Planning Department Development Application Form

Complete Application

A complete development application consists of the following:

1. A completed, signed, and notarized application form
2. Supporting information adequate to illustrate your proposal as indicated in **Section H** of this application form
3. Written authorization from the registered owner of the subject lands where the applicant is not the owner as per Section N
4. Cash, debit, credit or cheque payable to Norfolk County in the amount set out in the user fees By-Law that will be accepted and deposited once the application has been deemed complete.

Pre-Submission Consultation:

Norfolk County requires a Pre-Consultation Meeting for all applications; however, minor applications may be exempted depending on the nature of the proposal. The purpose of a Pre-Consultation Meeting is to provide the applicant with an opportunity to present the proposed application, discuss potential issues, and for the Norfolk County and Agency staff to identify the application requirements. Application requirements, as detailed in the Pre-Consultation Meeting Comments, are valid for one year after the meeting date.

Development Application Process

Once an application has been deemed complete by a Planner, Norfolk County staff will circulate the application to adjacent landowners, public agencies, and internal departments for comment. The time involved in application processing varies depending on its complexity, acceptability to the other agencies, and statutory Planning Act decision time-frames.

Payment is required once your application is deemed complete. Pre-payments will not be accepted.

Norfolk County collects personal information submitted through this form under the Municipal Freedom of Information and Protection Act's authority. Norfolk County will use this information for the purposes indicated or implied by this form. You can direct questions about collecting personal information to Norfolk GIS Services at NorfolkGIS@norfolkcounty.ca.

Additional studies required for the complete application shall be at the applicant's sole expense. Sometimes, peer reviews may be necessary to review particular studies at the applicant's expense. In these caseds, Norfolk County staff will select the company to complete the peer review.

Norfolk County will refund the original fee if applicants withdraw their applications before circulation. If Norfolk County must recirculate your drawings, there will be an additional fee. If Norfolk County must do more than three reviews of engineering drawings due to revisions by the owner or failure to revise engineering drawings as requested, Norfolk County will charge an additional fee. Full refunds are only available before Norfolk County has circulated the application.

Notification Sign Requirements

For public notification, Norfolk County will provide you with a sign to indicate the intent and purpose of your development application. It is your responsibility to:

1. Post one sign per frontage in a conspicuous location on the subject lands.
2. Ensure one sign is posted at the front of the subject lands at least three feet above ground level and not on a tree.
3. Notify the Planner when the sign is in place.
4. Maintain the sign until the development application is finalized and, after that, remove it.

Contact Us

For additional information or assistance completing this application, please contact a Planner at 519-426-5870 or 519-875-4485 extension 1842 or planning@norfolkcounty.ca. Please submit the completed application and fees to the attention of the Planning Department at 185 Robinson Street, Suite 200, Simcoe, ON N3Y 5L6.

For Office Use Only:

File Number		Public Notice Sign	
Related File Number		Application Fee	
Pre-consultation Meeting		Conservation Authority Fee	
Application Submitted		Well & Septic Info Provided	
Complete Application		Planner	

Check the type of planning application(s) you are submitting.

- ☐ Official Plan Amendment
- ☐ Zoning By-Law Amendment
- ☐ Temporary Use By-law
- ☐ Draft Plan of Subdivision/Vacant Land Condominium
- ☐ Condominium Exemption
- ☒ Site Plan Application
- ☐ Extension of a Temporary Use By-law
- ☐ Part Lot Control
- ☐ Cash-in-Lieu of Parking
- ☐ Renewable Energy Project or Radio Communication Tower

Please summarize the desired result of this application (for example, a special zoning provision on the subject lands to include additional use(s), changing the zone or official plan designation of the subject lands, creating a certain number of lots, or similar)

This application is being submitted for the purpose of the site plan approval of 2 proposed buildings for Bilger Slinger Services Inc.. This application also includes a gravel lot extension, 1 future storage building, and a stormwater management facility (wet pond). This propoerty is existing and is already zoned correctly for the development and therefore no special zoning changes are requested. The existing shop and showroom is also to remain as part of this application.

Property Assessment Roll Number: 54102007600

A. Applicant Information

Name of Owner Bilger Slinger Services Inc. (Rob Bilger)

Address 480 ON-3

Town and Postal Code Tillsonburg

Phone Number 519-688-3315

Cell Number

Email rob.bilger@icloud.com

Name of Applicant Peter Penner

Address 261 Broadway

Town and Postal Code Tillsonburg

Phone Number 519-688-1000

Cell Number 519-842-0107

Email ppenner@cjdleng.com

Name of Agent N/A

Address N/A

Town and Postal Code N/A

Phone Number N/A

Cell Number N/A

Email N/A

Unless otherwise directed, Norfolk County will forward all correspondence and notices regarding this application to both owner and agent noted above.

☒ Owner ☐ Agent ☒ Applicant

Names and addresses of any holder of any mortgagees, charges or other encumbrances on the subject lands:

B. Location, Legal Description and Property Information

1. Legal Description (include Geographic Township, Concession Number, Lot Number, Block Number and Urban Area or Hamlet):
   Part of Lot 18, Concession 2, Geographic Township of Middleton

   Municipal Civic Address: 494 ON-3, Courtland, Ontario

   Present Official Plan Designation(s): Agricultural

   Present Zoning: Rural Commercial Zone

2. Is there a special provision or site specific zone on the subject lands?

   ☐ Yes ■ No If yes, please specify corresponding number:

3. Present use of the subject lands:
   The site is currently used as a retail location and shop for Blue West Equipment Inc.

4. Please describe **all existing** buildings or structures on the subject lands and whether they will be retained, demolished or removed. If retaining the buildings or structures, please describe the type of buildings or structures, and illustrate the setback, in metric units, from the front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:
   There are currently 2 existing buildings on the property. A retail showroom and shop for Blue West Equipment Inc. is the main building on the property and will remain as a part of this development. There is also a metal storage building which will be removed as a result of this development.

5. If an addition to an existing building is being proposed, please explain what it will be used for (for example: bedroom, kitchen, or bathroom). If new fixtures are proposed, please describe.
   No additions are proposed for the existing building at this time.

6. Please describe **all proposed** buildings or structures/additions on the subject lands. Describe the type of buildings or structures/additions, and illustrate the setback, in metric units, from front, rear and side lot lines, ground floor area, gross floor area, lot coverage, number of storeys, width, length, and height on your attached sketch which must be included with your application:
   A Site Plan has been included in the application that defines all of the proposed buildings. There are 2 proposed building at this site, a bay shop for the trucks and a covered storage building that will house the trucks overnight to keep them out of the elements.

7. Are any existing buildings on the subject lands designated under the *Ontario Heritage Act* as being architecturally and/or historically significant? Yes ☐ No ■

   If yes, identify and provide details of the building:

   N/A

8. If known, the length of time the existing uses have continued on the subject lands:

   Blue West was established originally in 2007

9. Existing use of abutting properties:

   Both are zoned agricultural and contain single detached residential dwellings.

10. Are there any easements or restrictive covenants affecting the subject lands?

    ☐ Yes ■ No If yes, describe the easement or restrictive covenant and its effect:

C. Purpose of Development Application

Note: Please complete all that apply.

1. Please explain what you propose to do on the subject lands/premises which makes this development application necessary:

   Construct 2 buildings and 1 future building. Extend and regrade existing gravel parking area. Construct new stormwater management facility and connect the outlet to the existing Ronson Municipal Drain - Section B. Construct storm sewers that collect water from the parking area and direct it towards the stormwater management facility.

2. Please explain why it is not possible to comply with the provision(s) of the Zoning By-law/and or Official Plan:

   N/A

3. Does the requested amendment alter all or any part of the boundary of an area of settlement in the municipality or implement a new area of settlement in the municipality? ☐ Yes ■ No If yes, describe its effect:

   N/A

4. Does the requested amendment remove the subject land from an area of employment? ☐ Yes ■ No If yes, describe its effect:

   N/A

5. Does the requested amendment alter, replace, or delete a policy of the Official Plan?
☐ Yes ■ No If yes, identify the policy, and also include a proposed text of the policy amendment (if additional space is required, please attach a separate sheet):
N/A

6. Description of land intended to be severed in metric units:
Frontage: N/A
Depth: N/A
Width: N/A
Lot Area: N/A
Present Use: N/A
Proposed Use: N/A
Proposed final lot size (if boundary adjustment): N/A
If a boundary adjustment, identify the assessment roll number and property owner of the lands to which the parcel will be added: N/A

Description of land intended to be retained in metric units:
Frontage: N/A
Depth: N/A
Width: N/A
Lot Area: N/A
Present Use: N/A
Proposed Use: N/A
Buildings on retained land: N/A

7. Description of proposed right-of-way/easement:
Frontage: N/A
Depth: N/A
Width: N/A
Area: N/A
Proposed use: N/A

8. Name of person(s), if known, to whom lands or interest in lands to be transferred, leased or charged (if known):

9. **Site Information**	**Zoning**	**Proposed**
Please indicate unit of measurement, for example: m, m^2 or %		
Lot frontage	30.0	163.5m²
Lot depth	N/A	N/A
Lot width	N/A	N/A
Lot area	1860m²	27650m²
Lot coverage	70%	12.3%
Front yard	13.0m	16.9m
Rear yard	0m* (Setback from Rail)	2.0m
Left Interior side yard	3.0m	3.0m
Right Interior side yard	3.0m	30.0m
Exterior side yard (corner lot)	13.0m	N/A
Landscaped open space	5%	38.8%
Entrance access width	9.0m	9.0m
Exit access width	9.0m	9.0m
Size of fencing or screening	N/A	N/A
Type of fencing	N/A	N/A
10. Building Size		
Number of storeys	N/A	N/A
Building height	11.0m	7.4m
Total ground floor area	40m² (min)	1161.3m²
Total gross floor area	40m² (min)	1161.3m²
Total useable floor area	N/A	N/A
11. Off Street Parking and Loading Facilities		
Number of off street parking spaces	38	38
Number of visitor parking spaces	N/A	N/A
Number of accessible parking spaces	2	2
Number of off street loading facilities	0	0

12. Residential (if applicable)

Number of buildings existing: N/A

Number of buildings proposed: N/A

Is this a conversion or addition to an existing building? ☐ Yes ■ No

If yes, describe: N/A

Type	Number of Units	Floor Area per Unit in m2
Single Detached	N/A	N/A
Semi-Detached	N/A	N/A
Duplex	N/A	N/A
Triplex	N/A	N/A
Four-plex	N/A	N/A
Street Townhouse	N/A	N/A
Stacked Townhouse	N/A	N/A
Apartment - Bachelor	N/A	N/A
Apartment - One bedroom	N/A	N/A
Apartment - Two bedroom	N/A	N/A
Apartment - Three bedroom	N/A	N/A

Other facilities provided (for example: play facilities, underground parking, games room, or swimming pool):

13. Commercial/Industrial Uses (if applicable)

Number of buildings existing: 2

Number of buildings proposed: 2

Is this a conversion or addition to an existing building? ☐ Yes ■ No

If yes, describe:

Indicate the gross floor area by the type of use (for example: office, retail, or storage):

Proposed Bay Shop (1161.3m²)

Proposed Covered Truck Storage (1161.3m²)

Future Storage (223m²) Existing Shop & Showroom (865.1m²)

Seating Capacity (for assembly halls or similar): N/A

Total number of fixed seats: N/A

Describe the type of business(es) proposed: Stone Slinger Services

Total number of staff proposed initially: 27

Total number of staff proposed in five years: 25

Maximum number of staff on the largest shift: 7

Is open storage required: ☒ Yes ☐ No

Is a residential use proposed as part of, or accessory to commercial/industrial use?

☐ Yes ☒ No If yes please describe:

N/A

14. Institutional (if applicable)

Describe the type of use proposed: N/A

Seating capacity (if applicable): N/A

Number of beds (if applicable): N/A

Total number of staff proposed initially: N/A

Total number of staff proposed in five years: N/A

Maximum number of staff on the largest shift: N/A

Indicate the gross floor area by the type of use (for example: office, retail, or storage):

N/A

15. Describe Recreational or Other Use(s) (if applicable)

N/A

D. Previous Use of the Property

1. Has there been an industrial or commercial use on the subject lands or adjacent lands? ■ Yes ☐ No ☐ Unknown

   If yes, specify the uses (for example: gas station or petroleum storage):
   Equipment Retail and Shop

2. Is there reason to believe the subject lands may have been contaminated by former uses on the site or adjacent sites? ☐ Yes ■ No ☐ Unknown
3. Provide the information you used to determine the answers to the above questions:
   Discussions with current land owner on previous uses of the property.
4. If you answered yes to any of the above questions in Section D, a previous use inventory showing all known former uses of the subject lands, or if appropriate, the adjacent lands, is needed. Is the previous use inventory attached? ☐ Yes ■ No

E. Provincial Policy

1. Is the requested amendment consistent with the provincial policy statements issued under subsection 3(1) of the *Planning Act, R.S.O. 1990, c. P. 13*? ■ Yes ☐ No

   If no, please explain:

2. It is owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws or other agency approvals, including the Endangered Species Act, 2007. Have the subject lands been screened to ensure that development or site alteration will not have any impact on the habitat for endangered or threatened species further to the provincial policy statement subsection 2.1.7? ☐ Yes ■ No

   If no, please explain:
   There is no alteration to the proposed use of the site and therefore this was not required

3. Have the subject lands been screened to ensure that development or site alteration will not have any impact on source water protection? ☐ Yes ■ No

   If no, please explain:

   Not required as it is not in a well head protection zone

   Note: If in an area of source water Wellhead Protection Area (WHPA) A, B or C please attach relevant information and approved mitigation measures from the Risk Manager Official.

4. Are any of the following uses or features on the subject lands or within 500 metres of the subject lands, unless otherwise specified? Please check boxes, if applicable.

   Livestock facility or stockyard (submit MDS Calculation with application)

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Wooded area

   ☐ On the subject lands or ■ within 500 meters – distance 20m

   Municipal Landfill

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Sewage treatment plant or waste stabilization plant

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Provincially significant wetland (class 1, 2 or 3) or other environmental feature

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Floodplain

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Rehabilitated mine site

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Non-operating mine site within one kilometre

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Active mine site within one kilometre

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Industrial or commercial use (specify the use(s))

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Active railway line

   ☐ On the subject lands or ■ within 500 meters – distance 10m

   Seasonal wetness of lands

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Erosion

   ☐ On the subject lands or ☐ within 500 meters – distance _____

   Abandoned gas wells

   ☐ On the subject lands or ☐ within 500 meters – distance _____

F. Servicing and Access

1. Indicate what services are available or proposed:

Water Supply

- ☐ Municipal piped water
- ☐ Communal wells
- ■ Individual wells
- ☐ Other (describe below)

Sewage Treatment

- ■ Municipal sewers
- ☐ Communal system
- ■ Septic tank and tile bed in good working order
- ☐ Other (describe below)

Storm Drainage

- ■ Storm sewers
- ☐ Open ditches
- ☐ Other (describe below)

2. Existing or proposed access to subject lands:

- ☐ Municipal road
- ■ Provincial highway
- ☐ Unopened road
- ☐ Other (describe below)

Name of road/street: Ontario Highway 3

G. Other Information

1. Does the application involve a local business? ■ Yes ☐ No
   If yes, how many people are employed on the subject lands?

2. Is there any other information that you think may be useful in the review of this application? If so, explain below or attach on a separate page.

H. Supporting Material to be submitted by Applicant

In order for your application to be considered complete, **folded** hard copies (number of paper copies as directed by the planner) and an **electronic version (PDF) of the properly named site plan drawings, additional plans, studies and reports** will be required, including but not limited to the following details:

1. Concept/Layout Plan
2. All measurements in metric
3. Key map
4. Scale, legend and north arrow
5. Legal description and municipal address
6. Development name
7. Drawing title, number, original date and revision dates
8. Owner's name, address and telephone number
9. Engineer's name, address and telephone number
10. Professional engineer's stamp
11. Existing and proposed easements and right of ways
12. Zoning compliance table – required versus proposed
13. Parking space totals – required and proposed
14. All entrances to parking areas marked with directional arrows
15. Loading spaces, facilities and routes (for commercial developments)
16. All dimensions of the subject lands
17. Dimensions and setbacks of all buildings and structures
18. Location and setbacks of septic system and well from all existing and proposed lot lines, and all existing and proposed structures
19. Gross, ground and useable floor area
20. Lot coverage
21. Floor area ratio
22. Building entrances, building type, height, grades and extent of overhangs
23. Names, dimensions and location of adjacent streets including daylighting triangles
24. Driveways, curbs, drop curbs, pavement markings, widths, radii and traffic directional signs
25. All exterior stairways and ramps with dimensions and setbacks
26. Retaining walls including materials proposed
27. Fire access and routes
28. Location, dimensions and number of parking spaces (including visitor and accessible) and drive aisles
29. Location of mechanical room, and other building services (e.g. A/C, HRV)
30. Refuse disposal and storage areas including any related screening (if indoors, need notation on site plan)
31. Winter snow storage location

32. Landscape areas with dimensions
33. Natural features, watercourses and trees
34. Fire hydrants and utilities location
35. Fencing, screening and buffering – size, type and location
36. All hard surface materials
37. Light standards and wall mounted lights (plus a note on the site plan that all outdoor lighting is to be dark sky compliant)
38. Business signs (make sure they are not in sight lines)
39. Sidewalks and walkways with dimensions
40. Pedestrian access routes into site and around site
41. Bicycle parking
42. Architectural elevations of all building sides
43. All other requirements as per the pre-consultation meeting

In addition, the following additional plans, studies and reports, including but not limited to, **may** also be required as part of the complete application submission:

☐ Zoning Deficiency Form

☐ On-Site Sewage Disposal System Evaluation Form (to verify location and condition)

☐ Architectural Plan

☒ Buildings Elevation Plan

☐ Cut and Fill Plan

☐ Erosion and Sediment Control Plan

☒ Grading and Drainage Control Plan (around perimeter and within site) (existing and proposed)

☐ Landscape Plan

☐ Photometric (Lighting) Plan

☐ Plan and Profile Drawings

☒ Site Servicing Plan

☒ Storm water Management Plan

☐ Street Sign and Traffic Plan

☐ Street Tree Planting Plan

☐ Tree Preservation Plan

☐ Archaeological Assessment

☐ Environmental Impact Study

- ■ Functional Servicing Report
- ☐ Geotechnical Study / Hydrogeological Review
- ☐ Minimum Distance Separation Schedule
- ☐ Noise or Vibration Study
- ☐ Record of Site Condition
- ☐ Storm water Management Report
- ■ Traffic Impact Study – please contact the Planner to verify the scope required

Site Plan applications will require the following supporting materials:

1. Two (2) complete sets of the site plan drawings folded to 8½ x 11 and an electronic version in PDF format
2. Letter requesting that the Holding be removed (if applicable)
3. A cost estimate prepared by the applicant's engineer
4. An estimate for Parkland dedication by a certified land appraiser
5. Property Identification Number (PIN) printout

Standard condominium exemptions will require the following supporting materials:

- ☐ Plan of standard condominium (2 paper copies and 1 electronic copy)
- ☐ Draft condominium declaration
- ☐ Property Identification Number (PIN) printout

Your development approval might also be dependent on other relevant federal or provincial legislation, municipal by-laws or other agency approvals.

All final plans must include the owner's signature as well as the engineer's signature and seal.

I. Development Agreements

A development agreement may be required prior to site plan approval, subdivision and condominium applications. Should this be necessary for your development, you will be contacted by the agreement administrator with further details of the requirements including but not limited to insurance coverage, professional liability for your engineer, additional fees and securities.

J. Transfers, Easements and Postponement of Interest

The owner acknowledges and agrees that if required, it is their solicitor's responsibility on behalf of the owner, to disclose the registration of all transfer(s) of land and/or easement in favour of the County and/or utilities. Also, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner for the registration of postponements of any charges in favour of the County.

K. Permission to Enter Subject Lands

Permission is hereby granted to Norfolk County officers, employees or agents, to enter the premises subject to this application for the purposes of making inspections associated with this application, during normal and reasonable working hours.

L. Freedom of Information

For the purposes of the *Municipal Freedom of Information and Protection of Privacy Act*, I authorize and consent to the use by or the disclosure to any person or public body any information that is collected under the authority of the *Planning Act, R.S.O. 1990, c. P. 13* for the purposes of processing this application.

Owner/Applicant Signature — Date: 30 OCT 2024

M. Owner's Authorization

If the applicant/agent is not the registered owner of the lands that is the subject of this application, the owner(s) must complete the authorization set out below.

I/We Rob Bilger am/are the registered owner(s) of the lands that is the subject of this application.

I/We authorize Peter Penner to make this application on my/our behalf and to provide any of my/our personal information necessary for the processing of this application. Moreover, this shall be your good and sufficient authorization for so doing.

Owner — Date: 30 OCT 2024

Owner — Date

N. Declaration

I, PETER J. PENNER of NORFOLK COUNTY

solemnly declare that:

all of the above statements and the statements contained in all of the exhibits transmitted herewith are true and I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath and by virtue of *The Canada Evidence Act*.

Declared before me at:

Town of Tillsonburg

In County of Oxford

This 30th day of October

A.D., 20 24

Karla Cyr.

A Commissioner, etc.

Karla Suzanne Cyr, a Commissioner, etc.,
Province of Ontario,
for Cyril J. Demeyere Limited.
Expires March 21, 2025.

Owner/Applicant Signature

Pre-Consultation Meeting Notes

Date: June 7, 2023

Description of Proposal: The applicant proposes a Site Plan Amendment that would facilitate the development of a 1161 m2 warehouse that would replace a 456 m2 warehouse.

Property Location: 494 Hwy 3, Courtland

Roll Number: 541002007600

Please read all the information contained in this document, as it pertains to the requirements for future development planning applications. As a result of the information shared at the pre-consultation meeting dated June 7, 2023, the following applications and qualified professional documents / reports are required as part of a complete application. Failure to include all listed items with the application will deem the application incomplete. The County reserves the right to change, reduce or add requirements for a complete application, particularly if the submission does not match the proposal as reviewed during the pre-submission consultation meeting.

Please note that various fees are associated with each application and there are also costs for qualified professionals retained to complete various documents / reports. All requirements identified are minimum and determined as of the date of the pre-consultation meeting with the information available at that time. As the proposal proceeds and more information is made available, additional applications, studies, reports, etc. may be required.

The information contained in this document is applicable for a maximum of one (1) year from the date of meeting. If an application is not received within that time frame or any component of the proposal changes, a new pre-submission consultation meeting is required.

All applications are required to include information outlined in the Pre-submission consultation meeting notes; failure to include all items with the application submission without prior approval will necessitate a notice of incomplete application response by the County.

Before you submit your application, please contact the assigned Planner to arrange a pre-submission meeting to review the submission and confirm applicable fee.

As part of a complete application, a signed version of these meeting notes is required.

Proponent / Agent Name	Signature	Date

Attendance List

Proponent	Greg Eyre c/o Reid & Deleye
Community Development – Planning and Agreement	Mohammad Alam, Supervisor Development Lindsay King, Junior Planner Annette Helmig, Agreement and Development Coordinator
Building Department	Jonathan Weir, Building Inspector III Roxanne Lambrecht, Zoning Administrator
Reality Services	Karen Lambrecht, Corporate Services Generalist
Environment & Infrastructure Services – Development Engineering	Stephen Gradish, Development Technologist
Community Services – Fire	Katie Ballantyne, Community Safety Officer

Table of Contents

List of Application Requirements* and General Comments

Planning Department

Planning application(s) required to proceed	Required
Official Plan Amendment Application Choose an item.	
Zoning By-law Amendment Application Choose an item.	
Site Plan Application Choose an item.	X
Draft Plan of Subdivision Application	
Draft Plan of Condominium Application	
Part Lot Control Application	
Consent / Severance Application	
Minor Variance Application	

Removal of Holding Application		
Temporary Use By-Law Application		
Other - Click here to enter text.		
Planning requirements for a complete application The items below are to be submitted as part of the identified Planning Application(s). ** electronic/PDF copies of all plans, studies and reports are required**	**Required at OPA/ Zoning Stage**	**Required at Site Plan Stage**
Proposed Site Plan / Drawing		X
Planning Impact Analysis Report / Justification Report		
Environmental Impact Study Choose an item.		
Neighbourhood Plan (TOR (Terms of Reference) must be approved by the County)		
Agricultural Impact Assessment Report		
Archaeological Assessment		
Heritage Impact Assessment		
Market Impact Analysis		
Dust, Noise and/or Vibration Study		
MOE D-Series Guidelines Analysis		
Landscaping Plan		X
Elevation Plan		X
Photometrics (Lighting) Plan		X
Odour mitigation plan (in relation to Cannabis Production and Processing Facilities)		
Shadow Analysis Report		
Record of Site Condition		
Contaminated Site Study		
Minimum Distance Separation Schedule		
Parking Assessment		
Hydrogeological Study		
Restricted Land Use Screening Form		
Topographical Survey Drawing		X
Additional Planning requirements		**Required**
Development Agreement		X
Parkland Dedication/Cash-in-lieu of Parkland		X(TBD)

*The list of Planning Department requirements is based on the information submitted and as presented for this specific pre-consultation meeting. Norfolk County reserves the

right to adjust requirements including identifying additional requirements or reducing requirements. Any changes to a proposal may necessitate changes to Planning Department submission requirements. Furthermore, reports and studies are subject to peer review.

Community Development fees, applications, and helpful resources can be found can be found by visiting https://www.norfolkcounty.ca/government/planning/

Planning Comments

All comments are general and nature and subject to change pending modifications to the proposal and full analysis at the application submission stage.

Official Plan: The subject Lands are designated as 'Agricultural' in the Official Plan. The policies of the Agricultural Designation are also intended to provide the opportunity for businesses that support agricultural operations to locate on farms or in close proximity to farms. Although the proposed contractor supply and service shop may not directly related to agricultural operations, OP policies do not dictate to what is permitted in the Current Zoning.

Zoning By-Law: The subject lands are zoned as Rural Commercial (CR). Contractor supply and service shops are permitted in the CR zone.

Site Plan Control: The site is under Site Plan control and a site plan application is required under Site Plan Control By-law 2014-97.

Standard site plan components are required to be included with the application, which include:

- Key map

- Site Plan
o Development name
o All measurements in metric
o All dimensions of the subject lands
o Dimensions and setbacks of all buildings and structures
o Gross, ground and useable floor area
o Scale, legend and north arrow
o Legal description and municipal address
o Drawing title, number, original date and revision dates
o Owner's name, address and telephone number and signature
o Engineer's name, address and telephone number
o Professional engineer's stamp
o Any existing and proposed easements and right of ways
o Zoning compliance table – required versus proposed
o Parking space totals – required and proposed

o All entrances to parking areas marked with directional arrows
o Loading spaces, facilities and routes (for commercial & Industrial developments)
o Building entrances, building type, height, grades and extent of overhangs
o All exterior stairways and ramps with dimensions and setbacks
o Names, dimensions and location of adjacent streets including daylighting triangles
o Driveways, curbs, drop curbs, pavement markings, widths, radii and traffic directional signs
o Retaining walls including materials proposed
o Fire access and routes, including fire route signs
o Fire hydrants and utilities location
o Location, dimensions and number of parking spaces (including visitor and accessible) and drive aisles
o Location of mechanical room, and other building services (eg. A/C, HRV)
o Refuse disposal and storage areas including any related screening (if indoors, need notation on site plan and route used for truck pick-up)
o Winter snow storage location
o All hard surface materials
o Light standards and wall mounted lights (plus a note on the site plan that all outdoor lighting is to be dark sky compliant)
o Business signs (make sure they are not in sight-lines)
o Pedestrian access routes into site and around site
o Bicycle parking

- Other Features
o Landscape areas with dimensions
o Natural features and trees
o Fencing, screening and buffering – size, type and location
o All hard surface materials
o Light standards and wall mounted lights (plus a note on the site plan that all outdoor lighting is to be dark sky compliant)
o Business signs (make sure they are not outside of the property line)
o Sidewalks and/or walkways with dimensions

Site Plan/Development considerations:

1. Please clearly show the vehicular path of travel and parking spaces, and their construction materials; Type A Barrier free parking with appropriate signs will be required;
2. A barrier free path of travel from the accessible parking to the building will be required;
3. Please include any loading areas as per the zoning by-law if proposed;
4. Please provide privacy fencing at the property lines adjacent to existing residential developments to the east;
5. Please note that CN Rail has a development guideline that you must adhere to. Please review the CN Rail Development guidelines and any required buffer.

Endangered and threatened species and their habitat are protected under the provinces Endangered Species Act, 2007 (ESA), O. Reg. 242/08 & O. Reg. 830/21. The Act prohibits development or site alteration within areas of significant habitat for endangered or threatened species without demonstrating that no negative impacts will occur. The Ministry of Environment, Conservation and Parks provides the service of responding to species at risk information requests and project screenings. The proponent is responsible for discussing the proposed activity and having their project screened with MECP (Ministry of Environment, Conservation and Parks).

Please be advised that it is the owner's responsibility to be aware of and comply with all relevant federal or provincial legislation, municipal by-laws, or other agency approvals.

[see Appendix A for additional comments]

Assigned Planner:

Mohammad Alam
Supervisor Development Planning
Extension 1828
Mohammad.Alam@norfolkcounty.ca

Development Engineering

Development Engineering – 494 Hwy #3, Courtland – SPA for Contractor Shop

Development Engineering requirements to proceed The below requirements are to be submitted as part of the Formal Development Planning application.	**Required at OPA/ Zoning Stage**	**Required at Site Plan Stage**	**Potentially Required (See Notes Section)**
General Requirements			
Concept Plan		X	
Lot Grading Plan		X[2]	
Siltation and Erosion Control Plan		X[2]	
General Plan of Services		X[2]	
Geotechnical Report			X[12]
Functional Servicing Report		X[3]	

Storm Water Servicing Requirements – Section 7.0 and Section 8 Norfolk County Design Criteria and ISMP Section 4.0			
Storm Water Management Design Report (including calculations)		X[4]	
Storm Water Drainage Plan		X[5]	
Establish/Confirm Legal and Adequate Outlet		X[6]	
Anticipated Flow/Analysis to Receiving Collection System		X[7]	
Municipal Drainage		X[8, 9]	
Transportation Requirements – Section 6.0 Norfolk County Design Criteria, ISMP Section 5.0, Section 6.0 and Appendix J			
Traffic Impact Study		X[10]	
Improvements to Existing Roads & Sidewalk (urbanization, pavement structure, widening sidewalk replacement, upgrades, extension and accessibility)		X[11]	

General Notes:

- Securities will be required in the form of a schedule. Any works completed within the Municipal Right-of-Way (R.O.W.) is to be shown as 100% security. Any works completed within private property are to be shown as 10% security. This can be submitted at time of Site Plan.
- All reports and plans are to be signed and stamped by a Professional Engineer (P.Eng.).
- All reports are to be completed in reference to Norfolk County's Design Criteria and Integrated Sustainable Master Plan (ISMP).
- Recommendations from all reports must be incorporated into the engineering design.
- Norfolk County's Design Criteria can be provided.

Required at Zoning Amendment Stage:

In Development Engineering review of this submission for Pre consultation, Development Engineering has assumed the current Zoning is adequate and have no comments specific to a Zoning Amendment. If a Zone change is ever required Development Engineering would have additional comments.

Required at Site Plan Amendment Stage Notes:

1. A Concept Plan

2. Lot Grading Plan, Siltation and Erosion Control Plan, and General Plan of Services drawing (showing Domestic Well and Septic system locations) can be shown on one engineering plan as long as it's legible for review.
3. A Functional Servicing Brief (FSB) will be required. The FSB shall explain the proposed water and wastewater needs of the site and confirm that the future Well and septic are adequate to support the development.
4. A Stormwater Management Report is to be completed as per Norfolk County Design Criteria Section 7.
5. A Storm water Drainage Plan will be required to identify any external Storm flows to the Site and also identify all areas of this site that discharge Storm water to neighboring properties.
6. The developer is responsible to establish and confirm a legal and adequate Storm water outlet. At the Pre-consultation meeting it was mentioned this property is part of the Ronson A and Ronson B Municipal Drains.
7. Anticipated Flow/Analysis to Receiving Collection System (Ronson A and Ronson B Municipal Drain) will be required.
8. The subject lands are within the Ronson A and Ronson B Municipal Drain Watershed. Prior to approval of site plan, the site must comply with all conditions of the Drainage Act.

   During detailed engineering review of the site plan the overall development will be reviewed for changes to the Watershed area. Any changes to the Municipal Drain or drainage area changes due to the Intensification or increased flows will require Drainage Act compliance. For questions or concerns pertaining to the Drainage Act please contact Bill Mayes, Drainage Superintendent, Norfolk County, bill.mayes@norfolkcounty.ca.

9. A Drain report may need to be amended to address the changes as a result of this development. The extent of which will be highly dependent on the final development servicing and where overland flows are being discharged. Any or all changes to the drain or drain report will be the requirement of the proponent.

   The drain will accommodate drainage from the development but to the extent of the existing conditions which would be considered a limited outlet. The drain is designed to an agricultural drain design standard which may have considered this property as farmland. Any additional runoff will need to be managed on-site or alterations to the drain through an engineer report under the *Drainage Act*.

10. As per Norfolk County's Integrated Sustainable Master Plan (ISMP) – Appendix J: Traffic Impact Study (TIS) Guidelines, a Traffic Impact Study should be required with every planning application. As this site fronts onto HWY #3 all requirements for a TIS will be as per the MTO standards. Please ensure Norfolk County receives a copy of the TIS prepared for MTO. This report will be accepted as information.

11. All requirements for any proposed upgrades to the Entrances will be determined by MTO. All permits are to be applied for with MTO. Norfolk County standards are not required for Width and Surface upgrades as Norfolk County is not the Road Authority at this location.

Potentially Required Notes:

12. A Geotechnical report must be submitted if Storm water management practices involving infiltration are proposed.

Stephen Gradish
Development Technologist
Extension 8015
Stephen.Gradish@norfolkcounty.ca

Agreements

A recommended condition of your planning application approval could be to enter into a development agreement with the County that will be registered on title to the subject lands, at the Owner's expense. The additional requirements for a development agreement could include, but are not limited to the following:

- Engineering drawing review
- Engineer's schedule of costs for the works
- Clearance letter and supporting documentation to support condition clearance
- User fees and performance securities
- Current property identification number (PIN printout) (can be obtained by visiting https://help.onland.ca/en/home/)
- Owner's commercial general liability insurance to be obtained and kept in force during the terms of the agreement
- Postponement of interest. If there are mortgages / charges on your property identifier, your legal representative will be required to obtain a postponement from your bank or financial institution to the terms outlined in your development agreement
- Transfers and / or transfer easements along with registered reference plan

Annette Helmig
Agreement and Development Coordinator
Extension 8053
Annette.Helmig@norfolkcounty.ca

Building
Zoning Administrator:

Zoned CR (Rural Commercial)

-proposed replacement of existing 456sqm structure with a new 1161sqm contractor supply and service shop
-needs to meet setbacks to property lines
-13m front
-3m interior side
-9m rear
-needs to be less than the maximum height of 11m
-requires minimum 33 parking spaces (1 per every 35sqm of usable floor)
-parking spaces should be 3m x 5.8 m
-also requires at least 1 type A and 1 type B accessible parking spaces
-type A accessible space needs to be at least 3.4m x 5.8m with an access isle
-note that special provision 14.353 permits an accessory showroom (restricted in size) in the other building on the property, does not apply to this proposed building
14.353 In addition to the uses permitted in the CR Zone, a metal working shop and welding shop for steel and accessory showroom shall also be permitted provided the maximum usable floor area of the building be restricted to what was existing on December 10, 1994. Further, the sale of used vehicles for the carrying of passengers or the transport of goods, and the sale of used mobile construction equipment shall also be permitted.
-include a zoning table on the site sketch that lists the requirements and the proposed parking, setbacks and height
-also include the parking spaces on the site sketch with dimensions, including labelling accessible spots

3.5 Building Separation from Railways The pertinent side yard and rear yard provisions contained herein shall not apply where an interior lot line is in common with a railway right-of-way boundary in which case the minimum separation distance between any building or structure and the railway rightof-way boundary shall be as follows:
a) for any dwelling unit, institutional use, hotel, motel, motor hotel, hospital, school – 15 metres;
b) for any industrial, commercial or agricultural building requiring direct rail loading facilities, or for any building or structure accessory to any permitted use – 0 metres;
c) all other buildings – 6 metres.

Roxanne Lambrecht
Zoning Administrator
Extension 1839
Roxanne.Lambrecht@norfolkcounty.ca

Building Inspector:

The proposed construction is considered an F2-Industrial occupancy with possible E-Retail and D-Office type occupancies as defined by the Ontario Building Code (OBC). You will need to retain the services of an Architect or a Professional Engineer to complete the design documentation for this application.

The Designer will need to provide a Part 3 Building Code matrix. This matrix represents selected elements from your detailed code analysis and presents a quick overview to the municipal building official of the key OBC factors concerning your design. The matrix will identify OBC review items such as occupant loads, fire separations, project description, building size, building classification, fire alarms, type of construction, barrier free requirements, plumbing fixture requirements and spatial separations.

The Designer will need to view all aspects of OBC Sentence 3.2.5.7. Water Supply in regards to firefighting. This will include the expanded requirements and water supply tables from the OBC Appendix for Water Supply, where municipal water supply capacities are limited, it will be necessary to have on-site supplemental water supply. Greg has asked about using the pond from the West property for firefighting water supply, the OBC does not comment on this. I would recommend contacting the Planner in charge to discuss what may be required in terms of an easement to access the water from the neighboring property, this is due to the fact either property could be sold and the service/operation of the fire service main must be maintained.

A demolition permit will be required for any buildings being removed.

A qualified individual with a BCIN# for On-Site Sewage Systems would be required to complete the design for any proposed new septic system. The septic system must be sized for the proposed flow and all OBC Part 8 clearances will be required. Municipal septic permits/inspections are for the sum of all septic systems on the property up to a flow of 10,000L, above which requires MOE approvals.

Signs proposed due to development will require a permit as part of Norfolk's Sign Bylaw and may need a Building Permit according to the OBC.

Items for Site Plan

Site plan drawings need to have enough detail, to determine compliance with the code references listed.

1. Indicate location of access route and access route design [OBC 3.2.5.4 to 3.2.5.6]
2. Revised fire water pond design and calculations. [OBC 3.2.5.7]
3. Indicate location of existing and new fire department connections. Dimensions between hydrants and building entrances is required.

[OBC 3.2.5.16]

3. Location and specifications of exterior lighting. Lighting to be included in SB-10 report – energy efficiency
4. Indicate barrier free path of travel from parking area to building entrance. Construction of curb cuts and location of tactile attention indicators is required. [OBC 3.8.1.3, & 3.8.3.2]
5. Location of revised septic system (if required)
6. Provide building elevations and cross section, showing building massing, location of proposed entrances and exits, barrier free controls, exterior lighting locations, and exterior signage. [Planning Act 41(4).2]

Items for Building Permit

"-Industrial Commercial Institutional (ICI)" & "Applicable Law Checklist" Step by Step Guide Building Permit Package has been attached to the minutes herein, this contains information on drawing requirements, designers, forms, contact information for Building Department etc.

If you have any questions on the building permit process or plans required, please contact permits@norfolkcounty.ca or 226-NORFOLK (226-667-3655) ext. 6016

Jonathan Weir
Building Inspector III
Extension 1832
jonathan.weir@norfolkcounty.ca

Corporate Support Services – Realty Services

Click here to enter text.

If a Development Agreement is required, then the County will require postponements of any charges/mortgages (if any) on title to the County's Development Agreement. We recommend that you contact your Lender(s) (if any) and/or your solicitor as early in the process as possible to avoid any delays.

If access to neighbouring property is being requested, an easement may be required to be registered on title to both the subject and neighbouring properties. We recommend that you contact your solicitor to discuss the process of preparing/registering such an easement on title.

Karen Lambrecht
Corporate Services Generalist, Realty Services
Extension 8140
karen.lambrecht@norfolkcounty.ca

Fire Department

Norfolk County Fire Department has the following comments for this proposal:

- Ensure adequate access for fire apparatus

Katie Ballantyne
Community Safety Officer
Extension 2423
Katie.Ballantyne@norfolkcounty.ca

External Agencies

Ministry of Transportation

The subject property is located adjacent to Highway 3, which is classified as a *Provincial Arterial* and designated as a *Controlled Access Highway* (CAH). As such, all requirements, guidelines and best practices in accordance with this classification and designation shall apply.

The owner should be aware that the property falls within MTO's Permit Control Area (PCA), and as such, MTO Permits are required before any demolition, grading, construction or alteration to the site commences. In accordance with the Ontario Building Code, municipal permits may not be issued until such time as all other applicable requirements (i.e.: MTO permits/approvals) are satisfied. As a condition of MTO permit(s) MTO will require the following for review approval:

Site Plans;

An MTO Building and Land Use Permit is required. As a condition of MTO permits, the following shall be provided:

- The Proponent shall submit an acceptable Site Plan, Grading Plan, Illumination Plan, Drainage Plan and Site Servicing Plan for MTO review and approval. These plans shall clearly identify all structures/works (existing and proposed). MTO requires all buildings, structures and features integral to the site to be located a minimum of 14 metres from the highway property limit (along Highway 3), inclusive of fire-lanes, parking and stormwater management facilities.

Traffic Impact Study

MTO will require a Traffic Impact Study (TIS). The TIS shall be completed by a Registry, Appraisal and Qualification System (RAQS) approved Transportation Engineer in accordance with MTO traffic guidelines. Should highway improvements be identified, it shall be the responsibility (financially and otherwise) of the owner to acquire any required property, and to design and construct the works in accordance with MTO standards, specifications, and criteria.

Additionally, it must be noted that if the TIS identifies that highway / intersection improvements are required, but our review indicates that the required improvements cannot be geometrically accommodated, then MTO may be unable to approve the application, and MTO permits would not be available.

Entrance/Access Management

- Interconnection to adjacent properties will not be permitted. As a condition of MTO permits, fencing, berms or any other kinds of physical barriers shall be constructed prohibiting vehicular traffic between this and adjacent properties.
- In accordance with MTO’s Highway Access Management Manual guidelines, the property is limited to (1) one entrance only, and all other entrances shall be removed.
- Due to the intensification of the site, any required entrance modifications to the site must be supported by the TIS. Modifications to the entrance layout shall meet the width, shape and radii design standard of MTOD 305.140 and/or comply with the requirements identified in the TIS. Additionally, the new modified entrance is required to be located on the far east limits of the site in order to accomplish a more appropriate offset from Goshen Road.

Storm Water Management Report (SWMR);

As a condition of MTO permits, to ensure that stormwater runoff from this property does not adversely

affect our highway drainage system or highway corridor, MTO may require the owner to submit a Storm Water Management Report (SWMR) report along with the above-noted grading/drainage plans for the proposed development for our review and approval.

The drainage engineer/consultant should refer to the ministry website for applicable IDF curves, Highway Drainage Design Standards (2008) and the ministry's Stormwater Management Requirements for Land Development Proposals. https://www.ontario.ca/page/resources-transportation-planners#section-5

- The drainage engineer/consultant shall ensure that all return periods are assessed (2yr, 5yr, 10yr, 25yr, 50yr, 100yr and Regional).

Signs

Any/all signage visible from Highway 3 including temporary development signs, must be identified on the plans, must conform to MTO policies and guidelines, and will require a valid MTO Sign Permit before installation. The minimum Commercial Signage setback is 3.0m.

Encroachments

Any encroachments and proposed work within the Highway 3 property limits are subject to MTO conditions, approval and permits, prior to construction. All provincial highway property encroachments are strictly regulated and must meet all conditions set out by MTO. MTO Encroachment permit may be required to perform entrance modification/restoration works within the MTO property limits.

MTO looks forward to receiving additional materials for assessment as the project advances. Please feel free to contact me directly should you have any questions or concerns.

Michael Kilgore - Corridor Management Planner (A)
Ministry of Transportation
226-973-7021
Michael.kilgore@ontario.ca

Appendix A: Planning Reference Materials

Following is a summary of some land use planning reference materials. It is the requirement of the applicant to ensure compliance with applicable legislation, policies and regulations.

Provincial Policy Statement, 2020

https://www.ontario.ca/page/provincial-policy-statement-2020

Norfolk County Official Plan
https://www.norfolkcounty.ca/government/planning/official-plan/

Section 9.6.1 outlines requirements in relation to requests to amend the Official Plan.

Section 9.6.2 outlines requirements in relation to requests to amend the Zoning By-law.

It is the responsibility of the proponent to review and ensure relevant Official Plan policies are addressed in any future development application.

Norfolk County Zoning By-Law 1-Z-2014
https://www.norfolkcounty.ca/government/planning/new-zoning-by-law/

The provisions of the Norfolk County Zoning By-Law shall apply to all lands within the boundaries of Norfolk County. No land, building or structure shall be used, erected, or altered in whole or in part except in conformity with the provisions of this By-Law. No land, building or structure shall be used or occupied except for uses that are specifically identified in the By-Law as permitted uses by the relevant zoning category.

It is the responsibility of the proponent to review and ensure relevant Zoning By-law provisions are addressed in any future development application

REQUIRED INFORMATION

Name of Owner_____

Property Legal Description_____

Roll Number_____

PIN Number_____

Type and Number of Units

Single Detached_____

Semi-Detached_____

Duplex _____

Triplex _____

Four-plex_____

Street Townhouse_____

Stacked Townhouse_____

Apartment_____

Transfer Easements Block Number and Purpose_____

Transfer Block Number and Purpose_____

Geotechnical Report prepared for Lands	◯ YES	◯ NO	◯ UNKNOWN
Lands are Within the Source Water Protection Area	◯ YES	◯ NO	◯ UNKNOWN
Lands Contain any Contaminated or Impacted Soil	◯ YES	◯ NO	◯ UNKNOWN
Lands Contain any Natural Watercourse	◯ YES	◯ NO	◯ UNKNOWN
Lands Contain any Wetlands	◯ YES	◯ NO	◯ UNKNOWN
Lands Contain any Archaeological Sites	◯ YES	◯ NO	◯ UNKNOWN
Lands Contain an Existing Well and or Septic Field	◯ YES	◯ NO	◯ UNKNOWN
Species at Risk Branch MECP Screening	◯ YES	◯ NO	◯ UNKNOWN
Lands Contain any Endangered Species	◯ YES	◯ NO	◯ UNKNOWN

OWNER INFORMATION

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

AGENT INFORMATION

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

ENGINEER INFORMATION

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

LAWYER INFORMATION

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL_____

INSURANCE PROVIDER INFORMATION

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL_____

FINANCIAL INSTITUTION INFORMATION (IF APPLICABLE)

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL_____

MORTGAGEE INFORMATION (IF APPLICABLE)

NAME AND CONTACT_____

ADDRESS WITH POSTAL CODE_____

PHONE NUMBER_____

EMAIL _____

SPECIES AT RISK SCREENING

The Ontario Endangered Species Act inquiries and Species at Risk screening are now handled by the Ministry of the Environment, Conservation and Parks, specifically the "Species at Risk Branch" and the new e-mail address for handling these inquiries is now SAROntario@ontario.ca.

TRANSFERS, EASEMENTS AND POSTPONEMENT OF INTEREST

The owner acknowledges and agrees that, it is their solicitor's responsibility on behalf of the owner for the registration of all transfer(s) of land to the County, free and clear of any charges or encumbrances, and/or transfer(s) of easement in favour of the County and/or utilities at no cost to the County. In addition, the owner further acknowledges and agrees that it is their solicitor's responsibility on behalf of the owner for the registration of postponements of any charges to the County's agreements.

INSURANCE CERTIFICATES

Prior to the execution of the development agreement, the owner shall at their expense obtain and keep in force, during the term of this development agreement, commercial general liability insurance coverage satisfactory to the County. The owner further acknowledges and agrees that he/she has authorized the County to discuss with their insurance provider the specific insurance requirements of the County for agreement purposes. In addition, the County will require any professionals hired to carry professional liability insurance to provide coverage for acts, errors and omissions arising from their professional services performed.

OWNER'S AUTHORIZATION

I/We _____ am/are the registered owner(s) of the lands that is the subject of this site plan agreement.

I/We authorize our Agent _____ to provide information on my/our behalf and to provide any of my/our personal information necessary for the processing of this site plan agreement. Moreover, this shall be your good and sufficient authorization for so doing.

I/We authorize the Agreement Administrator to provide and receive information on my/our behalf in connection to the insurance coverage, letter of credit and agreement registration of my/our development.

I/We acknowledge that if there are any new charges or mortgage holders on the property they will be added to the development agreement and will be required to postpone their interest on the property to the County's development conformity interest.

Owner Signature Date

To start your agreement, please return the required supporting information and fees along with the first three pages of this document completed and signed. Provide your payments by the mail or courier to the address below or drop off at ServiceNorfolk customer service desk on the first floor 185 Robinson Street, Simcoe ON N3Y 5L6 Monday to Friday from 9 am to 4 pm. Please make your cheque payable to the Corporation of Norfolk County. If paying by credit card please contact ServiceNorfolk at 519 426-5870 Ext. 4636.

CONTACT FOR FURTHER INFORMATION AND QUESTIONS

Annette Helmig, Agreement and Development Coordinator
Norfolk County, Community Development Division, Planning Department, Agreement Services
185 Robinson Street Suite 200, Simcoe ON N3Y 5L6
226.777.1445
annette.helmig@norfolkcounty.ca

The information submitted on this form is collected under the authority of the *Freedom of Information and Protection of Privacy Act* (FIPPA) and *Municipal Freedom of Information and Protection of Privacy Act* (MFIPPA) for Norfolk County employees to use for the purpose of preparing and registering a development agreement. Questions about the collection of personal information through this form may be directed to the Agreement and Development Coordinator or Information and Privacy Coordinator, Corporation of Norfolk County, 50 Colborne Street South, Simcoe ON N3Y 4H3.

DOCUMENTATION AND FEES REQUIRED

- ☐ Owner's agreement authorization
- ☐ Postponement of interest from mortgagee / chargee (if applicable)
- ☐ Current parcel register (property identifier or PIN printout)
- ☐ Owner's commercial general liability certificate of insurance
- ☐ Construction estimates (100% for external works and 10% of internal works)
- ☐ Professional liability insurance for surveyor and / or engineer
- ☐ Final reference plan for any easements and lands to be conveyed
- ☐ Letter from owner requesting holding (H) symbol be removed from the subject lands
- ☐ Letter of credit or certified cheque for performance securities
- ☐ Current property taxes paid
- ☐ User fees (according to the By-Law in effect at the time that payment is made). If time is of the essence, a certified cheque is requested otherwise it will take three weeks for the cheque to clear our financial institution.

  $2,780 for preparation of the site plan agreement
  $924 to remove the holding from the zoning on the property (if applicable)
  $447 for financial administration of this agreement
  $542 per tree cash-in-lieu of trees (if applicable)
  2% or 5% land appraisal cash-in-lieu of parkland as per consolidated by-law 2016-126 (if applicable)

APPLICABLE LAW CHECKLIST

The Building Code Act prohibits the issuance of a building permit if the proposed construction or demolition will contravene an applicable law as defined by the Building Code. The questions below will help you to determine if an applicable law applies to your project. No timeframe for building permit review can be established until all required applicable law approvals are completed and the approval documents are submitted to the Building Division.

If the answer is **YES** to any question, the relevant approval documents must be submitted with this permit application. Where any required approval has **NOT** been obtained, the agencies listed on the back of this form must be contacted to obtain approval, and the declaration on the bottom of this form must state accordingly.

Property Address: _____ **Permit Number** (office use)_____

Zoning By-Laws – *Norfolk County Planning Department*	YES	NO
Is/was relief required to permit a minor zoning variance in your proposal?		
Is/was rezoning required to permit the proposed building or land use?		
Is a land division or subdivision required and not yet fully completed?		
Are municipal services required but not yet completed or available?		

Planning Approval - *Norfolk County Planning Department*	YES	NO
Is this property regulated by Site Plan Control under Section 41 of the Planning Act?		

Heritage - N*orfolk County Heritage and Culture Department*	YES	NO
Are you demolishing a building that is listed on the County's heritage inventory?		
Is the building designated or in the process of being designated?		
Is the property located in a heritage district or study area?		

Construction and Fill Permits – *Long Point Regional or Grand River Conservation Authority*	YES	NO
Is the property located within a regulated area (i.e. abutting a ravine, watercourse, wetland, or shoreline)?		

Building and Land Use Permits - *Ontario Ministry of Transportation*	YES	NO
Is the property within 45m of a highway or 180 m from any highway intersection?		
Is the property within 395m of a controlled highway intersection? (applies to Sign Permits)		
Is this a major traffic generating project located within 800m of a highway?		

Clean Water Act – *Public Works*	YES	NO
Is the property located within a Source Water Protection regulated area?		
If yes: does a Water Source Protection Plan restrict the land use you are proposing? (s.59 screening form may be required)		

Community Development Division- Building Department
185 Robinson Street, Suite 200, Simcoe, ON N3Y 5L6 • 519-426-5870 Ext. 6016

Agriculture and Farms - *Ontario Ministry of Agriculture and Food*	YES	NO
Is this a farm building that will house animals or manure?		
Is this a milk processing plant?		

Crown Lands Work Permit – *Ministry of Natural Resources*	YES	NO
Are you proposing to construct or place a structure or combination of structures that are in physical contact with more than 15 square meters of shore lands?		
Are you proposing to build on Crown Land?		

Electrical Conductor Clearances - *Electrical Safety Authority*	YES	NO
Are any overhead power lines located above or within 5.5 metres of the proposed building?		

Environmental Approvals - *Ministry of Environment, Conservation, Parks*	YES	NO
Is a Record of Site Condition required to be filed because of a change to more sensitive land use? Is the property a former waste disposal site?		
Is this project a major industrial, commercial, or government project?		
Is this a renewable energy project?		
Does this property have a Certificate of Property Use under the Environmental Protection Act?		

Child Care Centres - *Ministry of Education*	YES	NO
Is a daycare proposed in any part of the building?		

Seniors Centres - Ministry of Children, Community and Social Services	YES	NO
Is this a seniors project where Ontario Government funding is being sought?		

Long Term Care Centres – *Ministry of Health & Long Term Care*	YES	NO
Construction, alteration or conversion of building used for a nursing home?		

Education Act - *Ministry of Education*	YES	NO
Is the project being carried out on the property of an educational facility?		
If so, is any or all building on the property being fully or partially demolished?		

DELCARATION – I have considered the list of applicable laws in the Ontario Building Code as described above, and do hereby declare that:

	None of these applicable law approvals apply to this project
	Applicable laws check 'yes' apply to this project, and approval documents are submitted with this application.
	Applicable laws checked 'yes' apply to this project; however, all approval documents have not yet been obtained

The information provided on this form is true to the best of my knowledge. I have authority to act on behalf of the owner, corporation, or partnership with respect to this application (if applicable).

Name: _____ Signature: _____ Date: _____

Approvals from other agencies are required in many instances before a building permit can be processed and issued. These approvals are **NOT** administered by the Building Department. The fastest way to obtain a building permit is to ensure that all other required approvals are completed prior to permit application. The Building Department is required by law to prioritize applications that are fully complete in terms of applicable law approvals and document submissions. Building permit documents must be consistent with applicable law approvals. If you answer yes to any of the following question please reach out to these agencies for approvals.

Zoning and Planning – Community Services Division – Norfolk County

Zoning 519-426-5870 ext. 6064 or zoning@norfolkcounty.ca
Planning 519-426-5870 ext. 1842 or planning@norfolkcounty.ca

Planning Act, s.34, 34(5), 45, and Part VI
Zoning By-laws restrict such things as land use, lot size, building size, and setbacks. If your project does not comply with any part of the Zoning By-law, a minor variance or rezoning must be obtained before any building permit can be issued. Zoning By-laws also restrict the issuance of permits until any associated land division, subdivision, or municipal servicing is complete.
Planning Act, s.41
Site Plan Approval applies to commercial, industrial, institutional, multi-residential and intensive livestock site plans. The site plan agreement must be registered before site plans will be approved.

Conservation Authority Permits

Grand River Conservation Authority (GRCA)1-866-900-4722 or grca@grandriver.ca
Long Point Regional Conservation Authority (LPRCA) 1-888-231-5408 or conservation@lprca.on.ca

Conservation Authorities Act s. 28 (1)(c), regulation 166/06
Development within certain conservation regulated areas requires a construction and fill permit from the conservation authority before any building permit can be issued. GRCA or LPRCA will confirm if your property falls within their jurisdiction.

Highway Corridor Building & Land Use Permits

Ministry of Transportation (MTO) 1-800-268-4686 or
www.mto.gov.on.ca/english/highway-bridges/highway-corridor-management/index.shtml

Public Transportation and Highway Improvement Act, s.34, 38
Ministry authorization is required for construction of all buildings within certain distances of a highway or intersection. The requirement for Ministry authorization extents to 800m from a highway where development will generate major traffic, such as a shopping centre.

Environmental Approvals

Ministry of the Environment, Conservation and Parks (MECP)1-800-461-6290 or www.ontario.ca

Environmental Protection Act s. 46, 47.3, 168 and the Environmental Assessment Act s 5.
Ministry of Environment approvals are required where a property of industrial or commercial use is changed to more sensitive residential or parkland use, for major government, industrial and commercial projects where defined by regulation, properties formerly used for landfill or waste disposal, or renewable energy projects.

Electrical Conductor Clearances

Electrical Safety Authority 1-877-372-7233 or www.esasafe.com

Subsection 3.1.19. of the Ontario Building Code prohibits buildings being located beneath or within a certain minimum distances of overhead electrical conductor wires, other than the power feed to the building.

Source Water Protection – Environmental and Infrastructure Services – Norfolk County

Environmental Services – Stephanie Davis- Manager, Water & Wastewater Compliance- 519-426-5870 ext. 8037 or Stephanie.Davis@norfolkcounty.ca
Cambium Inc. Racheal Doyle – sourcewaterprotection@cambium-inc.com

Clean Water Act s. 59
Special land use restrictions may apply if a water source protection plan is in effect in the area where the building is located. Uses affected by these restrictions require the approval of the designated Risk Management Official

Agriculture and Farms

Ministry of Agriculture Food and Rural Affairs 1-877-424-1300 or www.omafra.gov.on.ca

Nutrient Management Act 2002 s.11 reg 267/03, Milk Act s.14
Buildings or structures that house animals or store manure may trigger a requirement for a nutrient management strategy approved by the Ministry. The Ministry must determine that a milk processing plant is necessary and authorize it before a building permit can be issued.

Child Care Centres

Ministry of Education (905) 895-9192 or www.ontario.ca

Child Care and Early Years Act, s. 14 reg 137/15
Ministry plan approval is required if a new building is proposed to be used as a day nursery, an existing building is proposed to be used, altered or renovated for a day nursery, or if an existing day nursery is altered or renovated.

Seniors Centres

Ministry of Children, Community and Social Services 1-888-789-4199 or www.mcss.gov.on.ca

Elderly Persons Centres Act s. 6 of reg 314
Reports must be submitted to the Minister and approval obtained for all seniors centres to which government funding applies.

Long Term Care Homes

Ministry of Health & Long Term Care 1-800-387-5559 or www.health.gov.on.ca

Nursing Home Act s. 4, 5 reg 832
Homes for the Aged & Rest Homes Act s. 14
The Long Term Heath Care Act is designed to help ensure that residents of long-term care homes receive safe, consistent, high-quality, resident-centred care.

Education

Ministry of Education (905) 895-9192 or www.ontario.ca

Education Act s. 194
The board shall obtain approval from the Minister for the demolition of any buildings located on a school site regulated by the Education Act. App

Crown Lands Works Permits

Ministry of Natural Resources www.ontario.ca/page/crown-land-work-permits

Ontario Regulation 239/13 s. 2, s. 5
Ministry approval is required to construct a building on crown lands or to construct or place a structure along shorelines.

INDUSTRIAL
COMMERCIAL
INSTITUTIONAL

Building Permit Package

A step by step guide for making a building permit application

Norfolk County Building Department
Community Development Division
185 Robinson Street, Suite 200 Simcoe, Ontario, N3Y 5L6
norfolkcounty.ca

Industrial, Commercial, Institutional Large Residential Permit Package

Building permits help protect you, your home, and the interests of your community by making sure the project is structurally sound and follows the Ontario Building Code, municipal zoning and other applicable laws.

There are multiple steps to the building permit process. The purpose of this permit package is to highlight these steps and provide guidance to the building permit process.

STEP 1: Applicable Law.

Approvals from other agencies are required in many instances before a building permit can be processed and issued. These approvals are **NOT** administered by the Building Department. The fastest way to obtain a building permit is to ensure that all other required approvals are completed prior to permit application.

An Applicable Law Checklist is required as part of a complete application. Agency contacts are attached with this form. Our community mapping has many of these layers mapped to help you determine if additional approvals are required for your application.

Community Development Division - Building Department
185 Robinson Street, Suite 200, Simcoe, ON N3Y 5L6 • 519-426-5870 Ext. 6016

Pre-consultation meeting – Site plan approval.

Most industrial, commercial and institutional buildings are located on properties where a site plan approval is required through the Planning Act. Before you submit a planning application, please contact our office about the necessity of a pre-consultation meeting.

These confidential meetings are hosted by the Planning Department with staff from various departments (and agencies, as applicable) who will provide valuable feedback on your proposal and outline what will be required as part of a complete planning application. After the meeting, you will receive a detailed summary of the meeting which will summarize the feedback from each department. The document will also include a clear list of what you need to submit as part of a complete planning application form.

To request a pre-consultation meeting, please email the Planning Department at precon@norfolkcounty.ca. You can also call us at (519) 426-5870 ext. 1842.

For more information on the process, please see the Norfolk County Planning Website.

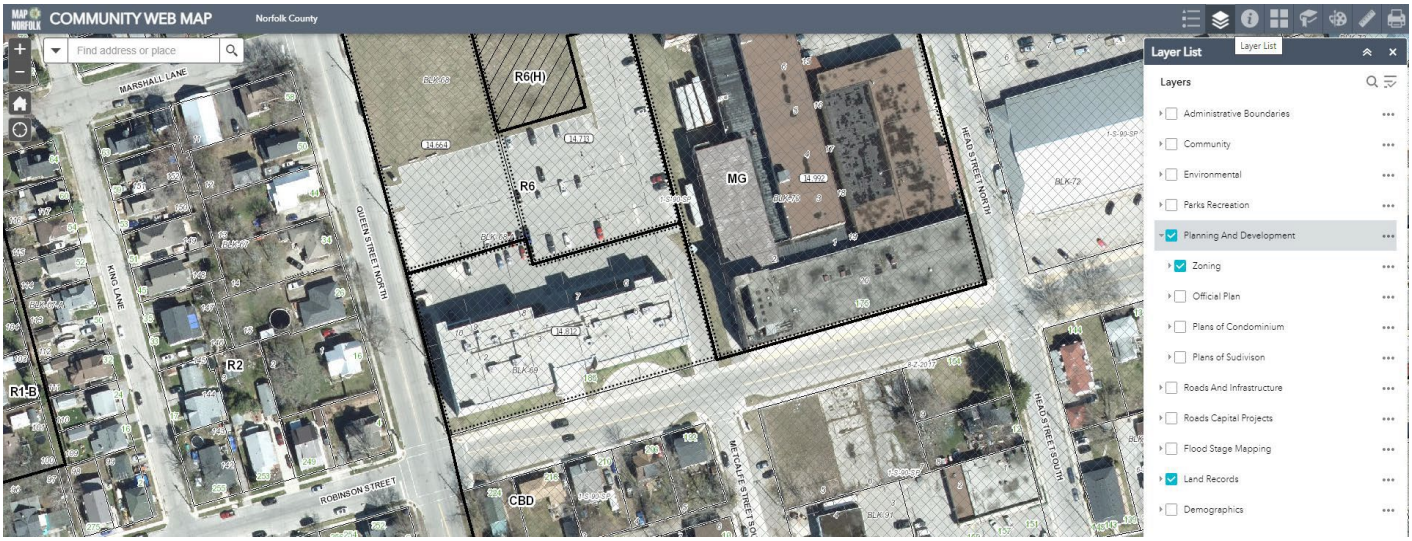
Site Plan Control.

