Asphalt

 Bentonite

 Cement/ Grout

 Drill Cuttings

 Grout

 Gravel

 Sand

 Slough

 Topsoil Backfill

## Lithology - Graphical Legend[1]

 Asphalt

 Bedrock

 Cobbles/Boulders

 Clay

 Coal

 Concrete

 Fill

 Gravel

 Limestone

 Mudstone

 Organics

 Peat

 Sand

 Sandstone

 Shale

 Silt

 Siltstone

 Till

 Topsoil

1. The graphical legend is an approximation and for visual representation only. Soil strata may comprise a combination of the basic symbols shown above. Particle sizes are not drawn to scale

TETRA TECH

**Sumus Property Group Ltd.**

# Borehole No: **23BH001**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 999.61 m |
| Lethbridge County, AB | UTM: 371849 E; 5508582 N; Z 12 |

| Depth (m) | Method | Soil Description | SOIL SYMBOL | USC | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | | | 999 |
| | | CLAY - silty, some sand, damp, very stiff, medium plastic, light brown, sand pockets. | | | | B1 | | 8.8 | | | |
| 1 | | ... silt lenses. | | | | B2 | | 15.1 | | | 998 |
| | | ... damp to moist, stiff, white precipitates. | | | | D1 | 10 | | | | |
| 2 | | CLAY (TILL) - silty, some sand, trace gravel, moist, very stiff, medium plastic, brown with dark brown mottling, coal and oxide specks, sand pockets throughout. | | | | B3 | | 14 | | | |
| | | ... sandy, low plastic for 150 mm. | | | | B4 | | 15.2 | | | 997 |
| | | ... silt lenses. | | | | | | | | | |
| 3 | | ... very moist, firm, dark brown with grey mottling, oxide staining, with stiff clay layers. | | CI | | D2 | 5 | 15.2 | | | |
| | | ... heavy oxide staining. | | | | B5 | | | | | 996 |
| 4 | Solid stem auger | ... moist, stiff. | | | | B6 | | | | | |
| | | ... occasional very moist and firm spots. | | | | D3 | 9 | 18.1 | | | 995 |
| 5 | | | | | | B7 | | | | | |
| | | | | | | B8 | | | | | 994 |
| 6 | | ... brown to dark brown, sand pockets. | | | | D4 | 10 | 16 | | | |
| | | ... very stiff. | | | | B9 | | | | | 993 |
| 7 | | ... coal fragments. | | | | B10 | | | | | |
| | | | | | | D5 | 12 | 17.5 | | | 992 |
| 8 | | ... coal smearing. | | | | B11 | | | | | |
| | | | | | | B12 | | | | | 991 |
| 9 | | | | | | | | | | | |
| | | | | | | D6 | 11 | 16.8 | | | 990 |
| 10 | | End of Borehole @ 9.6 m. No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 9.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | | | |
| | | | | | | | | | | | 989 |
| 11 | | | | | | | | | | | |

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 9.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH002**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 997.44 m |
| Lethbridge County, AB | UTM: 372128 E; 5508641 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | 997 |
| | | CLAY - silty, some sand, damp to moist, very stiff, medium plastic, light brown, sand pockets. | | B1 | | 14.4 | | | |
| 1 | | ... white precipitates, oxide specks. | | B2 | | 10.3 | | | 996 |
| | | CLAY (TILL) - silty, some sand, trace gravel, damp to moist, very stiff, medium plastic, brown to dark brown, coal and oxide specks, white precipitates, sand pockets. | | D1 | 14 | 11.5 | | | |
| 2 | | ... grey mottling, white precipitates throughout. | | B3 | | | | | |
| | | | | B4 | | 14.3 | | | 995 |
| 3 | Solid stem auger | ... coal fragments. | | D2 | 16 | 15.1 | | | |
| | | ... moist, heavy sand inclusions for 100 mm. | | B5 | | | | | 994 |
| 4 | | ... oxide staining. | | B6 | | | | | |
| | | ... stiff to very stiff. | | D3 | 10 | 16 | | | 993 |
| 5 | | | | B7 | | | | | |
| | | | | B8 | | | | | 992 |
| 6 | | | | D4 | 11 | 16.5 | | | |
| | 2/10/2023 | End of Borehole @ 6.6 m. | | | | | | | 991 |
| 7 | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 6.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | 2/10/2023 |
| | | | | | | | | | 990 |
| 8 | | | | | | | | | |
| | | | | | | | | | 989 |
| 9 | | | | | | | | | |
| | | | | | | | | | 988 |
| 10 | | | | | | | | | |
| | | | | | | | | | 987 |
| 11 | | | | | | | | | |

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH003**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 996.71 m |
| Lethbridge County, AB | UTM: 372397 E; 5508601 N; Z 12 |

| Depth (m) | Method | Soil Description | SOIL SYMBOL | USC | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | | | 996 |
| | | CLAY - silty, some sand, moist, very stiff, medium plastic, brown, silt lenses. | | | | B1 | | 17.3 | | | |
| 1 | | ... damp to moist, sand pockets. | | CL-CI | | B2 | | 14.6 | | | |
| | | ... some sand to sandy, very moist, firm, low to medium plastic, white precipitates. | | | | D1 | 5 | | | | 995 |
| 2 | | CLAY (TILL) - silty, some sand, trace gravel, very moist, firm to stiff, medium plastic, brown, coal and oxide specks, sand pockets. | | | | B3 | | 15.3 | | | |
| | | | | | | B4 | | 17.1 | | | 994 |
| 3 | | ... oxide staining. | | | | D2 | 6 | 17.7 | | | |
| | | ... sand inclusions. | | | | B5 | | | | | 993 |
| 4 | | | | | | B6 | | 20 | | | |
| | Solid stem auger | | | | | D3 | 9 | 17.7 | | | 992 |
| 5 | | ... stiff, grey mottling, occasional high plastic clay inclusions. | | | | B7 | | | | | |
| | | ... oxide staining. | | | | B8 | | | | | 991 |
| 6 | | | | CI | | D4 | 7 | 21.3 | | | |
| | | ... stiff to very stiff. | | | | B9 | | | | | 990 |
| 7 | | | | | | B10 | | | | | |
| | | | | | | D5 | 8 | 18.1 | | | 989 |
| 8 | | ... very stiff. | | | | B11 | | | | | |
| | | | | | | B12 | | | | | 988 |
| 9 | | | | | | D6 | 14 | 20.1 | | | |
| | | End of Borehole @ 9.6 m. | | | | | | | | | 987 |
| 10 | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 9.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | | | |
| 11 | | | | | | | | | | | 986 |

2/10/2023 (Depth) 2/10/2023 (Elevation)

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 9.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

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**Sumus Property Group Ltd.**

# Borehole No: **23BH004**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 996.6 m |
| Lethbridge County, AB | UTM: 372340 E; 5508804 N; Z 12 |

| Depth (m) | Method | Soil Description | SOIL SYMBOL | USC | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | | | 996 |
| | | CLAY - silty, some sand, damp, very stiff, medium plastic, brown, white precipitates, sand pockets. | | | | B1 | | 13 | | | |
| 1 | | | | | | B2 | | 12.6 | | | 995 |
| | | ... stiff, silt pockets. | | CI | | D1 | 6 | 12.9 | | | |
| 2 | | CLAY (TILL) - silty, some sand, trace gravel, moist, stiff, medium plastic, brown, coal and oxide specks, sand pockets throughout. | | | | B3 | | | | | |
| | | | | | | B4 | | 15.8 | | | 994 |
| | | ... coal fragments. | | | | | | | | | |
| 3 | | | | | | D2 | 8 | 16.9 | | | |
| | | ... sand pockets throughout. | | | | | | | | | 993 |
| | | | | | | B5 | | | | | |
| 4 | | | | | | B6 | | | | | |
| | | | | | | | | | | | 992 |
| | | | | | | D3 | 9 | 17.9 | | | |
| 5 | | ... very stiff, grey mottling, oxide staining. | | | | B7 | | | | | |
| | | | | | | B8 | | | | | |
| | | | | | | | | | | | 991 |
| 6 | | | | | | D4 | 17 | 16.9 | | | |
| | | End of Borehole @ 6.6 m. | | | | | | | | | 990 |
| 7 | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 6.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | | | 989 |
| 8 | | | | | | | | | | | 988 |
| 9 | | | | | | | | | | | 987 |
| 10 | | | | | | | | | | | 986 |
| 11 | | | | | | | | | | | |

Solid stem auger

2/10/2023

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH005**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 998.4 m |
| Lethbridge County, AB | UTM: 372087 E; 5508832 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | 998 |
| | | CLAY - silty, some sand to sandy, damp, very stiff, medium plastic, brown, sand pockets. | | B1 | | 12.7 | | | |
| 1 | | ... light brown, white precipitates. | | | | | | | |
| | | ...soluble sulfate content = 0.008% @ 1.2 m. | | B2 | | 9.8 | | | 997 |
| | | ... stiff. | | D1 | 9 | | | | |
| 2 | | CLAY (TILL) - silty, trace to some sand, trace gravel, moist, very stiff, medium to high plastic, light brown, coal specks. | | B3 | | 32 | | | |
| | | ... some sand, medium plastic, silt and sand pockets. | | B4 | | 18.9 | | | 996 |
| 3 | Solid stem auger | | | | | | | | |
| | | ... moist to very moist, firm to stiff, high plastic clay inclusions. | | D2 | 6 | 19 | | | |
| | | | | B5 | | | | | 995 |
| 4 | | | | | | | | | |
| | | ... very moist, oxide staining. | | B6 | | | | | 994 |
| | | ... trace to some sand, moist, stiff, medium to high plastic. | | D3 | 8 | 23.8 | | | |
| 5 | | | | B7 | | | | | |
| | | ... sand pockets. | | B8 | | | | | 993 |
| 6 | 2/10/2023 | | | | | | | | 2/10/2023 |
| | | ... some sand, medium plastic, occasional high plastic clay inclusions. | | D4 | 9 | 18.4 | | | 992 |
| | | End of Borehole @ 6.6 m. | | | | | | | |
| 7 | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 6.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | 991 |
| 8 | | | | | | | | | |
| | | | | | | | | | 990 |
| 9 | | | | | | | | | |
| | | | | | | | | | 989 |
| 10 | | | | | | | | | |
| | | | | | | | | | 988 |
| 11 | | | | | | | | | |

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH006**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 999.49 m |
| Lethbridge County, AB | UTM: 371894 E; 5508792 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | 999 |
| | | CLAY - silty, some sand, damp, very stiff, medium plastic, brown, sand pockets. | | B1 | | 12 | | | |
| 1 | | | | B2 | | 8.1 | | | 998 |
| | | CLAY (TILL) - silty, some sand, trace gravel, damp to moist, very stiff, medium plastic, brown, coal and oxide specks, white precipitates throughout, sand pockets. | | D1 | 12 | 12 | | | |
| 2 | | | | B3 | | | | | |
| | | ... brown with dark brown mottling. | | B4 | | 14.6 | | | 997 |
| 3 | | | | D2 | 10 | 14.5 | | | |
| | | ... moist, stiff to very stiff, coal fragments. | | B5 | | | | | 996 |
| 4 | | ... grey mottling, oxide staining. | | B6 | | | | | |
| | | ... sand pockets. | | D3 | 10 | 15 | | | 995 |
| 5 | | | | B7 | | | | | |
| | | | | B8 | | | | | 994 |
| 6 | | ... grey brown. | | D4 | 13 | 15.1 | | | |
| | | End of Borehole @ 6.6 m. | | | | | | | 993 |
| 7 | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 6.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | 992 |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | 991 |
| 10 | | | | | | | | | 990 |
| 11 | | | | | | | | | 989 |

Solid stem auger

2/10/2023

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH007**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 999.13 m |
| Lethbridge County, AB | UTM: 371835 E; 5509001 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | 999 |
| | | CLAY - silty, some sand to sandy, damp, very stiff, medium plastic, light brown, sand pockets. | | B1 | | 13.5 | | | |
| 1 | | ... stiff, high plastic clay inclusions. | | B2 | | 20.5 | | | 998 |
| | | | | D1 | 9 | | | | |
| 2 | | CLAY (TILL) - silty, some sand, trace gravel, moist, stiff to very stiff, medium plastic, brown with dark brown mottling, coal and oxide specks, high plastic clay inclusions, white precipitates. | | B3 | | 14 | | | 997 |
| | | ... silt lenses, oxide staining. | | B4 | | 15.3 | | | |
| 3 | Solid stem auger | ... moist to very moist, firm to stiff, grey mottling. | | D2 | 6 | 16.6 | | | 996 |
| | | | | B5 | | | | | |
| 4 | | ... very moist. | | B6 | | 20.6 | | | 995 |
| | | ... coal fragments. | | D3 | 6 | | | | |
| 5 | | ... sand pockets throughout. | | B7 | | 21.8 | | | 994 |
| | | ... moist to very moist, stiff. | | B8 | | | | | |
| 6 | | | | | | | | | 993 |
| | | ... moist, very stiff. | | D4 | 14 | 16 | | | |
| 7 | | End of Borehole @ 6.6 m. | | | | | | | 992 |
| | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 6.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | |
| 8 | | | | | | | | | 991 |
| 9 | | | | | | | | | 990 |
| 10 | | | | | | | | | 989 |
| 11 | | | | | | | | | |

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH008**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 997.7 m |
| Lethbridge County, AB | UTM: 372126 E; 5509018 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | 997 |
| 1 | Solid stem auger | CLAY - silty, some sand, damp to moist, very stiff, medium plastic, brown, sand pockets. | | B1 | | 16.6 | | | |
| | | ... damp, light brown. | | B2 | | 11.2 | | | |
| | | | | D1 | 7 | | | | 996 |
| 2 | | CLAY (TILL) - silty, some sand, trace gravel, damp, stiff, medium plastic, light brown, coal and oxide specks, low blow count probably due to less moisture (brittle). | | B3 | | 13.9 | | | |
| | | ... stiff to very stiff, brown, sand pockets. | | B4 | | 13.5 | | | |
| | | ... white precipitates. | | | | | | | 995 |
| 3 | | ... moist, stiff, dark brown mottling. | | D2 | 10 | 15 | | | |
| | | | | B5 | | | | | 994 |
| 4 | | | | B6 | | | | | |
| | | ... grey mottling and oxide staining. | | D3 | 8 | 16.8 | | | 993 |
| 5 | | | | B7 | | | | | |
| | | | | B8 | | | | | 992 |
| 6 | | ... very stiff. | | D4 | 12 | 17.1 | | | |
| | | ... occasional very moist and firm spots (pp = 0.75~1.25) | | B9 | | | | | 991 |
| 7 | | | | B10 | | | | | |
| | | | | D5 | 17 | 15.2 | | | 990 |
| 8 | | ... low pocket pen reading probably due to frequent sand inclusions. | | B11 | | | | | |
| | | | | B12 | | | | | 989 |
| 9 | | | | | | | | | |
| | | | | D6 | 14 | 15 | | | 988 |
| 10 | | End of Borehole @ 9.6 m. | | | | | | | |
| | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 9.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | 987 |
| 11 | | | | | | | | | |

2/10/2023

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 9.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH009**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 996.2 m |
| Lethbridge County, AB | UTM: 372360 E; 5508990 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen, dark brown, trace rootlets and organics. | | | | | | | 996 |
| | | CLAY - silty, some sand, very moist, firm, medium plastic, brown, sand pockets. | | B1 | | 23 | | | |
| 1 | | ... moist to very moist, stiff, grey brown, silt lenses. | | B2 | | 22.4 | | | 995 |
| | | | | D1 | 5 | | | | |
| 2 | | ... firm, sand pockets throughout, trace free water. | | B3 | | 21.3 | | | 994 |
| | | CLAY (TILL) - silty, some sand, trace gravel, very moist, firm, medium plastic, brown, coal and oxide specks. | | B4 | | 20.3 | | | |
| 3 | | ... sand pockets, coal fragments. | | D2 | 8 | 16.7 | | | 993 |
| | | ... moist, stiff, sand pockets throughout. | | B5 | | | | | |
| 4 | | | | B6 | | | | | 992 |
| | | | | D3 | 5 | 17.5 | | | |
| 5 | | ... moist to very moist, firm to stiff, grey mottling. | | B7 | | | | | 991 |
| | | | | B8 | | | | | |
| 6 | | ... moist, very stiff, grey brown. | | D4 | 16 | 15 | | | 990 |
| | | ... sand inclusions throughout. | | | | | | | |
| 7 | | End of Borehole @ 6.6 m. | | | | | | | 989 |
| | | Seepage at 1.5 m, Sloughing at 6.1 m. Slotted 1" PVC Pipe Installed to 6.1 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | |
| 8 | | | | | | | | | 988 |
| 9 | | | | | | | | | 987 |
| 10 | | | | | | | | | 986 |
| 11 | | | | | | | | | |

2/10/2023 (Depth)

Solid stem auger

2/10/2023 (Elevation)

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 2, 2023 |
| Logged By: SA | Completion Date: February 2, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH010**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 996.93 m |
| Lethbridge County, AB | UTM: 372159 E; 5509196 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen to moist, dark brown, trace rootlets and organics. | | | | | | | 996.93 |
| | | CLAY - silty, some sand, damp, very stiff, medium plastic, light brown, sand pockets. | | B1 | | 9.9 | | | |
| 1 | | CLAY (TILL) - silty, some sand, trace gravel, damp, very stiff, medium plastic, light brown, coal and oxide specks, sand pockets, white precipitates. | | B2 | | 18.4 | | | 996 |
| | | ... moist, brown. | | | | | | | |
| | | ... damp to moist, stiff, grey mottling, white precipitates. | | D1 | 9 | | | | |
| 2 | | | | B3 | | 12.6 | | | 995 |
| | | | | B4 | | 14.2 | | | |
| 3 | Solid stem auger | | | | | | | | 994 |
| | | ... very moist, firm, oxide staining. | | D2 | 5 | 17.4 | | | |
| | | ... firm to stiff, sand pockets throughout. | | B5 | | | | | |
| 4 | | | | | | | | | 993 |
| | | | | B6 | | | | | |
| | | ... coal fragments. | | D3 | 6 | 17.2 | | | |
| 5 | | ... moist, stiff. | | B7 | | 16.1 | | | 992 |
| | | ... heavy oxide staining. | | B8 | | | | | |
| 6 | | | | | | | | | 991 |
| | | ... gypsum crystals. | | D4 | 10 | 17.1 | | | |
| | | End of Borehole @ 6.6 m. | | | | | | | |
| 7 | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 6.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | 990 |
| 8 | | | | | | | | | 989 |
| 9 | | | | | | | | | 988 |
| 10 | | | | | | | | | 987 |
| 11 | | | | | | | | | 986 |

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 3, 2023 |
| Logged By: SA | Completion Date: February 3, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH011**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 998.04 m |
| Lethbridge County, AB | UTM: 371906 E; 5509221 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen to moist, dark brown, trace rootlets and organics. | | | | | | | 998 |
| | | CLAY - silty, some sand, damp, very stiff, medium plastic, light brown, silt and sand pockets. | | B1 | | 7.8 | | | |
| 1 | | | | B2 | | 7.7 | | | 997 |
| | | CLAY (TILL) - silty, some sand, trace gravel, moist, stiff, medium plastic, brown, coal and oxide specks, white precipitates. | | D1 | 8 | | | | |
| 2 | | ... stiff to very stiff, sand pockets. | | B3 | | 17.3 | | | 996 |
| | | | | B4 | | 18.2 | | | |
| 3 | Solid stem auger | ... coal fragmnets. | | D2 | 10 | 16.5 | | | 995 |
| | | ... grey mottling. | | B5 | | | | | |
| 4 | | | | B6 | | | | | 994 |
| | | ... coal smearing. | | D3 | 9 | 17.7 | | | |
| 5 | | | | B7 | | | | | 993 |
| | | ... moist, very stiff. | | B8 | | | | | |
| 6 | | ... oxide staining. | | D4 | 15 | 16.8 | | | 992 |
| | | End of Borehole @ 6.6 m. | | | | | | | |
| 7 | | No Seepage or Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 6.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | 991 |
| 8 | | | | | | | | | 990 |
| 9 | | | | | | | | | 989 |
| 10 | | | | | | | | | 988 |
| 11 | | | | | | | | | |

2/10/2023

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 3, 2023 |
| Logged By: SA | Completion Date: February 3, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH012**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 997.26 m |
| Lethbridge County, AB | UTM: 371849 E; 5509493 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen to moist, dark brown, trace rootlets and organics. | | | | | | | 997 |
| | | CLAY - silty, some sand, damp, very stiff, medium plastic, light brown, silt and sand pockets. | | B1 | | 9.4 | | | |
| 1 | | | | B2 | | 9.4 | | | 996 |
| | | ... brown. | | D1 | 10 | | | | |
| | | CLAY (TILL) - silty, some sand, trace gravel, moist, stiff to very stiff, medium plastic, brown with dark brown mottling, coal and oxide specks, white precipitates, sand pockets throughout. | | B3 | | 16.1 | | | |
| 2 | | | | B4 | | 11.2 | | | 995 |
| | | ... sandy, low plastic for 300 mm, coal fragments. | | | | | | | |
| | Solid stem auger | ... some sand, medium plastic, sand pockets. | | D2 | 10 | 14.5 | | | |
| 3 | | | | B5 | | | | | 994 |
| | | | | B6 | | | | | |
| 4 | | ... oxide staining, coal smearing, occasional very moist and firm spots. | | D3 | 10 | 17.1 | | | 993 |
| | | | | B7 | | | | | |
| 5 | | ... trace gravel up to 50 mm. | | B8 | | | | | 992 |
| | | | | D4 | 15 | 14.8 | | | |
| 6 | | | | | | | | | 991 |
| | | End of Borehole @ 6.6 m. | | | | | | | |
| 7 | | No Seepage or Sloughing upon Completion.<br>Slotted 1" PVC Pipe Installed to 6.6 m.<br>Water Level Measured as DRY on 2/10/2023 | | | | | | | 990 |
| 8 | | | | | | | | | 989 |
| 9 | | | | | | | | | 988 |
| 10 | | | | | | | | | 987 |
| 11 | | | | | | | | | |

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 3, 2023 |
| Logged By: SA | Completion Date: February 3, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH013**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 997.22 m |
| Lethbridge County, AB | UTM: 372083 E; 5509440 N; Z 12 |

| Depth (m) | Method | Soil Description | SOIL SYMBOL | USC | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen to moist, dark brown, trace rootlets and organics. | | | | | | | | | 997 |
| | | CLAY - silty, some sand to sandy, damp, very stiff, low to medium plastic, light brown, silt inclusions throughout. | | | | B1 | | 11.1 | | | |
| 1 | | CLAY (TILL) - silty, some sand, trace gravel, moist, very stiff, medium plastic, brown, coal and oxide specks, sand pockets. | | | | B2 | | 21.8 | | | 996 |
| | | ...soluble sulfate content = 0.075% @ 1.5 m. | | CI | | D1 | 4 | 16 | | | |
| | | ... very moist, firm, grey mottling. | | | | B3 | | 15.2 | | | |
| 2 | | ... moist, very stiff for 300 mm, white precipitates. | | | | B4 | | 17.4 | | | 995 |
| | | ... very moist to moist, firm to stiff. | | | | | | | | | |
| 3 | | | | | | D2 | 8 | 17.9 | | | 994 |
| | | ... moist, stiff, brown with grey mottling, coal fragments. | | | | B5 | | | | | |
| 4 | Solid stem auger | | | | | B6 | | | | | 993 |
| | | ... oxide staining. | | | | D3 | 8 | 15.4 | | | |
| | | ... occasional sand pockets. | | | | B7 | | | | | |
| 5 | | | | | | B8 | | | | | 992 |
| 6 | | | | | | D4 | 8 | 18.8 | | | 991 |
| | | ... occasional very moist and firm spots, heavy oxide staining, sand pockets throughout. | | | | B9 | | | | | |
| 7 | | | | | | B10 | | | | | 990 |
| | | | | | | D5 | 5 | 19.7 | | | |
| 8 | | ... heavy sand inclusions for 100 mm, trace free water. | | | | B11 | | | | | 989 |
| | | | | | | B12 | | 16.7 | | | |
| 9 | | | | | | | | | | | 988 |
| | | ... high plastic, light grey. | | CH | | D6 | 22 | 18.5 | | | |
| | | End of Borehole @ 9.6 m. | | | | | | | | | |
| 10 | | Seepage at 7.8 m, No Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 9.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | | | 987 |
| 11 | | | | | | | | | | | |

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 9.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 3, 2023 |
| Logged By: SA | Completion Date: February 3, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH014**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 995.95 m |
| Lethbridge County, AB | UTM: 372080 E; 5509659 N; Z 12 |

| Depth (m) | Method | Soil Description | SOIL SYMBOL | USC | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen to moist, dark brown, trace rootlets and organics. | | | | | | | | | |
| | | CLAY - silty, some sand, moist, stiff, medium plastic, brown, silt and sand pockets. | | | | B1 | | 20.7 | | | |
| 1 | | | | | | B2 | | 17.8 | | | 995 |
| | | CLAY (TILL) - silty, some sand, trace gravel, very moist, firm, medium plastic, brown, coal and oxide specks, sand pockets, white precipitates. | | | | D1 | 4 | 22.4 | | | |
| 2 | | ... coal fragments. | | | | B3 | | | | | |
| 2/10/2023 | | | | | | B4 | | 16 | | | 994 |
| 3 | Solid stem auger | ... some sand to sandy, firm to stiff, low to medium plastic, trace gravel up to 30 mm. | | CL-CI | | D2 | 6 | 14.6 | | | 993 |
| | | ... some sand, medium plastic, occasional stiff spots. | | | | B5 | | | | | |
| 4 | | ... sand pockets distributed throughout. | | | | B6 | | 16.2 | | | 992 |
| | | ... moist, stiff, grey mottling. | | | | D3 | 8 | 17.4 | | | |
| 5 | | ... heavy oxide staining. | | | | B7 | | | | | 991 |
| | | ... stiff to very stiff. | | | | B8 | | | | | |
| 6 | | | | | | D4 | 10 | 16.4 | | | 990 |
| | | End o Borehole @ 6.6 m. | | | | | | | | | |
| 7 | | No Seepage, Sloughing at 6.0 m upon Completion. Slotted 1" PVC Pipe Installed to 6.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | | | 989 |
| 8 | | | | | | | | | | | 988 |
| 9 | | | | | | | | | | | 987 |
| 10 | | | | | | | | | | | 986 |
| 11 | | | | | | | | | | | 985 |

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 6.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 3, 2023 |
| Logged By: SA | Completion Date: February 3, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

**Sumus Property Group Ltd.**

# Borehole No: **23BH015**

| | |
|---|---|
| Project: Chinook Industrial Park ASP | Project No: 704-ENG.LGEO04625-01 |
| Location: 10-9-21-W4M | Ground Elev: 996.41 m |
| Lethbridge County, AB | UTM: 371926 E; 5509752 N; Z 12 |

| Depth (m) | Method | Soil Description | Sample Type | Sample Number | SPT (N) | Moisture Content (%) | Plastic Limit / Moisture Content / Liquid Limit (20 40 60 80) | SPT (N) (20 40 60 80) / Pocket Pen. (kPa) (100 200 300 400) | Elevation (m) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | TOPSOIL - clay, silty, sandy, frozen to moist, dark brown, trace rootlets and organics. | | | | | | | |
| | | CLAY - silty, some sand, damp, very stiff, medium plastic, light brown, sand pocket. | | B1 | | 12.2 | | | 996 |
| 1 | | | | B2 | | 11.8 | | | |
| | | CLAY (TILL) - silty, some sand, trace gravel, moist, stiff to very stiff, medium plastic, brown to dark brown, sand pockets, white precipitates. | | D1 | 8 | 15.2 | | | 995 |
| 2 | | ... coal fragments. | | B3 | | 17.7 | | | |
| | | | | B4 | | | | | 994 |
| 3 | | ... moist to very moist, stiff. | | D2 | 6 | 18 | | | |
| | | | | B5 | | | | | 993 |
| 4 | | | | B6 | | 16.7 | | | |
| | Solid stem auger | ... very moist, firm, heavy oxide staining, sand pockets distributed throughout. | | D3 | 5 | 25.3 | | | 992 |
| 5 | | ... firm to stiff. | | B7 | | | | | |
| | | ... moist, stiff to very stiff, dark brown to grey. | | B8 | | | | | 991 |
| 6 | | | | | | | | | |
| | | ... trace free water. | | D4 | 9 | 18.6 | | | 990 |
| | | | | B9 | | | | | |
| 7 | | | | | | | | | |
| | | | | B10 | | | | | 989 |
| 8 | | | | D5 | 13 | 16.9 | | | |
| | | | | B11 | | | | | 988 |
| | | | | B12 | | | | | |
| 9 | | | | | | | | | |
| | | | | D6 | 15 | 16.5 | | | 987 |
| | | End of Borehole @ 9.6 m. | | | | | | | |
| 10 | | Seepage at 6.3 m, No Sloughing upon Completion. Slotted 1" PVC Pipe Installed to 9.6 m. Indicated Water Level Measured on 2/10/2023. | | | | | | | 986 |
| 11 | | | | | | | | | |

2/10/2023

TETRA TECH

| | |
|---|---|
| Contractor: Chilako Drilling | Completion Depth: 9.6 m |
| Equipment Type: 150 mm Solid Stem | Start Date: February 3, 2023 |
| Logged By: SA | Completion Date: February 3, 2023 |
| Reviewed By: JZ | Page 1 of 1 |

GEOTECHNICAL 704-ENG.LGEO04625-01.GPJ EBA.GDT 4/14/23

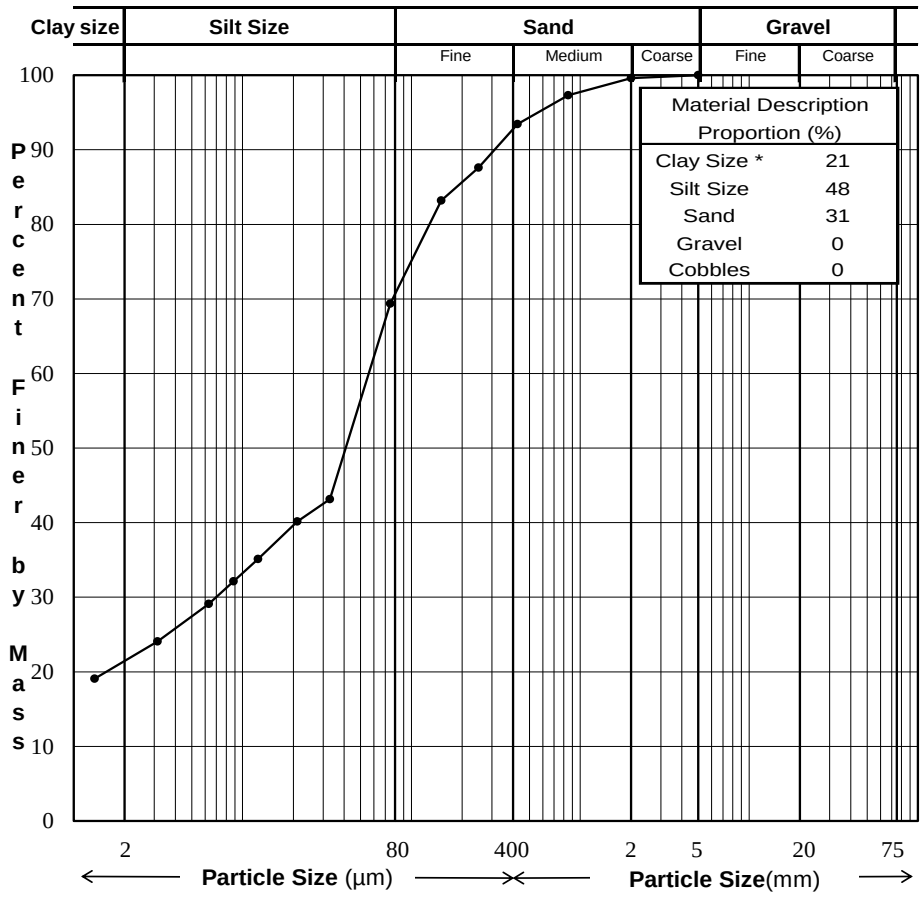
# APPENDIX C
## LABORATORY RESULTS

## PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

| | | | |
|---|---|---|---|
| Project: | Chinook Industrial Park - ASP | Sample No.: | |
| Client: | Sumus Property Group Ltd. | Borehole/ TP: | 23BH001 |
| Project No.: | ENG.LGEO04625-01 | Depth: | D2 (3.0 - 3.45 m) |
| Location: | | Date Tested | February 13, 2023 |
| Description **: | CLAY - silty, sandy. | Tested By: | SA |

| Particle Size | Percent Passing |
|---|---|
| 100 mm | |
| 75 mm | |
| 50 mm | |
| 38 mm | |
| 25 mm | |
| 19 mm | |
| 13 mm | |
| 10 mm | |
| 5 mm | 100 |
| 2 mm | 100 |
| 850 µm | 97 |
| 425 µm | 93 |
| 250 µm | 88 |
| 150 µm | 83.2 |
| 75 µm | 69.4 |
| 33 µm | 43.2 |
| 21 µm | 40.1 |
| 12 µm | 35.1 |
| 9 µm | 32.1 |
| 6 µm | 29.1 |
| 3 µm | 24.1 |
| 1 µm | 19.1 |




**Remarks:** * The upper clay size of 2 µm is as per the Canadian Foundation Manual.

** The description is behaviour based & subject to Tetra Tech description protocols.

**Reviewed By:** _____ P.Eng.

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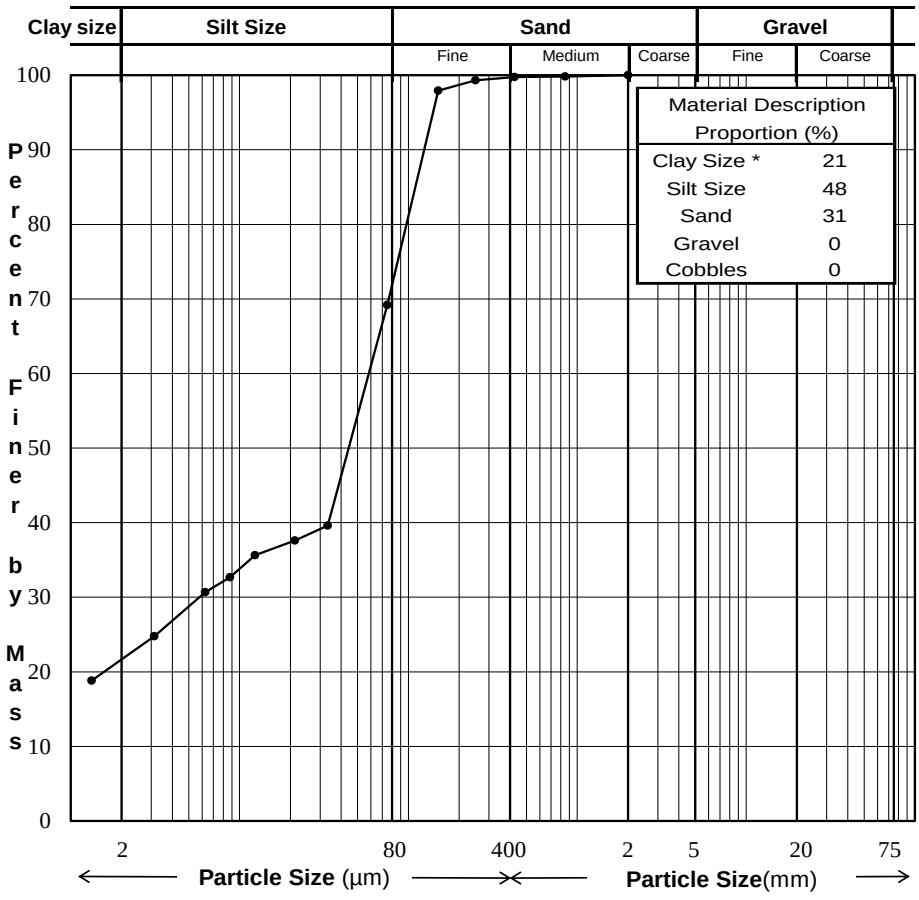
TETRA TECH

