
Volume 1, Section 5 Snake Lake Reservoir Expansion Project

Project Description

Transportation Infrastructure and Traffic Impact Assessment



Prepared by:



a division of **Englobe**

MPE Engineering
A division of Englobe
Lethbridge, Alberta

On Behalf of:



Eastern Irrigation District
Brooks, Alberta

With support from:



AAR Environmental Services
Calgary, Alberta

March 26, 2025

AARES Project #: 21-127

Executive Summary

The Eastern Irrigation District is applying for approval under the *Environmental Protection and Enhancement Act* to construct the proposed Snake Lake Reservoir Expansion Project (the Project). The Project, located between Bassano and Brooks in Alberta, involves the construction of a roughly 8 km long, 20 m high dam to increase the storage capacity of the reservoir system from 19.25 million m³ to 87.4 million m³. This document provides an assessment of transportation infrastructure, including a Traffic Impact Assessment (TIA), in relation to the Project and surrounding areas. This section meets the requirements outlined in the Final Terms of Reference (FTOR) for transportation infrastructure.

Changes in traffic volume and timing are predicted to increase over the phases of construction of the Project but return to baseline levels post-development. Through communication with the County of Newell (County), traffic considerations regarding construction and development of the Project have been identified and recommendations for furthering communication with various stakeholders regarding these considerations has been made.

In addition, through analysis of intersection geometry and sight distance, historical collision data, traffic volumes, turn lane warrant analysis, swept path analysis, and County consideration, the TIA makes several recommendations:

- Maintain the study intersection layouts to accommodate the post-development (temporary construction traffic) traffic conditions.
- Complete a pavement condition assessment at the study roadways before and after the development construction and provide roadway maintenance, as required.
- Develop a traffic accommodation plan during each development phase, to ensure safe and proper accommodation of the temporary post-development construction traffic.
- Use specific intersections for certain trips, for example, using the intersection of Highway (Hwy) 539 and Township Road (Twp Rd) 174 for inbound trips only (Left-turn from Hwy 539 into Twp Rd 174)
- Explore partnership/agreement opportunities with the County of Newell to complete surface pavement and maintenance of the roadways within County limits that are impacted by construction traffic.
- Provide on-going maintenance of the Project roadways used by construction traffic (within County limits) to minimize roadway pavement and structural impacts.

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Abbreviations

ATEC	Alberta Transportation and Economic Corridors
EID	Eastern Irrigation District
ERAP	Emergency Response Assistance Plan
FTOR	Final Terms of Reference
GOA	Government of Alberta
GOC	Government of Canada
Hwy	Highway
MPE	MPE a division of Englobe
RR	Range Road
TIA	Traffic Impact Assessment
Twp Rd	Township Road

5.1 TRANSPORTATION INFRASTRUCTURE ASSESSMENT

MPE a division of Englobe (MPE) was retained by the Eastern Irrigation District (EID) to prepare a Transportation Infrastructure Assessment to support the proposed infrastructure development. The assessment includes a Traffic Impact Assessment (TIA), traffic considerations, infrastructure considerations, communication documentation and dangerous goods considerations. The following subsections address the Final Terms of Reference (FTOR; Volume 2, Appendix A).

MPE prepared a TIA in accordance with the *Transportation and Economic Corridors' Traffic Impact Assessment Guidelines* (Government of Alberta [GOA], 2021). The requirements of the TIA were discussed and agreed upon with Alberta Transportation and Economic Corridors (ATEC) and the County of Newell (County).

MPE submitted the TIA, titled *Eastern Irrigation District Snake Lake Reservoir Expansion Traffic Impact Assessment*, on November 8, 2024. On December 6, 2024, ATEC accepted the conclusions and recommendations of the report. The TIA report and letter of acceptance are provided in Attachment 5A and B.

5.2 TRAFFIC CONSIDERATIONS

The following traffic considerations were requested to be addressed within the FTOR.

5.2.1 Traffic Maps

A map of the Project and network are included within the TIA document (Attachment 5B: TIA Appendix B).

5.2.2 Options Considered

Three potential truck routes were identified in the TIA Report: Two truck routes to provide materials from the material pits to the Project construction site, and one commuting route for the construction site (Attachment 5B: TIA Section 1.2).