Site Plan Control is a tool utilized by the County to ensure that specific development proposals meet the Official Plan and Zoning By-law objectives. Essentially, site plans approved under this process are very detailed and outline precisely how a particular property will be developed. Site Plan Approval is typically the last planning approval necessary before the Building Permit process.

A Site Plan Agreement is sometimes required for more complicated developments. Where a property has site plan control designation, but the proposed construction is deemed minor in nature, the applicant will need to provided a site plan waiver from the Planning Department as part of an Applicable Law review.

Zoning Requirements.

Finding the zoning associated with your property is easy with our GIS Community Web Map, position over your property and turn on the zoning layer by clicking layer list, planning, zoning. Norfolk County Zoning Bylaw is available online.



To confirm your project conforms to the Zoning By-law you will need to provide a plot plan indicating:

- Property lines and lot dimension,
- Location of building and all other structures on the lot,
- Location of all steps and landings,
- Distance from dwelling to property lines,
- Parking spots with dimensions,
- Location of septic system.

If your proposed building / structure does not comply with the zoning requirements, a planning application will be required. Zoning and Planning approval is required as part of a complete permit application.

Planning Department: planning@norfolkcounty.ca or 519-426-5870 ext. 1842.
Zoning: zoning@norfolkcounty.ca or 519-426-5870 ext. 1000.

Community Development Division - Building Department
185 Robinson Street, Suite 200, Simcoe, ON N3Y 5L6 • 519-426-5870 Ext. 6016

Lot Grading.

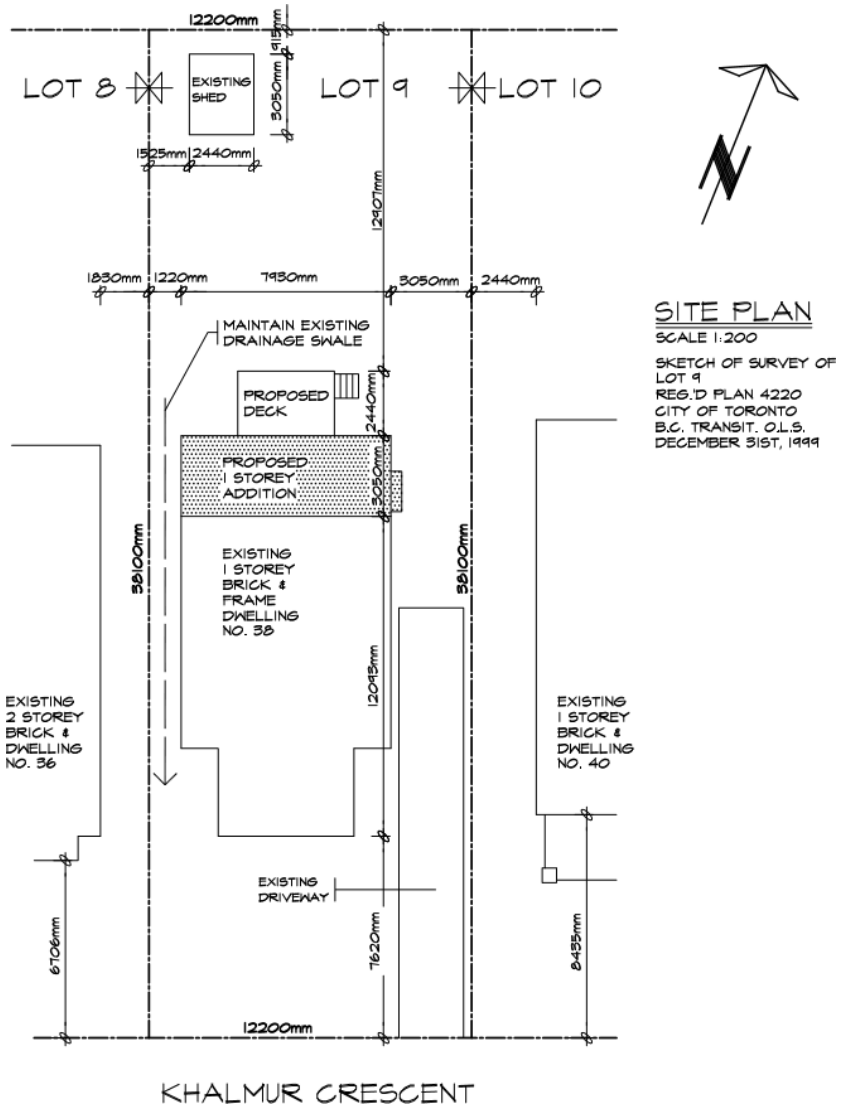
Where a property has been issued a site plan waiver, and the footprint of the building is increasing in size, a lot grading is required.

Proposed grading plans and lot grading form shall be submitted with all building permit applications, under Norfolk County Grading and Drainage By-law.

Proposed grading plans needs to identify:

- all surface features;
- existing and proposed structures;
- changes in grade and slopes in percent between such changes; and
- include sufficient information regarding adjacent properties to confirm conformance with this By-Law with respect to drainage onto those properties.

An exemption may be considered for a lot in a rural area (complete form, fee applies)



STEP 2: Preparing your application.

A building permit application consists of many documents. The forms attached are to be completed, signed, and dated.

Who can design the building?

There are many factors to determine who can complete drawings and design documents for these types of buildings. Your design team can be made up of qualified individuals with a Building Code Identification number (BCIN), an architect, and/or Professional Engineers. If you are unsure what qualifications a designer needs for your specific project, reach out to a building inspector for more information.

Building Department staff cannot make recommendation on a specific designer or design company.

Drawings and Documents.

Drawings are to be legible and to scale. Use a ruler or computer aided drafting (CAD) software to complete your drawings. Provide enough information and detail to ensure compliance with the Ontario Building Code.

The Ontario Building Code is available online under the 'regulations under this act' tab.

Building Department staff are not permitted by law to provide design advice. It is the responsibility of the property owner or authorized agent to complete a design that meets the requirements of the Ontario Building Code (OBC) and the Building Code Act (BCA).

Building Permits – Application Checklist.

Completed Forms.

- □ Building Permit Application Form.
- □ Signed Commitment to General Review.
- □ Property Owner Consent Form, if application is not completed by the property owner,
- □ Applicable Law Checklist and supporting documents.
- □ Lot grading form (projects with a site plan waiver).

Required Documents.

- □ Approved Site Plan approval plot plan.
- □ Drawings of the building.
  - Architectural,
  - Structural,
  - Electrical,
  - Mechanical,
  - Plumbing.
- □ Building Code Matrix.
- □ Completed SB-10 report (energy efficiency).

- □ Septic System or Sewage Works.
  - Sewage system is under 10,000 litres/day daily design flow for the whole site. (separate application through Norfolk County)
  - Sewage Works is over 10,000 litres/day daily design flow for the whole site. ECA to be obtained from The Ministry of Environment, Conservation, Parks.

    Contact: *Christopher O'Connor.*
    Phone: 1-800-668-4557, Cell: 905-515-9618
    Email: Chris.O'Connor2@ontario.ca

Fees.

- □ Building Permit fee.
- □ Plumbing fee.
- □ Occupancy fee.
- □ Civic address (where applicable).
- □ Water / Sanitary / Storm Connection Permit (where applicable).
- □ Development charges (if applicable).

Septic Permits - Application Checklist.

Completed Forms.

- □ Building Permit Application Form.
- □ Schedule 1: Designer Information.
- □ Schedule 2: Sewage System Installer Information.

Required Documents.

- □ Septic System Permit Application Information Package / Worksheets.
- □ Percolation time ('T' time) report from a licensed testing agency.

Fees.

- □ Septic Permit fee.

STEP 3: Applying.

Online Portal: Visit Norfolk Permits Portal and make your application online.

Building Department

Apply for a Building Permit
Status and Fees

In Person: Visit our service counter located at 185 Robinson Street, Suite 200 Simcoe Ontario.

Our Permit Coordinators will review your application and provide in writing any item which may be missing from the application and a cost break down for the permit fees and payment options.

Step 4: Plans Review.

A Building Inspector will contact you in writing if there are building code concerns or missing information from your application.

A building permit is issued once all documentation has been received, fees are paid in full, and your plans are check for compliance with zoning by-law and the building code.

Step 5: Inspections

Once you have obtained a building permit, a building inspector needs to attend your site at several milestones in the construction process. For more information, please check the inspection section of Norfolk County's Building Department website. Once all inspections are complete and passed your permit is closed.

Need Help? If you have any question on the building permit process or plans required, please contact permits@norfolkcounty.ca or 519-426-5870 ext. 6016

Updated October 2022

BILGER BAY SHOP - SITE PLAN
NORFOLK COUNTY - COURTLAND
SECURITIES AND CONSTRUCTION ESTIMATES

REVISION

31 OCTOBER 2024 - PRELIMINARY FOR APPROVAL
DATE - COLLECTED AT REGISTRATION
DATE - HELD AFTER ACCEPTANCE

ITEM	DESCRIPTION	UNIT	QTY.	UNIT PRICE	TOTAL COST	Securities	
						10%	100%
BELOW GROUND							
WATERMAIN							
	Water						
	a) Dry Hydrant	L/S	1	$7,000	$7,000	$700	
	b) Conncrete Chamber for Well	L/S	1	$3,000	$3,000	$300	
	TOTAL WATERMAIN				**$10,000**	**$1,000**	**$0**
STORM SEWERS							
	Storm Sewer						
	a) 200mm Diameter HDPE	M	129	$120	$15,432	$1,543	
	b) 300mm Diameter	M	127	$220	$28,006	$2,801	
	c) 375mm Diameter	M	103	$260	$26,780	$2,678	
	1200mm Diameter Manholes	EA	1	$6,000	$6,000	$600	
	Video Inspection and Report	L.S.	1	$1,500	$1,500		$1,500
	TOTAL BELOW STORM SEWER				**$77,718**	**$7,622**	**$1,500**
					$87,718	**$8,622**	**$1,500**
ABOVE GROUND							
STORM SEWERS							
	Catchbasins	EA	7	$2,500	$17,500	$1,750	
	Ditch Inlet	EA	1	$3,000	$3,000	$300	
	Rip Rap R50	M²	55	$50	$2,750	$275	
	TOTAL ABOVE STORM SEWER				**$23,250**	**$2,325**	
TRUCK YARD CONSTRUCTION							
	Granular 'A'	M³	900	$60	$54,000	$5,400	
	Granular 'B'	M³	3880	$50	$194,000	$19,400	
	TOTAL TRUCK YARD CONSTRUCTION				**$248,000**	**$24,800**	
					$271,250	**$27,125**	
FINISHING WORKS							
	Top Soil Grading and Seeding	M²	6250	$3	$18,750		$18,750
	Driveway Apron	L/S	1	$10,000	$10,000		$10,000
					$28,750		**$28,750**

						10%	100%
BELOW GROUND							
STORM WATER MANAGEMENT POND							
	Excavation and Grading of SWM Pond (6000m³)	L/S	1	$30,000	$30,000		$30,000
					$30,000		**$30,000**
LANDSCAPING AND ON SITE WORKS							
	1.8m High Chainlink Fence	M	318	$75	$23,850		$23,850
	Wall Mounted Exterior Lighting	EACH	9	$500	$4,500		$4,500
					$28,350		**$28,350**

SUMMARY

BELOW GROUND	$87,718	$8,622	$1,500
ABOVE GROUND	$271,250	$27,125	$0
FINISHING WORKS	$28,750	$0	$28,750
STORM WATER MANAGEMENT POND	$30,000	$0	$30,000
LANDSCAPING AND ON SITE WORKS	$28,350	$0	$28,350

TOTAL SECURITIES REQUIRED AT REGISTRATION **$124,347**

494 HIGHWAY 3
PROPOSED SITE IMPROVEMENTS
BILGER SLINGER SERVICES
COURTLAND, ONTARIO

FUNCTIONAL SERVICING REPORT

CJDL
Consulting Engineers

23044
30 October 2024

23044

494 HIGHWAY 3

PROPOSED SITE IMPROVEMENTS

BILGER SLINGER SERVICES

FUNCTIONAL SERVICING REPORT

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CJDL Consulting Engineers

CYRIL J. DEMEYERE LIMITED
Peter J. Penner, P. Eng. | Deren Lyle, P. Eng.
Alex Muirhead, P. Eng.

261 Broadway, P.O. Box 460, Tillsonburg, ON N4G 4H8 T: 519-688-1000 www.cjdleng.com

23044
30 October 2024

494 HIGHWAY 3

PROPOSED SITE IMPROVEMENTS

BILGER SLINGER SERVICES

FUNCTIONAL SERVICING REPORT

1.0 INTRODUCTION

The subject site, 494 Highway 3, near the village of Courtland, Norfolk County, is located on the south side of Highway 3 between Goshen Road and Plowman's Line. The site is currently zoned rural commercial (CR). The proposed use complies with the current zoning and therefore there is no zoning amendment required for this property.

Site Grading and Servicing Plans have been prepared by Cyril J. Demeyere Limited (CJDL) in support of the proposed Bay Shop, Storage Building and Covered Truck Parking for Bilger Slinger Services. The site is currently an equipment dealership with a paved parking lot and a partial gravel storage yard with an existing storage building. Blue West will continue to lease the front portion of the existing building operating as a separate business containing a retail show room and shop. Access to the site will be provided through two existing 8.0m± wide driveways from Highway 3 as shown on the Site Plan. The western access is currently paved and will remain unchanged as a result of this development. The eastern entrance is currently gravel and will be upgraded to a 9.0m wide heavy duty asphalt. No new entrances onto Highway 3 are proposed as a part of this development. A Traffic Impact Study was conducted by Paradigm Transportation Solutions in support of this application.

2.0 TRAFFIC IMPACT STUDY

A Traffic Impact Study was completed by Paradigm Transportation Solutions Limited is attached in Appendix 'C'. The study examined existing and future traffic conditions under a 5-yr and 10-yr horizon and provided recommendations on Site access upon completion of the expansion. The study assumed that the location of the 2 current entrances to the site would be maintained and remain stop sign controlled at the exits only. The study was completed in accordance with both the requirements detailed by the MTO TIS Guidelines and the Norfolk County TIS Guidelines. It was concluded based on the findings of the study that maintaining 2 driveway accesses onto Highway 3 be considered for approval as proposed. No improvements to Hwy No. 3 are required as a result of the proposed Site Plan. Both adjacent intersections on Hwy No. 3 will continue to operate at acceptable levels of service past the 2034 horizon.

3.0 SANITARY SERVICING

The existing building located on the site is serviced by a septic system located within the existing front yard of the site. This system is still functional and is intended to remain in use for the proposed development. The proposed buildings will not require sanitary service as they will not have washrooms or process water. There is not anticipated to be an increase in sanitary usage on site as a result of this development and therefore no septic system upgrades are proposed.

4.0 WATER SUPPLY

Currently there is an existing well on site that is used to service the existing building. There will be no process water or bathrooms within the proposed buildings therefore there is not expected to be any significant increase in water usage on site. The existing well will continue to provide service to the existing building after this development takes place. The well record is attached in appendix 'B' of this report. A pumping rate of 5.8 GPM was recommended on the well record and it is anticipated that this rate will continue to be sufficient for the proposed site.

Firefighting flows will be provided by an on-site stormwater management/fire pond. There is no municipal pressurized water source available at this property, therefore a dry hydrant and fire pond will be utilized to satisfy the fire protection requirements of the property. Firefighting flow requirements were determined in accordance to the Ontario Building Code. The volume of water required for each of the buildings on the property was calculated, with the highest required value being the value required to be stored within the fire pond. In accordance with the OBC, the bottom 0.60m of the pond was not used in this calculation to allow for sediment to accumulate at the bottom of the pond. The top 0.6m was also taken out of the volume to account for the potential ice that could form on the pond in the winter months.

As this pond will act as both a fire protection pond and stormwater management pond, it should be noted that the volumes were calculated from the permanent water level and therefore there is a potential for more fire storage within the pond during large storm events. It should be noted that the permanent water level will be located in native silty clay and therefore a clay liner will not be required for the pond to maintain the required water levels. The inlet for the dry hydrant will be located 0.45m above the bottom of the pond to minimize the amount of sediment drawn though the hydrant during firefighting operations. The dry hydrant will be located adjacent to the gravel parking lot with a clear path to all of the buildings on site. The dry hydrant will be located approximately 0.60m above the ground and approximately 3.1m above the permanent water level. This should allow for effective drafting operations to take place should it be required. Table 1 below summarizes the required volume of water for firefighting for each building on site as well as the amount provided within the pond.

Table 1: Required Fire Flow Volumes

Required Volume	Prop. Bay Shop	Prop. Covered Truck Parking	Prop. Storage Building	Existing Building	Provided Fire Pond Storage
Volume (L)	191,266	181,546	27,516	79,589	223,920

As is shown above, the fire pond will contain 223,920 L of fire storage to provided which is above the required 191,266 L of fire storage to comply with the OBC. Detailed fire flow calculations are included in Appendix B of this report.

5.0 STORMWATER MANAGEMENT

5.1 Rainfall information

IDF curves for this site were determined using the Norfolk County Design Criteria (2019). The equation and parameters can be found below:

Intensity (i) = a/(t+b)^c
Where: I = rainfall intensity (mm/h)
a,b,c = rainfall parameters listed below
t = inlet time based off time of concentration (hours)

The inlet time (t) was calculated using the Airport Formula for areas with a C value less than 0.4 and the Bransby Williams Method for areas with a C value greater than 0.4 as recommended by the MECP.

Table 2: Rainfall Parameters (Norfolk County Design Criteria (2019))

Parameters	2 Year	5 Year	100 Year
a	529.711	583.017	801.041
b	4.501	3.007	1.501
c	0.745	0.703	0.657

5.2 Pre-Development Conditions

The entire property is currently tributary to the Ronson Drain located at the southeast corner of the property. The existing topography is generally flat with the majority of the property draining to the southeast of the property. The site generally flows overland to this drain with 2 catchbasins that outlet to the open ditch potion of the drain located along the west side of Plowmans Line. The municipal drain at the outlet consists of an open ditch with a 900mm diameter culvert directly downstream that crosses under the existing railroad tracks. Norfolk County typically requires all sites to control post development outflow back to predevelopment levels. For this property, the drain was not sized to accommodate the current pre development flow rates and therefore post development flows will be restricted back to the capacity of the drain estimated to be 1”/24hrs. This equates to an outlet rate of approximately 9.2 l/s. Detailed pre-development calculations are included in Appendix A of this report.

A test pit was conducted to determine the soil type in the location of the proposed pond. It was concluded that there is approximately 0.5m of silty sand located below the topsoil. Below that the material appeared to be all silty clay in nature and will therefore be suitable to line the pond without the need to import a clay liner. This matches the material shown in the well log completed on site in 1961.

5.3 Post-Development Conditions

In post development conditions, SWM quantity controls will be implemented to control post-development storm run-off from the site back to the capacity of the drain for the 2 to 100-Year storms.

The following will be used for all post development runoff calculations:

- Building C = 0.95
- Gravel C = 0.70
- Grass C = 0.15
- Asph./Conc. C = 0.95
- Pond C= 0.95
- Q, Rational Method Q = 0.0028*C*I*A
- Intensity: I = a/(t+b)^c
- a,b,c Factors Norfolk County Design Criteria (2019)
- Tc, Airport Method $T_c = \frac{3.26*(1.1-C)*L^{0.5}}{S_w{}^{0.33}}$
- Tc, Bransby Williams $T_c = \frac{0.057*L}{S_w{}^{0.2} * A^{0.1}}$

The site is generally graded to contain all of the surface runoff within the site before outletting at the southeast corner of the site to the Ronson Municipal Drain through a proposed SWM pond. A small portion of the western edge of the site currently flows overland towards an existing roadside ditch along Highway 3. This area will not be altered as part of this development and therefore the flow will remain tributary to this existing ditch.

All controlled flow on site will flow through a proposed wet pond to be located in the southeast corner of this site. This wet pond will contain a 1.5m deep permanent pool which will also contain enough storage for firefighting purposes. The pond been designed following the Norfolk County Design Criteria (2019) & MOE 2003 SWM Manual for wet ponds. The surface of the permanent pool will be located at an elevation of 237.70m which is located within the clay soil layer. A test pit was conducted on September 12, 2023 at this location to confirm the soil type. Soil depths were measured on site and the soil was determined to be clay below an elevation of 238.74m (0.8m below surface). A table including the test results are included on the site plan drawings. A 150mm outlet pipe at 0.36% will restrict flows from the pond down to 9.1 l/s which is within the design capacity municipal drain's 2.8ha allocated to this site. This flow rate was calculated using the pipes capacity. It was assumed that as the water level increases in the pond, the water level in the outlet ditch will rise at a similar rate. An increase in the hydraulic grade line is not anticipated as the pond fills up. For this reason it is assumed that the slope and diameter of the pipe are the only limiting factors in the outflow rate of the pond. This outlet will be through a 600 x 600 ditch inlet complete with a 2:1 sloping grate. Detailed calculation relating to outflow rates is included in Appendix A of this report.

The wet pond will pond to an elevation pond 238.68m during the 100-year flood which will allow for 0.32m of freeboard to the top of pond elevation of 239.00m. This correlates to an active storage depth of 0.48m. Table 3 below illustrates the total volume stored during each storm event as well as the corresponding elevation. Detailed post development calculations and storage tables are included in Appendix A of this report.

Table 3: Overall Site Outflow and Storage Summary

Ponding Elev. (m)	Total Storage Pond Volume (m^3)	Total Active Storage Provided (m^3)	Total Active Storage Required (m^3)	Peak Discharge			Notes
				Controlled (l/s)	Pre-Dev. (l/s)	Outlet Culvert Capacity (l/s)	
237.20	N/A	N/A	N/A	N/A	N/A	N/A	Outlet
238.02	1728	497	490	9.1	81	9.2	2-YEAR
238.20	2050	818	811	9.1	107	9.2	5-YEAR
239.12	4193	2960	2943	9.1	180	9.2	100-YEAR

An overflow swale will be provided to direct emergency overflow from the pond overland to the Ronson Municipal Drain ditch. This swale will ensure the surrounding properties do not experience flooding should the pond outlet fail. This swale will also be used to drain the undeveloped portion of the southeast of the property to the municipal drain via overland flow. This area is currently relatively flat manicured lawn and there will be no change to this area as a result of this development.

6.0 EROSION AND SEDIMENTATION CONTROL/CONSTRUCTION PRACTICES

Prior to topsoil stripping and bulk grading being completed, silt fence will be placed at drainage outlets around the perimeter of the site adjacent to existing developments. As servicing progresses, silt fence (with straw bales, if required) will be reinstated.

Catch basins will contain 300mm minimum deep sumps which will collect sediment.

In addition to the silt fence, the Contractor will place geotextile under all catch basin and manhole castings to prevent the flow of construction silt into the storm sewers and to the receiving water courses.

All silt will be removed as accumulated and/or as directed by the Engineer on site. Catch basins will be cleaned by the Contractor during construction to remove any silt which may accumulate.

All finished earth surfaces will be topsoiled and sodded. The Contractor will be required to return within the guaranteed maintenance period to remedy any areas of erosion which develop.

7.0 ELECTRICAL AND UTILITIES

It is anticipated that the existing hydro service will be sufficient to feed the new building as a single metered service. The current Enbridge Gas service provided to the property will also be maintained as a part of this development. Bell Canada and Execulink have existing services available to this property for communication and internet. Contact with Utility companies will continue throughout the Site Plan Application Process.

** ** **

If there are any questions, please do not hesitate to contact this office.

All of which is respectfully submitted,

Zachary Rachar, EIT

Peter Penner, P. Eng.

ZDR/kc

APPENDIX 'A' – SWM CALCULATIONS

Pre-Development Flows
2-Year Post Development Storage Requirements
5-Year Post Development Storage Requirements
100-Year Post Development Storage Requirements
Overall Site Storage Summary

APPENDIX A

Bilger Slinger Services

Proposed Bilger Warehouse - Functional Servicing Report

Norfolk County - Courtland

PROJECT: 23044

DATE: 30-Oct-24

DESIGN BY: ZDR

PRE-DEVELOPMENT FLOW

RUNOFF COEF.

Catchment	Grass	Building Roof	Conc. Asph	Open Space (Gravel)	Total
C=	**0.15**	**0.95**	**0.95**	**0.7**	**0.36**
Area	1.84	0.13	0.17	0.63	**2.77**

IDF PARAMETERS (NORFOLK COUNTY DESIGN CRITERIA, 2019)

Parameters	2-Year	5-Year	100-Year
a	529.711	583.017	801.041
b	4.501	3.007	1.501
c	0.745	0.703	0.657

I= rainfall intensity (mm/hr), a,b= paramenters, t= time of concentration (hours)

TIME OF CONCENTRATION (MINUTES)

Catchment	Method	Flow Length (L)	Slope (S_w)	Area (ha)	T_c (min)
Pre Dev	AIRPORT (C<0.4)	322	0.90	2.77	44.72

RAINFALL INTENSITY (mm/h)

Catchment	2-Year	5-Year	100-Year
Pre Dev	29.07	38.51	64.55

I = a/(t+b)^c : I= rainfall intensity (mm/hr), a,b,c= paramenters, t= time of concentration (hours)

DISCHARGE (L/s) (Q = 2.778 * C * I * A)

Catchment	2-Year	5-Year	100-Year
Pre Dev	80.9	107.2	179.6

* 2 to 10 year storm : Q X 1.0, * 25 year storm : Q X 1.1, * 50 year storm: Q x 1.2, 100 year storm: Q x 1.25

MUNICIPAL DRAIN OUTLET DESIGN RESTRICTION (L/s):

2.8ha of 171Ha

1.637% of culvert capacity of 563.3l/s
(900mm steel culvert @ 0.33%)
0.01637 * 563.3 = 9.2 l/s

No.	REVISION	BY	DATE

APPENDIX A

Bilger Slinger Services

Proposed Bilger Warehouse - Functional Servicing Report

Norfolk County - Courtland

PROJECT: 23044

DATE: 30-Oct-24

DESIGN BY: ZDR

POST-DEVELOPMENT STORAGE VOLUME CALCULATIONS - 2-Year Storm

RUNOFF COEF.

Catchment	Grass	Conc / Asph	Open Space (Gravel)	Building Roof	Pond	Total Area	Runoff Coefficient
C=	**0.15**	**0.95**	**0.7**	**0.95**	**0.95**		
Area	0.65	0.17	1.39	0.34	0.22	**2.77**	**0.64**

IDF PARAMETERS (NORFOLK COUNTY DESIGN CRITERIA, 2019)

Parameters	2-Year
a	529.711
b	4.501
c	0.745

I= rainfall intensity (mm/hr), a,b,c= paramenters, t= time of concentration (hours)

Rate of Release 9.2 L/s

0.0092 m^3/s

Time [hrs]	Rainfall Intensity [mm/hr]	Total Volume [m^3]	Inflow [m^3/s]	Max. Rate of Release [m^3/s]	Volume Released [m^3]	Volume Stored [m^3]	
0.083	99.1	145	0.486	0.0092	3	142	
0.167	72.2	213	0.354	0.0092	6	207	
0.333	48.9	287	0.240	0.0092	11	276	
0.50	37.9	334	0.186	0.0092	17	317	
0.667	31.3	369	0.153	0.0092	22	346	
0.833	26.9	396	0.132	0.0092	28	368	
1	23.8	419	0.116	0.0092	33	386	
1.5	17.9	473	0.088	0.0092	50	423	
2	14.6	514	0.071	0.0092	66	447	
3	10.9	575	0.053	0.0092	99	475	
4	8.8	621	0.043	0.0092	132	489	**←Max Storage**
8	5.3	747	0.026	0.0092	265	482	
12	3.9	830	0.019	0.0092	397	432	
18	2.9	922	0.014	0.0092	596	325	
24	2.3	993	0.011	0.0092	795	198	

No.	REVISION			BY	DATE

APPENDIX A

Bilger Slinger Services

Proposed Bilger Warehouse - Functional Servicing Report

Norfolk County - Courtland

PROJECT: 23044

DATE: 30-Oct-24

DESIGN BY: ZDR

POST-DEVELOPMENT STORAGE VOLUME CALCULATIONS - 5 Year Storm

RUNOFF COEF.

Catchment	Grass	Conc / Asph	Open Space (Gravel)	Building Roof	Pond	Total Area	Runoff Coefficient
C=	**0.15**	**0.95**	**0.7**	**0.95**	**0.95**		
Area	0.65	0.17	1.39	0.34	0.22	**2.77**	**0.64**

IDF PARAMETERS (NORFOLK COUNTY DESIGN CRITERIA, 2019)

Parameters	5 Year
a	583.017
b	3.007
c	0.703

I= rainfall intensity (mm/hr), a,b,c= paramenters, t= time of concentration (hours)

Rate of Release 9.2 L/s

0.0092 m^3/s

Time [hrs]	Rainfall Intensity [mm/hr]	Total Volume [m^3]	Inflow [m^3/s]	Max. Rate of Release [m^3/s]	Volume Released [m^3]	Volume Stored [m^3]	
0.083	135.3	198	0.663	0.0092	3	195	
0.167	95.9	283	0.470	0.0092	6	277	
0.333	64.4	378	0.315	0.0092	11	367	
0.50	49.9	440	0.245	0.0092	17	424	
0.667	41.4	487	0.203	0.0092	22	465	
0.833	35.8	526	0.175	0.0092	28	498	
1	31.7	559	0.155	0.0092	33	526	
1.5	24.1	637	0.118	0.0092	50	588	
2	19.8	698	0.097	0.0092	66	632	
3	15.0	792	0.073	0.0092	99	693	
4	12.3	865	0.060	0.0092	132	733	
8	7.6	1068	0.037	0.0092	265	803	
12	5.7	1206	0.028	0.0092	397	809	←Max Storage
18	4.3	1362	0.021	0.0092	596	766	
24	3.5	1484	0.017	0.0092	795	689	

No.	REVISION	BY	DATE

APPENDIX A

CJDL Consulting Engineers

Bilger Slinger Services

Proposed Bilger Warehouse - Functional Servicing Report

Norfolk County - Courtland

PROJECT: 23044

DATE: 30-Oct-24

DESIGN BY: ZDR

POST-DEVELOPMENT STORAGE VOLUME CALCULATIONS - 100 Year Storm

RUNOFF COEF.

Catchment	Grass	Conc / Asph	Open Space (Gravel)	Building Roof	Pond	Total Area	Runoff Coefficient *1.25
C=	**0.15**	**0.95**	**0.7**	**0.95**	**0.95**		
Area	0.65	0.17	1.39	0.34	0.22	**2.77**	**0.80**

IDF PARAMETERS (NORFOLK COUNTY DESIGN CRITERIA, 2019)

Parameters	100 Year
a	801.041
b	1.501
c	0.657

I= rainfall intensity (mm/hr), a,b,c= paramenters, t= time of concentration (hours)

Rate of Release 9.2 L/s

0.0092 m^3/s

Time [hrs]	Rainfall Intensity [mm/hr]	Total Volume [m^3]	Inflow [m^3/s]	Max. Rate of Release [m^3/s]	Volume Released [m^3]	Volume Stored [m^3]	
0.083	234.6	429	1.437	0.0092	3	427	
0.167	160.8	592	0.985	0.0092	6	587	
0.333	106.8	784	0.654	0.0092	11	773	
0.50	83.0	915	0.509	0.0092	17	899	
0.667	69.3	1019	0.424	0.0092	22	996	
0.833	60.1	1104	0.368	0.0092	28	1077	
1	53.5	1180	0.328	0.0092	33	1147	
1.5	41.2	1363	0.252	0.0092	50	1313	
2	34.2	1508	0.210	0.0092	66	1442	
3	26.3	1738	0.161	0.0092	99	1639	
4	21.8	1921	0.133	0.0092	132	1789	
8	13.8	2442	0.085	0.0092	265	2177	
12	10.6	2808	0.065	0.0092	397	2410	
18	8.1	3228	0.050	0.0092	596	2632	
46	4.4	4456	0.027	0.0092	1524	2933	←**Max Storage**

No.	REVISION	BY	DATE

APPENDIX A

Bilger Slinger Services
Proposed Bilger Warehouse - Functional Servicing Report
Norfolk County - Courtland

PROJECT: 23044
DATE: 30-Oct-24
DESIGN BY: ZDR

OVERALL SITE STORAGE TABLE

Ponding Elev. (m)	Total Storage Pond Volume (m^3)	Total Active Storage Provided (m^3)	Total Active Storage Required (m^3)	Peak Discharge			Notes
				Controlled (l/s)	Pre Dev. (l/s)	Outlet Culvert Capacity (l/s)	
237.70	N/A	N/A	N/A	N/A	N/A	N/A	Outlet
238.02	1728	497	489	9.2	81	9.2	2-YEAR
238.20	2050	818	809	9.2	107	9.2	5-YEAR
239.12	4193	2960	2933	9.2	180	9.2	100-YEAR

STAGE STORAGE PONDING

Fire/SWM Pond

PONDING ELEV. (m)	TOTAL VOLUME (m^3)	AVTIVE STORAGE VOLUME (m^3)	DEPTH (m^3)
237.70	1232	0	0.00
237.75	1303	72	0.05
237.80	1377	145	0.10
237.85	1453	221	0.15
237.90	1531	300	0.20
237.95	1612	380	0.25
238.00	1695	463	0.30
238.05	1780	548	0.35
238.10	1867	636	0.40
238.15	1957	726	0.45
238.20	2050	818	0.50
238.25	2144	912	0.55
238.30	2241	1009	0.60
238.35	2341	1109	0.65
238.40	2442	1211	0.70
238.45	2547	1315	0.75
238.50	2654	1422	0.80
238.55	2763	1531	0.85
238.60	2875	1643	0.90
238.65	2989	1758	0.95
238.70	3106	1875	1.00
238.75	3226	1994	1.05
238.80	3348	2116	1.10
238.85	3473	2241	1.15
238.90	3600	2368	1.20
238.95	3730	2498	1.25
239.00	3863	2631	1.30
239.05	3998	2767	1.35
239.10	4137	2905	1.40
239.15	4277	3046	1.45
239.20	4421	3189	1.50

Release Rate of Outlet Pipe (Capacity)

$$Q = VA \qquad V = \frac{k}{n}\left(\frac{A}{P}\right)^{2/3} S^{1/2}$$

r= 0.200/2 = 0.1 m
k= 1
n= 0.013
A= Pi(r)^2 = 0.03142 m^2
P= 2Pi(r) = 0.62832 m
S= 0.0008
Q= 9.2 l/s

NO.	REVISION	BY	DATE

APPENIDX ‘B’ – WATER SERVICING

OBC Fire Flow Calculations
Ontario Water Well Record (910370347)

Norfolk County
Bilger Slinger Services

CJDL Consulting Engineers

PROJECT No. 23044
DATE: 30-Oct-24
DESIGN BY: GN/ZDR
CHECKED BY: PJP

Ontario Building Code Fire Demand Calculations

Average Floor Area	**1161.3**	m^2	
No.Storeys	**2**		
Building Height	**6.10**	m	(Height to Underside of Roof Deck) (OBC Section 3)
Sprinkler System?	**No**		
Building Class	**F2**		
Fire Resistance/Separation	**1.0**	h	
Construction Type	**Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.**		
K	**27**		
Building Volume	**7083.93**	m^3	(Average Floor Area * Building Height)

S_{FRONT}	**0.0**	(Distance =	100.00	m) (OFM TG-03-1999 Section 6.3)
S_{LEFT}	**0.0**	(Distance =	77.00	m) (OFM TG-03-1999 Section 6.3)
S_{RIGHT}	**0.0**	(Distance =	30.00	m) (OFM TG-03-1999 Section 6.3)
S_{REAR}	**0.0**	(Distance =	46.00	m) (OFM TG-03-1999 Section 6.3)
S_{SUM}	**0.0**			

S_{TOT}	**1.0**		($S_{TOT} = 1 + S_{SUM}$) (OFM TG-03-1999 Section 6.3)
Q	**191266**	L	($Q = K*Volume*S_{TOT}$) (OFM TG-03-1999 Section 6.3)
REQUIRED FIRE FLOW	**6300**	L/min	(Table 2 - OFM TG-03-1999 Section 6.3)
REQUIRED FIRE FLOW	**105**	L/s	

No.	REVISION	BY	DATE
02	Updated Building Size	PJP	1-Feb-24
01	Updated Per Municipal Comments	PJP	9-Nov-23

Norfolk County
Bilger Slinger Services

CJDL Consulting Engineers

PROJECT No. 23044
DATE: 30-Oct-24
DESIGN BY: GN/ZDR
CHECKED BY: PJP

Ontario Building Code Fire Demand Calculations

Average Floor Area	**1161.3**	m^2	
No.Storeys	**1**		
Building Height	**5.79**	m	(Height to Underside of Roof Deck) (OBC Section 3)
Sprinkler System?	**No**		
Building Class	**F2**		
Fire Resistance/Separation	**1.0**	h	
Construction Type	**Building is of noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. of the OBC. Floor assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.**		
K	**27**		
Building Volume	**6723.93**	m^3	(Average Floor Area * Building Height)

S_{FRONT}	**0.0**	(Distance =	46.00	m) (OFM TG-03-1999 Section 6.3)
S_{LEFT}	**0.0**	(Distance =	40.00	m) (OFM TG-03-1999 Section 6.3)
S_{RIGHT}	**0.0**	(Distance =	100.00	m) (OFM TG-03-1999 Section 6.3)
S_{REAR}	**0.0**	(Distance =	100.00	m) (OFM TG-03-1999 Section 6.3)
S_{SUM}	**0.0**			

S_{TOT}	**1.0**		($S_{TOT} = 1 + S_{SUM}$) (OFM TG-03-1999 Section 6.3)
Q	**181546.0**	L	($Q = K*Volume*S_{TOT}$) (OFM TG-03-1999 Section 6.3)
REQUIRED FIRE FLOW	**5400**	L/min	(Table 2 - OFM TG-03-1999 Section 6.3)
REQUIRED FIRE FLOW	**90**	L/s	

No.	REVISION	BY	DATE
02	Updated Building Size	PJP	1-Feb-24
01	Updated Per Municipal Comments	PJP	9-Nov-23

Norfolk County
Bilger Slinger Services

CJDL Consulting Engineers

PROJECT No. 23044
DATE: 30-Oct-24
DESIGN BY: GN/ZDR
CHECKED BY: PJP

Ontario Building Code Fire Demand Calculations

Average Floor Area	**223.0**	m^2	
No.Storeys	**1**		
Building Height	**4.57**	m	(Height to Underside of Roof Deck) (OBC Section 3)
Sprinkler System?	**No**		
Building Class	**F2**		
Fire Resistance/Separation	**1.0**	h	
Construction Type	**Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.**		
K	**27**		
Building Volume	**1019.11**	m^3	(Average Floor Area * Building Height)

S_{FRONT}	**0.0**	(Distance =	15.37	m) (OFM TG-03-1999 Section 6.3)
S_{LEFT}	**0.0**	(Distance =	100.00	m) (OFM TG-03-1999 Section 6.3)
S_{RIGHT}	**0.0**	(Distance =	33.00	m) (OFM TG-03-1999 Section 6.3)
S_{REAR}	**0.0**	(Distance =	100.00	m) (OFM TG-03-1999 Section 6.3)
S_{SUM}	**0.0**			

S_{TOT}	**1.0**		(S_{TOT} = 1 + S_{SUM}) (OFM TG-03-1999 Section 6.3)
Q	**27516.0**	L	(Q = K*Volume*S_{TOT}) (OFM TG-03-1999 Section 6.3)
REQUIRED FIRE FLOW	**2700**	L/min	(Table 2 - OFM TG-03-1999 Section 6.3)
REQUIRED FIRE FLOW	**45**	L/s	

No.	REVISION	BY	DATE
02	Updated Building Size	PJP	1-Feb-24
01	Updated Per Municipal Comments	PJP	9-Nov-23

Norfolk County
Bilger Slinger Services

CJDL Consulting Engineers

PROJECT No. 23044
DATE: 30-Oct-24
DESIGN BY: GN/ZDR
CHECKED BY: PJP

Ontario Building Code Fire Demand Calculations

Average Floor Area	865.1	m^2	
No.Storeys	1		
Building Height	4.00	m	(Height to Underside of Roof Deck) (OBC Section 3)
Sprinkler System?	No		
Building Class	D		
Fire Resistance/Separation	1.0	h	
Construction Type	Building is of noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2. of the OBC, including loadbearing walls, columns and arches.		
K	23		
Building Volume	3460.40	m^3	(Average Floor Area * Building Height)

S_{FRONT}	0.0	(Distance =	26.36	m) (OFM TG-03-1999 Section 6.3)
S_{LEFT}	0.0	(Distance =	30.00	m) (OFM TG-03-1999 Section 6.3)
S_{RIGHT}	0.0	(Distance =	20.60	m) (OFM TG-03-1999 Section 6.3)
S_{REAR}	0.0	(Distance =	955.00	m) (OFM TG-03-1999 Section 6.3)
S_{SUM}	0.0			

S_{TOT}	1.0		(S_{TOT} = 1 + S_{SUM}) (OFM TG-03-1999 Section 6.3)
Q	79589.2	L	(Q = K*Volume*S_{TOT}) (OFM TG-03-1999 Section 6.3)
REQUIRED FIRE FLOW	2700	L/min	(Table 2 - OFM TG-03-1999 Section 6.3)
REQUIRED FIRE FLOW	**45**	L/s	

No.	REVISION	BY	DATE
02	Updated Building Size	PJP	1-Feb-24
01	Updated Per Municipal Comments	PJP	9-Nov-23

APL

61-16

40 I/15 E

GROUND WATER BRANCH
No. 44
DEC 20 1961
ONTARIO WATER RESOURCES COMMISSION

713

17 Z 527870 E
15 R 4743350 N

The Ontario Water Resources Commission Act

Elev. 15 R 01290

WATER WELL RECORD

Basin 23 — County or District NORFOLK — Township, Village, Town or City MIDDLETON

Con. 11 T.T.R. — Lot 18 — Date completed 20 (day) 11 (month) 61 (year)

[redacted] Address

Casing and Screen Record

Inside diameter of casing 4"
Total length of casing 29'
Type of screen Johnson
Length of screen 5'
Depth to top of screen 27'
Diameter of finished hole 4"

Pumping Test

Static level 4'
Test-pumping rate 5 Gal G.P.M.
Pumping level 17'
Duration of test pumping 2 hrs
Water clear or cloudy at end of test clear
Recommended pumping rate 350 P.hr ~~G.P.M.~~
with pump setting of 31½ feet below ground surface

Well Log

Overburden and Bedrock Record	From ft.	To ft.	Water Record: Depth(s) at which water(s) found	Water Record: Kind of water (fresh, salty, sulphur)
yellow Sand	0	6	20	Fresh
Blue clay	6	20	32	
Fine to ravel & coarse Sand	20	32		

For what purpose(s) is the water to be used? Cooling in a warehouse

Is well on upland, in valley, or on hillside? Upland

Drilling or Boring Firm W. E. Locker

Address R.R. #2 Vienna Ont

Licence Number 150

Name of Driller or Borer W. E. Locker

Address R.R. #2 Vienna

Date

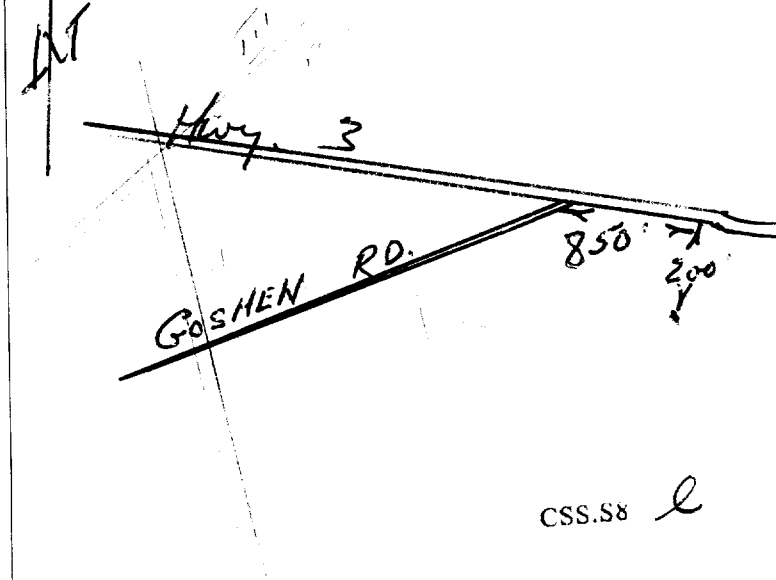
W. E. Locker
(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M Sets 60-5930

OWRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



CSS.S8

APPENIDX ‘C’ – TRAFFIC IMPACT STUDY

Traffic Impact Study (Paradigm Transportation Solutions, 2024)

494 Highway 3, Courtland, Norfolk County Transportation Impact Study

Paradigm Transportation Solutions Limited

2024-10
230661

ptsl.com

Great Place To Work. Certified NOV 2023 - NOV 2024 CANADA

Project Summary

Project Number:

230661

Date and Version:

2024-10
1.0.0

Client:

Reid & Deleye
Greg Eyre

Peter Penner
Cyril J. Demeyere Limited Consulting Engineers
261 Broadway, P.O. Box 460
Tillsonburg ON N4G 4H8

Consultant Project Team

Rajan Philips, M.Sc. (PI), P.Eng.
Patrick Neal, P.Eng.

Paradigm Transportation Solutions Limited

5A-150 Pinebush Road
Cambridge ON N1R 8J8
p: 519.896.3163
    905.381.2229
    416.479.9684
www.ptsl.com

494 Highway 3, Courtland, Norfolk County Transportation Impact Study

<< Original Signed By >>

Rajan Philips, P.Eng.

Disclaimer

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact Study (TIS) for the proposed changes to the property located at 494 Highway 3 in the community of Courtland, Norfolk County. The changes will provide for expanding an existing Equipment Warehouse and accommodate a new Truck Yard for two different businesses.

This TIS includes description and analysis of existing road and traffic conditions, a description of the proposed development, analysis of future traffic conditions, and assessment of the existing access arrangement to accommodate the proposed changes.

Proposed Site Changes

The subject property is located on the south side of Highway 3, east of Goshen Road. The property is owned by Bilger Slinger Services and is currently rented to Blue West Equipment for use as a storage and sales facility for farm, residential, and commercial equipment.

The proposed changes to the site are to accommodate the relocation of Bilger Slinger Services from their current location at 480 Highway 3 to the property at 494 Highway 3 and shared use of the site with Blue West Equipment.

Specifically, the changes will include the development of a truck yard for Bilger Slinger Services and the replacement of an existing warehouse with a GFA of 456 m^2 with a larger warehouse of 1161 m^2 GFA for Blue West Equipment. Bilger Slinger Services currently stores and services 18 slinger trucks but is planning to expand to include 24 trucks by 2034.

The property has two driveways on Highway 3 approximately 70 metres apart and at distances of 165 metres and 235 metres east of Goshen Road. The westerly driveway is proposed to be used for Blue West Equipment, and the easterly driveway by Bilger Slinger Services. It is noted that the easterly driveway is temporarily closed.

TIS Scope

The scope of the Transportation Impact Study for the proposed development includes:

- **Study Area Intersections:**

  - Highway 3 and Goshen Road; and
  - Two site access intersections on Highway 3.
- **Analysis Periods:** Weekday AM and PM peak hours.
- **Traffic Conditions:** Existing (2023), expansion completion (2024), five years after completion (2029), and ten years after completion (2034).

Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions:** The intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are operating at satisfactory levels of service (LOS A/B).
- **Site Traffic Volumes:** The existing site driveway volumes indicate that 5 AM peak hour trips and 4 PM peak hour generated by the current site operations.

  With the proposed changes, the site traffic volumes are projected to increase to 7 AM peak hour trips and 15 PM peak hour trips.

  Based on the current and future site traffic volumes, the site could be considered to be a low trip generator with minimal impact on driveway and road traffic operations.
- **Background Traffic Conditions:** The two intersections are forecast to operate at acceptable levels of service under 2024, 2029, and 2034 background traffic conditions.
- **Total Traffic Conditions:** The intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours under 2024, 2029, and 2034 total traffic conditions, as under existing conditions.
- **Site Accesses:** The Westerly and Easterly Site Access intersections on Highway 3 are forecast to operate at acceptable levels of service under 2024, 2029, and 2034 total traffic conditions.

  Both access locations satisfy the sight distance requirements, and do not require an auxiliary westbound left-turn lane on Highway 3 to accommodate inbound left-turning traffic.

Recommendations

Based on the findings and conclusions of this study, it is recommended that the Site Changes with two driveways for the property at 494 Highway 3, Courtland be considered for approval as proposed.

Contents

Appendices

Figures

Tables

1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact Study (TIS) for the proposed changes to the property located at 494 Highway 3 in the community of Courtland, Norfolk County. The changes will provide for expanding an existing Equipment Warehouse and accommodate a new Truck Yard for two different businesses.

Figure 1.1 details the subject development location.

The subject property is located on the south side of Highway 3, east of Goshen Road. The property is owned by Bilger Slinger Services and is currently rented to Blue West Equipment for use as a storage and sales facility for farm, residential, and commercial equipment.

The proposed changes to the site are to accommodate the relocation of Bilger Slinger Services from their current location at 480 Highway 3 to the property at 494 Highway 3 and shared use of the site with Blue West Equipment.

Specifically, the changes will include the development of a truck yard for Bilger Slinger Services and the replacement of an existing warehouse with a GFA of 456 m^2 with a larger warehouse of 1161 m^2 GFA for Blue West Equipment. Bilger Slinger Services currently stores and services 18 slinger trucks but is planning to expand to include 24 trucks by 2034.

The property has two driveways on Highway 3 approximately 70 metres apart and at distances of 165 metres and 235 metres east of Goshen Road. The westerly driveway is proposed to be used for Blue West Equipment, and the easterly driveway by Bilger Slinger Services. It is noted that the easterly driveway is temporarily closed.

1.2 Purpose and Scope

The purpose of this report is to assess the location and operation of the existing site driveways to accommodate the proposed site changes. The scope of the study, shared with Norfolk County and Ministry staff via e-mail in November 2023, includes:

- assessment of the current road, traffic and site conditions within the study area;

- estimates of background traffic growth for the year of the proposed site changes (2024), five years after changes (2029), and ten years after changes (2034);
- estimates of additional traffic generated by the proposed site changes;
- analyses of the impact of the future traffic on the surrounding road network, including the following study area intersections:
  - Highway 3 and Goshen Road; and
  - Two access intersections on Highway 3.
- Operational and safety assessment of the two site driveways in accommodating the proposed site changes.

Appendix A contains the pre-study consultation material.

This study has been prepared in accordance with the requirements detailed by the MTO TIS Guidelines[1] and Norfolk County TIS Guidelines[2].

[1] General Guidelines for the Preparation of Traffic Impact Studies, Ministry of Transportation Ontario, March 2023.

[2] Norfolk County Integrated Sustainable Master Plan (ISMP), Appendix J: TIS Guidelines, September 2016.

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Location of Subject Site

494 Highway 3, Courtland TIS
230661

Figure 1.1

2 Existing Conditions

2.1 Existing Roadways

The main roadways near the subject development considered in assessing the traffic impacts of the development include:

- **Highway 3** is an east-west provincial highway[3] with a two-lane cross section. The posted speed limit is 80 km/h.
- **Goshen Road** is a north-south local road with a two-lane cross section. The posted speed limit is 60 km/h.

Side-street stop control is provided at the intersection of Highway 3 and Goshen Road.

Figure 2.1 illustrates the traffic control and lane configuration at the intersections of Highway 3 and Goshen Road.

2.2 Existing Driveways on Highway 3

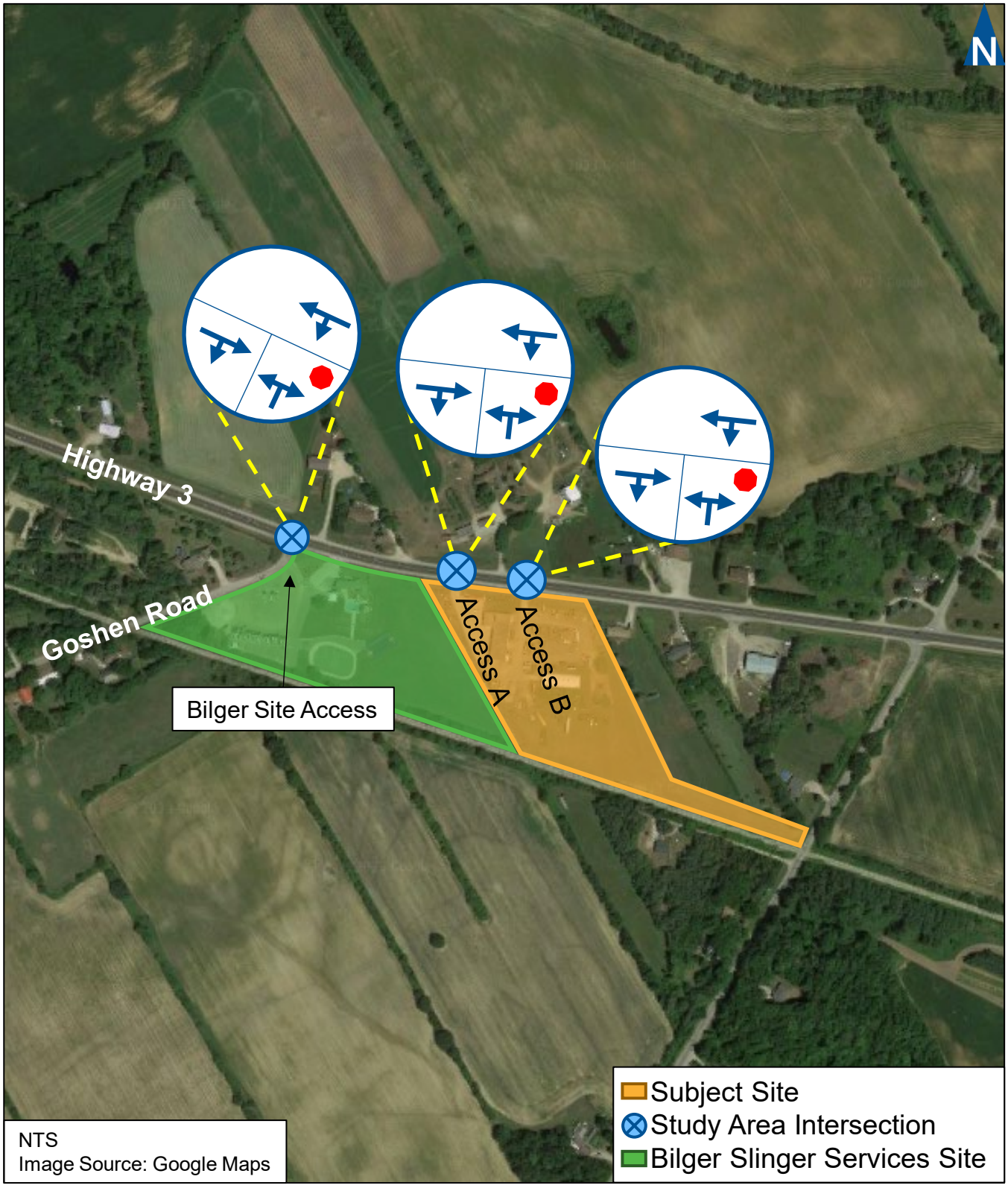
Highway 3 in the study area is identified as a 2B Arterial Road in MTO's Access Management Classification System.[4]

2B Arterial roads typically allows consideration of access connections based on spacing, density (number of accesses over a kilometre), property frontage, and safety requirements.

In the section of Highway 3 between Goshen Road and Plowman's Line, a distance of 625 metres, there are seven driveways on the north side of the highway and six on the south.

The driveways on the south side include the two driveways to the subject property. The property frontage on Highway 3 is 160 metres, and the two driveways are 70 metres apart, exceeding the minimum separation requirement of 30 metres. The westerly and easterly site driveways are located at 165 metres and 235 metres west of Goshen Road, respectively. The two driveways are under stop sign control as shown in **Figure 2.1**.

[3] *Norfolk County Official Plan*, Schedule E-4: Delhi Transportation, 5 October 2018.
[4] Ministry of Transportation. Highway Corridor Management Manual. April 2022.



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Existing Lane Configuration and Traffic Control

2.3 Traffic Volumes

Paradigm conducted turning movement counts at the intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Blue West Equipment Access A on 28 November 2023. Paradigm also conducted turning movement counts at the Goshen Road and Bilger Access intersection on 28 November 2023 to determine the existing traffic in and out of the Bilger Slinger Services site.

Table 2.1 summarizes the traffic peak hours at each intersection.

TABLE 2.1: INTERSECTION PEAK HOURS

Intersection	AM Peak Hour	PM Peak Hour
Highway 3 and Goshen Road	7:45 – 8:45	3:45 – 4:45
Highway 3 and the Blue West Equipment Access A	7:45 – 8:45	3:45 – 4:45
Goshen Road and Bilger Access	7:00 – 8:00	4:00 – 5:00

Appendix B contains the detailed traffic counts for the intersections.

Figure 2.2 illustrates the existing AM and PM weekday peak hour turning movement traffic volumes at the study area intersections.

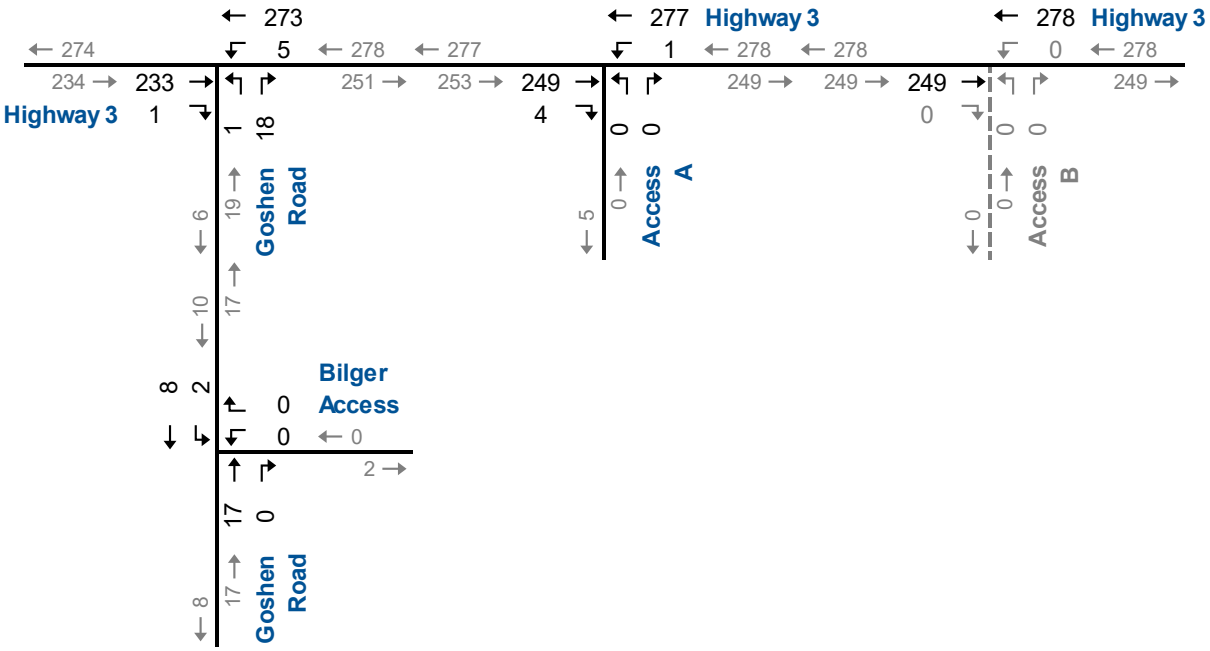
Table 2.2 shows the 8-hour hourly breakdown of inbound and outbound traffic on Gosehn Road at the Bilger site access.

The study area roadway and driveway traffic volumes and turning movements are noted to be low to moderate:

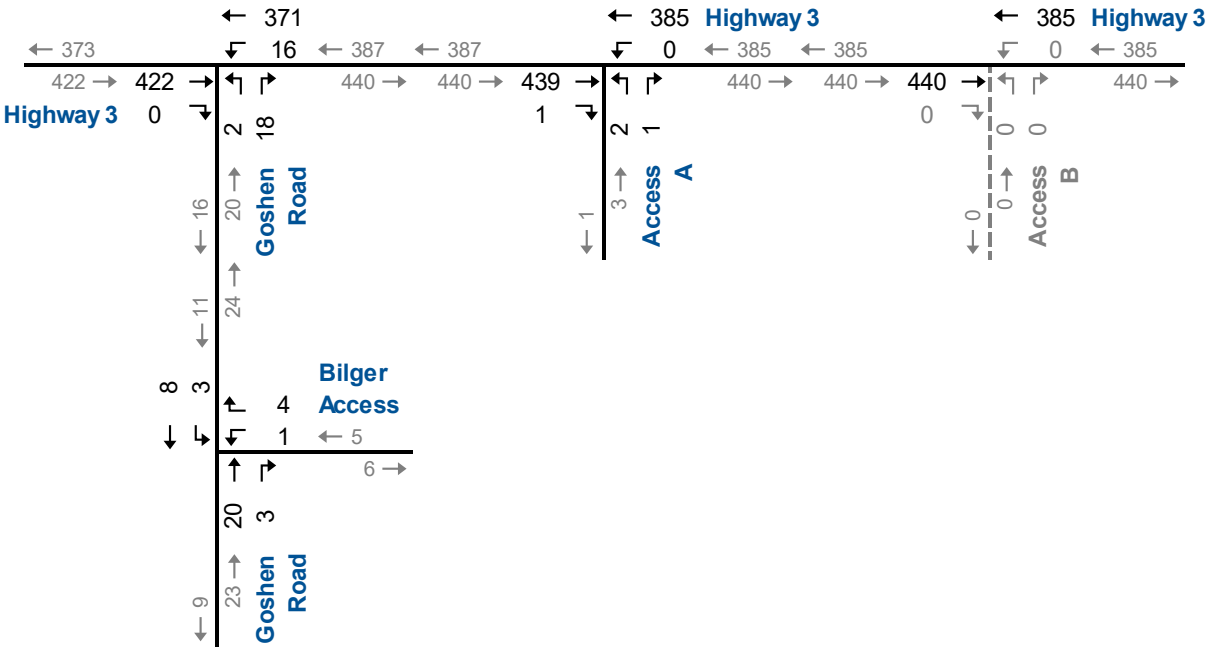
- The peak directional traffic volume on Highway 3 is under 300 vph in the AM peak hour and under 450 vph in the PM peak hour.
- The traffic on Goshen Road is under 20 vph in either direction during either peak hour.
- The driveway turning movements are less than 5 vph.

It is noted that with the proposed changes, the driveway volumes on Goshen Road for the property at 480 Highway 3 will be transferred to the subject site driveways on Highway 3 for the property at 494 Highway 3.

AM Peak Hour



PM Peak Hour



Existing Traffic Volumes

TABLE 2.2: BILGER SITE ACCESS 8-HOUR TRAFFIC VOLUMES

Time	Inbound	Outbound
7:00 – 8:00 AM	2	0
8:00 – 9:00 AM	2	1
9:00 – 10:00 AM	2	4
11:30 AM – 12:30 PM	2	2
12:30 – 1:30 PM	0	0
3:00 – 4:00 PM	4	2
4:00 – 5:00 PM	6	5
5:00 – 6:00 PM	5	4
Total	**20**	**18**

2.4 Traffic Operations

The level of service conditions at the Highway 3 and Goshen Road intersection, and at the Highway 3 and Access A intersection have been assessed through intersection operational analysis using Synchro 11.