## PARTICLE SIZE ANALYSIS (Hydrometer) TEST REPORT

ASTM D422

| | | | |
|---|---|---|---|
| Project: | Chinook Industrial Park - ASP | Sample No.: | |
| Client: | Sumus Property Group Ltd. | Borehole/ TP: | 23BH003 |
| Project No.: | ENG.LGEO04625-01 | Depth: | B2 (1.2 m) |
| Location: | | Date Tested | February 13, 2023 |
| Description **: | CLAY - silty, sandy. | Tested By: | SA |

| Particle Size | Percent Passing |
|---|---|
| 100 mm | |
| 75 mm | |
| 50 mm | |
| 38 mm | |
| 25 mm | |
| 19 mm | |
| 13 mm | |
| 10 mm | |
| 5 mm | |
| 2 mm | 100 |
| 850 µm | 100 |
| 425 µm | 100 |
| 250 µm | 99 |
| 150 µm | 97.9 |
| 75 µm | 69.2 |
| 33 µm | 39.6 |
| 21 µm | 37.6 |
| 12 µm | 35.6 |
| 9 µm | 32.7 |
| 6 µm | 30.7 |
| 3 µm | 24.7 |
| 1 µm | 18.8 |




**Remarks:** * The upper clay size of 2 µm is as per the Canadian Foundation Manual.

** The description is behaviour based & subject to Tetra Tech description protocols.

**Reviewed By:** _____ P.Eng.

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TETRA TECH

# CONSTANT HEAD HYDRAULIC CONDUCTIVITY TEST REPORT

ASTM D5084

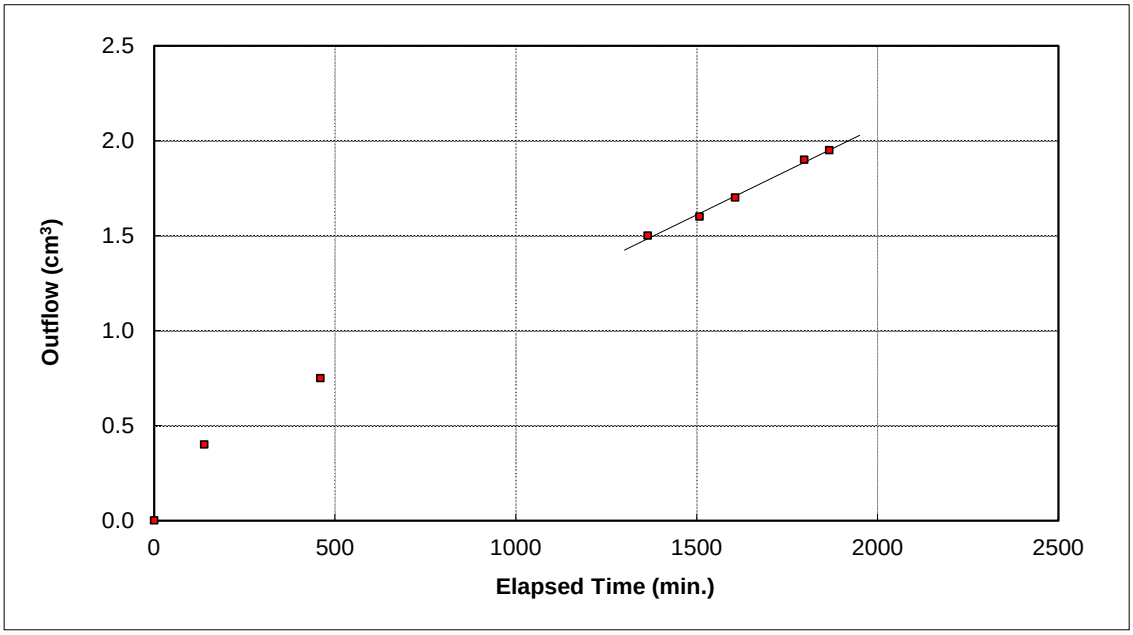
| | | | |
|---|---|---|---|
| Project: | Chinook Industrial Park ASP | Sample No.: | L-24 (P-1) |
| Project No.: | ENG.LGEO04625-01 | Borehole No.: | 23BH-014 |
| Client: | Sumus Property Group Ltd. | Depth: | 1.5-3.0 m |
| Attention: | Michael Kelly | Date Tested: | February 17, 2023 |
| | | Tested By: | TD |

Soil Description: CLAY, silty, some sand, brown

| | Initial | Final |
|---|---|---|
| Moisture Content (%) | 15.0 | 16.9 |
| Dry Density (kg/m3) | 1824 | 1835 |
| Compaction SPD (if applicable) | 97.6% | 98.1% |

| | | |
|---|---|---|
| Sample Height = | 5.14 | cm |
| Sample Diameter = | 7.08 | cm |
| Head Differential = | 14 | kPa |
| Flow Q = | 1.8E-05 | $cm^3/sec$ |
| Hydraulic Gradient i = | 27.78 | |
| Area of Sample A = | 39.39 | $cm^2$ |

Hydraulic Conductivity $k_{20}$ = **1.6E-08 cm/sec**




**Remarks:** Remolded Sample

**Reviewed By:** V.O P.Eng.

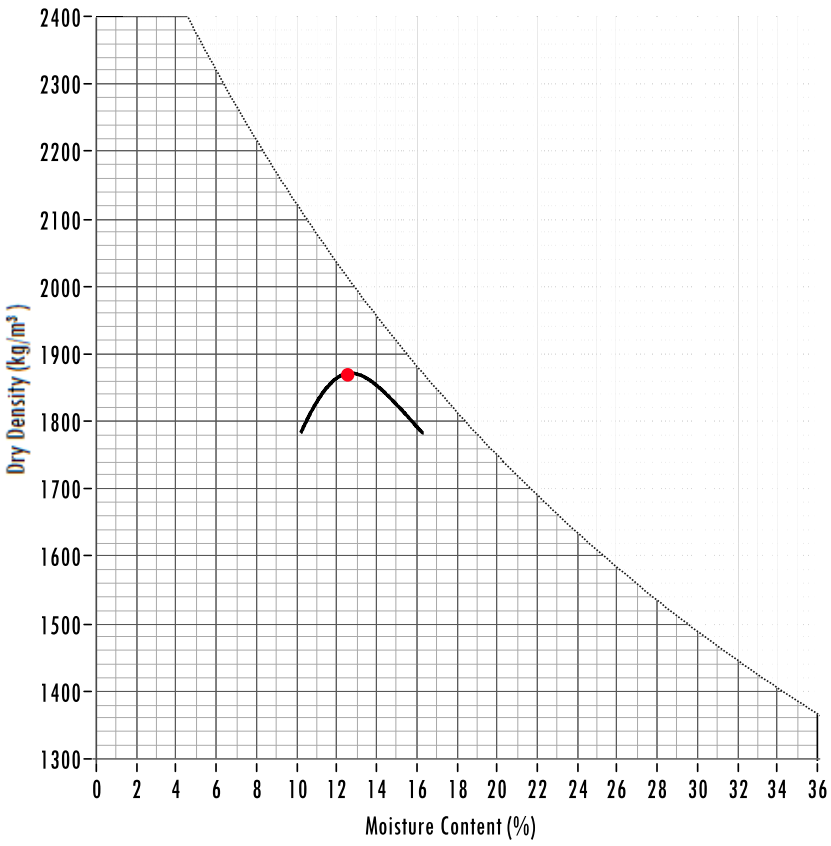
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TETRA TECH

# Moisture-Density Relationship - Proctor Report

ASTM D698

| | | | | | |
|---|---|---|---|---|---|
| Proj No: | LGE004625-01 | Sample #: | L-24 | | |
| Project: | Chinook Industrial Park ASP | Site: | Densities | Rpt #: | 1 |
| Client: | Sumus Property Group Ltd | Date Received: | Feb 03,2023 | By: | SA |
| Address: | PO Box 932 (MSK Developments), Lethbridge Alberta T1J3Z8 | Date Tested: | Feb 13,2023 | By: | MS |
| Description: | Clay, silty, some sand | | | | |
| Soil Source: | Native | Location: | 23BH-014 @ 1.5-3.0m | | |
| Attention: | Michael Kelly | | | | |




Maximum Density: 1870 kg/m³
Optimum Moisture: 12.5 %

as-Received Moisture: 17.3 %

Method: ☑ A ☐ B ☐ C

Compaction: Manual

Zero Air Voids SG: 2.70

Reviewed by: Christa Toles

Christa Toles, C.E.T.

Remarks:

cc:

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# APPENDIX D
## DESIGN AND CONSTRUCTION GUIDELINES

# SHALLOW FOUNDATIONS

Design and construction of shallow foundations should comply with relevant Building Code requirements.

The term ‘shallow foundations’ includes strip and spread footings, mat slab, and raft foundations.

Minimum footing dimensions in plan should be in accordance with the applicable design code of the local jurisdiction.

No loose, disturbed or sloughed material should be allowed to remain in open foundation excavations. Hand cleaning should be undertaken to prepare an acceptable bearing surface.

Foundation excavations and bearing surfaces should be protected from rain, snow, freezing temperatures, excessive drying, and the ingress of free water before, during, and after footing construction.

Footing excavations should be carried down into the designated bearing stratum.

After the bearing surface is approved, a mud slab should be poured to protect the soil against inclement weather and provide a working surface for construction.

All constructed foundations should be placed on unfrozen soils, which should be at all times protected from frost penetration.

All foundation excavations and bearing surfaces should be inspected by a qualified geotechnical engineer to check that the recommendations contained in this report have been followed.

Where over-excavation has been carried out through a weak or unsuitable stratum to reach into a suitable bearing stratum or where a foundation pad is to be placed above stripped natural ground surface such over-excavation may be backfilled to subgrade elevation utilizing either structural fill or lean-mix concrete. These materials are defined below:

- “Structural engineered fill” should comprise clean, well-graded granular soils.
- “Lean-mix concrete” should be low strength concrete having a minimum 28-day compressive strength of 3.5 MPa.

# BORED CAST-IN-PLACE CONCRETE PILES

Design and construction of piles should comply with relevant Building Code requirements.

Piles should be installed under full-time inspection of qualified geotechnical personnel. Pile design parameters should be reviewed in light of the findings of the initial bored shafts drilled on a site. Further design review may be necessary if conditions observed during site construction do not conform to design assumptions.

Where fill material or lenses or strata of sand, silt or gravel are present within the designed pile depth, these may be incompetent and/or water bearing and may cause sloughing. Casing should be on hand before drilling starts and be used, if necessary, to seal off water and/or prevent sloughing of the bore.

If piles are to be underreamed (belled), the underreams should be formed entirely in self-supporting soil and entirely within the competent bearing stratum. Where sloughing occurs at design elevation it may be necessary to extend the base of the pile bell to a greater depth. Piles may be constructed with bells having outside diameters up to approximately three times the diameters of their shafts. Piles with shaft diameters of less than 400 mm should not be underreamed due to difficulties associated with ensuring a clean base.

Prior to pouring concrete, bottoms of pile bells or of straight shaft end bearing piles should be mechanically cleaned of all disturbed material.

Pile bores should be visually inspected after completion to ensure that disturbed materials and/or water are not present on the base so that recommended allowable bearing and skin friction parameters may apply.

Other procedures to inspect the pile shafts may be used where shaft diameters of less than 760 mm (30 inch) are constructed, such as, inspection with a light or with the use of a downhole camera.

For safety reasons, where hand cleaning and/or 'down shaft' inspection by personnel are required, the pile shaft must be cased full length prior to personnel entering the shaft.

Reinforcing steel should be on hand and should be placed as soon as the bore has been completed and approved.

Longitudinal reinforcing steel is recommended to counteract the possible tensile stresses induced by frost action and should extend to a minimum depth of 3.5 m. A minimum steel of 0.5 percent of the gross shaft area is recommended or per applicable building code requirements.

Where a limited quantity of water is present on the pile base (<50 mm), it should be removed. Where significant quantities of water are present (>50 mm), and it is impracticable to exclude water from the pile bore, concrete should be placed by tremie techniques or a concrete pump.

A "dry" pile should be poured by "free fall" of concrete only where impact of the concrete against the reinforcing cage, which can cause segregation of the concrete, will not occur. A hopper should be used to direct concrete down the centre of the pile base and to prevent impact of concrete against reinforcing steel.

Concrete used for "dry" uncased piles should be self-compacting and should have a target slump of 125 mm. Where casing is required to prevent sloughing or seepage, the slump should be increased to 150 mm. The casing should be filled with concrete and then the casing should be withdrawn smoothly and continuously. Sufficient concrete should be placed to allow for the additional volume of the casing and reduction in level of the concrete as the casing is withdrawn. Concrete should not be poured on top of previously poured concrete, after the casing is withdrawn. In order to comply with maximum water:cement ratios for the concrete, the use of chemicals (or superplasticizers) to temporarily increase the slump may be required. Concrete for each pile should be poured in one continuous operation and should be placed immediately after excavation and inspection of piles, to reduce the opportunity for the ingress of free water or deterioration of the exposed soil or rock.

If piles cannot be formed in dry conditions then the concrete should be placed by tremie tube or concrete pump. Concrete placed by tremie should have a slump of not less than 150 mm. A ball or float should be used in the tremie tube to separate the initial charge of concrete from the water in the pile bore. The outlet of the tremie tube should be maintained at all times 1.0 m to 2.0 m below the surface of the concrete. The diameter of the tremie tube should be at least 200 mm. The tube should be water tight and not be made of aluminum. Smaller diameter pipes may be used with a concrete pump. The surface of the concrete should be allowed to rise above the cut off level of the pile, so that when the temporary casing is withdrawn and the surface level of the concrete adjusts to the new volume, the top of the uncontaminated concrete is at or above the cut off level. The concrete should be placed in one continuous smooth operation without any halts or delays. Placing the lower portion of the pile by tremie tube and placing the upper portion of the pile by "free fall" should not be permitted, to ensure that defects in the pile shaft at the top of the tremie concrete do not occur. As the surface of the concrete rises in the pile bore the water in the pile bore will be displaced upwards and out of the top of the pile casing.

When concreting piles by tremie techniques, allowance should be made for the removal of contaminated or otherwise defective concrete at the tops of the piles.

An accurate record of the volume of concrete placed should be maintained as a check that a continuous pile had been formed.

Concrete should not be placed if its temperature is less than 5°C or exceeds 30°C, or if it is more than two hours old.

Where tension, horizontal or bending moment loading on the pile is foreseen, steel reinforcing should be extended and tied into the grade beam or pile cap. The steel should be designed to transfer loads to the required depth in the pile and to resist resultant bending moments and shear forces.

Void formers should be placed beneath all grade beams to reduce the risk of damage due to frost effects or soil moisture changes.

Where the drilling operation might affect the concrete in an adjacent pile (i.e., where pile spacing is less than approximately three diameters) drilling should not be carried out before the previously poured pile concrete has set for at least 24 hours.

Where a group of four or more piles are used the allowable working load on the piles may need to be modified to allow for group effects.

Piles should be spaced no closer than 2.5 times the pile shaft diameter, measured centre-to-centre. Strict control of pile location and verticality should be exercised to provide accurate locations and spacings of piles. In general, piles should be constructed within a tolerance of 75 mm plan distance in any direction and within a verticality of 1%.

A detailed record should be kept of pile construction; the following information should be included, pile number, shaft/base diameter, date and time bored, date and time concreted, elevation of piling platform, depths (from piling platform level) to pile base and to concrete cut off level, length of casing used, details of reinforcement, details of any obstructions, details of any groundwater inflows, brief description of soils encountered in the bore and details of any unusual occurrences during construction.

If a large number of piles are to be installed, it may be possible to optimize the design on the basis of pile load tests or conducting high strain dynamic pile testing.

# FLOOR SLABS-ON-GRADE

All soft, loose or organic material should be removed from beneath slab areas. If any local 'hard spots' such as old basement walls or abandoned pile foundation are revealed beneath the slab area, these should be over-excavated and removed to not less than 0.9 m below underside of slab level. The exposed soil should be proof-rolled and the final grade restored by engineered fill placement. If proof-rolling reveals any soft or loose spots, these should be excavated and the desired grade restored by engineered fill placement. The subgrade should be compacted to a depth of not less than 0.3 m to a density of not less than 98 percent Standard Proctor Maximum Dry Density (ASTM Test Method D698).

If, for economic reasons, it is considered desirable to leave low quality material in-place, such as existing fills, beneath a slab-on-grade, special ground treatment procedures may be considered, Tetra Tech could provide additional advice on this aspect if required.

A levelling course of well graded granular fill (with maximum size of 20 mm), at least 150 mm in compacted thickness, is recommended directly beneath all slabs-on-grade. The type of granular fill should be selected based on the design floor loadings. Alternatively a minimum thickness of 150 mm of 80 mm pit-run gravel overlain by a minimum thickness of 50 mm of 20 mm crushed gravel may be used. Coarse gravel particles larger than 25 mm diameter should be avoided directly beneath the slab-on-grade to limit potential stress concentrations within the slab. All levelling courses directly under floor slabs should be compacted to 100 percent of Standard Proctor Maximum Dry Density (ASTM Test Method D698).

Engineered fill, pit-run gravel and crushed gravel are defined under the heading 'Backfill Materials and Compaction' elsewhere in this Appendix.

The excavated subgrade beneath slabs-on-grade should be protected at all times from rain, snow, freezing temperatures, excessive drying and the ingress of free water. This applies before, during, and after the construction period.

# CONSTRUCTION EXCAVATIONS

Construction should be in accordance with good practice and comply with the requirements of the responsible regulatory agencies.

All excavations greater than 1.5 m deep should be sloped or shored for worker protection.

Shallow excavations up to about 3 m depth may use temporary sideslopes of 1H:1V. A flatter slope of 2H:1V should be used if groundwater is encountered. Localized sloughing can be expected from these slopes.

Deep excavations or trenches may require temporary support if space limitations or economic considerations preclude the use of sloped excavations.

For excavations greater than 3 m depth, temporary support should be designed by a qualified geotechnical engineer. The design and proposed installation and construction procedures should be submitted to Tetra Tech for review.

The construction of a temporary support system should be monitored. Detailed records should be taken of installation methods, materials, in situ conditions and the movement of the system. If anchors are used, they should be load tested. Tetra Tech can provide further information on monitoring and testing procedures if required.

Attention should be paid to structures or buried service lines close to the excavation. For structures, a general guideline is that if a line projected down, at 45 degrees from the horizontal from the base of foundations of adjacent structures intersects the extent of the proposed excavation, these structures may require underpinning or special shoring techniques to avoid damaging earth movements. The need for any underpinning or special shoring techniques and the scope of monitoring required can be determined when details of the service ducts and vaults, foundation configuration of existing buildings and final design excavation levels are known.

No surface surcharges should be placed closer to the edge of the excavation than a distance equal to the depth of the excavation, unless the excavation support system has been designed to accommodate such surcharge.

# BACKFILL MATERIALS AND COMPACTION (GENERAL)

## 1.0 DEFINITIONS

“Landscape fill” is typically used in areas such as berms and grassed areas where settlement of the fill and noticeable surface subsidence can be tolerated. “Landscape fill” may comprise soils without regard to engineering quality.

“General engineered fill” is typically used in areas where a moderate potential for subgrade movement is tolerable, such as asphalt (i.e., flexible) pavement areas. “General engineered fill” should comprise clean, granular or clay soils.

“Select engineered fill” is typically used below slabs-on-grade or where high volumetric stability is desired, such as within the footprint of a building. “Select engineered fill” should comprise clean, well-graded granular soils or inorganic low to medium plastic clay soils.

“Structural engineered fill” is used for supporting structural loads in conjunction with shallow foundations. “Structural engineered fill” should comprise clean, well-graded granular soils.

“Lean-mix concrete” is typically used to protect a subgrade from weather effects including excessive drying or wetting. “Lean-mix concrete” can also be used to provide a stable working platform over weak subgrades. “Lean-mix concrete” should be low strength concrete having a minimum 28-day compressive strength of 3.5 MPa.

Standard Proctor Density (SPD) as used herein means Standard Proctor Maximum Dry Density (ASTM Test Method D698). Optimum moisture content is defined in ASTM Test Method D698.

## 2.0 GENERAL BACKFILL AND COMPACTION RECOMMENDATIONS

Exterior backfill adjacent to abutment walls, basement walls, grade beams, pile caps and above footings, and below highway, street, or parking lot pavement sections should comprise “general engineered fill” materials as defined above.

Exterior backfill adjacent to footings, foundation walls, grade beams and pile caps and within 600 mm of final grade should comprise inorganic, cohesive “general engineered fill”. Such backfill should provide a relatively impervious surficial zone to reduce seepage into the subsoil against the structure.

Backfill should not be placed against a foundation structure until the structure has sufficient strength to withstand the earth pressures resulting from placement and compaction. During compaction, careful observation of the foundation wall for deflection should be carried out continuously. Where deflections are apparent, the compactive effort should be reduced accordingly.

In order to reduce potential compaction induced stresses, only hand-held compaction equipment should be used in the compaction of fill within 1 m of retaining walls or basement walls. If compacted fill is to be placed on both sides of the wall, they should be filled together so that the level on either side is within 0.5 m of each other.

All lumps of materials should be broken down during placement. Backfill materials should not be placed in a frozen state, or placed on a frozen subgrade.

Where the maximum-sized particles in any backfill material exceed 50% of the minimum dimension of the cross-section to be backfilled (e.g., lift thickness), such particles should be removed and placed at other more suitable locations on site or screened off prior to delivery to site.

Excavation and construction operations expose materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration of performance. Unless otherwise specifically indicated in this report, the walls and floors of excavations, and stockpiles, must be protected from the elements, particularly moisture, desiccation, frost, and construction activities. Should desiccation occur, bonding should be provided between backfill lifts. For fine-grained materials the previous lift should be scarified to the base of the desiccated layer, moisture-conditioned, and recompacted and bonded thoroughly to the succeeding lift. For granular materials, the surface of the previous lift should be scarified to about a 75 mm depth followed by proper moisture-conditioning and recompaction.

## 3.0 COMPACTION AND MOISTURE CONDITIONING

“Landscape fill” material should be placed in compacted lifts not exceeding 300 mm and compacted to a density of not less than 90% of SPD unless a higher percentage is specified by the jurisdiction.

“General engineered fill” and “select engineered fill” materials should be placed in layers of 150 mm compacted thickness and should be compacted to not less than 98% of SPD. Note that the contract may specify higher compaction levels within 300 mm of the design elevation. Cohesive materials placed as “general engineered fill” or “select engineered fill” should be compacted at 0 to 2% above the optimum moisture content. Note that there are some silty soils which can become quite unstable when compacted above optimum moisture content. Granular materials placed as “general engineered fill” or “select engineered fill” should be compacted at slightly below (0 to 2%) the optimum moisture content.

“Structural engineered fill” material should be placed in compacted lifts not exceeding 150 mm in thickness and compacted to not less than 100% of SPD at slightly below (0 to 2%) the optimum moisture content.

## 4.0 “GENERAL ENGINEERED FILL”

Cohesive or granular soils are considered acceptable for use as “general engineered fill,” providing the soils are inorganic and free of deleterious materials.

## 5.0 “SELECT ENGINEERED FILL”

Low to medium plastic clay with the following range of plasticity properties is generally considered suitable for use as “select engineered fill”:

| | |
|---|---|
| Liquid Limit | = 20 to 40% |
| Plastic Limit | = 10 to 20% |
| Plasticity Index | = 10 to 30% |

Test results should be considered on a case-by-case basis.

“Pit-run gravel” and “fill sand” are generally considered acceptable for use as “select engineered fill.” See exact project or jurisdiction for specifications.

The “pit-run gravel” should be free of any form of coating and any gravel or sand containing clay, loam or other deleterious materials should be rejected. No material oversize of the specified maximum sieve size should be tolerated. This material would typically have a fines content of less than 10%.

The materials above are also suitable for use as “general engineered fill.”

## 6.0 "STRUCTURAL ENGINEERED FILL"

Crushed gravel used as "structural engineered fill" should be hard, clean, well graded, crushed aggregate, free of organics, coal, clay lumps, coatings of clay, silt, and other deleterious materials. The aggregates should conform to the requirement when tested in accordance with ASTM C136 and C117. See exact project or jurisdiction for specifications. This material would typically have a fines content of less than 10%.

In addition to the above, further specification criteria identified below should be met:

**"Structural Engineered Fill" – Additional Material Properties**

| Material Type | Percentage of Material Retained on 5 mm Sieve having Two or More Fractured Faces | Plasticity Index (<400 μm) | L.A. Abrasion Loss (percent Mass) |
|---|---|---|---|
| Various sized Crushed Gravels | See exact project or jurisdiction for specifications | See exact project or jurisdiction for specifications | See exact project or jurisdiction for specifications |

Materials that meet the grading limits and material property criteria are also suitable for use as "select engineered fill."

## 7.0 DRAINAGE MATERIALS

"Coarse gravel" for drainage or weeping tile bedding should be free draining. Free-draining gravel or crushed rock generally containing no more than 5% fine-grained soil (particles passing No. 200 sieve) based on the fraction passing the 3/4-inch sieve or material with sand equivalent of at least 30.

"Coarse sand" for drainage should conform to the following grading limits:

**"Coarse Sand" Drainage Material – Percent Passing by Weight**

| Sieve Size | Coarse Sand* |
|---|---|
| 10 mm | 100 |
| 5 mm | 95 – 100 |
| 2.5 mm | 80 – 100 |
| 1.25 mm | 50 – 90 |
| 630 μm | 25 – 65 |
| 315 μm | 10 – 35 |
| 160 μm | 2 – 10 |
| 80 μm | 0 – 3 |

* From CSA A23.1-09, Table 10, "Grading Limits for Fine Aggregate", Class FA1

Note that the "coarse sand" above is also suitable for use as pipe bedding material. See exact project or jurisdiction for specifications.

## 8.0 BEDDING MATERIALS

The "Coarse Sand "gradation presented above in Section 7.0 is suitable for use as pipe bedding and as backfill within the pipe embedment zone, however see exact project or jurisdiction for specifications.

# APPENDIX D

# Phase I Environmental Site Assessment
# Chinook Industrial Park ASP
# Portions of West ½ Section 10 TWP 9 RGE 21 W4M
# Lethbridge County, Alberta



PRESENTED TO
**Sumus Property Group Ltd.**

FEBRUARY 28, 2023
ISSUED FOR USE
FILE: ENG.LGEO04625-01.002

Tetra Tech Canada Inc.
442 – 10 Street North
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# EXECUTIVE SUMMARY

## Foreword

Sumus Property Group Ltd., care of MSK Developments, retained Tetra Tech Canada Inc. (Tetra Tech) to conduct a Phase I environmental site assessment (ESA) on the Chinook Industrial Park, located within the west half of Section 10, Township 9, Range 21, West of the Fourth Meridian (W1/2 10-009-21 W4M).

Tetra Tech understands this Phase I ESA is being conducted for due diligence in support of an area structure plan (ASP) for the Chinook Industrial Park (Phase 2 and Phase 3). Phase 2 and Phase 3 of the ASP are adjacent to the north of Phase 1A and 1B of the ASP. The proposed land consists of two legal properties: Plan 1113171, Block 1, Lot 5, and Plan 0013201, Block 1, Lot 1.

The objective of the Phase I ESA is to comment on whether any past or present land use, either offsite or onsite, may have a potential to cause environmental impairment to the site.

The Phase I ESA was completed in general accordance with the Alberta Environment and Parks Alberta Environmental Site Assessment Standard and with the methods outlined in the document titled "*Canadian Standards Association Standard (CSA) Z768-01 Phase I ESA*", published by the CSA (reaffirmed 2022).

## Findings and Conclusions

In general terms, there are two distinct types of potential environmental risk to any property. The first type of risk is from potential contamination from on-site land use. This would include potential accidental spills or site practices that may contaminate the property directly. The second type of risk is from contamination caused by adjacent property owners, which might then be transported through the subsurface soils by groundwater, or in overland runoff onto the site.

## Potential for Impairment from On-Site Source(s)

There were no on-site sources that might have a potential to cause environmental impairment to the site through historical and/or current land use.

## Potential for Impairment from Off-Site Source(s)

There were no off-site sources that might have a potential to cause environmental impairment to the site through historical and/or current land use.

## Further Action/Rendering an Opinion

Based on the present study, Tetra Tech recommends that no further environmental investigation is required at this time.

Tetra Tech recommends the following for consideration:

- If buried debris or staining are encountered during future investigation or ground disturbance, a qualified environmental professional should be contacted.
- If soils containing organics are encountered during future investigation or ground disturbance, they should be removed from building footprints and not be reburied; a qualified environmental professional should be contacted.

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## LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Sumus Property Group Ltd. and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Sumus Property Group Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in Appendix A or Contractual Terms and Conditions executed by both parties.

# 1.0 INTRODUCTION

## 1.1 General

Sumus Property Group Ltd. care of MSK Developments retained Tetra Tech Canada Inc. (Tetra Tech) to conduct a Phase I environmental site assessment (ESA) for the Chinook Industrial Park, located within the west half of Section 10, Township 9, Range 21, West of the Fourth Meridian (W1/2 10-009-21 W4M).

Tetra Tech understands this Phase I ESA is being conducted for due diligence in support of an area structure plan (ASP) for the Chinook Industrial Park (Phase 2 and Phase 3). Phase 2 and Phase 3 of the ASP are adjacent and to the north of Phase 1A and 1B of the ASP. The proposed land consists of two legal properties: Plan 1113171, Block 1, Lot 5, and Plan 0013201, Block 1, Lot 1.

The objective of the Phase I ESA is to comment on whether any past or present land use, either offsite or onsite, may have a potential to cause environmental impairment to the site.

The Phase I ESA was completed in general accordance with the 2016 Alberta Environment and Parks Alberta Environmental Site Assessment Standard and with the methods outlined in the document titled "*Canadian Standards Association Standard (CSA) Z768-01 Phase I ESA*", published by the CSA (reaffirmed 2022).

## 1.2 Authorization

Michael Kelly of MSK Developments provided written authorization to proceed with the present study to Tetra Tech on January 23, 2023.

## 1.3 Scope of Work

Tetra Tech conducted the following scope of work for the Phase I ESA:

- Conducted a records review for the site and surrounding properties, for a minimum search distance of 100 m. The records review included the following current and historical information searches:
  - Provincial regulatory information including the Alberta Safety Codes Authority (ASCA); Alberta Energy Regulator (AER) via Abacus Datagraphics Database (AbaData); Alberta Environment and Protected Areas (AEPA) ESA Repository (ESAR), Online Water Well Database, Authorization Viewer; Historical Environmental Enforcement Search; and the Alberta Land Titles Spatial Information System (SPIN2).
  - Regional and municipal regulatory information, including Lethbridge County.
  - Historical information sources including business directories, fire insurance plans, land titles, and historical aerial photographs.
  - Geological and hydrogeological information including published topographic, geologic, soil, and groundwater maps and reports.
- Conducted a site visit to evaluate the extent and manner that current and historical surrounding activities may impact upon the site and the environment. Sampling was not included as part of the Phase I ESA scope of work.
- Conducted interviews with persons familiar with the site and surrounding properties.
- Evaluated the results and prepared this report discussing the site history and identified any potential for environmental concerns resulting from past or present land use on site and in the surrounding area.

## 1.4 Qualifications of Assessors

**Jaymes Going, B.Sc., EP**, conducted the site visit, historical review, and wrote this report. Jaymes is an Environmental Scientist with Tetra Tech's Environment and Water Practice and has over 15 years of experience in the environmental industry.

**Henri Carriere, P.Eng., M.N.R.M.**, provided the senior review of this report. Henri is a Senior Project Engineer with Tetra Tech's Environment and Water Practice in Calgary, Alberta. He has more than 30 years of experience in the environmental industry.

## 1.5 General Site Details

The irregular shaped site consists of two legal properties and is approximately 60.12 hectares (ha) in size. The site is located adjacent to the east municipal boundary of the City of Lethbridge, within Lethbridge County. The site consists of cultivated agricultural cropland with the exception of a small building/structure located on the northern portion of the site that houses a water fill station. The water fill station is within one of the two legal properties (Plan 0013201, Block 1, Lot 1). An electrical transmission line is also present on the west site boundary.

The site is bound to the north by Township Road 92 (TWP RD 92), to the east by a St. Mary River Irrigation District (SMRID) irrigation canal, to the south by Phase 1A and Phase 1B of the Chinook Industrial Park and to the west by 43 Street North.

Adjacent to the north of the site beyond TWP RD 92 is a rural property with miscellaneous storage (irrigation pipes and various equipment), to the northeast by a rural residence and to the northwest by Pratt & Whitney. Beyond the SMRID canal to the east is agricultural land and a farm operation including numerous corrals. South of the site within Phase 1A and Phase 1B of the Chinook Industrial Park are Southland International Trucks and trailer storage and a stormwater retention pond. West of the site is the Churchill Industrial Park located within the City of Lethbridge. Adjacent commercial/industrial properties to the west of the site include the City of Lethbridge Animal Services, Haul-All Equipment Ltd., Peterbilt Lethbridge, Southland Trailer Corp., and miscellaneous storage associated with the industrial businesses.

Figure 1 shows the site location plan and Figure 2 shows the detailed site plan showing surrounding land use. Photographs of the site are provided in Appendix B.

# 2.0 RECORDS REVIEW

The results of regulatory searches are provided in Appendix C. Records were reviewed for the site and for adjacent properties within a minimum distance of 100 m from the site boundary.

## 2.1 Location, Size, and Ownership

The site is located in Lethbridge County, Alberta. The legal description, legal land description, size, and ownership are summarized in Table A.

**Table A: Legal Description, Legal Land Description, Size, and Ownership**

| Legal Description | Legal Land Description | Size (ha)* | Ownership* |
|---|---|---|---|
| Plan 1113171, Block 1, Lot 5 | W 10-009-21 W4M | 59.56 | 1000824 Alberta Ltd. |
| Plan 0013201, Block 1, Lot 1 | NW 10-009-21 W4M | 0.56 | Lethbridge Regional Water Services Commission |

* Size and ownership were obtained from the current land title.

## 2.2 Historical Records Review

A historical records review was undertaken for the site. The review dates were based on available records.

### 2.2.1 Historical Land Title Records

A historical and current land title search was initiated for the site. The results of the historical land title search had not been received at the time of report issuance. Should the review of the historical land tiles change the findings, an addendum letter will be issued. The current land titles are included in Appendix C.

**Table B: Land Titles Summary**

| Year(s) of Ownership | Owner(s) | Tetra Tech Evaluation |
|---|---|---|
| Plan 1113171, Block 1, Lot 5 | | |
| 2011 to present | 1000824 Alberta Ltd. | Based on the name, there is no obvious potential for environmental concern. |
| Plan 0013201, Block 1, Lot 1 | | |
| 2002 to present | Lethbridge Regional Water Services Commission | Based on the name, there is no obvious potential for environmental concern. |

### 2.2.2 Aerial Photographs

Aerial photographs provide visual evidence of site occupancy, operational activities, and general site details. Aerial photographs capture a view of the site and the surrounding areas at a given time. The results of the aerial photograph review are summarized in Table C.

**Table C: Historical Aerial Photo Summary**

| Year | Scale | Observations |
|---|---|---|
| 1950 | 1:40,000 | **On-site:** Site appears as agricultural cropland. |
| | | **Off-site:** The surrounding land is predominantly agricultural cropland. Linear features are visible to the west (43 Street North), north (TWP RD 92), and east (SMRID canal). Structures are also visible to the east at the location of the farm operation. |
| 1961 | 1:31,680 | **On-site:** Similar to the previous aerial photograph. |
| | | **Off-site:** Similar to the previous aerial photograph. |
| 1970 | 1:31,680 | **On-site:** Similar to the previous aerial photograph. |
| | | **Off-site:** Similar to the previous aerial photograph. |
| 1979 | 1:31,680 | **On-site:** Similar to the previous aerial photograph. |
| | | **Off-site:** Generally similar to the previous aerial photograph although corrals have been constructed to the east at the farm operation location and a building has been constructed to the west (current Haul-All Equipment Ltd.). Outdoor storage is also visible to the north of Haul-All Equipment Ltd. |
| 1991 | 1:30,000 | **On-site:** Similar to the previous aerial photograph. |
| | | **Off-site:** Similar to the previous aerial photograph. |
| 1999 | 1:30,000 | **On-site:** Similar to the previous aerial photograph. |
| | | **Off-site:** Additional structures have been constructed to the west of the site at the current location of Southland Trailer Corp. Additional outside storage is visible to the west of the site. |

**Table C: Historical Aerial Photo Summary**

| Year | Scale | Observations |
|---|---|---|
| 2011 | * | **On-site:** Similar to the previous aerial photograph although the building and access for the water fill station has been constructed on the northern portion of the site. |
| | | **Off-Site:** Additional structures have been constructed to the west of the site at the current location of Peterbilt and the Lethbridge Animal Services. |
| 2022 | * | **On-site:** Similar to the previous aerial imagery. |
| | | **Off-Site:** South of the site a building has been constructed (Southland International Trucks) and trailer storage is visible. The stormwater retention pond has also been constructed south of the site. |

**Notes:**
To be read in conjunction with the accompanying report.
The aerial photographs are enlarged (where possible) for the review.
* Aerial photograph was obtained from Google Earth's satellite image archive.

Based on the aerial photograph review, the site has been agricultural land since 1950 with the only change being the construction of the water fill station between 1999 and 2011.

The surrounding area has also been predominantly agricultural land since 1950 with development occurring to the west of the site within the City of Lethbridge since 1979 and most recently with the development to the south of the site with Phase 1A and Phase 1B of the ASP prior to 2022.

### 2.2.3 Museum Archives

Tetra Tech inquired with the Galt Museum and Archives for indications of historical land use at the site and the surrounding area. Museum personnel indicated that there was no information specific to the site.

### 2.2.4 Business Directories

No business directories were available for Tetra Tech to review for the site.

### 2.2.5 Fire Insurance Plans

No fire insurance plans were available for Tetra Tech to review for the site.

### 2.2.6 Other Archival Records

No additional archival records were reviewed by Tetra Tech for the site.

## 2.3 Provincial Regulatory Information

This section describes the results of provincial regulatory searches. Copies of the search results and correspondence are provided in Appendix C.

### 2.3.1 Alberta Safety Codes Authority

Tetra Tech contacted the Alberta Safety Codes Authority (ASCA) regarding the potential for registered petroleum storage tanks (PSTs) at the site (Plan 1113171, Block 1, Lot 5 and W1/2 10-009-21 W4M and Plan 0013201, Block 1, Lot 1 and NW 10-009-21 W4M) and at the location of Haul-All Equipment Ltd. (4115 – 18 Avenue North; NE 09-009-21 W4M) due to the age of this property dating to the late 1970s.

The ASCA indicated that no records exist for the site or for the location of Haul-All Equipment Ltd.

The ASCA requires that all underground storage tanks (USTs) be registered; however, only above-ground storage tanks (ASTs) with a capacity greater than 2,500 L require registration. The database is based on a limited survey conducted in 1992 and voluntary information submitted thereafter; therefore, it is not considered a comprehensive inventory of PSTs in Alberta.

### 2.3.2 Alberta Energy Regulator

#### 2.3.2.1 AbaData Database

Tetra Tech acquires AER database information through AbaData. The AbaData database was searched to determine if oil/gas wells and/or pipelines exist or have existed at the site and on the surrounding properties. The information provided by the AER indicated that there are available records for two high pressure gas lines owned and operated by ATCO Gas and Pipelines Ltd. (one active and one to be constructed) near the western and eastern site boundaries.

The operating high pressure gas line (natural gas) is oriented north to south along 43 Street North and the yet to be constructed high pressure gas line is proposed to the east of the SMRID canal.

No other records for oil/gas wells and/or pipelines and spills/complaints were identified within 100 m of the site boundaries. AbaData also shows a buried cable right-of-way (ROW) transecting the approximate middle of the site in a diagonal direction. No additional information on the ROW was available.

Several low-pressure gas lines (owned by ATCO Gas) are identified offsite and within 100 m of the site boundaries to the north and east that service rural properties.

High-pressure pipeline and well information provided by AbaData is current to January 1, 2023 and information on low-pressure pipelines is current to December 20, 2022.

The Coal Mine Atlas was reviewed, and it was determined that no abandoned or active coal mines are present at the site or within 100 m of the site.

### 2.3.3 Alberta Environment and Parks

#### 2.3.3.1 Environmental Site Assessment Repository

The AEP ESAR is an online, searchable database that provides scientific and technical information about assessed sites throughout Alberta. The search of ESAR indicated that there were no records available for the site or within 100 m from the site boundary. Several records were available greater than 100 m to the east and west of the site.

#### 2.3.3.2 Online Authorization Viewer

The AEP Online Authorization Viewer allows the public to view approvals, licenses, registrations and permits issued under the Water Act and EPEA. There were no records available for the site by the legal description (Plan 1113171, Block 1, Lot 5 or Plan 0013201, Block 1, Lot 1), however, six records were available for the section in which the site is located (10-009-21 W4M). The available records are for the Lethbridge Regional Water Distribution System, the Rave Industrial Area Storm Drainage System, and for the Coaldale/Management/Lethbridge County (stormwater drainage).

#### 2.3.3.3 Water Well Information Database

The AEP Water Well Database was searched to view records of water wells within the site or within an approximate 1,000 m radius from the approximate centre of the site. The search identified no records of water wells located on or offsite within a 1,000 m radius.

### 2.3.4 Alberta Government – Alberta Land Titles Spatial Information System

The SPIN2 website map for the site and surrounding area shows the legal property boundaries for the site and surrounding area including the ROW for the SMRID irrigation canal adjacent to the east of the site. The SPIN2 map also shows a buried cable ROW transecting the approximate middle of the site.

### 2.3.5 Historical Environmental Enforcement Search

The historical environmental enforcement search provides records taken against a company or individual related to AEP's legislation. The search was conducted for each of the current site owners as per the land title records listed in Section 2.2.1. The search resulted in no records for the individuals or companies listed.

## 2.4 Regional and Municipal Regulatory Information

This section describes the results of regional and municipal regulatory searches. Copies of the search results and correspondence are provided in Appendix C.

### 2.4.1 Lethbridge County

Tetra Tech requested a site inquiry with Lethbridge County for information on the site (W1/2 10-009-21 W4M). The response indicated that there are no records of storage tanks, chemical storage, spills, fires or landfills for the site including Phase 1A and Phase 1B of the ASP (located within the W1/2 10-009-21 W4M). It was also indicated that existing development approvals for the area exist.

A copy of the letter from Lethbridge County is presented in Appendix C.

## 2.5 Land Forms and Geology

### 2.5.1 Topography

Surface topography can influence the direction of migration of contaminants at the soil surface. The local topography is the topography at the site, whereas regional topography is the overall expression of the surface in a given region. The local topography of the site was generally flat with no overall surface drainage pattern observed. Regional topography in the area is generally flat to undulating, and slopes northerly towards the Oldman River valley.

### 2.5.2 Surficial and Bedrock Geology

The surficial geology in the area is characterized by moraine till deposits with sporadic lenses of gravel, sand, and silt (Shetsen 1981).

The stratigraphy of the Lethbridge area is generally comprised of 65 m to 70 m of surficial deposits overlying bedrock. Bedrock in the Lethbridge area consists of strata from the upper Oldman Formation and the lower Bearpaw Formation, both of the late Cretaceous Age (Tokarsky 1974). The bedrock has a relatively flat surface dipping

slightly to the northwest and is locally encountered at about geodetic elevation 843 m. The bedrock strata consist of thin beds of predominantly weak mudstones, siltstones, and sandstones with occasional bentonite and coal seams.

### 2.5.3 Hydrogeology

Groundwater has the potential to be of significance as a means of contaminant transport. Regional groundwater flow is the overall direction of groundwater flow in a given region. Groundwater in a local area within the region, may travel in a different direction from the regional flow, due to influence by local topography and/or subsurface soil conditions.

There are currently no surface water bodies located at the site. The nearest surface water body is the SMRID canal adjacent to the east of the site. There is also a stormwater retention pond approximately 100 m south of the site (within Phase 1B of the ASP) and a dugout located east of the SMRID canal at the farm operation. The Oldman River is located approximately 6 km northwest of the site.

Regional groundwater flow is expected to be northerly toward the Oldman River. Perched groundwater tables are common and have been encountered in many areas of southern Alberta. The depth to these perched tables can vary from approximately 2 m below ground level to considerable depths within gravel, sand, and/or silt seams. The flow of these perched tables can differ from regional flow direction, or be relatively stagnant, depending on the geometry and the extent of the sand and/or silt seams.

It should be noted that topography, geologic materials, land development (including the irrigation canal), and soil disturbances can also cause localized variances in groundwater movement and pattern. Also, groundwater levels will fluctuate seasonally and in response to climatic conditions.

## 2.6 Previous Reports

No previous environmental reports were available to review for the site.

## 2.7 Other Information Sources

There were no other information sources reviewed for the site.

# 3.0 SITE VISIT

Jaymes Going, of Tetra Tech, visited the site on February 14, 2023. Full access to all outdoor areas of the site was granted, however, the water fill station building was not accessed. Weather conditions were favorable (i.e., no snow cover) and the site was walked over with visual observations made of adjacent properties from the site boundaries.

## 3.1 Building Details and Site Servicing

There is currently one building on the site. The building is for the water fill station and was constructed between 1999 and 2011.

The following table describes the site servicing.

### Table D: Site Servicing

| Item | Present | Type | Comments |
|---|---|---|---|
| Water Supply | Yes | Potable | The water fill station building owned and operated by the Lethbridge Regional Water Services Commission provides a source of potable water. |
| Storm Sewer | No | Not applicable | Overland surface drainage would follow the local topography; however, no specific site drainage patterns were observed. |
| Sanitary Sewer | No | None | There was no indication of sanitary sewer services located at the site. |
| Other Storage | No | Not applicable | No storage areas were observed at the site. |
| Pits | No | Not applicable | No pits were observed on the site. |
| Lagoons | No | Not applicable | No lagoons were observed on the site. |

## 3.2 Special Attention Items

Some construction materials contain compounds that may be hazardous to building occupants or users of the site. The following table summarizes these special attention items; further background information on these materials is provided in Appendix D.

### Table E: Special Attention Items

| Item | Presence/ Potential | Comments |
|---|---|---|
| Asbestos | Low | Based on age of the building at the site (after 1999), there is a low potential that the building contains asbestos and/or lead. |
| Lead | Low | |
| Urea Formaldehyde Foam Insulation (UFFI) | Low | No indication of UFFI at the site was observed. If this type of insulation was used, the fugitive emissions were likely the most harmful within two years of installation. |
| Ozone-depleting Substances (ODS) | Low | Based on the nature of the site building, it is unlikely that ODS are located at the site. |
| Polychlorinated Biphenyls (PCBs) | Low | Pole mounted transformers were observed at the site near the water fill station. Transformers are owned and maintained by the utility company. |
| Radon | Moderate to High | There was no radon gas testing reported for the site; however, natural radon concentrations are considered moderate to high in Alberta. A radon test was not completed by Tetra Tech as part of this investigation. There were no anthropogenic sources of radon gas identified. |
| Methane | Low | There was no methane gas testing reported for the site. Based upon information collected during this investigation (i.e., aerial photograph review, site reconnaissance), there is no evidence of deposits of buried organics at the site that could produce methane. Refer to Section 3.3.5 regarding potential fill areas. |
| Electromagnetic (EM) | Low | A high voltage transmission line is present on the west site boundary which could generate EMFs. No EMF assessment was completed by Tetra Tech for the site. |
| Noise and Vibration | Low | There were no major sources of noise or vibration on or adjacent to the site during the site visit. |

The above evaluation is based on building age and basic site observations. Intrusive investigation and sampling are not within the scope of a Phase I ESA.

## 3.3 Site Observations

This section describes observations made of the site during the site visit on February 14, 2023.

### 3.3.1 Surficial Stains

There were no surficial stains observed during the site visit.

### 3.3.2 Vegetation

Vegetation at the site was predominantly agricultural cropland with some weedy species expected in disturbed areas such as near the SMRID canal and near adjacent roadways. There was no evidence of stressed vegetation at the site, however, the site visit was conducted outside the growing season when vegetation was dormant.

### 3.3.3 Ponding of Water

There was no ponded water observed on the site at the time of the site visit.

### 3.3.4 Washouts and Erosion

There were no washouts or indications of erosion observed.

### 3.3.5 Fill Areas and Soil Conditions

There was no evidence of fill materials having been brought to the site. The potential for methane generation is described in Section 3.2.

Further information on soil conditions are presented in the geotechnical evaluation report completed at the site by Tetra Tech (Tetra Tech 2023, currently not issued).

### 3.3.6 Oil/Gas Wells and Pipelines

There were no well sites observed at the time of the site visit.

Refer to Section 2.3.2 for AER information.

### 3.3.7 Chemical Storage

There were no hazardous chemicals or large drums observed at the site during the site visit.

### 3.3.8 Transformers

There was a pole-mounted electrical transformer observed near the water fill station. Generally, pole-mounted transformers are owned and maintained by the utility companies.

### 3.3.9 Hydraulic Elevators and Hoists

There were no hydraulic elevators or hoists observed at the site visit.

### 3.3.10 Vent Pipes and Underground Storage Tanks

There were no vent pipes or USTs identified during the site visit.

### 3.3.11 Above-Ground Storage Tanks and Drum Storage

No ASTs or drum storage were present at the site during the site visit.

### 3.3.12 Waste Storage

No waste storage areas were observed at the site during the site visit.

### 3.3.13 General Housekeeping

The general housekeeping of the site was in good condition and no obvious evidence of negligent acts or illegal dumping were observed during the site visit.

## 3.4 Off-Site Observations

The following table summarizes the surrounding land use.

**Table F: Surrounding Land Use**

| Direction | Zoning* | Observations | Tetra Tech Evaluation |
|---|---|---|---|
| North | Lethbridge Urban Fringe | Agricultural land | No obvious concerns which may cause environmental impairment to the site were identified. |
| East | | SMRID canal, agricultural land, and farm operation | |
| South | | Southland International Trucks and trailer storage and stormwater retention pond | |
| West | General Industrial | Various commercial and industrial properties | |

*Land use obtained from Lethbridge County (Lethbridge County - Online Maps (lethcounty.ca)) and the City of Lethbridge (Property Information WebMAP (lethbridge.ca)).

The surrounding land is primarily agricultural with commercial and industrial properties to the west within the City of Lethbridge. Key surrounding land use is indicated on Figure 2.

# 4.0 PERSONNEL INTERVIEWS

Due to the land use being primarily agricultural from 1950 to current, no personnel interviews were conducted.

# 5.0 DISCUSSION AND CONCLUSIONS

## 5.1 General

In general terms, there are two distinct types of potential environmental risk to any property. The first type of risk is from potential contamination from on-site land use. This would include potential accidental spills or site practices that may contaminate the property directly. The second type of risk is from contamination caused by adjacent property owners, which might then be transported through the subsurface soils by groundwater, or in overland runoff onto the site.

## 5.2 Potential for Impairment from On-Site Source(s)

There were no on-site sources that might have a potential to cause environmental impairment to the site through historical and/or current land use.

## 5.3 Potential for Impairment from Off-Site Source(s)

There were no off-site sources that might have a potential to cause environmental impairment to the site through historical and/or current land use.

# 6.0 FURTHER ACTION/RENDERING AN OPINION

Based on the present study, Tetra Tech recommends that no further environmental investigation is required at this time.

Tetra Tech recommends the following for consideration:

- If buried debris or staining are encountered during future investigation or ground disturbance a qualified environmental professional should be contacted.
- If soils containing organics are encountered during future investigation or ground disturbance, they should be removed from building footprints and not be reburied; a qualified environmental professional should be contacted.

# 7.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

FILE: ENG.LGEO04625-01.002
FILE: ENG.LGEO04625-01.002
FILE: ENG.LGEO04625-01.002

Prepared by:
Jaymes Going, B.Sc., EP
Environmental Scientist
Environment & Water Practice
Direct Line: 403.308.4293
Jaymes.Going@tetratech.com

FILE: ENG.LGEO04625-01.002
FILE: ENG.LGEO04625-01.002
FILE: ENG.LGEO04625-01.002

Reviewed by:
Henri Carriere, P.Eng., M.N.R.M.
Senior Project Engineer
Environment & Water Practice
Direct Line: 403.993.4176
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/jmt

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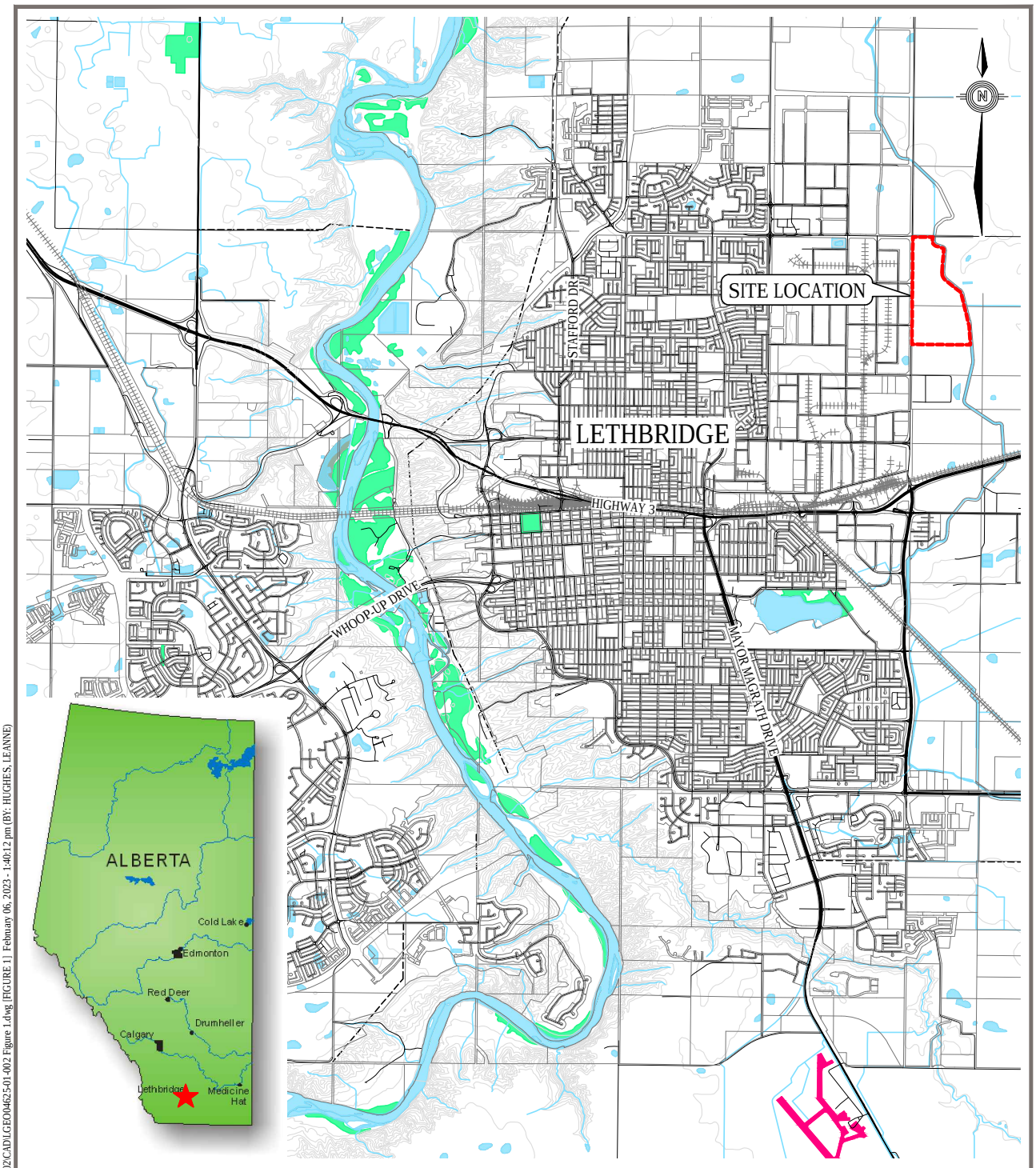
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# FIGURES

Figure 1 Site Location Plan
Figure 2 Detailed Site Plan Showing Surrounding Land Use




NOTES
DRAWING PROVIDED BY "© Department of Natural Resources Canada. All rights reserved."

0 3,000m

Scale: 1:60,000 @ 8.5"x11"

CLIENT

Sumus Property Group Ltd.

PHASE I ENVIRONMENTAL SITE ASSESSMENT
CHINOOK INDUSTRIAL PARK ASP
W1/2 10-009-21 W4M LETHBRIDGE COUNTY

SITE LOCATION PLAN

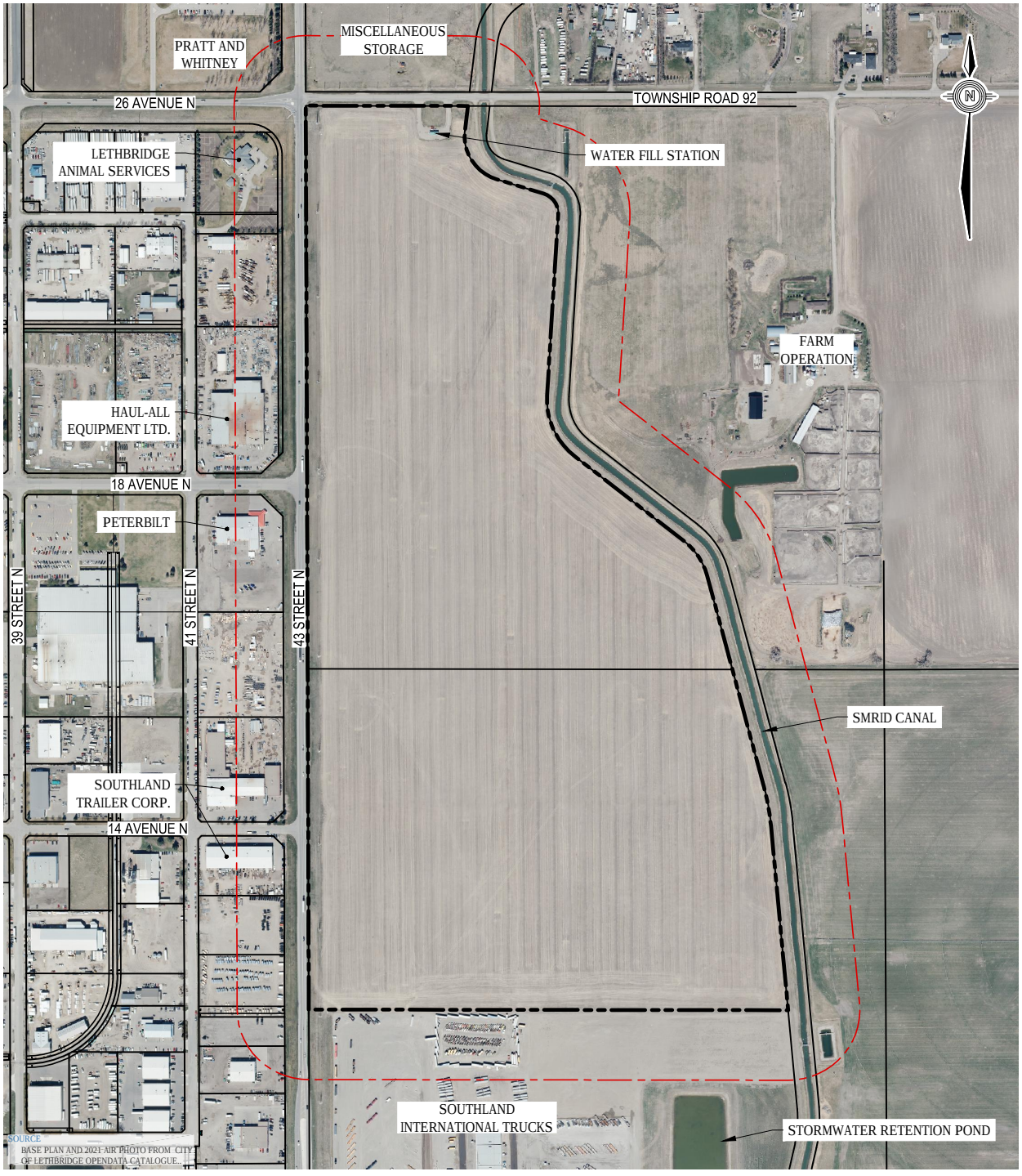
TETRA TECH

| PROJECT NO. | DWN | CKD | REV |
|---|---|---|---|
| LGEO04625-01-002 | LCH | JG | 0 |

| OFFICE | DATE |
|---|---|
| Tt Leth | February 2023 |

Figure 1

C:\Lethbridge\Drafting\ENG.LGEO\LGEO04625\002\CAD\LGEO04625-01-002 Figure 1.dwg [FIGURE 1] February 06, 2023 - 1:40:12 pm (BY: HUGHES, LEANNE)




SOURCE
BASE PLAN AND 2021 AIR PHOTO FROM CITY OF LETHBRIDGE OPENDATA CATALOGUE.

LEGEND

SITE BOUNDARY

100 m BOUNDARY

0 250m

Scale: 1:7,500 @ 8.5"x11"

CLIENT

Sumus Property Group Ltd.

PHASE I ENVIRONMENTAL SITE ASSESSMENT
CHINOOK INDUSTRIAL PARK ASP
W1/2 10-009-21 W4M LETHBRIDGE COUNTY

DETAILED SITE PLAN SHOWING SURROUNDING LAND USE

TETRA TECH

| PROJECT NO. | DWN | CKD | REV |
|---|---|---|---|
| LGEO04625-01-002 | LCH | JG | 0 |

| OFFICE | DATE |
|---|---|
| Tt Leth | February 2023 |

Figure 2

C:\Lethbridge\Drafting\ENG.LGEO\LGEO04625\002\CAD\LGEO04625-01-002 Figure 2.dwg [FIGURE 2] February 21, 2023 - 1:55:10 pm (BY: HUGHES, LEANNE)

# APPENDIX A

## TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

# LIMITATIONS ON USE OF THIS DOCUMENT

## GEOENVIRONMENTAL

### 1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

### 1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

### 1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

### 1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

### 1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

### 1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

### 1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

# APPENDIX B

## SITE PHOTOGRAPHS



**Photo 1:** View looking west at the approximate south site boundary.



**Photo 2:** View looking northwest at the site from the approximate southeast corner of the site.



**Photo 3:** View looking southwest at the site from near the middle of the east site boundary.



**Photo 4:** View looking south at the site from near the northeast corner of the site. The SMRID canal and access road are visible.



**Photo 5:** View looking west at water fill station located on the northern portion of the site.



**Photo 6:** View of adjacent property to the north beyond Township Road 92.



**Photo 7:** View of adjacent property to the east beyond the SMRID canal.



**Photo 8:** View of adjacent land use to the south; stormwater retention pond located within Phase 1B of the ASP.




**Photo 9:** View of one of the commercial/industrial businesses (Haul-All Equipment Ltd.) to the west of the site beyond 43 Street North.



**Photo 10:** View of one of the commercial/industrial businesses (Southland Trailer Corp.) to the west of the site beyond 43 Street North.

# APPENDIX C

## REGULATORY SEARCHES AND RESPONSES

LAND TITLE CERTIFICATE

S

| LINC | SHORT LEGAL | TITLE NUMBER |
|---|---|---|
| 0034 989 632 | 1113171;1;5 | 111 286 315 +1 |

LEGAL DESCRIPTION
PLAN 1113171
BLOCK 1
LOT 5
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 59.56 HECTARES (147.18 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
ATS REFERENCE: 4;21;9;10;W

MUNICIPALITY: LETHBRIDGE COUNTY

REFERENCE NUMBER: 091 136 885 +3
091 136 885 +2

---

REGISTERED OWNER(S)

| REGISTRATION | DATE(DMY) | DOCUMENT TYPE | VALUE | CONSIDERATION |
|---|---|---|---|---|
| 111 286 315 | 03/11/2011 | SUBDIVISION PLAN | | |

OWNERS

1000824 ALBERTA LTD.
OF 2365 ASPEN DRIVE
COALDALE
ALBERTA T1M 0E6
(DATA UPDATED BY: CHANGE OF ADDRESS 231007775)

---

ENCUMBRANCES, LIENS & INTERESTS

| REGISTRATION NUMBER | DATE (D/M/Y) | PARTICULARS |
|---|---|---|
| 1049KD . | 05/02/1968 | UTILITY RIGHT OF WAY<br>GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.<br>"PORTION DESCRIBED" |
| 1485KX . | 21/06/1971 | IRRIGATION ORDER/NOTICE<br>THIS PROPERTY IS INCLUDED IN THE ST. MARY RIVER IRRIGATION DISTRICT |

( CONTINUED )

| REGISTRATION NUMBER | DATE (D/M/Y) | PARTICULARS |
|---|---|---|
| 881 219 612 | 01/12/1988 | UTILITY RIGHT OF WAY<br>GRANTEE - ALBERTA GOVERNMENT TELEPHONES.<br>AS TO PORTION OR PLAN:8810684<br>"TAKES PRIORITY OF CAVEAT 871131928 REGISTERED 27/07/1987" |
| 991 249 227 | 30/08/1999 | IRRIGATION DISTRICT RESOLUTION<br>PART OF AN IRRIGABLE UNIT<br>" AFFECTS PART OF THIS TITLE " |
| 081 230 993 | 02/07/2008 | MORTGAGE<br>MORTGAGEE - ROYAL BANK OF CANADA.<br>180 WELLINGTON STREET WEST, 5TH FLOOR<br>TORONTO<br>ONTARIO M5J1J1<br>ORIGINAL PRINCIPAL AMOUNT: $1,150,000 |

TOTAL INSTRUMENTS: 005

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 21 DAY OF FEBRUARY, 2023 AT 08:57 A.M.

ORDER NUMBER: 46536252

CUSTOMER FILE NUMBER:

*END OF CERTIFICATE*

THIS ELECTRONICALLY TRANSMITTED LAND TITLES PRODUCT IS INTENDED FOR THE SOLE USE OF THE ORIGINAL PURCHASER, AND NONE OTHER, SUBJECT TO WHAT IS SET OUT IN THE PARAGRAPH BELOW.

THE ABOVE PROVISIONS DO NOT PROHIBIT THE ORIGINAL PURCHASER FROM INCLUDING THIS UNMODIFIED PRODUCT IN ANY REPORT, OPINION, APPRAISAL OR OTHER ADVICE PREPARED BY THE ORIGINAL PURCHASER AS PART OF THE ORIGINAL PURCHASER APPLYING PROFESSIONAL, CONSULTING OR TECHNICAL EXPERTISE FOR THE BENEFIT OF CLIENT(S).

LAND TITLE CERTIFICATE

S

| LINC | SHORT LEGAL | TITLE NUMBER |
|---|---|---|
| 0028 725 811 | 0013201;1;1 | 021 267 993 |

LEGAL DESCRIPTION

PLAN 0013201
BLOCK 1
LOT 1
CONTAINING 0.559 HECTARES (1.38 ACRES) MORE OR LESS
EXCEPTING THEREOUT:

| PLAN | NUMBER | HECTARES | (ACRES) | MORE OR LESS |
|---|---|---|---|---|
| ROAD | 0110313 | 0.054 | 0.13 | |

EXCEPTING THEREOUT ALL MINES AND MINERALS

ATS REFERENCE: 4;21;9;10;NW
ESTATE: FEE SIMPLE

MUNICIPALITY: LETHBRIDGE COUNTY

REFERENCE NUMBER: 011 025 754 +1

REGISTERED OWNER(S)

| REGISTRATION | DATE(DMY) | DOCUMENT TYPE | VALUE | CONSIDERATION |
|---|---|---|---|---|
| 021 267 993 | 01/08/2002 | TRANSFER OF LAND | $212,000 | $1 |

OWNERS

LETHBRIDGE REGIONAL WATER SERVICES COMMISSION.
OF 100,905-4 AVE. SOUTH
LETHBRIDGE
ALBERTA T1J 4E4

ENCUMBRANCES, LIENS & INTERESTS

| REGISTRATION NUMBER | DATE (D/M/Y) | PARTICULARS |
|---|---|---|
| 359EM . | 31/01/1934 | EASEMENT<br>"(SUBJECT TO) IN FAVOUR OF NE 1/4 OF SECTION 10, PORTION LSD 6, ALL OF LSD 7 & 8" |

( CONTINUED )

| REGISTRATION NUMBER | DATE (D/M/Y) | PARTICULARS |
|---|---|---|
| 1049KD . | 05/02/1968 | UTILITY RIGHT OF WAY<br>GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.<br>"PORTION DESCRIBED" |
| 1485KX . | 21/06/1971 | IRRIGATION ORDER/NOTICE<br>THIS PROPERTY IS INCLUDED IN THE ST. MARY RIVER IRRIGATION DISTRICT |

TOTAL INSTRUMENTS: 003

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 21 DAY OF FEBRUARY, 2023 AT 08:57 A.M.