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles intending to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to the opposing traffic flows and intersection geometry.

The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume to capacity (v/c) ratio is greater than 1.00, the movement is classed as LOS F and remedial measures are usually implemented if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

Movements are considered critical under the following conditions:

- Signalized Intersections:
  - v/c ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.85 or above;
  - v/c ratios for exclusive movements increased to 0.95 or above; or

- queues for an individual movement are projected to exceed available turning lane storage.

- Unsignalized Intersections:
  - LOS based on average delay per vehicle, on individual movements exceeds LOS “E”; or
  - the estimated 95th percentile queue length for an individual movement exceeds the available queue storage.

Table 2.3 summarizes the results of the intersection operational analysis under existing conditions, including the AM and PM peak hour LOS, v/c ratios, and 95th percentile queues experienced.

The results indicate that the two intersections are operating at satisfactory levels of service (LOS A/B), and with no problem movements.

Appendix C contains the detailed Synchro 11 reports.

TABLE 2.3: EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	10		>	10					
			V/C		0.00	>		<	0.00			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	12		>	12					
			V/C		0.00	>		<	0.02			0.04		>						
			Q		0	>		<	1			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

3 Proposed Site Changes

3.1 Description of Site Changes

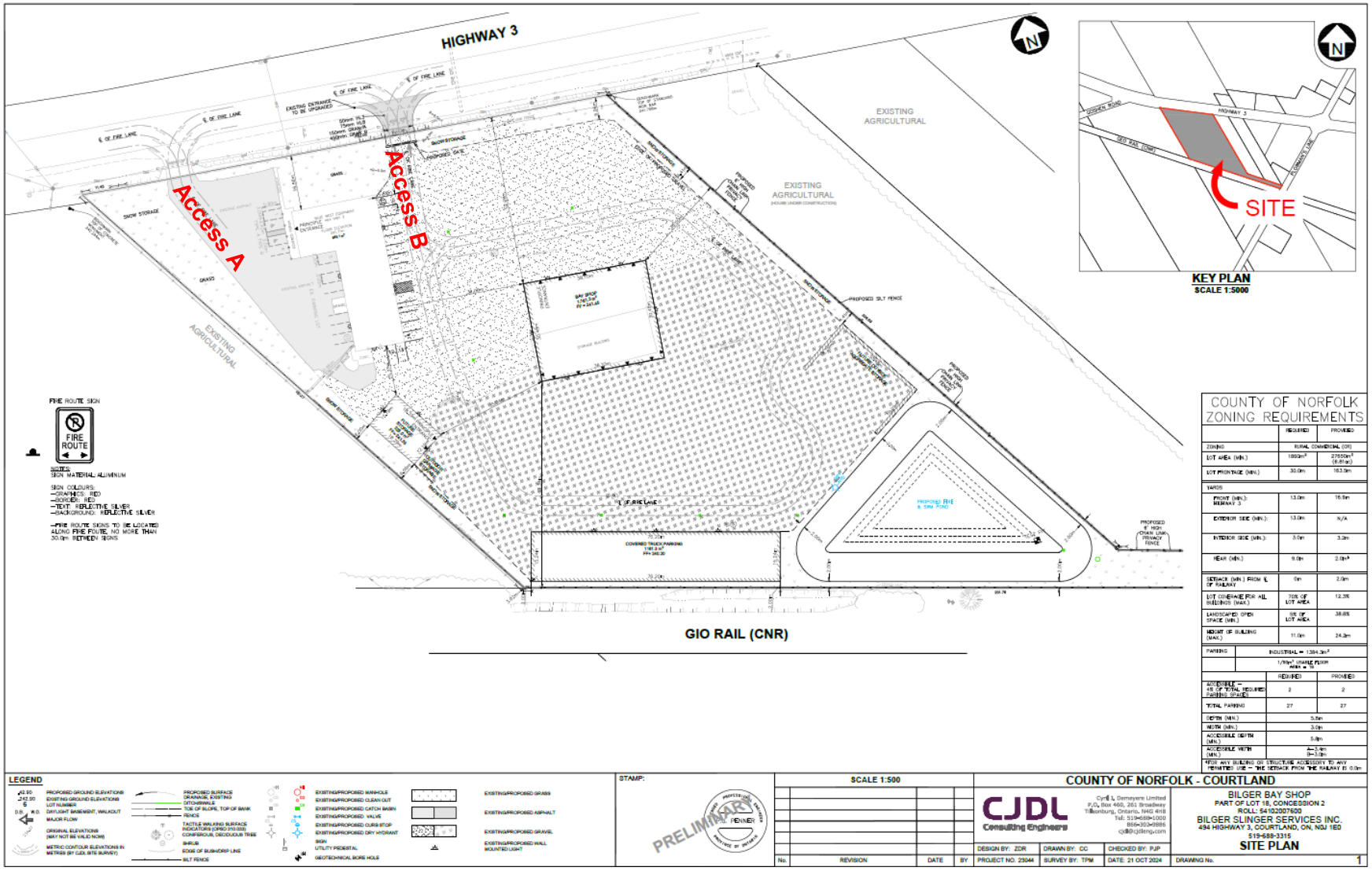
The subject property is located on the south side of Highway 3, east of Goshen Road. The property is owned by Bilger Slinger Services and is currently rented to Blue West Equipment for use as a storage and sales facility for farm, residential, and commercial equipment.

The proposed changes to the site are to accommodate the relocation of Bilger Slinger Services from their current location at 480 Highway 3 to the property at 494 Highway 3 and shared use of the site with Blue West Equipment.

Specifically, the changes will include the development of a truck yard for Bilger Slinger Services and the replacement of an existing warehouse with a GFA of 456 m^2 with a larger warehouse of 1161 m^2 GFA for Blue West Equipment. Bilger Slinger Services currently stores and services 18 slinger trucks but is planning to expand to include 24 trucks by 2034.

The property has two driveways on Highway 3 approximately 70 metres apart and at distances of 165 metres and 235 metres east of Goshen Road. The westerly driveway is proposed to be used for Blue West Equipment, and the easterly driveway by Bilger Slinger Services. It is noted that the easterly driveway is temporarily closed.

Figure 3.1 includes the preliminary grading plan for the site illustrating the proposed changes including the access arrangement.



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Proposed Site Changes

494 Highway 3, Courtland TIS
230661

Figure 3.1

3.2 Site Trip Generation

The trip generation for each of the Blue West Equipment and Bilger Slinger Services sites are expected to be the same as under existing conditions.

Table 3.1 summarizes the number of trips generated by the proposed development.

TABLE 3.1: TRIP GENERATION

Site	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Blue West Equipment	5	0	**5**	1	3	**4**
Bilger Slinger Services	2	0	**2**	6	5	**11**
Total Trip Generation	**7**	**0**	**7**	**7**	**8**	**15**

3.3 Development Trip Distribution and Assignment

The trip distribution for the Bilger Slinger Services site traffic was determined based on the existing assignment of traffic volumes at the site driveway and the existing travel patterns within the study area. **Table 3.2** displays the breakdown of trip distributions used in this study.

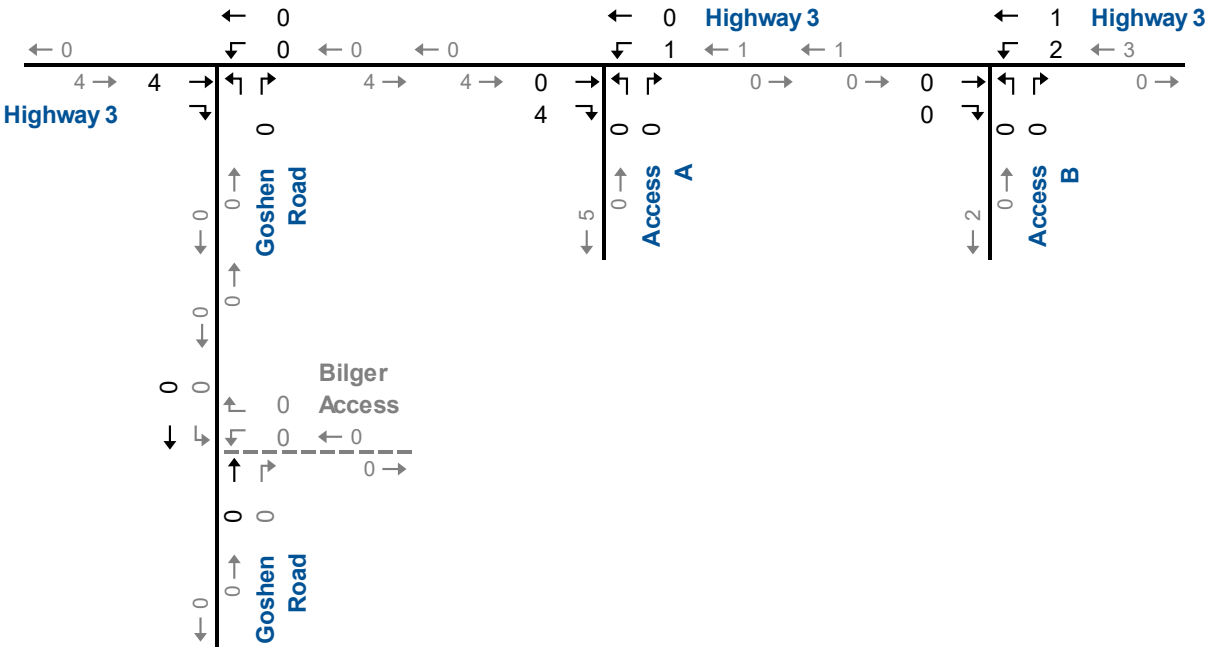
TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
East via Highway 3	83%	0%	50%	72%
West via Highway 3	17%	0%	0%	8%
South via Goshen Road	0%	0%	50%	20%
Total	**100%**	**0%**	**100%**	**100%**

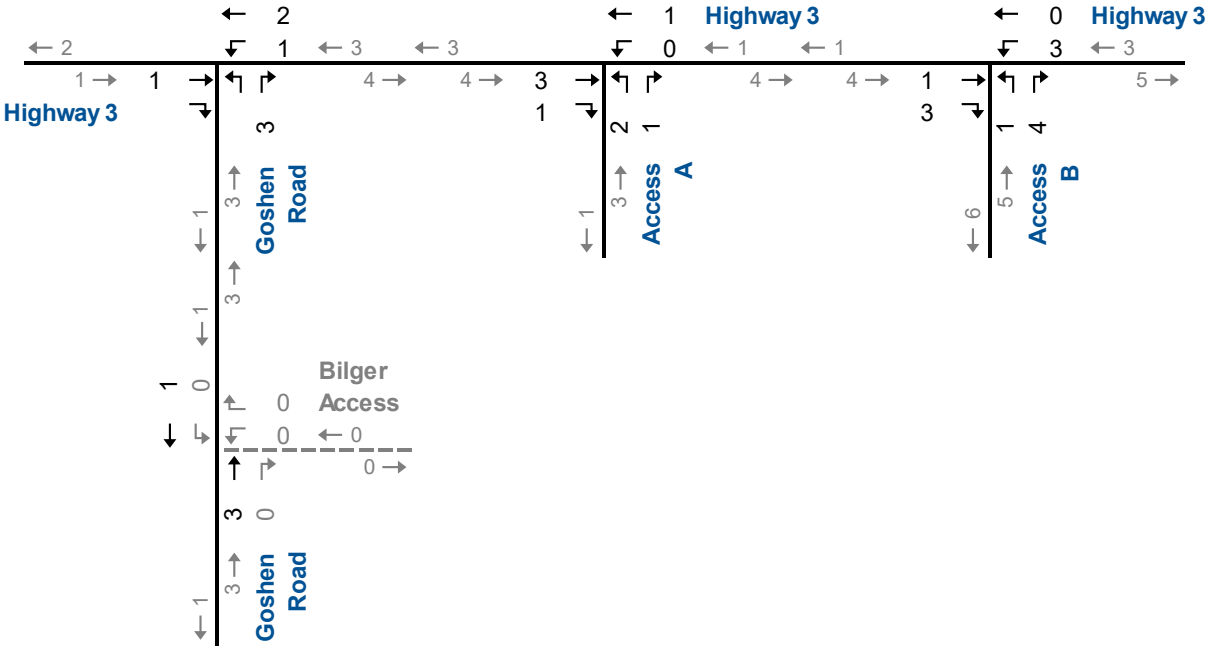
Figure 3.2 illustrates the site-generated traffic volumes for the AM and PM peak hours. The site traffic for Blue West Equipment is unchanged from the existing traffic volumes.

It is noted that as under existing traffic conditions the driveway volumes will remain minimal following the proposed site changes.

AM Peak Hour



PM Peak Hour



Site Generated Traffic Volumes

4 Access Assessment

The assessment of the subject driveways under future traffic conditions is based on future background and total traffic volumes, corresponding to the proposed timing of site changes (2024), five years after changes (2029), and ten years after changes (2034).

4.1 Background Traffic Forecasts

In order to derive the generalized background traffic volumes, a growth rate of 2.0% per annum was applied to the existing roadway traffic volumes.

No background developments were included in the future traffic volumes.

4.2 2024 Background Traffic Operations

Figure 4.1 illustrates the 2024 background traffic volumes, including road traffic growth.

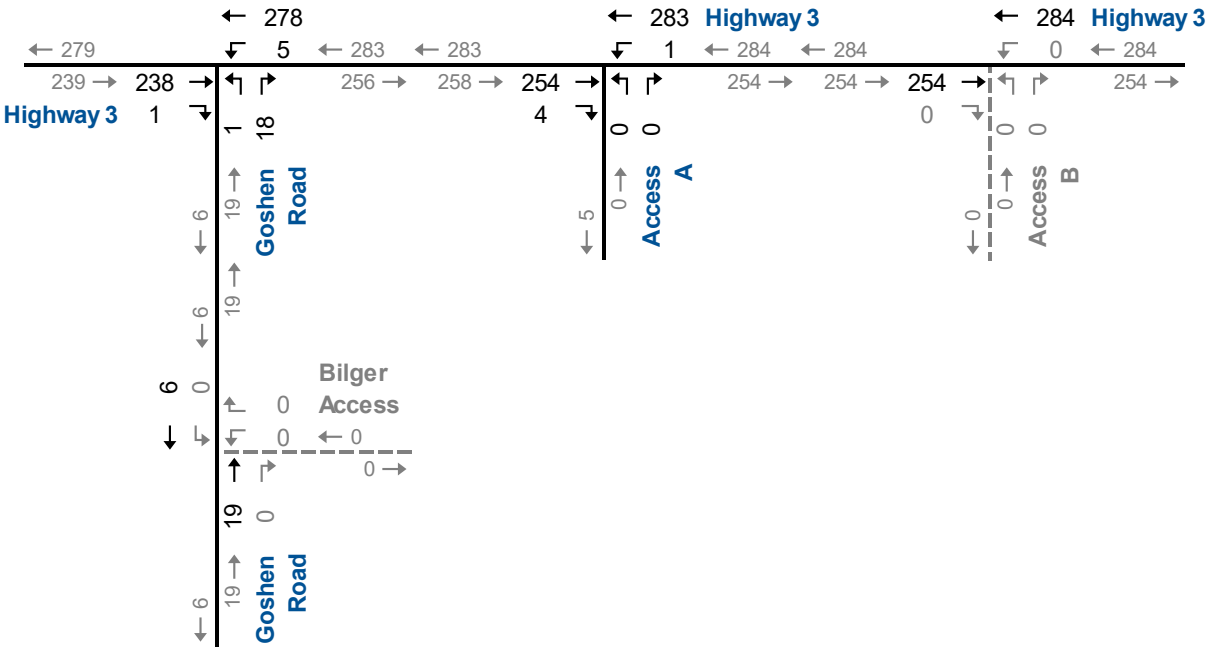
The 2024 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions.

It is noted that no changes have been made to the turning movements at the intersection of Highway 3 and Goshen Road even they would likely be reduced following the proposed relocation of Bilger truck operations.

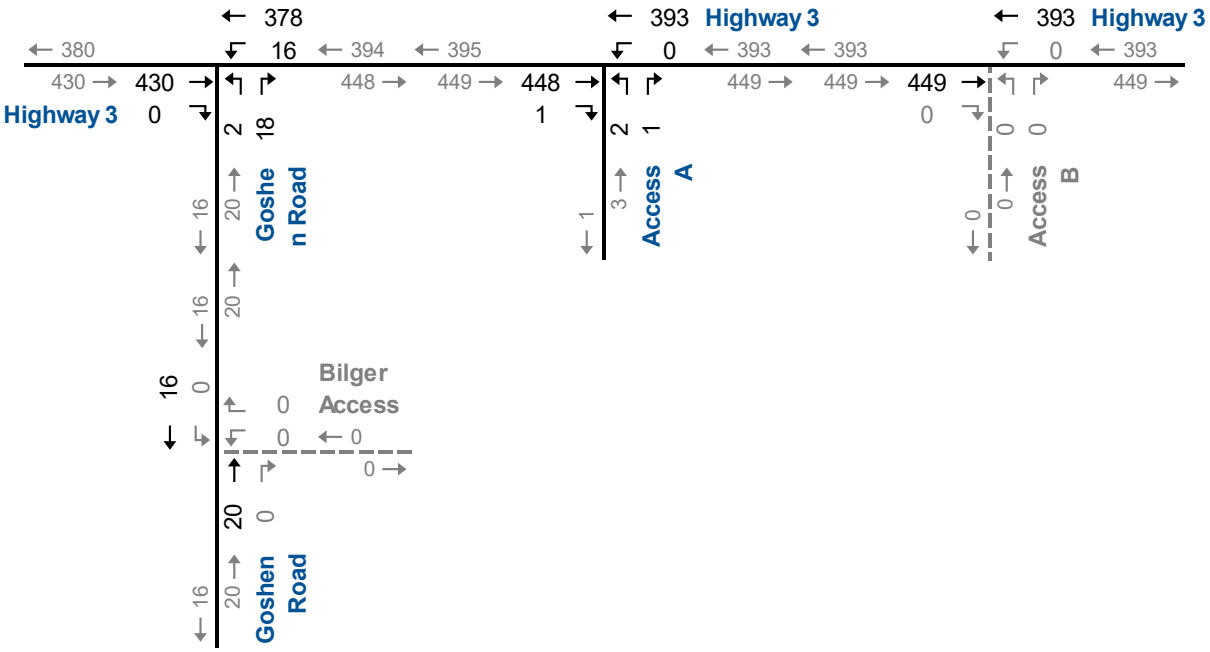
Table 4.1 summarizes the results of the 2024 background traffic operations. The results indicate that the intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are forecast to operate at satisfactory levels of service (LOS A/B), and with no problem movements.

Appendix D contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2024 Background Traffic Volumes

494 Highway 3, Courtland TIS
230661

Figure 4.1

TABLE 4.1: 2024 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	10		>	10					
			V/C		0.00	>		<	0.01			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	12		>	12					
			V/C		0.00	>		<	0.02			0.04		>						
			Q		0	>		<	1			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.3 2024 Total Traffic Operations

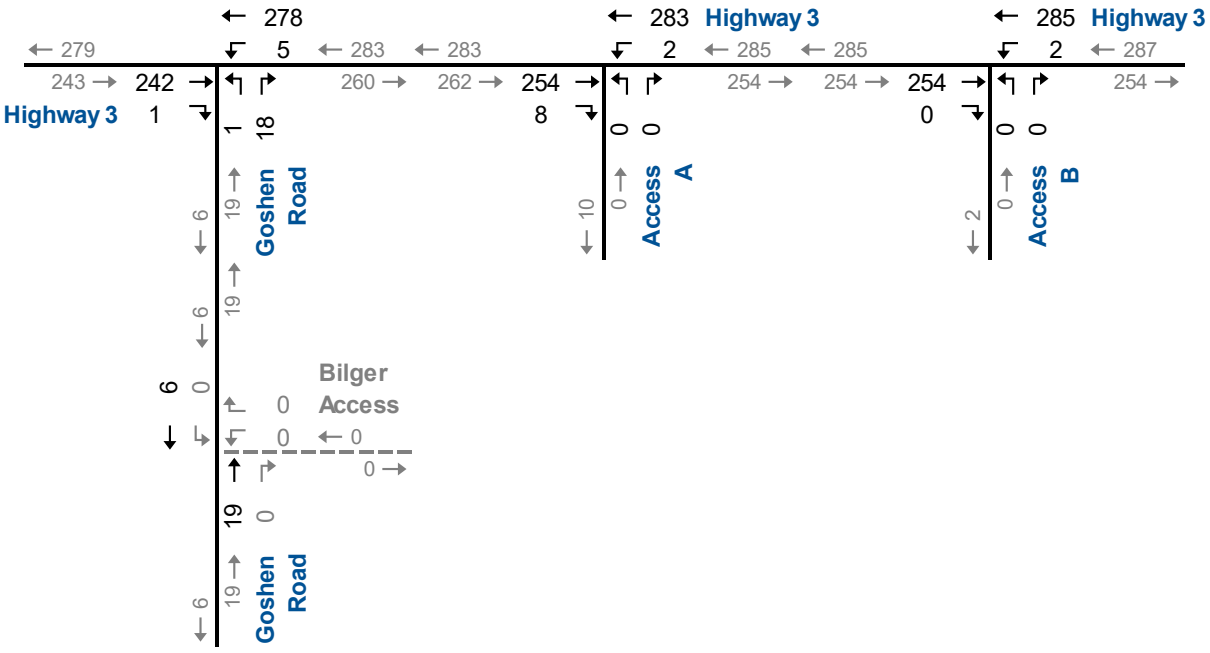
Figure 4.2 illustrates the 2024 total traffic volumes, including trips generated by the proposed development.

The 2024 total traffic volumes have been analyzed using the same methodology as under existing and background traffic conditions.

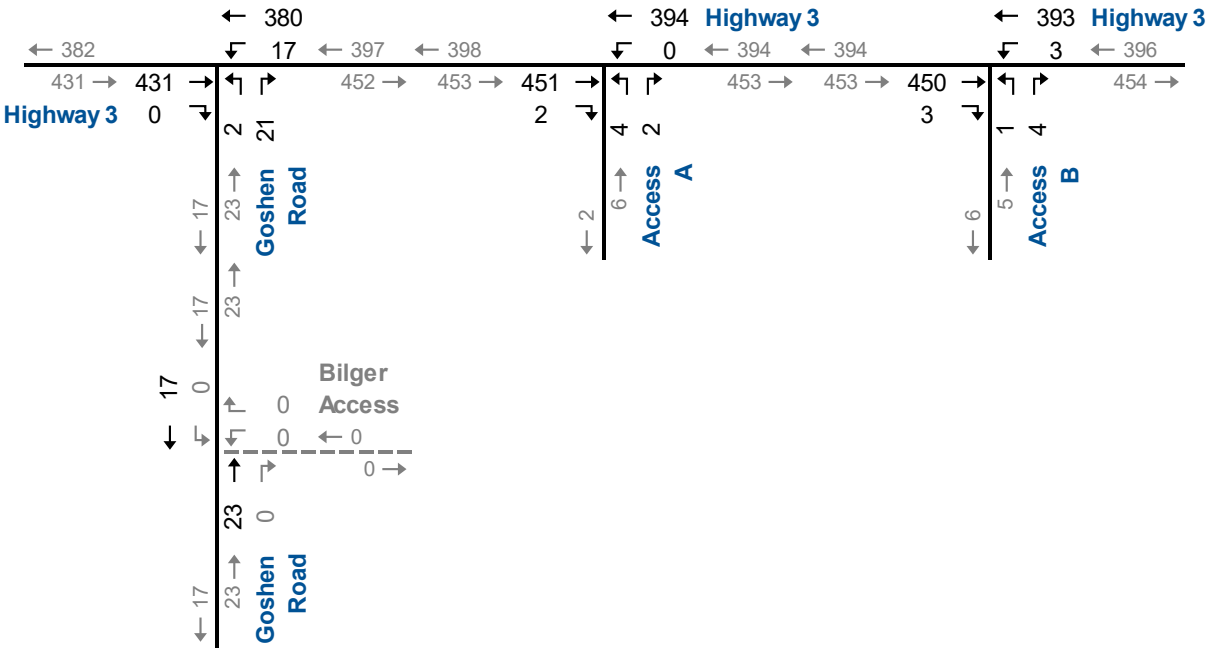
Table 4.2 summarizes the results of the 2024 total traffic operations. The results indicate that the intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours. Both Site Access intersections to Highway 3 are forecast to operate at acceptable levels of service during the AM and PM peak hours.

Appendix E contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2024 Total Traffic Volumes

494 Highway 3, Courtland TIS
230661

Figure 4.2

TABLE 4.2: 2024 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	10		>	10					
			V/C		0.00	>		<	0.01			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
	Highway 3 & Access B	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	12		>	12					
			V/C		0.00	>		<	0.02			0.04		>						
			Q		0	>		<	1			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.00	>		<	0.00			0.02		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access B	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	12		>	12					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.4 2029 Background Traffic Operations

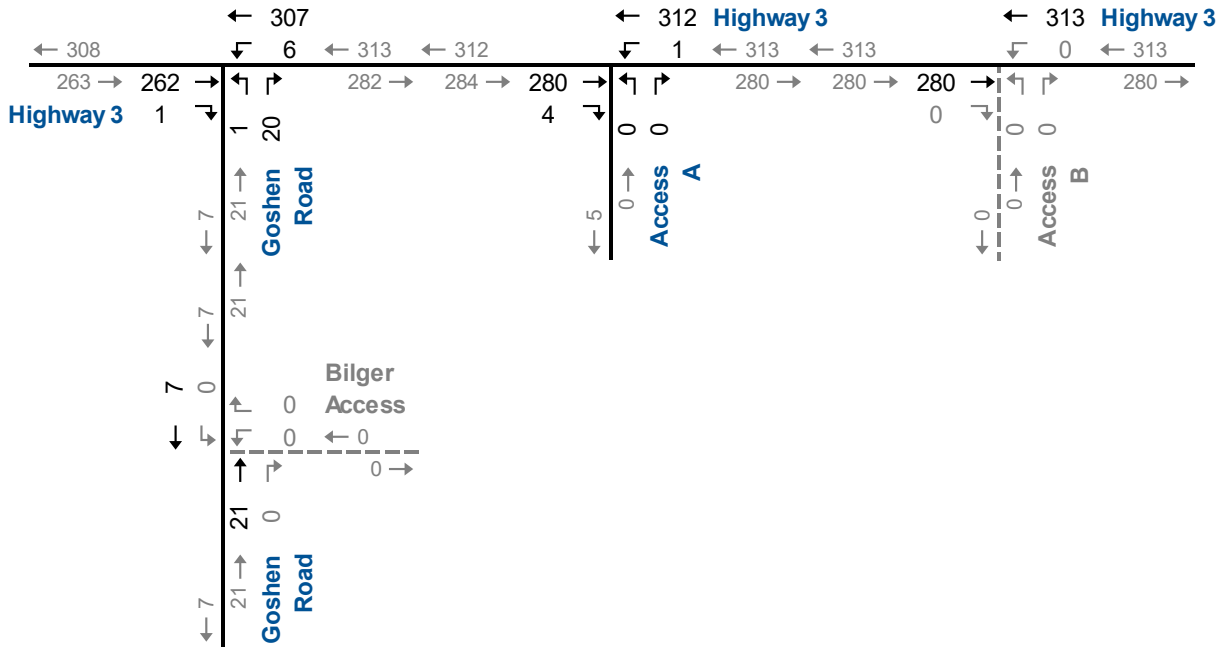
Figure 4.3 illustrates the 2029 background traffic volumes, including road traffic growth.

The 2029 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions.

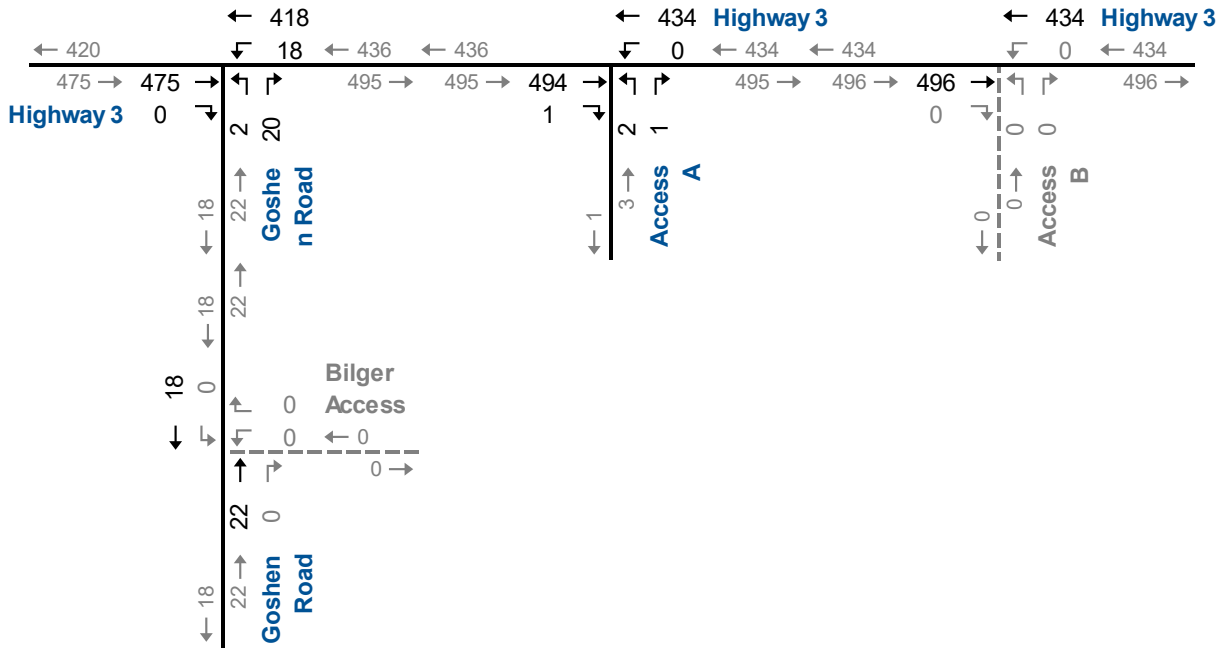
Table 4.3 summarizes the results of the 2029 background traffic operations. The results indicate that the intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are forecast to operate at acceptable levels of service, and with no problem movements.

Appendix F contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2029 Background Traffic Volumes

TABLE 4.3: 2029 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	10		>	10					
			V/C		0.00	>		<	0.01			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	12		>	12					
			V/C		0.00	>		<	0.02			0.05		>						
			Q		0	>		<	1			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	0		0	16		>	16					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

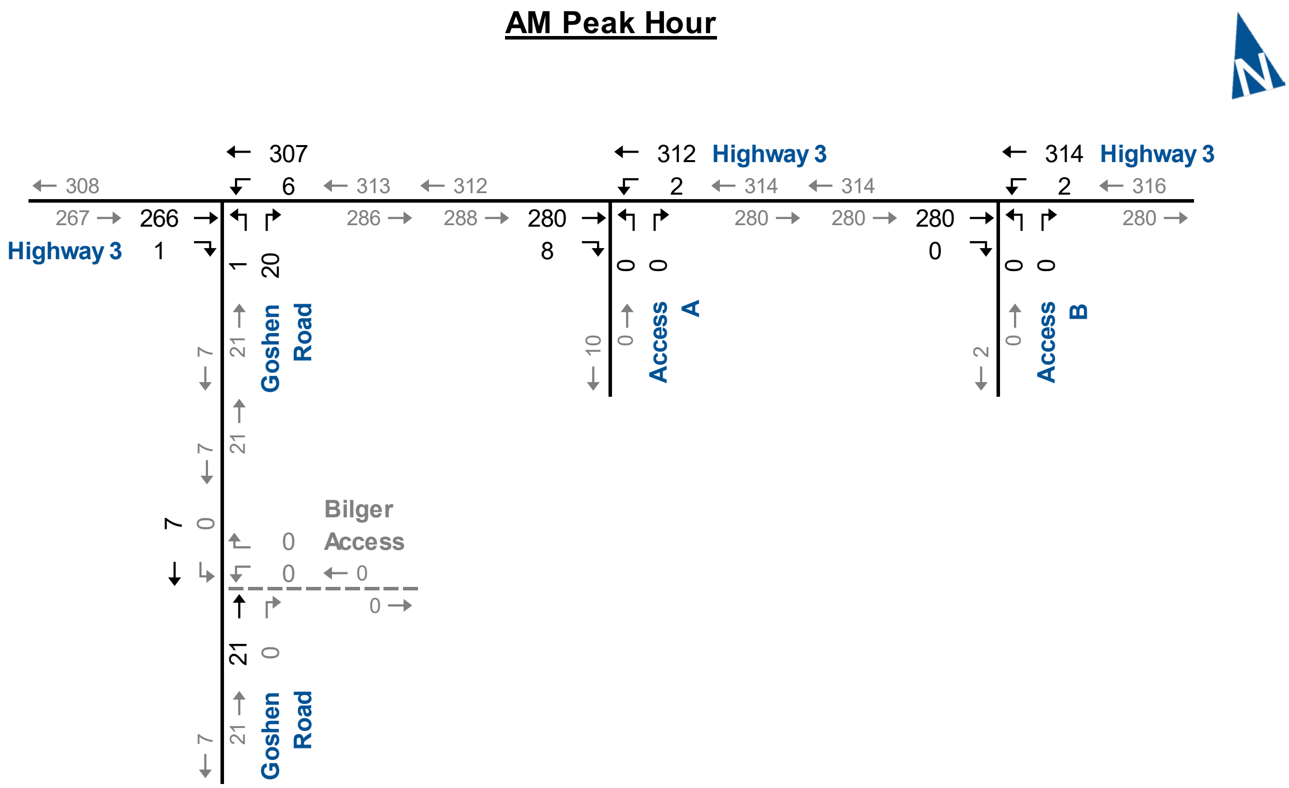
4.5 2029 Total Traffic Operations

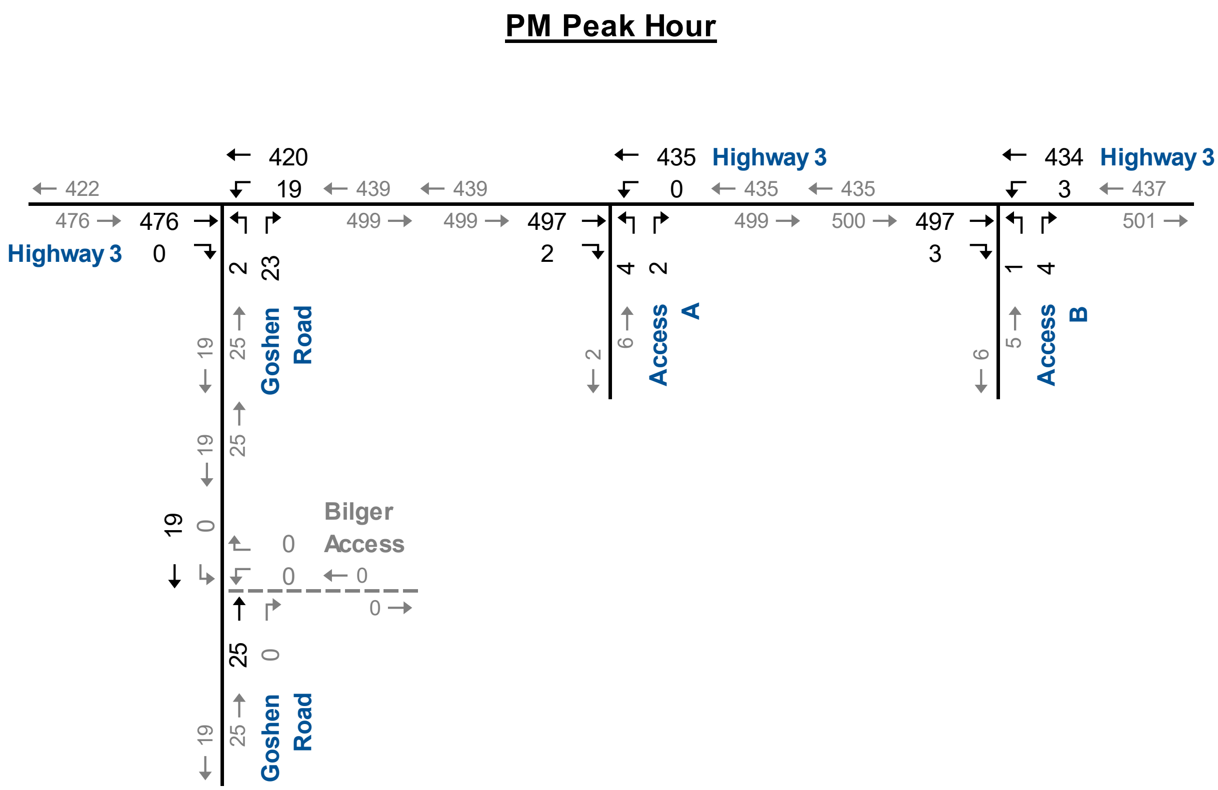
Figure 4.4 illustrates the 2029 total traffic volumes, including trips generated by the proposed development.

The 2029 total traffic volumes have been analyzed using the same methodology as under existing and background traffic conditions.

Table 4.4 summarizes the results of the 2029 total traffic operations. The results indicate that the intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours. Both Site Access intersections to Highway 3 are forecast to operate at acceptable levels of service during the AM and PM peak hours.

Appendix G contains the supporting detailed Synchro 11 reports.





2029 Total Traffic Volumes

Figure 4.4

TABLE 4.4: 2029 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	8		**0**	10		>	**10**					
			V/C		0.00	>		<	0.01			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					
			Delay		0	>	**0**	<	8		**0**	0		>	**0**					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
	Highway 3 & Access B	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					
			Delay		0	>	**0**	<	8		**0**	0		>	**0**					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	9		**0**	12		>	**12**					
			V/C		0.00	>		<	0.02			0.05		>						
			Q		0	>		<	1			2		>						
	Highway 3 & Access A	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**C**					
			Delay		0	>	**0**	<	0		**0**	16		>	**16**					
			V/C		0.00	>		<	0.00			0.02		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access B	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	8		**0**	13		>	**13**					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.6 2034 Background Traffic Operations

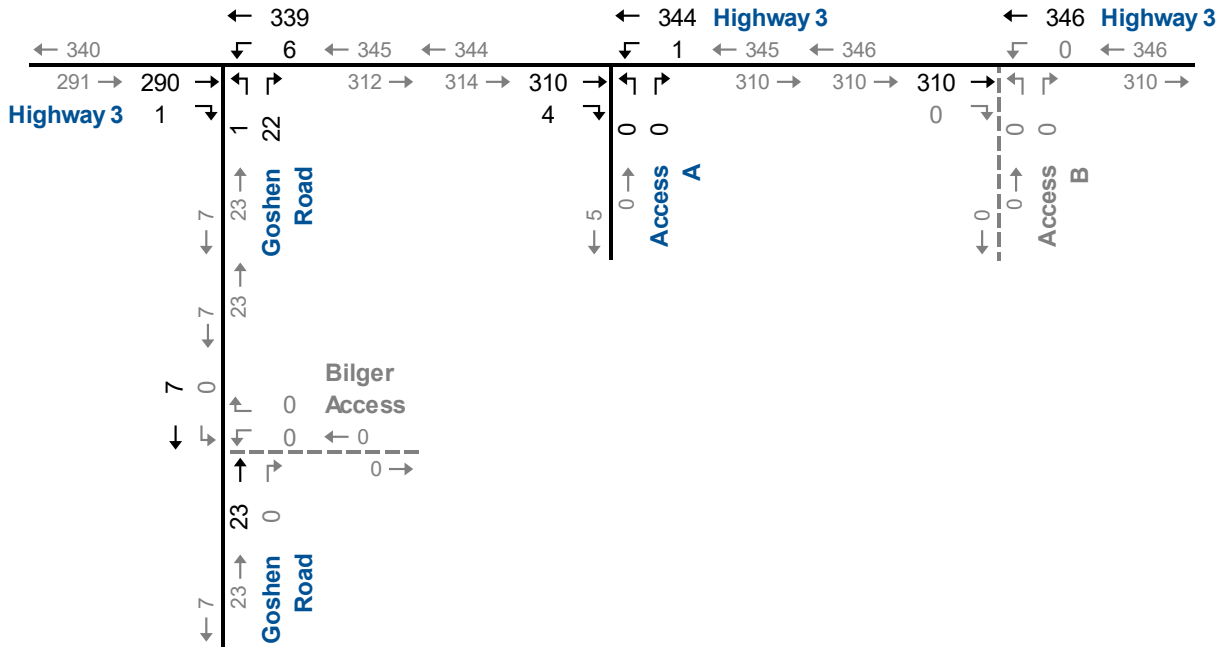
Figure 4.5 illustrates the 2034 background traffic volumes, including road traffic growth.

The 2034 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions.

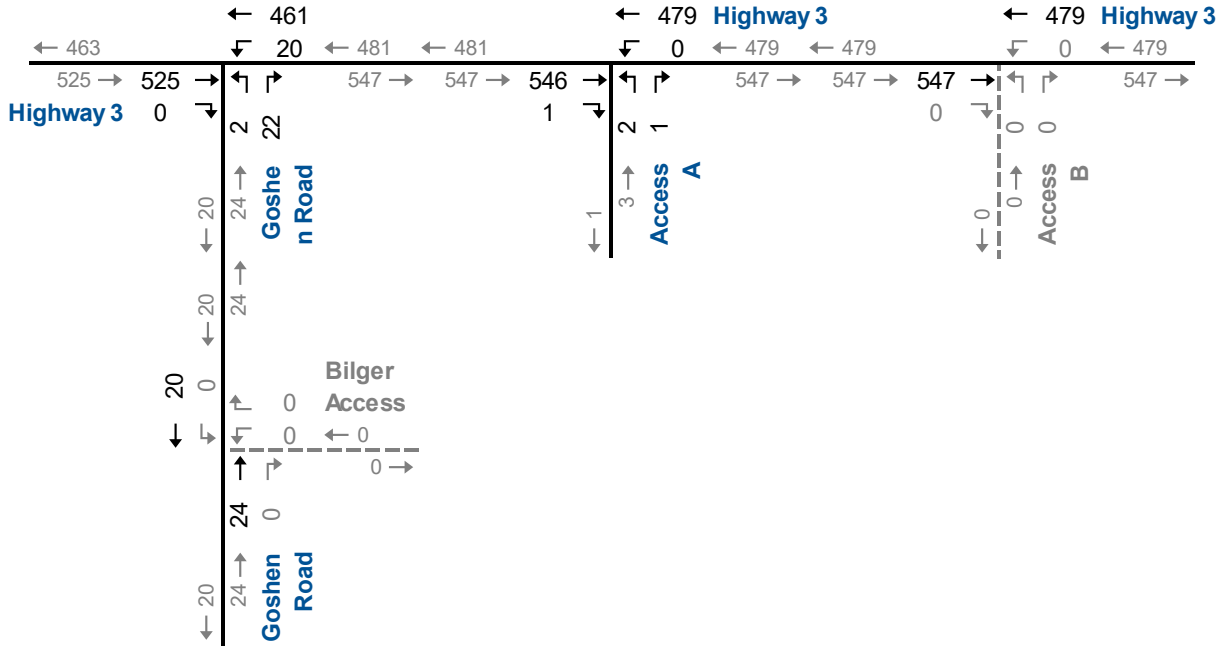
Table 4.5 summarizes the results of the 2034 background traffic operations. The results indicate that the intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are forecast to operate at acceptable levels of service, and with no problem movements.

Appendix H contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2034 Background Traffic Volumes

TABLE 4.5: 2034 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	11		>	11					
			V/C		0.00	>		<	0.01			0.04		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	13		>	13					
			V/C		0.00	>		<	0.03			0.06		>						
			Q		0	>		<	1			2		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	0		0	18		>	18					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.7 2034 Total Traffic Operations

Figure 4.6 illustrates the 2034 total traffic volumes, including trips generated by the proposed development.

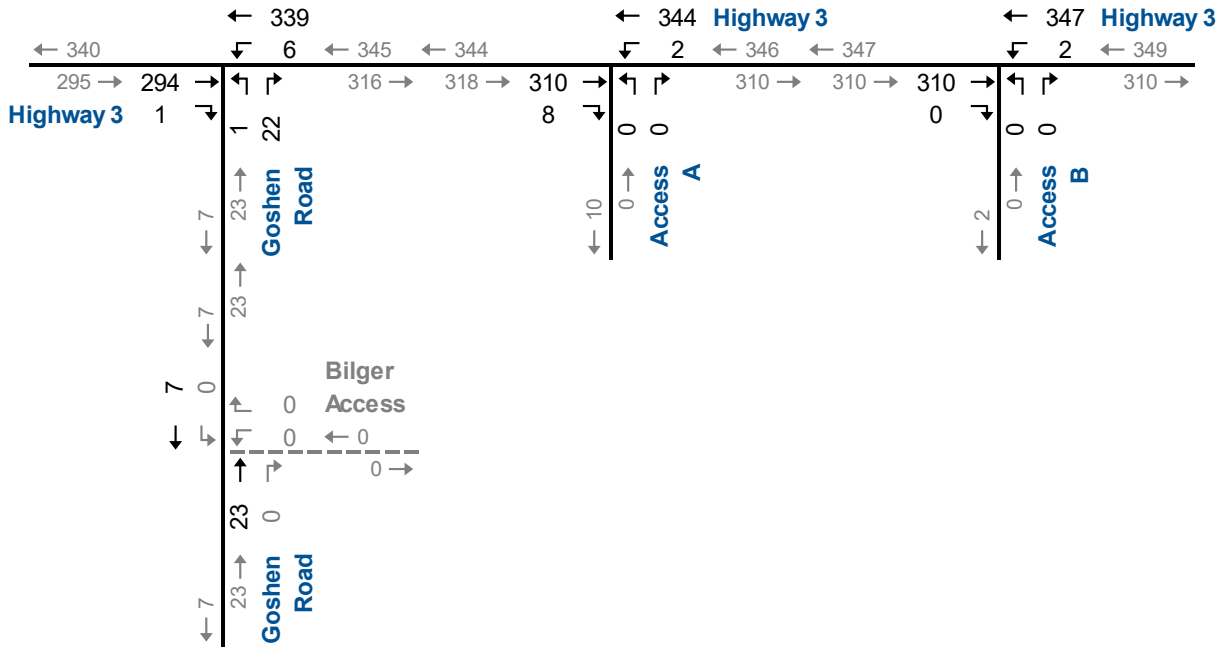
The 2034 total traffic volumes have been analyzed using the same methodology as under existing and background traffic conditions.

As seen in **Figure 4.6**, the study area roadway traffic volumes and turning movements are projected to remain low to moderate in 2034 as they are under existing conditions.

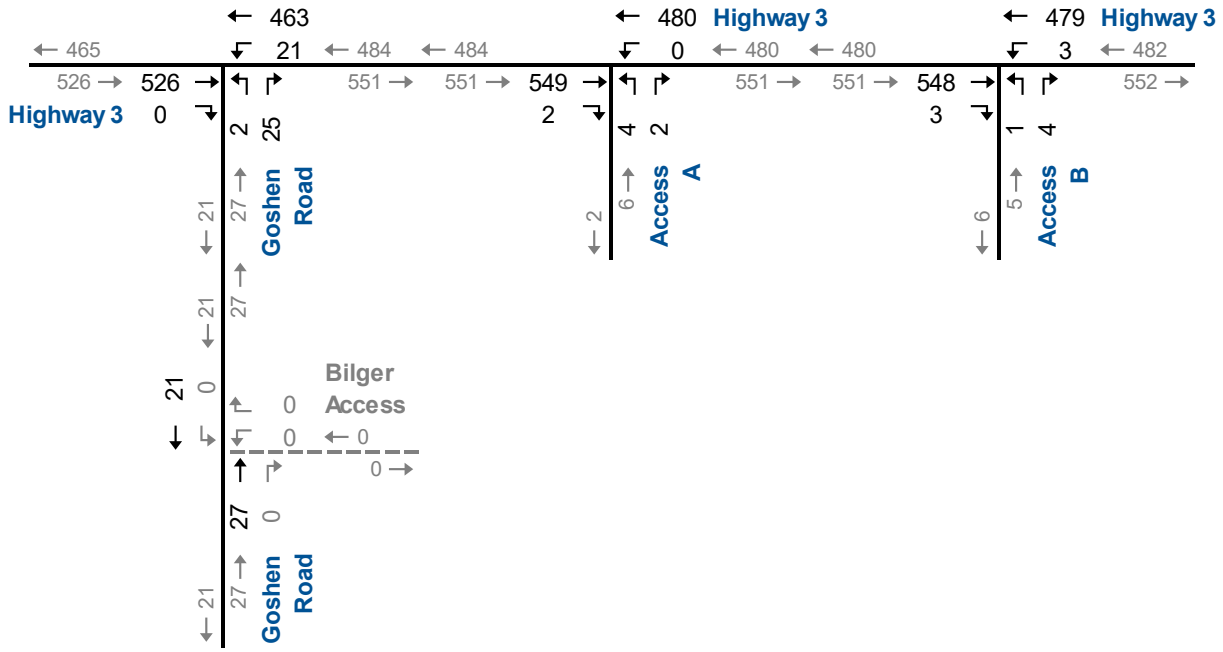
Table 4.6 summarizes the results of the 2034 total traffic operations. The results indicate that the intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours. Both Site Access intersections to Highway 3 are forecast to operate at acceptable levels of service during the AM and PM peak hours.

Appendix I contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2034 Total Traffic Volumes

494 Highway 3, Courtland TIS
230661

Figure 4.6

TABLE 4.6: 2034 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	8		**0**	11		>	**11**					
			V/C		0.00	>		<	0.01			0.04		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					
			Delay		0	>	**0**	<	8		**0**	0		>	**0**					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
	Highway 3 & Access B	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					
			Delay		0	>	**0**	<	8		**0**	0		>	**0**					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	9		**0**	13		>	**13**					
			V/C		0.00	>		<	0.03			0.06		>						
			Q		0	>		<	1			2		>						
	Highway 3 & Access A	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**C**					
			Delay		0	>	**0**	<	0		**0**	18		>	**18**					
			V/C		0.00	>		<	0.00			0.02		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access B	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	9		**0**	14		>	**14**					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
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V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.8 Review of Access Locations

The existing access locations for the subject site were reviewed for available sight distances and left-turn lane requirements. The sight distance assessment is based on field inspection and Transportation Association of Canada design standards.

4.8.1 Sight Distance Assessment

Available sight distances for the existing access points were measured during a site visit on 27 November 2023 and are compared with sight distance requirements identified in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[5] (GDGCR).

Stopping and Decision Sight Distance requirements were reviewed for a design speed of 70 km/h corresponding to the posted speed of 60 km/h.

Table 4.7 summarizes the sight distance measurements and requirements at the access intersections, which indicate that the two existing driveway locations on Highway 3 satisfy the TAC requirements for Decision Sight Distances and Stopping Sight Distance.

TABLE 4.7: SIGHT DISTANCE MEASUREMENTS

Intersection	Decision Sight Distance (m)				Stopping Sight Distance (m)	
	Left-Turn		Right-Turn			
	Required	Measured	Required	Measured	Required	Measured
Highway 3 and Access A	210	**250+**	185	**250+**	185	**250+**
Highway 3 and Access B		**250+**		**250+**		**250+**

4.8.2 Left-Turn Lanes

The assessment of the need for auxiliary left-turning lanes is based on the requirements and procedures detailed in the Ministry of Transportation Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[6].

It is noted that the forecast westbound left-turn movements on Highway 3 at Site Access A and at Site Access B are less than five vph during AM and PM peak hours, which is less than 2.5% of the total

[5] Transportation Association of Canada, Geometric Design Guide for Canadian Roads, June 2017.

[6] *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads*, June 2017.

westbound traffic volumes. The provision of left-turn lanes on Highway 3 at each of the two driveways is, therefore, identified as not warranted.

It is noted that the need for a westbound left-turn lane on Highway 3 at the intersection of Goshen Road is also identified as not warranted.

5 Conclusions and Recommendations

5.1 Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions:** The intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are operating at satisfactory levels of service (LOS A/B).
- **Site Traffic Volumes:** The existing site driveway volumes indicate that 5 AM peak hour trips and 4 PM peak hour generated by the current site operations.

  With the proposed changes, the site traffic volumes are projected to increase to 7 AM peak hour trips and 15 PM peak hour trips.

  Based on the current and future site traffic volumes, the site could be considered to be a low trip generator with minimal impact on driveway and road traffic operations.
- **Background Traffic Conditions:** The two intersections are forecast to operate at acceptable levels of service under 2024, 2029, and 2034 background traffic conditions.
- **Total Traffic Conditions:** The intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours under 2024, 2029, and 2034 total traffic conditions, as under existing conditions.
- **Site Accesses:** The Westerly and Easterly Site Access intersections on Highway 3 are forecast to operate at acceptable levels of service under 2024, 2029, and 2034 total traffic conditions.

  Both access locations satisfy the sight distance requirements, and do not require an auxiliary westbound left-turn lane on Highway 3 to accommodate inbound left-turning traffic.

5.2 Recommendations

Based on the findings and conclusions of this study, it is recommended that the Site Changes with two driveways for the property at 494 Highway 3, Courtland be considered for approval as proposed.

Appendix A

Pre-Study Consultation

From:	Patrick Neal
To:	"Mentley, Ryan (MTO)"; Stephen Gradish
Cc:	Rajan Philips
Subject:	(230661) 494 Highway 3, Courtland TIS - Pre-Study Consultation
Date:	November 2, 2023 4:04:00 PM
Attachments:	(230661) Site Location.png image001.png image002.png 23044_Preliminary Grading Plan.pdf

---

Hi Ryan and Stephen,

We have been retained to complete the Transportation Impact Study (TIS) in support of a Site Plan application for a Truck Yard and Warehouse expansion located at 494 Highway 3 in Courtland, Norfolk County.

The subject property is located on the south side of Highway 3, east of Goshen Road. The property is owned by Bilger Slinger Services and is currently rented to Blue West Equipment for a storage and sales facility for farm, residential and commercial equipment.

The proposed changes to the site are to accommodate the relocation of Bilger Slinger Services from their current location at 480 Highway 3 to the property at 494 Highway 3, and share its use with Blue West Equipment.

Specifically, the changes will include the development of a truck yard for Bilger Slinger Services and the replacement of an existing warehouse with a GFA of 456 sq. m. with a larger warehouse of 1161 sq. m. GFA.

The site operations for Bilger Slinger Services will include:

- 18 employees.
- Storing and servicing 18 slinger trucks with a possible ten-year expansion to 24 trucks.
- Main deliveries twice a month to the site.

The site operations for Blue West Equipment will include:

- Six to eight employees.
- 12 customers per day.
- Main deliveries twice a week to the site.

A Google Map showing the two properties and a preliminary grading plan for 494 Highway 3 are attached.

The property has two driveways on Highway 3 approximately 76 metres apart. Both driveways are proposed to be retained as part of redevelopment, and both are needed to serve the two businesses that will be located on the subject site. It is noted that the proposed site changes will not add new traffic to Highway 3, because traffic from the business at 480 Highway 3 is already included in the existing traffic volumes. The relocation will only shift a portion of the turning movements from the intersection at Goshen Road to the driveways at 494 Highway 3.

Based on the above information, we have prepared the following scope of work for

review/approval:

- Weekday AM and PM peak hours of analysis.
- Study Area Intersections:
  - Highway 3 and Goshen Road (unsignalized); and
  - two access intersections on Highway 3.
- Horizon Years (as required by MTO): (1) development completion, (2) five years after completion, and (3) ten years after completion.
- Background Growth: 2.0% compounded per annum, **please confirm**.
- Background Developments: **Please confirm** and provide corresponding site statistics or TIS.
- Roadway Improvements: **Please confirm any planned changes to the study area roadways.**
- Trip Generation: ITE Trip Generation Manual 11th Edition.
- Trip Distribution: Existing traffic patterns.

Please let us know if you have any questions or comments.