ORDER NUMBER: 46536252

CUSTOMER FILE NUMBER:

*END OF CERTIFICATE*

THIS ELECTRONICALLY TRANSMITTED LAND TITLES PRODUCT IS INTENDED FOR THE SOLE USE OF THE ORIGINAL PURCHASER, AND NONE OTHER, SUBJECT TO WHAT IS SET OUT IN THE PARAGRAPH BELOW.

THE ABOVE PROVISIONS DO NOT PROHIBIT THE ORIGINAL PURCHASER FROM INCLUDING THIS UNMODIFIED PRODUCT IN ANY REPORT, OPINION, APPRAISAL OR OTHER ADVICE PREPARED BY THE ORIGINAL PURCHASER AS PART OF THE ORIGINAL PURCHASER APPLYING PROFESSIONAL, CONSULTING OR TECHNICAL EXPERTISE FOR THE BENEFIT OF CLIENT(S).

Safety Codes Council
Alberta Safety Codes Authority

February 13, 2023

Jaymes M Going
Tetra Tech
442-10 Street North
Lethbridge, AB T1H 2C7

Email: jaymes.going@tetratech.com

Re: ASCA Storage Tank Search Request- Your File ENG.LGEO04625-01.002

Dear Jaymes M Going ,

As per As per your search requests received February 13, 2023 , Alberta Safety Codes Authority (ASCA) has searched the storage tank database for existing and former installations of storage tank systems, as defined by the Fire Code, including those known to be inside structures at the following address:

1. Lethbridge County | Lot 111317 Block 1 Plan 5 | 10-9-21-W4
2. Lethbridge County | Lot 001320 Block 1 Plan 1 |NW- 10-9-21-W4

The search of the storage tank database determined no records were available for the address requested.

The Freedom of Information and Protection of Privacy Act governs the information provided. Please note that the database is ***not*** complete. The main limitation of the database is that it only includes information reported through registration and permitting or a survey of abandoned sites completed in 1992 and should not be considered a comprehensive inventory of all past or present storage tank sites. ASCA's storage tank systems database is solely maintained based on information provided by owners and or operators of storage tank systems; therefore, the database may not reflect information related to all existing or former storage tank systems in Alberta. Further information on storage tank systems or investigations involving a spill/release or contamination may be filed with the local fire service or Alberta Environment.

Regards,

**Amanda McIntyre (she/her)**
**ASCA Tanks**
**Alberta Safety Codes Authority**
**Safety Codes Council | safetycodes.ab.ca**
Tel. 780.392-1551 | Toll-Free 1-888-413-0099

Safety Codes Council
Alberta Safety Codes Authority

February 24, 2023

Jaymes M Going
Tetra Tech
442-10 Street North
Lethbridge, Alberta T1H 2C7

Email: jaymes.going@tetratech.com

Re: ASCA Storage Tank Search Request

Dear Melody Crozier-Smith,

As per As per your search requests received February 23, 2023 , Alberta Safety Codes Authority (ASCA) has searched the storage tank database for existing and former installations of storage tank systems, as defined by the Fire Code, including those known to be inside structures at the following address:

1. 4115 18 Ave N Lethbridge| Lot 1 Block 5 Plan 7710884 | NE-9-9-21-W4

The search of the storage tank database determined no records were available for the address requested.

The Freedom of Information and Protection of Privacy Act governs the information provided. Please note that the database is ***not*** complete. The main limitation of the database is that it only includes information reported through registration and permitting or a survey of abandoned sites completed in 1992 and should not be considered a comprehensive inventory of all past or present storage tank sites. ASCA's storage tank systems database is solely maintained based on information provided by owners and or operators of storage tank systems; therefore, the database may not reflect information related to all existing or former storage tank systems in Alberta. Further information on storage tank systems or investigations involving a spill/release or contamination may be filed with the local fire service or Alberta Environment.

Regards,

**Amanda McIntyre (she/her)**
**ASCA Tanks**
**Alberta Safety Codes Authority**
**Safety Codes Council | safetycodes.ab.ca**
Tel. 780.392-1551 | Toll-Free 1-888-413-0099




Monday, February 13, 2023

1:14,237

0 170 340 680 m

AbaData

# Pipeline Information

ATCO GAS AND PIPELINES LTD. | AB00002185 - 11

Government Pipeline Data Current to January 1, 2023

| | | | |
|---|---|---|---|
| **Permit Date:** | April 30, 2008 | **License Date:** | |
| **From Location:** | 9-16-9-21 W4M PL | **To Location:** | 1-9-9-21 W4M PL |
| **Length:** | 2.5 kms \| 1.56 mi | **Status:** | O |
| **Substance:** | NG | **$H_2S$:** | 0 mol/kmol \| 0 ppm |
| **Outside Diameter:** | 273.1 mm \| 10.75 " | **Wall Thickness:** | 6.4 mm \| 0.25 " |
| **Material:** | S | **Type:** | 5L |
| **Grade:** | X42 | **Max Operating Pressure:** | 2380 kPa \| 345 psi |
| **Joints:** | W | **Internal Coating:** | U |
| **Stress Level:** | 18 % | **Environment:** | |
| **Original Permit Date:** | | **Construction Date:** | |
| **Original License/Line No:** | 0 - 0 | **NEB Registration:** | |
| **Last Occurrence Year:** | 2008 | **Abacus No:** | N/A |

# Pipeline Information

ATCO GAS AND PIPELINES LTD. | AB00002027 - 182

Government Pipeline Data Current to January 1, 2023

| | | | |
|---|---|---|---|
| **Permit Date:** | August 10, 2022 | **License Date:** | |
| **From Location:** | 14-27-9-21 W4M PL | **To Location:** | 14-3-9-21 W4M PL |
| **Length:** | 8.13 kms \| 5.08 mi | **Status:** | P |
| **Substance:** | NG | **$H_2S$:** | 0.01 mol/kmol \| 10 ppm |
| **Outside Diameter:** | 219.1 mm \| 8.63 " | **Wall Thickness:** | 4.8 mm \| 0.19 " |
| **Material:** | S | **Type:** | Z245.1 |
| **Grade:** | 3592 | **Max Operating Pressure:** | 4960 kPa \| 719 psi |
| **Joints:** | W | **Internal Coating:** | U |
| **Stress Level:** | 32 % | **Environment:** | |
| **Original Permit Date:** | August 10, 2022 | **Construction Date:** | |
| **Original License/Line No:** | 2027 - 182 | **NEB Registration:** | |
| **Last Occurrence Year:** | 2022 | **Abacus No:** | N/A |

# Disposition Information

APPLICATION

ROE580 | RIGHT OF ENTRY AGREEMENT

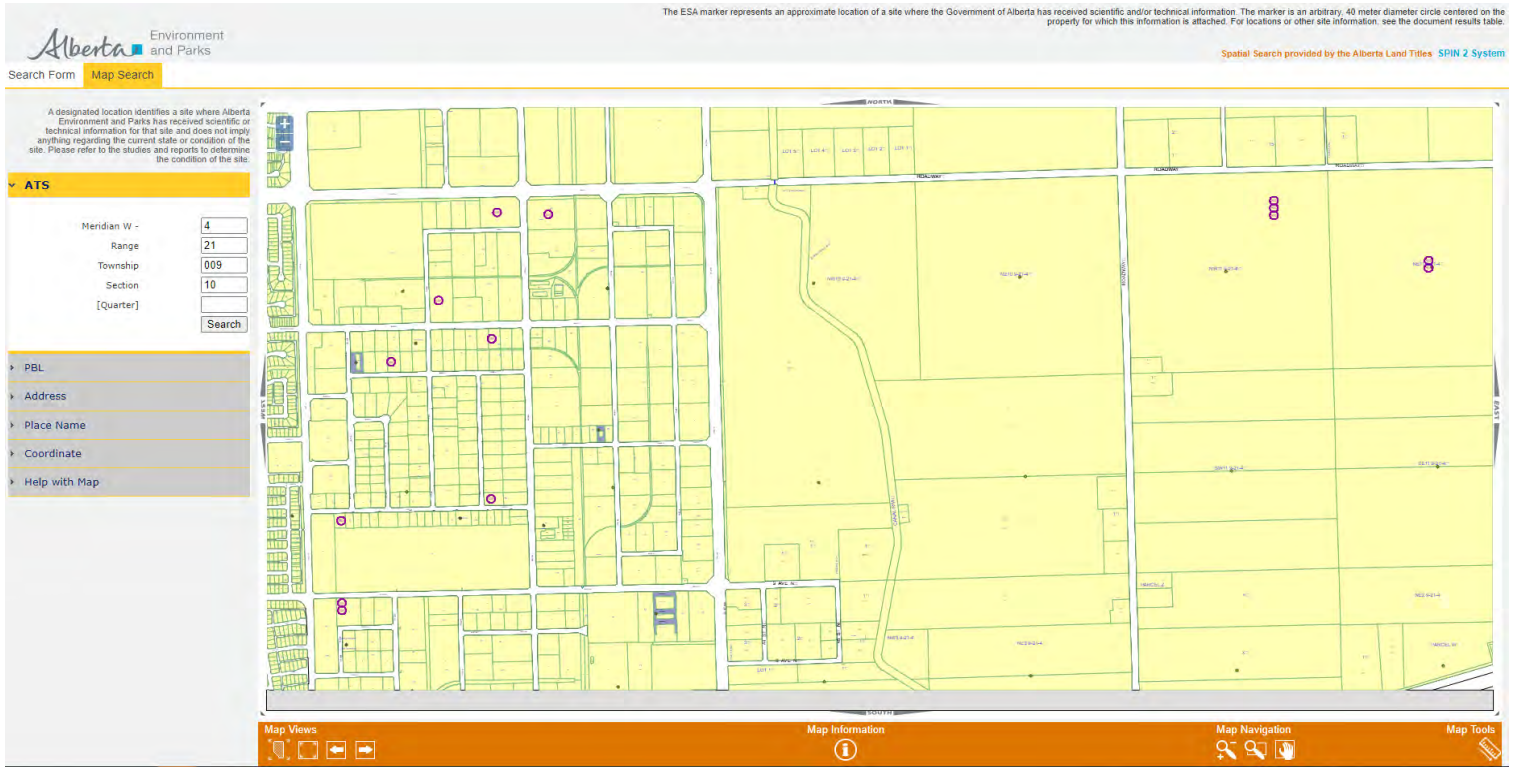
| | | | |
|---|---|---|---|
| **Client:** | ATCO GAS AND PIPELINES LTD. (SOUTH) | | |
| **Source Document:** | Survey | **Version Date:** | December 6, 1989 |
| **Discrepancies?** | No | **Last Edit Date:** | February 18, 2009 |
| **Process Date:** | February 2, 2023 | **Application Date:** | March 3, 1952 |
| **Letter of Authority Date:** | | **Amendment to Letter of Authority Date:** | |
| **Effective Date:** | March 12, 1952 | **Amendment Date:** | |
| **Cancellation Date:** | | **Renewal Date:** | |
| **Expiry Date:** | December 31, 2999 | **Reinstatement Date:** | |
| **Plan Number:** | 15225P | **Near Water?** | No |
| **Status:** | ACTIVE/DISPOSED | | |
| **Purpose:** | PIPELINE | | |
| **Dimensions:** | P/L 16.5FT (W) | | |
| **Area (hectares):** | 0.40 | **Area (acres):** | 1.00 |
| **Restriction:** | | | |
| **Exceptions to Restriction:** | | | |

# Low Pressure Pipeline Information

NATURAL GAS CO-OPERATIVE CONTACT INFORMATION

Data Current To December 20, 2022

| | | | |
|---|---|---|---|
| **Name:** | ATCO Natural Gas Distribution Customer Correspondence | | |
| **Address:** | PO Box 2409 Edmonton, T5J 2S3 | | |
| **Phone #:** | 310-5678 | **Alternate Phone #:** | |
| **Website:** | http://www.atcogas.com | | |


Alberta Environment and Parks
The ESA marker represents an approximate location of a site where the Government of Alberta has received scientific and/or technical information. The marker is an arbitrary, 40 meter diameter circle centered on the property for which this information is attached. For locations or other site information, see the document results table.
Spatial Search provided by the Alberta Land Titles SPIN 2 System
Search Form
Map Search
A designated location identifies a site where Alberta Environment and Parks has received scientific or technical information for that site and does not imply anything regarding the current state or condition of the site. Please refer to the studies and reports to determine the condition of the site.
ATS
Meridian W -
4
Range
21
Township
009
Section
10
[Quarter]
Search
PBL
Address
Place Name
Coordinate
Help with Map
Map Views
Map Information
Map Navigation
Map Tools

Authorization Viewer | Traditional Agriculture Registration Viewer | Public Notices Viewer | Help

## Authorization Viewer - Search Results

For Water Act approvals, amendments and Code of Practice notifications issued by the Alberta Energy Regulator during or after 2018, please refer to the following link OneStop Application Query Tool (aer.ca).

| The Search Used the Following Values: | |
|---|---|
| Legal Land Location: | 10-009-21-W4 |
| Act / Document Type: | Water Act, EPEA |
| Show Inactive Authorizations: | Yes |

The resulting Authorizations based on the search criteria will be displayed below. A  will appear next to the Authorization when documentation is available for viewing or downloading. Please click Viewer Help if you encounter problems viewing the Authorization document.

6 Result(s)

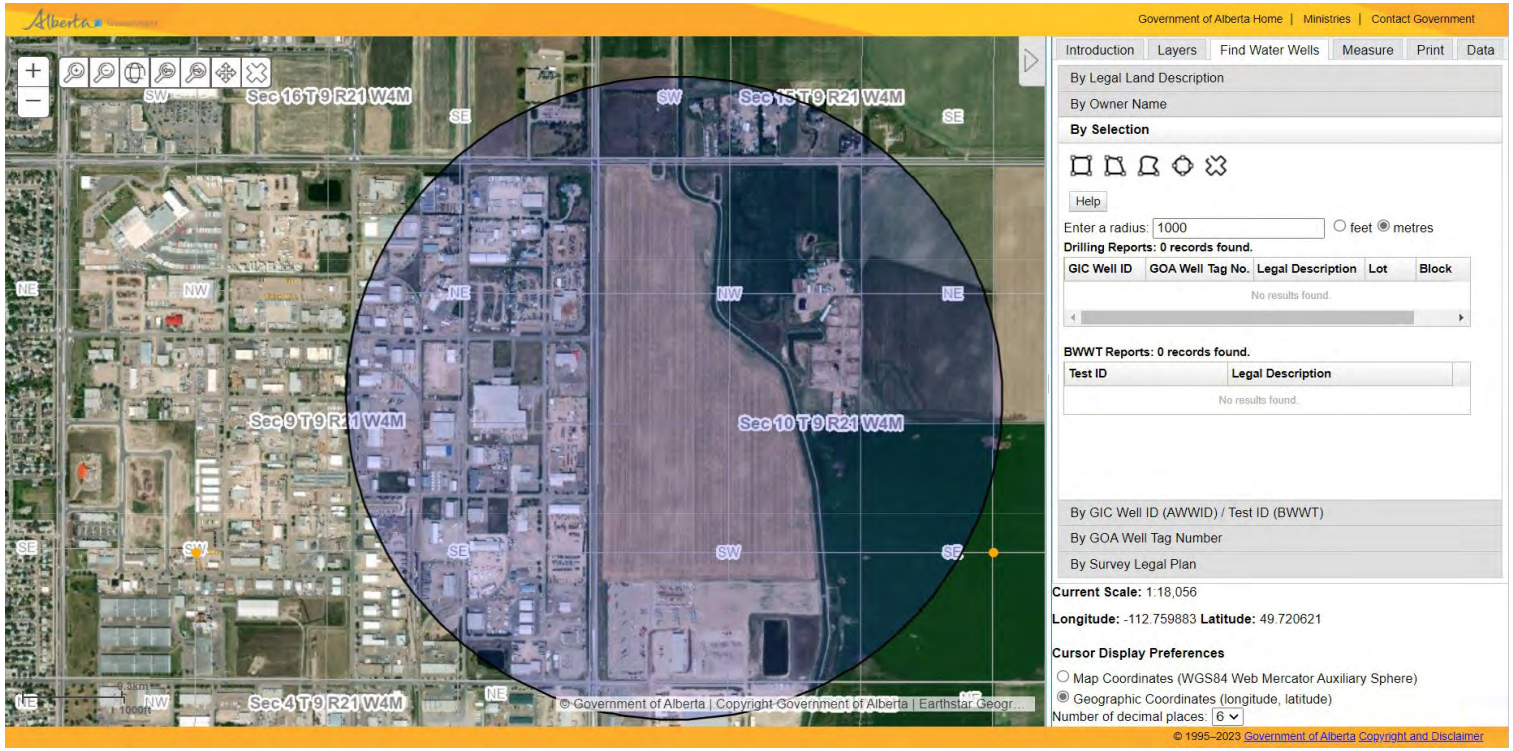
| | |
|---|---|
|  | Document 00181809-00-00 LETHBRIDGE REGIONAL WATER SERVICES WATERWORKS SYSTEM is held by Lethbridge Regional Water Services Commission, under the provisions of the *Environmental Protection & Enhancement Act*. This Approval is currently issued as of Jun. 18, 2002 and does not expire. |
|  | Document 00181809-00-01 LETHBRIDGE REGIONAL WATER SERVICES WATERWORKS SYSTEM - LEGISLATIVE CHANGES is held by Lethbridge Regional Water Services Commission, under the provisions of the *Environmental Protection & Enhancement Act*. This Registration is currently renewed. |
|  | Document 00181809-01-00 LETHBRIDGE REGIONAL WATER DISTRIBUTION SYSTEM - CODE OF PRACTICE is held by Lethbridge Regional Water Services Commission, under the provisions of the *Environmental Protection & Enhancement Act*. This Registration is currently issued as of Apr. 01, 2005 and does not expire. |
|  | Document 00181809-01-01 LETHBRIDGE REGIONAL WATER DISTRIBUTION SYSTEM - REVISED LEAD MAC NOTICE is held by Lethbridge Regional Water Services Commission, under the provisions of the *Environmental Protection & Enhancement Act*. This Registration is currently issued as of Oct. 30, 2019 and does not expire. |
|  | Document 00335366-00-00 COALDALE/MANAGEMENT/LETHBRIDGE COUNTY - F00335366 is held by Lethbridge County, under the provisions of the *Water Act*. This Approval is currently issued as of Jun. 18, 2020 and expires on Jun. 17, 2045. |
|  | Document 00374661-00-00 RAVE INDUSTRIAL AREA STORM DRAINAGE SYSTEM is held by Lethbridge County, under the provisions of the *Environmental Protection & Enhancement Act*. This Registration is currently issued as of Jul. 24, 2020 and does not expire. |

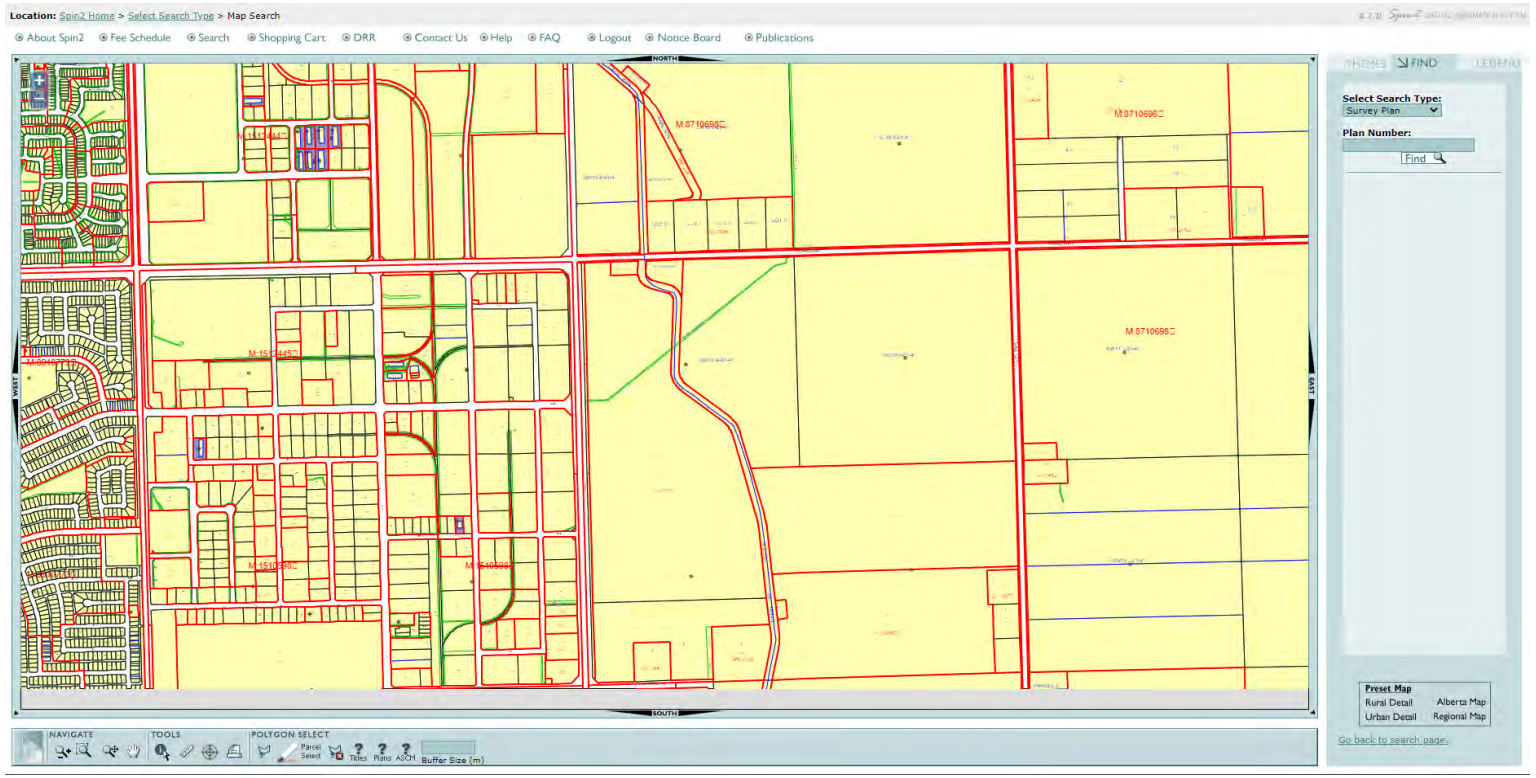
Clear & Return

Comments regarding the Authorization Viewer page may be directed to the Regulatory Approvals Centre RAC.Environment@gov.ab.ca.


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Alberta Environment and Parks
Authorization Viewer
Traditional Agriculture Registration Viewer
Public Notices Viewer
Help
Authorization Viewer - Search Results
For Water Act approvals, amendments and Code of Practice notifications issued by the Alberta Energy Regulator during or after 2018, please refer to the following link OneStop Application Query Tool (aer.ca).
The Search Used the Following Values:
Area Parcel: Plan: 1113171 Block: 1 Lot: 5
Act / Document Type: Water Act, EPEA
Show Inactive Authorizations: Yes
The resulting Authorizations based on the search criteria will be displayed below. A will appear next to the Authorization when documentation is available for viewing or downloading. Please click Viewer Help if you encounter problems viewing the Authorization document.
0 Result(s)
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Authorization Viewer
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Public Notices Viewer
Help
Authorization Viewer - Search Results
For Water Act approvals, amendments and Code of Practice notifications issued by the Alberta Energy Regulator during or after 2018, please refer to the following link OneStop Application Query Tool (aer.ca).
The Search Used the Following Values:
Area Parcel: Plan: 0013201 Block: 1 Lot: 1
Act / Document Type: Water Act, EPEA
Show Inactive Authorizations: Yes
The resulting Authorizations based on the search criteria will be displayed below. A will appear next to the Authorization when documentation is available for viewing or downloading. Please click Viewer Help if you encounter problems viewing the Authorization document.
0 Result(s)
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Comments regarding the Authorization Viewer page may be directed to the Regulatory Approvals Centre RAC.Environment@gov.ab.ca.
Alberta Environment and Parks
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Introduction
Layers
Find Water Wells
Measure
Print
Data
By Legal Land Description
By Owner Name
By Selection
Help
Enter a radius: 1000
feet
metres
Drilling Reports: 0 records found.
GIC Well ID
GOA Well Tag No.
Legal Description
Lot
Block
No results found.
BWWT Reports: 0 records found.
Test ID
Legal Description
No results found.
By GIC Well ID (AWWID) / Test ID (BWWT)
By GOA Well Tag Number
By Survey Legal Plan
Current Scale: 1:18,056
Longitude: -112.759883 Latitude: 49.720621
Cursor Display Preferences
Map Coordinates (WGS84 Web Mercator Auxiliary Sphere)
Geographic Coordinates (longitude, latitude)
Number of decimal places: 6
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Sec 16 T 9 R21 W4M
Sec 15 T 9 R21 W4M
Sec 9 T 9 R21 W4M
Sec 10 T 9 R21 W4M
Sec 4 T 9 R21 W4M
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Fee Schedule
Search
Shopping Cart
DRR
Contact Us
Help
FAQ
Logout
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NORTH
SOUTH
WEST
EAST
M 8710698
THEMES
FIND
LEGEND
Select Search Type:
Survey Plan
Plan Number:
Find
Preset Map
Rural Detail
Urban Detail
Alberta Map
Regional Map
Go back to search page.
NAVIGATE
TOOLS
POLYGON SELECT
Parcel Select
Titles
Plans
ASCII
Buffer Size (m)

LETHBRIDGE COUNTY

#100, 905 - 4th Avenue South, Lethbridge, Alberta T1J 4E4

February 7, 2023

Tetra Tech Canada Inc.
Attn: Jaymes Going
442 – 10 Street N
Lethbridge, AB T1H 2C7

Re: Environmental Record Search: All properties on W1/2 10-9-21-W4M

The following properties were reviewed per your request:

- Plan 0013201; Block 1; Lot 1
- Plan 1113171; Block 1; Lot 4
- Plan 1113171; Block 1; Lot 5
- Plan 1710178; Block 1; Lot 6PUL
- Plan 1911847; Block 1; Lot 7

The following information is the County's response to your inquiry regarding the above-mentioned properties.

A review of the property file was completed and following can be reported:

- There were no environmental reports,
- There were no permits indicating approval for any fuel or chemical storage facilities,
- There was no record of any underground storage tanks,
- There was no record of any historic or potential landfills in the area, and
- There was no record of any spills and/or leaks on the properties or in the area.
    - You may wish to contact the Lethbridge Fire Department to see if they have any records of spills or leaks as this property is within their Fire / Emergency Response Area.
- There are some existing Development Permit approvals for the subject properties. They may be provided upon request.

If you have any other questions regarding this matter please contact Nathan Hill, Development Planner at 403-328-5525.

Regards,

Nathan Hill
Development Planner

Tel: (403) 328-5525 E-Mail: mailbox@lethcounty.ca Fax: (403) 328-5602

# APPENDIX D

## SPECIAL ATTENTION ITEMS – BACKGROUND INFORMATION

### D1 Asbestos

Construction materials used prior to the late 1970s were known to possibly contain asbestos (i.e., ceiling or floor tiles, drywall, and insulation for the walls, boiler, piping, and/or ducts). Asbestos is considered a health hazard if it is friable, airborne, and exposed to humans.

### D2 Polychlorinated Biphenyls (PCBs)

The federal Environmental Contaminants Act (1976) has restricted the use and controlled the phase out of polychlorinated biphenyls (PCBs) in Canada. Additionally, the storage and disposal of PCBs is regulated. The Act prohibited the use of PCBs in electrical equipment installed after July 1, 1980. PCBs are commonly found in light ballasts, electrical transformers (pole or ground mounted) and various other types of electrical equipment (i.e., rectifiers) dating back to the early 1980s or earlier.

PCB containing light ballasts/electrical equipment should be disposed of appropriately at the end of their useful life.

### D3 Ozone-Depleting Substances (ODS)

In December of 1998, The Government of Canada enacted the Ozone-depleting Substances (ODS) Regulations, which governs the use, handling and release of ODS. ODS may include, but are not limited to, chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl bromide. ODS are usually associated with operations such as: fire extinguishing systems; foam manufacturing; fumigant and pesticide application; prescription metered dose inhalers; refrigeration and air conditioning units; and solvent cleaning and degreasing facilities. ODS are not a health issue for people in the building but are more a maintenance issue to limit or prevent their release. This is accomplished by regular maintenance by trained personnel.

### D4 Lead

Lead can be associated with paints, plumbing solder, pipes, and other products such as wall shielding in x-ray rooms. Lead-based paint was withdrawn from the market in the late 1970s. If present, lead-based paint is typically concealed beneath multiple layers of paint applied over the years during renovations. Lead-based paint and plumbing equipment are not a direct health risk when concealed (sealed behind layers of non-lead paint) and/or in good condition. It should, however, be considered when planning future renovations, when particles from lead-based paint could be released and/or ingested in the course of the work.

### D5 Urea Formaldehyde Foam Insulation (UFFI)

Insulation materials used during the 1970s and 1980s were known to possibly contain urea formaldehyde foam insulation (UFFI). UFFI was banned in 1980 under the federal Hazardous Products Act.

### D6 Radon

Radon gas is a product of the decay series that begins with uranium. Radon is produced directly from radium that is often found in bedrock that contains black shale and/or granite. The gas and its by-products occur naturally everywhere, in soil, water, and air, but usually in concentrations too low to pose a threat. Radon gas can migrate through the ground and enter buildings through porous concrete or fractures. Certain building materials including concrete, and gyprock can also release radon. The potential radon hazard in north-central, central, and southern Alberta is relatively high where it can accumulate in enclosed spaces. In outdoor air, radon gas concentrations are usually well below target limits set for Canada and are not a concern. Potential anthropogenic sources of radon gas should be considered.

### D7 Methane

Methane gas is a product of anaerobic decomposition of organic material (e.g., buried fill high in organic material). Methane is also associated with natural gas deposits. Methane gas can migrate through the ground and enter buildings through porous concrete, joints or fractures. Methane presents a potential explosive hazard when it accumulates to concentrations greater than the lower explosive limit (LEL) in the presence of an ignition source.

# LETHBRIDGE COUNTY
# IN THE PROVINCE OF ALBERTA

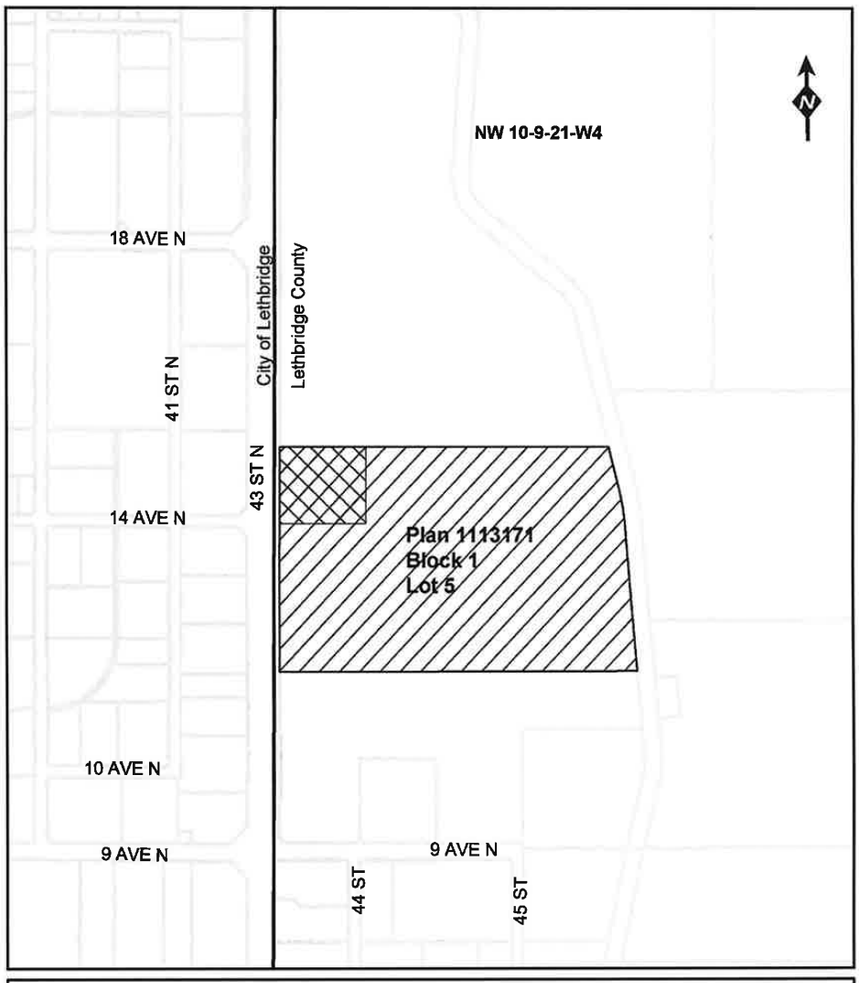
## BYLAW NO. 23-009

Bylaw 23-009 of Lethbridge County being a bylaw for the purpose of amending Land Use Bylaw 1404, in accordance with Sections 230, 606 and 692 of the Municipal Government Act, R.S.A. 2000, Chapter M-26.

WHEREAS the purpose of Bylaw 23-009 is to re-designate a portion of Plan 1113171 Block 1 Lot 5 from Lethbridge Urban Fringe (LUF) to Rural General Industrial (RGI) and Business Light Industrial (BLI) as shown below;

AND WHEREAS the re-designation of the lands will allow for future residential subdivision and development of the parcels;

AND WHEREAS the municipality must prepare an amending bylaw and provide for its notification and consideration at a public hearing;




Land Use Redesignation
Bylaw 23-009: Lethbridge Urban Fringe (LUF) to Rural General Industrial (RGI) and Lethbridge Urban Fringe (LUF) to Business Light Industrial (BLI)
Parcels: Portion of NW 10-9-21-W4 (Plan 1113171 Block 1 Lot 5 ), Approx 59.33 Acres (RGI) and Approx 5.14 Acres (BLI)

Lethbridge Urban Fringe (LUF) to Rural General Industrial (RGI)

Lethbridge Urban Fringe (LUF) to Business Light Industrial (BLI)

AND WHEREAS the re-designation of the lands will allow for future residential subdivision and development of the parcels;

AND WHEREAS the municipality must prepare an amending bylaw and provide for its notification and consideration at a public hearing;

NOW THEREFORE, under the authority of the Municipal Government Act, R.S.A. 2000, C-26, as amended, the Council of Lethbridge County in the Province of Alberta duly assembled does hereby enact the following, with the bylaw only coming into effect upon three successful reading thereof;

GIVEN first reading this 6th day of April 2023.