Regards,

Patrick Neal, EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
5A-150 Pinebush Road, Cambridge ON N1R 8J8
p: 416.479.9684 x510
m: 416.688.7338
e: pneal@ptsl.com
w: www.ptsl.com

Appendix B

Existing Traffic Data

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Data

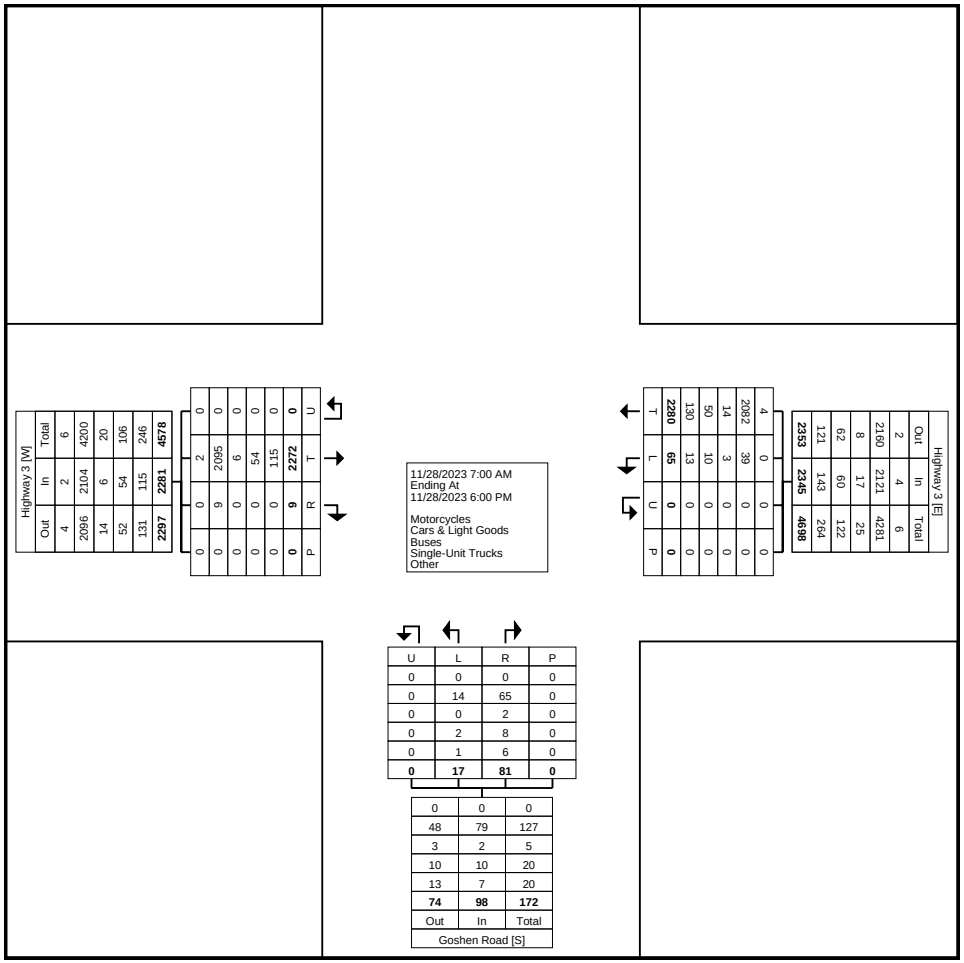
Start Time	Highway 3 Eastbound					Highway 3 Westbound					Goshen Road Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	52	2	0	0	54	2	51	0	0	53	1	1	0	0	2	109
7:15 AM	66	1	0	0	67	1	56	0	0	57	0	4	0	0	4	128
7:30 AM	48	0	0	0	48	3	67	0	0	70	2	2	0	0	4	122
7:45 AM	61	0	0	0	61	1	71	0	0	72	0	8	0	0	8	141
Hourly Total	227	3	0	0	230	7	245	0	0	252	3	15	0	0	18	500
8:00 AM	63	1	0	0	64	1	66	0	0	67	1	1	0	0	2	133
8:15 AM	56	0	0	0	56	0	61	0	0	61	0	1	0	0	1	118
8:30 AM	53	0	0	0	53	3	75	0	0	78	0	8	0	0	8	139
8:45 AM	47	1	0	0	48	2	74	0	0	76	0	4	0	0	4	128
Hourly Total	219	2	0	0	221	6	276	0	0	282	1	14	0	0	15	518
9:00 AM	45	0	0	0	45	0	56	0	0	56	0	3	0	0	3	104
9:15 AM	46	0	0	0	46	1	64	0	0	65	0	0	0	0	0	111
9:30 AM	48	0	0	0	48	2	72	0	0	74	0	3	0	0	3	125
9:45 AM	42	2	0	0	44	3	61	0	0	64	0	1	0	0	1	109
Hourly Total	181	2	0	0	183	6	253	0	0	259	0	7	0	0	7	449
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	66	0	0	0	66	1	66	0	0	67	0	0	0	0	0	133
11:45 AM	82	0	0	0	82	2	58	0	0	60	0	4	0	0	4	146
Hourly Total	148	0	0	0	148	3	124	0	0	127	0	4	0	0	4	279
12:00 PM	63	0	0	0	63	3	74	0	0	77	1	2	0	0	3	143
12:15 PM	89	0	0	0	89	3	64	0	0	67	1	3	0	0	4	160
12:30 PM	68	0	0	0	68	4	65	0	0	69	1	3	0	0	4	141
12:45 PM	62	0	0	0	62	3	65	0	0	68	0	0	0	0	0	130
Hourly Total	282	0	0	0	282	13	268	0	0	281	3	8	0	0	11	574
1:00 PM	78	0	0	0	78	0	74	0	0	74	2	1	0	0	3	155
1:15 PM	57	0	0	0	57	1	69	0	0	70	2	1	0	0	3	130
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	135	0	0	0	135	1	143	0	0	144	4	2	0	0	6	285
3:00 PM	99	0	0	0	99	2	70	0	0	72	0	2	0	0	2	173
3:15 PM	62	0	0	0	62	0	82	0	0	82	0	2	0	0	2	146
3:30 PM	97	0	0	0	97	1	82	0	0	83	0	0	0	0	0	180
3:45 PM	96	0	0	0	96	3	90	0	0	93	1	1	0	0	2	191
Hourly Total	354	0	0	0	354	6	324	0	0	330	1	5	0	0	6	690
4:00 PM	113	0	0	0	113	5	102	0	0	107	1	1	0	0	2	222
4:15 PM	110	0	0	0	110	4	77	0	0	81	0	5	0	0	5	196
4:30 PM	103	0	0	0	103	4	102	0	0	106	0	11	0	0	11	220

4:45 PM	86	0	0	0	86	4	88	0	0	92	1	5	0	0	6	184
Hourly Total	412	0	0	0	412	17	369	0	0	386	2	22	0	0	24	822
5:00 PM	96	0	0	0	96	1	86	0	0	87	2	0	0	0	2	185
5:15 PM	88	0	0	0	88	0	58	0	0	58	1	1	0	0	2	148
5:30 PM	76	1	0	0	77	2	75	0	0	77	0	0	0	0	0	154
5:45 PM	54	1	0	0	55	3	59	0	0	62	0	3	0	0	3	120
Hourly Total	314	2	0	0	316	6	278	0	0	284	3	4	0	0	7	607
Grand Total	2272	9	0	0	2281	65	2280	0	0	2345	17	81	0	0	98	4724
Approach %	99.6	0.4	0.0	-	-	2.8	97.2	0.0	-	-	17.3	82.7	0.0	-	-	-
Total %	48.1	0.2	0.0	-	48.3	1.4	48.3	0.0	-	49.6	0.4	1.7	0.0	-	2.1	-
Motorcycles	2	0	0	-	2	0	4	0	-	4	0	0	0	-	0	6
% Motorcycles	0.1	0.0	-	-	0.1	0.0	0.2	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	2095	9	0	-	2104	39	2082	0	-	2121	14	65	0	-	79	4304
% Cars & Light Goods	92.2	100.0	-	-	92.2	60.0	91.3	-	-	90.4	82.4	80.2	-	-	80.6	91.1
Buses	6	0	0	-	6	3	14	0	-	17	0	2	0	-	2	25
% Buses	0.3	0.0	-	-	0.3	4.6	0.6	-	-	0.7	0.0	2.5	-	-	2.0	0.5
Single-Unit Trucks	54	0	0	-	54	10	50	0	-	60	2	8	0	-	10	124
% Single-Unit Trucks	2.4	0.0	-	-	2.4	15.4	2.2	-	-	2.6	11.8	9.9	-	-	10.2	2.6
Articulated Trucks	114	0	0	-	114	13	130	0	-	143	1	6	0	-	7	264
% Articulated Trucks	5.0	0.0	-	-	5.0	20.0	5.7	-	-	6.1	5.9	7.4	-	-	7.1	5.6
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023

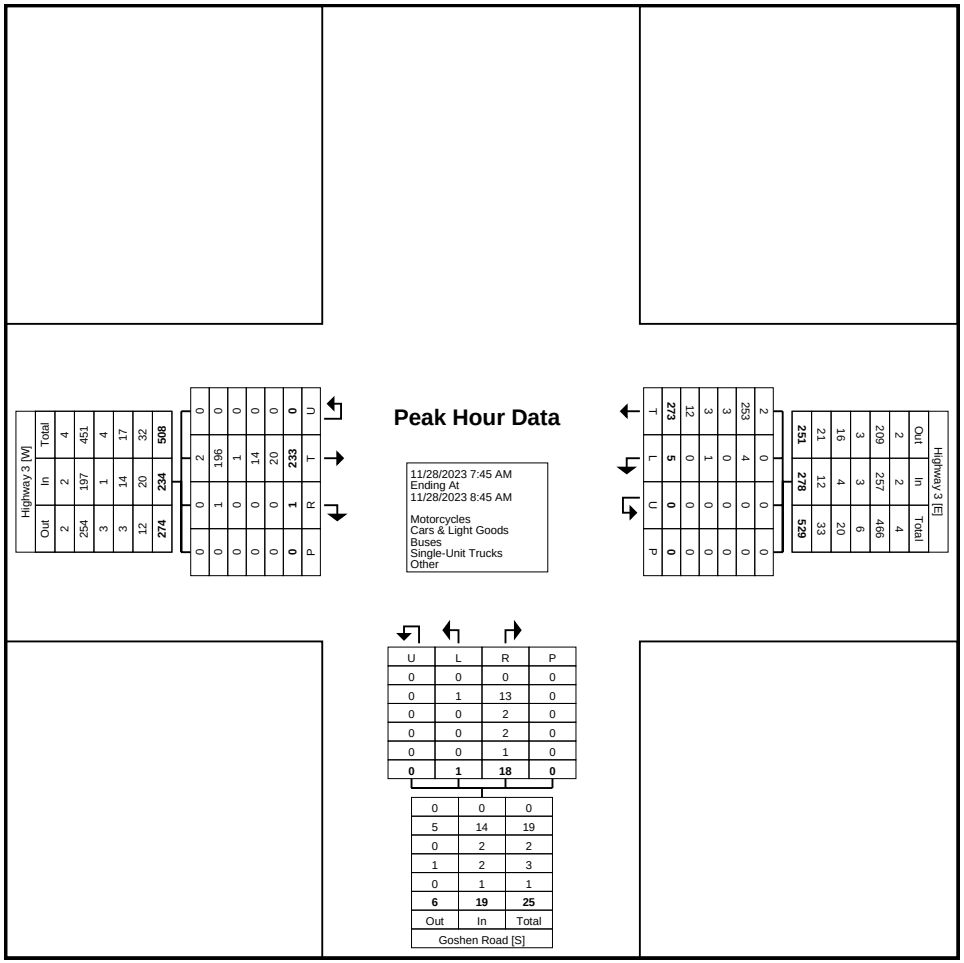
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Goshen Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	61	0	0	0	61	1	71	0	0	72	0	8	0	0	8	141
8:00 AM	63	1	0	0	64	1	66	0	0	67	1	1	0	0	2	133
8:15 AM	56	0	0	0	56	0	61	0	0	61	0	1	0	0	1	118
8:30 AM	53	0	0	0	53	3	75	0	0	78	0	8	0	0	8	139
Total	233	1	0	0	234	5	273	0	0	278	1	18	0	0	19	531
Approach %	99.6	0.4	0.0	-	-	1.8	98.2	0.0	-	-	5.3	94.7	0.0	-	-	-
Total %	43.9	0.2	0.0	-	44.1	0.9	51.4	0.0	-	52.4	0.2	3.4	0.0	-	3.6	-
PHF	0.925	0.250	0.000	-	0.914	0.417	0.910	0.000	-	0.891	0.250	0.563	0.000	-	0.594	0.941
Motorcycles	2	0	0	-	2	0	2	0	-	2	0	0	0	-	0	4
% Motorcycles	0.9	0.0	-	-	0.9	0.0	0.7	-	-	0.7	0.0	0.0	-	-	0.0	0.8
Cars & Light Goods	196	1	0	-	197	4	253	0	-	257	1	13	0	-	14	468
% Cars & Light Goods	84.1	100.0	-	-	84.2	80.0	92.7	-	-	92.4	100.0	72.2	-	-	73.7	88.1
Buses	1	0	0	-	1	0	3	0	-	3	0	2	0	-	2	6
% Buses	0.4	0.0	-	-	0.4	0.0	1.1	-	-	1.1	0.0	11.1	-	-	10.5	1.1
Single-Unit Trucks	14	0	0	-	14	1	3	0	-	4	0	2	0	-	2	20
% Single-Unit Trucks	6.0	0.0	-	-	6.0	20.0	1.1	-	-	1.4	0.0	11.1	-	-	10.5	3.8
Articulated Trucks	19	0	0	-	19	0	12	0	-	12	0	1	0	-	1	32
% Articulated Trucks	8.2	0.0	-	-	8.1	0.0	4.4	-	-	4.3	0.0	5.6	-	-	5.3	6.0
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.4	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023



Highway 3 [W]								
	Total	4	451	4	17	32	**508**
	In	2	197	1	14	20	**234**
	Out	2	254	3	3	12	**274**

U	T	R	P
0	0	0	0
2	196	1	14	20	**233**
0	1	0	0	0	**1**
0	0	0	0	0	**0**

T	L	U	P
273	**5**	**0**	**0**
12	0	0	0
3	1	0	0
3	0	0	0
253	4	0	0
2	0	0	0

Highway 3 [E]			
Out	In	Total	
2	2	4	
209	257	466	
3	3	6	
16	4	20	
21	12	33	
251	**278**	**529**	

U	L	R	P
0	0	0	0
0	1	13	0
0	0	2	0
0	0	2	0
0	0	1	0
0	**1**	**18**	**0**

0	0	0
5	14	19
0	2	2
1	2	3
0	1	1
6	**19**	**25**
Out	In	Total
Goshen Road [S]		

Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023

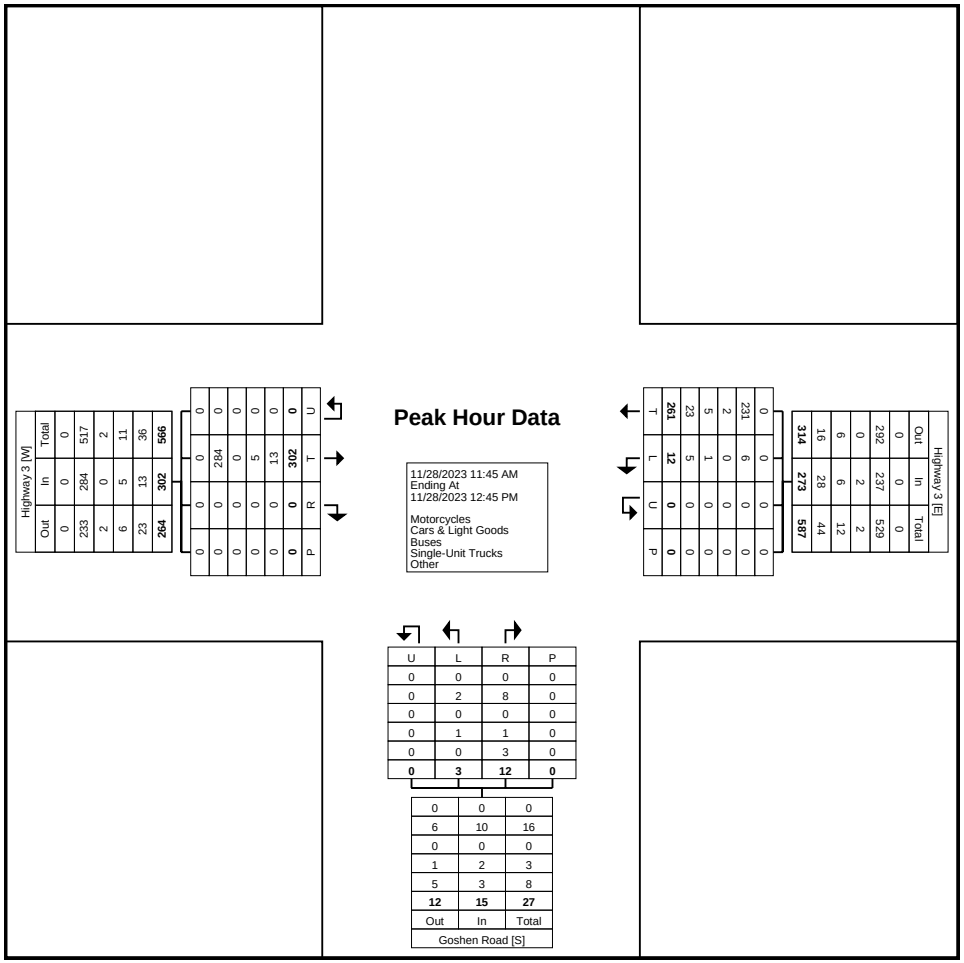
Turning Movement Peak Hour Data (11:45 AM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Goshen Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:45 AM	82	0	0	0	82	2	58	0	0	60	0	4	0	0	4	146
12:00 PM	63	0	0	0	63	3	74	0	0	77	1	2	0	0	3	143
12:15 PM	89	0	0	0	89	3	64	0	0	67	1	3	0	0	4	160
12:30 PM	68	0	0	0	68	4	65	0	0	69	1	3	0	0	4	141
Total	302	0	0	0	302	12	261	0	0	273	3	12	0	0	15	590
Approach %	100.0	0.0	0.0	-	-	4.4	95.6	0.0	-	-	20.0	80.0	0.0	-	-	-
Total %	51.2	0.0	0.0	-	51.2	2.0	44.2	0.0	-	46.3	0.5	2.0	0.0	-	2.5	-
PHF	0.848	0.000	0.000	-	0.848	0.750	0.882	0.000	-	0.886	0.750	0.750	0.000	-	0.938	0.922
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	284	0	0	-	284	6	231	0	-	237	2	8	0	-	10	531
% Cars & Light Goods	94.0	-	-	-	94.0	50.0	88.5	-	-	86.8	66.7	66.7	-	-	66.7	90.0
Buses	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Buses	0.0	-	-	-	0.0	0.0	0.8	-	-	0.7	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	5	0	0	-	5	1	5	0	-	6	1	1	0	-	2	13
% Single-Unit Trucks	1.7	-	-	-	1.7	8.3	1.9	-	-	2.2	33.3	8.3	-	-	13.3	2.2
Articulated Trucks	13	0	0	-	13	5	23	0	-	28	0	3	0	-	3	44
% Articulated Trucks	4.3	-	-	-	4.3	41.7	8.8	-	-	10.3	0.0	25.0	-	-	20.0	7.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023

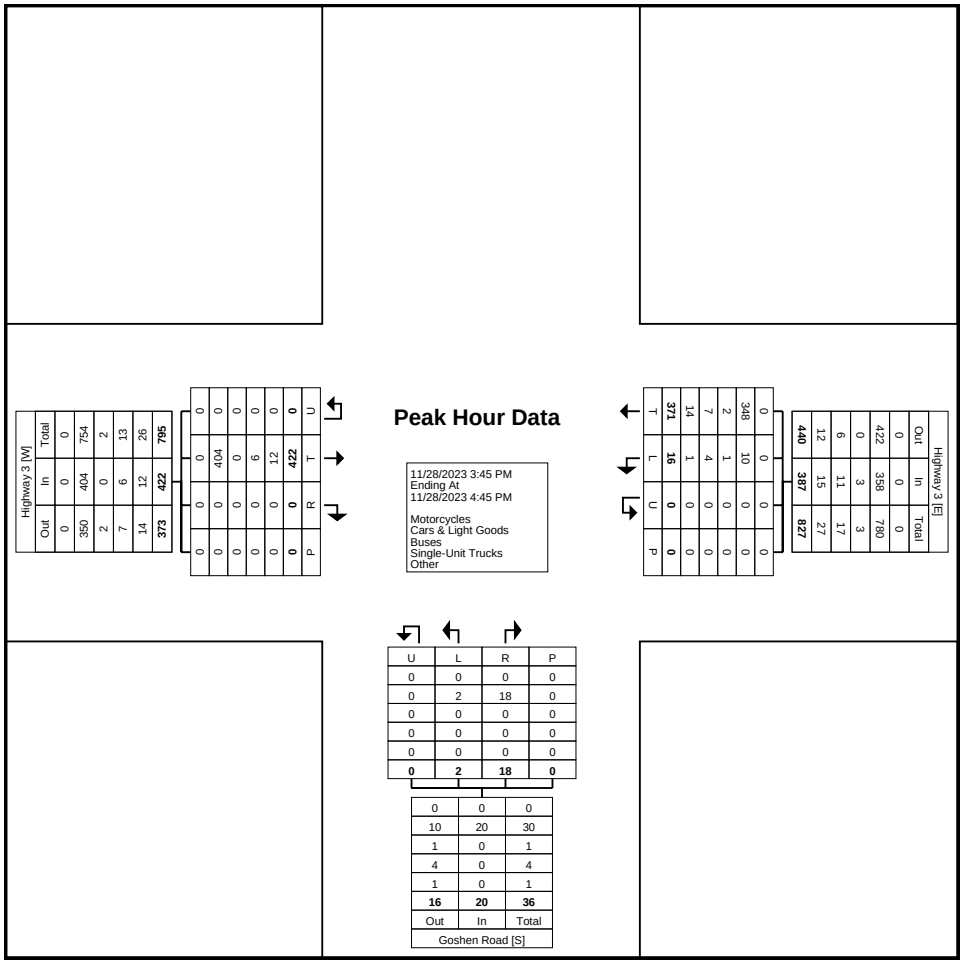
Turning Movement Peak Hour Data (3:45 PM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Goshen Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
3:45 PM	96	0	0	0	96	3	90	0	0	93	1	1	0	0	2	191
4:00 PM	113	0	0	0	113	5	102	0	0	107	1	1	0	0	2	222
4:15 PM	110	0	0	0	110	4	77	0	0	81	0	5	0	0	5	196
4:30 PM	103	0	0	0	103	4	102	0	0	106	0	11	0	0	11	220
Total	422	0	0	0	422	16	371	0	0	387	2	18	0	0	20	829
Approach %	100.0	0.0	0.0	-	-	4.1	95.9	0.0	-	-	10.0	90.0	0.0	-	-	-
Total %	50.9	0.0	0.0	-	50.9	1.9	44.8	0.0	-	46.7	0.2	2.2	0.0	-	2.4	-
PHF	0.934	0.000	0.000	-	0.934	0.800	0.909	0.000	-	0.904	0.500	0.409	0.000	-	0.455	0.934
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	404	0	0	-	404	10	348	0	-	358	2	18	0	-	20	782
% Cars & Light Goods	95.7	-	-	-	95.7	62.5	93.8	-	-	92.5	100.0	100.0	-	-	100.0	94.3
Buses	0	0	0	-	0	1	2	0	-	3	0	0	0	-	0	3
% Buses	0.0	-	-	-	0.0	6.3	0.5	-	-	0.8	0.0	0.0	-	-	0.0	0.4
Single-Unit Trucks	6	0	0	-	6	4	7	0	-	11	0	0	0	-	0	17
% Single-Unit Trucks	1.4	-	-	-	1.4	25.0	1.9	-	-	2.8	0.0	0.0	-	-	0.0	2.1
Articulated Trucks	12	0	0	-	12	1	14	0	-	15	0	0	0	-	0	27
% Articulated Trucks	2.8	-	-	-	2.8	6.3	3.8	-	-	3.9	0.0	0.0	-	-	0.0	3.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (3:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Data

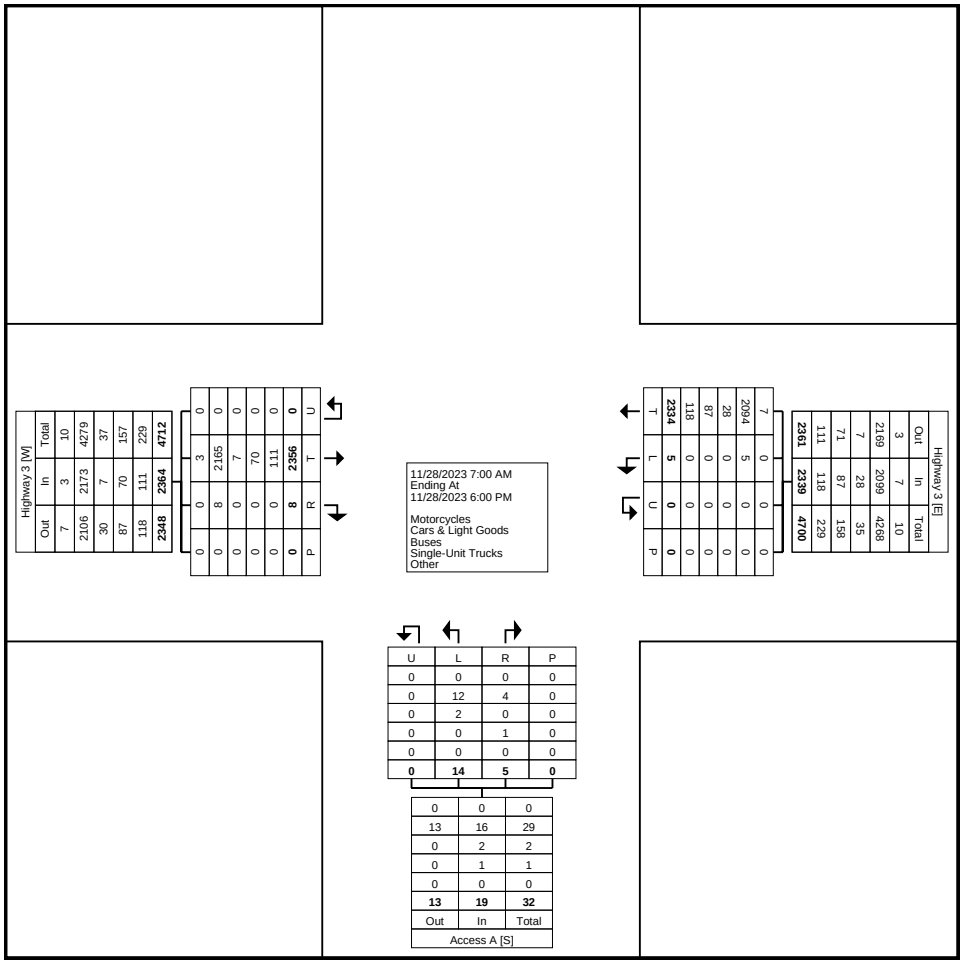
Start Time	Highway 3 Eastbound					Highway 3 Westbound					Access A Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	53	0	0	0	53	0	53	0	0	53	0	0	0	0	0	106
7:15 AM	72	0	0	0	72	0	62	0	0	62	0	0	0	0	0	134
7:30 AM	51	0	0	0	51	1	68	0	0	69	0	0	0	0	0	120
7:45 AM	66	3	0	0	69	1	74	0	0	75	0	0	0	0	0	144
Hourly Total	242	3	0	0	245	2	257	0	0	259	0	0	0	0	0	504
8:00 AM	65	0	0	0	65	0	65	0	0	65	0	0	0	0	0	130
8:15 AM	57	0	0	0	57	0	58	0	0	58	0	0	0	0	0	115
8:30 AM	61	1	0	0	62	0	80	0	0	80	0	0	0	0	0	142
8:45 AM	51	0	0	0	51	0	65	0	0	65	0	0	0	0	0	116
Hourly Total	234	1	0	0	235	0	268	0	0	268	0	0	0	0	0	503
9:00 AM	46	1	0	0	47	0	55	0	0	55	1	0	0	0	1	103
9:15 AM	46	0	0	0	46	0	66	0	0	66	1	0	0	0	1	113
9:30 AM	50	0	0	0	50	0	73	0	0	73	0	0	0	0	0	123
9:45 AM	42	0	0	0	42	0	69	0	0	69	0	0	0	0	0	111
Hourly Total	184	1	0	0	185	0	263	0	0	263	2	0	0	0	2	450
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	67	0	0	0	67	0	67	0	0	67	0	0	0	0	0	134
11:45 AM	81	0	0	0	81	0	62	0	0	62	0	0	0	0	0	143
Hourly Total	148	0	0	0	148	0	129	0	0	129	0	0	0	0	0	277
12:00 PM	67	0	0	0	67	1	75	0	0	76	0	0	0	0	0	143
12:15 PM	91	0	0	0	91	0	64	0	0	64	2	1	0	0	3	158
12:30 PM	71	0	0	0	71	1	67	0	0	68	0	0	0	0	0	139
12:45 PM	62	0	0	0	62	0	68	0	0	68	0	0	0	0	0	130
Hourly Total	291	0	0	0	291	2	274	0	0	276	2	1	0	0	3	570
1:00 PM	79	0	0	0	79	1	74	0	0	75	0	0	0	0	0	154
1:15 PM	57	1	0	0	58	0	72	0	0	72	0	1	0	0	1	131
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	136	1	0	0	137	1	146	0	0	147	0	1	0	0	1	285
3:00 PM	101	0	0	0	101	0	70	0	0	70	2	1	0	0	3	174
3:15 PM	72	0	0	0	72	0	82	0	0	82	0	0	0	0	0	154
3:30 PM	97	1	0	0	98	0	82	0	0	82	1	0	0	0	1	181
3:45 PM	100	0	0	0	100	0	91	0	0	91	1	0	0	0	1	192
Hourly Total	370	1	0	0	371	0	325	0	0	325	4	1	0	0	5	701
4:00 PM	114	0	0	0	114	0	109	0	0	109	1	1	0	0	2	225
4:15 PM	116	1	0	0	117	0	81	0	0	81	0	0	0	0	0	198
4:30 PM	109	0	0	0	109	0	104	0	0	104	0	0	0	0	0	213

4:45 PM	93	0	0	0	93	0	88	0	0	88	5	1	0	0	6	187
Hourly Total	432	1	0	0	433	0	382	0	0	382	6	2	0	0	8	823
5:00 PM	94	0	0	0	94	0	88	0	0	88	0	0	0	0	0	182
5:15 PM	92	0	0	0	92	0	61	0	0	61	0	0	0	0	0	153
5:30 PM	77	0	0	0	77	0	78	0	0	78	0	0	0	0	0	155
5:45 PM	56	0	0	0	56	0	63	0	0	63	0	0	0	0	0	119
Hourly Total	319	0	0	0	319	0	290	0	0	290	0	0	0	0	0	609
Grand Total	2356	8	0	0	2364	5	2334	0	0	2339	14	5	0	0	19	4722
Approach %	99.7	0.3	0.0	-	-	0.2	99.8	0.0	-	-	73.7	26.3	0.0	-	-	-
Total %	49.9	0.2	0.0	-	50.1	0.1	49.4	0.0	-	49.5	0.3	0.1	0.0	-	0.4	-
Motorcycles	3	0	0	-	3	0	7	0	-	7	0	0	0	-	0	10
% Motorcycles	0.1	0.0	-	-	0.1	0.0	0.3	-	-	0.3	0.0	0.0	-	-	0.0	0.2
Cars & Light Goods	2165	8	0	-	2173	5	2094	0	-	2099	12	4	0	-	16	4288
% Cars & Light Goods	91.9	100.0	-	-	91.9	100.0	89.7	-	-	89.7	85.7	80.0	-	-	84.2	90.8
Buses	7	0	0	-	7	0	28	0	-	28	2	0	0	-	2	37
% Buses	0.3	0.0	-	-	0.3	0.0	1.2	-	-	1.2	14.3	0.0	-	-	10.5	0.8
Single-Unit Trucks	70	0	0	-	70	0	87	0	-	87	0	1	0	-	1	158
% Single-Unit Trucks	3.0	0.0	-	-	3.0	0.0	3.7	-	-	3.7	0.0	20.0	-	-	5.3	3.3
Articulated Trucks	111	0	0	-	111	0	116	0	-	116	0	0	0	-	0	227
% Articulated Trucks	4.7	0.0	-	-	4.7	0.0	5.0	-	-	5.0	0.0	0.0	-	-	0.0	4.8
Bicycles on Road	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023

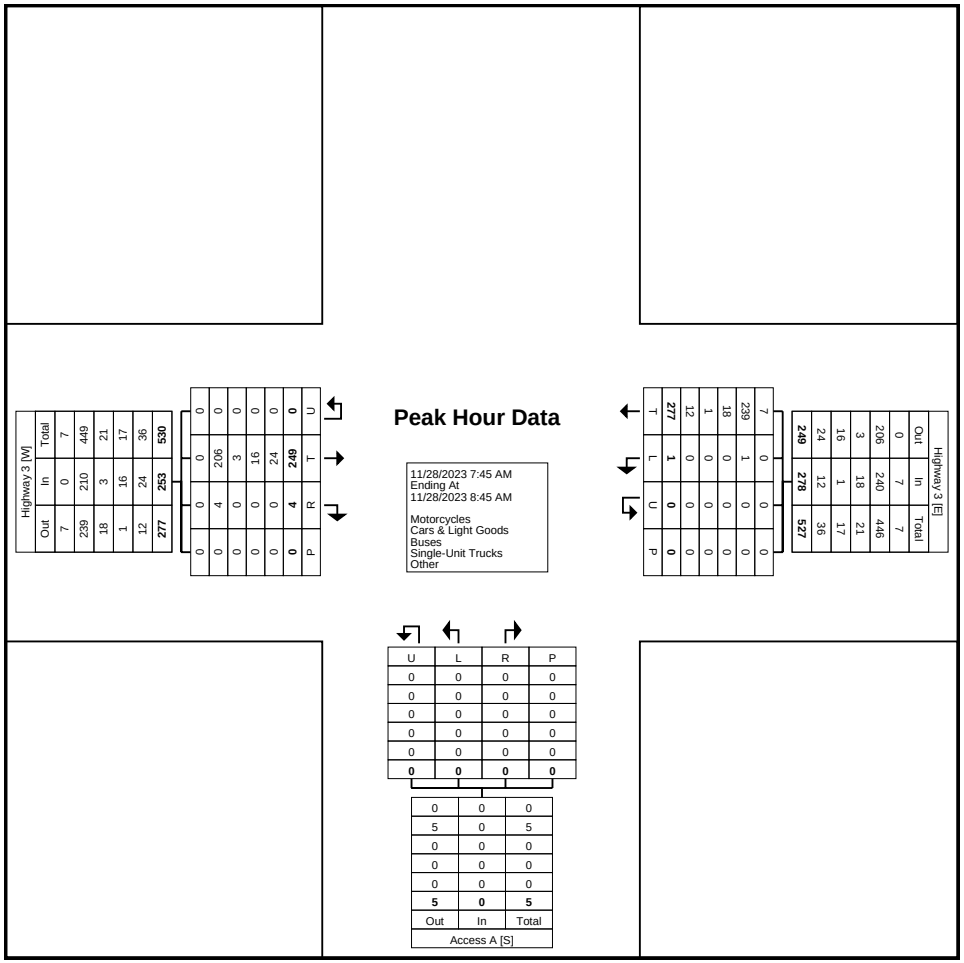
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Access A Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	66	3	0	0	69	1	74	0	0	75	0	0	0	0	0	144
8:00 AM	65	0	0	0	65	0	65	0	0	65	0	0	0	0	0	130
8:15 AM	57	0	0	0	57	0	58	0	0	58	0	0	0	0	0	115
8:30 AM	61	1	0	0	62	0	80	0	0	80	0	0	0	0	0	142
Total	249	4	0	0	253	1	277	0	0	278	0	0	0	0	0	531
Approach %	98.4	1.6	0.0	-	-	0.4	99.6	0.0	-	-	0.0	0.0	0.0	-	-	-
Total %	46.9	0.8	0.0	-	47.6	0.2	52.2	0.0	-	52.4	0.0	0.0	0.0	-	0.0	-
PHF	0.943	0.333	0.000	-	0.917	0.250	0.866	0.000	-	0.869	0.000	0.000	0.000	-	0.000	0.922
Motorcycles	0	0	0	-	0	0	7	0	-	7	0	0	0	-	0	7
% Motorcycles	0.0	0.0	-	-	0.0	0.0	2.5	-	-	2.5	-	-	-	-	-	1.3
Cars & Light Goods	206	4	0	-	210	1	239	0	-	240	0	0	0	-	0	450
% Cars & Light Goods	82.7	100.0	-	-	83.0	100.0	86.3	-	-	86.3	-	-	-	-	-	84.7
Buses	3	0	0	-	3	0	18	0	-	18	0	0	0	-	0	21
% Buses	1.2	0.0	-	-	1.2	0.0	6.5	-	-	6.5	-	-	-	-	-	4.0
Single-Unit Trucks	16	0	0	-	16	0	1	0	-	1	0	0	0	-	0	17
% Single-Unit Trucks	6.4	0.0	-	-	6.3	0.0	0.4	-	-	0.4	-	-	-	-	-	3.2
Articulated Trucks	24	0	0	-	24	0	12	0	-	12	0	0	0	-	0	36
% Articulated Trucks	9.6	0.0	-	-	9.5	0.0	4.3	-	-	4.3	-	-	-	-	-	6.8
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	-	-	-	-	-	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023

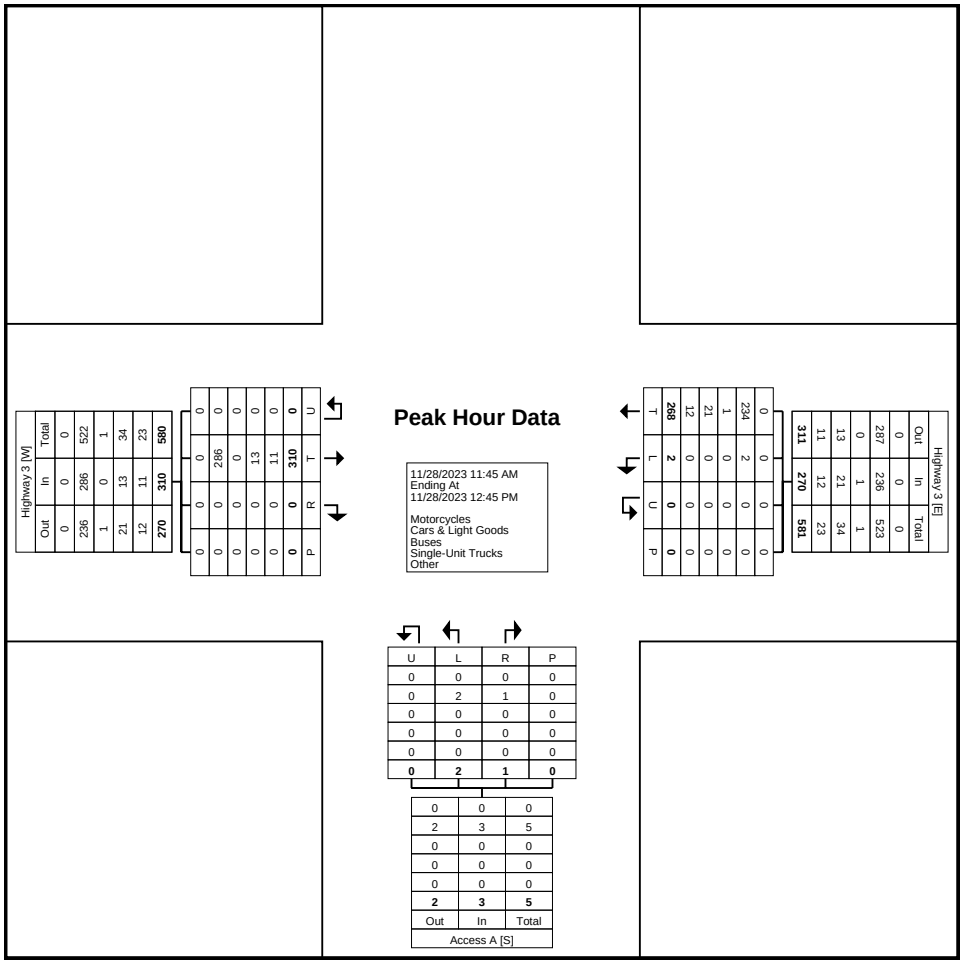
Turning Movement Peak Hour Data (11:45 AM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Access A Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:45 AM	81	0	0	0	81	0	62	0	0	62	0	0	0	0	0	143
12:00 PM	67	0	0	0	67	1	75	0	0	76	0	0	0	0	0	143
12:15 PM	91	0	0	0	91	0	64	0	0	64	2	1	0	0	3	158
12:30 PM	71	0	0	0	71	1	67	0	0	68	0	0	0	0	0	139
Total	310	0	0	0	310	2	268	0	0	270	2	1	0	0	3	583
Approach %	100.0	0.0	0.0	-	-	0.7	99.3	0.0	-	-	66.7	33.3	0.0	-	-	-
Total %	53.2	0.0	0.0	-	53.2	0.3	46.0	0.0	-	46.3	0.3	0.2	0.0	-	0.5	-
PHF	0.852	0.000	0.000	-	0.852	0.500	0.893	0.000	-	0.888	0.250	0.250	0.000	-	0.250	0.922
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	286	0	0	-	286	2	234	0	-	236	2	1	0	-	3	525
% Cars & Light Goods	92.3	-	-	-	92.3	100.0	87.3	-	-	87.4	100.0	100.0	-	-	100.0	90.1
Buses	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Buses	0.0	-	-	-	0.0	0.0	0.4	-	-	0.4	0.0	0.0	-	-	0.0	0.2
Single-Unit Trucks	13	0	0	-	13	0	21	0	-	21	0	0	0	-	0	34
% Single-Unit Trucks	4.2	-	-	-	4.2	0.0	7.8	-	-	7.8	0.0	0.0	-	-	0.0	5.8
Articulated Trucks	11	0	0	-	11	0	12	0	-	12	0	0	0	-	0	23
% Articulated Trucks	3.5	-	-	-	3.5	0.0	4.5	-	-	4.4	0.0	0.0	-	-	0.0	3.9
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023

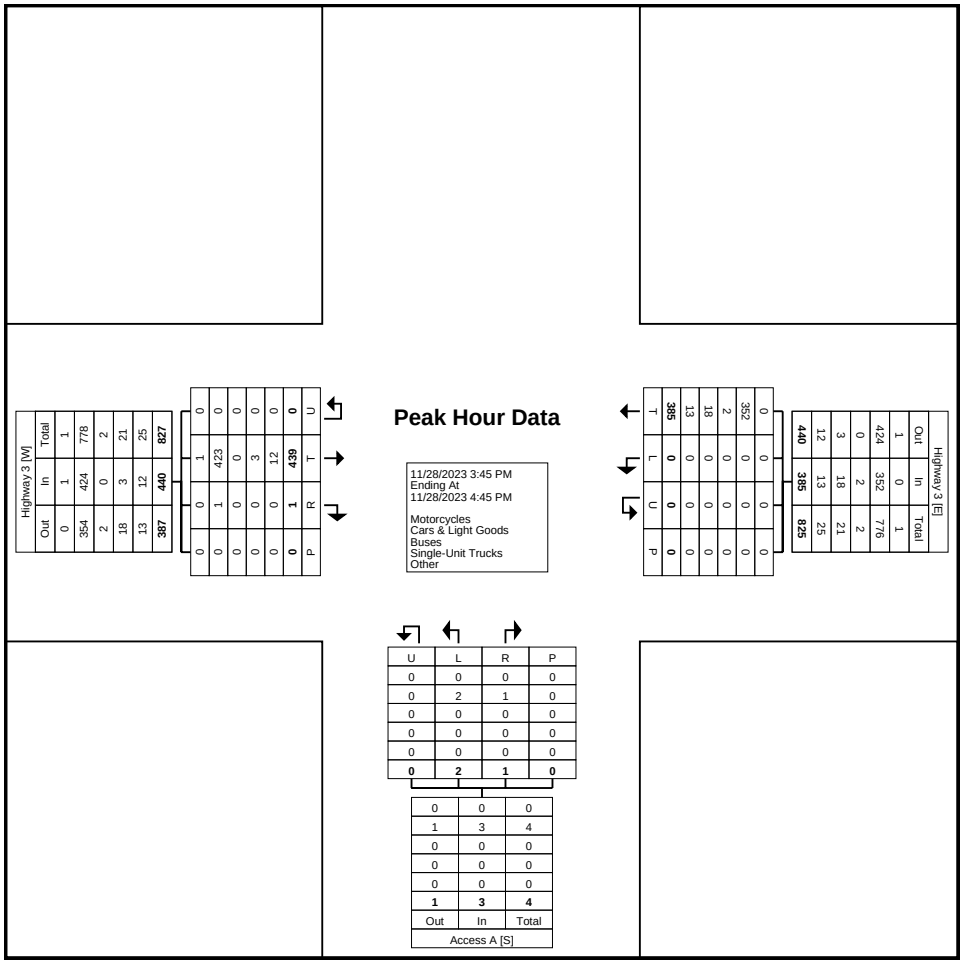
Turning Movement Peak Hour Data (3:45 PM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Access A Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
3:45 PM	100	0	0	0	100	0	91	0	0	91	1	0	0	0	1	192
4:00 PM	114	0	0	0	114	0	109	0	0	109	1	1	0	0	2	225
4:15 PM	116	1	0	0	117	0	81	0	0	81	0	0	0	0	0	198
4:30 PM	109	0	0	0	109	0	104	0	0	104	0	0	0	0	0	213
Total	439	1	0	0	440	0	385	0	0	385	2	1	0	0	3	828
Approach %	99.8	0.2	0.0	-	-	0.0	100.0	0.0	-	-	66.7	33.3	0.0	-	-	-
Total %	53.0	0.1	0.0	-	53.1	0.0	46.5	0.0	-	46.5	0.2	0.1	0.0	-	0.4	-
PHF	0.946	0.250	0.000	-	0.940	0.000	0.883	0.000	-	0.883	0.500	0.250	0.000	-	0.375	0.920
Motorcycles	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Motorcycles	0.2	0.0	-	-	0.2	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	423	1	0	-	424	0	352	0	-	352	2	1	0	-	3	779
% Cars & Light Goods	96.4	100.0	-	-	96.4	-	91.4	-	-	91.4	100.0	100.0	-	-	100.0	94.1
Buses	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Buses	0.0	0.0	-	-	0.0	-	0.5	-	-	0.5	0.0	0.0	-	-	0.0	0.2
Single-Unit Trucks	3	0	0	-	3	0	18	0	-	18	0	0	0	-	0	21
% Single-Unit Trucks	0.7	0.0	-	-	0.7	-	4.7	-	-	4.7	0.0	0.0	-	-	0.0	2.5
Articulated Trucks	12	0	0	-	12	0	13	0	-	13	0	0	0	-	0	25
% Articulated Trucks	2.7	0.0	-	-	2.7	-	3.4	-	-	3.4	0.0	0.0	-	-	0.0	3.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (3:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Data

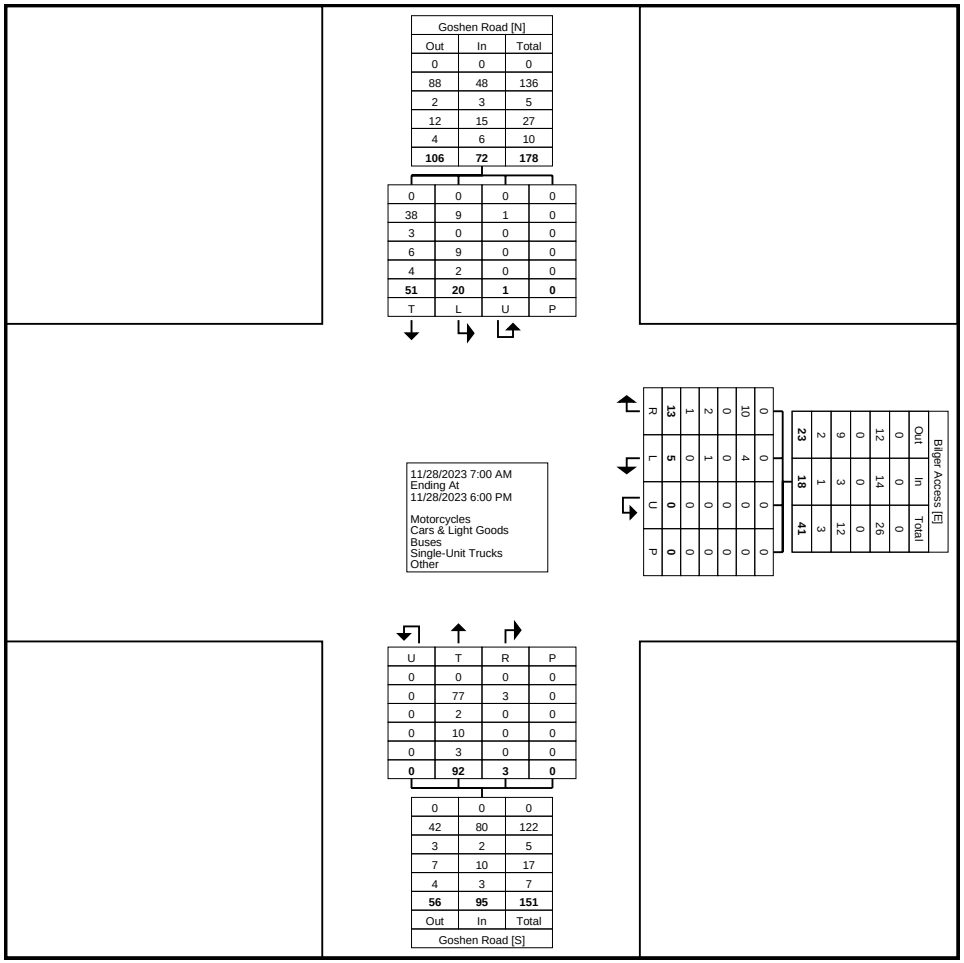
Start Time	Bilger Access Westbound					Goshen Road Northbound					Goshen Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	2	0	0	0	2	1	3	0	0	4	6
7:15 AM	0	0	0	0	0	4	0	0	0	4	1	1	0	0	2	6
7:30 AM	0	0	0	0	0	4	0	0	0	4	0	3	0	0	3	7
7:45 AM	0	0	0	0	0	7	0	0	0	7	0	1	0	0	1	8
Hourly Total	0	0	0	0	0	17	0	0	0	17	2	8	0	0	10	27
8:00 AM	0	0	0	0	0	1	0	0	0	1	0	1	1	0	2	3
8:15 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	7	0	0	0	7	2	1	0	0	3	10
8:45 AM	1	0	0	0	1	5	0	0	0	5	0	3	0	0	3	9
Hourly Total	1	0	0	0	1	14	0	0	0	14	2	5	1	0	8	23
9:00 AM	0	2	0	0	2	2	0	0	0	2	0	0	0	0	0	4
9:15 AM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	2
9:30 AM	1	0	0	0	1	3	0	0	0	3	1	1	0	0	2	6
9:45 AM	1	0	0	0	1	1	0	0	0	1	1	4	0	0	5	7
Hourly Total	2	2	0	0	4	7	0	0	0	7	2	6	0	0	8	19
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:45 AM	0	0	0	0	0	4	0	0	0	4	0	2	0	0	2	6
Hourly Total	0	0	0	0	0	4	0	0	0	4	0	3	0	0	3	7
12:00 PM	0	0	0	0	0	3	0	0	0	3	2	1	0	0	3	6
12:15 PM	0	2	0	0	2	3	0	0	0	3	0	3	0	0	3	8
12:30 PM	0	0	0	0	0	4	0	0	0	4	0	4	0	0	4	8
12:45 PM	0	0	0	0	0	1	0	0	0	1	0	3	0	0	3	4
Hourly Total	0	2	0	0	2	11	0	0	0	11	2	11	0	0	13	26
1:00 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
1:15 PM	0	0	0	0	0	3	0	0	0	3	0	1	0	0	1	4
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	5	0	0	0	5	0	1	0	0	1	6
3:00 PM	0	1	0	0	1	3	0	0	0	3	2	0	0	0	2	6
3:15 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
3:30 PM	0	0	0	0	0	2	0	0	0	2	0	1	0	0	1	3
3:45 PM	0	1	0	0	1	1	0	0	0	1	2	1	0	0	3	5
Hourly Total	0	2	0	0	2	8	0	0	0	8	4	2	0	0	6	16
4:00 PM	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	5	3	0	0	8	1	3	0	0	4	12
4:30 PM	0	0	0	0	0	11	0	0	0	11	1	2	0	0	3	14

4:45 PM	0	3	0	0	3	3	0	0	0	3	1	3	0	0	4	10
Hourly Total	1	4	0	0	5	20	3	0	0	23	3	8	0	0	11	39
5:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
5:15 PM	0	0	0	0	0	2	0	0	0	2	1	2	0	0	3	5
5:30 PM	1	0	0	0	1	0	0	0	0	0	2	2	0	0	4	5
5:45 PM	0	1	0	0	1	4	0	0	0	4	2	2	0	0	4	9
Hourly Total	1	3	0	0	4	6	0	0	0	6	5	7	0	0	12	22
Grand Total	5	13	0	0	18	92	3	0	0	95	20	51	1	0	72	185
Approach %	27.8	72.2	0.0	-	-	96.8	3.2	0.0	-	-	27.8	70.8	1.4	-	-	-
Total %	2.7	7.0	0.0	-	9.7	49.7	1.6	0.0	-	51.4	10.8	27.6	0.5	-	38.9	-
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	4	10	0	-	14	77	3	0	-	80	9	38	1	-	48	142
% Cars & Light Goods	80.0	76.9	-	-	77.8	83.7	100.0	-	-	84.2	45.0	74.5	100.0	-	66.7	76.8
Buses	0	0	0	-	0	2	0	0	-	2	0	3	0	-	3	5
% Buses	0.0	0.0	-	-	0.0	2.2	0.0	-	-	2.1	0.0	5.9	0.0	-	4.2	2.7
Single-Unit Trucks	1	2	0	-	3	10	0	0	-	10	9	6	0	-	15	28
% Single-Unit Trucks	20.0	15.4	-	-	16.7	10.9	0.0	-	-	10.5	45.0	11.8	0.0	-	20.8	15.1
Articulated Trucks	0	1	0	-	1	3	0	0	-	3	2	4	0	-	6	10
% Articulated Trucks	0.0	7.7	-	-	5.6	3.3	0.0	-	-	3.2	10.0	7.8	0.0	-	8.3	5.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023

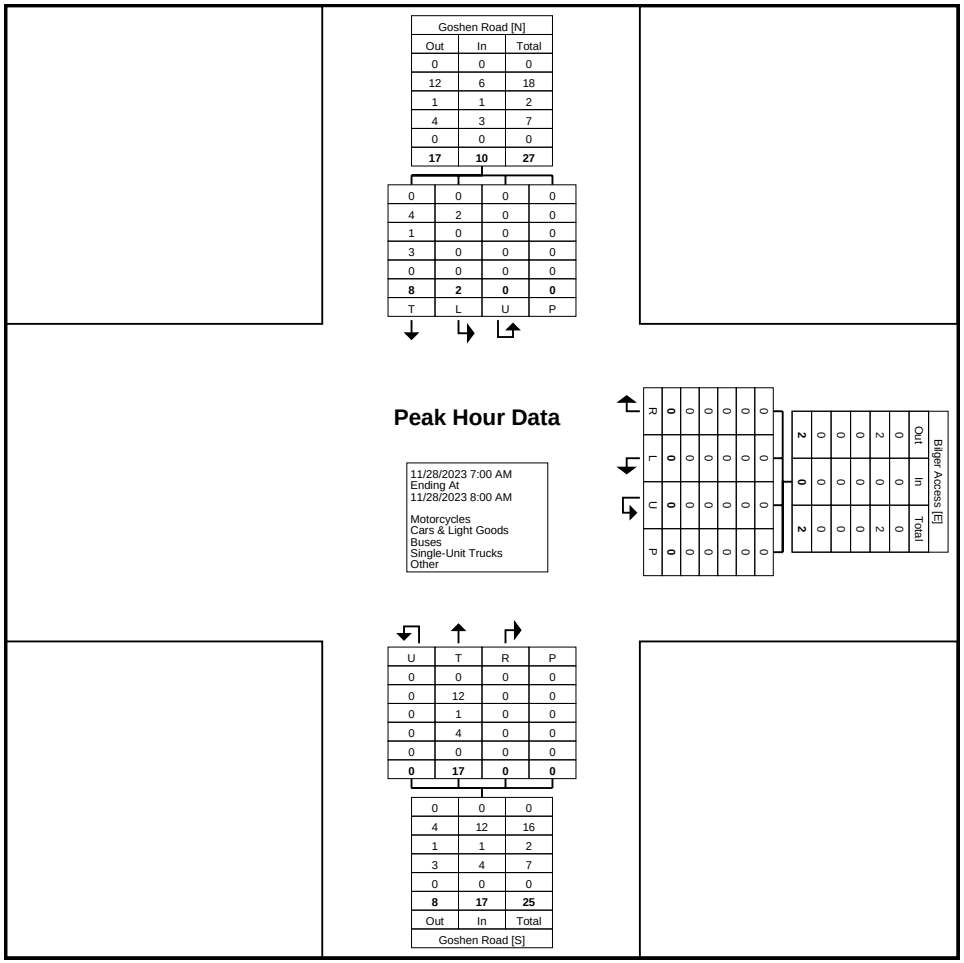
Turning Movement Peak Hour Data (7:00 AM)

Start Time	Bilger Access Westbound					Goshen Road Northbound					Goshen Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	2	0	0	0	2	1	3	0	0	4	6
7:15 AM	0	0	0	0	0	4	0	0	0	4	1	1	0	0	2	6
7:30 AM	0	0	0	0	0	4	0	0	0	4	0	3	0	0	3	7
7:45 AM	0	0	0	0	0	7	0	0	0	7	0	1	0	0	1	8
Total	0	0	0	0	0	17	0	0	0	17	2	8	0	0	10	27
Approach %	0.0	0.0	0.0	-	-	100.0	0.0	0.0	-	-	20.0	80.0	0.0	-	-	-
Total %	0.0	0.0	0.0	-	0.0	63.0	0.0	0.0	-	63.0	7.4	29.6	0.0	-	37.0	-
PHF	0.000	0.000	0.000	-	0.000	0.607	0.000	0.000	-	0.607	0.500	0.667	0.000	-	0.625	0.844
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	0	0	0	-	0	12	0	0	-	12	2	4	0	-	6	18
% Cars & Light Goods	-	-	-	-	-	70.6	-	-	-	70.6	100.0	50.0	-	-	60.0	66.7
Buses	0	0	0	-	0	1	0	0	-	1	0	1	0	-	1	2
% Buses	-	-	-	-	-	5.9	-	-	-	5.9	0.0	12.5	-	-	10.0	7.4
Single-Unit Trucks	0	0	0	-	0	4	0	0	-	4	0	3	0	-	3	7
% Single-Unit Trucks	-	-	-	-	-	23.5	-	-	-	23.5	0.0	37.5	-	-	30.0	25.9
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023
Page No: 5



Turning Movement Peak Hour Data Plot (7:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023

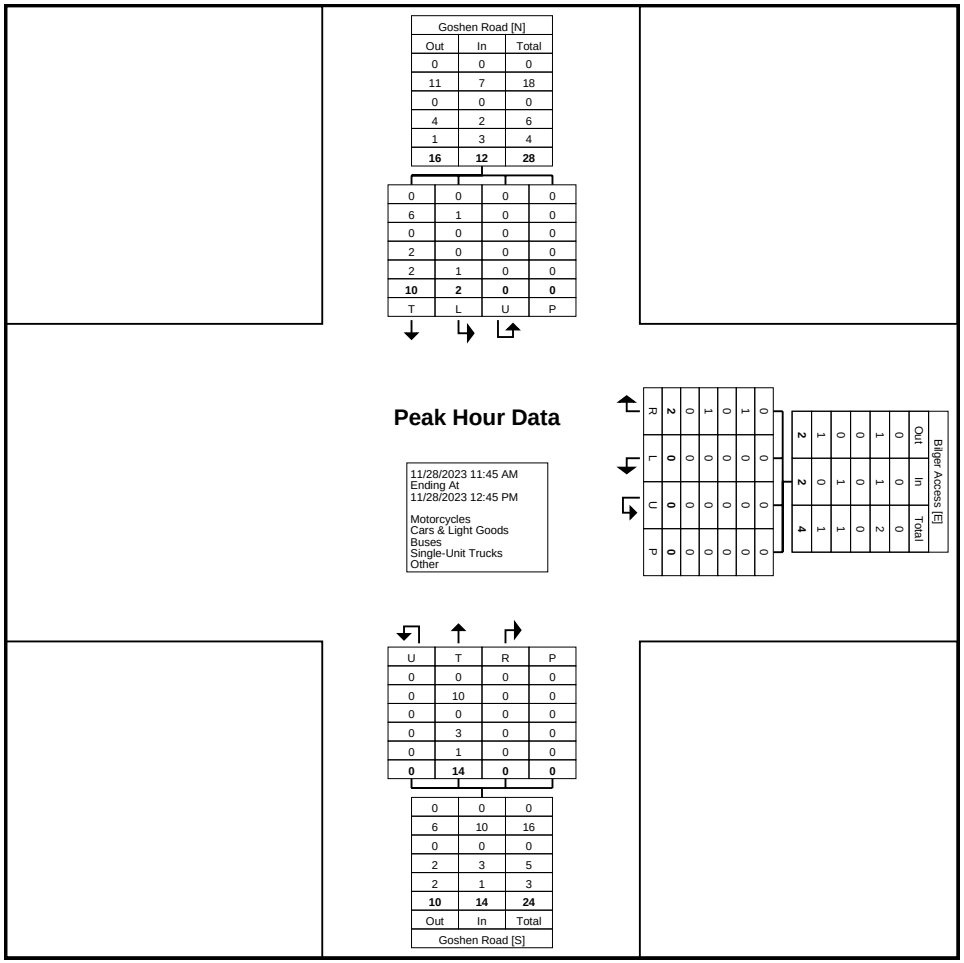
Turning Movement Peak Hour Data (11:45 AM)

Start Time	Bilger Access Westbound					Goshen Road Northbound					Goshen Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
11:45 AM	0	0	0	0	0	4	0	0	0	4	0	2	0	0	2	6
12:00 PM	0	0	0	0	0	3	0	0	0	3	2	1	0	0	3	6
12:15 PM	0	2	0	0	2	3	0	0	0	3	0	3	0	0	3	8
12:30 PM	0	0	0	0	0	4	0	0	0	4	0	4	0	0	4	8
Total	0	2	0	0	2	14	0	0	0	14	2	10	0	0	12	28
Approach %	0.0	100.0	0.0	-	-	100.0	0.0	0.0	-	-	16.7	83.3	0.0	-	-	-
Total %	0.0	7.1	0.0	-	7.1	50.0	0.0	0.0	-	50.0	7.1	35.7	0.0	-	42.9	-
PHF	0.000	0.250	0.000	-	0.250	0.875	0.000	0.000	-	0.875	0.250	0.625	0.000	-	0.750	0.875
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	-	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	0	1	0	-	1	10	0	0	-	10	1	6	0	-	7	18
% Cars & Light Goods	-	50.0	-	-	50.0	71.4	-	-	-	71.4	50.0	60.0	-	-	58.3	64.3
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	-	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	1	0	-	1	3	0	0	-	3	0	2	0	-	2	6
% Single-Unit Trucks	-	50.0	-	-	50.0	21.4	-	-	-	21.4	0.0	20.0	-	-	16.7	21.4
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	1	2	0	-	3	4
% Articulated Trucks	-	0.0	-	-	0.0	7.1	-	-	-	7.1	50.0	20.0	-	-	25.0	14.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	-	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023
Page No: 7



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Bilger Access Westbound					Goshen Road Northbound					Goshen Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
4:00 PM	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	5	3	0	0	8	1	3	0	0	4	12
4:30 PM	0	0	0	0	0	11	0	0	0	11	1	2	0	0	3	14
4:45 PM	0	3	0	0	3	3	0	0	0	3	1	3	0	0	4	10
Total	1	4	0	0	5	20	3	0	0	23	3	8	0	0	11	39
Approach %	20.0	80.0	0.0	-	-	87.0	13.0	0.0	-	-	27.3	72.7	0.0	-	-	-
Total %	2.6	10.3	0.0	-	12.8	51.3	7.7	0.0	-	59.0	7.7	20.5	0.0	-	28.2	-
PHF	0.250	0.333	0.000	-	0.417	0.455	0.250	0.000	-	0.523	0.750	0.667	0.000	-	0.688	0.696
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	0	3	0	-	3	20	3	0	-	23	0	8	0	-	8	34
% Cars & Light Goods	0.0	75.0	-	-	60.0	100.0	100.0	-	-	100.0	0.0	100.0	-	-	72.7	87.2
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	1	1	0	-	2	0	0	0	-	0	3	0	0	-	3	5
% Single-Unit Trucks	100.0	25.0	-	-	40.0	0.0	0.0	-	-	0.0	100.0	0.0	-	-	27.3	12.8
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Cambridge, Ontario, Canada N1R 8J8
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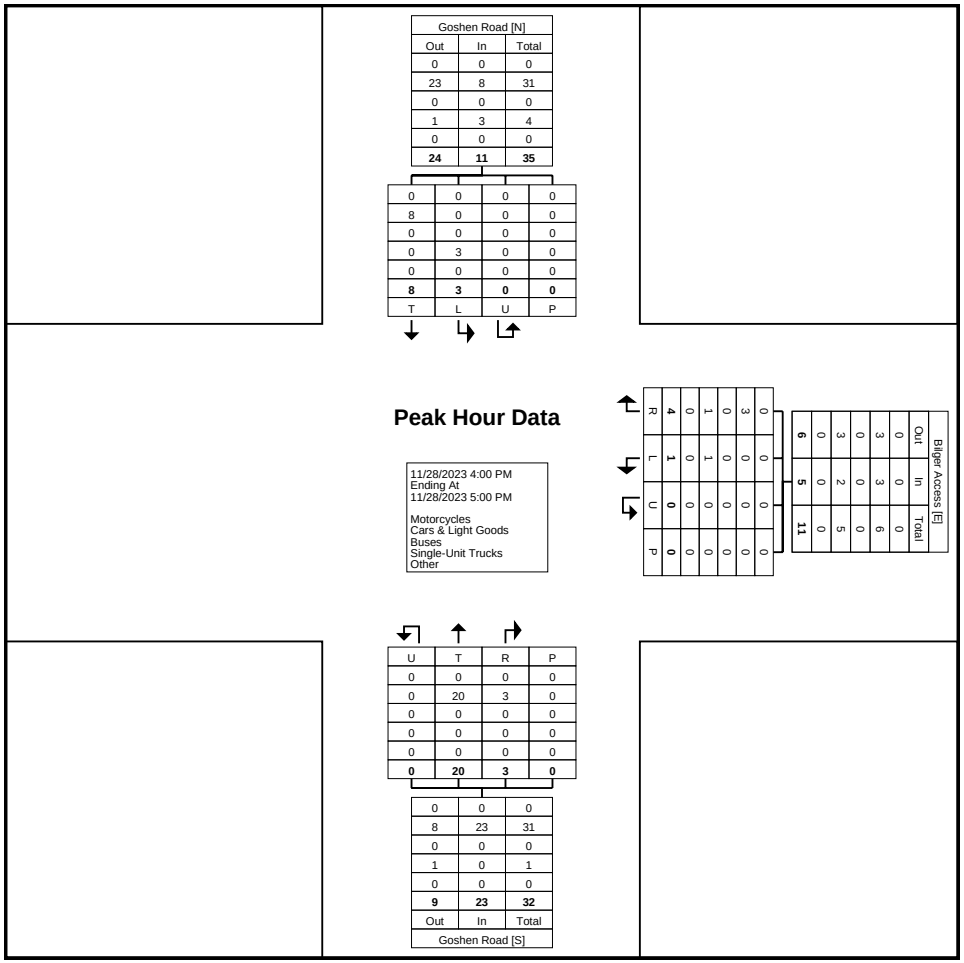
Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)

Appendix C

Existing Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	233	1	5	273	1	18
Future Volume (vph)	233	1	5	273	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1666	0	0	1787	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1666	0	0	1787	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	253	1	5	297	1	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	0	0	302	21	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	233	1	5	273	1	18
Future Vol, veh/h	233	1	5	273	1	18
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	253	1	5	297	1	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	561	254
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	307	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1213	-	492	749
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	751	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1213	-	490	749
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	729	-	-	1213	-
HCM Lane V/C Ratio	0.028	-	-	0.004	-
HCM Control Delay (s)	10.1	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	249	4	1	277	0	0
Future Volume (vph)	249	4	1	277	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	1638	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1638	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	271	4	1	301	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	275	0	0	302	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 18.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	249	4	1	277	0	0
Future Vol, veh/h	249	4	1	277	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	271	4	1	301	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	275	0	576	273
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	303	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1300	-	482	771
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1300	-	482	771
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	753	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1300	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	422	0	16	371	2	18
Future Volume (vph)	422	0	16	371	2	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.877	
Flt Protected				0.998	0.995	
Satd. Flow (prot)	1827	0	0	1772	1658	0
Flt Permitted				0.998	0.995	
Satd. Flow (perm)	1827	0	0	1772	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	459	0	17	403	2	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	459	0	0	420	22	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	422	0	16	371	2	18
Future Vol, veh/h	422	0	16	371	2	18
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	459	0	17	403	2	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	459	0	896	459
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	965	-	313	606
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	965	-	306	606
Mov Cap-2 Maneuver	-	-	-	-	306	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	640	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	552	-	-	965	-
HCM Lane V/C Ratio	0.039	-	-	0.018	-
HCM Control Delay (s)	11.8	-	-	8.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	439	1	0	385	2	1
Future Volume (vph)	439	1	0	385	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	477	1	0	418	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	478	0	0	418	3	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	439	1	0	385	2	1
Future Vol, veh/h	439	1	0	385	2	1
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	477	1	0	418	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	478	0	896	478
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	418	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1095	-	313	591
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	669	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1095	-	313	591
Mov Cap-2 Maneuver	-	-	-	-	313	-
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	669	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	371	-	-	1095	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	14.8	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix D

2024 Background Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	238	1	5	278	1	18
Future Volume (vph)	238	1	5	278	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1666	0	0	1787	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1666	0	0	1787	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	259	1	5	302	1	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	260	0	0	307	21	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	238	1	5	278	1	18
Future Vol, veh/h	238	1	5	278	1	18
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	259	1	5	302	1	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	260	0	572	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1207	-	485	744
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1207	-	483	744
Mov Cap-2 Maneuver	-	-	-	-	483	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	743	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	723	-	-	1207	-
HCM Lane V/C Ratio	0.029	-	-	0.005	-
HCM Control Delay (s)	10.1	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	254	4	1	283	0	0
Future Volume (vph)	254	4	1	283	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	1638	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1638	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	276	4	1	308	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	280	0	0	309	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	254	4	1	283	0	0
Future Vol, veh/h	254	4	1	283	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	276	4	1	308	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	280	0	588	278
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	310	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1294	-	475	766
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1294	-	475	766
Mov Cap-2 Maneuver	-	-	-	-	475	-
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1294	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	430	0	16	378	2	18
Future Volume (vph)	430	0	16	378	2	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.877	
Flt Protected				0.998	0.995	
Satd. Flow (prot)	1827	0	0	1772	1658	0
Flt Permitted				0.998	0.995	
Satd. Flow (perm)	1827	0	0	1772	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	467	0	17	411	2	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	467	0	0	428	22	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	430	0	16	378	2	18
Future Vol, veh/h	430	0	16	378	2	18
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	467	0	17	411	2	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	467	0	912	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	958	-	307	600
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	958	-	300	600
Mov Cap-2 Maneuver	-	-	-	-	300	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	635	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	545	-	-	958	-
HCM Lane V/C Ratio	0.04	-	-	0.018	-
HCM Control Delay (s)	11.9	-	-	8.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	448	1	0	393	2	1
Future Volume (vph)	448	1	0	393	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	487	1	0	427	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	488	0	0	427	3	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	448	1	0	393	2	1
Future Vol, veh/h	448	1	0	393	2	1
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	487	1	0	427	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	488	0	915	488
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1086	-	305	584
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1086	-	305	584
Mov Cap-2 Maneuver	-	-	-	-	305	-
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	363	-	-	1086	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	15	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix E

2024 Total Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	242	1	5	278	1	18
Future Volume (vph)	242	1	5	278	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1666	0	0	1787	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1666	0	0	1787	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	263	1	5	302	1	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	264	0	0	307	21	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	242	1	5	278	1	18
Future Vol, veh/h	242	1	5	278	1	18
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	263	1	5	302	1	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	264	0	576	264
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1203	-	482	740
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1203	-	480	740
Mov Cap-2 Maneuver	-	-	-	-	480	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	743	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	719	-	-	1203	-
HCM Lane V/C Ratio	0.029	-	-	0.005	-
HCM Control Delay (s)	10.2	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	254	8	2	283	0	0
Future Volume (vph)	254	8	2	283	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1639	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1639	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	276	9	2	308	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	285	0	0	310	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	254	8	2	283	0	0
Future Vol, veh/h	254	8	2	283	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	276	9	2	308	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	285	0	593	281
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1289	-	472	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1289	-	471	763
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	746	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1289	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	254	0	2	285	0	0
Future Volume (vph)	254	0	2	285	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	276	0	2	310	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	276	0	0	312	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	254	0	2	285	0	0
Future Vol, veh/h	254	0	2	285	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	276	0	2	310	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	276	0	590	276
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	314	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1287	-	470	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1287	-	469	763
Mov Cap-2 Maneuver	-	-	-	-	469	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	740	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1287	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	431	0	17	380	2	21
Future Volume (vph)	431	0	17	380	2	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.876	
Flt Protected				0.998	0.996	
Satd. Flow (prot)	1827	0	0	1771	1658	0
Flt Permitted				0.998	0.996	
Satd. Flow (perm)	1827	0	0	1771	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	468	0	18	413	2	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	468	0	0	431	25	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	431	0	17	380	2	21
Future Vol, veh/h	431	0	17	380	2	21
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	468	0	18	413	2	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	468	0	917	468
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	449	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	958	-	304	599
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	647	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	958	-	297	599
Mov Cap-2 Maneuver	-	-	-	-	297	-
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	550	-	-	958	-
HCM Lane V/C Ratio	0.045	-	-	0.019	-
HCM Control Delay (s)	11.9	-	-	8.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	451	2	0	394	4	2
Future Volume (vph)	451	2	0	394	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1843	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1843	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	490	2	0	428	4	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	492	0	0	428	6	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	451	2	0	394	4	2
Future Vol, veh/h	451	2	0	394	4	2
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	490	2	0	428	4	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	492	0	919	491
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1082	-	304	582
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1082	-	304	582
Mov Cap-2 Maneuver	-	-	-	-	304	-
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	362	-	-	1082	-
HCM Lane V/C Ratio	0.018	-	-	-	-
HCM Control Delay (s)	15.1	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	450	3	3	393	1	4
Future Volume (vph)	450	3	3	393	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.892	
Flt Protected					0.990	
Satd. Flow (prot)	1861	0	0	1863	1645	0
Flt Permitted					0.990	
Satd. Flow (perm)	1861	0	0	1863	1645	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	489	3	3	427	1	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	492	0	0	430	5	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	450	3	3	393	1	4
Future Vol, veh/h	450	3	3	393	1	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	489	3	3	427	1	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	492	0	924	491
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1071	-	299	578
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	654	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1071	-	298	578
Mov Cap-2 Maneuver	-	-	-	-	298	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	487	-	-	1071	-
HCM Lane V/C Ratio	0.011	-	-	0.003	-
HCM Control Delay (s)	12.5	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix F

2029 Background Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	262	1	6	307	1	20
Future Volume (vph)	262	1	6	307	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1667	0	0	1786	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1667	0	0	1786	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	285	1	7	334	1	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	286	0	0	341	23	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	262	1	6	307	1	20
Future Vol, veh/h	262	1	6	307	1	20
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	285	1	7	334	1	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	286	0	634	286
Stage 1	-	-	-	-	286	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1180	-	446	719
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1180	-	443	719
Mov Cap-2 Maneuver	-	-	-	-	443	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	714	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	1180	-
HCM Lane V/C Ratio	0.033	-	-	0.006	-
HCM Control Delay (s)	10.3	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	280	4	1	312	0	0
Future Volume (vph)	280	4	1	312	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	1638	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1638	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	304	4	1	339	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	308	0	0	340	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	280	4	1	312	0	0
Future Vol, veh/h	280	4	1	312	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	304	4	1	339	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	308	0	647	306
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	341	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1264	-	439	739
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1264	-	439	739
Mov Cap-2 Maneuver	-	-	-	-	439	-
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	724	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1264	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	475	0	18	418	2	20
Future Volume (vph)	475	0	18	418	2	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.876	
Flt Protected				0.998	0.996	
Satd. Flow (prot)	1827	0	0	1771	1658	0
Flt Permitted				0.998	0.996	
Satd. Flow (perm)	1827	0	0	1771	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	516	0	20	454	2	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	516	0	0	474	24	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	475	0	18	418	2	20
Future Vol, veh/h	475	0	18	418	2	20
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	516	0	20	454	2	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	516	0	1010	516
Stage 1	-	-	-	-	516	-
Stage 2	-	-	-	-	494	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	917	-	268	563
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	917	-	260	563
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	509	-	-	917	-
HCM Lane V/C Ratio	0.047	-	-	0.021	-
HCM Control Delay (s)	12.4	-	-	9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	494	1	0	434	2	1
Future Volume (vph)	494	1	0	434	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	537	1	0	472	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	538	0	0	472	3	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	494	1	0	434	2	1
Future Vol, veh/h	494	1	0	434	2	1
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	537	1	0	472	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	538	0	1010	538
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	472	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1040	-	268	547
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	632	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1040	-	268	547
Mov Cap-2 Maneuver	-	-	-	-	268	-
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	632	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	323	-	-	1040	-
HCM Lane V/C Ratio	0.01	-	-	-	-
HCM Control Delay (s)	16.3	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix G

2029 Total Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	266	1	6	307	1	20
Future Volume (vph)	266	1	6	307	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1667	0	0	1786	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1667	0	0	1786	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	289	1	7	334	1	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	290	0	0	341	23	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	266	1	6	307	1	20
Future Vol, veh/h	266	1	6	307	1	20
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	289	1	7	334	1	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	290	0	638	290
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1176	-	444	715
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1176	-	441	715
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	714	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	694	-	-	1176	-
HCM Lane V/C Ratio	0.033	-	-	0.006	-
HCM Control Delay (s)	10.4	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	280	8	2	312	0	0
Future Volume (vph)	280	8	2	312	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1638	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1638	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	304	9	2	339	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	313	0	0	341	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	280	8	2	312	0	0
Future Vol, veh/h	280	8	2	312	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	304	9	2	339	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	313	0	652	309
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1259	-	436	736
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1259	-	435	736
Mov Cap-2 Maneuver	-	-	-	-	435	-
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	722	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1259	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	280	0	2	314	0	0
Future Volume (vph)	280	0	2	314	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	0	2	341	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	304	0	0	343	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	280	0	2	314	0	0
Future Vol, veh/h	280	0	2	314	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	304	0	2	341	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	304	0	649	304
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	345	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1257	-	434	736
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	717	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1257	-	433	736
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	716	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1257	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	476	0	19	420	2	23
Future Volume (vph)	476	0	19	420	2	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.875	
Flt Protected				0.998	0.996	
Satd. Flow (prot)	1827	0	0	1771	1656	0
Flt Permitted				0.998	0.996	
Satd. Flow (perm)	1827	0	0	1771	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	517	0	21	457	2	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	517	0	0	478	27	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	476	0	19	420	2	23
Future Vol, veh/h	476	0	19	420	2	23
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	517	0	21	457	2	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	517	0	1016	517
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	499	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	916	-	266	562
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	614	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	916	-	258	562
Mov Cap-2 Maneuver	-	-	-	-	258	-
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	595	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	514	-	-	916	-
HCM Lane V/C Ratio	0.053	-	-	0.023	-
HCM Control Delay (s)	12.4	-	-	9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	497	2	0	435	4	2
Future Volume (vph)	497	2	0	435	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	540	2	0	473	4	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	542	0	0	473	6	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	497	2	0	435	4	2
Future Vol, veh/h	497	2	0	435	4	2
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	540	2	0	473	4	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	542	0	1014	541
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1037	-	267	545
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1037	-	267	545
Mov Cap-2 Maneuver	-	-	-	-	267	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	322	-	-	1037	-
HCM Lane V/C Ratio	0.02	-	-	-	-
HCM Control Delay (s)	16.4	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	497	3	3	434	1	4
Future Volume (vph)	497	3	3	434	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.892	
Flt Protected					0.990	
Satd. Flow (prot)	1861	0	0	1863	1645	0
Flt Permitted					0.990	
Satd. Flow (perm)	1861	0	0	1863	1645	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	540	3	3	472	1	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	543	0	0	475	5	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	497	3	3	434	1	4
Future Vol, veh/h	497	3	3	434	1	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	540	3	3	472	1	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	543	0	1020	542
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	478	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1026	-	262	540
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1026	-	261	540
Mov Cap-2 Maneuver	-	-	-	-	261	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	622	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	445	-	-	1026	-
HCM Lane V/C Ratio	0.012	-	-	0.003	-
HCM Control Delay (s)	13.2	-	-	8.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix H

2034 Background Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	290	1	6	339	1	22
Future Volume (vph)	290	1	6	339	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.870	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1667	0	0	1786	1418	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1667	0	0	1786	1418	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	315	1	7	368	1	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	316	0	0	375	25	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	290	1	6	339	1	22
Future Vol, veh/h	290	1	6	339	1	22
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	315	1	7	368	1	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	316	0	698	316
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1149	-	410	691
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1149	-	407	691
Mov Cap-2 Maneuver	-	-	-	-	407	-
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	688	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	671	-	-	1149	-
HCM Lane V/C Ratio	0.037	-	-	0.006	-
HCM Control Delay (s)	10.6	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	310	4	1	344	0	0
Future Volume (vph)	310	4	1	344	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	1637	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1637	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	337	4	1	374	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	341	0	0	375	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	4	1	344	0	0
Future Vol, veh/h	310	4	1	344	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	337	4	1	374	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	341	0	715	339
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	376	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1229	-	400	708
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1229	-	400	708
Mov Cap-2 Maneuver	-	-	-	-	400	-
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	698	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1229	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	525	0	20	461	2	22
Future Volume (vph)	525	0	20	461	2	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.875	
Flt Protected				0.998	0.996	
Satd. Flow (prot)	1827	0	0	1771	1656	0
Flt Permitted				0.998	0.996	
Satd. Flow (perm)	1827	0	0	1771	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	571	0	22	501	2	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	571	0	0	523	26	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	525	0	20	461	2	22
Future Vol, veh/h	525	0	20	461	2	22
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	571	0	22	501	2	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	571	0	1116	571
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	545	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	873	-	232	524
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	873	-	224	524
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	565	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	471	-	-	873	-
HCM Lane V/C Ratio	0.055	-	-	0.025	-
HCM Control Delay (s)	13.1	-	-	9.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	546	1	0	479	2	1
Future Volume (vph)	546	1	0	479	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	593	1	0	521	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	594	0	0	521	3	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	546	1	0	479	2	1
Future Vol, veh/h	546	1	0	479	2	1
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	593	1	0	521	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	594	0	1115	594
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	521	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	992	-	232	509
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	992	-	232	509
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	600	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	283	-	-	992	-
HCM Lane V/C Ratio	0.012	-	-	-	-
HCM Control Delay (s)	17.9	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix I

2034 Total Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	294	1	6	339	1	22
Future Volume (vph)	294	1	6	339	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.870	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1667	0	0	1786	1418	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1667	0	0	1786	1418	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	320	1	7	368	1	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	321	0	0	375	25	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	294	1	6	339	1	22
Future Vol, veh/h	294	1	6	339	1	22
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	320	1	7	368	1	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	321	0	703	321
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1144	-	407	686
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1144	-	404	686
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	688	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	666	-	-	1144	-
HCM Lane V/C Ratio	0.038	-	-	0.006	-
HCM Control Delay (s)	10.6	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	310	8	2	344	0	0
Future Volume (vph)	310	8	2	344	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1637	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1637	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	337	9	2	374	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	346	0	0	376	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	8	2	344	0	0
Future Vol, veh/h	310	8	2	344	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	337	9	2	374	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	346	0	720	342
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	378	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1224	-	398	705
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	697	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1224	-	397	705
Mov Cap-2 Maneuver	-	-	-	-	397	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1224	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	310	0	2	347	0	0
Future Volume (vph)	310	0	2	347	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	0	2	377	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	337	0	0	379	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	0	2	347	0	0
Future Vol, veh/h	310	0	2	347	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	337	0	2	377	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	337	0	718	337
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	381	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1222	-	396	705
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	691	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1222	-	395	705
Mov Cap-2 Maneuver	-	-	-	-	395	-
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	690	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1222	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	526	0	21	463	2	25
Future Volume (vph)	526	0	21	463	2	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.874	
Flt Protected				0.998	0.997	
Satd. Flow (prot)	1827	0	0	1771	1656	0
Flt Permitted				0.998	0.997	
Satd. Flow (perm)	1827	0	0	1771	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	572	0	23	503	2	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	572	0	0	526	29	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	526	0	21	463	2	25
Future Vol, veh/h	526	0	21	463	2	25
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	572	0	23	503	2	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	572	0	1121	572
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	872	-	230	523
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	872	-	221	523
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	561	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	475	-	-	872	-
HCM Lane V/C Ratio	0.062	-	-	0.026	-
HCM Control Delay (s)	13.1	-	-	9.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	549	2	0	480	4	2
Future Volume (vph)	549	2	0	480	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	597	2	0	522	4	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	599	0	0	522	6	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	549	2	0	480	4	2
Future Vol, veh/h	549	2	0	480	4	2
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	597	2	0	522	4	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	599	0	1120	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	988	-	231	506
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	988	-	231	506
Mov Cap-2 Maneuver	-	-	-	-	231	-
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	282	-	-	988	-
HCM Lane V/C Ratio	0.023	-	-	-	-
HCM Control Delay (s)	18.1	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	548	3	3	479	1	4
Future Volume (vph)	548	3	3	479	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.892	
Flt Protected					0.990	
Satd. Flow (prot)	1861	0	0	1863	1645	0
Flt Permitted					0.990	
Satd. Flow (perm)	1861	0	0	1863	1645	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	596	3	3	521	1	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	599	0	0	524	5	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	548	3	3	479	1	4
Future Vol, veh/h	548	3	3	479	1	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	596	3	3	521	1	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	599	0	1125	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	527	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	978	-	227	502
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	978	-	226	502
Mov Cap-2 Maneuver	-	-	-	-	226	-
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	590	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	403	-	-	978	-
HCM Lane V/C Ratio	0.013	-	-	0.003	-
HCM Control Delay (s)	14.1	-	-	8.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

494 Highway 3, Courtland, Norfolk County Transportation Impact Study

Paradigm Transportation Solutions Limited

2024-10
230661

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Project Summary

Project Number:

230661

Date and Version:

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1.0.0

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494 Highway 3, Courtland, Norfolk County Transportation Impact Study

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Executive Summary

Content

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact Study (TIS) for the proposed changes to the property located at 494 Highway 3 in the community of Courtland, Norfolk County. The changes will provide for expanding an existing Equipment Warehouse and accommodate a new Truck Yard for two different businesses.

This TIS includes description and analysis of existing road and traffic conditions, a description of the proposed development, analysis of future traffic conditions, and assessment of the existing access arrangement to accommodate the proposed changes.

Proposed Site Changes

The subject property is located on the south side of Highway 3, east of Goshen Road. The property is owned by Bilger Slinger Services and is currently rented to Blue West Equipment for use as a storage and sales facility for farm, residential, and commercial equipment.

The proposed changes to the site are to accommodate the relocation of Bilger Slinger Services from their current location at 480 Highway 3 to the property at 494 Highway 3 and shared use of the site with Blue West Equipment.

Specifically, the changes will include the development of a truck yard for Bilger Slinger Services and the replacement of an existing warehouse with a GFA of 456 m^2 with a larger warehouse of 1161 m^2 GFA for Blue West Equipment. Bilger Slinger Services currently stores and services 18 slinger trucks but is planning to expand to include 24 trucks by 2034.

The property has two driveways on Highway 3 approximately 70 metres apart and at distances of 165 metres and 235 metres east of Goshen Road. The westerly driveway is proposed to be used for Blue West Equipment, and the easterly driveway by Bilger Slinger Services. It is noted that the easterly driveway is temporarily closed.

TIS Scope

The scope of the Transportation Impact Study for the proposed development includes:

- **Study Area Intersections:**

  - Highway 3 and Goshen Road; and
  - Two site access intersections on Highway 3.
- **Analysis Periods:** Weekday AM and PM peak hours.
- **Traffic Conditions:** Existing (2023), expansion completion (2024), five years after completion (2029), and ten years after completion (2034).

Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions:** The intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are operating at satisfactory levels of service (LOS A/B).
- **Site Traffic Volumes:** The existing site driveway volumes indicate that 5 AM peak hour trips and 4 PM peak hour generated by the current site operations.

  With the proposed changes, the site traffic volumes are projected to increase to 7 AM peak hour trips and 15 PM peak hour trips.

  Based on the current and future site traffic volumes, the site could be considered to be a low trip generator with minimal impact on driveway and road traffic operations.
- **Background Traffic Conditions:** The two intersections are forecast to operate at acceptable levels of service under 2024, 2029, and 2034 background traffic conditions.
- **Total Traffic Conditions:** The intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours under 2024, 2029, and 2034 total traffic conditions, as under existing conditions.
- **Site Accesses:** The Westerly and Easterly Site Access intersections on Highway 3 are forecast to operate at acceptable levels of service under 2024, 2029, and 2034 total traffic conditions.

  Both access locations satisfy the sight distance requirements, and do not require an auxiliary westbound left-turn lane on Highway 3 to accommodate inbound left-turning traffic.

Recommendations

Based on the findings and conclusions of this study, it is recommended that the Site Changes with two driveways for the property at 494 Highway 3, Courtland be considered for approval as proposed.

Contents

Appendices

Figures

Tables

1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited (Paradigm) has been retained to conduct this Transportation Impact Study (TIS) for the proposed changes to the property located at 494 Highway 3 in the community of Courtland, Norfolk County. The changes will provide for expanding an existing Equipment Warehouse and accommodate a new Truck Yard for two different businesses.

Figure 1.1 details the subject development location.

The subject property is located on the south side of Highway 3, east of Goshen Road. The property is owned by Bilger Slinger Services and is currently rented to Blue West Equipment for use as a storage and sales facility for farm, residential, and commercial equipment.

The proposed changes to the site are to accommodate the relocation of Bilger Slinger Services from their current location at 480 Highway 3 to the property at 494 Highway 3 and shared use of the site with Blue West Equipment.

Specifically, the changes will include the development of a truck yard for Bilger Slinger Services and the replacement of an existing warehouse with a GFA of 456 m^2 with a larger warehouse of 1161 m^2 GFA for Blue West Equipment. Bilger Slinger Services currently stores and services 18 slinger trucks but is planning to expand to include 24 trucks by 2034.

The property has two driveways on Highway 3 approximately 70 metres apart and at distances of 165 metres and 235 metres east of Goshen Road. The westerly driveway is proposed to be used for Blue West Equipment, and the easterly driveway by Bilger Slinger Services. It is noted that the easterly driveway is temporarily closed.

1.2 Purpose and Scope

The purpose of this report is to assess the location and operation of the existing site driveways to accommodate the proposed site changes. The scope of the study, shared with Norfolk County and Ministry staff via e-mail in November 2023, includes:

- assessment of the current road, traffic and site conditions within the study area;

- estimates of background traffic growth for the year of the proposed site changes (2024), five years after changes (2029), and ten years after changes (2034);
- estimates of additional traffic generated by the proposed site changes;
- analyses of the impact of the future traffic on the surrounding road network, including the following study area intersections:
  - Highway 3 and Goshen Road; and
  - Two access intersections on Highway 3.
- Operational and safety assessment of the two site driveways in accommodating the proposed site changes.

Appendix A contains the pre-study consultation material.

This study has been prepared in accordance with the requirements detailed by the MTO TIS Guidelines[1] and Norfolk County TIS Guidelines[2].

[1] General Guidelines for the Preparation of Traffic Impact Studies, Ministry of Transportation Ontario, March 2023.

[2] Norfolk County Integrated Sustainable Master Plan (ISMP), Appendix J: TIS Guidelines, September 2016.

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Location of Subject Site

494 Highway 3, Courtland TIS
230661

Figure 1.1

2 Existing Conditions

2.1 Existing Roadways

The main roadways near the subject development considered in assessing the traffic impacts of the development include:

- **Highway 3** is an east-west provincial highway[3] with a two-lane cross section. The posted speed limit is 80 km/h.
- **Goshen Road** is a north-south local road with a two-lane cross section. The posted speed limit is 60 km/h.

Side-street stop control is provided at the intersection of Highway 3 and Goshen Road.

Figure 2.1 illustrates the traffic control and lane configuration at the intersections of Highway 3 and Goshen Road.

2.2 Existing Driveways on Highway 3

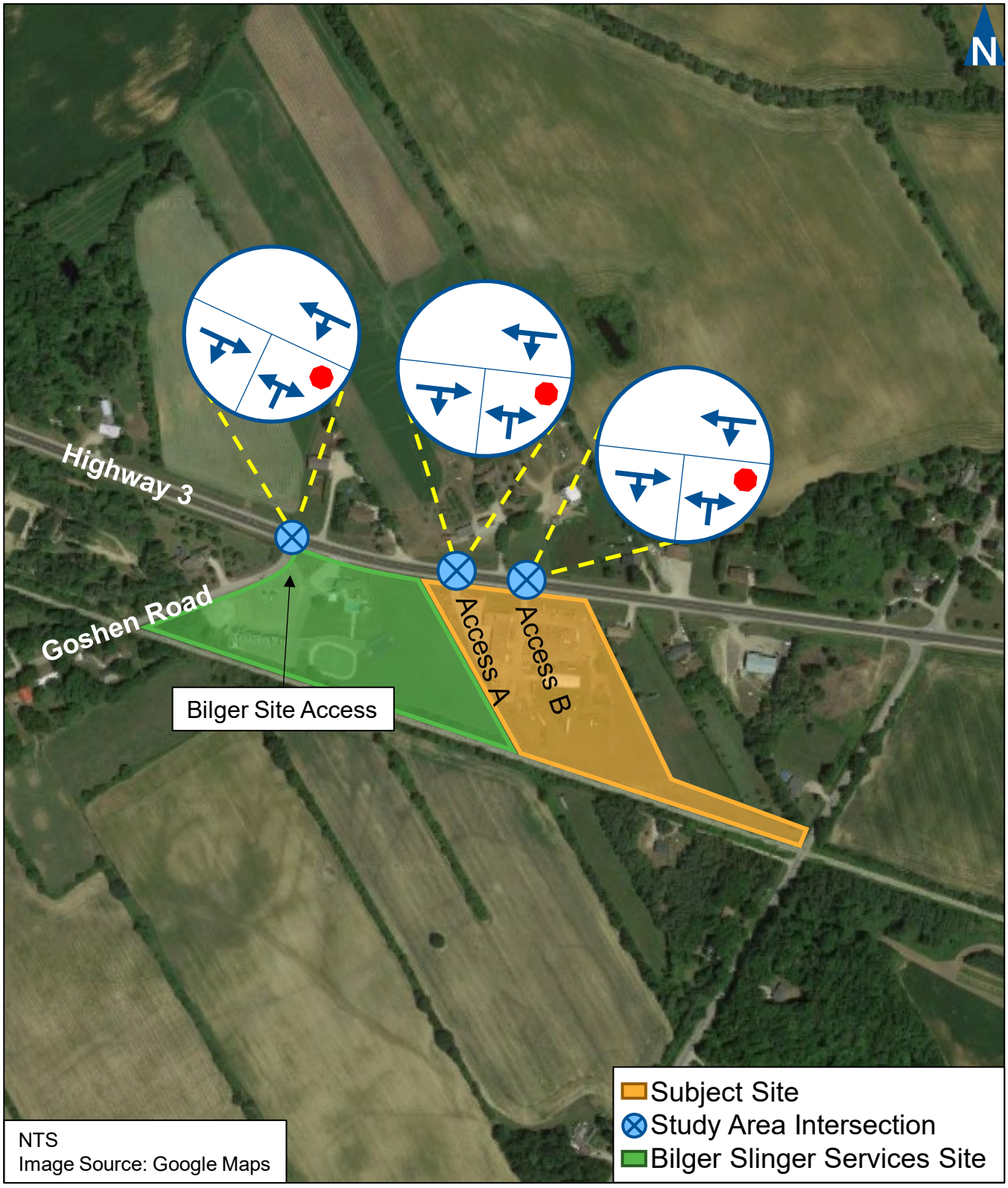
Highway 3 in the study area is identified as a 2B Arterial Road in MTO's Access Management Classification System.[4]

2B Arterial roads typically allows consideration of access connections based on spacing, density (number of accesses over a kilometre), property frontage, and safety requirements.

In the section of Highway 3 between Goshen Road and Plowman's Line, a distance of 625 metres, there are seven driveways on the north side of the highway and six on the south.

The driveways on the south side include the two driveways to the subject property. The property frontage on Highway 3 is 160 metres, and the two driveways are 70 metres apart, exceeding the minimum separation requirement of 30 metres. The westerly and easterly site driveways are located at 165 metres and 235 metres west of Goshen Road, respectively. The two driveways are under stop sign control as shown in **Figure 2.1**.

[3] *Norfolk County Official Plan*, Schedule E-4: Delhi Transportation, 5 October 2018.
[4] Ministry of Transportation. Highway Corridor Management Manual. April 2022.



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Existing Lane Configuration and Traffic Control

2.3 Traffic Volumes

Paradigm conducted turning movement counts at the intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Blue West Equipment Access A on 28 November 2023. Paradigm also conducted turning movement counts at the Goshen Road and Bilger Access intersection on 28 November 2023 to determine the existing traffic in and out of the Bilger Slinger Services site.

Table 2.1 summarizes the traffic peak hours at each intersection.

TABLE 2.1: INTERSECTION PEAK HOURS

Intersection	AM Peak Hour	PM Peak Hour
Highway 3 and Goshen Road	7:45 – 8:45	3:45 – 4:45
Highway 3 and the Blue West Equipment Access A	7:45 – 8:45	3:45 – 4:45
Goshen Road and Bilger Access	7:00 – 8:00	4:00 – 5:00

Appendix B contains the detailed traffic counts for the intersections.

Figure 2.2 illustrates the existing AM and PM weekday peak hour turning movement traffic volumes at the study area intersections.

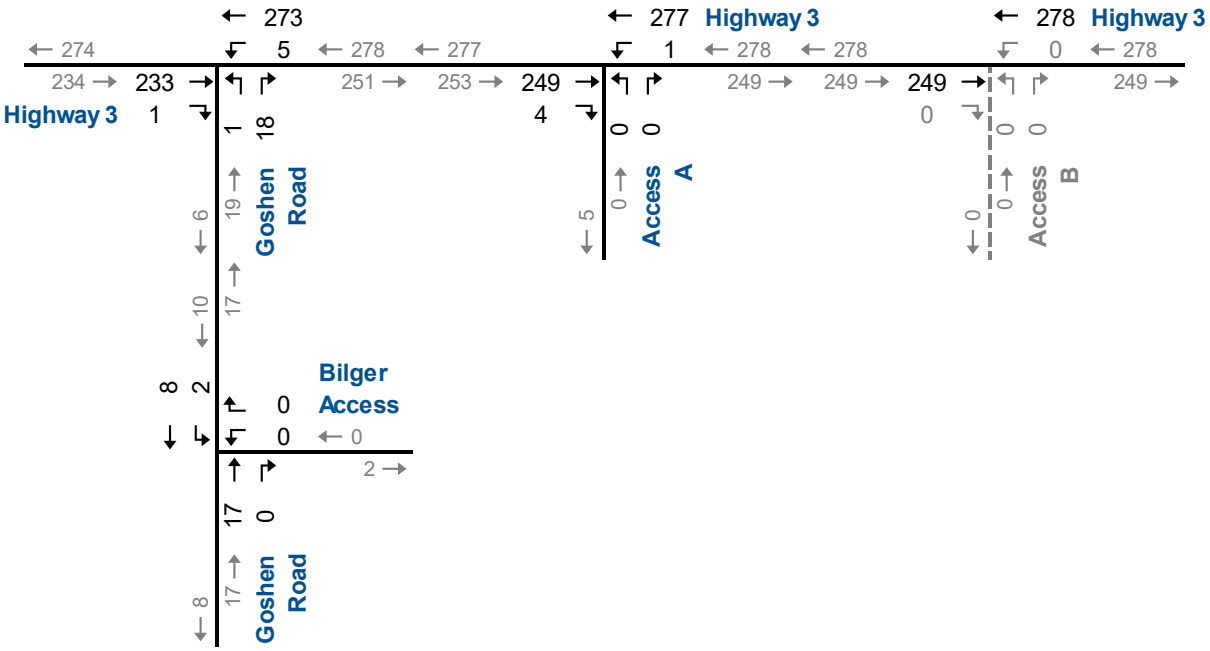
Table 2.2 shows the 8-hour hourly breakdown of inbound and outbound traffic on Gosehn Road at the Bilger site access.

The study area roadway and driveway traffic volumes and turning movements are noted to be low to moderate:

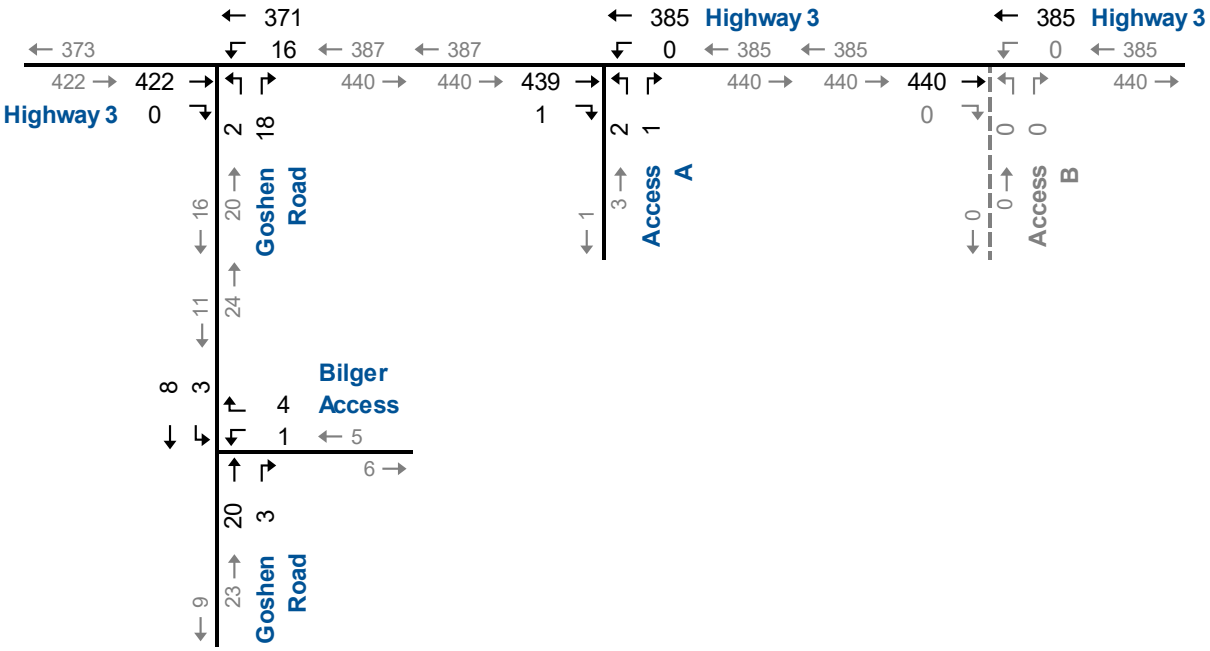
- The peak directional traffic volume on Highway 3 is under 300 vph in the AM peak hour and under 450 vph in the PM peak hour.
- The traffic on Goshen Road is under 20 vph in either direction during either peak hour.
- The driveway turning movements are less than 5 vph.

It is noted that with the proposed changes, the driveway volumes on Goshen Road for the property at 480 Highway 3 will be transferred to the subject site driveways on Highway 3 for the property at 494 Highway 3.

AM Peak Hour



PM Peak Hour



Existing Traffic Volumes

TABLE 2.2: BILGER SITE ACCESS 8-HOUR TRAFFIC VOLUMES

Time	Inbound	Outbound
7:00 – 8:00 AM	2	0
8:00 – 9:00 AM	2	1
9:00 – 10:00 AM	2	4
11:30 AM – 12:30 PM	2	2
12:30 – 1:30 PM	0	0
3:00 – 4:00 PM	4	2
4:00 – 5:00 PM	6	5
5:00 – 6:00 PM	5	4
Total	**20**	**18**

2.4 Traffic Operations

The level of service conditions at the Highway 3 and Goshen Road intersection, and at the Highway 3 and Access A intersection have been assessed through intersection operational analysis using Synchro 11.

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles intending to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on several criteria related to the opposing traffic flows and intersection geometry.

The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume to capacity (v/c) ratio is greater than 1.00, the movement is classed as LOS F and remedial measures are usually implemented if they are feasible. LOS E is usually used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on delays.

Movements are considered critical under the following conditions:

- Signalized Intersections:
  - v/c ratios for overall intersection operations, through movements or shared through/turning movements increased to 0.85 or above;
  - v/c ratios for exclusive movements increased to 0.95 or above; or

- queues for an individual movement are projected to exceed available turning lane storage.

- Unsignalized Intersections:
  - LOS based on average delay per vehicle, on individual movements exceeds LOS “E”; or
  - the estimated 95th percentile queue length for an individual movement exceeds the available queue storage.

Table 2.3 summarizes the results of the intersection operational analysis under existing conditions, including the AM and PM peak hour LOS, v/c ratios, and 95th percentile queues experienced.

The results indicate that the two intersections are operating at satisfactory levels of service (LOS A/B), and with no problem movements.

Appendix C contains the detailed Synchro 11 reports.

TABLE 2.3: EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	10		>	10					
			V/C		0.00	>		<	0.00			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	12		>	12					
			V/C		0.00	>		<	0.02			0.04		>						
			Q		0	>		<	1			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

3 Proposed Site Changes

3.1 Description of Site Changes

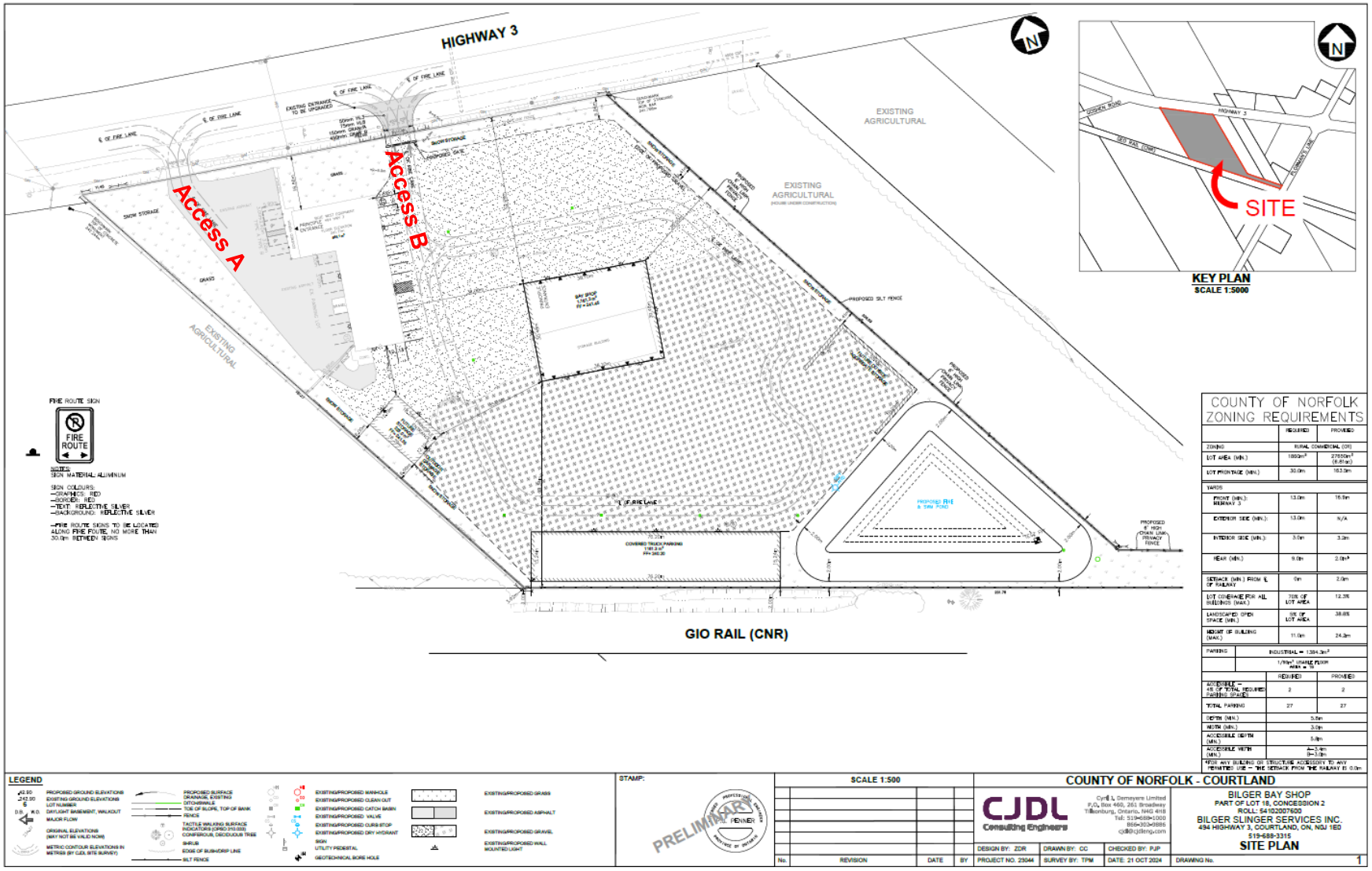
The subject property is located on the south side of Highway 3, east of Goshen Road. The property is owned by Bilger Slinger Services and is currently rented to Blue West Equipment for use as a storage and sales facility for farm, residential, and commercial equipment.

The proposed changes to the site are to accommodate the relocation of Bilger Slinger Services from their current location at 480 Highway 3 to the property at 494 Highway 3 and shared use of the site with Blue West Equipment.

Specifically, the changes will include the development of a truck yard for Bilger Slinger Services and the replacement of an existing warehouse with a GFA of 456 m^2 with a larger warehouse of 1161 m^2 GFA for Blue West Equipment. Bilger Slinger Services currently stores and services 18 slinger trucks but is planning to expand to include 24 trucks by 2034.

The property has two driveways on Highway 3 approximately 70 metres apart and at distances of 165 metres and 235 metres east of Goshen Road. The westerly driveway is proposed to be used for Blue West Equipment, and the easterly driveway by Bilger Slinger Services. It is noted that the easterly driveway is temporarily closed.

Figure 3.1 includes the preliminary grading plan for the site illustrating the proposed changes including the access arrangement.



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Proposed Site Changes

494 Highway 3, Courtland TIS
230661

Figure 3.1

3.2 Site Trip Generation

The trip generation for each of the Blue West Equipment and Bilger Slinger Services sites are expected to be the same as under existing conditions.

Table 3.1 summarizes the number of trips generated by the proposed development.

TABLE 3.1: TRIP GENERATION

Site	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Blue West Equipment	5	0	**5**	1	3	**4**
Bilger Slinger Services	2	0	**2**	6	5	**11**
Total Trip Generation	**7**	**0**	**7**	**7**	**8**	**15**

3.3 Development Trip Distribution and Assignment

The trip distribution for the Bilger Slinger Services site traffic was determined based on the existing assignment of traffic volumes at the site driveway and the existing travel patterns within the study area. **Table 3.2** displays the breakdown of trip distributions used in this study.

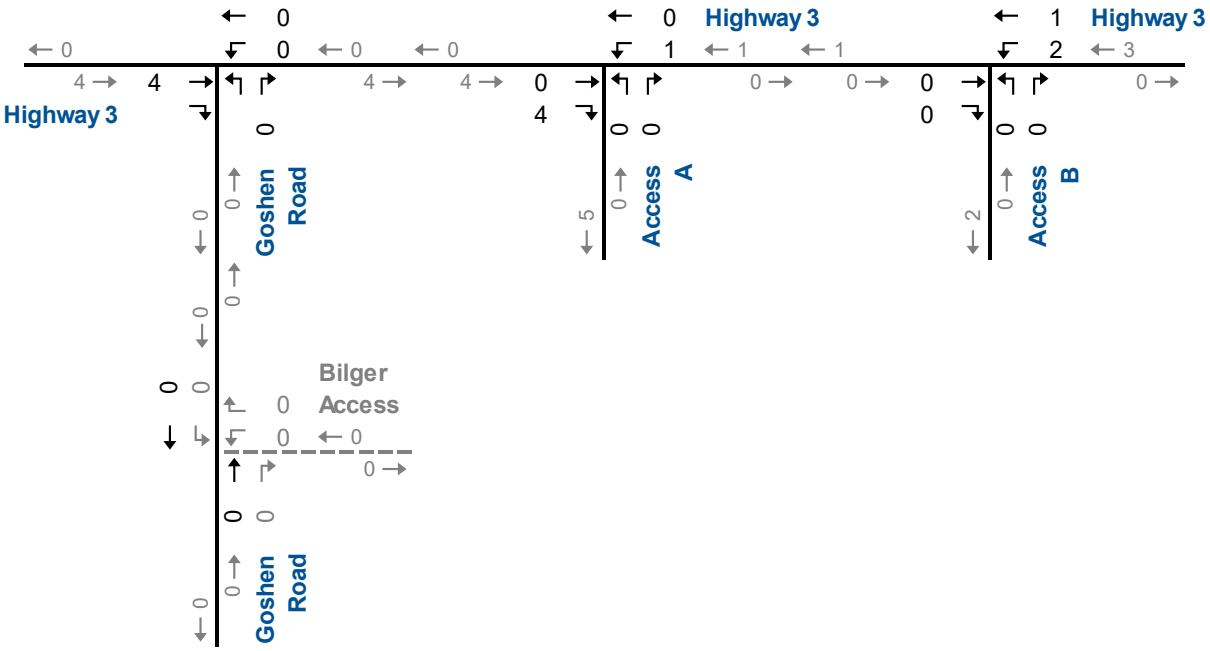
TABLE 3.2: ESTIMATED TRIP DISTRIBUTION

Origin/Destination	AM Peak Hour		PM Peak Hour	
	Inbound	Outbound	Inbound	Outbound
East via Highway 3	83%	0%	50%	72%
West via Highway 3	17%	0%	0%	8%
South via Goshen Road	0%	0%	50%	20%
Total	**100%**	**0%**	**100%**	**100%**

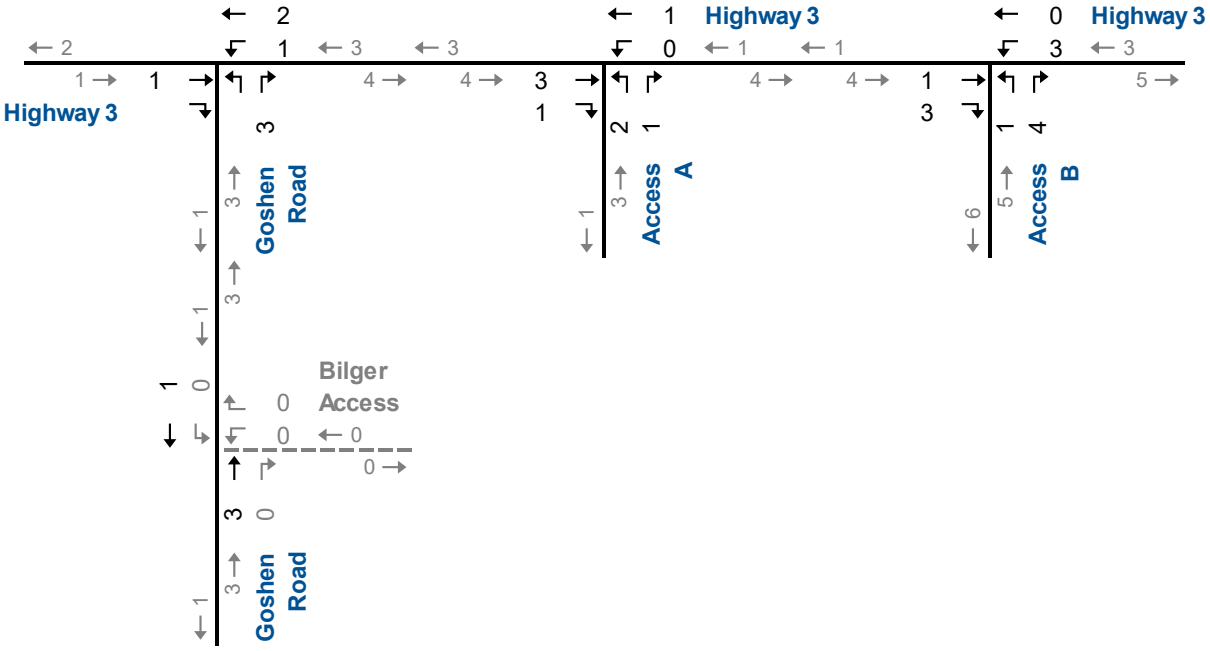
Figure 3.2 illustrates the site-generated traffic volumes for the AM and PM peak hours. The site traffic for Blue West Equipment is unchanged from the existing traffic volumes.

It is noted that as under existing traffic conditions the driveway volumes will remain minimal following the proposed site changes.

AM Peak Hour



PM Peak Hour



Site Generated Traffic Volumes

4 Access Assessment

The assessment of the subject driveways under future traffic conditions is based on future background and total traffic volumes, corresponding to the proposed timing of site changes (2024), five years after changes (2029), and ten years after changes (2034).

4.1 Background Traffic Forecasts

In order to derive the generalized background traffic volumes, a growth rate of 2.0% per annum was applied to the existing roadway traffic volumes.

No background developments were included in the future traffic volumes.

4.2 2024 Background Traffic Operations

Figure 4.1 illustrates the 2024 background traffic volumes, including road traffic growth.

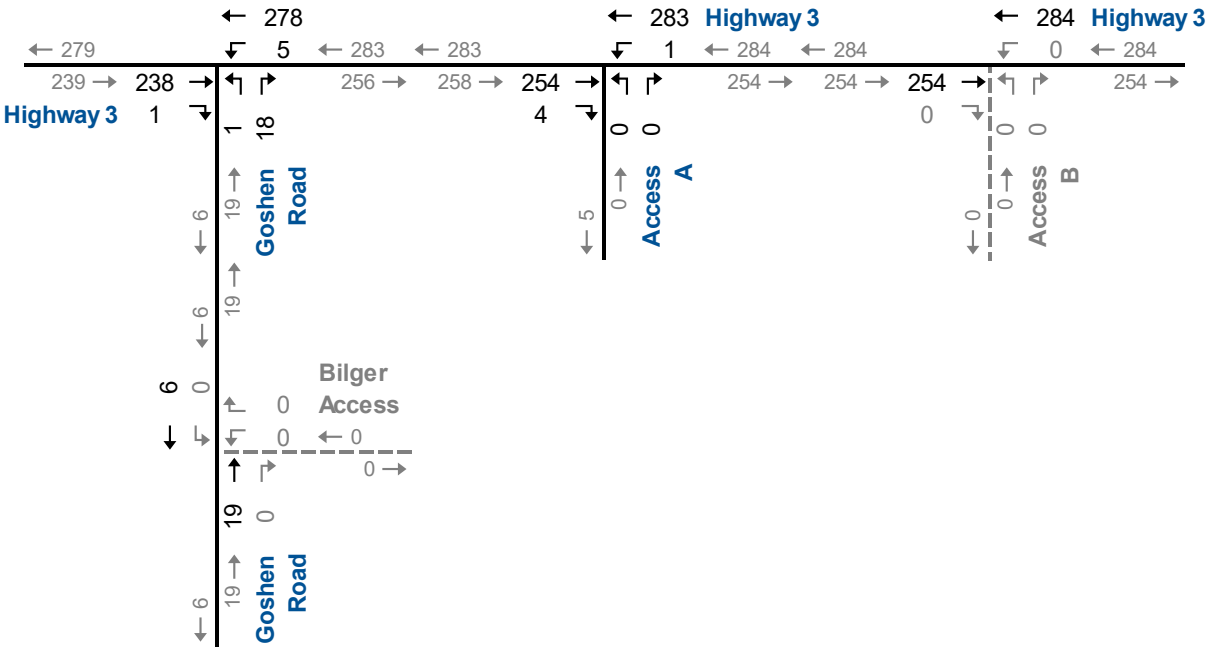
The 2024 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions.

It is noted that no changes have been made to the turning movements at the intersection of Highway 3 and Goshen Road even they would likely be reduced following the proposed relocation of Bilger truck operations.

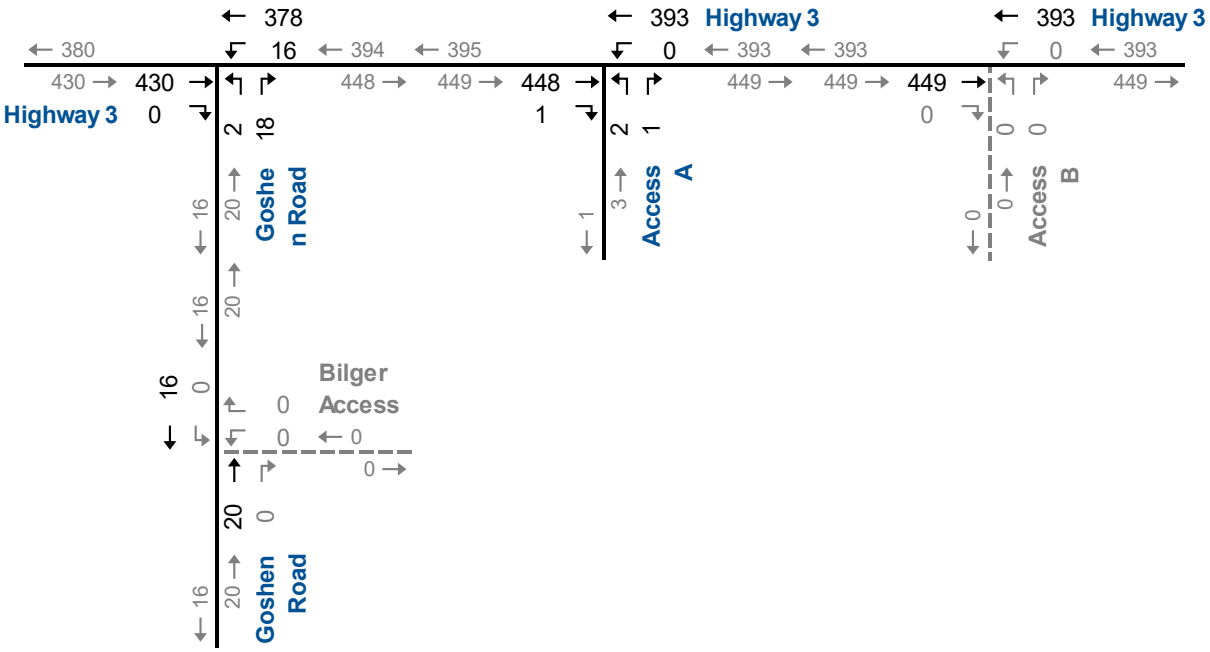
Table 4.1 summarizes the results of the 2024 background traffic operations. The results indicate that the intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are forecast to operate at satisfactory levels of service (LOS A/B), and with no problem movements.

Appendix D contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2024 Background Traffic Volumes

494 Highway 3, Courtland TIS
230661

Figure 4.1

TABLE 4.1: 2024 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	10		>	10					
			V/C		0.00	>		<	0.01			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	12		>	12					
			V/C		0.00	>		<	0.02			0.04		>						
			Q		0	>		<	1			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.3 2024 Total Traffic Operations

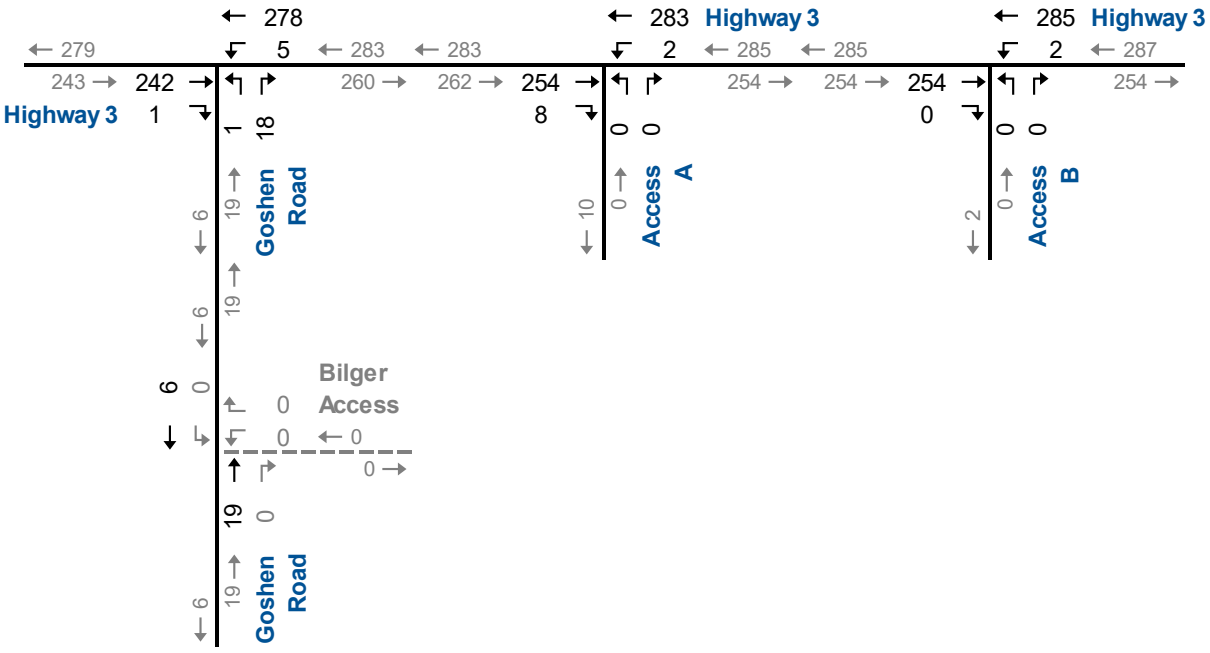
Figure 4.2 illustrates the 2024 total traffic volumes, including trips generated by the proposed development.

The 2024 total traffic volumes have been analyzed using the same methodology as under existing and background traffic conditions.

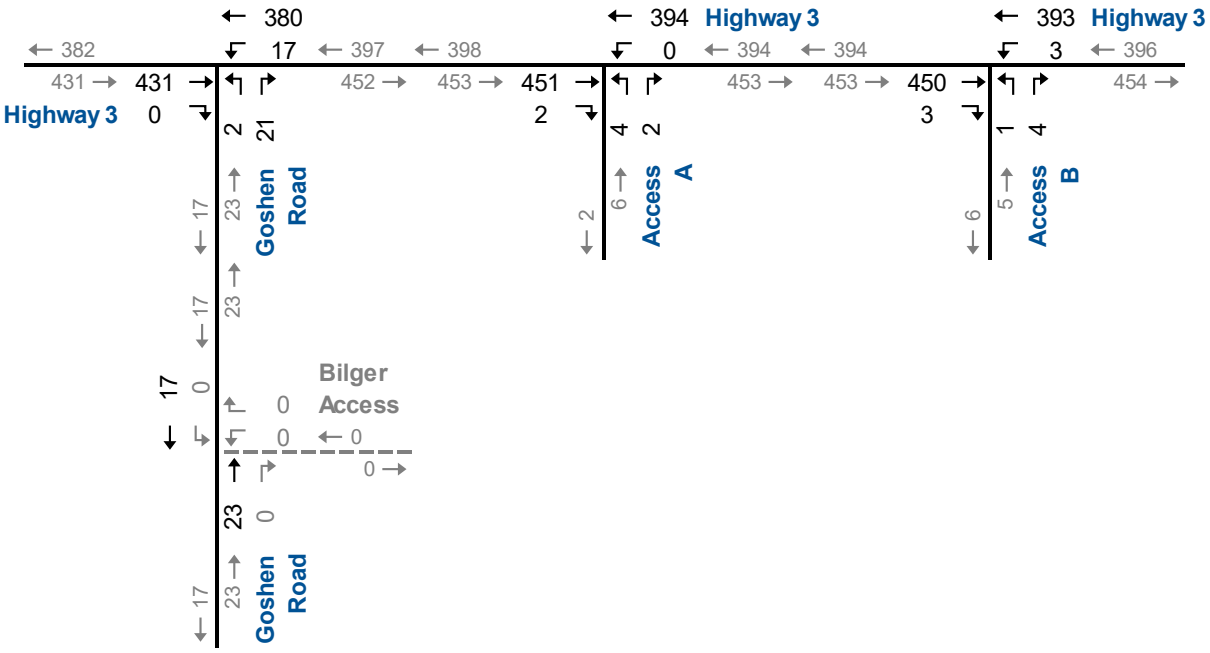
Table 4.2 summarizes the results of the 2024 total traffic operations. The results indicate that the intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours. Both Site Access intersections to Highway 3 are forecast to operate at acceptable levels of service during the AM and PM peak hours.

Appendix E contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2024 Total Traffic Volumes

494 Highway 3, Courtland TIS
230661

Figure 4.2

TABLE 4.2: 2024 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	10		>	10					
			V/C		0.00	>		<	0.01			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
	Highway 3 & Access B	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	12		>	12					
			V/C		0.00	>		<	0.02			0.04		>						
			Q		0	>		<	1			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	0		0	15		>	15					
			V/C		0.00	>		<	0.00			0.02		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access B	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	12		>	12					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.4 2029 Background Traffic Operations

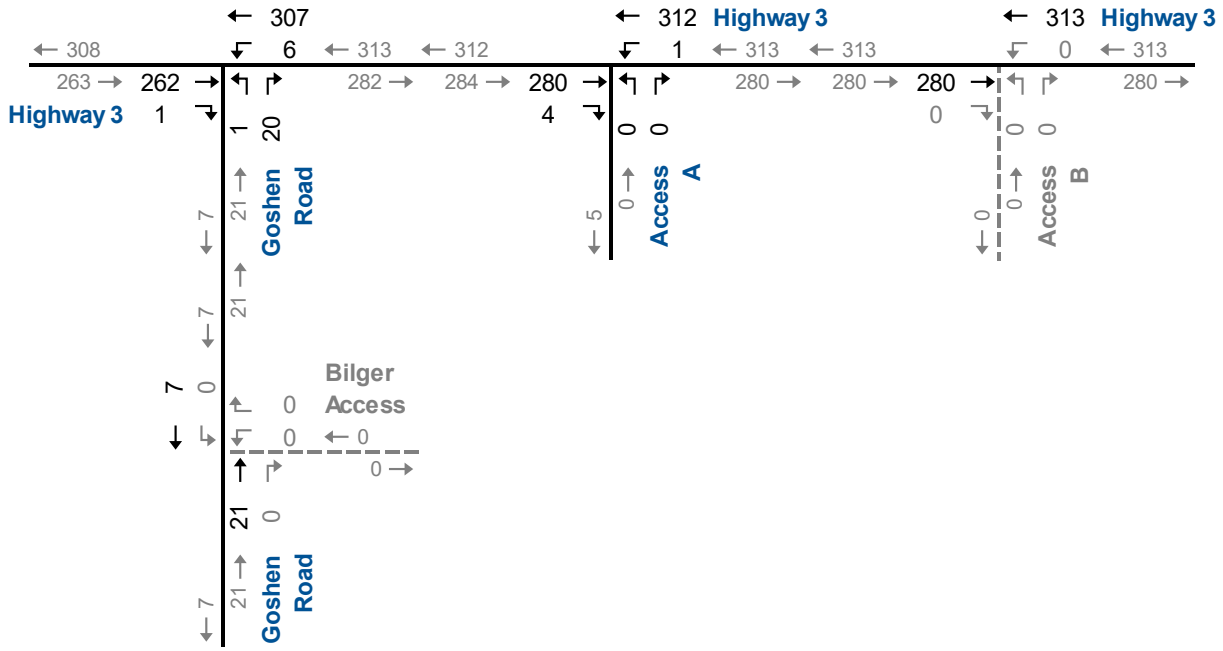
Figure 4.3 illustrates the 2029 background traffic volumes, including road traffic growth.

The 2029 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions.

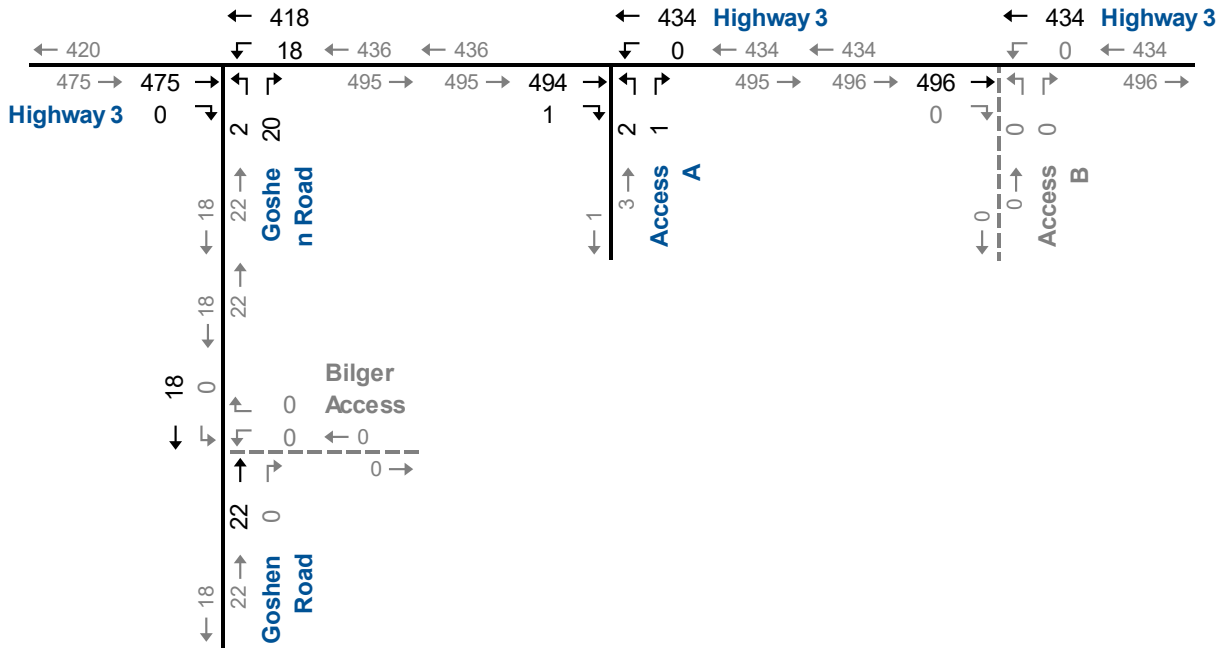
Table 4.3 summarizes the results of the 2029 background traffic operations. The results indicate that the intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are forecast to operate at acceptable levels of service, and with no problem movements.