Reeve

Chief Administrative Officer

GIVEN second reading this _____ day of _____, 20___.

Reeve

Chief Administrative Officer

GIVEN third reading this _____ day of _____, 20_____.

Reeve

Chief Administrative Officer

| | |
|---|---|
| 1st Reading | April 6, 2023 |
| 2nd Reading | |
| Public Hearing | |
| 3rd Reading | |

# LETHBRIDGE COUNTY
# IN THE PROVINCE OF ALBERTA

## BYLAW NO. 23-008

**A BYLAW OF LETHBRIDGE COUNTY BEING A BYLAW PURSUANT TO SECTION 633(1) OF THE MUNICIPAL GOVERNMENT ACT, REVISED STATUTES OF ALBERTA 2000, CHAPTER M.26**

Bylaw 23-008 of Lethbridge County, being a Bylaw for the purpose of amending the Chinook Industrial Park Area Structure Plan Bylaw 18-012.

WHEREAS the developer wishes to update the Chinook Industrial Park Area Structure Plan to better align with the future subdivision and development of the area;

AND WHEREAS the County's Municipal Development Plan requires that developers prepare an amendment to the Area Structure Plan to ensure sound development occurs within the County;

AND WHEREAS the landowner/developer have prepared amendment to the "Chinook Industrial Park Area Structure Plan" which contains engineering, survey, and geotechnical information to support the above conditions.

NOW THEREFORE BE IT RESOLVED, under the Authority and subject to the provisions of the Municipal Government Act, Revised Statutes of Alberta, 2000, Chapter M-26, as amended, the Council of Lethbridge County in the Province of Alberta duly assembled does hereby enact the following:

1. The "Bylaw 18-012 - Chinook Industrial Park Structure Plan" as amended by Bylaw No.23-002, is attached as "Appendix A".

GIVEN first reading this 6th day of April, 2023.

Reeve

CAO

GIVEN second reading this _____ day of _____, 20___.

Reeve

CAO

GIVEN third reading this _____ day of _____, 20_____.

Reeve

CAO

## Hilary Janzen

**From:** circulations <circulations@telus.com>
**Sent:** February 17, 2023 12:49 PM
**To:** Hilary Janzen
**Subject:** RE: Lethbridge County Referral - Bylaws 23-008 and 23-009 - Email 1

Good afternoon,

TELUS Communications Inc. has no objection or comments on the above notification.

Thank you,

**Tanya Roberts**
**Real Estate Specialist |TELUS Rights of Way**
Network Engineering & Operations (NEO) | TELUS | Rights of Way
2930 Centre Avenue NE, Calgary, AB T2A 4Y2
circulations@telus.com




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**From:** Hilary Janzen <hjanzen@lethcounty.ca>
**Sent:** February 14, 2023 04:48 PM
**To:** Alberta Health Services (SouthZone.EnvironmentalHealth@ahs.ca) <southzone.environmentalhealth@ahs.ca>; Alberta Transportation (transdevelopmentlethbridge@gov.ab.ca) <transdevelopmentlethbridge@gov.ab.ca>; SMRID (lpark@smrid.ab.ca) <lpark@smrid.ab.ca>; FortisAlberta Inc. - Referrals (landserv@fortisalberta.com) <landserv@fortisalberta.com>; ATCO Pipelines (SouthDistrictEngineering1@atco.com) <southdistrictengineering1@atco.com>; ATCO Gas - Referrals Lethbridge (southlandadmin@atcogas.com) <southlandadmin@atcogas.com>; circulations <circulations@telus.com>; Tyson Boylan <Tyson.Boylan@lethbridge.ca>; Jason Price (jason.price@lethbridge.ca) <Jason.Price@lethbridge.ca>
**Subject:** Lethbridge County Referral - Bylaws 23-008 and 23-009 - Email 1

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Good Afternoon,

Please review and respond to the attached referral from Lethbridge County comments are due no later than March 14, 2023. I will be sending separate email with the Traffic Impact Assessment If there are issues in receiving the documents, please let me know.

Regards,

**Hilary Janzen,** RPP, MCIP
**Interim Director of Community Services**
P: 403.380.1580 C: 403.331.5036 E: hjanzen@lethcounty.ca
www.lethcounty.ca







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SMRID
ST. MARY RIVER IRRIGATION DISTRICT

March 14, 2023

Lethbridge County - Lethbridge
905 4 Ave S
Lethbridge, AB
T1J 4E4

Dear Sir/Madam:

**RE: Plan 1113171, Block 1, Lot 5**
**(SW-10-09-21-W4)**
**Bylaw 23-008 and Bylaw 23-009**

Further to your February 14th, 2023, Land Use Bylaw Amendment in respect to the above-noted, we offer the following comments:

1. Any future development plans must follow the requirements of the South Saskatchewan Regional Plan (SSRP) regarding water management and storm runoff. This would Include the 1:100 storm event storage capability with zero release.
2. Zone 200 requires a Conveyance Agreement between Lethbridge County and St. Mary River Irrigation District (SMRID) for release of stormwater into the SMRID canal.
3. Water must be sampled, tested and meet St. Mary River Irrigation District water quality standards prior to release.
4. Available conveyance capacity within the canal must be confirmed prior to the operation of a pumped discharge of stormwater into our system.
5. The St. Mary River Irrigation District has no issues with the Traffic Impact Assessment.

If you have any further questions or concerns, please contact our Manager of Operations, George Bohner in the Lethbridge office at 403-328-4401.

Yours truly,

Linda Park
Land Administrator

lp

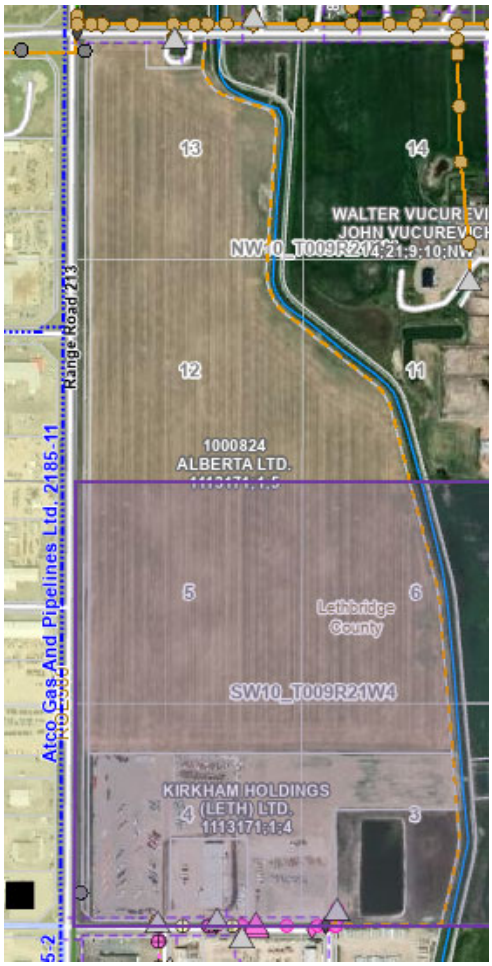
525 40th St. South
Lethbridge, AB T1J 4M1
Tel: 403.328.4401
Fax: 403.328.4460
smrid@smrid.com
smrid.com

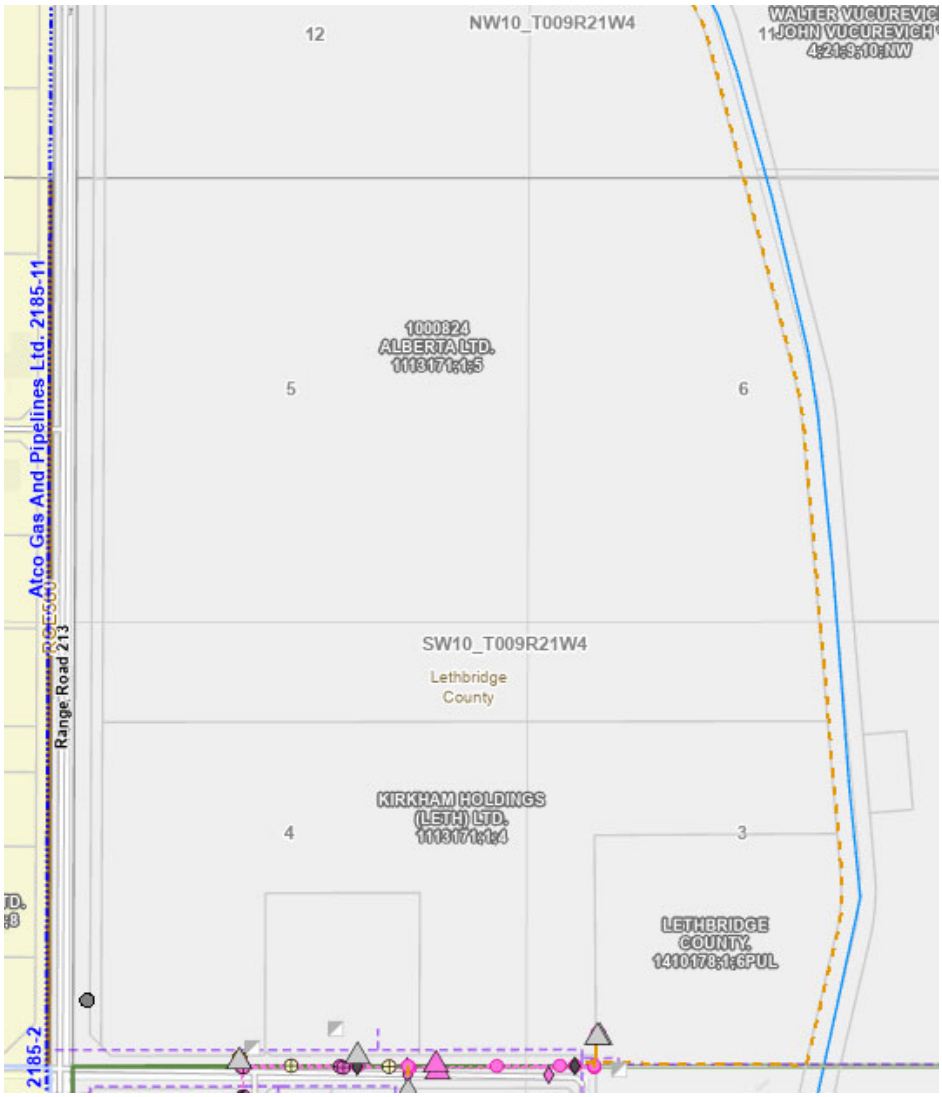
Supporting Sustainable Communities, Environment and Agriculture with Water.

## Hilary Janzen

**From:** Tracy Davidson <tracy.davidson@fortisalberta.com> on behalf of Land Service <landserv@fortisalberta.com>
**Sent:** March 1, 2023 10:42 AM
**To:** Hilary Janzen
**Subject:** FW: [CAUTION] Lethbridge County Referral - Bylaws 23-008 and 23-009 - Email 1
**Attachments:** Bylaw 23-009 - Land Use Redesignation_20230213.pdf; Bylaw 23-008 - Amendments to Chinook Industrial ASP.pdf; External Circulation - Bylaws 23-008 and 23-009.docx; Bylaw 23-008 - Stormwater Management Plan.pdf

Good morning,
FortisAlberta Inc. has no concerns regarding these land use redesignation and area structure plan amendments.






Thank you,

**Tracy Davidson** | Land Coordinator

**FortisAlberta Inc.** | 100 Chippewa Road, Sherwood Park, AB, T8A 4H4 | Direct 780-464-8815

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**From:** Hilary Janzen <hjanzen@lethcounty.ca>
**Sent:** Tuesday, February 14, 2023 4:48 PM
**To:** Alberta Health Services (SouthZone.EnvironmentalHealth@ahs.ca) <southzone.environmentalhealth@ahs.ca>; Alberta Transportation (transdevelopmentlethbridge@gov.ab.ca) <transdevelopmentlethbridge@gov.ab.ca>; SMRID (lpark@smrid.ab.ca) <lpark@smrid.ab.ca>; Land Service <landserv@fortisalberta.com>; ATCO Pipelines (SouthDistrictEngineering1@atco.com) <southdistrictengineering1@atco.com>; ATCO Gas - Referrals Lethbridge (southlandadmin@atcogas.com) <southlandadmin@atcogas.com>; Telus Referrals (All) (circulations@telus.com) <circulations@telus.com>; Tyson Boylan <Tyson.Boylan@lethbridge.ca>; Jason Price (jason.price@lethbridge.ca) <Jason.Price@lethbridge.ca>
**Subject:** [CAUTION] Lethbridge County Referral - Bylaws 23-008 and 23-009 - Email 1

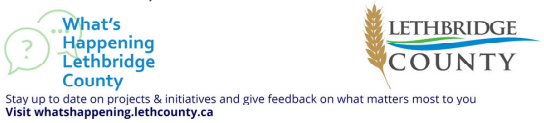
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Good Afternoon,

Please review and respond to the attached referral from Lethbridge County comments are due no later than March 14, 2023. I will be sending separate email with the Traffic Impact Assessment If there are issues in receiving the documents, please let me know.

Regards,

**Hilary Janzen,** RPP, MCIP
**Interim Director of Community Services**
P: 403.380.1580 C: 403.331.5036 E: hjanzen@lethcounty.ca
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CITY OF Lethbridge

GATEWAY TO OPPORTUNITY

March 8, 2023

Lethbridge County
905 4th Ave S
Lethbridge, AB T1J 4E4

RE: Proposed Amendments to Chinook Industrial Area Structure Plan (ASP) and Lethbridge County Land Use Bylaw (Lethbridge County Bylaws 23-008 & 23-009) - City of Lethbridge Comments

The City of Lethbridge appreciates the opportunity to provide comments to Lethbridge County regarding the proposed amendments to the Chinook Industrial ASP and Lethbridge County Land Use Bylaw (Bylaws 23-008 & 23-009). A review has been undertaken based on the Inter-municipal Development Plan (IDP). Please be advised, that the City of Lethbridge offers the following comments on the proposed Amendment:

- This is site is located within Policy Area 4, Sub Area 1 of the Intermunicipal Development Plan (IDP). In general, the IDP is supportive of industrial development in this location. Any future, proposed non-industrial land use district may require further amendments to the IDP and the Chinook Industrial ASP (with appropriate technical background studies) and would require circulation to the City of Lethbridge for comment.

- The City of Lethbridge is in favour of the proposed changes to **Section 6.1 - Sanitary Sewer System** of the ASP, as the City's current sanitary infrastructure is not capable of accommodating additional sanitary sewer flows from this development.

- The industrial roads that end in cul-de-sacs that are shown on **Map 3.0** could result in trucks getting stuck unless the bulb is designed to accommodate large truck turn around. It is suggested that these cul-de-sac bulbs be designed to be large enough to accommodate this.

- The roadway cross section on **Map 5.0** does not match the City of Lethbridge's Design Standards, yet **Section 7 – Roads** states that, *"roads within the subdivision will comply with City of Lethbridge and Lethbridge County engineering standards."* Please resolve this inconsistency by either removing refence to the City of Lethbridge's Design Standards or updating the cross section shown in the ASP, as per the City of Lethbridge's Design Standards.

- **Section 7 – Roads** states that there will be no sidewalks constructed in the development. The City of Lethbridge suggests incorporating sidewalks into the

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Planning and Design
4TH Floor, City Hall
910 – 4th Avenue South
Lethbridge, AB, T1J 0P6

**P.** 403.320.3920
**F.** 403.327.6571
planning@lethbridge.ca

development to improve accessibility. Sidewalks installed on both sides of an Industrial Collector roadway are also required under the City of Lethbridge's Design Standards that are described above.

- In **Section 7 – Roads**, the sentence, *"roads in the Phases 2 and 3 area will be constructed as identified with no provision for on street parking as industrial land uses in these phases will be required to accommodate all customer parking on site"*, should also include employees in addition to customers when discussing on site parking.

- The development driven improvements that are described in **Section 7 – Roads** on page 24 will need to be built when the intersections are built, and not at the full-build out horizon, unless traffic analysis is completed to specify the improvement trigger conditions. Please revise the wording to reflect this.

  Please also add text in this section that the developer will be responsible for funding the roadway improvements that are required to support the development. This includes required improvements to 43rd St. N.

- **Section 11 – Phasing and Implementation** states that*, "in accordance with the City of Lethbridge / Lethbridge County IDP Section 3.4.4.13, landscaping will follow standards with respect to shielding and buffering."* However this section does not describe at what development stage and how this will be accomplished, as it just repeats what the IDP states in regards to 43rd St N. While this does not have to include specifics, this section should include text on what will be used to accomplish shielding and buffering along 43rd St. N (landscaping, setbacks, fencing etc.) and how the developer intends carry this out.

In regards to the TIA that was submitted with the amended ASP please find the following technical comments:

- The intersection of 9 Ave N should be included in this analysis. The ASP (**Map 3.0**) shows the lands abutting 9 Ave N as having cul-de-sacs installed and appearing to be divided into new developments. It also lists 9 Ave N as one of the accesses to the ASP area.

- The areas shown as the "Flex Industrial" land uses in the ASP should use the worst case scenario (highest trip generation) for the TIA's traffic analysis. **Figure 3.1** in **Section 3.1** of the TIA, shows these areas as a mix of Business Light Industrial (BLI) and Rural General Industrial (RGI), while it is actually unknown as to where these

land uses will be located at this time. Because this is currently unknown, the highest trip generation should be used.

- The BLI zoning allows for land uses that are aligned with ITE's Business Park Land Use Code. The ITE Business Park Land Use Code should be used in the analysis, instead of the Light Industrial Land Use Code.

- The 210m queue that is identified under Section 4.3 of the TIA for the for the northbound movement at 43 Street N and 14 Ave N may have trouble being cleared within one cycle considering the number of heavy trucks with poor acceleration characteristics on this road. If it cannot be cleared, the left turn lanes should be installed when the intersections are signalized.

- The background analysis from the previous TIA (EASL Transportation Consultants Inc, 2018) identifies that signalization is required as a result of this proposed development. The developer is expected to fund the installation of traffic signals at the 14 Ave N and 18 Ave N intersections and this should be noted in both the TIA and the ASP.

The City of Lethbridge has no concerns with the proposed Land Use Bylaw Amendment (Bylaw 23-009), as long as it follows the amended ASP, subject to the comments listed above.

Please contact myself at 403-320-3928 or tyson.boylan@lethbridge.ca if you have further questions or wish to discuss the proposed ASP and LUB amendments.

Regards,



Tyson Boylan, RPP, MCIP
Senior Community Planner
City of Lethbridge

cc: Maureen Gaehring, Jason Price & Joel Sanchez

## Hilary Janzen

**From:** Michael Kelly <MSKDevelopments@outlook.com>
**Sent:** March 13, 2023 8:24 AM
**To:** Schmidtke, Brad
**Subject:** FW: [External] Re: 43rd Street

FYI

MSK DEVELOPMENTS

**Michael Kelly**
OWNER
MSK DEVELOPMENTS

**Mobile:** 825-594-3634
**Email**: MSKDevelopments@outlook.com

---

**From:** Devon Thiele <dthiele@lethcounty.ca>
**Sent:** September 16, 2022 8:55 AM
**To:** Michael Kelly <MSKDevelopments@outlook.com>
**Cc:** Hilary Janzen <hjanzen@lethcounty.ca>
**Subject:** FW: [External] Re: 43rd Street

Good Morning Michael,

Please see the below response from the City regarding traffic signals.

Thanks,

**Devon Thiele**, C.E.T.
**Infrastructure Manager**
P: 403.317.6055 E: dthiele@lethcounty.ca
www.lethcounty.ca

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LETHBRIDGE COUNTY

---

**From:** Darwin Juell <Darwin.Juell@lethbridge.ca>
**Sent:** September 12, 2022 10:03 AM
**To:** Devon Thiele <dthiele@lethcounty.ca>; Richard Brummund <Richard.Brummund@lethbridge.ca>
**Cc:** Joel Sanchez <Joel.Sanchez@lethbridge.ca>; Ann Mitchell <amitchell@lethcounty.ca>
**Subject:** RE: [External] Re: 43rd Street

Devon, I looked at the TIA and have the following comments relative to the TIA and need for signalization of numerous intersections along 43 Street North. In general we try to use the TIA as the basis for when signalization occurs but also temper this with actual traffic counts and warrants at the time.

1. 26 Ave and 43 St N, this intersection was recently improved approximately 4 years ago by the City and currently operates satisfactorily. The TIA even says that signalization is not warranted at 2022 and not even at 2037,

however due to the westbound traffic congestion recommends signalization at about 2037, or 15 years in the future. We will periodically set up traffic counts at this location to evaluate the actual warrants.

2. The intersection of 18 Ave and 43 St N recommends signalization upon development in the County, 2022 or when development occurs in the County. As per our practice, The City would cost share this signalization and intersection improvement at 50-50 when development occurs.
3. The intersection of 14 Ave and 43 St N recommends signalization and a left bound left turn bay upon development in the County, 2022 or when development occurs in the County. As per our practice, The City would cost share this signalization and intersection improvement at 50-50 when development occurs.
4. The remaining intersections to the south are entirely unaffected by access to the east and therefore are the City's responsibility to upgrade as required along with Alberta Transportation.

Regarding 26 Ave/43 St N intersection, as per the TIA the recommendation signalization is not warranted until at least about 2037 or development occurs to the east. Therefore, the City would not entertain signalization at this time. Generally, this signalization is funded at 50-50 if a new leg is constructed. In this case, the intersection is in the County, so it is logical that a similar 50-50 split would also occur, regardless if the developer is paying this cost or the County itself. Further, the County\developer would be responsible for all roadway tie-ins east of the existing 43 Street curb line, including designs\inspection services and construction once City has approved the design. Any addition lanes on 43rd required (NB left turns for example) would be cost shared at 50\50.

If you have any questions regarding any of these improvements, I am available at 403-320-4181 or via e-mail.

Darwin Juell, GM Transportation

## Hilary Janzen

**From:** Leah Olsen <leah.olsen@gov.ab.ca>
**Sent:** March 20, 2023 10:12 AM
**To:** Hilary Janzen
**Cc:** Leah Olsen
**Subject:** FW: Bylaw 23-008 - Alberta Transportation Comments

Good Morning Hilary,

No further action at this time for the TIA is required.
Thank you,

**Leah Olsen**
Development/Planning Technologist
Construction and Maintenance Division, Southern Region
Transportation and Economic Corridors I Government of Alberta

Tel 403-388-3105
Cell 403-308-2601
leah.olsen@gov.ab.ca




Transportation and Economic Corridors Online Permitting and Referral System Roadside Planning Application Tracking Hub (RPATH) is NOW LIVE! **https://roadsideplanning.alberta.ca/rpath**

Classification: Protected A

**From:** Leah Olsen <leah.olsen@gov.ab.ca>
**Sent:** Monday, March 20, 2023 9:49 AM
**To:** ! ANGELA.FORSYTH <Angela.Forsyth@stantec.com>
**Cc:** Leah Olsen <leah.olsen@gov.ab.ca>
**Subject:** RE: Bylaw 23-008 - Alberta Transportation Comments

Good Morning Angela,

Thank you for your email.
No further information is required at this time for the TIA.
I don't think our Infrastructure Engineer realized it was just for a lot update.
Thanks,

**Leah Olsen**
Development/Planning Technologist
Construction and Maintenance Division, Southern Region
Transportation and Economic Corridors I Government of Alberta

Tel 403-388-3105
Cell 403-308-2601

leah.olsen@gov.ab.ca

Alberta Transportation and Economic Corridors

Transportation and Economic Corridors Online Permitting and Referral System Roadside Planning Application Tracking Hub (RPATH) is NOW LIVE! **https://roadsideplanning.alberta.ca/rpath**

Classification: Protected A

**From:** Forsyth, Angela <Angela.Forsyth@stantec.com>
**Sent:** Wednesday, March 15, 2023 10:19 AM
**To:** Leah Olsen <leah.olsen@gov.ab.ca>
**Subject:** RE: Bylaw 23-008 - Alberta Transportation Comments

**CAUTION:** This email has been sent from an external source. Treat hyperlinks and attachments in this email with care.

Hi Leah,

Stantec was forwarded this email by Lethbridge County. I had a couple questions and/or clarifications regarding the TIA for the Chinook Industrial ASP Update. Apologies if this is supposed to go through the RPATH system, I attempted it and it told me to contact you directly if there is an open file.

This TIA is meant to be an update/amendment to the previous TIA, as the internal roadway connections within the development were adjusted, and the way traffic accesses the arterial network was altered; more traffic will be using the 14 Ave intersection. With the slight adjustment in land uses, the overall traffic entering/exiting the site is actually slightly decreased from the original TIA. The recommendations from the previous TIA were all preserved in the conclusion section of the update in regards to the Hwy3 & 43 St intersection.

Here are my questions for you:

- Is the Department requiring a brand new TIA be completed, as if the ASP is new? The original TIA is less than 5 years old and the area is partially developed already; this is a continuation of development. We are just updating to more specific land uses and severing two internal local road connections within the development.
    - If a new TIA is required, are AT counts from 2015 acceptable to form the basis of background volumes, grown annually at the appropriate rate? AT counts in 2020 are likely unusable due to the COVID impact on traffic flows.

If a call is easier, please don't hesitate to reach out or schedule a time that works.

Thanks,

**Angela Forsyth** P.Eng.
Transportation Engineer

Direct: 403-332-4876
Mobile: 403-360-5061
Fax: 403-328-0664
angela.forsyth@stantec.com

Stantec
Unit 230, 704 4 Avenue South
Lethbridge AB T1J 0N8



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**From:** Government of Alberta <services@gov.ab.ca>
**Sent:** Friday, March 10, 2023 11:20 AM
**To:** Hilary Janzen <hjanzen@lethcounty.ca>
**Cc:** steveharty@orrsc.com; transdevelopmentlethbridge@gov.ab.ca
**Subject:** DO NOT REPLY – Application RPATH0008347 for Municipal Referral - Planning Document Bylaw 23-008

Hello,

Please visit RPATH Portal.

Link to RPATH0008347 on RPATH Portal.

Ref:MSG12759273_Qvdx6P3zIu0Ujb0LFKw

**Caution:** This email originated from outside of Stantec. Please take extra precaution.

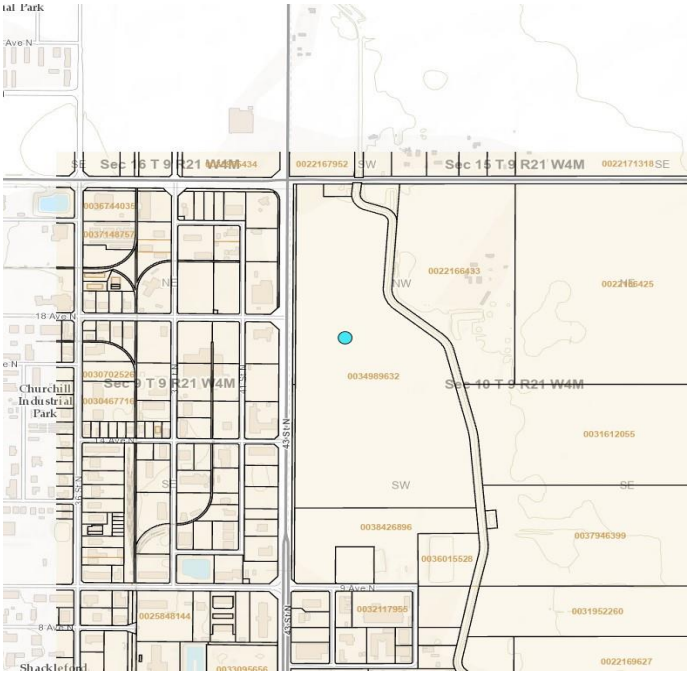
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# Alberta Transportation and Economic Corridors Notice of Referral Decision

Statutory plan in proximity of a provincial highway

| | | | |
|---|---|---|---|
| **Municipality File Number:** | Bylaw 23-*008* | **Highway(s):** | |
| **Legal Land Location:** | QS-NW SEC-10 TWP-009 RGE-21 MER-4 | **Municipality:** | Lethbridge County |
| **Decision By:** | Leah Olsen | **Issuing Office:** | Southern Region / Lethbridge |
| **Issued Date:** | 2023-03-10 11:04:13 | **AT Reference #:** | RPATH0008347 |
| **Description of Development:** | Lethbridge County Bylaw 23-*008 proposing updates to the Chinook Industrial Area Structure Plan (Bylaw 18-012) including the land uses, road network, and provision of services in the W 10-9-21-W4M in the vicinity of Highways 3 and 4. The Stormwater Management Plan and Traffic Impact Assessment have also been updated.* | | |



This will acknowledge receipt of your circulation regarding the above noted proposal. Alberta Transportation and Economic Corridors primary concern is protecting the safe and effective operation of provincial highway infrastructure, and planning for the future needs of the highway network in proximity to the proposed development(s).

Alberta Transportation and Economic Corridors offers the following comments and observations with respect to the proposed development(s):

The report does not cover intersection of 43rd Street/Highway 3 in the analysis; instead it has been appended in the 2017/18 TIA report that covers the said intersection. Also, the analysis considers only 2037 as future traffic scenario, which was suitable for the 2017 TIA but now it should be updated to consider the new 10 years and 20 years horizons (2033, 2043). The existing conditions also need to be updated to 2023. It is recommended that they add an executive summary to briefly describe the updates from the previous ASP/TIA and its impacts on the recommendations.

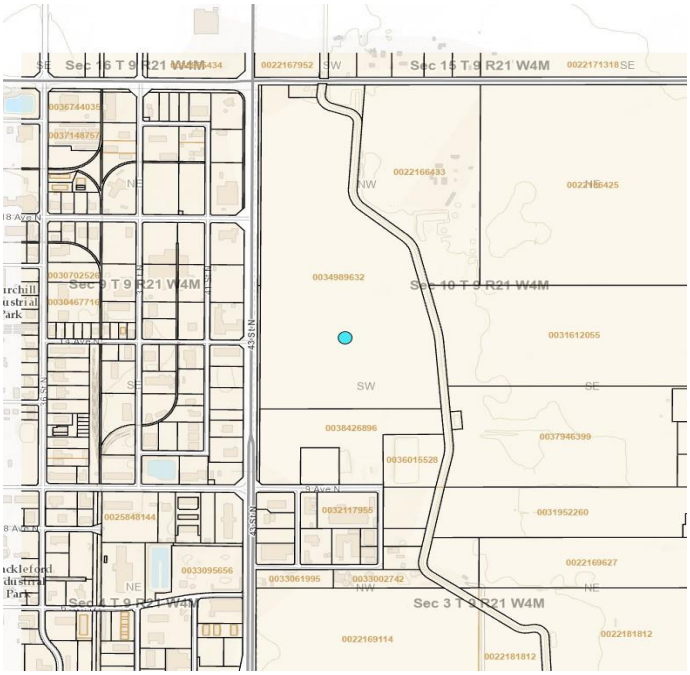
Please contact Alberta Transportation and Economic Corridors through the RPATH Portal if you have any questions, or require additional information

Issued by **Leah Olsen,** on **2023-03-10 11:04:13** on behalf of the Minister of Transportation and Economic Corridors pursuant to *Ministerial Order 52/20 – Department of Transportation Delegation of Authority*

# Alberta Transportation and Economic Corridors Notice of Referral Decision

Land Use Bylaw amendment in proximity of a provincial highway

| | | | |
|---|---|---|---|
| **Municipality File Number:** | Bylaw 23-*009* | **Highway(s):** | 3, 4 |
| **Legal Land Location:** | QS-SW SEC-10 TWP-009 RGE-21 MER-4 | **Municipality:** | Lethbridge County |
| **Decision By:** | Leah Olsen | **Issuing Office:** | Southern Region / Lethbridge |
| **Issued Date:** | 2023-03-10 11:32:24 | **AT Reference #:** | RPATH0008348 |
| **Description of Development:** | Lethbridge County Redesignation Circulation Bylaw 23-*009 to allow for the future subdivision in the SW 10-9-21-W4M in the vicinity of Highways 3 and 4* | | |




This will acknowledge receipt of your circulation regarding the above noted proposal. Alberta Transportation and Economic Corridors primary concern is protecting the safe and effective operation of provincial highway infrastructure, and planning for the future needs of the highway network in proximity to the proposed land use amendment(s).

Alberta Transportation and Economic Corridors offers the following comments and observations with respect to the proposed land use amendment (s):

1. Pursuant to Section 618.3(1) of the Municipal Government Act (MGA), the department expects that the municipality will comply with any applicable items related to provincial highways in an ALSA plan if applicable

2. Pursuant to 618.4(1) of the Municipal Government Act, the department expects that the Municipality will mitigate the impacts of traffic generated by developments approved on the local road connections to the highway system, in accordance with Policy 7 of the Provincial Land Use Policies.

This will acknowledge receipt of your circulation regarding the above noted proposal. The subsequent subdivision application would be subject to the requirements of Sections 18 and 19 of the Matters Related to Subdivision and Development Regulation (The Regulation), due to the proximity of Highway(s) 3, 4

**Alberta Transportation offers the following comments with respect to this application:**

The requirements of Section 18 of the Regulation are not met. The department anticipates minimal impact on the highway from this proposal. Pursuant to Section 20(1) of the Regulation, Alberta Transportation grants approval for the subdivision authority to vary the requirements of Section 18 of the Regulation subject to the following requirements:

The requirements of Section 19 of the Regulation are not met. There is no direct access to the highway and there is sufficient local road access to the subdivision and adjacent lands. Pursuant to Section 20(1) of the Regulation, Alberta Transportation grants approval for the subdivision authority to vary the requirements of Section 19 of the Regulation.

If there are any changes to the proposed subdivision that was submitted with this land use referral, a separate referral pursuant to Section 7(6)(d) of the Matters Related to Subdivision and Development Regulation is required and the comments in respect of Sections 18 and 19 of the Regulation contained in this decision are no longer valid.