Appendix F contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2029 Background Traffic Volumes

TABLE 4.3: 2029 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	10		>	10					
			V/C		0.00	>		<	0.01			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	12		>	12					
			V/C		0.00	>		<	0.02			0.05		>						
			Q		0	>		<	1			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	0		0	16		>	16					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

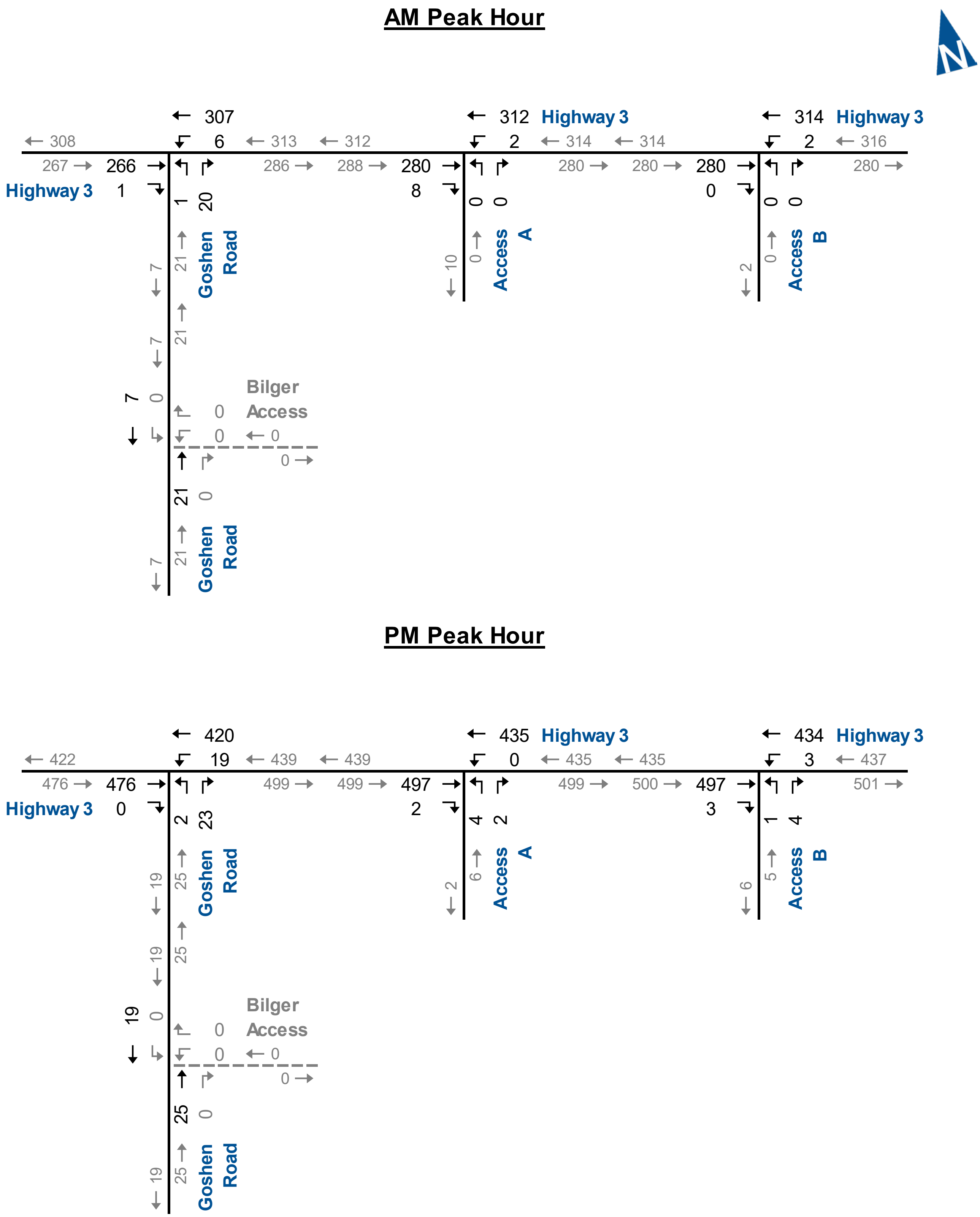
4.5 2029 Total Traffic Operations

Figure 4.4 illustrates the 2029 total traffic volumes, including trips generated by the proposed development.

The 2029 total traffic volumes have been analyzed using the same methodology as under existing and background traffic conditions.

Table 4.4 summarizes the results of the 2029 total traffic operations. The results indicate that the intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours. Both Site Access intersections to Highway 3 are forecast to operate at acceptable levels of service during the AM and PM peak hours.

Appendix G contains the supporting detailed Synchro 11 reports.



2029 Total Traffic Volumes

TABLE 4.4: 2029 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	8		**0**	10		>	**10**					
			V/C		0.00	>		<	0.01			0.03		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					
			Delay		0	>	**0**	<	8		**0**	0		>	**0**					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
	Highway 3 & Access B	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					
			Delay		0	>	**0**	<	8		**0**	0		>	**0**					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	9		**0**	12		>	**12**					
			V/C		0.00	>		<	0.02			0.05		>						
			Q		0	>		<	1			2		>						
	Highway 3 & Access A	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**C**					
			Delay		0	>	**0**	<	0		**0**	16		>	**16**					
			V/C		0.00	>		<	0.00			0.02		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access B	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	8		**0**	13		>	**13**					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.6 2034 Background Traffic Operations

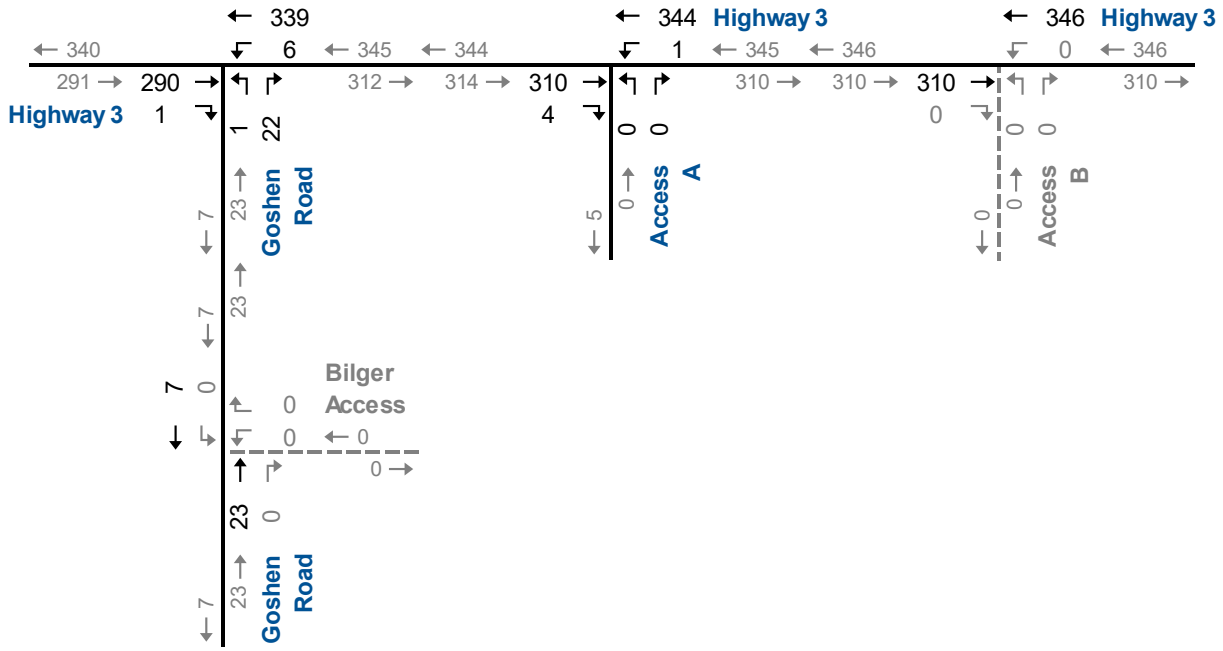
Figure 4.5 illustrates the 2034 background traffic volumes, including road traffic growth.

The 2034 background traffic volumes have been analyzed using the same methodology as under existing traffic conditions.

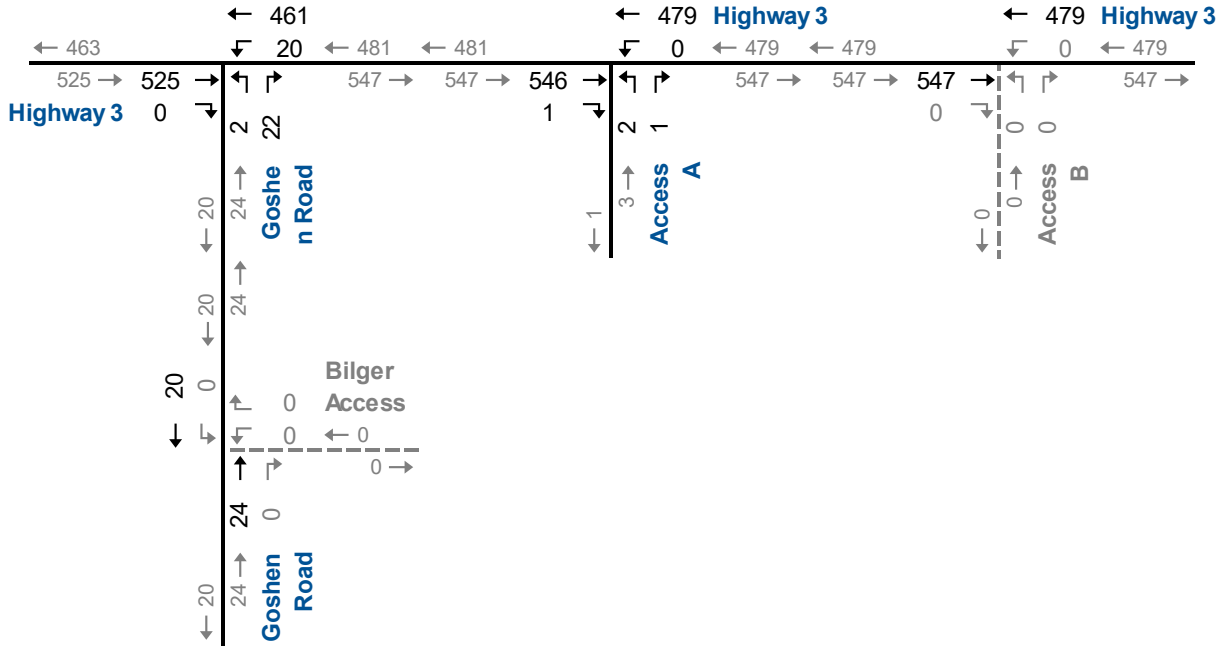
Table 4.5 summarizes the results of the 2034 background traffic operations. The results indicate that the intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are forecast to operate at acceptable levels of service, and with no problem movements.

Appendix H contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2034 Background Traffic Volumes

TABLE 4.5: 2034 BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	8		0	11		>	11					
			V/C		0.00	>		<	0.01			0.04		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	A		>	A					
			Delay		0	>	0	<	8		0	0		>	0					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	A	<	A		A	B		>	B					
			Delay		0	>	0	<	9		0	13		>	13					
			V/C		0.00	>		<	0.03			0.06		>						
			Q		0	>		<	1			2		>						
	Highway 3 & Access A	TWSC	LOS		A	>	A	<	A		A	C		>	C					
			Delay		0	>	0	<	0		0	18		>	18					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
Delay - Average Delay per Vehicle in Seconds
V/C - Volume to Capacity Ratio
Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.7 2034 Total Traffic Operations

Figure 4.6 illustrates the 2034 total traffic volumes, including trips generated by the proposed development.

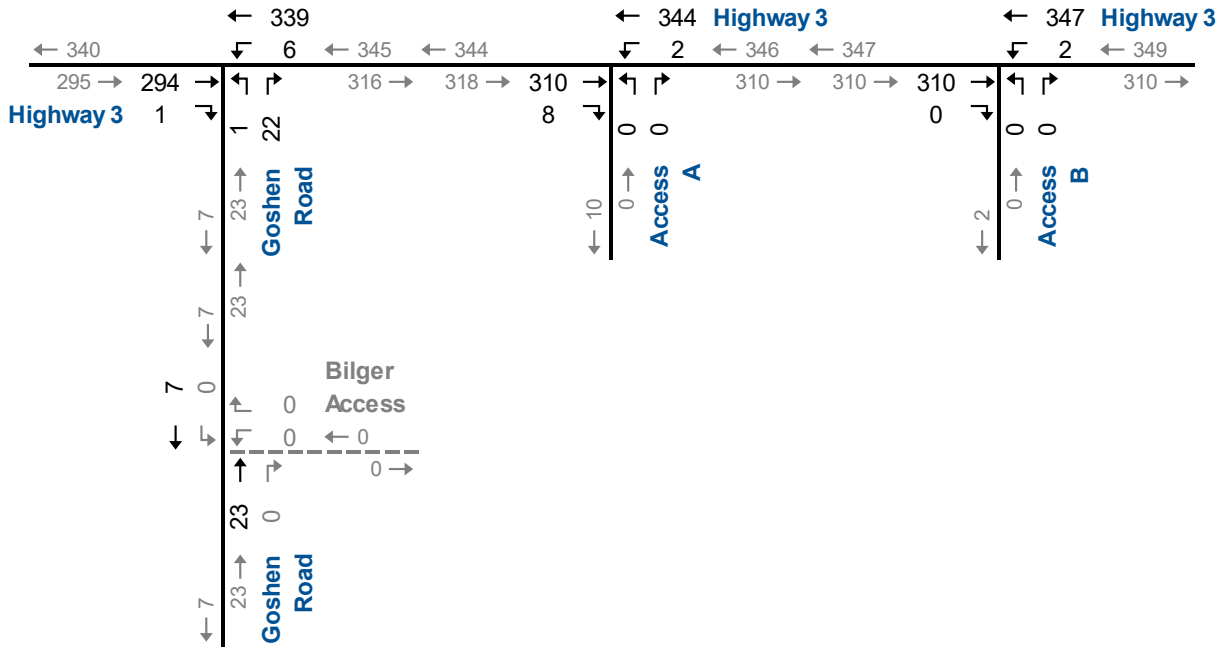
The 2034 total traffic volumes have been analyzed using the same methodology as under existing and background traffic conditions.

As seen in **Figure 4.6**, the study area roadway traffic volumes and turning movements are projected to remain low to moderate in 2034 as they are under existing conditions.

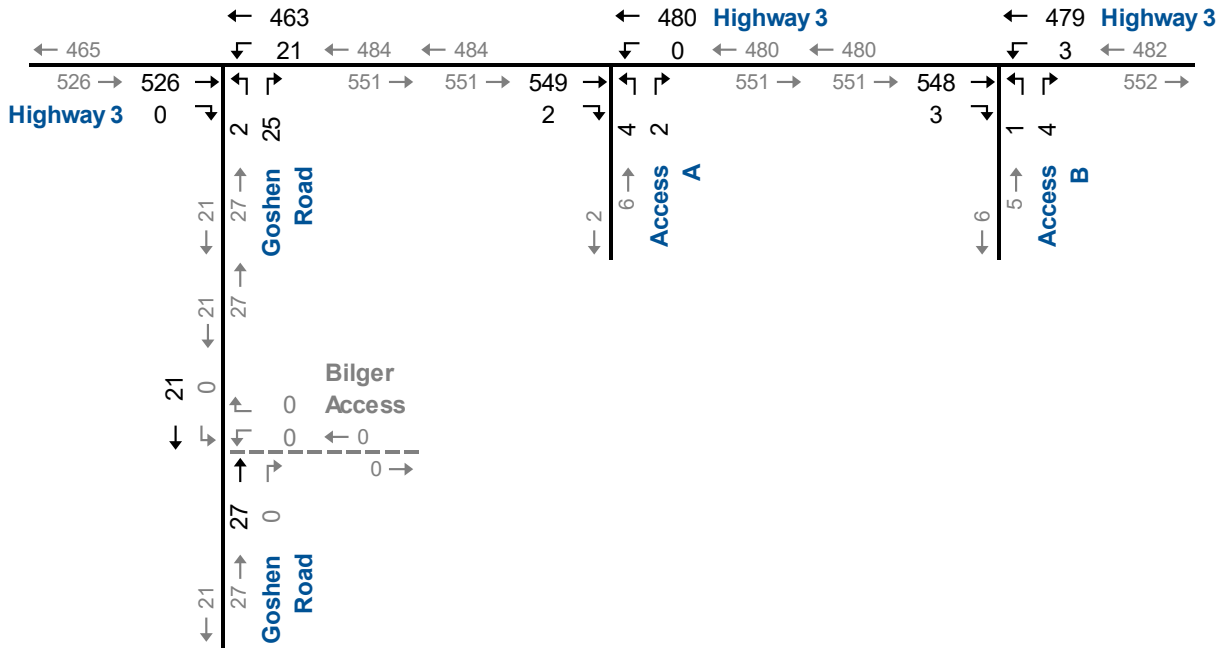
Table 4.6 summarizes the results of the 2034 total traffic operations. The results indicate that the intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours. Both Site Access intersections to Highway 3 are forecast to operate at acceptable levels of service during the AM and PM peak hours.

Appendix I contains the supporting detailed Synchro 11 reports.

AM Peak Hour



PM Peak Hour



2034 Total Traffic Volumes

494 Highway 3, Courtland TIS
230661

Figure 4.6

TABLE 4.6: 2034 TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	8		**0**	11		>	**11**					
			V/C		0.00	>		<	0.01			0.04		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access A	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					
			Delay		0	>	**0**	<	8		**0**	0		>	**0**					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
	Highway 3 & Access B	TWSC	LOS		A	>	**A**	<	A		**A**	A		>	**A**					
			Delay		0	>	**0**	<	8		**0**	0		>	**0**					
			V/C		0.00	>		<	0.00			0.00		>						
			Q		0	>		<	0			0		>						
PM Peak Hour	Highway 3 & Goshen Road	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	9		**0**	13		>	**13**					
			V/C		0.00	>		<	0.03			0.06		>						
			Q		0	>		<	1			2		>						
	Highway 3 & Access A	TWSC	LOS		A	>	**A**	<	A		**A**	C		>	**C**					
			Delay		0	>	**0**	<	0		**0**	18		>	**18**					
			V/C		0.00	>		<	0.00			0.02		>						
			Q		0	>		<	0			1		>						
	Highway 3 & Access B	TWSC	LOS		A	>	**A**	<	A		**A**	B		>	**B**					
			Delay		0	>	**0**	<	9		**0**	14		>	**14**					
			V/C		0.00	>		<	0.00			0.01		>						
			Q		0	>		<	0			0		>						

MOE - Measure of Effectiveness
LOS - Level of Service
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Q - 95th Percentile Queue Length (m)
TWSC - Two-Way Stop Control
< / > - Shared with through movement

4.8 Review of Access Locations

The existing access locations for the subject site were reviewed for available sight distances and left-turn lane requirements. The sight distance assessment is based on field inspection and Transportation Association of Canada design standards.

4.8.1 Sight Distance Assessment

Available sight distances for the existing access points were measured during a site visit on 27 November 2023 and are compared with sight distance requirements identified in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[5] (GDGCR).

Stopping and Decision Sight Distance requirements were reviewed for a design speed of 70 km/h corresponding to the posted speed of 60 km/h.

Table 4.7 summarizes the sight distance measurements and requirements at the access intersections, which indicate that the two existing driveway locations on Highway 3 satisfy the TAC requirements for Decision Sight Distances and Stopping Sight Distance.

TABLE 4.7: SIGHT DISTANCE MEASUREMENTS

Intersection	Decision Sight Distance (m)				Stopping Sight Distance (m)	
	Left-Turn		Right-Turn			
	Required	Measured	Required	Measured	Required	Measured
Highway 3 and Access A	210	**250+**	185	**250+**	185	**250+**
Highway 3 and Access B		**250+**		**250+**		**250+**

4.8.2 Left-Turn Lanes

The assessment of the need for auxiliary left-turning lanes is based on the requirements and procedures detailed in the Ministry of Transportation Design Supplement for the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads[6].

It is noted that the forecast westbound left-turn movements on Highway 3 at Site Access A and at Site Access B are less than five vph during AM and PM peak hours, which is less than 2.5% of the total

[5] Transportation Association of Canada, Geometric Design Guide for Canadian Roads, June 2017.

[6] *MTO Design Supplement for TAC Geometric Design Guide for Canadian Roads*, June 2017.

westbound traffic volumes. The provision of left-turn lanes on Highway 3 at each of the two driveways is, therefore, identified as not warranted.

It is noted that the need for a westbound left-turn lane on Highway 3 at the intersection of Goshen Road is also identified as not warranted.

5 Conclusions and Recommendations

5.1 Conclusions

Based on the investigations carried out, it is concluded that:

- **Existing Traffic Conditions:** The intersections of (1) Highway 3 and Goshen Road and (2) Highway 3 and the Westerly Access are operating at satisfactory levels of service (LOS A/B).
- **Site Traffic Volumes:** The existing site driveway volumes indicate that 5 AM peak hour trips and 4 PM peak hour generated by the current site operations.

  With the proposed changes, the site traffic volumes are projected to increase to 7 AM peak hour trips and 15 PM peak hour trips.

  Based on the current and future site traffic volumes, the site could be considered to be a low trip generator with minimal impact on driveway and road traffic operations.
- **Background Traffic Conditions:** The two intersections are forecast to operate at acceptable levels of service under 2024, 2029, and 2034 background traffic conditions.
- **Total Traffic Conditions:** The intersection of Highway 3 and Goshen Road is forecast to operate at satisfactory levels of service (LOS A/B) during the AM and PM peak hours under 2024, 2029, and 2034 total traffic conditions, as under existing conditions.
- **Site Accesses:** The Westerly and Easterly Site Access intersections on Highway 3 are forecast to operate at acceptable levels of service under 2024, 2029, and 2034 total traffic conditions.

  Both access locations satisfy the sight distance requirements, and do not require an auxiliary westbound left-turn lane on Highway 3 to accommodate inbound left-turning traffic.

5.2 Recommendations

Based on the findings and conclusions of this study, it is recommended that the Site Changes with two driveways for the property at 494 Highway 3, Courtland be considered for approval as proposed.

Appendix A

Pre-Study Consultation

From:	Patrick Neal
To:	"Mentley, Ryan (MTO)"; Stephen Gradish
Cc:	Rajan Philips
Subject:	(230661) 494 Highway 3, Courtland TIS - Pre-Study Consultation
Date:	November 2, 2023 4:04:00 PM
Attachments:	(230661) Site Location.png image001.png image002.png 23044_Preliminary Grading Plan.pdf

---

Hi Ryan and Stephen,

We have been retained to complete the Transportation Impact Study (TIS) in support of a Site Plan application for a Truck Yard and Warehouse expansion located at 494 Highway 3 in Courtland, Norfolk County.

The subject property is located on the south side of Highway 3, east of Goshen Road. The property is owned by Bilger Slinger Services and is currently rented to Blue West Equipment for a storage and sales facility for farm, residential and commercial equipment.

The proposed changes to the site are to accommodate the relocation of Bilger Slinger Services from their current location at 480 Highway 3 to the property at 494 Highway 3, and share its use with Blue West Equipment.

Specifically, the changes will include the development of a truck yard for Bilger Slinger Services and the replacement of an existing warehouse with a GFA of 456 sq. m. with a larger warehouse of 1161 sq. m. GFA.

The site operations for Bilger Slinger Services will include:

- 18 employees.
- Storing and servicing 18 slinger trucks with a possible ten-year expansion to 24 trucks.
- Main deliveries twice a month to the site.

The site operations for Blue West Equipment will include:

- Six to eight employees.
- 12 customers per day.
- Main deliveries twice a week to the site.

A Google Map showing the two properties and a preliminary grading plan for 494 Highway 3 are attached.

The property has two driveways on Highway 3 approximately 76 metres apart. Both driveways are proposed to be retained as part of redevelopment, and both are needed to serve the two businesses that will be located on the subject site. It is noted that the proposed site changes will not add new traffic to Highway 3, because traffic from the business at 480 Highway 3 is already included in the existing traffic volumes. The relocation will only shift a portion of the turning movements from the intersection at Goshen Road to the driveways at 494 Highway 3.

Based on the above information, we have prepared the following scope of work for

review/approval:

- Weekday AM and PM peak hours of analysis.
- Study Area Intersections:
  - Highway 3 and Goshen Road (unsignalized); and
  - two access intersections on Highway 3.
- Horizon Years (as required by MTO): (1) development completion, (2) five years after completion, and (3) ten years after completion.
- Background Growth: 2.0% compounded per annum, **please confirm**.
- Background Developments: **Please confirm** and provide corresponding site statistics or TIS.
- Roadway Improvements: **Please confirm any planned changes to the study area roadways.**
- Trip Generation: ITE Trip Generation Manual 11th Edition.
- Trip Distribution: Existing traffic patterns.

Please let us know if you have any questions or comments.

Regards,

Patrick Neal, EIT
Transportation Consultant

Paradigm Transportation Solutions Limited
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Appendix B

Existing Traffic Data

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Data

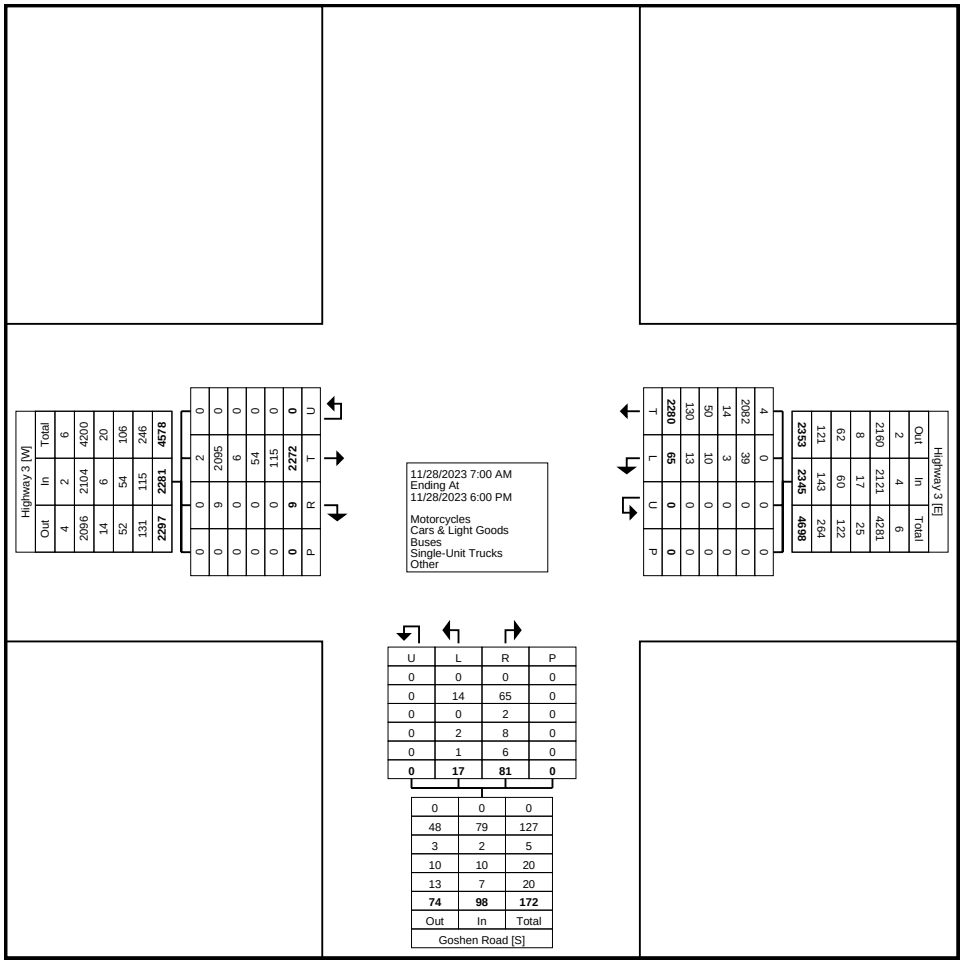
Start Time	Highway 3 Eastbound					Highway 3 Westbound					Goshen Road Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	52	2	0	0	54	2	51	0	0	53	1	1	0	0	2	109
7:15 AM	66	1	0	0	67	1	56	0	0	57	0	4	0	0	4	128
7:30 AM	48	0	0	0	48	3	67	0	0	70	2	2	0	0	4	122
7:45 AM	61	0	0	0	61	1	71	0	0	72	0	8	0	0	8	141
Hourly Total	227	3	0	0	230	7	245	0	0	252	3	15	0	0	18	500
8:00 AM	63	1	0	0	64	1	66	0	0	67	1	1	0	0	2	133
8:15 AM	56	0	0	0	56	0	61	0	0	61	0	1	0	0	1	118
8:30 AM	53	0	0	0	53	3	75	0	0	78	0	8	0	0	8	139
8:45 AM	47	1	0	0	48	2	74	0	0	76	0	4	0	0	4	128
Hourly Total	219	2	0	0	221	6	276	0	0	282	1	14	0	0	15	518
9:00 AM	45	0	0	0	45	0	56	0	0	56	0	3	0	0	3	104
9:15 AM	46	0	0	0	46	1	64	0	0	65	0	0	0	0	0	111
9:30 AM	48	0	0	0	48	2	72	0	0	74	0	3	0	0	3	125
9:45 AM	42	2	0	0	44	3	61	0	0	64	0	1	0	0	1	109
Hourly Total	181	2	0	0	183	6	253	0	0	259	0	7	0	0	7	449
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	66	0	0	0	66	1	66	0	0	67	0	0	0	0	0	133
11:45 AM	82	0	0	0	82	2	58	0	0	60	0	4	0	0	4	146
Hourly Total	148	0	0	0	148	3	124	0	0	127	0	4	0	0	4	279
12:00 PM	63	0	0	0	63	3	74	0	0	77	1	2	0	0	3	143
12:15 PM	89	0	0	0	89	3	64	0	0	67	1	3	0	0	4	160
12:30 PM	68	0	0	0	68	4	65	0	0	69	1	3	0	0	4	141
12:45 PM	62	0	0	0	62	3	65	0	0	68	0	0	0	0	0	130
Hourly Total	282	0	0	0	282	13	268	0	0	281	3	8	0	0	11	574
1:00 PM	78	0	0	0	78	0	74	0	0	74	2	1	0	0	3	155
1:15 PM	57	0	0	0	57	1	69	0	0	70	2	1	0	0	3	130
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	135	0	0	0	135	1	143	0	0	144	4	2	0	0	6	285
3:00 PM	99	0	0	0	99	2	70	0	0	72	0	2	0	0	2	173
3:15 PM	62	0	0	0	62	0	82	0	0	82	0	2	0	0	2	146
3:30 PM	97	0	0	0	97	1	82	0	0	83	0	0	0	0	0	180
3:45 PM	96	0	0	0	96	3	90	0	0	93	1	1	0	0	2	191
Hourly Total	354	0	0	0	354	6	324	0	0	330	1	5	0	0	6	690
4:00 PM	113	0	0	0	113	5	102	0	0	107	1	1	0	0	2	222
4:15 PM	110	0	0	0	110	4	77	0	0	81	0	5	0	0	5	196
4:30 PM	103	0	0	0	103	4	102	0	0	106	0	11	0	0	11	220

4:45 PM	86	0	0	0	86	4	88	0	0	92	1	5	0	0	6	184
Hourly Total	412	0	0	0	412	17	369	0	0	386	2	22	0	0	24	822
5:00 PM	96	0	0	0	96	1	86	0	0	87	2	0	0	0	2	185
5:15 PM	88	0	0	0	88	0	58	0	0	58	1	1	0	0	2	148
5:30 PM	76	1	0	0	77	2	75	0	0	77	0	0	0	0	0	154
5:45 PM	54	1	0	0	55	3	59	0	0	62	0	3	0	0	3	120
Hourly Total	314	2	0	0	316	6	278	0	0	284	3	4	0	0	7	607
Grand Total	2272	9	0	0	2281	65	2280	0	0	2345	17	81	0	0	98	4724
Approach %	99.6	0.4	0.0	-	-	2.8	97.2	0.0	-	-	17.3	82.7	0.0	-	-	-
Total %	48.1	0.2	0.0	-	48.3	1.4	48.3	0.0	-	49.6	0.4	1.7	0.0	-	2.1	-
Motorcycles	2	0	0	-	2	0	4	0	-	4	0	0	0	-	0	6
% Motorcycles	0.1	0.0	-	-	0.1	0.0	0.2	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	2095	9	0	-	2104	39	2082	0	-	2121	14	65	0	-	79	4304
% Cars & Light Goods	92.2	100.0	-	-	92.2	60.0	91.3	-	-	90.4	82.4	80.2	-	-	80.6	91.1
Buses	6	0	0	-	6	3	14	0	-	17	0	2	0	-	2	25
% Buses	0.3	0.0	-	-	0.3	4.6	0.6	-	-	0.7	0.0	2.5	-	-	2.0	0.5
Single-Unit Trucks	54	0	0	-	54	10	50	0	-	60	2	8	0	-	10	124
% Single-Unit Trucks	2.4	0.0	-	-	2.4	15.4	2.2	-	-	2.6	11.8	9.9	-	-	10.2	2.6
Articulated Trucks	114	0	0	-	114	13	130	0	-	143	1	6	0	-	7	264
% Articulated Trucks	5.0	0.0	-	-	5.0	20.0	5.7	-	-	6.1	5.9	7.4	-	-	7.1	5.6
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Goshen Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	61	0	0	0	61	1	71	0	0	72	0	8	0	0	8	141
8:00 AM	63	1	0	0	64	1	66	0	0	67	1	1	0	0	2	133
8:15 AM	56	0	0	0	56	0	61	0	0	61	0	1	0	0	1	118
8:30 AM	53	0	0	0	53	3	75	0	0	78	0	8	0	0	8	139
Total	233	1	0	0	234	5	273	0	0	278	1	18	0	0	19	531
Approach %	99.6	0.4	0.0	-	-	1.8	98.2	0.0	-	-	5.3	94.7	0.0	-	-	-
Total %	43.9	0.2	0.0	-	44.1	0.9	51.4	0.0	-	52.4	0.2	3.4	0.0	-	3.6	-
PHF	0.925	0.250	0.000	-	0.914	0.417	0.910	0.000	-	0.891	0.250	0.563	0.000	-	0.594	0.941
Motorcycles	2	0	0	-	2	0	2	0	-	2	0	0	0	-	0	4
% Motorcycles	0.9	0.0	-	-	0.9	0.0	0.7	-	-	0.7	0.0	0.0	-	-	0.0	0.8
Cars & Light Goods	196	1	0	-	197	4	253	0	-	257	1	13	0	-	14	468
% Cars & Light Goods	84.1	100.0	-	-	84.2	80.0	92.7	-	-	92.4	100.0	72.2	-	-	73.7	88.1
Buses	1	0	0	-	1	0	3	0	-	3	0	2	0	-	2	6
% Buses	0.4	0.0	-	-	0.4	0.0	1.1	-	-	1.1	0.0	11.1	-	-	10.5	1.1
Single-Unit Trucks	14	0	0	-	14	1	3	0	-	4	0	2	0	-	2	20
% Single-Unit Trucks	6.0	0.0	-	-	6.0	20.0	1.1	-	-	1.4	0.0	11.1	-	-	10.5	3.8
Articulated Trucks	19	0	0	-	19	0	12	0	-	12	0	1	0	-	1	32
% Articulated Trucks	8.2	0.0	-	-	8.1	0.0	4.4	-	-	4.3	0.0	5.6	-	-	5.3	6.0
Bicycles on Road	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Bicycles on Road	0.4	0.0	-	-	0.4	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
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Cambridge, Ontario, Canada N1R 8J8
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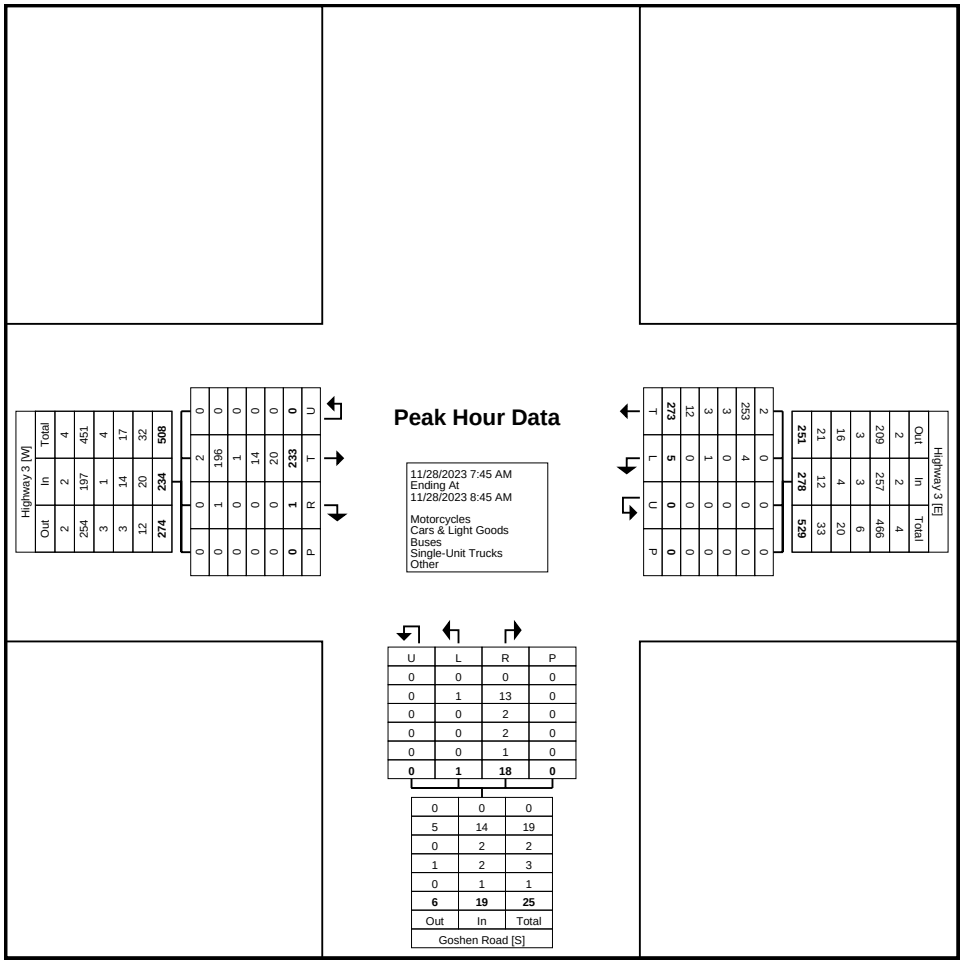
Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023



Highway 3 [W]								
	Total	4	451	4	17	32	**508**
	In	2	197	1	14	20	**234**
	Out	2	254	3	3	12	**274**

U	T	R	P
0	0	0	0
2	196	1	14	20	**233**
0	1	0	0	0	**1**
0	0	0	0	0	**0**

T	L	U	P
273	**5**	**0**	**0**
12	0	0	0
3	1	0	0
3	0	0	0
253	4	0	0
2	0	0	0

Highway 3 [E]			
Out	In	Total	
2	2	4	
209	257	466	
3	3	6	
16	4	20	
21	12	33	
251	**278**	**529**	

U	L	R	P
0	0	0	0
0	1	13	0
0	0	2	0
0	0	2	0
0	0	1	0
0	**1**	**18**	**0**

0	0	0
5	14	19
0	2	2
1	2	3
0	1	1
6	**19**	**25**
Out	In	Total
Goshen Road [S]		

Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Peak Hour Data (11:45 AM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Goshen Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:45 AM	82	0	0	0	82	2	58	0	0	60	0	4	0	0	4	146
12:00 PM	63	0	0	0	63	3	74	0	0	77	1	2	0	0	3	143
12:15 PM	89	0	0	0	89	3	64	0	0	67	1	3	0	0	4	160
12:30 PM	68	0	0	0	68	4	65	0	0	69	1	3	0	0	4	141
Total	302	0	0	0	302	12	261	0	0	273	3	12	0	0	15	590
Approach %	100.0	0.0	0.0	-	-	4.4	95.6	0.0	-	-	20.0	80.0	0.0	-	-	-
Total %	51.2	0.0	0.0	-	51.2	2.0	44.2	0.0	-	46.3	0.5	2.0	0.0	-	2.5	-
PHF	0.848	0.000	0.000	-	0.848	0.750	0.882	0.000	-	0.886	0.750	0.750	0.000	-	0.938	0.922
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	284	0	0	-	284	6	231	0	-	237	2	8	0	-	10	531
% Cars & Light Goods	94.0	-	-	-	94.0	50.0	88.5	-	-	86.8	66.7	66.7	-	-	66.7	90.0
Buses	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Buses	0.0	-	-	-	0.0	0.0	0.8	-	-	0.7	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	5	0	0	-	5	1	5	0	-	6	1	1	0	-	2	13
% Single-Unit Trucks	1.7	-	-	-	1.7	8.3	1.9	-	-	2.2	33.3	8.3	-	-	13.3	2.2
Articulated Trucks	13	0	0	-	13	5	23	0	-	28	0	3	0	-	3	44
% Articulated Trucks	4.3	-	-	-	4.3	41.7	8.8	-	-	10.3	0.0	25.0	-	-	20.0	7.5
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
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Count Name: Highway 3 & Goshen Road
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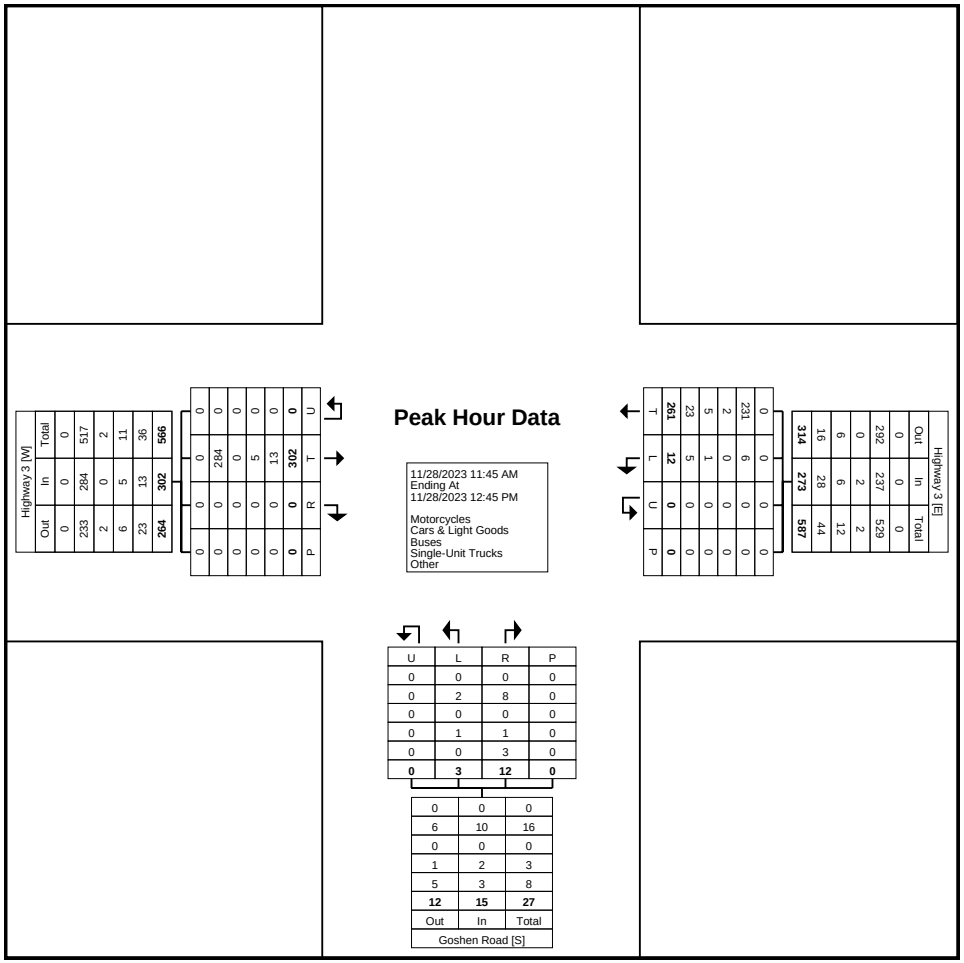
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023

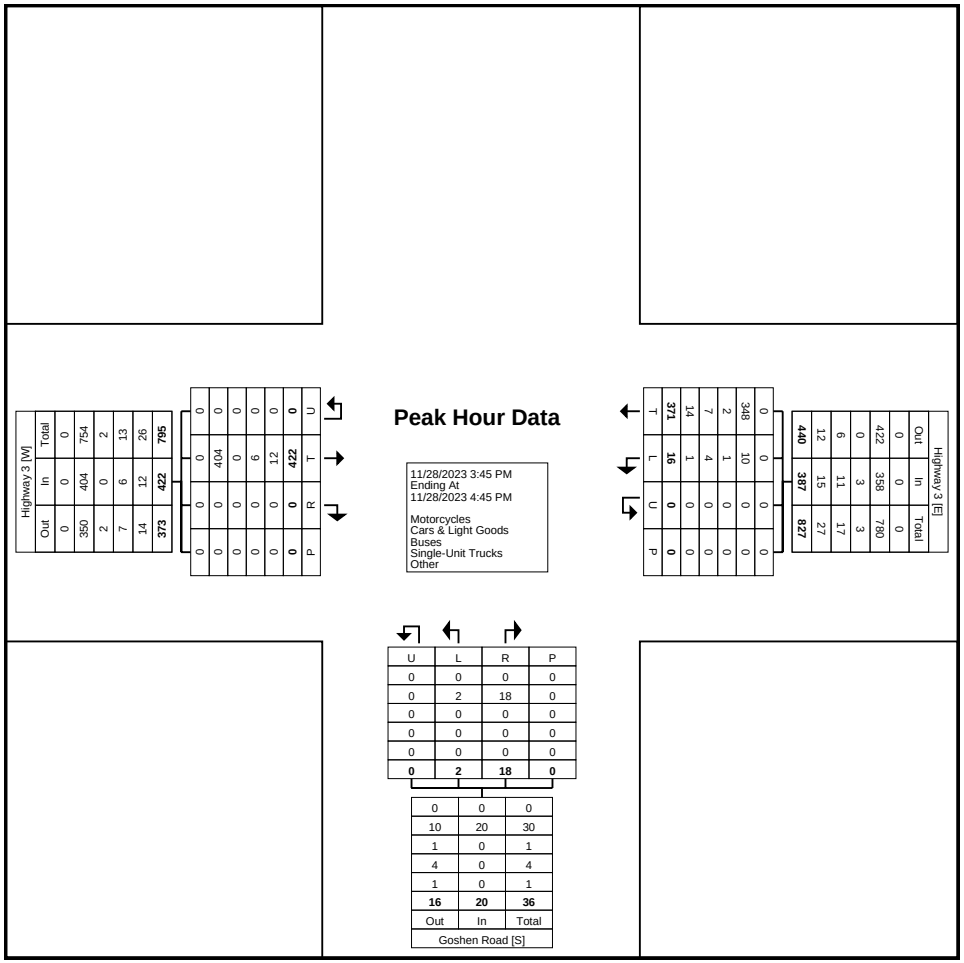
Turning Movement Peak Hour Data (3:45 PM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Goshen Road Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
3:45 PM	96	0	0	0	96	3	90	0	0	93	1	1	0	0	2	191
4:00 PM	113	0	0	0	113	5	102	0	0	107	1	1	0	0	2	222
4:15 PM	110	0	0	0	110	4	77	0	0	81	0	5	0	0	5	196
4:30 PM	103	0	0	0	103	4	102	0	0	106	0	11	0	0	11	220
Total	422	0	0	0	422	16	371	0	0	387	2	18	0	0	20	829
Approach %	100.0	0.0	0.0	-	-	4.1	95.9	0.0	-	-	10.0	90.0	0.0	-	-	-
Total %	50.9	0.0	0.0	-	50.9	1.9	44.8	0.0	-	46.7	0.2	2.2	0.0	-	2.4	-
PHF	0.934	0.000	0.000	-	0.934	0.800	0.909	0.000	-	0.904	0.500	0.409	0.000	-	0.455	0.934
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	404	0	0	-	404	10	348	0	-	358	2	18	0	-	20	782
% Cars & Light Goods	95.7	-	-	-	95.7	62.5	93.8	-	-	92.5	100.0	100.0	-	-	100.0	94.3
Buses	0	0	0	-	0	1	2	0	-	3	0	0	0	-	0	3
% Buses	0.0	-	-	-	0.0	6.3	0.5	-	-	0.8	0.0	0.0	-	-	0.0	0.4
Single-Unit Trucks	6	0	0	-	6	4	7	0	-	11	0	0	0	-	0	17
% Single-Unit Trucks	1.4	-	-	-	1.4	25.0	1.9	-	-	2.8	0.0	0.0	-	-	0.0	2.1
Articulated Trucks	12	0	0	-	12	1	14	0	-	15	0	0	0	-	0	27
% Articulated Trucks	2.8	-	-	-	2.8	6.3	3.8	-	-	3.9	0.0	0.0	-	-	0.0	3.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Highway 3 & Goshen Road
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (3:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Data

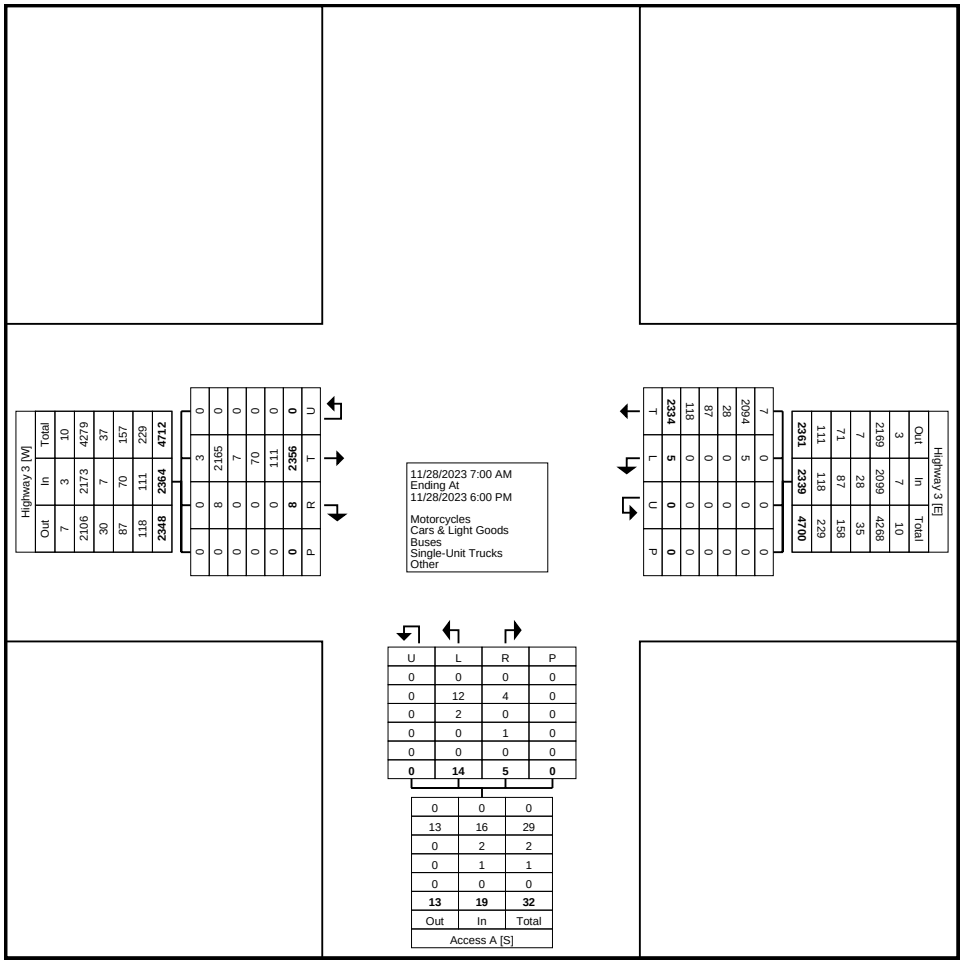
Start Time	Highway 3 Eastbound					Highway 3 Westbound					Access A Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
7:00 AM	53	0	0	0	53	0	53	0	0	53	0	0	0	0	0	106
7:15 AM	72	0	0	0	72	0	62	0	0	62	0	0	0	0	0	134
7:30 AM	51	0	0	0	51	1	68	0	0	69	0	0	0	0	0	120
7:45 AM	66	3	0	0	69	1	74	0	0	75	0	0	0	0	0	144
Hourly Total	242	3	0	0	245	2	257	0	0	259	0	0	0	0	0	504
8:00 AM	65	0	0	0	65	0	65	0	0	65	0	0	0	0	0	130
8:15 AM	57	0	0	0	57	0	58	0	0	58	0	0	0	0	0	115
8:30 AM	61	1	0	0	62	0	80	0	0	80	0	0	0	0	0	142
8:45 AM	51	0	0	0	51	0	65	0	0	65	0	0	0	0	0	116
Hourly Total	234	1	0	0	235	0	268	0	0	268	0	0	0	0	0	503
9:00 AM	46	1	0	0	47	0	55	0	0	55	1	0	0	0	1	103
9:15 AM	46	0	0	0	46	0	66	0	0	66	1	0	0	0	1	113
9:30 AM	50	0	0	0	50	0	73	0	0	73	0	0	0	0	0	123
9:45 AM	42	0	0	0	42	0	69	0	0	69	0	0	0	0	0	111
Hourly Total	184	1	0	0	185	0	263	0	0	263	2	0	0	0	2	450
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	67	0	0	0	67	0	67	0	0	67	0	0	0	0	0	134
11:45 AM	81	0	0	0	81	0	62	0	0	62	0	0	0	0	0	143
Hourly Total	148	0	0	0	148	0	129	0	0	129	0	0	0	0	0	277
12:00 PM	67	0	0	0	67	1	75	0	0	76	0	0	0	0	0	143
12:15 PM	91	0	0	0	91	0	64	0	0	64	2	1	0	0	3	158
12:30 PM	71	0	0	0	71	1	67	0	0	68	0	0	0	0	0	139
12:45 PM	62	0	0	0	62	0	68	0	0	68	0	0	0	0	0	130
Hourly Total	291	0	0	0	291	2	274	0	0	276	2	1	0	0	3	570
1:00 PM	79	0	0	0	79	1	74	0	0	75	0	0	0	0	0	154
1:15 PM	57	1	0	0	58	0	72	0	0	72	0	1	0	0	1	131
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	136	1	0	0	137	1	146	0	0	147	0	1	0	0	1	285
3:00 PM	101	0	0	0	101	0	70	0	0	70	2	1	0	0	3	174
3:15 PM	72	0	0	0	72	0	82	0	0	82	0	0	0	0	0	154
3:30 PM	97	1	0	0	98	0	82	0	0	82	1	0	0	0	1	181
3:45 PM	100	0	0	0	100	0	91	0	0	91	1	0	0	0	1	192
Hourly Total	370	1	0	0	371	0	325	0	0	325	4	1	0	0	5	701
4:00 PM	114	0	0	0	114	0	109	0	0	109	1	1	0	0	2	225
4:15 PM	116	1	0	0	117	0	81	0	0	81	0	0	0	0	0	198
4:30 PM	109	0	0	0	109	0	104	0	0	104	0	0	0	0	0	213

4:45 PM	93	0	0	0	93	0	88	0	0	88	5	1	0	0	6	187
Hourly Total	432	1	0	0	433	0	382	0	0	382	6	2	0	0	8	823
5:00 PM	94	0	0	0	94	0	88	0	0	88	0	0	0	0	0	182
5:15 PM	92	0	0	0	92	0	61	0	0	61	0	0	0	0	0	153
5:30 PM	77	0	0	0	77	0	78	0	0	78	0	0	0	0	0	155
5:45 PM	56	0	0	0	56	0	63	0	0	63	0	0	0	0	0	119
Hourly Total	319	0	0	0	319	0	290	0	0	290	0	0	0	0	0	609
Grand Total	2356	8	0	0	2364	5	2334	0	0	2339	14	5	0	0	19	4722
Approach %	99.7	0.3	0.0	-	-	0.2	99.8	0.0	-	-	73.7	26.3	0.0	-	-	-
Total %	49.9	0.2	0.0	-	50.1	0.1	49.4	0.0	-	49.5	0.3	0.1	0.0	-	0.4	-
Motorcycles	3	0	0	-	3	0	7	0	-	7	0	0	0	-	0	10
% Motorcycles	0.1	0.0	-	-	0.1	0.0	0.3	-	-	0.3	0.0	0.0	-	-	0.0	0.2
Cars & Light Goods	2165	8	0	-	2173	5	2094	0	-	2099	12	4	0	-	16	4288
% Cars & Light Goods	91.9	100.0	-	-	91.9	100.0	89.7	-	-	89.7	85.7	80.0	-	-	84.2	90.8
Buses	7	0	0	-	7	0	28	0	-	28	2	0	0	-	2	37
% Buses	0.3	0.0	-	-	0.3	0.0	1.2	-	-	1.2	14.3	0.0	-	-	10.5	0.8
Single-Unit Trucks	70	0	0	-	70	0	87	0	-	87	0	1	0	-	1	158
% Single-Unit Trucks	3.0	0.0	-	-	3.0	0.0	3.7	-	-	3.7	0.0	20.0	-	-	5.3	3.3
Articulated Trucks	111	0	0	-	111	0	116	0	-	116	0	0	0	-	0	227
% Articulated Trucks	4.7	0.0	-	-	4.7	0.0	5.0	-	-	5.0	0.0	0.0	-	-	0.0	4.8
Bicycles on Road	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023

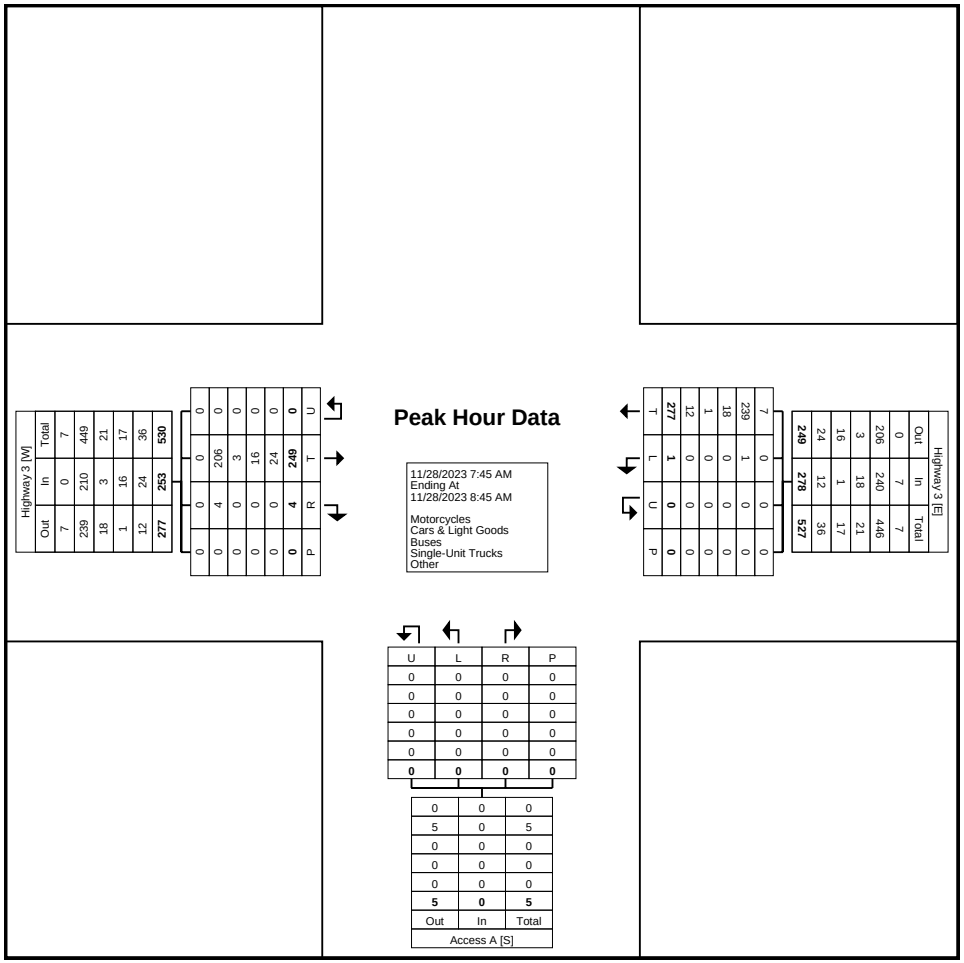
Turning Movement Peak Hour Data (7:45 AM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Access A Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
7:45 AM	66	3	0	0	69	1	74	0	0	75	0	0	0	0	0	144
8:00 AM	65	0	0	0	65	0	65	0	0	65	0	0	0	0	0	130
8:15 AM	57	0	0	0	57	0	58	0	0	58	0	0	0	0	0	115
8:30 AM	61	1	0	0	62	0	80	0	0	80	0	0	0	0	0	142
Total	249	4	0	0	253	1	277	0	0	278	0	0	0	0	0	531
Approach %	98.4	1.6	0.0	-	-	0.4	99.6	0.0	-	-	0.0	0.0	0.0	-	-	-
Total %	46.9	0.8	0.0	-	47.6	0.2	52.2	0.0	-	52.4	0.0	0.0	0.0	-	0.0	-
PHF	0.943	0.333	0.000	-	0.917	0.250	0.866	0.000	-	0.869	0.000	0.000	0.000	-	0.000	0.922
Motorcycles	0	0	0	-	0	0	7	0	-	7	0	0	0	-	0	7
% Motorcycles	0.0	0.0	-	-	0.0	0.0	2.5	-	-	2.5	-	-	-	-	-	1.3
Cars & Light Goods	206	4	0	-	210	1	239	0	-	240	0	0	0	-	0	450
% Cars & Light Goods	82.7	100.0	-	-	83.0	100.0	86.3	-	-	86.3	-	-	-	-	-	84.7
Buses	3	0	0	-	3	0	18	0	-	18	0	0	0	-	0	21
% Buses	1.2	0.0	-	-	1.2	0.0	6.5	-	-	6.5	-	-	-	-	-	4.0
Single-Unit Trucks	16	0	0	-	16	0	1	0	-	1	0	0	0	-	0	17
% Single-Unit Trucks	6.4	0.0	-	-	6.3	0.0	0.4	-	-	0.4	-	-	-	-	-	3.2
Articulated Trucks	24	0	0	-	24	0	12	0	-	12	0	0	0	-	0	36
% Articulated Trucks	9.6	0.0	-	-	9.5	0.0	4.3	-	-	4.3	-	-	-	-	-	6.8
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	-	-	-	-	-	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (7:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Peak Hour Data (11:45 AM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Access A Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
11:45 AM	81	0	0	0	81	0	62	0	0	62	0	0	0	0	0	143
12:00 PM	67	0	0	0	67	1	75	0	0	76	0	0	0	0	0	143
12:15 PM	91	0	0	0	91	0	64	0	0	64	2	1	0	0	3	158
12:30 PM	71	0	0	0	71	1	67	0	0	68	0	0	0	0	0	139
Total	310	0	0	0	310	2	268	0	0	270	2	1	0	0	3	583
Approach %	100.0	0.0	0.0	-	-	0.7	99.3	0.0	-	-	66.7	33.3	0.0	-	-	-
Total %	53.2	0.0	0.0	-	53.2	0.3	46.0	0.0	-	46.3	0.3	0.2	0.0	-	0.5	-
PHF	0.852	0.000	0.000	-	0.852	0.500	0.893	0.000	-	0.888	0.250	0.250	0.000	-	0.250	0.922
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	286	0	0	-	286	2	234	0	-	236	2	1	0	-	3	525
% Cars & Light Goods	92.3	-	-	-	92.3	100.0	87.3	-	-	87.4	100.0	100.0	-	-	100.0	90.1
Buses	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Buses	0.0	-	-	-	0.0	0.0	0.4	-	-	0.4	0.0	0.0	-	-	0.0	0.2
Single-Unit Trucks	13	0	0	-	13	0	21	0	-	21	0	0	0	-	0	34
% Single-Unit Trucks	4.2	-	-	-	4.2	0.0	7.8	-	-	7.8	0.0	0.0	-	-	0.0	5.8
Articulated Trucks	11	0	0	-	11	0	12	0	-	12	0	0	0	-	0	23
% Articulated Trucks	3.5	-	-	-	3.5	0.0	4.5	-	-	4.4	0.0	0.0	-	-	0.0	3.9
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Count Name: Access A
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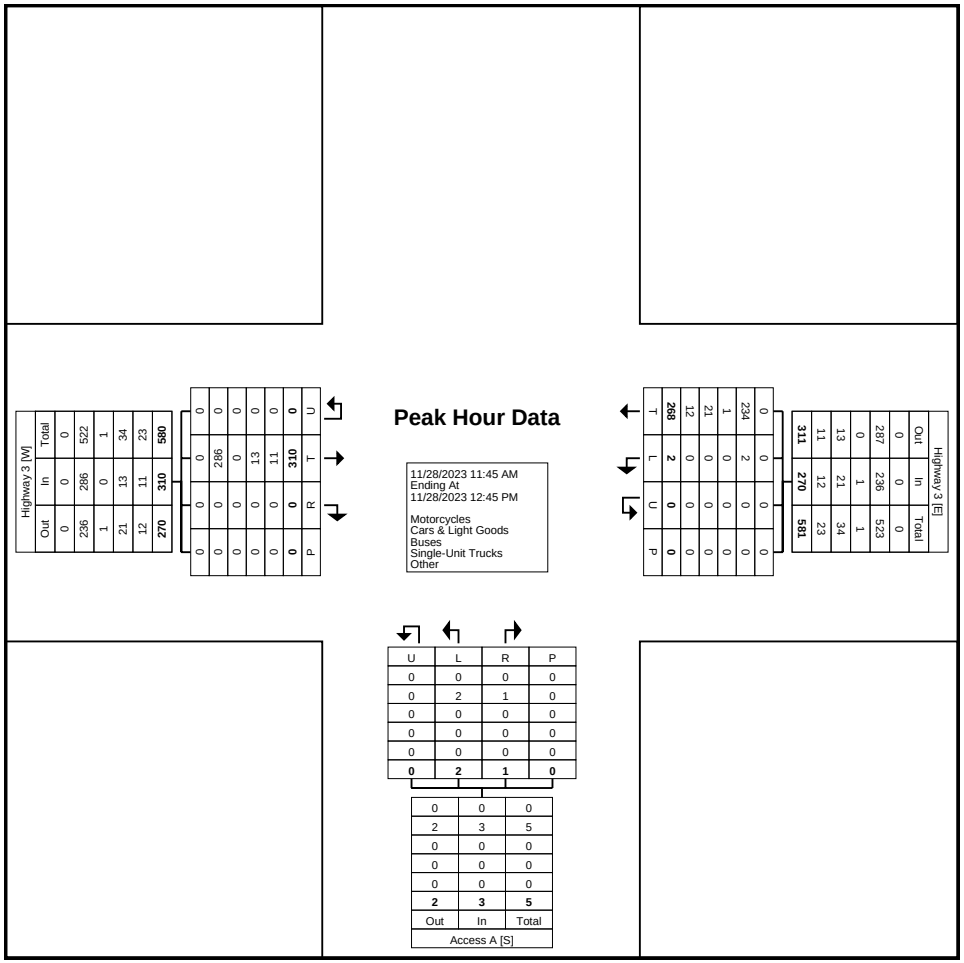
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023

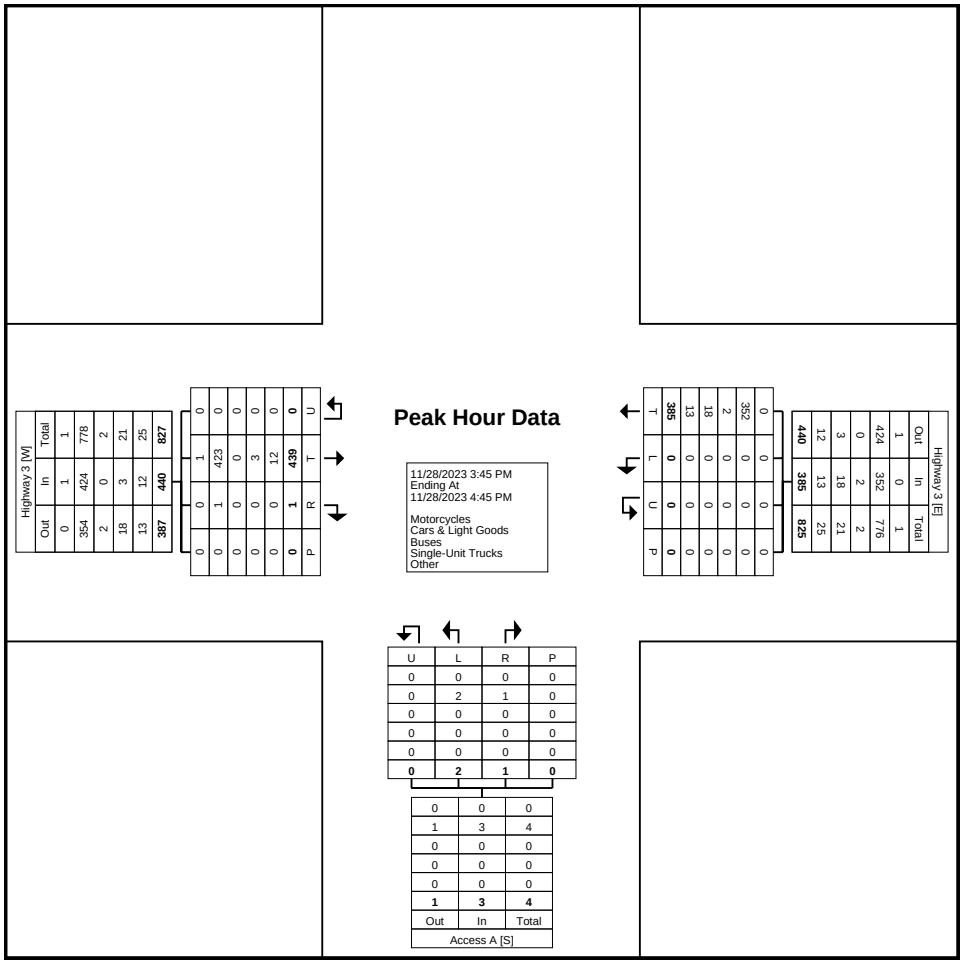
Turning Movement Peak Hour Data (3:45 PM)

Start Time	Highway 3 Eastbound					Highway 3 Westbound					Access A Northbound					
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	Int. Total
3:45 PM	100	0	0	0	100	0	91	0	0	91	1	0	0	0	1	192
4:00 PM	114	0	0	0	114	0	109	0	0	109	1	1	0	0	2	225
4:15 PM	116	1	0	0	117	0	81	0	0	81	0	0	0	0	0	198
4:30 PM	109	0	0	0	109	0	104	0	0	104	0	0	0	0	0	213
Total	439	1	0	0	440	0	385	0	0	385	2	1	0	0	3	828
Approach %	99.8	0.2	0.0	-	-	0.0	100.0	0.0	-	-	66.7	33.3	0.0	-	-	-
Total %	53.0	0.1	0.0	-	53.1	0.0	46.5	0.0	-	46.5	0.2	0.1	0.0	-	0.4	-
PHF	0.946	0.250	0.000	-	0.940	0.000	0.883	0.000	-	0.883	0.500	0.250	0.000	-	0.375	0.920
Motorcycles	1	0	0	-	1	0	0	0	-	0	0	0	0	-	0	1
% Motorcycles	0.2	0.0	-	-	0.2	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1
Cars & Light Goods	423	1	0	-	424	0	352	0	-	352	2	1	0	-	3	779
% Cars & Light Goods	96.4	100.0	-	-	96.4	-	91.4	-	-	91.4	100.0	100.0	-	-	100.0	94.1
Buses	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Buses	0.0	0.0	-	-	0.0	-	0.5	-	-	0.5	0.0	0.0	-	-	0.0	0.2
Single-Unit Trucks	3	0	0	-	3	0	18	0	-	18	0	0	0	-	0	21
% Single-Unit Trucks	0.7	0.0	-	-	0.7	-	4.7	-	-	4.7	0.0	0.0	-	-	0.0	2.5
Articulated Trucks	12	0	0	-	12	0	13	0	-	13	0	0	0	-	0	25
% Articulated Trucks	2.7	0.0	-	-	2.7	-	3.4	-	-	3.4	0.0	0.0	-	-	0.0	3.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Access A
Site Code: 230661
Start Date: 11/28/2023



Turning Movement Peak Hour Data Plot (3:45 PM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023

Turning Movement Data

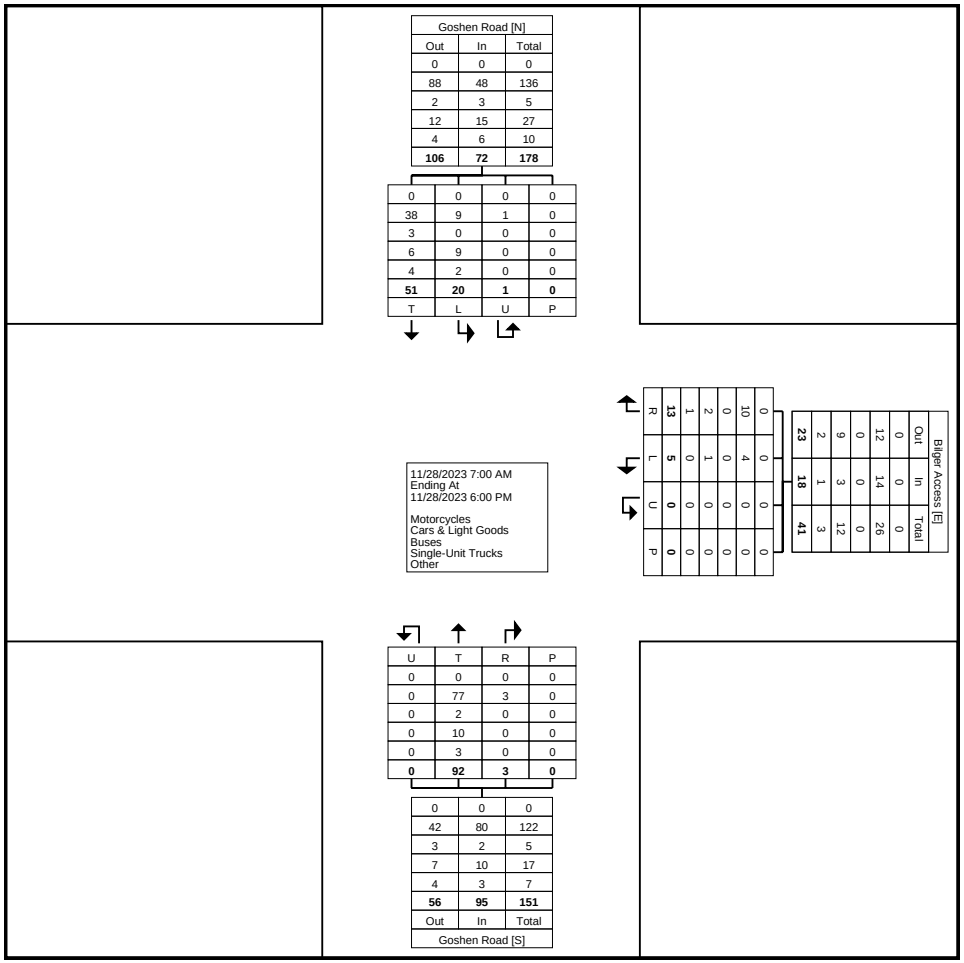
Start Time	Bilger Access Westbound					Goshen Road Northbound					Goshen Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	2	0	0	0	2	1	3	0	0	4	6
7:15 AM	0	0	0	0	0	4	0	0	0	4	1	1	0	0	2	6
7:30 AM	0	0	0	0	0	4	0	0	0	4	0	3	0	0	3	7
7:45 AM	0	0	0	0	0	7	0	0	0	7	0	1	0	0	1	8
Hourly Total	0	0	0	0	0	17	0	0	0	17	2	8	0	0	10	27
8:00 AM	0	0	0	0	0	1	0	0	0	1	0	1	1	0	2	3
8:15 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	7	0	0	0	7	2	1	0	0	3	10
8:45 AM	1	0	0	0	1	5	0	0	0	5	0	3	0	0	3	9
Hourly Total	1	0	0	0	1	14	0	0	0	14	2	5	1	0	8	23
9:00 AM	0	2	0	0	2	2	0	0	0	2	0	0	0	0	0	4
9:15 AM	0	0	0	0	0	1	0	0	0	1	0	1	0	0	1	2
9:30 AM	1	0	0	0	1	3	0	0	0	3	1	1	0	0	2	6
9:45 AM	1	0	0	0	1	1	0	0	0	1	1	4	0	0	5	7
Hourly Total	2	2	0	0	4	7	0	0	0	7	2	6	0	0	8	19
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
11:45 AM	0	0	0	0	0	4	0	0	0	4	0	2	0	0	2	6
Hourly Total	0	0	0	0	0	4	0	0	0	4	0	3	0	0	3	7
12:00 PM	0	0	0	0	0	3	0	0	0	3	2	1	0	0	3	6
12:15 PM	0	2	0	0	2	3	0	0	0	3	0	3	0	0	3	8
12:30 PM	0	0	0	0	0	4	0	0	0	4	0	4	0	0	4	8
12:45 PM	0	0	0	0	0	1	0	0	0	1	0	3	0	0	3	4
Hourly Total	0	2	0	0	2	11	0	0	0	11	2	11	0	0	13	26
1:00 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
1:15 PM	0	0	0	0	0	3	0	0	0	3	0	1	0	0	1	4
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	0	0	0	0	0	5	0	0	0	5	0	1	0	0	1	6
3:00 PM	0	1	0	0	1	3	0	0	0	3	2	0	0	0	2	6
3:15 PM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2
3:30 PM	0	0	0	0	0	2	0	0	0	2	0	1	0	0	1	3
3:45 PM	0	1	0	0	1	1	0	0	0	1	2	1	0	0	3	5
Hourly Total	0	2	0	0	2	8	0	0	0	8	4	2	0	0	6	16
4:00 PM	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	5	3	0	0	8	1	3	0	0	4	12
4:30 PM	0	0	0	0	0	11	0	0	0	11	1	2	0	0	3	14

4:45 PM	0	3	0	0	3	3	0	0	0	3	1	3	0	0	4	10
Hourly Total	1	4	0	0	5	20	3	0	0	23	3	8	0	0	11	39
5:00 PM	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
5:15 PM	0	0	0	0	0	2	0	0	0	2	1	2	0	0	3	5
5:30 PM	1	0	0	0	1	0	0	0	0	0	2	2	0	0	4	5
5:45 PM	0	1	0	0	1	4	0	0	0	4	2	2	0	0	4	9
Hourly Total	1	3	0	0	4	6	0	0	0	6	5	7	0	0	12	22
Grand Total	5	13	0	0	18	92	3	0	0	95	20	51	1	0	72	185
Approach %	27.8	72.2	0.0	-	-	96.8	3.2	0.0	-	-	27.8	70.8	1.4	-	-	-
Total %	2.7	7.0	0.0	-	9.7	49.7	1.6	0.0	-	51.4	10.8	27.6	0.5	-	38.9	-
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Cars & Light Goods	4	10	0	-	14	77	3	0	-	80	9	38	1	-	48	142
% Cars & Light Goods	80.0	76.9	-	-	77.8	83.7	100.0	-	-	84.2	45.0	74.5	100.0	-	66.7	76.8
Buses	0	0	0	-	0	2	0	0	-	2	0	3	0	-	3	5
% Buses	0.0	0.0	-	-	0.0	2.2	0.0	-	-	2.1	0.0	5.9	0.0	-	4.2	2.7
Single-Unit Trucks	1	2	0	-	3	10	0	0	-	10	9	6	0	-	15	28
% Single-Unit Trucks	20.0	15.4	-	-	16.7	10.9	0.0	-	-	10.5	45.0	11.8	0.0	-	20.8	15.1
Articulated Trucks	0	1	0	-	1	3	0	0	-	3	2	4	0	-	6	10
% Articulated Trucks	0.0	7.7	-	-	5.6	3.3	0.0	-	-	3.2	10.0	7.8	0.0	-	8.3	5.4
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023
Page No: 3



Turning Movement Data Plot

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023

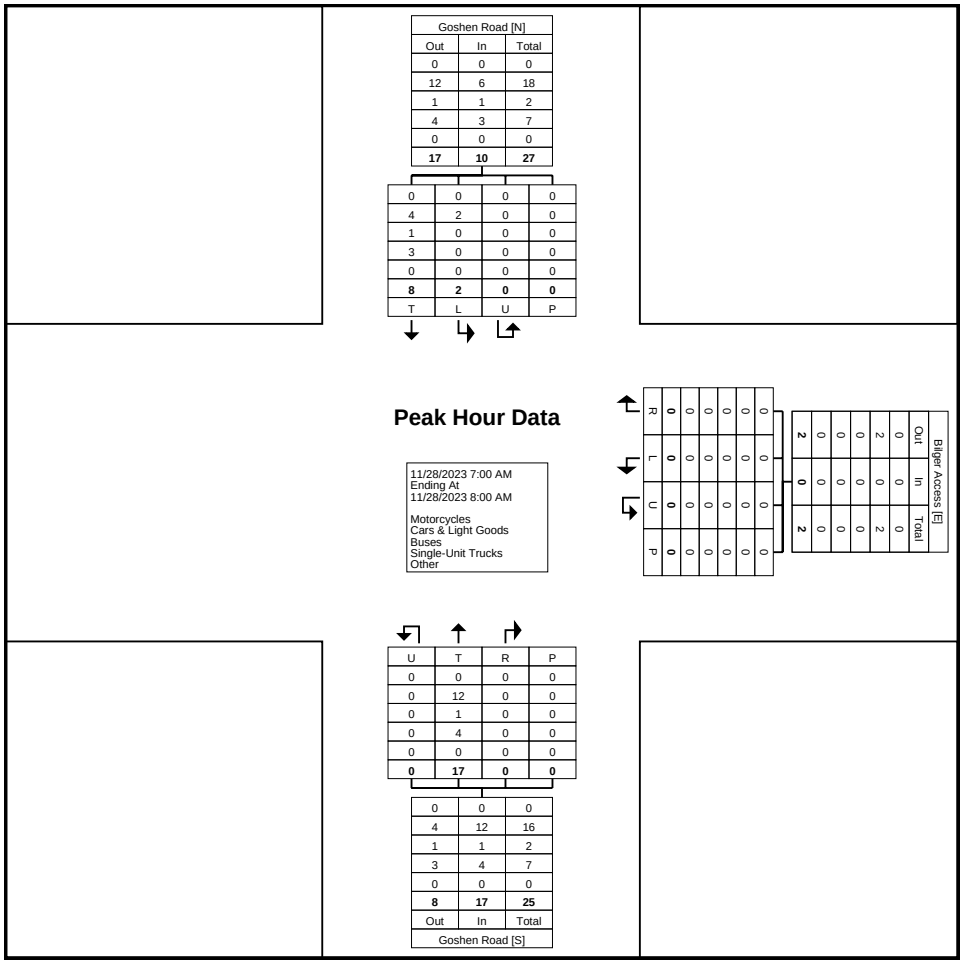
Turning Movement Peak Hour Data (7:00 AM)

Start Time	Bilger Access Westbound					Goshen Road Northbound					Goshen Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	2	0	0	0	2	1	3	0	0	4	6
7:15 AM	0	0	0	0	0	4	0	0	0	4	1	1	0	0	2	6
7:30 AM	0	0	0	0	0	4	0	0	0	4	0	3	0	0	3	7
7:45 AM	0	0	0	0	0	7	0	0	0	7	0	1	0	0	1	8
Total	0	0	0	0	0	17	0	0	0	17	2	8	0	0	10	27
Approach %	0.0	0.0	0.0	-	-	100.0	0.0	0.0	-	-	20.0	80.0	0.0	-	-	-
Total %	0.0	0.0	0.0	-	0.0	63.0	0.0	0.0	-	63.0	7.4	29.6	0.0	-	37.0	-
PHF	0.000	0.000	0.000	-	0.000	0.607	0.000	0.000	-	0.607	0.500	0.667	0.000	-	0.625	0.844
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	0	0	0	-	0	12	0	0	-	12	2	4	0	-	6	18
% Cars & Light Goods	-	-	-	-	-	70.6	-	-	-	70.6	100.0	50.0	-	-	60.0	66.7
Buses	0	0	0	-	0	1	0	0	-	1	0	1	0	-	1	2
% Buses	-	-	-	-	-	5.9	-	-	-	5.9	0.0	12.5	-	-	10.0	7.4
Single-Unit Trucks	0	0	0	-	0	4	0	0	-	4	0	3	0	-	3	7
% Single-Unit Trucks	-	-	-	-	-	23.5	-	-	-	23.5	0.0	37.5	-	-	30.0	25.9
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	-	-	-	-	-	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023
Page No: 5



Turning Movement Peak Hour Data Plot (7:00 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023

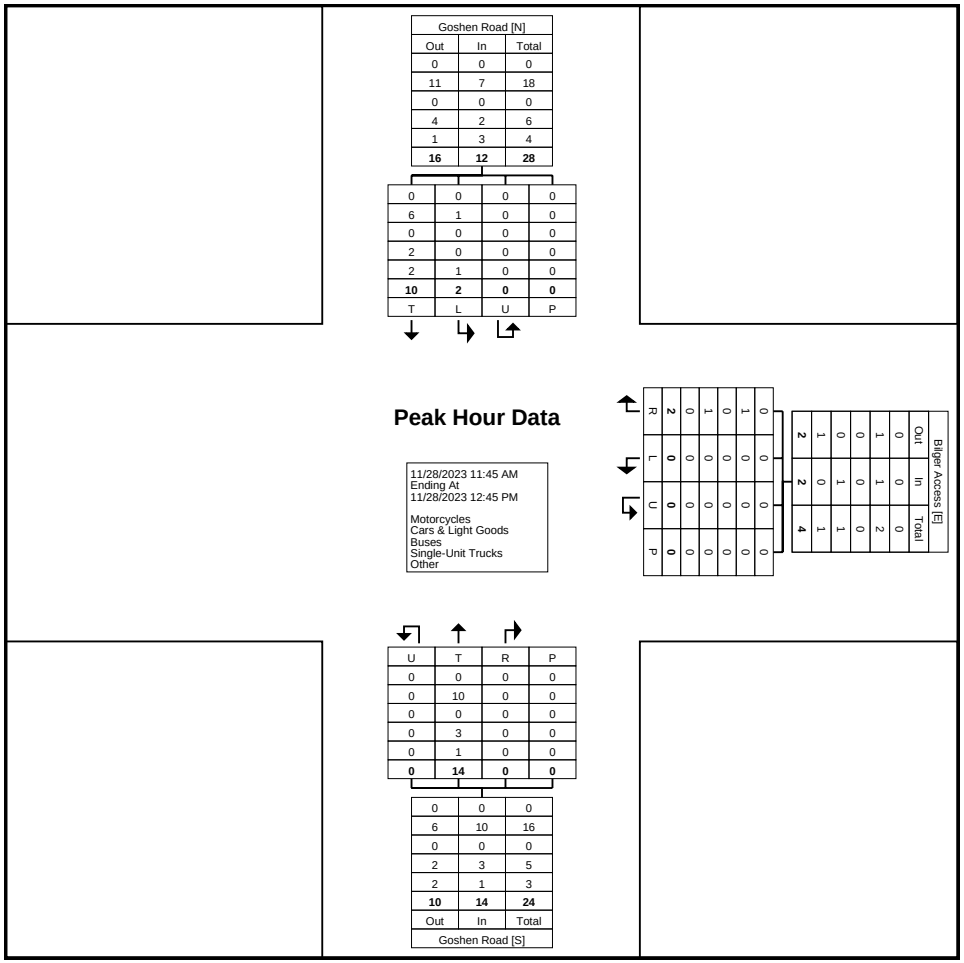
Turning Movement Peak Hour Data (11:45 AM)

Start Time	Bilger Access Westbound					Goshen Road Northbound					Goshen Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
11:45 AM	0	0	0	0	0	4	0	0	0	4	0	2	0	0	2	6
12:00 PM	0	0	0	0	0	3	0	0	0	3	2	1	0	0	3	6
12:15 PM	0	2	0	0	2	3	0	0	0	3	0	3	0	0	3	8
12:30 PM	0	0	0	0	0	4	0	0	0	4	0	4	0	0	4	8
Total	0	2	0	0	2	14	0	0	0	14	2	10	0	0	12	28
Approach %	0.0	100.0	0.0	-	-	100.0	0.0	0.0	-	-	16.7	83.3	0.0	-	-	-
Total %	0.0	7.1	0.0	-	7.1	50.0	0.0	0.0	-	50.0	7.1	35.7	0.0	-	42.9	-
PHF	0.000	0.250	0.000	-	0.250	0.875	0.000	0.000	-	0.875	0.250	0.625	0.000	-	0.750	0.875
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	-	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	0	1	0	-	1	10	0	0	-	10	1	6	0	-	7	18
% Cars & Light Goods	-	50.0	-	-	50.0	71.4	-	-	-	71.4	50.0	60.0	-	-	58.3	64.3
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	-	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	0	1	0	-	1	3	0	0	-	3	0	2	0	-	2	6
% Single-Unit Trucks	-	50.0	-	-	50.0	21.4	-	-	-	21.4	0.0	20.0	-	-	16.7	21.4
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	1	2	0	-	3	4
% Articulated Trucks	-	0.0	-	-	0.0	7.1	-	-	-	7.1	50.0	20.0	-	-	25.0	14.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	-	0.0	-	-	0.0	0.0	-	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023
Page No: 7



Turning Movement Peak Hour Data Plot (11:45 AM)

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023

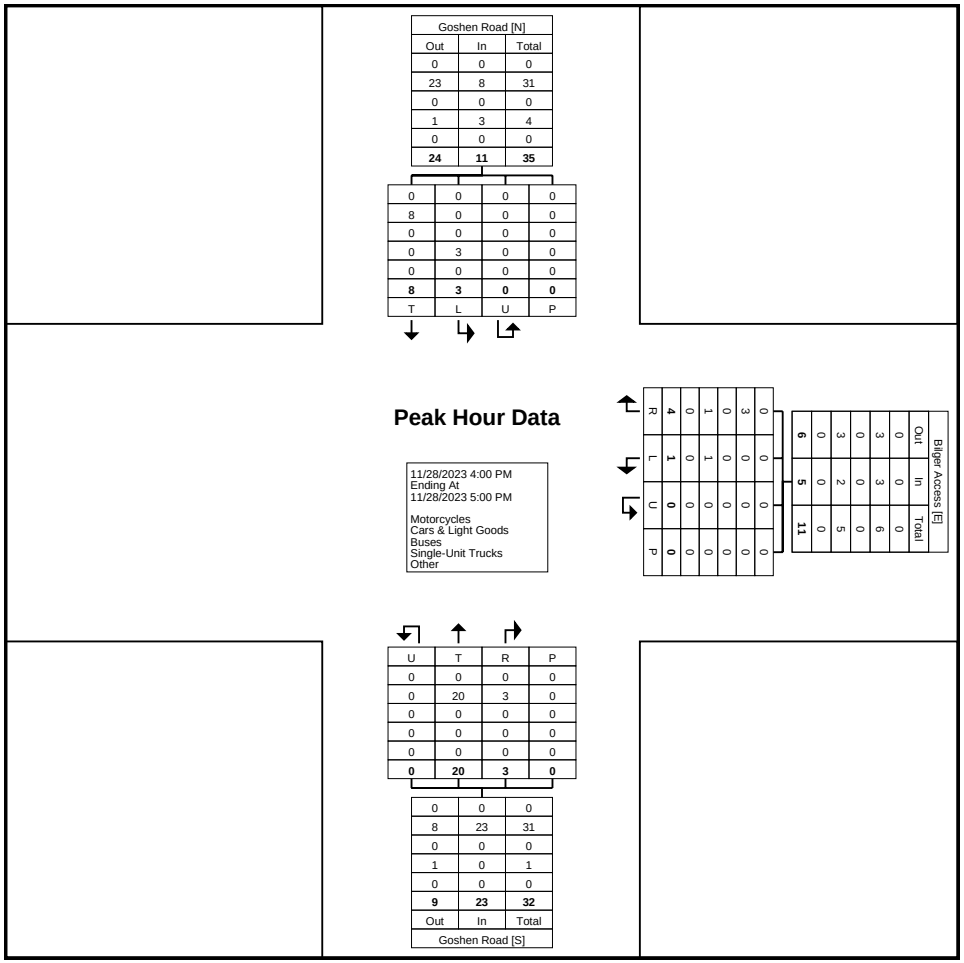
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Bilger Access Westbound					Goshen Road Northbound					Goshen Road Southbound					
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Int. Total
4:00 PM	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	3
4:15 PM	0	0	0	0	0	5	3	0	0	8	1	3	0	0	4	12
4:30 PM	0	0	0	0	0	11	0	0	0	11	1	2	0	0	3	14
4:45 PM	0	3	0	0	3	3	0	0	0	3	1	3	0	0	4	10
Total	1	4	0	0	5	20	3	0	0	23	3	8	0	0	11	39
Approach %	20.0	80.0	0.0	-	-	87.0	13.0	0.0	-	-	27.3	72.7	0.0	-	-	-
Total %	2.6	10.3	0.0	-	12.8	51.3	7.7	0.0	-	59.0	7.7	20.5	0.0	-	28.2	-
PHF	0.250	0.333	0.000	-	0.417	0.455	0.250	0.000	-	0.523	0.750	0.667	0.000	-	0.688	0.696
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	0	3	0	-	3	20	3	0	-	23	0	8	0	-	8	34
% Cars & Light Goods	0.0	75.0	-	-	60.0	100.0	100.0	-	-	100.0	0.0	100.0	-	-	72.7	87.2
Buses	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Buses	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Single-Unit Trucks	1	1	0	-	2	0	0	0	-	0	3	0	0	-	3	5
% Single-Unit Trucks	100.0	25.0	-	-	40.0	0.0	0.0	-	-	0.0	100.0	0.0	-	-	27.3	12.8
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Bilger Access
Site Code: 230661
Start Date: 11/28/2023
Page No: 9



Turning Movement Peak Hour Data Plot (4:00 PM)

Appendix C

Existing Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	233	1	5	273	1	18
Future Volume (vph)	233	1	5	273	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1666	0	0	1787	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1666	0	0	1787	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	253	1	5	297	1	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	254	0	0	302	21	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	233	1	5	273	1	18
Future Vol, veh/h	233	1	5	273	1	18
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	253	1	5	297	1	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	254	0	561	254
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	307	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1213	-	492	749
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	751	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1213	-	490	749
Mov Cap-2 Maneuver	-	-	-	-	490	-
Stage 1	-	-	-	-	793	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	729	-	-	1213	-
HCM Lane V/C Ratio	0.028	-	-	0.004	-
HCM Control Delay (s)	10.1	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	249	4	1	277	0	0
Future Volume (vph)	249	4	1	277	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	1638	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1638	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	271	4	1	301	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	275	0	0	302	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 18.7%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	249	4	1	277	0	0
Future Vol, veh/h	249	4	1	277	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	271	4	1	301	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	275	0	576	273
Stage 1	-	-	-	-	273	-
Stage 2	-	-	-	-	303	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1300	-	482	771
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1300	-	482	771
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	753	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1300	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	422	0	16	371	2	18
Future Volume (vph)	422	0	16	371	2	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.877	
Flt Protected				0.998	0.995	
Satd. Flow (prot)	1827	0	0	1772	1658	0
Flt Permitted				0.998	0.995	
Satd. Flow (perm)	1827	0	0	1772	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	459	0	17	403	2	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	459	0	0	420	22	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	422	0	16	371	2	18
Future Vol, veh/h	422	0	16	371	2	18
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	459	0	17	403	2	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	459	0	896	459
Stage 1	-	-	-	-	459	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	965	-	313	606
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	965	-	306	606
Mov Cap-2 Maneuver	-	-	-	-	306	-
Stage 1	-	-	-	-	641	-
Stage 2	-	-	-	-	640	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	552	-	-	965	-
HCM Lane V/C Ratio	0.039	-	-	0.018	-
HCM Control Delay (s)	11.8	-	-	8.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	439	1	0	385	2	1
Future Volume (vph)	439	1	0	385	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	477	1	0	418	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	478	0	0	418	3	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	439	1	0	385	2	1
Future Vol, veh/h	439	1	0	385	2	1
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	477	1	0	418	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	478	0	896	478
Stage 1	-	-	-	-	478	-
Stage 2	-	-	-	-	418	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1095	-	313	591
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	669	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1095	-	313	591
Mov Cap-2 Maneuver	-	-	-	-	313	-
Stage 1	-	-	-	-	628	-
Stage 2	-	-	-	-	669	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	371	-	-	1095	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	14.8	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix D

2024 Background Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	238	1	5	278	1	18
Future Volume (vph)	238	1	5	278	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1666	0	0	1787	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1666	0	0	1787	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	259	1	5	302	1	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	260	0	0	307	21	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	238	1	5	278	1	18
Future Vol, veh/h	238	1	5	278	1	18
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	259	1	5	302	1	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	260	0	572	260
Stage 1	-	-	-	-	260	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1207	-	485	744
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1207	-	483	744
Mov Cap-2 Maneuver	-	-	-	-	483	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	743	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	723	-	-	1207	-
HCM Lane V/C Ratio	0.029	-	-	0.005	-
HCM Control Delay (s)	10.1	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	254	4	1	283	0	0
Future Volume (vph)	254	4	1	283	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	1638	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1638	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	276	4	1	308	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	280	0	0	309	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	254	4	1	283	0	0
Future Vol, veh/h	254	4	1	283	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	276	4	1	308	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	280	0	588	278
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	310	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1294	-	475	766
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1294	-	475	766
Mov Cap-2 Maneuver	-	-	-	-	475	-
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1294	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	430	0	16	378	2	18
Future Volume (vph)	430	0	16	378	2	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.877	
Flt Protected				0.998	0.995	
Satd. Flow (prot)	1827	0	0	1772	1658	0
Flt Permitted				0.998	0.995	
Satd. Flow (perm)	1827	0	0	1772	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	467	0	17	411	2	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	467	0	0	428	22	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	430	0	16	378	2	18
Future Vol, veh/h	430	0	16	378	2	18
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	467	0	17	411	2	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	467	0	912	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	958	-	307	600
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	958	-	300	600
Mov Cap-2 Maneuver	-	-	-	-	300	-
Stage 1	-	-	-	-	635	-
Stage 2	-	-	-	-	635	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	545	-	-	958	-
HCM Lane V/C Ratio	0.04	-	-	0.018	-
HCM Control Delay (s)	11.9	-	-	8.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	448	1	0	393	2	1
Future Volume (vph)	448	1	0	393	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	487	1	0	427	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	488	0	0	427	3	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	448	1	0	393	2	1
Future Vol, veh/h	448	1	0	393	2	1
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	487	1	0	427	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	488	0	915	488
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1086	-	305	584
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1086	-	305	584
Mov Cap-2 Maneuver	-	-	-	-	305	-
Stage 1	-	-	-	-	621	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	363	-	-	1086	-
HCM Lane V/C Ratio	0.009	-	-	-	-
HCM Control Delay (s)	15	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix E

2024 Total Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	242	1	5	278	1	18
Future Volume (vph)	242	1	5	278	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1666	0	0	1787	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1666	0	0	1787	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	263	1	5	302	1	20
Shared Lane Traffic (%)						
Lane Group Flow (vph)	264	0	0	307	21	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	242	1	5	278	1	18
Future Vol, veh/h	242	1	5	278	1	18
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	263	1	5	302	1	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	264	0	576	264
Stage 1	-	-	-	-	264	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1203	-	482	740
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1203	-	480	740
Mov Cap-2 Maneuver	-	-	-	-	480	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	743	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	719	-	-	1203	-
HCM Lane V/C Ratio	0.029	-	-	0.005	-
HCM Control Delay (s)	10.2	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	254	8	2	283	0	0
Future Volume (vph)	254	8	2	283	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1639	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1639	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	276	9	2	308	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	285	0	0	310	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 19.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	254	8	2	283	0	0
Future Vol, veh/h	254	8	2	283	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	276	9	2	308	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	285	0	593	281
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	312	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1289	-	472	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1289	-	471	763
Mov Cap-2 Maneuver	-	-	-	-	471	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	746	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1289	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	254	0	2	285	0	0
Future Volume (vph)	254	0	2	285	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	276	0	2	310	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	276	0	0	312	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	19.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	254	0	2	285	0	0
Future Vol, veh/h	254	0	2	285	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	276	0	2	310	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	276	0	590	276
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	314	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1287	-	470	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1287	-	469	763
Mov Cap-2 Maneuver	-	-	-	-	469	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	740	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1287	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	431	0	17	380	2	21
Future Volume (vph)	431	0	17	380	2	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.876	
Flt Protected				0.998	0.996	
Satd. Flow (prot)	1827	0	0	1771	1658	0
Flt Permitted				0.998	0.996	
Satd. Flow (perm)	1827	0	0	1771	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	468	0	18	413	2	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	468	0	0	431	25	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 43.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	431	0	17	380	2	21
Future Vol, veh/h	431	0	17	380	2	21
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	468	0	18	413	2	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	468	0	917	468
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	449	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	958	-	304	599
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	647	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	958	-	297	599
Mov Cap-2 Maneuver	-	-	-	-	297	-
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	550	-	-	958	-
HCM Lane V/C Ratio	0.045	-	-	0.019	-
HCM Control Delay (s)	11.9	-	-	8.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	451	2	0	394	4	2
Future Volume (vph)	451	2	0	394	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1843	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1843	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	490	2	0	428	4	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	492	0	0	428	6	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	451	2	0	394	4	2
Future Vol, veh/h	451	2	0	394	4	2
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	490	2	0	428	4	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	492	0	919	491
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1082	-	304	582
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1082	-	304	582
Mov Cap-2 Maneuver	-	-	-	-	304	-
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	662	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	362	-	-	1082	-
HCM Lane V/C Ratio	0.018	-	-	-	-
HCM Control Delay (s)	15.1	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	450	3	3	393	1	4
Future Volume (vph)	450	3	3	393	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.892	
Flt Protected					0.990	
Satd. Flow (prot)	1861	0	0	1863	1645	0
Flt Permitted					0.990	
Satd. Flow (perm)	1861	0	0	1863	1645	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	489	3	3	427	1	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	492	0	0	430	5	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 33.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	450	3	3	393	1	4
Future Vol, veh/h	450	3	3	393	1	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	489	3	3	427	1	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	492	0	924	491
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	433	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1071	-	299	578
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	654	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1071	-	298	578
Mov Cap-2 Maneuver	-	-	-	-	298	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	651	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	487	-	-	1071	-
HCM Lane V/C Ratio	0.011	-	-	0.003	-
HCM Control Delay (s)	12.5	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix F

2029 Background Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	262	1	6	307	1	20
Future Volume (vph)	262	1	6	307	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1667	0	0	1786	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1667	0	0	1786	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	285	1	7	334	1	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	286	0	0	341	23	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	262	1	6	307	1	20
Future Vol, veh/h	262	1	6	307	1	20
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	285	1	7	334	1	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	286	0	634	286
Stage 1	-	-	-	-	286	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1180	-	446	719
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1180	-	443	719
Mov Cap-2 Maneuver	-	-	-	-	443	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	714	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	698	-	-	1180	-
HCM Lane V/C Ratio	0.033	-	-	0.006	-
HCM Control Delay (s)	10.3	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	280	4	1	312	0	0
Future Volume (vph)	280	4	1	312	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	1638	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1638	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	304	4	1	339	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	308	0	0	340	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 20.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	280	4	1	312	0	0
Future Vol, veh/h	280	4	1	312	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	304	4	1	339	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	308	0	647	306
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	341	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1264	-	439	739
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1264	-	439	739
Mov Cap-2 Maneuver	-	-	-	-	439	-
Stage 1	-	-	-	-	751	-
Stage 2	-	-	-	-	724	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1264	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	475	0	18	418	2	20
Future Volume (vph)	475	0	18	418	2	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.876	
Flt Protected				0.998	0.996	
Satd. Flow (prot)	1827	0	0	1771	1658	0
Flt Permitted				0.998	0.996	
Satd. Flow (perm)	1827	0	0	1771	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	516	0	20	454	2	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	516	0	0	474	24	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	475	0	18	418	2	20
Future Vol, veh/h	475	0	18	418	2	20
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	516	0	20	454	2	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	516	0	1010	516
Stage 1	-	-	-	-	516	-
Stage 2	-	-	-	-	494	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	917	-	268	563
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	617	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	917	-	260	563
Mov Cap-2 Maneuver	-	-	-	-	260	-
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	509	-	-	917	-
HCM Lane V/C Ratio	0.047	-	-	0.021	-
HCM Control Delay (s)	12.4	-	-	9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	494	1	0	434	2	1
Future Volume (vph)	494	1	0	434	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	537	1	0	472	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	538	0	0	472	3	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	494	1	0	434	2	1
Future Vol, veh/h	494	1	0	434	2	1
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	537	1	0	472	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	538	0	1010	538
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	472	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1040	-	268	547
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	632	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1040	-	268	547
Mov Cap-2 Maneuver	-	-	-	-	268	-
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	632	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	323	-	-	1040	-
HCM Lane V/C Ratio	0.01	-	-	-	-
HCM Control Delay (s)	16.3	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix G

2029 Total Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	266	1	6	307	1	20
Future Volume (vph)	266	1	6	307	1	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.871	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1667	0	0	1786	1421	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1667	0	0	1786	1421	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	289	1	7	334	1	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	290	0	0	341	23	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 31.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	266	1	6	307	1	20
Future Vol, veh/h	266	1	6	307	1	20
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	289	1	7	334	1	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	290	0	638	290
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	348	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1176	-	444	715
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1176	-	441	715
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	764	-
Stage 2	-	-	-	-	714	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	694	-	-	1176	-
HCM Lane V/C Ratio	0.033	-	-	0.006	-
HCM Control Delay (s)	10.4	-	-	8.1	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	280	8	2	312	0	0
Future Volume (vph)	280	8	2	312	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1638	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1638	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	304	9	2	339	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	313	0	0	341	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	280	8	2	312	0	0
Future Vol, veh/h	280	8	2	312	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	304	9	2	339	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	313	0	652	309
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1259	-	436	736
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1259	-	435	736
Mov Cap-2 Maneuver	-	-	-	-	435	-
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	722	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1259	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	280	0	2	314	0	0
Future Volume (vph)	280	0	2	314	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	304	0	2	341	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	304	0	0	343	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 21.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	280	0	2	314	0	0
Future Vol, veh/h	280	0	2	314	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	304	0	2	341	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	304	0	649	304
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	345	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1257	-	434	736
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	717	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1257	-	433	736
Mov Cap-2 Maneuver	-	-	-	-	433	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	716	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1257	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	476	0	19	420	2	23
Future Volume (vph)	476	0	19	420	2	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.875	
Flt Protected				0.998	0.996	
Satd. Flow (prot)	1827	0	0	1771	1656	0
Flt Permitted				0.998	0.996	
Satd. Flow (perm)	1827	0	0	1771	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	517	0	21	457	2	25
Shared Lane Traffic (%)						
Lane Group Flow (vph)	517	0	0	478	27	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	476	0	19	420	2	23
Future Vol, veh/h	476	0	19	420	2	23
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	517	0	21	457	2	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	517	0	1016	517
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	499	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	916	-	266	562
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	614	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	916	-	258	562
Mov Cap-2 Maneuver	-	-	-	-	258	-
Stage 1	-	-	-	-	603	-
Stage 2	-	-	-	-	595	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	514	-	-	916	-
HCM Lane V/C Ratio	0.053	-	-	0.023	-
HCM Control Delay (s)	12.4	-	-	9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	497	2	0	435	4	2
Future Volume (vph)	497	2	0	435	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	540	2	0	473	4	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	542	0	0	473	6	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	497	2	0	435	4	2
Future Vol, veh/h	497	2	0	435	4	2
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	540	2	0	473	4	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	542	0	1014	541
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1037	-	267	545
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1037	-	267	545
Mov Cap-2 Maneuver	-	-	-	-	267	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	631	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	322	-	-	1037	-
HCM Lane V/C Ratio	0.02	-	-	-	-
HCM Control Delay (s)	16.4	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	497	3	3	434	1	4
Future Volume (vph)	497	3	3	434	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.892	
Flt Protected					0.990	
Satd. Flow (prot)	1861	0	0	1863	1645	0
Flt Permitted					0.990	
Satd. Flow (perm)	1861	0	0	1863	1645	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	540	3	3	472	1	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	543	0	0	475	5	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 36.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	497	3	3	434	1	4
Future Vol, veh/h	497	3	3	434	1	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	540	3	3	472	1	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	543	0	1020	542
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	478	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1026	-	262	540
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1026	-	261	540
Mov Cap-2 Maneuver	-	-	-	-	261	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	622	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	445	-	-	1026	-
HCM Lane V/C Ratio	0.012	-	-	0.003	-
HCM Control Delay (s)	13.2	-	-	8.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix H

2034 Background Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	290	1	6	339	1	22
Future Volume (vph)	290	1	6	339	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.870	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1667	0	0	1786	1418	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1667	0	0	1786	1418	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	315	1	7	368	1	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	316	0	0	375	25	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	290	1	6	339	1	22
Future Vol, veh/h	290	1	6	339	1	22
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	315	1	7	368	1	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	316	0	698	316
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1149	-	410	691
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1149	-	407	691
Mov Cap-2 Maneuver	-	-	-	-	407	-
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	688	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	671	-	-	1149	-
HCM Lane V/C Ratio	0.037	-	-	0.006	-
HCM Control Delay (s)	10.6	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	310	4	1	344	0	0
Future Volume (vph)	310	4	1	344	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					
Flt Protected						
Satd. Flow (prot)	1637	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1637	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	337	4	1	374	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	341	0	0	375	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 22.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	4	1	344	0	0
Future Vol, veh/h	310	4	1	344	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	337	4	1	374	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	341	0	715	339
Stage 1	-	-	-	-	339	-
Stage 2	-	-	-	-	376	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1229	-	400	708
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1229	-	400	708
Mov Cap-2 Maneuver	-	-	-	-	400	-
Stage 1	-	-	-	-	726	-
Stage 2	-	-	-	-	698	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1229	-
HCM Lane V/C Ratio	-	-	-	0.001	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	525	0	20	461	2	22
Future Volume (vph)	525	0	20	461	2	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.875	
Flt Protected				0.998	0.996	
Satd. Flow (prot)	1827	0	0	1771	1656	0
Flt Permitted				0.998	0.996	
Satd. Flow (perm)	1827	0	0	1771	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	571	0	22	501	2	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	571	0	0	523	26	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 50.5%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	525	0	20	461	2	22
Future Vol, veh/h	525	0	20	461	2	22
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	571	0	22	501	2	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	571	0	1116	571
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	545	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	873	-	232	524
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	585	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	873	-	224	524
Mov Cap-2 Maneuver	-	-	-	-	224	-
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	565	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	471	-	-	873	-
HCM Lane V/C Ratio	0.055	-	-	0.025	-
HCM Control Delay (s)	13.1	-	-	9.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	546	1	0	479	2	1
Future Volume (vph)	546	1	0	479	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	593	1	0	521	2	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	594	0	0	521	3	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	546	1	0	479	2	1
Future Vol, veh/h	546	1	0	479	2	1
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	593	1	0	521	2	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	594	0	1115	594
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	521	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	992	-	232	509
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	992	-	232	509
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	600	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	17.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	283	-	-	992	-
HCM Lane V/C Ratio	0.012	-	-	-	-
HCM Control Delay (s)	17.9	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Appendix I

2034 Total Traffic Operations Reports

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	294	1	6	339	1	22
Future Volume (vph)	294	1	6	339	1	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.870	
Flt Protected				0.999	0.998	
Satd. Flow (prot)	1667	0	0	1786	1418	0
Flt Permitted				0.999	0.998	
Satd. Flow (perm)	1667	0	0	1786	1418	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	14%	0%	20%	6%	0%	17%
Adj. Flow (vph)	320	1	7	368	1	24
Shared Lane Traffic (%)						
Lane Group Flow (vph)	321	0	0	375	25	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 32.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	294	1	6	339	1	22
Future Vol, veh/h	294	1	6	339	1	22
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	92	92	92	92	92	92
Heavy Vehicles, %	14	0	20	6	0	17
Mvmt Flow	320	1	7	368	1	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	321	0	703	321
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	-	-	4.3	-	6.4	6.37
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.38	-	3.5	3.453
Pot Cap-1 Maneuver	-	-	1144	-	407	686
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1144	-	404	686
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	688	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	666	-	-	1144	-
HCM Lane V/C Ratio	0.038	-	-	0.006	-
HCM Control Delay (s)	10.6	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	310	8	2	344	0	0
Future Volume (vph)	310	8	2	344	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.996					
Flt Protected						
Satd. Flow (prot)	1637	0	0	1810	1900	0
Flt Permitted						
Satd. Flow (perm)	1637	0	0	1810	1900	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	16%	0%	0%	5%	0%	0%
Adj. Flow (vph)	337	9	2	374	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	346	0	0	376	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	8	2	344	0	0
Future Vol, veh/h	310	8	2	344	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	16	0	0	5	0	0
Mvmt Flow	337	9	2	374	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	346	0	720	342
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	378	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1224	-	398	705
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	697	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1224	-	397	705
Mov Cap-2 Maneuver	-	-	-	-	397	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1224	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	7.9	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	310	0	2	347	0	0
Future Volume (vph)	310	0	2	347	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	1863	0	0	1863	1863	0
Flt Permitted						
Satd. Flow (perm)	1863	0	0	1863	1863	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	337	0	2	377	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	337	0	0	379	0	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 23.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	310	0	2	347	0	0
Future Vol, veh/h	310	0	2	347	0	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	337	0	2	377	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	337	0	718	337
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	381	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1222	-	396	705
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	691	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1222	-	395	705
Mov Cap-2 Maneuver	-	-	-	-	395	-
Stage 1	-	-	-	-	723	-
Stage 2	-	-	-	-	690	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1222	-
HCM Lane V/C Ratio	-	-	-	0.002	-
HCM Control Delay (s)	0	-	-	8	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	-	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	526	0	21	463	2	25
Future Volume (vph)	526	0	21	463	2	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.874	
Flt Protected				0.998	0.997	
Satd. Flow (prot)	1827	0	0	1771	1656	0
Flt Permitted				0.998	0.997	
Satd. Flow (perm)	1827	0	0	1771	1656	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	256.2			158.5	186.1	
Travel Time (s)	18.4			11.4	13.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	0%	31%	6%	0%	0%
Adj. Flow (vph)	572	0	23	503	2	27
Shared Lane Traffic (%)						
Lane Group Flow (vph)	572	0	0	526	29	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 51.4%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	526	0	21	463	2	25
Future Vol, veh/h	526	0	21	463	2	25
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	92	92	92	92	92	92
Heavy Vehicles, %	4	0	31	6	0	0
Mvmt Flow	572	0	23	503	2	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	572	0	1121	572
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	549	-
Critical Hdwy	-	-	4.41	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.479	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	872	-	230	523
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	872	-	221	523
Mov Cap-2 Maneuver	-	-	-	-	221	-
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	561	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	475	-	-	872	-
HCM Lane V/C Ratio	0.062	-	-	0.026	-
HCM Control Delay (s)	13.1	-	-	9.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	549	2	0	480	4	2
Future Volume (vph)	549	2	0	480	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.955	
Flt Protected					0.968	
Satd. Flow (prot)	1845	0	0	1759	1756	0
Flt Permitted					0.968	
Satd. Flow (perm)	1845	0	0	1759	1756	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	158.5			70.1	130.3	
Travel Time (s)	11.4			5.0	9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	3%	0%	0%	8%	0%	0%
Adj. Flow (vph)	597	2	0	522	4	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	599	0	0	522	6	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	549	2	0	480	4	2
Future Vol, veh/h	549	2	0	480	4	2
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	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	8	0	0
Mvmt Flow	597	2	0	522	4	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	599	0	1120	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	988	-	231	506
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	988	-	231	506
Mov Cap-2 Maneuver	-	-	-	-	231	-
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	599	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	282	-	-	988	-
HCM Lane V/C Ratio	0.023	-	-	-	-
HCM Control Delay (s)	18.1	-	-	0	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	548	3	3	479	1	4
Future Volume (vph)	548	3	3	479	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.892	
Flt Protected					0.990	
Satd. Flow (prot)	1861	0	0	1863	1645	0
Flt Permitted					0.990	
Satd. Flow (perm)	1861	0	0	1863	1645	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	70.1			184.9	93.4	
Travel Time (s)	5.0			13.3	6.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	596	3	3	521	1	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	599	0	0	524	5	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.0%		ICU Level of Service A	
Analysis Period (min) 15			

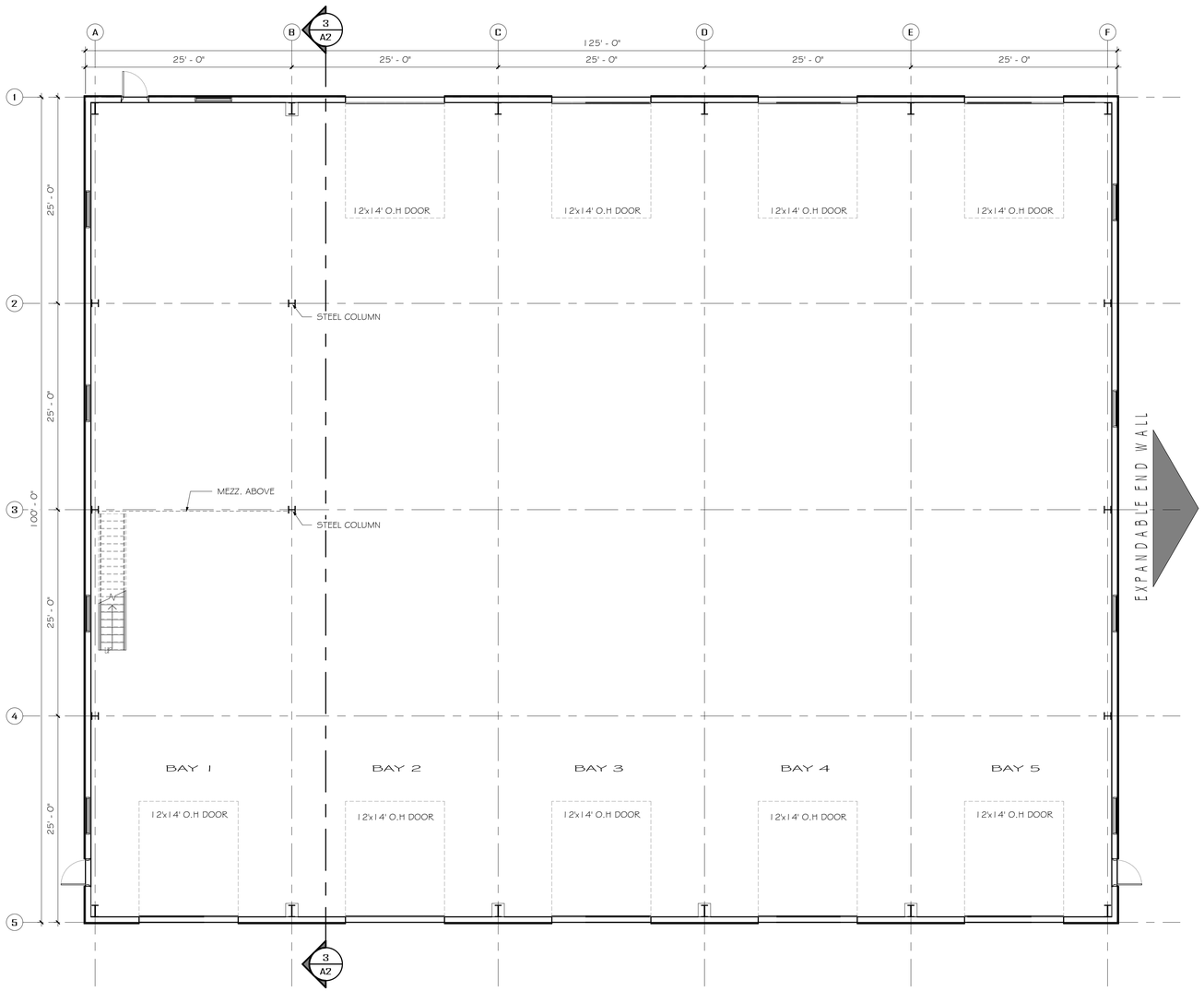
Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	548	3	3	479	1	4
Future Vol, veh/h	548	3	3	479	1	4
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	596	3	3	521	1	4

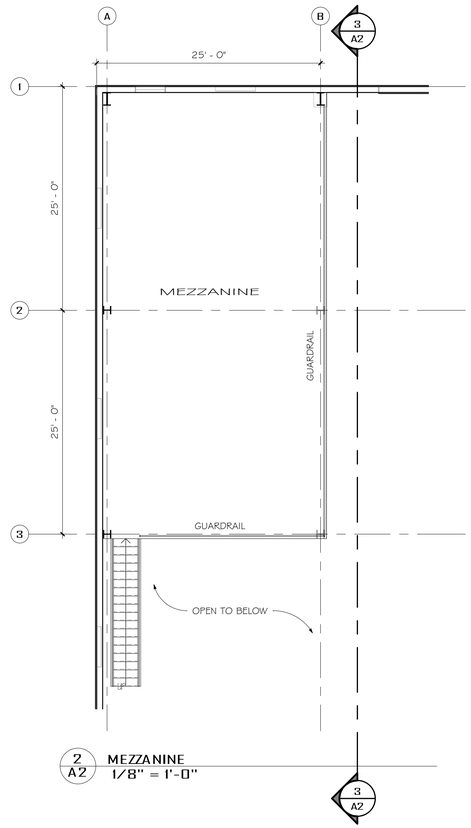
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	599	0	1125	598
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	527	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	978	-	227	502
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	978	-	226	502
Mov Cap-2 Maneuver	-	-	-	-	226	-
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	590	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	14.1
HCM LOS			B

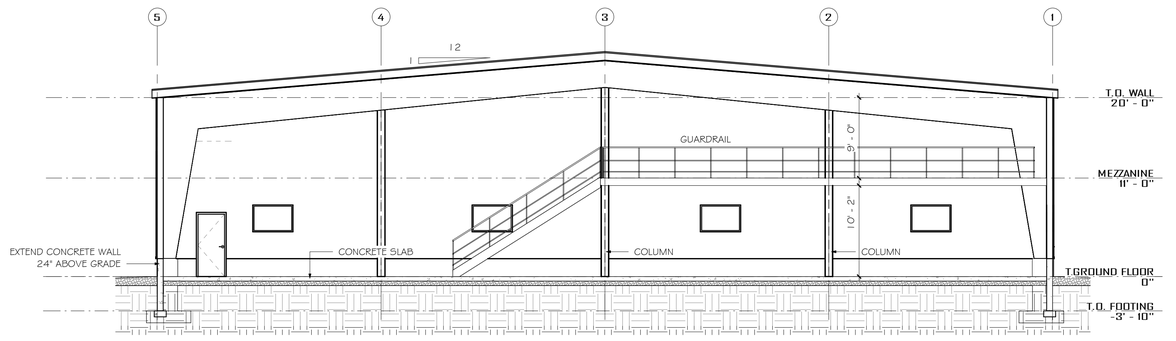
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	403	-	-	978	-
HCM Lane V/C Ratio	0.013	-	-	0.003	-
HCM Control Delay (s)	14.1	-	-	8.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-



1 A2 GROUND FLOOR PLAN
1/8" = 1'-0"



2 A2 MEZZANINE
1/8" = 1'-0"



3 A2 Section 1
1/8" = 1'-0"

No.	DESCRIPTION	DATE	BY
REVISION SCHEDULE			

REID & DELEYE CONTRACTORS LTD
Box 272 Courtland, Ontario N0J 1E0 Ph. (519) 688-2600 Fax (519) 688-2700

NORTH

PROPOSED 5 BAY SHOP
FOR
BILGER SLINGER SERVICES
TILLSONBURG ONT.