Please contact Alberta Transportation and Economic Corridors through the RPATH Portal if you have any questions, or require additional information

Issued by **Leah Olsen, ,** on **2023-03-10 11:32:24** on behalf of the Minister of Transportation and Economic Corridors pursuant to *Ministerial Order 52/20 – Department of Transportation Delegation of Authority*

**External Circulation**

**Lethbridge County Land Use Bylaw Amendment**

**Bylaw 23-008 and Bylaw 23-009**

Date: February 14, 2023

To: Alberta Transportation
Alberta Health Services
SMRID
Fortis
ATCO Gas
ATCO Pipelines
Telus
City of Lethbridge

Description:

Bylaw 23-008 proposes to amendments to update the Chinook Industrial Area Structure Plan (Bylaw 18-012) including the land uses, road network, and provision of services, it is noted that the general intent of the original plan is not being changed. The applicant has also updated the stormwater management plan and the TIA.

Bylaw 23-009 is to redesignation a portion of Plan 1113171 Block 1 Lot 5 from Lethbridge Urban Fringe to Rural General Industrial. The applicant is requesting the redesignation to allow for the future subdivision of the parcels as per the submitted plan.

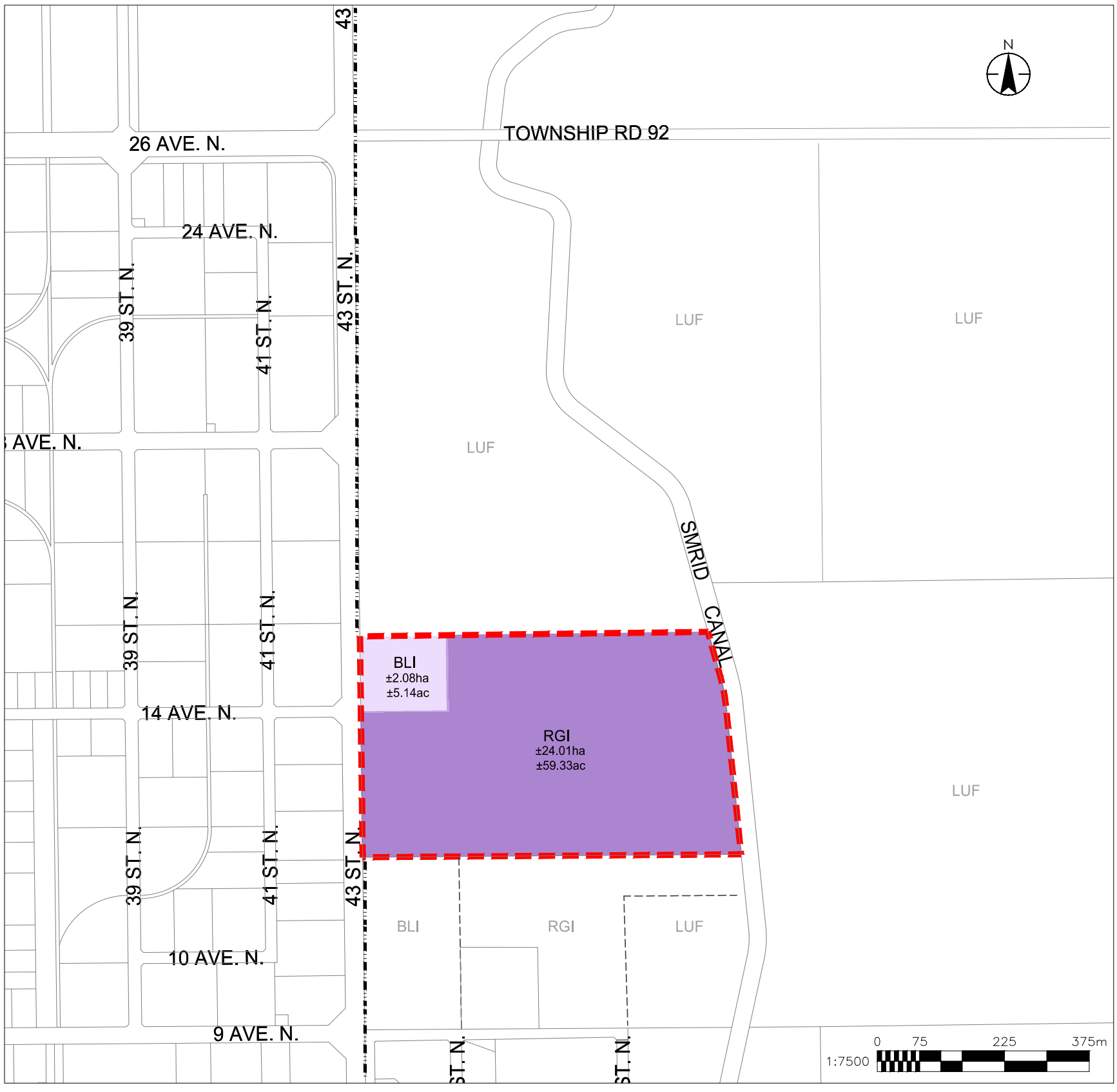
If you have any comments or concerns regarding this application, please contact me by March 14, 2023.

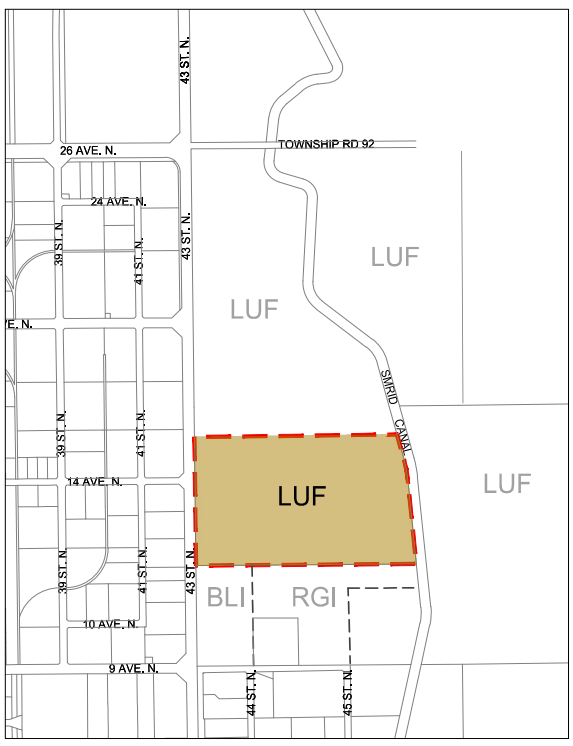
Regards,

_____

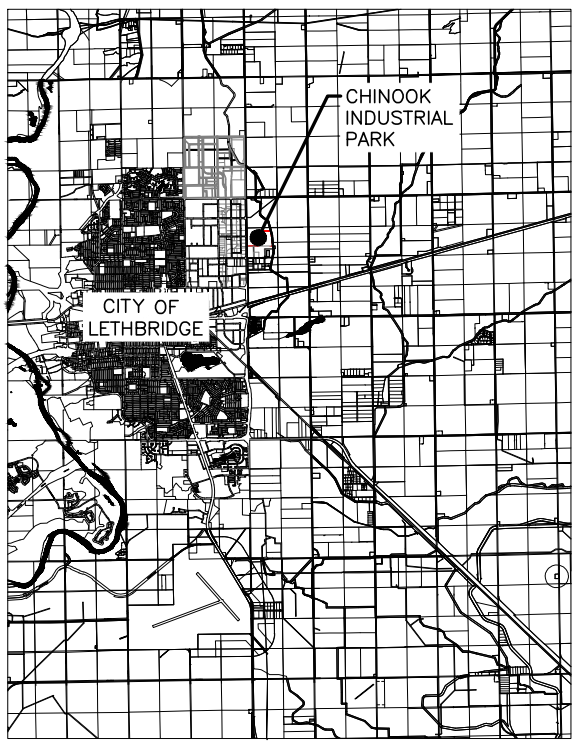
Hilary Janzen, RPP, MCIP
Interim Director of Community Services

Enclosures




EXISTING LAND USE




LOCATION PLAN

## LEGEND

- LAND USE REDESIGNATION BOUNDARY
- COUNTY/CITY BOUNDARY

### LAND USE REDESIGNATION STATISTICS

LUF TO BLI: ±2.08ha (±5.14ac)
LUF TO RGI: ±24.01ha (±59.33ac)

### LEGAL DESCRIPTION

SW-10-9-21-W4M

FIGURE 1.0 | CHINOOK INDUSTRIAL PARK

# LAND USE REDESIGNATION

PREPARED FOR: SUMUS DEVELOPMENT GP LTD.

V:\1165\Active\116549063\drawings\figures\Land Use Redesignation\49063_CIP_Fig 1.04 and Use Redesignation.dwg
2023/02/13 2:57 PM By: Bentz, Connor

Stantec

116549063
February 13, 2023

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## TRANS Development Lethbridge

**From:** Hilary Janzen <hjanzen@lethcounty.ca>
**Sent:** February 14, 2023 4:49 PM
**To:** Alberta Health Services (SouthZone.EnvironmentalHealth@ahs.ca); TRANS Development Lethbridge; SMRID (lpark@smrid.ab.ca); FortisAlberta Inc. - Referrals (landserv@fortisalberta.com); ATCO Pipelines (SouthDistrictEngineering1@atco.com); ATCO Gas - Referrals Lethbridge (southlandadmin@atcogas.com); Telus Referrals (All) (circulations@telus.com); Tyson Boylan; Jason Price (jason.price@lethbridge.ca)
**Subject:** RE: Lethbridge County Referral - Bylaws 23-008 and 23-009 - Email 2
**Attachments:** Bylaw 23-008 - Traffic Impact Assessment.pdf

**Follow Up Flag:** Follow up
**Flag Status:** Completed

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Please see the attached Traffic Impact Assessment.

Regards,

**Hilary Janzen,** RPP, MCIP
**Interim Director of Community Services**
P: 403.380.1580 C: 403.331.5036 E: hjanzen@lethcounty.ca
www.lethcounty.ca




---

**From:** Hilary Janzen
**Sent:** Tuesday, February 14, 2023 4:48 PM
**To:** Alberta Health Services (SouthZone.EnvironmentalHealth@ahs.ca) <southzone.environmentalhealth@ahs.ca>; Alberta Transportation (transdevelopmentlethbridge@gov.ab.ca) <transdevelopmentlethbridge@gov.ab.ca>; SMRID (lpark@smrid.ab.ca) <lpark@smrid.ab.ca>; FortisAlberta Inc. - Referrals (landserv@fortisalberta.com) <landserv@fortisalberta.com>; ATCO Pipelines (SouthDistrictEngineering1@atco.com) <southdistrictengineering1@atco.com>; ATCO Gas - Referrals Lethbridge (southlandadmin@atcogas.com) <southlandadmin@atcogas.com>; Telus Referrals (All) (circulations@telus.com) <circulations@telus.com>; Tyson Boylan <Tyson.Boylan@lethbridge.ca>; Jason Price (jason.price@lethbridge.ca) <Jason.Price@lethbridge.ca>
**Subject:** Lethbridge County Referral - Bylaws 23-008 and 23-009 - Email 1

Good Afternoon,

Please review and respond to the attached referral from Lethbridge County comments are due no later than March 14, 2023. I will be sending separate email with the Traffic Impact Assessment If there are issues in receiving the documents, please let me know.

Regards,

**Hilary Janzen,** RPP, MCIP
**Interim Director of Community Services**
P: 403.380.1580 C: 403.331.5036 E: hjanzen@lethcounty.ca
www.lethcounty.ca

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## Hilary Janzen

**From:** Lahnert, Jessica <Jessica.Lahnert@atco.com>
**Sent:** February 22, 2023 8:25 AM
**To:** Hilary Janzen
**Subject:** RE: Lethbridge County Referral - Bylaws 23-008 and 23-009 - Email 1

Hi Hilary,

ATCO Gas has no objection to the proposed.

Thanks,

**Jessica Lahnert**
Administrative Coordinator, Land
Natural Gas

P. 403 245 7443

---

**From:** Hilary Janzen <hjanzen@lethcounty.ca>
**Sent:** Tuesday, February 14, 2023 4:48 PM
**To:** Alberta Health Services (SouthZone.EnvironmentalHealth@ahs.ca) <southzone.environmentalhealth@ahs.ca>; Alberta Transportation (transdevelopmentlethbridge@gov.ab.ca) <transdevelopmentlethbridge@gov.ab.ca>; SMRID (lpark@smrid.ab.ca) <lpark@smrid.ab.ca>; FortisAlberta Inc. - Referrals (landserv@fortisalberta.com) <landserv@fortisalberta.com>; South District Engineering <SouthDistrictEngineering1@atco.com>; South Land Administration <SouthLandAdministration@atco.cul.ca>; Telus Referrals (All) (circulations@telus.com) <circulations@telus.com>; Tyson Boylan <Tyson.Boylan@lethbridge.ca>; Jason Price (jason.price@lethbridge.ca) <Jason.Price@lethbridge.ca>
**Subject:** Lethbridge County Referral - Bylaws 23-008 and 23-009 - Email 1

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Good Afternoon,

Please review and respond to the attached referral from Lethbridge County comments are due no later than March 14, 2023. I will be sending separate email with the Traffic Impact Assessment If there are issues in receiving the documents, please let me know.

Regards,

**Hilary Janzen,** RPP, MCIP
**Interim Director of Community Services**
P: 403.380.1580 C: 403.331.5036 E: hjanzen@lethcounty.ca
www.lethcounty.ca







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# Applicant Response: Circulation 23-008

| | | | |
|---|---|---|---|
| To: | Hilary Janzen, Interim Director - Community Services<br>Lethbridge County<br>Planning & Development<br>#100, 905 4 Avenue South<br>Lethbridge, AB | From: | Christina Lombardo, Planner<br>Brad Schmidtke, Project Manager<br>Stantec Consulting Ltd.<br>Unit 230, 704 4 Ave S<br>Lethbridge, AB T1J 0N8 |
| File: | 116549063 | Date: | April 20, 2023 |

**Reference: Circulation 23-008 : Chinook Industrial ASP & Land Use Redesignation – 1st Circulation**

Thank you for providing us with the Circulation comments, regarding our application for the Chinook Industrial Area Structure Plan and Land Use Redesignation. The following are written responses **in blue** to clarify and/or resolve issues related to the proposal.

| Department: **Planning & Development Services** | | |
|---|---|---|
| Issue: | City Recommendation/Comment: | Applicant Response |
| As information. | No comments received. | Noted. |

| Department: **Alberta Transportation** | | |
|---|---|---|
| Issue: | Recommendation/Comment: | Applicant Response |
| Intersection of 43rd Street & Highway 3 | It has been appended in the 2017/18 TIA report that covers the said intersection. Also, the analysis considers only 2037 as future traffic scenario, which was suitable for the 2017 TIA but now it should be updated to consider the new 10 years and 20 years horizons (2033, 2043). The existing conditions also need to be updated to 2023. It is recommended that they add an executive summary to briefly describe the updates from the previous ASP/TIA and its impacts on the recommendations. | A new letter will be sent to County after our discussion with AT. No additional information will be required. |

**Reference:** **Circulation 23-008 : Chinook Industrial ASP & Land Use Redesignation – 1st Circulation**

| Department: **City of Lethbridge** | | |
|---|---|---|
| Issue: | City Recommendation/Comment: | Applicant Response |
| As information. | This is site is located within Policy Area 4, Sub Area 1 of the Intermunicipal Development Plan (IDP). In general, the IDP is supportive of industrial development in this location. Any future, proposed non-industrial land use district may require further amendments to the IDP and the Chinook Industrial ASP (with appropriate technical background studies) and would require circulation to the City of Lethbridge for comment. | Noted. |
| As information. | The City of Lethbridge is in favour of the proposed changes to Section 6.1 - Sanitary Sewer System of the ASP, as the City's current sanitary infrastructure is not capable of accommodating additional sanitary sewer flows from this development. | Noted. |
| As information. | The industrial roads that end in cul-de-sacs that are shown on Map 3.0 could result in trucks getting stuck unless the bulb is designed to accommodate large truck turn around. It is suggested that these cul-de-sac bulbs be designed to be large enough to accommodate this. | Noted. |
| Road Design Standards | The roadway cross section on Map 5.0 does not match the City of Lethbridge's Design Standards, yet Section 7 – Roads states that, "roads within the subdivision will comply with City of Lethbridge and Lethbridge County engineering standards." Please resolve this inconsistency by either removing refence to the City of Lethbridge's Design Standards or updating the cross section shown in the ASP, as per the City of Lethbridge's Design Standards. | Remove reference to City of Lethbridge |

**Reference:** **Circulation 23-008 : Chinook Industrial ASP & Land Use Redesignation – 1st Circulation**

| Department: **City of Lethbridge** | | |
|---|---|---|
| Issue: | City Recommendation/Comment: | Applicant Response |
| Sidewalks | Section 7 – Roads states that there will be no sidewalks constructed in the development. The City of Lethbridge suggests incorporating sidewalks into the development to improve accessibility. Sidewalks installed on both sides of an Industrial Collector roadway are also required under the City of Lethbridge's Design Standards that are described above. | Noted. No changes made |
| Street Parking | In Section 7 – Roads, the sentence, "roads in the Phases 2 and 3 area will be constructed as identified with no provision for on street parking as industrial land uses in these phases will be required to accommodate all customer parking on site", should also include employees in addition to customers when discussing on site parking. | Noted. To be reviewed under a Development Permit |
| Roadway Improvements | The development driven improvements that are described in Section 7 – Roads on page 24 will need to be built when the intersections are built, and not at the full-build out horizon, unless traffic analysis is completed to specify the improvement trigger conditions. Please revise the wording to reflect this.<br>Please also add text in this section that the developer will be responsible for funding the roadway improvements that are required to support the development. This includes required improvements to 43rd St. N. | Road and intersection improvements along 43rd will be evaluated at detailed design and subdivision to ensure that improvements are constructed when appropriate to service growth.<br>Lethbridge County and City of Lethbridge have been communicating about a 50-50 cost share for signalization. Suggest the following language be added "Intersection signalization costs will be shared between City of Lethbridge and Lethbridge County. Allocation of final costs will be determined at the Subdivision/Development Agreement Stage" |

**Reference:** **Circulation 23-008 : Chinook Industrial ASP & Land Use Redesignation – 1st Circulation**

| Department: **City of Lethbridge** | | |
|---|---|---|
| Issue: | City Recommendation/Comment: | Applicant Response |
| Landscaping Timing | Section 11 – Phasing and Implementation states that, "in accordance with the City of Lethbridge / Lethbridge County IDP Section 3.4.4.13, landscaping will follow standards with respect to shielding and buffering." However this section does not describe at what development stage and how this will be accomplished, as it just repeats what the IDP states in regards to 43rd St N. While this does not have to include specifics, this section should include text on what will be used to accomplish shielding and buffering along 43rd St. N (landscaping, setbacks, fencing etc.) and how the developer intends carry this out. | Will be further defined at Development Permit stage. |
| TIA – 9 Ave N | The intersection of 9 Ave N should be included in this analysis. The ASP (Map 3.0) shows the lands abutting 9 Ave N as having cul-de-sacs installed and appearing to be divided into new developments. It also lists 9 Ave N as one of the accesses to the ASP area. | The intersection of 43 St N & 9 Ave N is not affected by the development. There are no internal roads connecting the 9 Ave N parcels to the north, so the only traffic accessing 43 St N via 9 Ave N is already doing so. Development to the north will not access 43 St N via 9 Ave N. |
| TIA trip generations | The areas shown as the "Flex Industrial" land uses in the ASP should use the worst case scenario (highest trip generation) for the TIA's traffic analysis. Figure 3.1 in Section 3.1 of the TIA, shows these areas as a mix of Business Light Industrial (BLI) and Rural General Industrial (RGI), while it is actually unknown as to where these land uses will be located at this time. Because this is currently unknown, the highest trip generation should be used. | Flex area will be approximately 25% BLI, which is reflected in the land use areas and trip generation. Rational to be provided and put a statement in the ASP. Subdivision design |
| TIA trip generations | The BLI zoning allows for land uses that are aligned with ITE's Business Park Land Use Code. The ITE Business Park Land Use Code should be used in the analysis, instead of the Light Industrial Land Use Code. | There is no Business Park land use, is the intent 130 – Industrial Park? Review during detailed design and approvals. |

**Reference:** **Circulation 23-008 : Chinook Industrial ASP & Land Use Redesignation – 1st Circulation**

| Department: **City of Lethbridge** | | |
|---|---|---|
| Issue: | City Recommendation/Comment: | Applicant Response |
| TIA - volumes | The 210m queue that is identified under Section 4.3 of the TIA for the for the northbound movement at 43 Street N and 14 Ave N may have trouble being cleared within one cycle considering the number of heavy trucks with poor acceleration characteristics on this road. If it cannot be cleared, the left turn lanes should be installed when the intersections are signalized. | Synchro is set at 10% heavy vehicles, which factors in their characteristics. Note these traffic volumes will not be achieved until full build-out of Chinook Industrial and 2037 background traffic volumes. |
| TIA – traffic signalization | The background analysis from the previous TIA (EASL Transportation Consultants Inc, 2018) identifies that signalization is required as a result of this proposed development. The developer is expected to fund the installation of traffic signals at the 14 Ave N and 18 Ave N intersections and this should be noted in both the TIA and the ASP. | Lethbridge County and City of Lethbridge have been communicating about a 50-50 cost share for signalization. Suggest the following language be added “Intersection signalization costs will be shared between City of Lethbridge and Lethbridge County. Allocation of final costs will be determined at the Subdivision/Development Agreement Stage” |

| Department: **Oldman River Regional Services Commission** | | |
|---|---|---|
| Issue: | City Recommendation/Comment: | Applicant Response |
| PUL identification | In the plan and on their diagrams, they did not identify or address the area of the City of Lethbridge owned PUL title(s) that run all along the east side of 43 Street at 10m wide (see attached). There should be some mention/reference of this, and the layout and design should account for this as they do not own it. The acres of land they have noted for the areas and parcels will be slightly less, as they do not account for the actual acres (approx. 3.8 Ac) of land comprising the City’s PUL which is two titles (2PUL and 3PUL, Block 1, Plan 0912605). | Figure 3.0 has been revised to reflect PUL area and all area calculations have been updated as required. |
| Bylaw Reference | Page 7, for the plan list they should include the Bylaw No. for the MDP (Bylaw No. 22-001). | Added. |
| Document Order | The overview on Page 9 would likely be better at the beginning of the document, | Moved to the Introduction section. |

**Reference:** **Circulation 23-008 : Chinook Industrial ASP & Land Use Redesignation – 1st Circulation**

| Department: **Oldman River Regional Services Commission** | | |
|---|---|---|
| Issue: | City Recommendation/Comment: | Applicant Response |
| | the first section in the introduction. This will better frame up the whole document as an amendment to Bylaw 18-012 and not a brand new ASP. Section 4 can be removed. | |
| Document Order | I would suggest the plan history be as per the attached document. | Amended as requested. |
| Bylaw Reference | Page 9, should refer to the County's assigned bylaw number for the existing ASP (Bylaw No. 18-012) and not Hasegawa's file number (HE17-006). | Bylaw number has been updated. |
| Flex Reference | The reference to the 'Flex Industrial Area' should be a noted in Table 1 that The final land statistics as reflected in the table will change for Business Light Industrial and Rural General Industrial at full build out once the Flex Area use is decided (i.e., it is a moment in time to guide the plan, as it is a land "potential" reference (i.e., one or the other district) and not an actual land use "district", such as the BLI or RGI are). | Additional note added clarifying that the Flex lands are not a Land Use District and that they will be transferred to BLI or RGI when redesignated and reflected in the table as such. |

| Department: **St. Mary River Irrigation District (SMRID)** | | |
|---|---|---|
| Issue: | Recommendation/Comment: | Applicant Response: |
| Storm Policy | Any future development plans must follow the requirements of the South Saskatchewan Regional Plan (SSRP) regarding water management and storm runoff. This would Include the 1:100 storm event storage capability with zero release. | Noted. |
| Conveyance Agreement | Zone 200 requires a Conveyance Agreement between Lethbridge County and St. Mary River Irrigation District (SMRID) for release of stormwater into the SMRID canal. | Text added to reflect this. |
| Testing Required | Water must be sampled, tested and meet St. Mary River Irrigation District water quality standards prior to release. | Already noted in ASP. |

**Reference:** **Circulation 23-008 : Chinook Industrial ASP & Land Use Redesignation – 1st Circulation**

| Department: **St. Mary River Irrigation District (SMRID)** | | |
|---|---|---|
| Issue: | Recommendation/Comment: | Applicant Response: |
| Capacity Confirmation | Available conveyance capacity within the canal must be confirmed prior to the operation of a pumped discharge of stormwater into our system. | Already noted in ASP. |
| As Information | The St. Mary River Irrigation District has no issues with the Traffic Impact Assessment. | Noted. |

Attachment: Draft Chinook Industrial Area Structure Plan (revised)

c. Hilary Janzen, Lethbridge County
Michael Kelly, Sumus
Brad Schmidtke, Stantec

CITY OF Lethbridge

GATEWAY TO OPPORTUNITY

April 24, 2023

Lethbridge County
905 4th Ave S
Lethbridge, AB T1J 4E4

RE: Proposed Amendments to Chinook Industrial Area Structure Plan (ASP) and Lethbridge County Land Use Bylaw (Lethbridge County Bylaws 23-008 & 23-009) – City of Lethbridge Submission to May 4, 2023 Public Hearing

Please be advised, that the City of Lethbridge has reviewed the proposed amendments to the Chinook Industrial ASP and Lethbridge County Land Use Bylaw (Bylaws 23-008 & 23-009) and offers the following comments:

- This is site is located within Policy Area 4, Sub Area 1 of the Intermunicipal Development Plan (IDP). In general, the IDP is supportive of industrial development in this location. Any future, proposed non-industrial land use district may require further amendments to the IDP and the Chinook Industrial ASP (with appropriate technical background studies) and would require circulation to the City of Lethbridge for comment.

- The City of Lethbridge is in favour of the proposed changes to **Section 6.1 - Sanitary Sewer System** of the ASP, as the City's current sanitary infrastructure is not capable of accommodating additional sanitary sewer flows from this development.

- The roadway cross section on **Map 5.0** does not match the City of Lethbridge's Design Standards, yet **Section 7 – Roads** states that*, "roads within the subdivision will comply with City of Lethbridge and Lethbridge County engineering standards."* Please resolve this inconsistency by either removing refence to the City of Lethbridge's Design Standards or updating the cross section shown in the ASP, as per the City of Lethbridge's Design Standards.

- The development driven improvements that are described in **Section 7 – Roads** on page 24 will need to be built when the intersections are built, and not at the full-build out horizon, unless traffic analysis is completed to specify the improvement trigger conditions. Please revise the wording to reflect this.

  Please also add text in this section that the developer will be responsible for funding the roadway improvements that are required to support the development. This includes required improvements to 43rd St. N and the installation of traffic signals at the 14 Ave N and 18 Ave N intersections.

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Planning and Design
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- **Section 11 – Phasing and Implementation** states that*, "in accordance with the City of Lethbridge / Lethbridge County IDP Section 3.4.4.13, landscaping will follow standards with respect to shielding and buffering."* However this section does not describe at what development stage and how this will be accomplished, as it just repeats what the IDP states in regards to 43rd St N. While this does not have to include specifics, this section should include text on what will be used to accomplish shielding and buffering along 43rd St. N (landscaping, setbacks, fencing etc.) and how the developer intends carry this out.

- The City of Lethbridge has no concerns with the proposed Land Use Bylaw Amendment (Bylaw 23-009), as long as it follows the amended ASP, subject to the comments listed above.

The City of Lethbridge appreciates the opportunity to review the proposed amendments and for the consideration of our comments by Lethbridge County Council.

Regards,



Tyson Boylan, RPP, MCIP
Senior Community Planner
City of Lethbridge

cc: Maureen Gaehring, Jason Price, Adam St. Amant & Joel Sanchez



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# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | January-March 2023 Community Peace Officer Report. |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | Community Services |
| **Report Author:** | David Entz |

**APPROVAL(S):**

| | |
|---|---|
| Hilary Janzen, Supervisor of Planning & Development | Approved - 19 Apr 2023 |
| Larry Randle, Interim Chief Administrative Officer | Approved - 21 Apr 2023 |

**STRATEGIC ALIGNMENT:**



**Governance** **Relationships** **Region** **Prosperity**

**EXECUTIVE SUMMARY:**

This report provides County Council with an overall summary of the County's CPO program for the months of January through March, 2023.

**RECOMMENDATION:**

No resolution is required.

**REASON(S) FOR RECOMMENDATION(S):**

No decision or resolution of Council is required as this report is for information purposes only.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

County Council is presented the CPO quarterly report and provided the opportunity to ask questions.

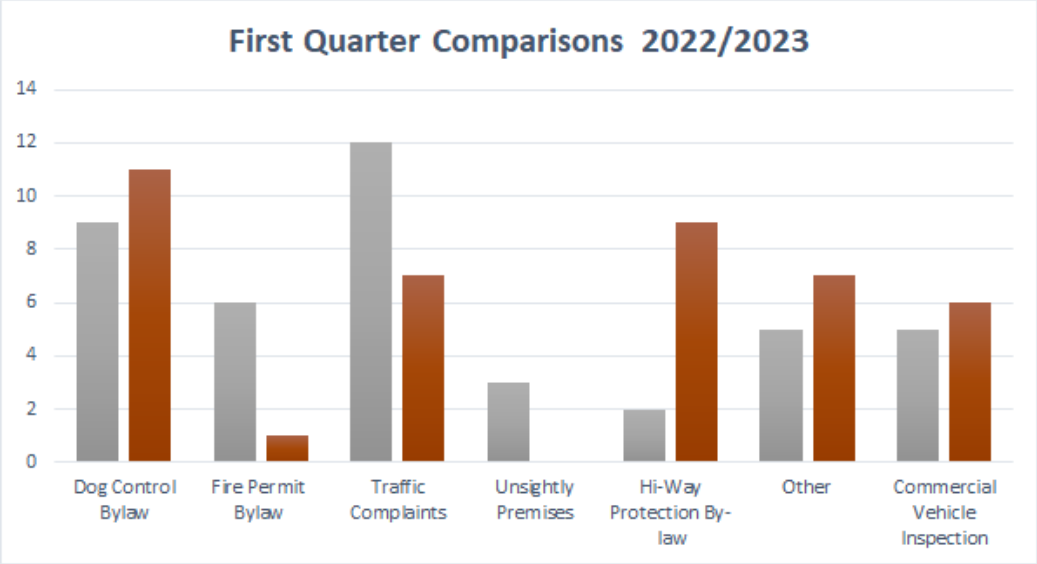
**BACKGROUND INFORMATION:**

Lethbridge County has one full-time Community Peace Officer (CPO) who provides education and enforcement on a variety of Lethbridge County Bylaws. The CPO is authorized to enforce the Traffic Safety Act and regulations under the Act. The CPO is also certified to inspect commercial vehicles.The CPO is part of the Community Services Department and reports to the Interim Department Director, Hilary Janzen.

**Notable events between January and March 2023**.

There were a total of 41 Case Reports created this period which is consistent within the same time period of 2022. The Highway Protection Bylaw has seen an increase, while the Fire Permit Bylaw has seen a significant decrease which is largely due to the new fire permitting system and the position of the Fire Services Manager.

The majority of the Highway Protection By-law complaints were for pushing snow into the County's Right of Way.




**Overweight trucks**

- There were a number of trucks weighed, some of which were overweight by 2000 to 3000 kgs. and some were repeat offenders. One loaded semi truck was weighed on a 75% road ban. The unit was overweight by 14,600 kgs. (32,187 lbs).
- The CPO observed a manure haul within the County. There was a loaded manure truck coming towards the CPO. When the diver was notified by one of his fellow co-workers that the CPO was in the area, the driver turned around and took the loaded manure truck back to the feedlot.

**Speeding**

- 141 and 130 KPH in maximum 80 KPH on RGE RD 23-4 (Very rough pavement)
- 70 KPH through a four way stop sign intersection, with rumble strips, on RGE RD 21-1 at TWP RD 8-4 intersection.
- 95 KPH in a well posted 50 KPH construction zone with workers present.

**Joint Force Operations**

- Commercial Vehicle Inspections with the Sheriffs branch

- Traffic Control during a winter storm for Nobleford Fire at an MVC

**Successes**

- Burned house was successfully removed from a property adjacent to Coalhurst.
- The Courts granted Lethbridge County a Court Order to clean up an unsightly property if the property owners fail to meet the Court imposed deadline.

**Challenges**

There have been some complaints of parked holiday trailers in Shaughnessy. The complainants want the trailers removed; however, if the trailers are plated and registered there is no mechanism in place to have the trailers removed.

**ALTERNATIVES / PROS / CONS:**

This report is for information purposes only.

**FINANCIAL IMPACT:**

Revenue received from fines issued help offset the cost of the CPO program. There was $45,332.00 of fines issued for this period of time by the CPO. Approximately 50% of this amount will be received by the County

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Proclamation of National Public Works Week - May 21 - 27, 2023 |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | Public Works |
| **Report Author:** | Jeremy Wickson |

**APPROVAL(S):**

| | |
|---|---|
| Jeremy Wickson, Director of Public Operations, | Approved - 17 Apr 2023 |
| Larry Randle, Interim Chief Administrative Officer | Approved - 17 Apr 2023 |

**STRATEGIC ALIGNMENT:**



**Governance** | **Relationships** | **Region** | **Prosperity**

**EXECUTIVE SUMMARY:**

National Public Works Week is May 21-27, 2023 and is held annually in municipalities across Canada and the United States to recognize the essential services provided by Public Works departments. Administration is requesting that Council proclaim this week in Lethbridge County to acknowledge our largest department and the importance of the services they carry out for our citizens and businesses.

**RECOMMENDATION:**

That Council proclaim May 21-27, 2023 as "National Public Works Week" in Lethbridge County.

**REASON(S) FOR RECOMMENDATION(S):**

Proclaiming May 21-27, 2023 as "National Public Works Week" in Lethbridge County provides an opportunity to recognize the hardworking staff who provide municipal services, as well as to educate the public on the important role these public works activities play in everyday life.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

Council has not made a proclamation for National Public Works Week in the past, however administration has recognized the week through social media posts and newsletter articles over the last several years.

**BACKGROUND INFORMATION:**

Public Works-related activities and services make up a considerable portion of the County's annual operating budget. Activities provided by Public Works staff are essential to the everyday functions of the County, such as water and wastewater management, maintenance of roads and bridges (grading, repairs, signage, snow plowing), parks and playgrounds, equipment, and more.

Administration plans to post information on the services provided by the Public Works department to our social media channels and has included an article in the May County Crier newsletter.

**ALTERNATIVES / PROS / CONS:**

Council may choose not to proclaim May 21-27 as "National Public Works Week" in Lethbridge County.
**PRO:** No clear benefit identified.
**CON:** Missed opportunity to join other municipalities across Canada in recognizing the work of Public Works staff.

**FINANCIAL IMPACT:**

None.

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

2023 National Public Works Week Poster


CONNECTING
THE WORLD
THROUGH PUBLIC WORKS
NATIONAL PUBLIC WORKS WEEK | MAY 21-27, 2023
APWA

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Bylaw 23-017 Tax Mill Rate |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | Corporate Services |
| **Report Author:** | Les Whitfield |

**APPROVAL(S):**

| | |
|---|---|
| Candice Robison, Executive Assistant | Approved - 21 Apr 2023 |
| Jennifer Place, Director of Finance & Administration | Approved - 21 Apr 2023 |
| Larry Randle, Interim Chief Administrative Officer | Approved - 21 Apr 2023 |

**STRATEGIC ALIGNMENT:**



**Governance** | **Relationships** | **Region** | **Prosperity**

**EXECUTIVE SUMMARY:**

The assessment roll has been prepared for the 2023 Tax Year. The 2023 municipal budget was presented and approved by Council on December 15, 2022 stating the tax support amount of $16,675,460 needs to be collected in order to support the County's 2023 operations with additional tax support for the Lethbridge Regional Waste Services Commission requisition and haul route capital funds for a total of $17,796,435. As per the Municipal Government Act, a Tax Rate Bylaw is required to be passed annually as it enables the Property Assessment and Tax Notices to be issued and annual tax levies to be collected. The County's property tax due date is July 31st.

**RECOMMENDATION:**

That the 2023 Tax Mill Rate Bylaw 23-017 be read a first time.

That the 2023 Tax Mill Rate Bylaw 23-017 be read a second time.

That Council proceeds to consideration of third reading of Bylaw 23-017.

That the 2023 Tax Mill Rate Bylaw 23-017 be read a third time.

**REASON(S) FOR RECOMMENDATION(S):**

The 2023 budget for expenditures and required tax support has been approved and the bylaw complies with legislative requirements.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

The 2023 Budget was approved per the attached resolution.

**F.1.2.** ***2023 - 2025 Operating & 2023 -2027 Capital Budget***

| | | |
|---|---|---|
| 347-2022 | Councillor VanderVeen | MOVED that the 2023 Operating Budget expenses in the amount of $30,204,555 as outlined in Attachment 1 be approved, and that the 2024 and 2025 Operating Budget expenses in the amounts of $30,538,430 and $30,804,015 respectively be approved in principle. |

CARRIED

Pursuant to Section 353 of the Municipal Government Act (MGA) each Council must pass a property tax bylaw annually to impose a tax in respect of property in the municipality to raise revenue to be used toward payment of expenditures and transfers as set out within the budget of the municipality as well as for the requisitions imposed.

The attached bylaw for Council consideration is closely based on the 2:1 ratio between Non-Residential and Residential tax rates, as in previous years. Administration has also included some additional tax rate options for Council's review. Should any of the attached options be considered the Tax Mill Rate Bylaw can be amended to reflect any decision changes.

**BACKGROUND INFORMATION:**

The total property assessment on the attached spreadsheet for the 2023 tax year includes:

$81,069,660 - increase in Residential Assessment from 2022 consisting of $24,082,330 growth (new development) and $56,987,330 is attributable to market value adjustments.

$57,154,770 - overall increase in Non-Residential/Machinery and Equipment (M&E) Assessments. This increase is attributed $16,790,800 in growth and $40,363,970 inflation.

The assessment classes are defined under Section 297 of the MGA as follows:
Class 1 - Residential;
Class 2 - Non-Residential;
Class 3 - Farmland;
Class 4 - Machinery and Equipment (M&E)

The below information is based on a 2:1 tax rate Ratio between Non- Residential and Residential.

The municipal tax rate for Non-Residential and M&E classes must be the same.

The 2023 Farmland tax rate is slightly higher compared to the 2022 tax rate of 3.78%.

The 2023 Residential tax rate has decreased by 3.39% due to the increase in assessment and results in an additional $162,985 in taxes over last year.

The 2023 Non-Residential/M&E tax rate has also decreased from 2022 by 3.36% due to assessment, resulting in a $230,193 increase in taxes over last year.

**ALTERNATIVES / PROS / CONS:**

Council must pass a Tax Rate Bylaw annual in order to impose taxes per the MGA.

However, Council does has the authority and option to change the tax rate ratios from what has been proposed within the bylaw presented, however they must ensure the appropriate amount of tax support is collected per the approved budget and that any rate changes comply with legislation.

**FINANCIAL IMPACT:**

Tax rates are calculated by dividing the Revenues required by the total assessment from the applicable property Assessment Class.

Below is a list of the required 2023 collection amounts:

| | | |
|---|---|---|
| Lethbridge County General | $ 15,571,250 | 5.12% increase |
| Lethbridge County Haul Route Network | $ 500,000 | 0% increase/decrease |
| Lethbridge Regional Waste Commission Levy | $ 620,975 | 3.36% increase |
| Provincial Police Levy | $ 704,210 | 50.11% increase |
| Green Acres Foundation | $ 325,623 | 3.41% increase |
| Alberta Education Requisition | $ 5,930,145 | 1.42% increase |
| Designated Industrial Property Requisition | $ 18,570 | 1.43% decrease |

2023 Proposed Total Tax Rates (Based on 2:1 Ration Non Res to Res):

| ASSESSMENT CLASS | 2023 TAX RATE | 2022 TAX RATE |
|---|---|---|
| Class 3 - Farmland | 28.6283 | 27.9873 |
| Class 1 - Residential | 7.4146 | 7.5906 |
| Class 2 - Non-Residential | 12.4388 | 12.8321 |
| Class 4 - Machinery and Equip. | 8.9625 | 9.1535 |

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

Bylaw 23-017 - 2023 Tax Rate
Municipal Tax Rates
Requisition Tax Rates
Municipal Tax Rate Comparison 23

# LETHBRIDGE COUNTY
# IN THE PROVINCE OF ALBERTA

## BYLAW NO. 23-017
## 2023 TAX MILL RATE

**A BYLAW OF LETHBRIDGE COUNTY TO AUTHORIZE THE 2021 TAX RATES OF ASSESSABLE PROPERTY WITHIN LETHBRIDGE COUNTY PURSUANT TO THE MUNICIPAL GOVERNMENT ACT**

WHEREAS the Lethbridge County has prepared and adopted detailed estimates of the municipal revenue and expenditures as required, at the Council meeting held on December 15, 2022; and

WHEREAS the estimated municipal expenditures and transfers from all sources for the Lethbridge County for 2023 total $30,204,555 and $17,796,435 is to be raised by general municipal taxation; and

NOW THEREFORE BE IT RESOLVED that the Council of Lethbridge County authorized the Chief Administration Officer to levy upon the assessed value of all assessable property shown on the assessment roll.

a) Tax rate for municipal purposes:

| | |
|---|---|
| - Class 3 Farmland (Sec. 297 MGA) | 26.0001 |
| - Class 1 Residential (Sec. 297 MGA) | 4.7864 |
| - Class 2 & 4 Non-Residential/M&E (Sec. 297 MGA) | 8.8172 |

| | |
|---|---|
| b) Tax rate for the Green Acres Foundation | 0.1453 |
| c) Tax rate for Designated Industrial Property | 0.0746 |

THAT the following rates for School Requisition purposes to be calculated to generate $5,526,827.71 for the 2023 Alberta School Foundation Fund (ASFF) and $403,318.10 for the 2023 Holy Spirit Roman Catholic School District:

| | |
|---|---|
| a) ASFF Residential and Farmland | 2.4829 |
| b) ASFF Non-Residential | 3.4763 |
| c) Holy Spirit Residential and Farmland | 2.4829 |
| d) Holy Spirit Non-Residential | 3.4763 |

This Bylaw shall hereby rescind previous Bylaw No. 22-007.

GIVEN first reading this 4th day of May, 2023.

_____
Reeve

_____
Chief Administrative Officer

GIVEN second reading this 4th day of May, 2023.

_____
Reeve

_____
Chief Administrative Officer

GIVEN third reading this 4th day of May, 2023.

_____
Reeve

_____
Chief Administrative Officer

| 20-Apr | | | LETHBRIDGE COUNTY TAX RATES - 2023 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | ACTUAL | 2023 REQUIRED | 2023 TAX | | 2022 | 2022 | 2022 TAX | | |
| | | ASSESSMENT | REVENUE | (MILL)RATE | | ASSESSMENT | REVENUE | RATE | | |
| | MUNICIPAL | | | | | | | | | |
| | GENERAL MUNICIPAL PURPOSES | | | | | | | | | |
| | Farmland | 158,492,200.00 | 3,500,640.00 | 22.0871 | 3.78% | 158,158,230.00 | 3,366,000.00 | 21.2825 | | |
| | Residential | 1,237,685,030.00 | 4,985,610.00 | 4.0282 | -3.39% | 1,156,615,370.00 | 4,822,625.00 | 4.1696 | | ` |
| | Non-Residential/M&E | 879,144,905.00 | 7,085,000.00 | 8.0590 | -3.36% | 821,990,135.00 | 6,854,807.00 | 8.3393 | | |
| | | 2,275,322,135.00 | 15,571,250.00 | | | 2,136,763,735 | | | | |
| | Add Provincial Police Services | 2,275,322,135.00 | 704,210 | 0.3095 | 40.94% | 2,136,763,735 | 469,138 | 0.2196 | | |
| | Add Recreation | 2,275,322,135.00 | 400,000 | 0.1758 | 7.33% | 2,136,763,735 | 350,000 | 0.1638 | | |
| | | | 16,675,460.00 | | | | 15,862,570.00 | | | |
| | Provincial Availability Adjustment | 34,541,365.00 | | | | 33,796,915.00 | | | | |
| | Total | **2,309,863,500** | **16,675,460** | | 5.12% | **2,170,560,650** | **15,862,570** | | | |
| | | | | | | | | | | |
| | Add Haul Route Network | 158,492,200.00 | 500,000 | 3.1547 | -3.93% | 158,158,230 | 519,383 | 3.2839 | | |
| | Add LRWMSC | 2,275,322,135.00 | 620,975 | 0.2729 | -2.95% | 2,136,763,735 | 600,780 | 0.2812 | | |
| | **Total Municipal** | | **$17,796,435.00** | | | | **$16,982,733.00** | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | **Farmland Rate** | 26.0001 | 3.05% | | **Farmland Rate** | 25.2310 | | |
| | MUNICIPAL RATES | | **Residential Rate** | 4.7864 | -0.99% | | **Residential Rate** | 4.8341 | | |
| | | | **Non-Res/M&E Rate** | 8.8172 | -2.07% | | **Non-Res/M&E Rate** | 9.0038 | | |
| | | | | | | | | | | |
| | **REQUISITIONS** | | **$ 6,274,338.79** | | | | **$ 6,181,276.80** | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | **TOTAL 2023 TAX LEVY** | | **$23,977,711.80** | | | | **$23,164,009.80** | | | |
| | | | | | | | | | | |
| | | | Farmland Rate | 28.6283 | 2.29% | | Farmland Rate | 27.9873 | | |
| | | | Residential Rate | 7.4146 | -2.32% | | Residential Rate | 7.5906 | | |
| | | | Non-Residential | 12.4388 | -3.07% | | Non-Residential | 12.8321 | | |
| | | | M & E Rate | 8.9625 | -2.09% | | M & E Rate | 9.1535 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| 20-Apr | | | LETHBRIDGE COUNTY TAX RATES - 2023 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | ACTUAL | 2023 REQUIRED | 2023 TAX | | 2022 | 2022 | 2022 TAX | |
| | | ASSESSMENT | REVENUE | (MILL)RATE | | ASSESSMENT | REVENUE | RATE | |
| | **REQUISITIONS** | | | | | | | | |
| | **Green Acres Foundation** | 2,240,780,770.00 | **325,623.19** | 0.1453 | -2.93% | **2,102,966,820** | **314,891.36** | **0.1497** | |
| | **Designated Industrial Property** | 248,924,820.00 | **18,569.79** | 0.0746 | -2.61% | **242,046,970** | **18,307.68** | **0.0766** | |
| | **SCHOOLS** | | | | | | | | |
| | ASFF RESIDENTIAL & FARMLAND | 1,272,953,573.00 | 3,160,616.43 | 2.4829 | -4.75% | 1,197,186,412 | 3,120,442.66 | 2.6068 | |
| | ASFF NON-RESIDENTIAL | 680,669,470.00 | 2,366,211.28 | 3.4763 | -5.50% | 631,345,822 | 2,327,611.61 | 3.6785 | |
| | NON-TAXABLE ELECTRIC LINEAR | 16,601,370.00 | | | | 15,904,880 | | | |
| | MACHINERY & EQUIPMENT | 120,077,100.00 | | | | 114,953,090 | | | |
| | PROVINCIAL GIPOT RES. & FARMLAND | 5,271,980.00 | | | | 5,039,160 | | | |
| | PROVINCIAL GIPOT NON RESIDENTIAL | 63,810,750.00 | | | | 62,554,670 | | | |
| | | 2,159,384,243.00 | $ 5,526,827.71 | | | 2,026,984,034 | | | |
| | **TOTAL ASFF EDUCATION REQUISITION** | $ 2,159,384,243.00 | 5,526,827.71 | | | $2,026,984,034.00 | 5,448,054.27 | | |
| | HOLY SPIRIT RES. & FARMLAND | 120,587,667.00 | $299,407.12 | 2.4829 | -4.75% | 115,067,608 | $300,336.97 | 2.6068 | |
| | HOLY SPIRIT NON-RESIDENTIAL | 29,891,590.00 | $103,910.98 | 3.4763 | -5.50% | 28,509,008 | $99,686.52 | 3.6785 | |
| | | 150,479,257.00 | | | | | | | |
| | **TOTAL HOLY SPIRIT REQUISITION** | 150,479,257.00 | 403,318.10 | | | 143,576,616.00 | 400,023.49 | | |
| | | | - | | | | | | |
| | **TOTAL** | 2,309,863,500.00 | $ 5,930,145.81 | | 1.40% | 2,081,760,410 | $5,848,077.76 | | |
| | | | $ 5,930,145.81 | | | | | | |
| | **TOTAL 2023 REQUISTIONS TAX LEVY** | | **$6,274,338.79** | | | | $6,181,276.80 | | |
| | | | **Farmland Rate** | 2.6282 | -4.65% | | Farmland Rate | 2.7565 | |
| | | | **Residential Rate** | 2.6282 | -4.65% | | Residential Rate | 2.7565 | |
| | | | **Non-Residential** | 3.6216 | -5.40% | | Non-Residential | 3.8282 | |
| | | | **M & E Rate** | 0.1453 | -2.94% | | M & E Rate | 0.1497 | |

# TAX RATE 100 YEAR COMPARISON
# MUNICIPAL ONLY

| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **FARMLAND** | 17.0070 | 17.6415 | 20.4163 | 20.4495 | 24.8131 | 24.8348 | 24.8625 | 24.9373 | 25.0363 | 25.2310 | 26.0001 |
| **RESIDENTIAL** | 4.5483 | 4.5786 | 4.5824 | 4.6156 | 4.6290 | 4.7279 | 4.6903 | 4.8461 | 4.8989 | 4.8341 | 4.7864 |
| **NON-RESIDENTIAL** | 9.5700 | 9.2238 | 9.2275 | 9.0654 | 9.0788 | 9.2213 | 9.1147 | 9.3040 | 9.3435 | 9.0038 | 8.8172 |
| **M & E** | 9.5700 | 9.2238 | 9.2275 | 9.0654 | 9.0788 | 9.2213 | 9.1147 | 9.3040 | 9.3435 | 9.0038 | 8.8172 |

# AGENDA ITEM REPORT

| | |
|---|---|
| **Title:** | Quarterly Financial Report - January - March 2023 |
| **Meeting:** | Council Meeting - 04 May 2023 |
| **Department:** | Corporate Services |
| **Report Author:** | Jennifer Place |

**APPROVAL(S):**

Larry Randle, Interim Chief Administrative Officer — Approved - 25 Apr 2023

**STRATEGIC ALIGNMENT:**



**Governance** ☒ **Relationships** ☐ **Region** ☐ **Prosperity** ☐

**EXECUTIVE SUMMARY:**

This is the financial report for the period of January to March 2023 for Lethbridge County.

**RECOMMENDATION:**

No resolution is required.

**REASON(S) FOR RECOMMENDATION(S):**

This report is for County Council information regarding the County's financial position as of March 31, 2023.

**PREVIOUS COUNCIL DIRECTION / POLICY:**

Financial reports are presented to Council throughout the year for information.

**BACKGROUND INFORMATION:**

Section 268.1 of the Municipal Government Act states:

A municipality must ensure that:
(a) accurate records and accounts are kept of the municipality's financial affairs, including the things on which a municipality's debt limit is based and the things included in the definition of debt for that municipality;
(b) the actual revenues and expenditures of the municipality compared with the estimates in the operating or capital budget approved by council are reported to council as often as council directs;
(c) the revenues of the municipality are collected and controlled and receipts issued in e manner directed by council.

**ALTERNATIVES / PROS / CONS:**

N/A

**FINANCIAL IMPACT:**

N/A

**LEVEL OF PUBLIC PARTICIPATION:**

☒ Inform ☐ Consult ☐ Involve ☐ Collaborate ☐ Empower

**ATTACHMENTS:**

Financial Report ending Mar 31-23



# Financial Report

Ending March 31, 2023

LETHBRIDGE COUNTY

**FISCAL YEAR 2023**

**Presented by:**
**Jennifer Place**
**Director of Finance & Administration**

# QUARTERLY FINANCIAL DASHBOARD to March 31-23

**Total Revenue**

3,879,790

3,719,937
Jan – Apr 2022

**Total Expenses**

8,408,163

10,213,076
Jan – Apr 2022

**Investments**

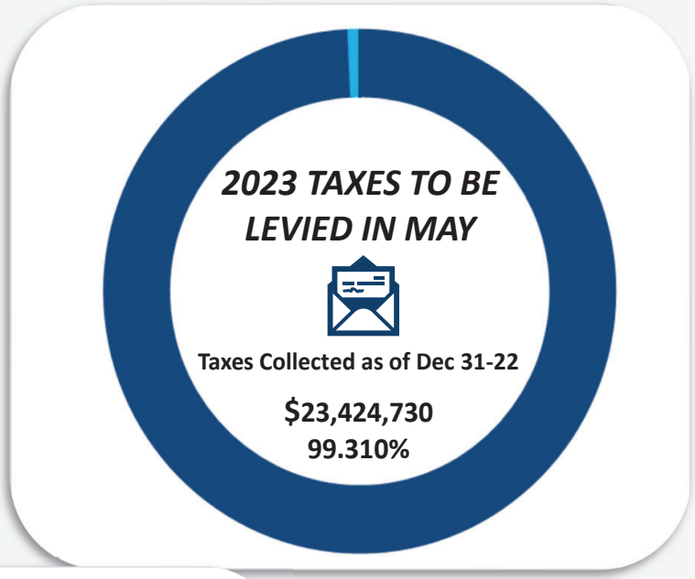
25,936,982

As of March 2022
$27,980,792
(includes M.R. GIC)

**Cash at end of quarter**

7,159,879

As of December 31-22
$10,857,475
(HISA acct funds included)




**Accounts Payable**

5,373,089

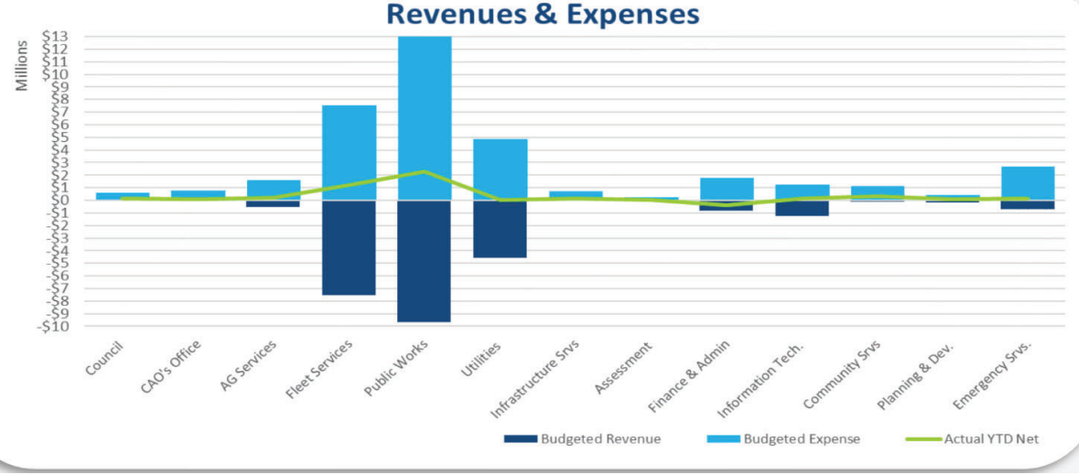
6,705,089
Jan – March 2022

**Accounts Receivable**

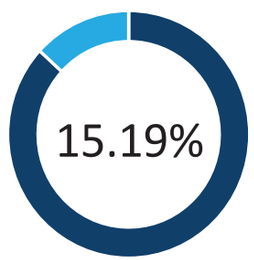
240,220

267,276
Jan – March 2022

**Revenues & Expenses**



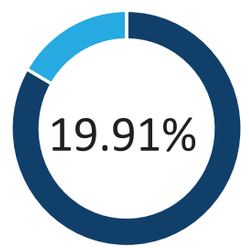

**% of income Budget**




Excluding Tax Support

| | |
|---|---|
| Budget | 25,549,095 |
| YTD Balance | 3,879,790 |

**% of Expenses Budget**



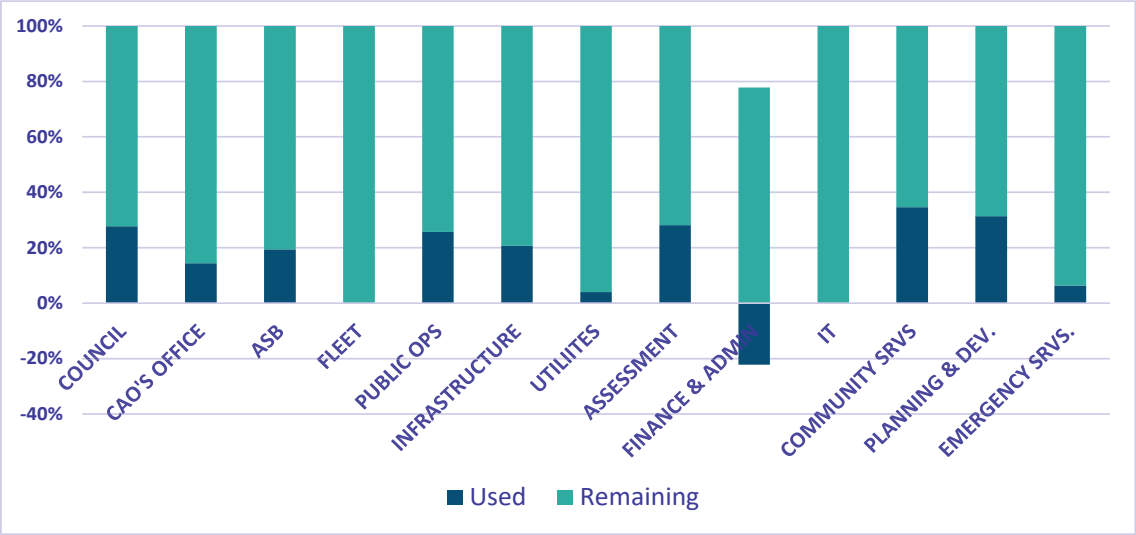

| | |
|---|---|
| Budget | 42,224,555 |
| YTD Balance | 8,408,163 |

# March 31, 2023 Financial Summary

## *CONSOLIDATED FINANCIAL SUMMARY*

The below financial report is for the period of January 1 to March 31, 2023. As this report is focused on the first quarter of the year, the projections show that costs will remain in line with the approved budget. As operational activities will begin to increase over the next quarter, further projection estimates will be made. As the County Council is aware, the 2023 budget was approved with some operational increases to address inflationary costs such as fuel, materials and supplies. With these items having been updated within the budget Administration is not currently anticipating any major deficits. As always, the County will continue to monitor expenses as we move through the year and reports will continue to be brought forward to Council for their review.

The below chart shows the tax support funding used and remaining by department as of March 31, 2023.



### *Tax Support by Department*

*as of March 31, 2023*

| Department | *Budget* | Actual YTD | Projected | *Surplus (Deficit)* | % |
|---|---|---|---|---|---|
| Council | (602,545) | (167,461) | (602,545) | - | 100.00% |
| CAO's Office | (740,435) | (106,356) | (740,435) | - | 100.00% |
| Agricultural Services | (1,072,205) | (208,617) | (1,072,205) | - | 100.00% |
| Fleet Services | - | (1,244,959) | - | - | N/A |
| Public Works | (8,982,455) | (2,309,806) | (8,982,455) | - | 100.00% |
| Infrastructure Department | (618,610) | (127,873) | (618,610) | - | 100.00% |
| Utilities | (327,925) | (13,126) | (327,925) | - | 100.00% |
| Assessment & Taxation | (204,245) | (57,429) | (204,245) | - | 100.00% |
| Finance & Administration | (928,970) | 371,516 | (928,970) | - | 100.00% |
| IT | - | (126,414) | - | - | N/A |
| Community Services | (966,595) | (335,024) | (966,595) | - | 100.00% |
| Planning & Development | (246,095) | (77,156) | (246,095) | - | 100.00% |
| Emergency Services | (1,985,380) | (125,668) | (1,985,380) | - | 100.00% |
| **Tax Support** | **(16,675,460)** | **(4,528,373)** | **(16,675,460)** | **-** | **100.00%** |

**Consolidated Financial Summary**

| Revenues | *Budget* | Actual YTD | Projected | *Variance* | % |
|---|---|---|---|---|---|
| Grants (Operating) | 3,423,855 | - | 4,794,855 | **1,371,000** | 140.04% |
| Sales & User Charges | 4,989,525 | 1,238,112 | 4,989,525 | - | 100.00% |
| Fines | 95,000 | 11,517 | 95,000 | - | 100.00% |
| Penalties | 225,000 | 531,531 | 225,000 | - | 100.00% |
| Rentals | 188,190 | 47,048 | 188,190 | - | 100.00% |
| Return on Investments | 300,000 | 203,718 | 300,000 | - | 100.00% |
| Other Revenue | 7,381,025 | 1,847,864 | 7,381,025 | - | 100.00% |
| From Reserves | 8,946,500 | - | 7,575,500 | **(1,371,000)** | 84.68% |
| ***Total Revenue*** | **25,549,095** | **3,879,790** | **25,549,095** | **-** | **100.00%** |
| **Expenditures** | | | | | |
| Operating / Projects | (48,804,255) | (6,144,233) | (48,804,255) | - | 100.00% |
| To Reserves | (3,307,800) | - | (3,307,800) | - | 100.00% |
| To Capital | 9,887,500 | (2,263,930) | 9,887,500 | - | 0.00% |
| ***Total Expenditures*** | **(42,224,555)** | **(8,408,163)** | **(42,224,555)** | **-** | **100.00%** |
| **Tax Support** | **(16,675,460)** | **(4,528,373)** | **(16,675,460)** | **-** | **100.00%** |

## *Statement of Operations and Capital**

*as of March 31, 2023*

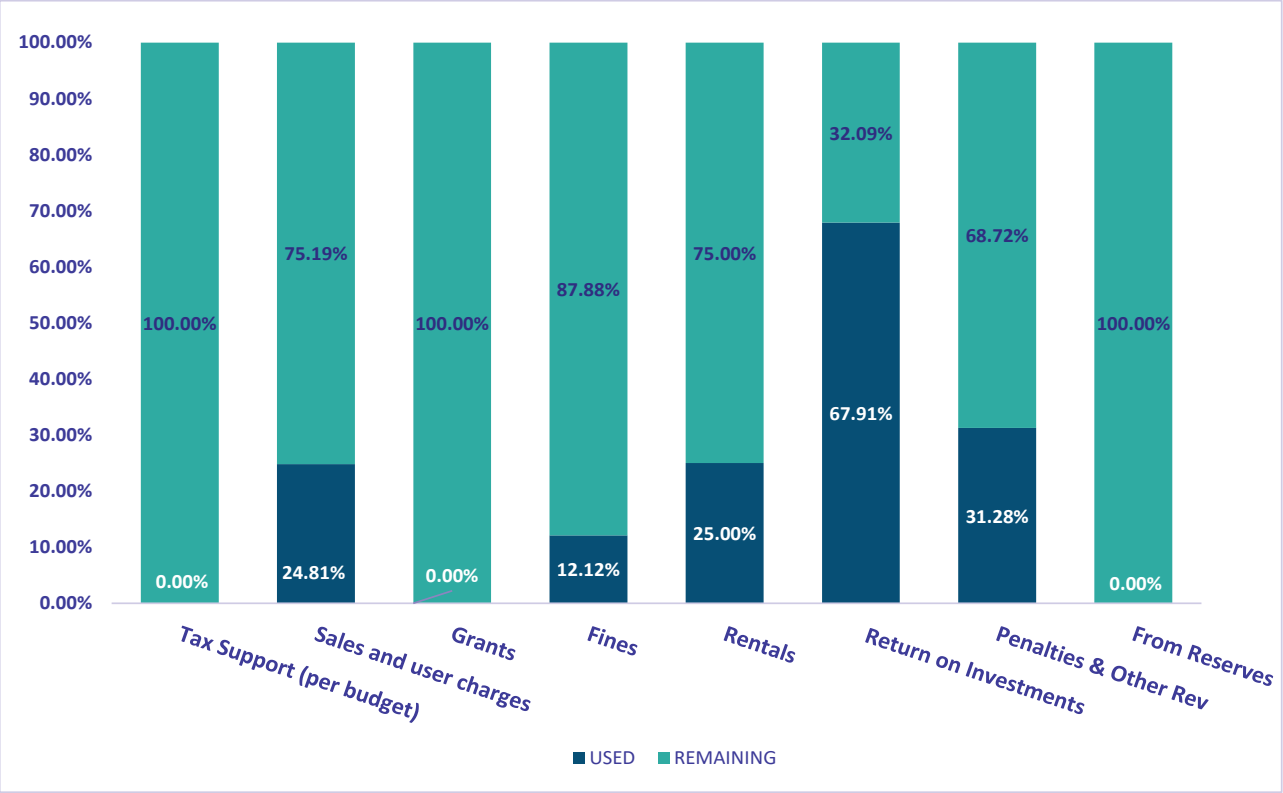
| | 2023 Budget | 2023 Actual | *Projected* |
|---|---|---|---|
| **Revenue:** | | | |
| Tax Support (per budget) | $ *16,675,460* | $ - | $ *16,675,460* |
| Sales and user charges | 4,989,525 | 1,238,112 | 4,989,525 |
| Grants | 3,423,855 | - | 4,794,855 |
| Fines | 95,000 | 11,517 | 95,000 |
| Penalties and costs on taxes | 225,000 | 531,531 | 225,000 |
| Rentals | 188,190 | 47,048 | 188,190 |
| Return on Investments | 300,000 | 203,718 | 300,000 |
| Other revenues | 7,381,025 | 1,847,864 | 7,381,025 |
| From Reserves | 8,946,500 | - | 7,575,500 |
| **Total revenue** | **42,224,555** | **3,879,790** | ***42,224,555*** |
| **Expenses:** | | | |
| Council and other legislative | 602,545 | 167,461 | 602,545 |
| General administration | 5,464,010 | 1,336,048 | 5,464,010 |
| Fire services | 2,486,940 | 107,207 | 2,486,940 |
| CPO Services | 199,940 | 60,689 | 199,940 |
| PW - Roads, streets, walks and lighting | 18,673,655 | 2,718,188 | 18,673,655 |
| Infrastructure | 696,610 | 128,398 | 696,610 |
| Fleet services | 7,524,635 | 2,831,353 | 7,524,635 |
| (UT) Water, wastewater and waste management | 4,874,565 | 769,242 | 4,874,565 |
| Family and community support | 81,045 | 80,960 | 81,045 |
| Agricultural development | 1,507,950 | 187,698 | 1,507,950 |
| Parks and recreation | 112,660 | 20,919 | 112,660 |
| **Total expenses** | **42,224,555** | **8,408,163** | ***42,224,555*** |
| **Excess (deficiency) of revenue over expenses** | - | (4,528,373) | - |

The above statement of operations provides a snapshot of the revenues received to date and expenditures by department, including capital purchases.

**The Statement of Operations as reflected in the yearend financial statements is presented differently.*

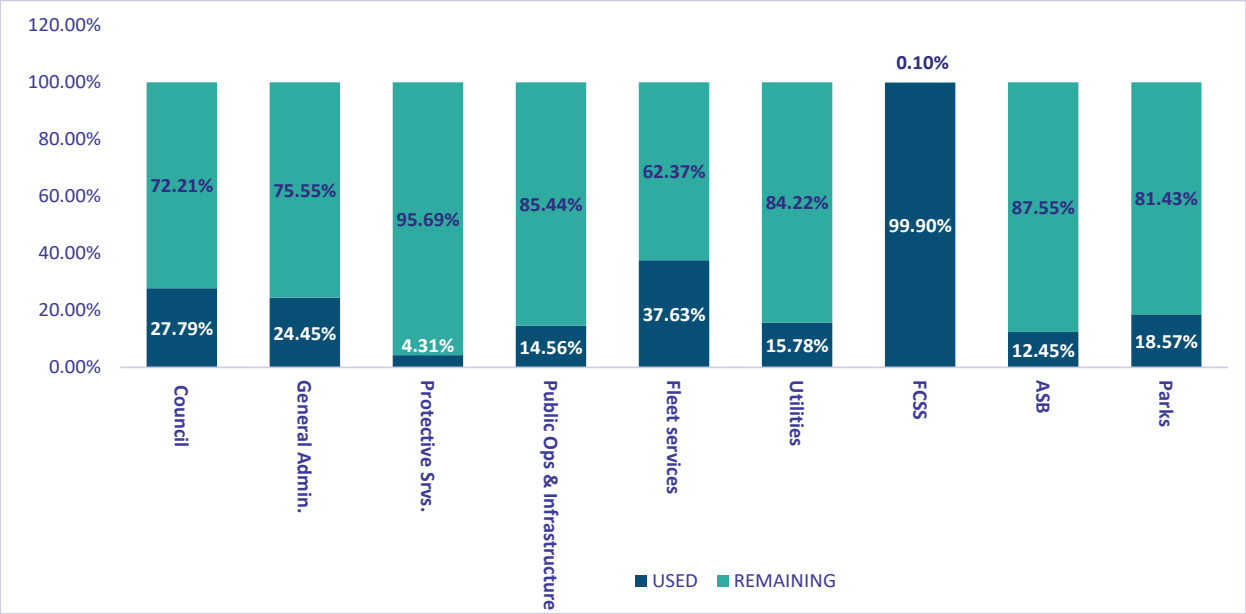
## *Revenues Earned to date*

The below chart indicates the revenues recorded through to March 31st. To date the County has received just over $3.8 million in revenues, primarily from sales and user charges, tax penalties (although a large portion of that is related to oil and gas companies) and additional interest received from a GIC renewal in early March. The revenues collected to date represents approximately 15% of the total revenue budgeted (excluding the 2023 tax levy amount).