GROUND FLOOR PLAN

PROJECT NUMBER	-
DATE	SEPT. 27/23
DRAWN BY	SH
CHECKED BY	-

A2

SCALE 1/8" = 1'-0"

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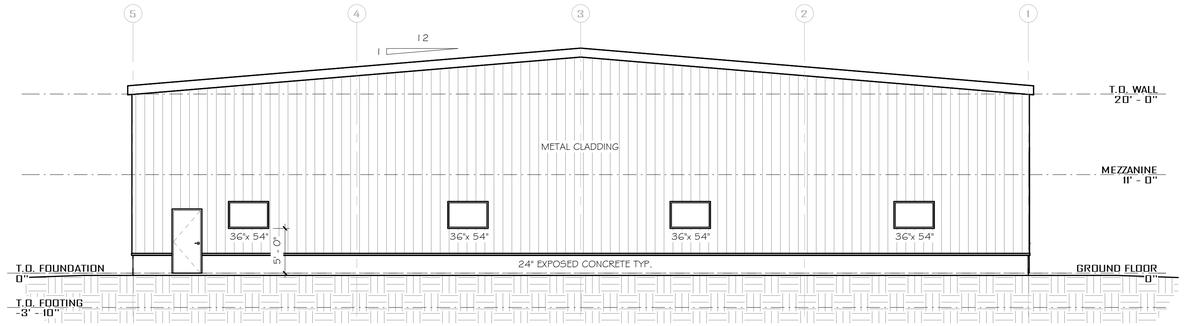
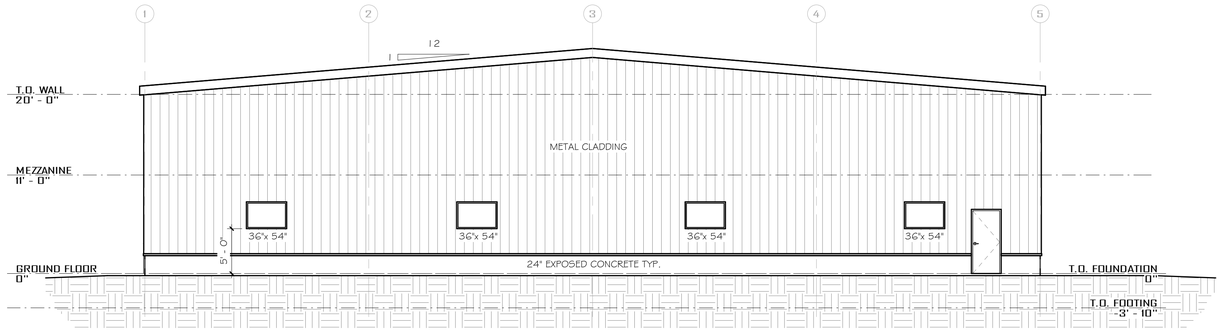
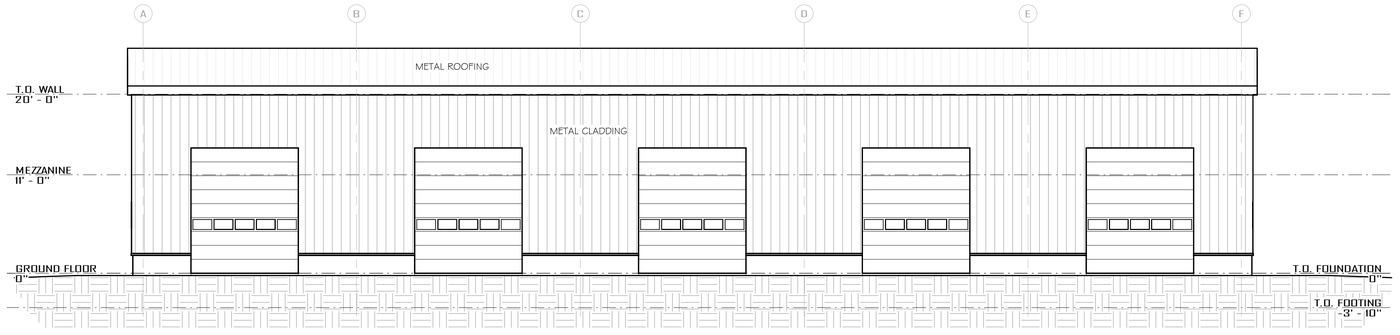


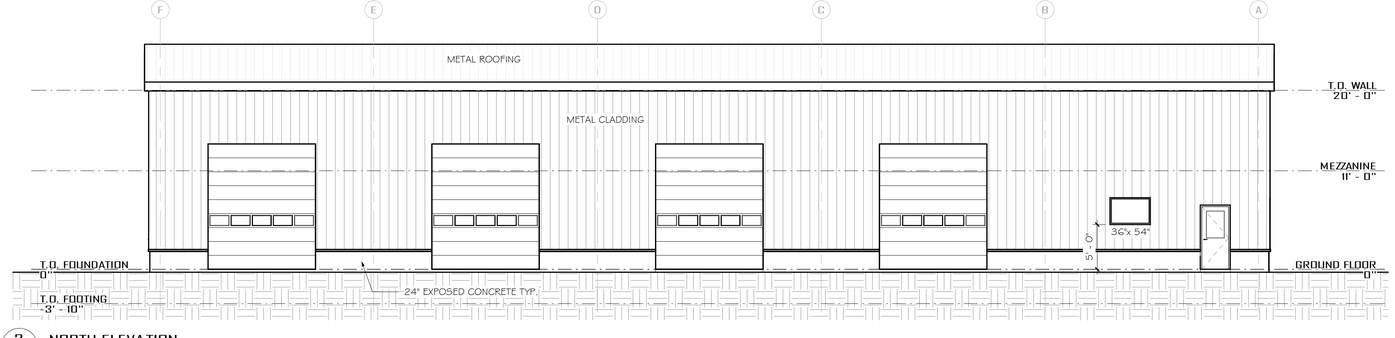
1 / A3 EAST ELEVATION
1/8" = 1'-0"



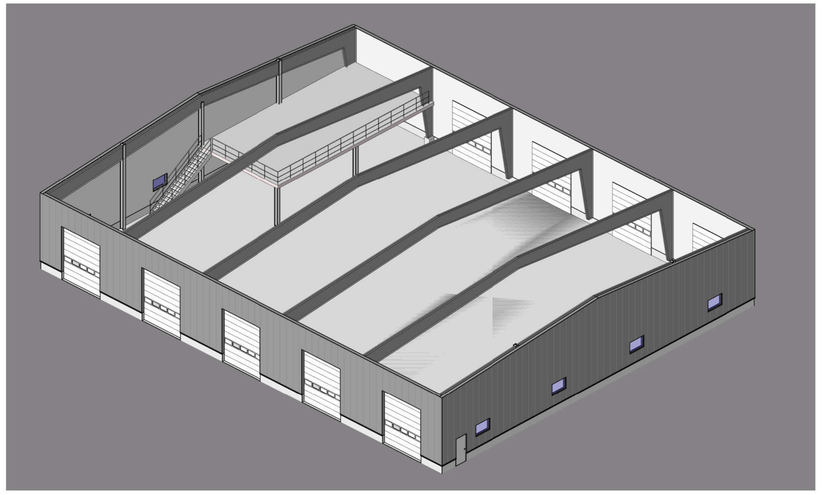
4 / A3 WEST ELEVATION
1/8" = 1'-0"



3 / A3 SOUTH ELEVATION
1/8" = 1'-0"



2 / A3 NORTH ELEVATION
1/8" = 1'-0"



5 / A3 {3D}

No.	DESCRIPTION	DATE	BY
REVISION SCHEDULE			

REID & DELEYE CONTRACTORS LTD
Box 272 Courtland, Ontario N0J 1E0 Ph. (519) 688-2600 Fax (519) 688-2700

NORTH

PROPOSED 5 BAY SHOP
FOR
BILGER SLINGER SERVICES
TILLSONBURG ONT.

ELEVATIONS

PROJECT NUMBER	-
DATE	SEPT. 27/23
DRAWN BY	Author
CHECKED BY	Checker

A3

SCALE 1/8" = 1'-0"

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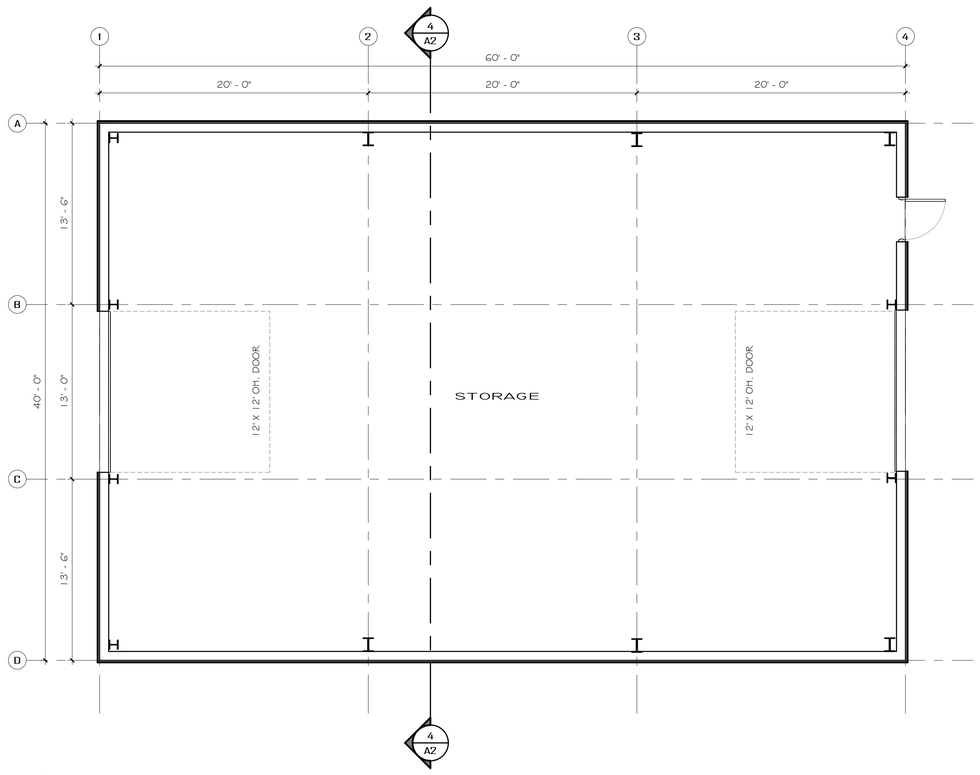
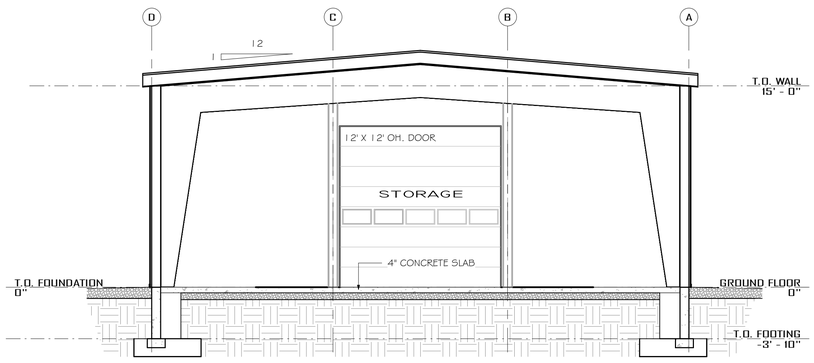
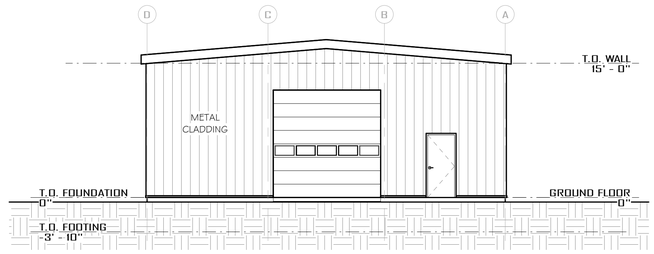


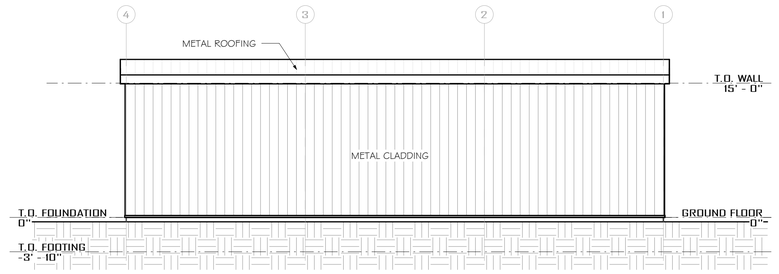
1 A2 GROUND FLOOR PLAN
3/16" = 1'-0"



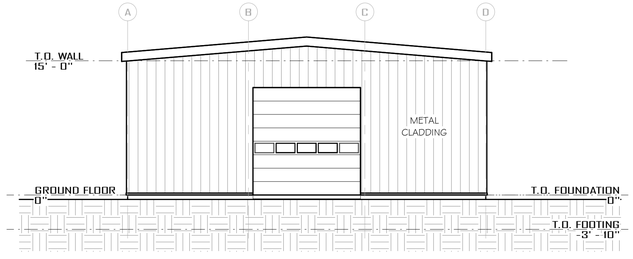
4 A2 Section 1
3/16" = 1'-0"



2 A2 EAST ELEVATION
1/8" = 1'-0"



3 A2 NORTH ELEVATION
1/8" = 1'-0"



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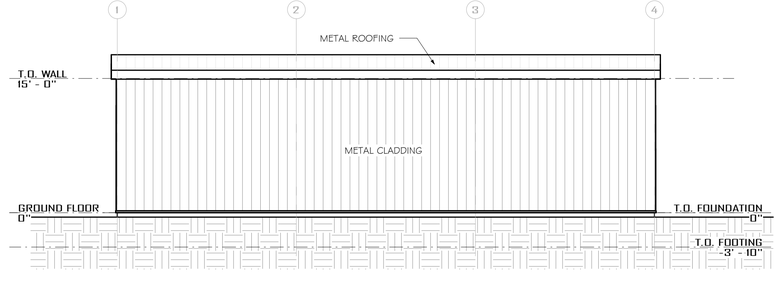
1/8" = 1'-0"



6 A2 SOUTH ELEVATION
1/8" = 1'-0"

No.	DESCRIPTION	DATE	BY
REVISION SCHEDULE			

REID & DELEYE CONTRACTORS LTD
Box 272 Courtland, Ontario N0J 1E0 Ph. (519) 688-2600 Fax (519) 688-2700

NORTH

PROPOSED STORAGE BUILDING
FOR
BLUE WEST
TILLSONBURG ONT.

GROUND FLOOR PLAN

PROJECT NUMBER	-
DATE	SEPT 28/23
DRAWN BY	SH
CHECKED BY	-

A2

SCALE As indicated

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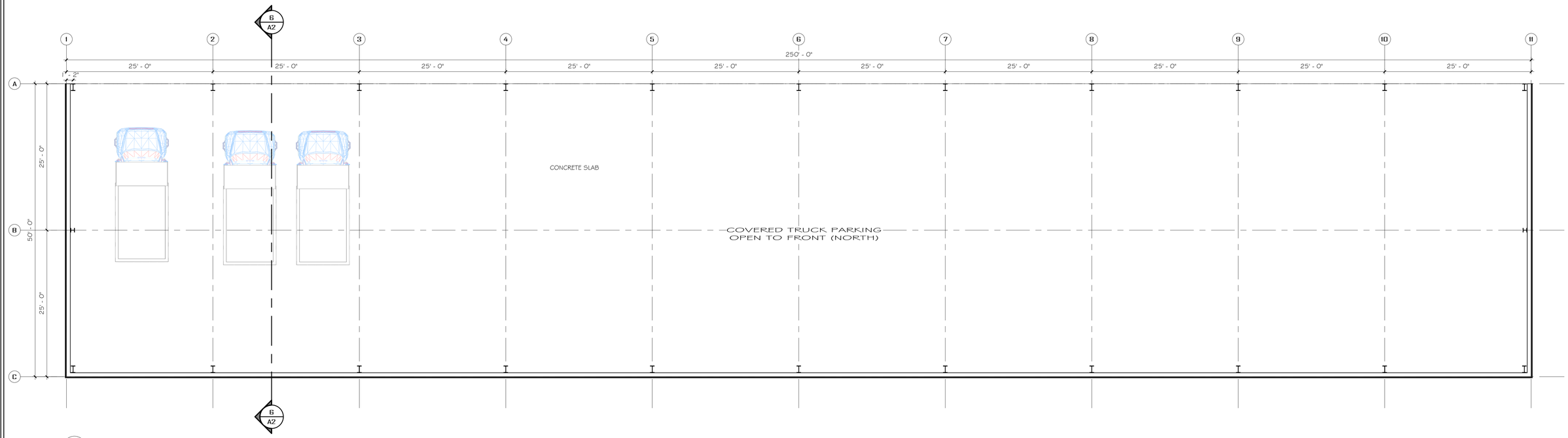
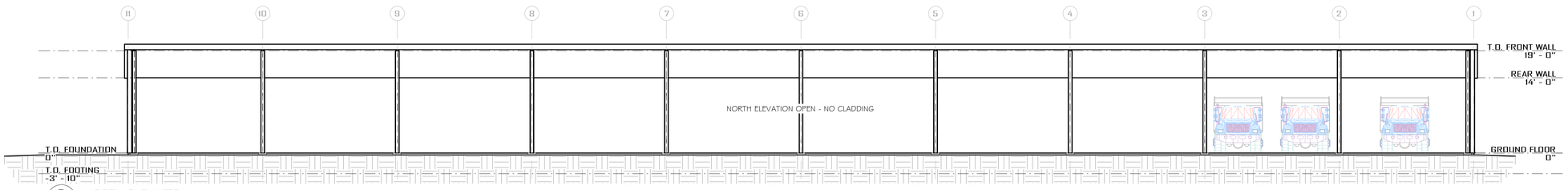
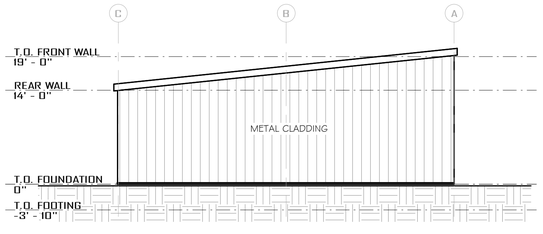


1 / A2 GROUND FLOOR PLAN
1/8" = 1'-0"



2 / A2 NORTH ELEVATION
3/32" = 1'-0"



3 / A2 EAST ELEVATION
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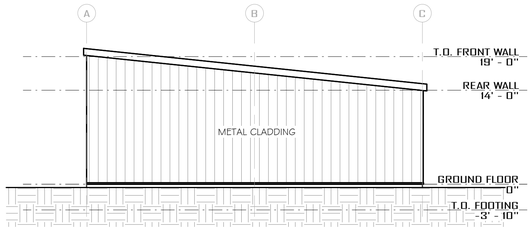

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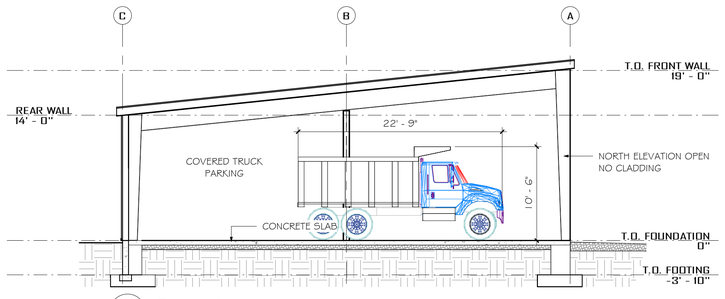
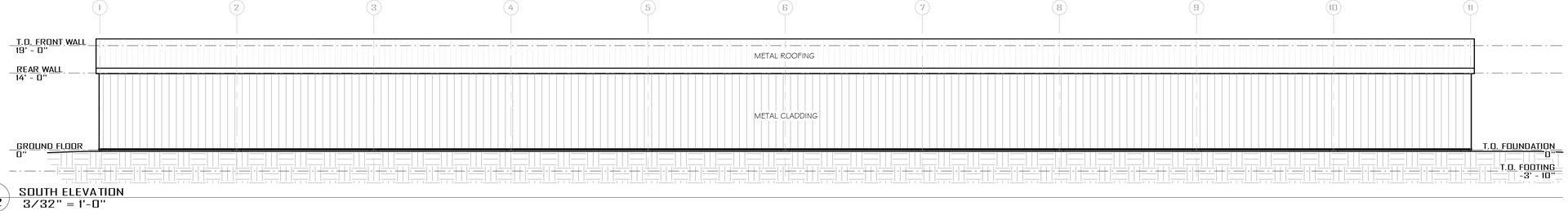


6 / A2 Section 1
1/8" = 1'-0"



5 / A2 SOUTH ELEVATION
3/32" = 1'-0"

No.	DESCRIPTION	DATE	BY
REVISION SCHEDULE			

REID & DELEYE CONTRACTORS LTD
Box 272 Courtland, Ontario N0J 1E0 Ph. (519) 688-2600 Fax (519) 688-2700

NORTH

COVERED TRUCK PARKING
FOR
BILGER SLINGER SERVICES
TILLSONBURG ONT.

GROUND FLOOR PLAN

PROJECT NUMBER	-
DATE	SEPT. 28/23
DRAWN BY	SH
CHECKED BY	-

A2

SCALE As indicated

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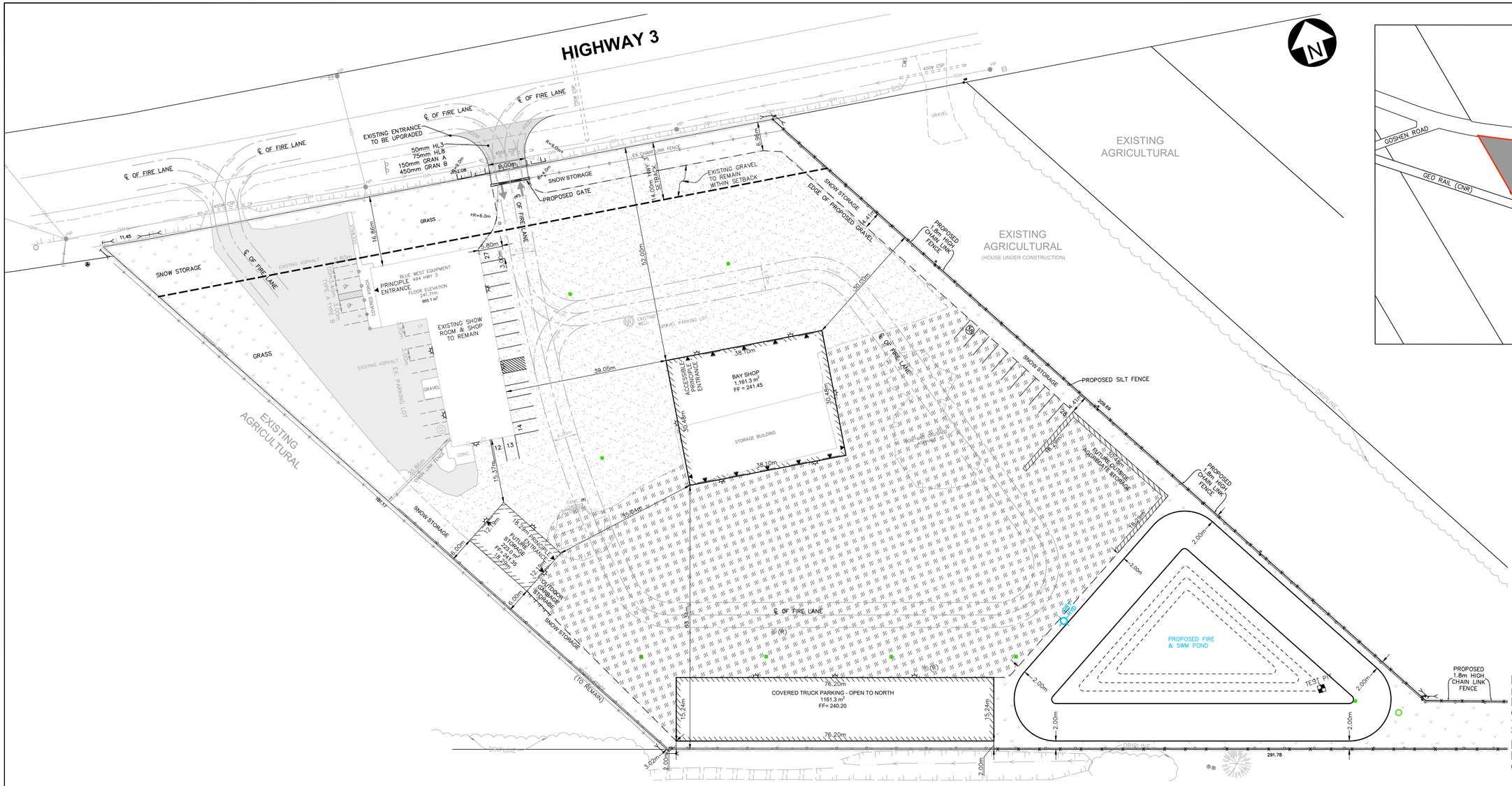
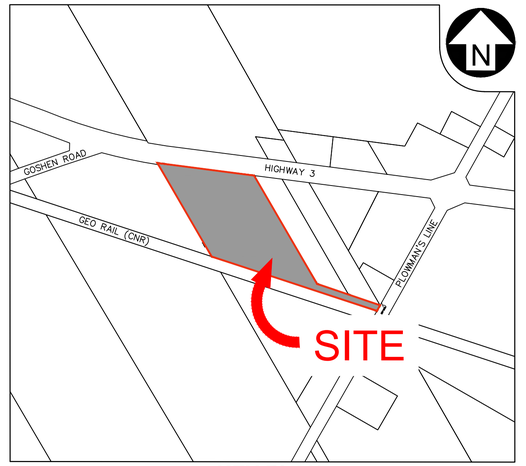
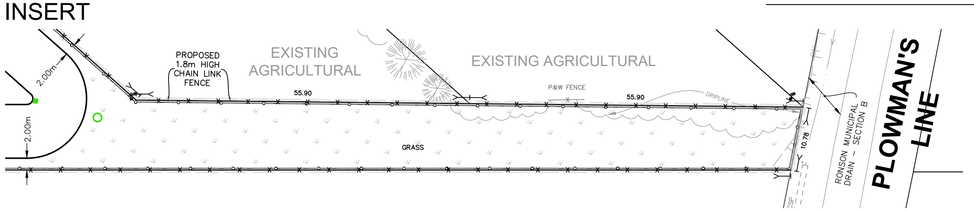




KEY PLAN
SCALE 1:5000

SEE INSERT

INSERT



SEE DWG. 2 FOR GENERAL NOTES

COUNTY OF NORFOLK ZONING REQUIREMENTS

	REQUIRED	PROVIDED
ZONING	RURAL COMMERCIAL (CR)	
LOT AREA (MIN.)	1860m²	27650m² (6.81ac)
LOT FRONTAGE (MIN.)	30.0m	163.5m
YARDS		
FRONT (MIN.): HIGHWAY 3	13.0m	16.9m
EXTERIOR SIDE (MIN.):	13.0m	N/A
INTERIOR SIDE (MIN.):	3.0m	3.2m
REAR (MIN.)	9.0m	2.0m*
SETBACK (MIN.) FROM ℄ OF RAILWAY	0m	2.0m
LOT COVERAGE FOR ALL BUILDINGS (MAX.)	70% OF LOT AREA	12.3%
LANDSCAPED OPEN SPACE (MIN.)	5% OF LOT AREA	19.0%
HEIGHT OF BUILDING (MAX.)	11.0m	7.4m

PARKING	INDUSTRIAL = 3410.7m²	
	1/90m² USABLE FLOOR AREA = 38	
	REQUIRED	PROVIDED
ACCESSIBLE – 4% OF TOTAL REQUIRED PARKING SPACES	2	2
TOTAL PARKING	38	38
DEPTH (MIN.)	5.8m	
WIDTH (MIN.)	3.0m	
ACCESSIBLE DEPTH (MIN.)	5.8m	
ACCESSIBLE WIDTH (MIN.)	A–3.4m B–3.0m	

*FOR ANY BUILDING OR STRUCTURE ACCESSORY TO ANY PERMITTED USE – THE SETBACK FROM THE RAILWAY IS 0.0m

LEGEND

- 42.90 PROPOSED GROUND ELEVATIONS
- 242.90 EXISTING GROUND ELEVATIONS
- 6 LOT NUMBER
- D.B., W.O. DAYLIGHT BASEMENT, WALKOUT
- MAJOR FLOW
- ORIGINAL ELEVATIONS (MAY NOT BE VALID NOW)
- METRIC CONTOUR ELEVATIONS IN METRES (BY CJDL SITE SURVEY)
- PROPOSED SURFACE DRAINAGE, EXISTING DITCH/SWALE
- TOE OF SLOPE, TOP OF BANK
- FENCE
- TACTILE WALKING SURFACE INDICATORS (OPSD 310.033)
- CONIFEROUS, DECIDUOUS TREE
- SHRUB
- EDGE OF BUSH/DRIP LINE
- SILT FENCE
- EXISTING/PROPOSED MANHOLE
- EXISTING/PROPOSED CLEAN OUT
- EXISTING/PROPOSED CATCH BASIN
- EXISTING/PROPOSED VALVE
- EXISTING/PROPOSED CURB STOP
- EXISTING/PROPOSED DRY HYDRANT
- SIGN
- UTILITY PEDESTAL
- GEOTECHNICAL BORE HOLE
- EXISTING/PROPOSED GRASS
- EXISTING/PROPOSED ASPHALT
- EXISTING/PROPOSED GRAVEL
- EXISTING/PROPOSED WALL MOUNTED LIGHT

STAMP:

LICENSED PROFESSIONAL ENGINEER — P.J. PENNER — 31 OCT 2024 — PROVINCE OF ONTARIO

SCALE 1:500

No.	REVISION	DATE	BY
1	ISSUED FOR SITE PLAN APPROVAL	31 OCT 2024	PJP

COUNTY OF NORFOLK - COURTLAND

CJDL Consulting Engineers
Cyril J. Demeyere Limited
P.O. Box 460, 261 Broadway
Tillsonburg, Ontario. N4G 4H8
Tel: 519-688-1000
866-302-9886
cjdl@cjdleng.com

DESIGN BY: ZDR | DRAWN BY: AK | CHECKED BY: PJP
PROJECT NO. 23044 | SURVEY BY: TPM | DATE: 31 OCT 2024

BILGER BAY SHOP
PART OF LOT 18, CONCESSION 2
ROLL: 54102007600
BILGER SLINGER SERVICES INC.
494 HIGHWAY 3, COURTLAND, ON, N0J 1E0
519-688-3315

SITE PLAN

DRAWING No. 1 OF 4

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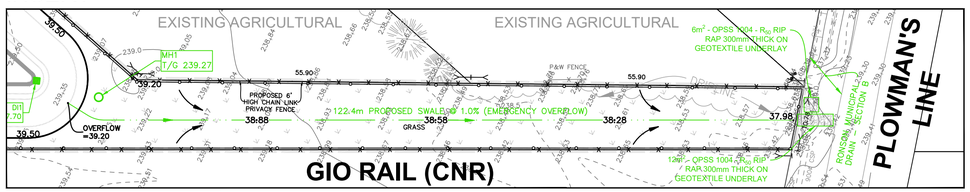

GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A STAGING/LAY DOWN LOCATION SUBJECT TO THE APPROVAL OF THE ENGINEER. SITE ACCESS WILL BE VIA THE EXISTING GRAVEL DRIVEWAY AT THE NORTH-WEST SITE LIMIT EXTENDING FROM HIGHWAY 3. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE SITE ACCESS AND ANY/ALL RESTORATION TO PRE-CONSTRUCTION CONDITION TO THE APPROVAL OF THE COUNTY OF NORFOLK.
2. THE CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND REPORT ANY DISCREPANCIES TO ENGINEERING FOR RESOLUTION BEFORE STARTING CONSTRUCTION.
3. BUILDER TO VERIFY GROUNDWATER TABLE, SOIL BEARING CAPACITY, EXTRA FOOTING REQUIREMENTS AND ANY ADJUSTMENTS REQUIRED TO T/FDN ELEVATION, ETC. PRIOR TO CONSTRUCTION.
4. ASPHALT PAVING SHALL BE SUPPLIED AND PLACED IN ACCORDANCE WITH OPSS 310 AND 1150. GRANULAR 'B' SHALL BE COMPACTED TO 98% MSPDD, AND GRANULAR 'A' SHALL BE COMPACTED TO 100% MSPDD.
5. PROFILE DESIGN FOR NEW PARKING LOT: GRAVEL AREA: 450mm GRAN 'B' / 100mm GRAN 'A' / 50mm RAP; ASPHALT AREA: 450mm GRAN 'B' / 150mm GRAN 'A' / 75mm HL8 / 50mm HL3

   ALL OTHER SOFTSCAPE AREAS SHALL RECIEVE 150mm TOPSOIL AND SEED AND BE MAINTAINED UNTIL GROWTH IS ESTABLISHED
6. RIP-RAP SHALL BE PER OPSS 1004 R_{50} INSTALLED PER OPSD 810.010 TYPE B. GEOTEXTILE SHALL BE TERRAFIX 270R OR APPROVED EQUAL.
7. TOPSOIL SHALL BE STRIPPED FOR ALL AREAS TO BE DISTURBED. TOPSOIL MAY BE USED AS FILL OUTSIDE OF PROPOSED PARKING AND BUILDING AREAS. COMPACT ALL FILL TO 95% PROCTOR IN 300 mm MAXIMUM LAYERS. AREA UNDER BUILDINGS AND PARKING AREA SHALL BE RAISED TO GRADE AS REQUIRED WITH GRANULAR (SAND ACCEPTABLE) IN 150mm LAYERS COMPACTED TO 98% PROCTOR, CERTIFIED BY GEOTECHNICAL ENGINEER.
8. THE CONTRACTOR SHALL AVOID DAMAGE TO EXISTING FENCES, TREES AND PAVEMENT AND SHALL BE RESPONSIBLE FOR THE COST OF ANY REPAIRS. TRACKING OF CLEATED EQUIPMENT WILL NOT BE PERMITTED ON PAVED SURFACES.
9. THE CONTRACTOR MUST USE LASER EQUIPMENT FOR GRADING OPERATIONS. INSTALL 1.8m T-RAIL STEEL FENCE POSTS AT ALL R.O.W. PROPERTY BARS (OR AT WOOD STAKES IF PROPERTY BARS NOT INSTALLED) BEFORE COMMENCING CONSTRUCTION IF REQUESTED. T-RAILS SHALL BE LOCATED 150mm ON STREET SIDE WITH 'T' POINTING TO BAR. THE CONTRACTOR MUST NOT DISTURB THIS CONTROL.
10. ANY SUMP PUMPS REQUIRED FOR PROPOSED BUILDING SHALL OUTLET TO SURFACE.
11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT SHOULD WORK WITHIN THE R.O.W. BE REQUIRED.
12. THE CONTRACTOR SHALL AVOID DAMAGE TO EXISTING SITE FEATURES AND SHALL BE RESPONSIBLE FOR THE COST OF ANY REPAIRS.
13. GEOTEXTILE SHALL BE TERRAFIX 270R OR APPROVED EQUAL.
14. GEOTEXTILE SHALL BE PLACED UNDER ALL CB UNTIL ROADWORK IS COMPLETE. GEOTEXTILE SHALL BE CHANGED AND MAINTAINED WEEKLY AND AFTER EVERY RAIN EVENT AT A MINIMUM.
15. ALL RAINWATER LEADERS TO OUTLET TO SURFACE.
16. SEDIMENT LOADING TO STORM SEWERS MUST BE MINIMIZED AT ALL TIMES INCLUDING PRIOR TO CONSTRUCTION, BY PLACING SILT FENCES (WITH STRAW BALES, IF REQUIRED) AROUND WORK SITE AS SHOWN IN PLAN. SEDIMENT CONTROLS MUST BE CHECKED, CLEANED AND MAINTAINED BY CONTRACTOR AS DIRECTED UNTIL PROJECT IS ACCEPTED. THE CONTRACTOR SHALL RETURN TO REMOVE THE SILT FENCES AND/OR STRAW BALES UPON ESTABLISHMENT OF GROWTH AT NO EXTRA COST. ANY ACCUMULATED SILT SHALL BE REMOVED AT REGULAR INTERVALS AT NO ADDITIONAL COST TO THIS PROJECT.
17. THE CONTRACTOR SHALL INSTALL ANY SILT CONTROL MEASURES REQUIRED TO STOP SILT MIGRATION FROM ENTERING STORM SEWERS OR DRAINS TO THE SATISFACTION OF THE MINISTRY OF NATURAL RESOURCES, LONG POINT REGION CONSERVATION AUTHORITY, MINISTRY OF ENVIRONMENT OR ANY OTHER REGULATORY AGENCY OR MINISTRY, AND IN PARTICULAR, THE GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES (MNRF). THE CONTRACTOR SHALL ASSUME THE DEFENSE OF AND INDEMNIFY AND SAVE HARMLESS BILGER STRINGER SERVICES INC. AND CYRIL J. DEMEYERE LTD. FROM ALL FINES, CHARGES AND CLAIMS RELATING TO THE PROJECT FROM ANY REGULATORY AGENCY OR MINISTRY.
18. THE OWNER'S CONSULTING ENGINEER SHALL' CERTIFY IN WRITING THAT ALL SITE WORK, GRADING AND SERVICING HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE APPROVED DRAWINGS.
19. ALL EXTERIOR LIGHTING TO BE DESIGNED TO BE ENERGY EFFICIENT,DIRECTED DOWNWARDS, AND LOCATED OR ARRANGED TO DEFLECT GLARE AWAY FROM ADJACENT RESIDENTIAL USES, STREETS AND THE NIGHT SKY AND TO AVOID CAUSING NUISANCE TO ADJACENT PROPERTY OWNERS, OR ANY CONFUSION WITH TRAFFIC SIGNALS. ALL OUTDOOR LIGHTING SHALL BE DARK SKY COMPLIANT.
20. DATUM IS GEODETIC, RELATED TO MNR BENCHMARK 19688035, A BRASS TABLET SET IN THE EAST FACE OF THE CONCRETE FOUNDATION OF ONE AND ONE-HALF STOREY FRAME HOUSE, ON THE SOUTH SIDE OF HWY #3, 1.0km EAST OF JACKSON ROAD, 23m SOUTH OF CENTER OF PAVEMENT. TABLET IS 4.45m SOUTH OF N.E. CORNER, 0.40m BELOW FRAMEWORK. OTHER BENCHMARKS SHOWN ON THE DRAWINGS ARE NOT GUARANTEED BY CYRIL J. DEMEYERE LIMITED (CJDL).
21. NO EXTERNAL LOADING SPACES SHOWN ON PLAN. EXTERNAL LOADING MAY TAKE PLACE AROUND OUTDOOR AGGREGATE STORAGE AREA.
22. SOLID WASTE WILL BE STORED WITHIN BUILDINGS OR OUTSIDE BINS AS SHOWN FOR PRIVATE PICKUP & DISPOSAL.

SEPT 12, 2023 –

TEST PIT INVESTIGATION

TEST PIT	GROUND ELEVATION (m)	DEPTH (m)	TEST PIT LAYERS
1	239.54	4.2 (ELEV. 235.34)	0.0–0.3m TOPSOIL 0.3–0.8m SAND 0.8–2.5m BROWN CLAY 2.5–4.2m GREY CLAY

STORMWATER MANAGEMENT

	PROPOSED	C – VALUE	
CONTROLLED TRIBUTARY	2.77 Ha	0.46 (AVG)	
LANDSCAPED AREA	0.65 Ha	0.15	
GRAVEL	1.39 Ha	0.70	
ASPHALT/CONCRETE	0.17 Ha	0.95	
BUILDINGS	0.34 Ha	0.95	
FIRE & SWM POND	0.22 Ha	0.95	
SWM	REQUIRED	PROVIDED	MAX PONDING DEPTH
STORAGE (m^3) 2YR	489 m^3	497 m^3	0.32m (238.02)
STORAGE (m^3) 5YR	809 m^3	818 m^3	0.50m (238.20)
STORAGE (m^3) 100YR	2933 m^3	2960 m^3	1.42m* (239.12)

LEGEND

- 242.90 PROPOSED GROUND ELEVATIONS
- 242.90 EXISTING GROUND ELEVATIONS
- 6 LOT NUMBER
- D.B., W.O. DAYLIGHT BASEMENT, WALKOUT
- MAJOR FLOW
- ORIGINAL ELEVATIONS (MAY NOT BE VALID NOW)
- METRIC CONTOUR ELEVATIONS IN METRES (BY CJDL SITE SURVEY)
- PROPOSED SURFACE DRAINAGE, EXISTING DITCH/SWALE
- TOE OF SLOPE, TOP OF BANK
- FENCE
- TACTILE WALKING SURFACE INDICATORS (OPSD 310.033)
- CONIFEROUS, DECIDUOUS TREE
- SHRUB
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- EXISTING/PROPOSED GRASS
- EXISTING/PROPOSED ASPHALT
- EXISTING/PROPOSED GRAVEL
- EXISTING/PROPOSED WALL MOUNTED LIGHT

STAMP:

LICENSED PROFESSIONAL ENGINEER — P.J. PENNER — 31 OCT 2024 — PROVINCE OF ONTARIO

SCALE 1:500

No.	REVISION	DATE	BY
1	ISSUED FOR SITE PLAN APPROVAL	31 OCT 2024	PJP

COUNTY OF NORFOLK - COURTLAND

CJDL Consulting Engineers
Cyril J. Demeyere Limited
P.O. Box 460, 261 Broadway
Tillsonburg, Ontario. N4G 4H8
Tel: 519-688-1000
866-302-9886
cjdl@cjdleng.com

DESIGN BY: ZDR | DRAWN BY: AK | CHECKED BY: PJP
PROJECT NO. 23044 | SURVEY BY: TPM | DATE: 31 OCT 2024

BILGER BAY SHOP
PART OF LOT 18, CONCESSION 2
ROLL: 54102007600
BILGER SLINGER SERVICES INC.
494 HIGHWAY 3, COURTLAND, ON, N0J 1E0
519-688-3315

GRADING PLAN

DRAWING No. 2 OF 4

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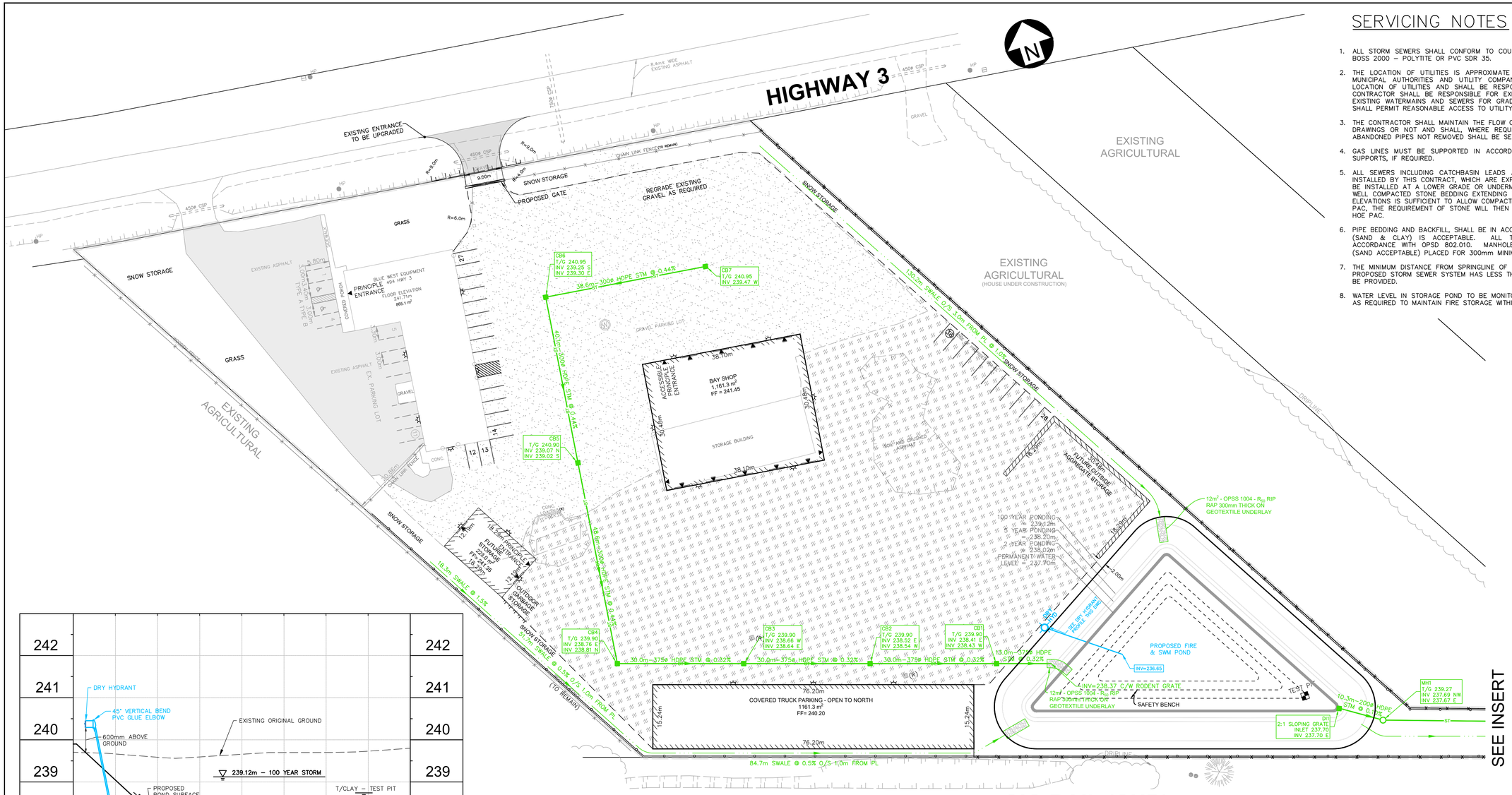
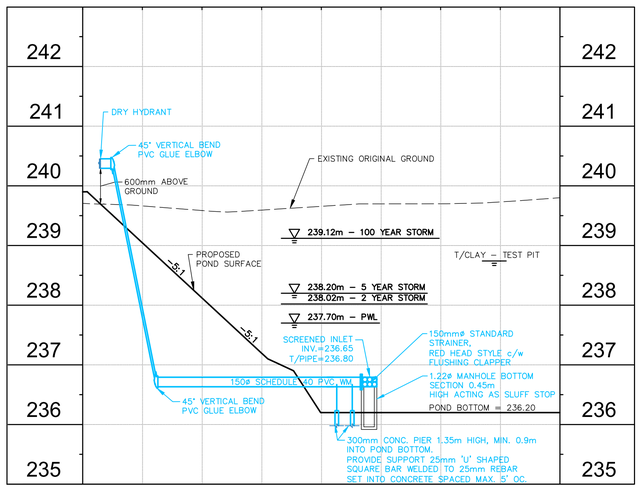
SERVICING NOTES

1. ALL STORM SEWERS SHALL CONFORM TO COUNTY OF NORFOLK DESIGN CRITERIA. PIPES SHALL BE HDPE BOSS 2000 – POLYTITE OR PVC SDR 35.
2. THE LOCATION OF UTILITIES IS APPROXIMATE ONLY AND SHOULD BE DETERMINED BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES CONCERNED. THE CONTRACTOR SHALL PROVE THE LOCATION OF UTILITIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION FROM DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXPOSING ALL POTENTIALLY CONFLICTING UTILITIES, INCLUDING EXISTING WATERMAINS AND SEWERS FOR GRADE CHECKS BEFORE LAYING ANY PIPES. THE CONTRACTOR SHALL PERMIT REASONABLE ACCESS TO UTILITY COMPANIES TO ADJUST UTILITIES IN CONFLICT.
3. THE CONTRACTOR SHALL MAINTAIN THE FLOW OF ALL EXISTING DRAINS ENCOUNTERED, WHETHER SHOWN ON DRAWINGS OR NOT AND SHALL, WHERE REQUESTED, CONNECT THE DRAINS INTO STORM SEWERS. ANY ABANDONED PIPES NOT REMOVED SHALL BE SEALED WITH CEMENT MORTAR.
4. GAS LINES MUST BE SUPPORTED IN ACCORDANCE WITH ENBRIDGE GAS SPECIFICATIONS FOR GAS LINE SUPPORTS, IF REQUIRED.
5. ALL SEWERS INCLUDING CATCHBASIN LEADS AND PRIVATE DRAIN CONNECTIONS, WHETHER EXISTING OR INSTALLED BY THIS CONTRACT, WHICH ARE EXPOSED BY A TRENCH, EXCAVATED FOR A PIPE CROSSING TO BE INSTALLED AT A LOWER GRADE OR UNDERMINED FOR ANY OTHER REASON, SHALL BE SUPPORTED WITH WELL COMPACTED STONE BEDDING EXTENDING TO THE LOWER PIPE BEDDING. IF THE DIFFERENCE IN PIPE ELEVATIONS IS SUFFICIENT TO ALLOW COMPACTION OF BACKFILL BELOW THE UNDERMINED PIPE WITH A HOE PAC, THE REQUIREMENT OF STONE WILL THEN BE REDUCED TO THE DEPTH OF BEDDING INACCESSIBLE BY HOE PAC.
6. PIPE BEDDING AND BACKFILL, SHALL BE IN ACCORDANCE WITH DETAIL, DRAWING 4. CLEAN NATIVE BACKFILL (SAND & CLAY) IS ACCEPTABLE. ALL TRENCH BACKFILL SHALL BE UNIFORMLY COMPACTED IN ACCORDANCE WITH OPSD 802.010. MANHOLES AND CATCHBASINS SHALL HAVE GRANULAR BACKFILL (SAND ACCEPTABLE) PLACED FOR 300mm MINIMUM ON ALL SIDES.
7. THE MINIMUM DISTANCE FROM SPRINGLINE OF THE PIPE TO THE FINISHED GRADE SHALL BE 1.2m. IF THE PROPOSED STORM SEWER SYSTEM HAS LESS THAN THE MINIMUM DEPTHS, THEN PROPER INSULATION SHALL BE PROVIDED.
8. WATER LEVEL IN STORAGE POND TO BE MONITORED BY OWNER AND TOPPED UP USING THE ON SITE WELL AS REQUIRED TO MAINTAIN FIRE STORAGE WITHIN POND.



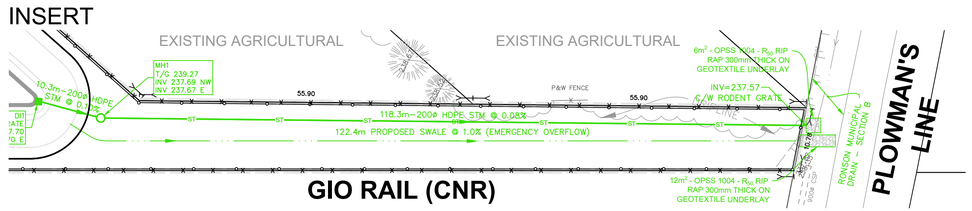
GIO RAIL (CNR)



DRY HYDRANT PROFILE

H. SCALE 1:250 V. SCALE 1:50

INSERT



GIO RAIL (CNR)

FIRE STORAGE		
	ELEVATION	STORAGE
PERMANENT WATER LEVEL	237.70	1232m³
B/ICE 0.6m ALLOWANCE	237.10	537m³
T/SEDIMENT 0.6m ALLOWANCE	236.80	313m³
FIRE STORAGE PROVIDED		224m³
FIRE STORAGE REQUIRED*		191m³

LEGEND

242.90	PROPOSED GROUND ELEVATIONS
242.90	EXISTING GROUND ELEVATIONS
6	LOT NUMBER
D.B. , W.O.	DAYLIGHT BASEMENT, WALKOUT
	MAJOR FLOW
234.37	ORIGINAL ELEVATIONS (MAY NOT BE VALID NOW)
233.0	METRIC CONTOUR ELEVATIONS IN METRES (BY CJDL SITE SURVEY)
	PROPOSED SURFACE DRAINAGE, EXISTING DITCH/SWALE
	TOE OF SLOPE, TOP OF BANK
x x	FENCE
	TACTILE WALKING SURFACE INDICATORS (OPSD 310.033)
	CONIFEROUS, DECIDUOUS TREE
	SHRUB
	EDGE OF BUSH/DRIP LINE
	SILT FENCE
MH	EXISTING/PROPOSED MANHOLE
CO	EXISTING/PROPOSED CLEAN OUT
CB	EXISTING/PROPOSED CATCH BASIN
WV	EXISTING/PROPOSED VALVE
CS	EXISTING/PROPOSED CURB STOP
HYD	EXISTING/PROPOSED DRY HYDRANT
SIGN	SIGN
UP	UTILITY PEDESTAL
BH	GEOTECHNICAL BORE HOLE
	EXISTING/PROPOSED GRASS
	EXISTING/PROPOSED ASPHALT
	EXISTING/PROPOSED GRAVEL
	EXISTING/PROPOSED WALL MOUNTED LIGHT

STAMP:

LICENSED PROFESSIONAL ENGINEER — P.J. PENNER — 31 OCT 2024 — PROVINCE OF ONTARIO

SCALE 1:500

No.	REVISION	DATE	BY
1	ISSUED FOR SITE PLAN APPROVAL	31 OCT 2024	PJP

COUNTY OF NORFOLK - COURTLAND

CJDL Consulting Engineers
Cyril J. Demeyere Limited
P.O. Box 460, 261 Broadway
Tillsonburg, Ontario. N4G 4H8
Tel: 519-688-1000
866-302-9886
cjdl@cjdleng.com

BILGER BAY SHOP
PART OF LOT 18, CONCESSION 2
ROLL: 54102007600
BILGER SLINGER SERVICES INC.
494 HIGHWAY 3, COURTLAND, ON, N0J 1E0
519-688-3315

SERVICING PLAN

DESIGN BY: ZDR	DRAWN BY: AK	CHECKED BY: PJP
PROJECT NO. 23044	SURVEY BY: TPM	DATE: 31 OCT 2024

DRAWING No. 3 OF 4

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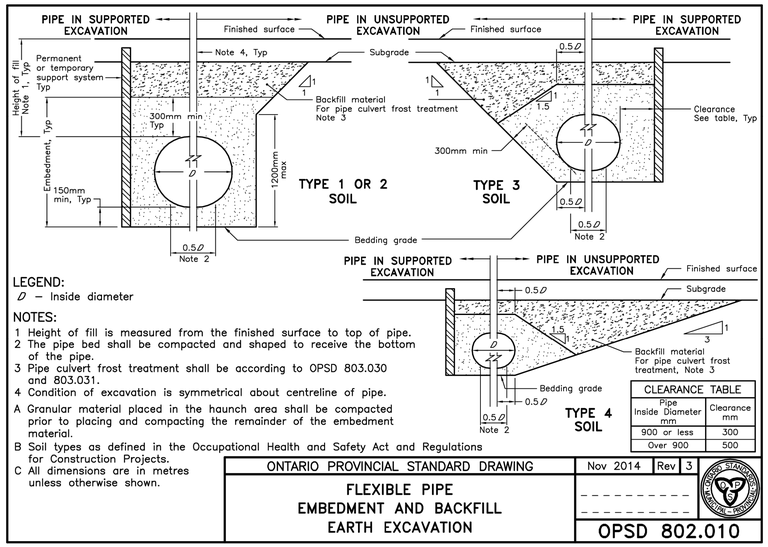
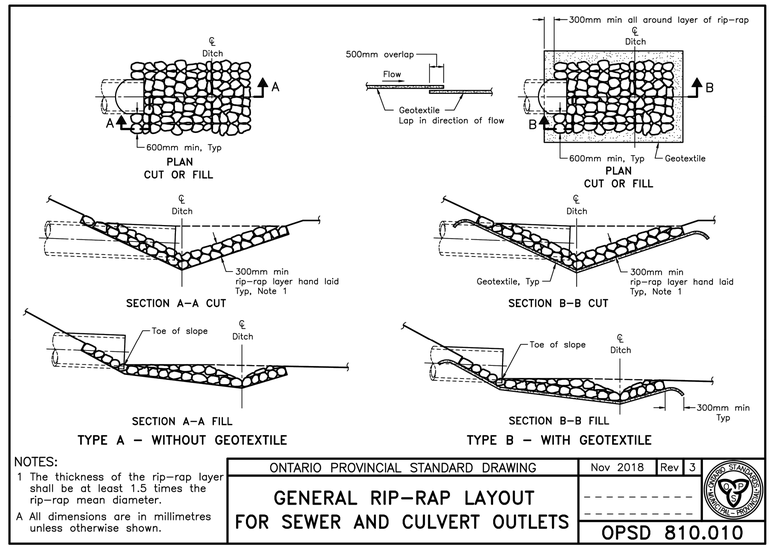


LEGEND:
D – Inside diameter

NOTES:
1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.
A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.
B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
C All dimensions are in metres unless otherwise shown.

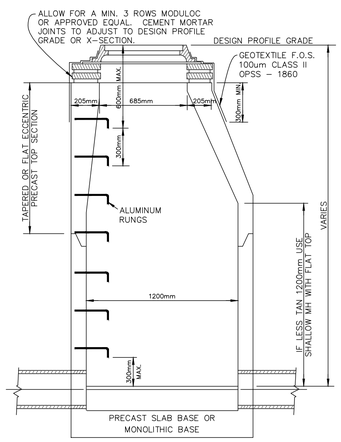
CLEARANCE TABLE	
Pipe Inside Diameter mm	Clearance mm
900 or less	300
Over 900	500

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2014	Rev 3
FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION		
	OPSD 802.010	



NOTES:
1 The thickness of the rip-rap layer shall be at least 1.5 times the rip-rap mean diameter.
A All dimensions are in millimetres unless otherwise shown.

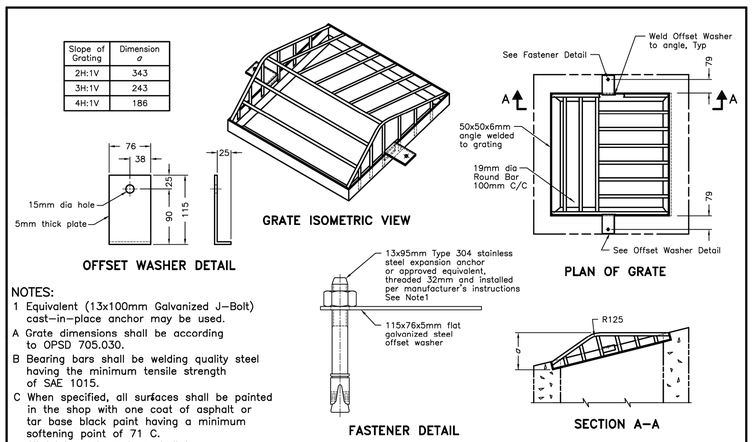
ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2018	Rev 3
GENERAL RIP-RAP LAYOUT FOR SEWER AND CULVERT OUTLETS		
	OPSD 810.010	



PRECAST MANHOLE
N.T.S.

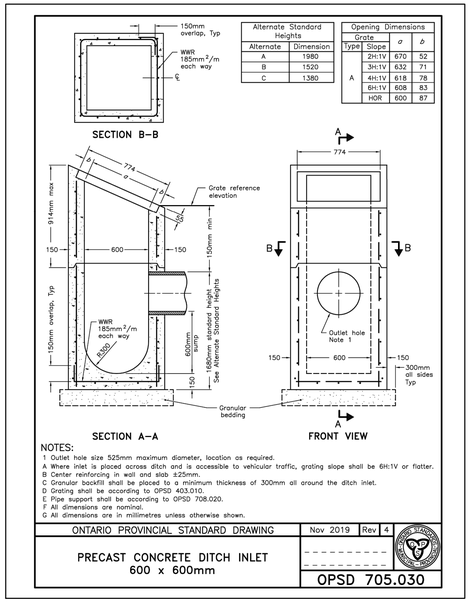
MANHOLE NOTES

1. PRECAST SECTIONS SHALL COMPLY WITH CURRENT OPSD 700 SERIES FOR PRECAST CONCRETE MANHOLES. PREBENCHED MANHOLES ARE ACCEPTABLE.
2. ON OVERSIZED MANHOLES, THE TRANSITION TO 1200mm SHALL NOT BE LESS THAN 1.5m ABOVE MAINLINE OVERT.
3. FIRST PIPE JOINT TO BE WITHIN 300 mm OF OUTSIDE MANHOLE WALL. OTHERWISE CONCRETE CRADLE SUPPORT TO FIRST JOINT. (CLASS 'B' BEDDING ACCEPTABLE ON PIPES 450mmø & LARGER).
4. PVC AND POLYETHYLENE PIPE SHALL BE CONNECTED TO MANHOLES WITH FACTORY SAND COATED PVC STUB OR KOR-N-SEAL COUPLING.
5. BENCHING ON END MANHOLES TO EXTEND TO FAR INSIDE WALL. BENCHING ON LATERAL INLETS SHALL BE 500mm C RADIUS. BENCHING TO CONFORM TO OPSD 701.021. MANHOLES SHALL BE PREBENCHED FOR ALL PDCs / LATERALS.
6. TOP LADDER RUNG SHALL NOT EXCEED 600 mm FROM FINISHED GRADE. MANHOLES OVER 5.0m DEEP SHALL INCLUDE SAFETY GRATE PER OPSD 404.020.
7. MANHOLE FRAMES AND GRATES SHALL BE; O.P.S.D. 401.010 – CLOSED COVER MANHOLE COVERS SHALL BE SET ON GEOTEXTILE F.O.S. 250 um CLASS II O.P.S.S. 1860 UNTIL STREET IS PAVED.
8. CEMENT MORTAR USED FOR SETTING OF PIPES, BENCHING, ADJUSTMENT & SETTING OF FRAMES FOR CATCHBASINS & MANHOLES, SHALL CONSIST OF ONE PART NORMAL PORTLAND CEMENT TO TWO PARTS MASONRY SAND WITH ONLY SUFFICIENT WATER TO MAKE THE MIXTURE PLASTIC. ADJUSTMENT RINGS TO BE PARGED ON OUTSIDE; INSIDE JOINTS TO BE POINTED ONLY, NOT PARGED.
9. GRANULAR BACKFILL SHALL BE PLACED TO A MIN. WIDTH OF 300mm ALL AROUND MANHOLES, IN 300 mm MAX. LIFTS COMPACTED TO 95% STANDARD PROCTOR.
10. ADJUSTMENTS IN EXCESS OF 300mm SHALL BE MADE WITH PRECAST RISER SECTIONS. NO STEPS SHALL BE INSTALLED IN CONCRETE ADJUSTMENTS UNITS.
11. IN AREAS OF HIGH GROUNDWATER, WATERPROOFING OF MANHOLES AND CHAMBERS IS REQUIRED AS PER COUNTY GUIDELINES. SEALTIGHT MEL-ROL WATERPROOFING SYSTEM AS MANUFACTURED BY W.R. MEADOWS OR APPROVED EQUAL.
12. EXTERNAL DROP STRUCTURE PER OPSD 1003.010 SHALL BE PROVIDED IN MANHOLES WHEN THE DIFFERENCE IN ELEVATION BETWEEN INVERTS OF THE INLET PIPE AND AN OUTLET PIPE EXCEED 0.9m FOR STORM AND 0.6m FOR SANITARY.
13. ALL CATCHBASINS MANHOLES (CBMH) ARE TO BE BENCHED UNLESS OTHERWISE NOTES ON DESIGN DRAWINGS OR DIRECTED ON-SITE BY ENGINEER.



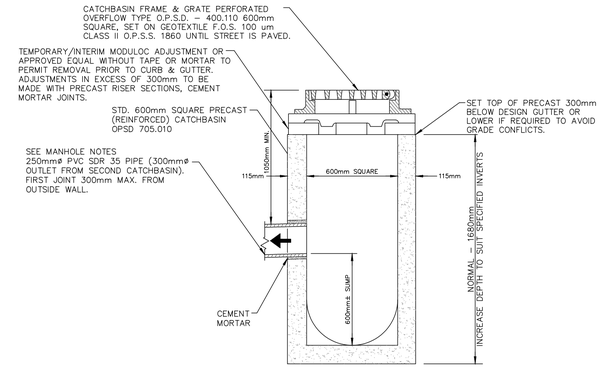
NOTES:
1 Equivalent (13x100mm Galvanized J-Bolt) cast-in-place anchor may be used.
A Grate dimensions shall be according to OPSD 705.030.
B Bearing bars shall be welding quality steel having the minimum tensile strength of SAE 1015.
C When specified, all surfaces shall be painted in the shop with one coat of asphalt or tar base black paint having a minimum softening point of 71 C. All joints and crevices shall be thoroughly coated.
D Bearing bars shall be welded to angle bar along both legs with a 5mm fillet weld.
E All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2017	Rev 1
RAISED BAR GRATE FOR DITCH INLET 600 x 600mm		
	OPSD 403.011	



NOTES:
1 Outlet hole size 525mm maximum diameter, location as required.
A Where inlet is placed across ditch and is accessible to vehicular traffic, grating slope shall be 6H:1V or flatter.
B Center reinforcing in wall and slab ±25mm.
C Granular backfill shall be placed to a minimum thickness of 300mm all around the ditch inlet.
D Grating shall be according to OPSD 403.010.
E Pipe support shall be according to OPSD 708.020.
F All dimensions are nominal.
G All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2019	Rev 4
PRECAST CONCRETE DITCH INLET 600 x 600mm		
	OPSD 705.030	



WHERE DOUBLE CATCHBASINS ARE DESIGNATED, USE TWIN INLET PRECAST CATCHBASINS (OPSD 705.020)
PRECAST UNITS MUST BE ALIGNED DIRECTLY UNDER PROPOSED FRAME & GRATE LOCATION. DEVIATIONS FROM ABOVE REQUIRE AUTHORIZATION FROM ENGINEER PRIOR TO INSTALLATION OF PRECAST CATCHBASIN.

STANDARD CATCHBASIN
N.T.S.

STAMP:

No.	REVISION	DATE	BY
1	ISSUED FOR SITE PLAN APPROVAL	31 OCT 2024	PJP

COUNTY OF NORFOLK - COURTLAND

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GENERAL DETAILS

DESIGN BY: ZDR | DRAWN BY: AK | CHECKED BY: PJP
PROJECT NO. 23044 | SURVEY BY: TPM | DATE: 31 OCT 2024
DRAWING No. 4 OF 4

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