## *Expenditures by Department*

This chart represents a comparison of actual expenditures spent against the budget by department. Total expenses to date are just over $8.4 Million or 20% of the budgeted. As the spring and summer seasons get going a large portion of the Ag Services and Public Works budgets will be utilized as that is the busiest time for those departments. Capital costs to date are minimal with the majority of them associated with fleet purchase. With the construction season just around the corner the County will also begin to see larger capital expenditures and use of budgeted funds.



## *DEPARTMENT OPERATING ACTIVITY SUMMARY*

The below information is a summary of department activities over the last quarter.

### *Council*

- Council has had 6 regular County Council meetings and 1 Agricultural Service Board meeting since January. Several council requests, subdivisions, public hearings and policy related matters have been presented to Council over the last few months. All Council meetings are live streamed and council agendas, minutes and recordings are available on the County website. Each Councillor provides an update of their monthly activities at one of the Council meetings for public information.
- Council began the recruitment process for a new CAO as the CAO Mitchell resigned in January.
- Council attended the Rural Municipalities Association (RMA) Spring Conference in March, where they met with various Ministers and attended several sessions.

As of March 31st, Council made the following contributions as per resolution:

| | |
|---|---|
| *Alberta Conservation Association - $1,000* | *Community Planning Association Sponsorship $2,500 and Gift Prize Basket - $155.90* |
| *Oldman Watershed Council 2022 Contribution - $4,866* | *Picture Butte Rural Crime Watch - $1,000* |
| *Picture Butte Chamber of Commerce Sponsorship-$200* | *Public School Betterment Society of Picture Butte Harvest Celebration - $200* |
| *Each of the Community Centre Associations within the County and the Prairie Tractor & Engine Museum received $10,000 for a total of $80,000 through the Community Services Budget in an effort to help support their operational and/or capital needs.* | |

### *CAO's Office*

In addition to attending regular meetings with Council, the Senior Leadership Team and stakeholders on behalf of the county, below is a summary of some of the activities the Interim CAO has been focused on over the last quarter.

- Regional Emergency Management collaboration with Town of Coaldale and small urbans
- Recruitment of a new Human Resources Manager
- Lead the Regional Pathway Project team for project presentation to council.
- Managing the RFP for development of a county Economic Development Strategy
- Working with administration to prepare for a major water infrastructure project to support the McCain expansion.
- Help facilitate restructuring of the fire services delivery model to county residents.

The Human Resources Department falls under the CAO Office's, below is a list of some of the items they have been working on:

- The new HR Manager was hired and began working with the County in March. Following onboarding, Introductions to Council, Senior Management and County staff took place.
- Recalls, recruitment, interviews and onboarding for the upcoming spring and summer season has been taking place.
- HR continues to work out of the Picture Butte office on a weekly basis.
- Various other HR related activities such as management of training activities, toolbox meeting preparation, policy review, discipline requirements, etc. has also been taking place over the past several months.

## *Agricultural Services*

- Equipment is being prepared for the upcoming spring/summer season and have received capital purchase of a new Disc and Trailer
- 4 Seed Plants were inspected and licensed.
- The Rural Living and Ag-Extension newsletter was published in Mid-March
- Environmental Farm Plans are ongoing.
- Equipment has been ordered for the Shaughnessy Playground Upgrades project.
- A Shelterbelt workshop was held as well as 3 Nutrient Management webinars were produced.
- Over the next few months, the Ag Services department will be busy with roadside seeding, spraying and mowing. AS well as park maintenance and the Shaughnessy Playground build.

## *Fleet Services*

- Regular maintenance of machinery and equipment is ongoing throughout the year to ensure equipment is safe and to help reduce any activity delays.
- The fleet department has completed 21 of CVIPS.
- 78 of minor equipment defects and 11 major equipment defects have been repaired.
- Multiple pieces of equipment have been prepared for the upcoming road construction and Base Stabilization season.
- Equipment purchases  based on scheduled replacements and requirements are ongoing.

Fleet Capital Purchases to March 31st are as follows:

| 2023 FLEET CAPITAL BUDGET | | |
|---|---|---|
| **FLEET ITEM** | **Budget Request** | **COST** |
| Replacement Divisional Grader MG-037 | 625,000 | **608,330** |
| Replacement Divisional Grader MG-038 | 625,000 | **608,330** |
| Replacement of TR-138 Truck & Plow Equipment | 325,000 | **0** |
| Replacement of LD-111 JD 644K Wheel Loader | 500,000 | **494,935** |
| Replacement of 2 X PW/ASB Trucks 3/4 & 1 Tons | 140,000 | **13,638** |
| Replacement of 1 X ASB Construction 1 Tons (2022 Purchase) | 90,000 | **0** |
| Replacement of 1 X PW Construction 3 Ton | 100,000 | **0** |
| Tow Behind Scissor Man Lift | 45,000 | **50,000** |
| Replacement of ASB 10' Disc | 65,000 | **30,460** |
| Replacement of Equipment Trailer | 25,000 | **17,520** |
| Replacement of ASB Roadside Mower | 50,000 | **0** |
| Replacement of Small Rock Box - Salt Dawg | 25,000 | **23,025** |
| Replacement of Fuel Pumps - PB and Coaldale | 40,000 | **0** |
| Enterprise Fleet Program - 12 X Crewcab 1/2 ton Truck | 600,000 | **277,589** |
| Enterprise Fleet Program - 1 X SUV | 55,000 | **0** |
| Replacement of Wheel Skid Steer (Trade in EVCON) | 75,000 | **5,916** |
| Replacement of Track Skid Steer (Trade in EVCON) | 85,000 | **7,900** |
| | | |
| | **$ 3,470,000** | **2,137,643** |

## *Public Works*

- Snow removal has been a priority throughout the winter.
- The sign program has installed/replaced 38 signs to date.
- 750+ assets of various types have been collected and updated within the Asset Management Program
- Building inspections, maintenance and site cleanup has been conducted.

Grading and Gravelling Update:

| ACTIVITY | Year to Date |
|---|---|
| GRADING | 1,070 miles have been graded to date. |
| GRAVELLING | 19,500 Tonnes has been stockpiled for road maintenance/construction. |
| All divisional gravelling is complete for the year. | |

The following activities are planned for the upcoming quarter:

- Gravel pit reclamation in Hoffarth Pit to begin before mobilizing to the RR20-1/TWP9-4 project.
- Returning staff and new hires mid/end of April.
- Base Stabilization – Maintenance Treatments to begin by end of April.
- Dust Control – Proofing and preparing for dust control at the beginning of the second quarter with applications finished by end of second quarter.
- Grading maintenance will increase as Ag Services activities ramp up.

## *Utilities*

The Utilities Department continues to manage daily activities and deal with utility related issues as they arise.

The first quarter of the year have been busy within the Utilities department. As of March 31st, there have been a total of 521 Alberta One Call requests that needed to be addressed. Three members of the department attended the AWWOA Operators Seminar in Banff, earning required Continuing Education Units for their certifications. In February, all Annual Reports were completed and submitted to Alberta Environment & Parks (AEP).

In the field, the upgrade to the SCADA system is ongoing, and nearing completion. All AEP requirements regarding weekly and daily testing of all our Water Distribution sites for Lethbridge County, and per County agreements. Work is taking place at the Broxburn Park to manage sewer and storm water issues.

Looking ahead, with summer approaching it will get busier as the Co-op's will begin to put lines in the ground and hook up new services, we are required to be onsite for any work done to the main distribution system for both co-ops. In early May a piping upgrade at the Fairview lift station will take place, this is a much-needed upgrade and will help with the sustainability of the station going forward. AEP will continue as required for testing and reporting.

## *Infrastructure Services*

The Infrastructure Department remains busy managing capital projects, working with consultants and engineers on various projects and studies, ensuring developments meet engineering standards, and continually improving the Asset Management Program.

Additional activities include:

- Collaborating with other municipalities on important regional infrastructure projects such as the Horsefly Spillway, Malloy Basin Phase 2B, and other regional servicing projects.
- Collaborating with Council on critical initiatives to help support and grow the County's current commercial and industrial businesses.
- Working with Industry to find long term solutions in addressing water and wastewater requirements.
- Collaborate with other departments to achieve organizational goals and support informed decision-making across the organization through effective Asset Management

Below is a cost summary and status update of the infrastructure capital projects.

| 2023 Infrastructure Capital Projects Summary | | | |
|---|---|---|---|
| Project Name | Budget Request | Project Costs to Date | Project Status |
| South Park Lake Road Overlay 6.4km | 1,830,000 | $ 4,564 | In the preliminary design phase. |
| Rave Industrial Park Infrastructure Upgrades - Phase 2 (Final) 1.1km | 3,600,000 | $ - | In the detailed design and tender phase. |
| Range Road 21-1 Reconstruction (McNally Road) 1.7km | 2,160,000 | $ - | In the preliminary design phase. |
| Lethbridge County/Coaldale Regional Water Supply Study | 200,000 | $ 8,472 | In the preliminary design phase. |
| Local Bridge Replacement - 79589 | 300,000 | $ - | In the request for proposal phase. |
| Local Bridge Replacement - 70758 | 30,000 | $ - | In the request for quotation phase. |
| | $ 8,120,000 | | |
| **MARKET ACCESS NETWORK PROGRAM** | | | |
| Calcium Base Stabilization Debt Repayment | 705,220 | $ 195,212 | Payments are made throughout the year. |
| Market Access Network - Reserve Transfer | 1,444,780 | $ - | This is a year end transfer entry. |
| **TOTAL FUNDING PROGRAM** | $ 10,270,000 | | |
| **CARRY FORWARD CAPITAL PROJECTS** | | | |
| Malloy Drain Phase 2B | 340,000 | $ - | In the environmental & climate assessment phase |
| Iron Springs Road Improvements | 1,510,000 | $ 592,103 | Winter shutdown, will re-commence construction in spring |
| Lafarge Road Realignment | 600,000 | $ 5,637 | On hold pending further investigation |
| Bridge File #79770 | 350,000 | $ 19,613 | Construction complete, in warranty phase. Awaiting final invoicing. |
| Horsefly Spillway Drainage | 890,000 | $ 888,910 | In the construction phase. Anticipate completion by April 2024. |
| Elevator Upgrades | 120,000 | $ - | In the material procurement and pre-construction phase. |
| Financial Software Conversion | 200,000 | $ 106,531 | Conversion is ongoing with anticipated completion |
| | 4,010,000 | $ 1,612,794 | |

## *Finance & Administration*

The Finance & Administration Department has spent the majority of the first quarter working preparing the Annual Financial Statements for the County, Waste and Water Commissions. The Audit took place in March with the financial statements being presented for approval in April.

In additional to year end preparation, the department has also been working on the following activities:

- Working with the Municipal Intern on various aspects of the intern workplan
- Configuration and training of various modules within the new software program is ongoing. This is a time consuming detailed process that requires the coordinated effort of many staff members.
- Accounts receivable and payables are processed regularly for invoicing and payment.
- 15% Tax Penalty was levied on all outstanding balances on February 1st h in the amount of $520,514.48. Much of this balance is related to outstanding oil and gas company taxes. Although all efforts continue to be made the

County has made a provision as part of the year end process for these outstanding accounts in the case that the County cannot fully collect.

- Utility bills have been levied for January – March. The total revenues for water, wastewater and garbage sales to date is $804,659.80 (meter readings used are based on the previous month's use).
- Payroll was also busy with yearend preparation, configuring the pay codes for software conversion, updating payroll tax rates as well as updating all new hire information within the payroll system.

## *Information Technology (IT)*

The IT Department manages and maintains all of the County's phones and computer related hardware and software as well as all Audio-Visual equipment. Throughout the year the department is busy assisting staff with IT support, equipment repairs, software upgrades and purchasing and installing scheduled equipment replacements.
The department has also been working on the following projects:

- Cyber security is the number one priority for the Information Technology Department, this is ongoing and highly guarded. Things like identity theft, malware (malicious software), and fraud emails are on the rise. The County is vigilant in its efforts.
- Employee Corporate Mobility Plan:
  - The existing contract expired, and the decision was made to move with a new vendor
  - Coordinated all employees and Council to be switched from the existing vendor to the new vendor
- Records Management:
  - Land files transferred to WCD Connect in Calgary for scanning.
  - This is a major undertaking and will span across several months and training is ongoing.
- Financial Software Conversion:
  - The conversion is still in progress and staff is continually being trained. The final go live date is expected to be in the last quarter of this year, however various modules will be active and in use prior to that.
- New Network Copiers and Printers installed at both the Lethbridge Office and Picture Butte Shops
- Ongoing Technology Support, Network Maintenance, Security Testing.

## *Community Services*

The Community Services Department remains busy providing assistance to all departments, updating policies, working on Planning and Development items and Economic Development related matters.
Some additional activities include:

- Communications has been working on the Winter edition of the County Connection, Spring Edition of the Rural Living & Ag Extension in conjunction with the AG Services Department and the monthly County Crier newsletters in addition to preparing all public service announcements, managing social media and the website, as well as other communication projects as required.
- The County has recently partnered with the University of Lethbridge on renewable energy, transition, sustainability research being completed by three PhD students.
- A Request for Proposal was issued for the purpose of developing an Economic Development Strategic Plan.
- An updated report on the Economic Impact of Agriculture in the County was completed in the first quarter.
- In conjunction with the LINK Pathway Committee, Administration assisted in the presentation for the approval of Phase 2 of the project.

## *Planning & Development*

A thorough quarterly report of the Planning & Development Department for the period ending March 31st was provided to Council at the April 20th County Council meeting. Below are a few highlights from the report:

- The Intermunicipal Development Plan with the Town of Coaldale was approved in March, as well as the Industrial-Commercial Land Use Strategy and the Annual Internal Review for Alberta Safety Codes.
- 59 development permit applications have been received, with 49 development permits issued and 1 refused to date. Of those 15 were residential, 16 accessory buildings, 8 commercial/industrial, 5 agriculture, 1 sign and 1 miscellaneous.
- Building permits issued include: 19 Building Permits, 63 Electrical Permits, 35 Gas, 19 Plumbing, and 1 private septic disposal system.
- County Council acts as the Subdivision Authority approved 5 subdivisions between January and March, with no appeals to date.
- The County has received $14,211.61 in revenue from Park Enterprises for the issuance of Safety Codes Permits and $21,243 in Development Permits and Misc. Revenues.

## *Emergency Services*

The Emergency Services Department financial summary includes all of the CPO Activities, Fire revenues, fire agreement and Policing Costs. Fire services revenues earned to date is $49,886.15 with fire services contracted out paid to the municipalities on a quarterly basis.

***Fire Services***

Responses in the County by Fire Departments for January – March 2023:

| | |
|---|---|
| City of Lethbridge | 3 |
| Town of Coaldale | 53 |
| Town of Coalhurst | 29 |
| Town of Nobleford (est. awaiting final reports) | 11 |
| Town of Picture Butte | 22 |

Below is a listing of the Manager of Fire Services activities:

- Attended 30 emergency incidents, 8 business inspections, 15 plans reviews, 7 fire investigations.
- Regional Emergency management grant received in the amount of $200,000.
- Fire training grant received in the amount of $4,700.
- Hired 2 Fire Prevention officers in coordination with Coaldale.
- Completed agreement with Coaldale & Coalhurst to expand their primary response area to city limits.
- First due mostly functional (all in 1 response and RMS system)
- Built fire inspection forms in new reporting program, First Due
- Started building pre-plans for businesses and points of interest in the County.
- Completed volunteer fire fighter directive.

- The Manger of Fire Services has also attended the following meetings in the last quarter; Alberta fire chiefs zone meeting, Alberta fire training officers' meetings, IDP county and city and is involved with the policy review committee.

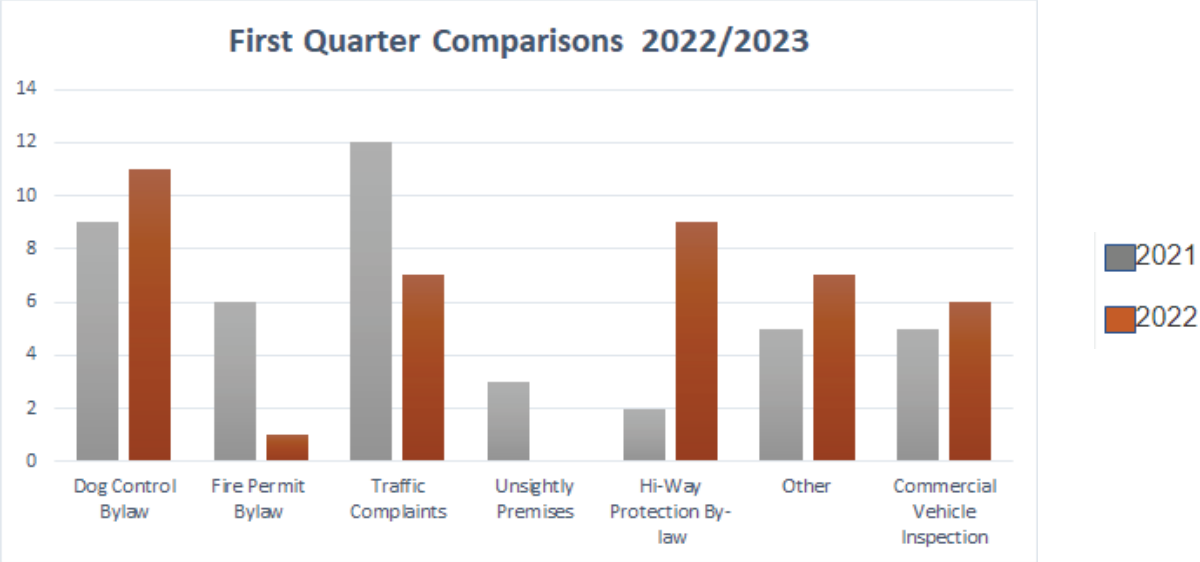
Item currently in progress include:

- Working on aid agreement with city
- Building level of service document to take to council.
- Establishing rural water source points around county
- Beginning process of new contracts with contracted departments
- Attended

***Community Peace Officer (CPO)***

Lethbridge County has one full-time CPO who uses education and enforcement to gain compliance on a variety of Lethbridge County Bylaws. The CPO is also authorized to enforce the Traffic Safety Act and regulations under the Act.

The Community Peace Officer has prepared a quarterly report for the period ending March 31st for the May 4th County Council meeting. Below is a chart of the first quarter CPO activities compared to the previous year for information:




To date $45,332.00 of fines have been issued by the CPO, the County will receive approximately 50% of this amount. Revenues received from fines as of March 31st are $ 21,451.13.

## *Provincial Updates*

On behalf of the County, administrative staff are continually researching and looking for grant funding opportunities that will assist the County with capital projects.

**Municipal Sustainability Initiative (MSI) Grant Funding**

The province has notified that the MSI Grant funding stream will end in 2023-24 and will be replaced with the Local Government Fiscal Framework (LGFF) beginning in 2024-25. The LGFF will include $722 million in capital funding legislated under the Local Government Fiscal Framework Act and non-legislated operating funding ($382 million to Calgary and Edmonton with $340 million to other Alberta Municipalities). Municipal Affairs has noted that, "The change from MSI to LGFF provides an opportunity to seek input on the details of the new program, including the allocation formula and program administration. The Government of Alberta has engaged with local governments to seek their input in these areas. A public announcement of the allocation formula and program administration is anticipated later in 2023.No funding formula or program design has been announced as of yet, it is hopeful that an announcement will be made in early 2023".

The 2023 MSI allocations have been provided and the County will receive $1,388,843 in Capital funding (the same amount as in 2022) and $210,780 in operating grant funds (which doubled from the 2022 amount of $105,390).

**Canada Community Building Fund (CCBF) (Formerly Gas Tax Fund) Grant Funding**

A preliminary allocation for 2023 has been provided, the 2023 CCBF funding anticipated for the County is $648,115, which is up slightly from the 2022 allocation of $620,413. (2021 allocation was $619,899 plus top-up of $592,320). No information regarding Lethbridge County's 2023 allocation amount has been made as of yet.

**Local Municipal Initiative (LMI) Grant Funding**

Lethbridge County was notified in early April 2023 that the County application through the Local Municipal Initiative (LMI) Grant for funding of the Park Lake Road Rehabilitation project was approved, and the grant will fund 75% of the eligible project costs up to a maximum of $1,370,754. The total project cost was approved in the budget for $1,830,000, this funding announcement frees up reserve dollars for other capital projects.

*Grant Summary*

# Lethbridge County
# GRANTS SUMMARY
## as at March 31, 2023

| | Budget As approved | Grant Approved | Funds Received | Comments |
|---|---|---|---|---|
| **ADMINISTRATION & FINANCE** | | | | |
| MSI Operating - Asset Retirement Obligation-PSAB | 25,000 | | | Submission of Spending Plan no longer required |
| **INFORMATION TECHNOLOGY** | | | | |
| MSI OP- Records Management Document Scanning | 75,000 | | | Submission of Spending Plan no longer required |
| **INFRASTRUCTURE** | | | | |
| MSI-OP Shaugnessy Wastewater Lagoon Review | 21,000 | | | Submission of Spending Plan no longer required |
| MSI OP - Diamond City Inflow and Infiltration Study | 38,000 | | | Submission of Spending Plan no longer required |
| MSI OP - Iron Springs Treated Water Reservoir Structural | 16,000 | | | Submission of Spending Plan no longer required |
| **INFRASTRUCTURE** | | | | |
| ACP - Lethbridge County/Coaldale Regional Water Supply Study | 200,000 | Y | | Approved project |
| FGTF-Rave Industrial Park Infrastructure Upgrades-Ph2 (Final) | 2,000,000 | Y | 2,000,000 | Approved project |
| MSI - Rave Industrial Park Infrastructure Upgrades-Ph2 (Final) | 540,000 | Y | | Approved project |
| MSI-BMTG Road Rehabilitation | 248,950 | N | | Project in review |
| **TOTAL** | **$ 3,163,950** | | **$ 2,000,000** | |

| | C/F to 2023 | Approved | Received | |
|---|---|---|---|---|
| MSI - 8 Mile Lake Basin & Battersea Drain - CAP 8842 | 173,389.76 | Y | 235,000.00 | C/F to 2023 |
| MSI - Rave Infrastructure Upgrades-Eng. - CAP7711 | 107,714.00 | Y | 160,000.00 | C/F to 2023. Project tied with Hwy 3 Corridor. |
| MSI - Shaughnessy Ph4&5 - Eng & Land Purchase - CAP 12296 | 7,310.00 | y | 135,000.00 | C/F to 2023 |
| MSI - Malloy Phase 2B-CAP 13395 | 340,000.00 | Y | 340,000.00 | C/F to 2023 |
| MSI - Horsefly Spillway | 890,000.00 | Y | 890,000.00 | C/F to 2023 |
| MSI - Rge Rd 21-1 Overlay (Corteva Road) | 110,478.65 | Y | 550,000.00 | C/F to 2023 |
| MSI - Iron Springs Rd Improvements | 917,896.73 | Y | 1,510,000.00 | C/F to 2023 |
| MSI - Lafarge Road Re-Alignment | 594,363.50 | Y | 600,000.00 | C/F to 2023 |

| | Additional Grant Funds | Approved | Received | |
|---|---|---|---|---|
| ACP - Municipal Internship - Finance Officer | 60,000 | Y | 60,000.00 | Funds received-August 3, 2022 |
| MSI OP - Research & Dev. Study - UofL & Siksika | 18,252 | Y | | Submission of Spending Plan no longer required |
| MSI OP - Economic Dev. Impact Study | 40,000 | Y | | Submission of Spending Plan no longer required |
| Summer Jobs Grant | | N | | Project in review |
| STIP-LRB - Bridge File #79589 | 350,000 | N | | Project in review |
| STIP-LMI - Park Lake Rehabilitation Project | 1,827,673 | N | | Project in review |

***Y*** *- Yes, project is approved.*
***N*** *- No, awaiting for approval.*
***D*** *- Declined.*
***P*** *- Pending.*
***C*** *- Cancelled.*

## *Investment Summary*

*As of March 31, 2023*

| DATE INVESTED | DATE MATURITY | PURCHASE PRICE | MATURITY VALUE | Monthly Interest | Total Interest | Interest Rate | Type |
|---|---|---|---|---|---|---|---|
| April 14, 2022 | April 15, 2023 | 2,709,425.27 | 2,758,736.81 | 4,188.10 | 49,311.54 | 1.820% | Canaccord |
| February 27, 2023 | February 27, 2024 | 1,031,150.00 | 1,050,742.29 | 1,664.00 | 19,592.29 | 4.750% | Canaccord |
| October 19, 2022 | October 19, 2023 | 2,036,200.00 | 2,097,517.51 | 5,207.79 | 61,317.51 | 4.450% | Servus Credit |
| December 31, 2022 | December 31, 2023 | 34,409.19 | 35,145.19 | 62.51 | 736.00 | 4.050% | CIBC WoodGundy |
| December 31, 2022 | December 31, 2023 | 6,437,326.80 | 6,561,466.01 | 10,344.93 | 124,139.21 | 2.258% | CIBC WoodGundy |
| December 31, 2022 | January 3, 1900 | 3,407,400.00 | 3,477,149.31 | 5,812.44 | 69,749.31 | 2.139% | CIBC WoodGundy |
| September 30, 2022 | September 30,2023 | 5,000,000.00 | 5,105,000.00 | 8,750.00 | 105,000.00 | 2.139% | Raymond James |
| January 11, 2023 | January 11, 2024 | 2,025,545.21 | 2,141,001.28 | 9,621.34 | 115,456.07 | 5.700% | Raymond James |
| September 30, 2022 | September 30,2023 | 3,000,000.00 | 3,153,000.00 | 12,750.00 | 153,000.00 | 5.100% | Raymond James |
| | | **25,681,456.47** | | | | | |
| RBC Savings Account | | 3,056,021.16 | 3,068,214.94 | 12,193.78 | 143,571.87 | 4.698% | RBC |
| | **TOTALS** | **28,737,477.63** | **29,447,973.34** | **70,594.90** | **841,873.80** | | |
| *Land Trust Funds* | | | | | | | |
| *May 7, 2022* | *May 7, 2023* | *255,525.18* | *262,168.83* | *564.26* | *6,643.65* | *2.600%* | *CWB GIC* |

*Below is an investment portfolio update from CIBC Wood Gundy*

CIBC HOBSON CHAHAL ADVISORY GROUP
WOOD GUNDY

# Lethbridge County

*Portfolio Update and Key Economic Themes*

**Key Economic Themes:**

- Central banks hiked interest rates aggressively over the past year, taking the Canada overnight rate from 0.25% all the way up to 4.50%
- With inflation showing signs of easing in response to easing supply chain issues and weakening consumer demand, we expect the Bank of Canada to pause rate hikes for now
- The bond market is already pricing in rate-cuts as soon as later in 2023/early 2024. This is due to the view that rates this high may trigger a mild recession
- Alberta economy anticipated to outperform all other provinces in 2023, largely due to strong commodity prices
- A mild recession is highly possible given the dramatic rise in interest rates (largest on records dating back to 1962) and Canadians sensitivity to higher debt costs

**Portfolio Management Update**

- The yield curve remains inverted due to the above outlook for interest rates. This means shorter-term bonds have higher yields than longer-term bonds.
- The yield curve inverts when market participants expect rates to be lower in the future, so they lock-in rates at these levels for longer-term bonds
- Equity markets over the past year have been extremely challenging and posted negative returns across the board
- In addition due to rising interest rates, the bond market also has negative returns over the past year

**Portfolio Update**

`- The County`s portfolio remains fully compliant with the MGA and Investment Policy and holds only fully-guaranteed bonds and notes
- The bond ladder remains well-diversified with staggered maturities across a wide range of issuers
- The largest impact to performance over the past year has been the negative return environment for both equities and fixed-income as interest rates rose at a historic pace
- This presents as a lower performance number as the prices of the bonds fall in the interim. We remain unconcerned as performance will 'snap back' as bonds approach maturity
- Our forecast is that bond yields have likely peaked and should come down in the future. This creates opportunities for excess-capital gains in the portfolio
- Our best advice is to remain fully invested throughout these difficult markets, and stay disciplined with the long-term strategy
- This interim volatility is not unique to Lethbridge County. Of the 70+ municipalities we manage investments for, these challenges have been across all accounts
`- The focus should be on bottom-line investment revenue which will increase as we reinvest at rates north of 5.00%. This should materially increase over the coming years

Given the return nature of all the investments are fixed, the market values will fluctuate with changing market interest rates in the interim. The impact to the value is just short-term volatility and the prices will naturally accrue higher as the investments approach maturity or when they are redeemed with interest. The rising rate environment over the last year has created a lot of volatility; the most important element is that this is just noise as all investments have principal guarantees at maturity. It's counterintuitive but the rising rate environment is a positive for the portfolio over the long-term as we can now reinvest cashflows and maturities at materially higher rates than what we had forecast. When assessing these portfolios, our focus is always on yield and what are the returns we can expect if we continue to hold. We continue monitoring the portfolio for opportunities to reinvest cash flows and maturities at higher rates.

*This report is not an official record. The information contained in this report is to assist you in managing your investment portfolio recordkeeping and cannot be guaranteed as accurate for income tax purposes. In the event of a discrepancy between this report and your client statement or tax slips, the client statement or tax slip should be considered the official record of your account(s). Please consult your tax advisor for further information. Information contained herein is obtained from sources believed to be reliable, but is not guaranteed. Some positions may be held at other institutions not covered by the Canadian Investor Protection Fund (CIPF). Refer to your official statements to determine which positions are eligible for CIPF protection or held in segregation. Calculations/projections are based on a number of assumptions; actual results may differ. Yields/rates are as of the date of this report unless otherwise noted. Benchmark totals on performance reports do not include dividend values unless the benchmark is a Total Return Index, denoted with a reference to 'TR' or 'Total Return'. CIBC Wood Gundy is a division of CIBC World Markets Inc., a subsidiary of CIBC.*

- *Prepared for: Lethbridge County*
- *Prepared by: James Hobson, CFA and Charet Chahal, CFA*
- *Date: Apr 24, 2023*

# Lethbridge Coaldale 4-H Beef Club

95037 Range Road 211
Lethbridge County, AB T1J 5P3

Lethbridge County,

The Lethbridge-Coaldale 4-H Beef Club would like to invite you and your Administration to our 100th Anniversary Gala being held Saturday June 10, 2023 at the New Agrifood Hub in Lethbridge.

The doors open at 5 and the dinner starts at 6:30. Tickets are available on line and a link can be found on the Agrifood Hub website under events or here (QR Code at the bottom of this letter). Tickets are $75.00 each or $550.00 for a table of 8.

The club started in 1923 and held its first show at the Lethbridge Exhibition. The first club champion was from Coaldale. Over the years the club name changed starting with Lethbridge-Coaldale Club before joining 4-H and becoming the Lethbridge-Coaldale 4-H Beef Club.

4-H is the largest youth organization in Alberta. Members learn leadership and communication skills and are taught to be good citizens in their community.

Our members have represented the club at District, Regional, Provincial, National and International events in areas such as Public Speaking and Multi Species Judging as well as being ambassadors and representatives for their communities and 4-H. They have been proud to represent Lethbridge and Coaldale as well as the County.

They have been great ambassadors for our region and aren't shy to tell anyone how great our community is to anyone who will listen. Many community members are themselves, alumni to this amazing club and organization, including me.

The members and Alumni are looking forward to celebrating this milestone. The Club is one of the few consecutively running clubs in existence. Their long standing relationship with the Exhibition is also unique not only to Alberta but also to Canada.

We look forward to celebrating with the community that has supported the club for the past 100 years.

Thank you in advance for your interest and support of this once in a lifetime event.

Sincerely,

Kim Daniels
Club Volunteer
Co-Chair of Gala Committee

ALBERTA
CULTURE

*Office of the Minister*

Reeve Tory Campbell
Lethbridge County
100, 905 - 4 Avenue South
Lethbridge AB  T1J 4E4

Dear Reeve Campbell:

As Minister of Culture responsible for sport in Alberta, I am pleased to invite your municipality or Band Council to submit a bid to host either the 2026 Alberta Winter Games or the 2026 Alberta Summer Games.

I encourage your municipality or Band Council to consider this invitation and the many benefits that can result from hosting these events. The 2020 Alberta Winter Games and 2018 Alberta Summer Games provided an economic impact of approximately $2.1 million to each of the host regions. A successful host municipality or Band Council is offered the opportunity to showcase its community to participants from all regions of the province, along with numerous spectators and special guests.

Municipalities or Band Councils with populations of less than 10,000 are encouraged to collaborate with neighbouring municipalities to submit a joint bid, or consider the smaller, modified games format. The municipality or Band Council awarded a 2026 Alberta Games will receive a $420,000 operating grant.

A letter of interest to host either the 2026 Alberta Winter or Summer Games, together with a letter of support from Municipal or Band Council must be received by June 30, 2023. Completed bids must be received by August 31, 2023.

Bid guidelines and staff consultation are available by contacting Suzanne Becker, Sport, Physical Activity and Recreation Branch, Ministry of Culture, at 403-297-2709 (toll-free by first dialing 310-0000) or suzanne.becker@gov.ab.ca.

Sincerely,

Jason Luan
Minister

Room 132 Legislature Building, 10800 - 97 Avenue, Edmonton, Alberta  T5K 2B6  Canada  Telephone 780-422-3559

57977

Classification: Protected A




Canada's Agriculture Destination

We at Farming for Tomorrow are proud to produce a once in a lifetime commemorative publication to recognize not only the past 125 years of success from Lethbridge Exhibition & Trade, but usher in a new era of development for the Lethbridge community.

For 125 years Lethbridge Exhibition & Trade has worked to foster an environment of community growth and prosperity for Lethbridge and its inhabitants. Now, the city is also home to a brand new, state of the art event venue: the Agri-Food Hub & Trade Center.

The advent of this facility ensures that Lethbridge remains forefront in economic and community development in all areas of life, from Agriculture to Arts & Entertainment.

We'd like to extend an invitation to join us in a shared celebration of this incredible anniversary and grand opening and cement yourself in the local history!

## Why advertise?

- 5000 editions of this once in a lifetime publication will be shared with partners, shareholders, and community members
- Become a part of Lethbridge's legacy
- Celebrate continued community growth

## Rates

| | |
|---|---|
| DPS | $5590 |
| Full Page | $3410 |
| Half Page (Horizontal) | $1825 |
| Quarter Page (Vertical) | $1180 |

**Ad Space Deadline** June 26
**Ad Copy Deadline** July 3



**Nancy Bielecki** - Advertising Executive
**P:** 587.774.7618
**E:** nancy@farmingfortomorrow.ca