The truck traffic route from the EID Eyremore Pit to the Project site was the only viable option which provides a direct route between both sites. Alternatives to the anticipated truck traffic route from Dennis Dirtworx Ltd. Pit to the Project site were reviewed. The evaluation shows that the alternative routes from Dennis Dirtworx Ltd. Pit to the construction site via Highway (Hwy) 526, Hwy 36, and Hwy 1 (Trans-Canada Highway) were not as desirable due to the high number of left turns, which pose safety risks and potential traffic disruptions.

5.2.3 Preferred Option Compatibility

In reviewing the preferred option, ATEC did not identify any future highway plans that would impact the selected routes or any concerns with the selected route.

5.2.4 Traffic Cumulative Effects

Existing traffic conditions, historical data, and consideration of post-development traffic that may impact the area as a result of the Project are presented in the TIA (Attachment 5B: TIA Sections 2 & 3.3).

5.2.5 Schedule of Work

The anticipated schedule for the recommendations and considerations from the TIA report is summarized in Table 5-1.

Table 5-1: Anticipated schedule for the recommendations of the TIA report

TIA Recommendation	Schedule
Pavement condition assessment before and after construction (coordination with the County of Newell).	Before July 2025 and after the end of construction.
Traffic accommodation plan (before construction and required updates).	Before July 2025 and upgrades as per Project phases.
Provide signage and discuss the recommended truck traffic accommodation at the intersections of Highway (Hwy) 539 and Township Road (Twp Rd) 174, and Hwy 539 and Range Road 171.	Before July 2025.
Mitigation of dust and noise.	Before July 2025.
Meet with the County and discuss road-bans, on-going maintenance, and partnerships opportunities.	Before July 2025.
Coordinate with Canadian Pacific Kansas City for the use of the at-grade crossing along Twp Rd 200, if required.	Before July 2025.

5.3 INFRASTRUCTURE CONSIDERATIONS

Other Project impacts that may affect highway users, including PM_{2.5} and noise effects, are reviewed in the Air Quality section (Volume 2, Section 4.5) and Noise section (Volume 2, Section 5.5), respectively.

5.4 COMMUNICATION DOCUMENTATION

5.4.1 ATEC Communication Summary

On July 22, 2024, MPE held a meeting with ATEC to discuss and review the ATEC's specific requirements for this Project. ATEC confirmed that a TIA was required by their department. The following are key requirements and considerations that were identified in the meeting:

- Requirements for TIA:
 - Study periods should include both during and after material distribution and construction, as applicable (if there is any site traffic after construction).
 - Traffic generation should consider both construction and staff traffic.
 - Study intersections are selected along the construction route.
 - Include the intersection of Hwy 539 and Township Road (Twp Rd) 171 in the analysis.
 - Capacity analysis is not required as the number of site trips appears to be low.
 - Collision review and traffic safety assessment are required (see Attachment 5B: TIA Section 2.2).

- Turn lane warrant analysis is required (see Attachment 5B: TIA Section 4, Table 4.1).
- Other Considerations:
 - Off-site developments or future highway improvements are not anticipated within the study horizons.

5.4.2 County Communication Summary

On August 12, 2024, MPE held a meeting with the County to discuss and review the County's specific requirements for this Project. A TIA is not required by the County; however, a development permit is required. The following are key items identified in the meeting:

- **General information:**
 - Twp Rd 182, Twp Rd 200, Range Road (RR) 162, and the Service Road along East Branch Canal are private roads used as oil field trails and are not maintained by the County.
 - The TIA study area has minimal residences.
 - The County plans to pave RR 171 and Twp Rd 182 (timeline unknown).
 - The County is planning for future maintenance of Twp Rd 184.
- **County traffic considerations for the Project:**
 - There are no traffic concerns; therefore, the County does not require a TIA.
 - The County suggests completing the turn warrant analysis for the intersection of Hwy 539 and RR 171 (see Attachment 5B: TIA Section 4, Table 4.1).
- **Other County considerations:**
 - The County will require a traffic accommodation strategy (plan) including provisions for traffic detours and public access during the temporary construction traffic conditions.
 - The County requires that the Project provides mitigation measures for dust and noise control along RR 171 to minimize potential impact on the residents.
 - The Project owner (EID) should discuss road bans with the County.
 - The County requires on-going maintenance of the Project roadways used by construction traffic (within County limits) to minimize roadway pavement and structural impacts.
 - It is recommended to complete a pavement assessment on the Project roadways within County limits to ensure roadway structures are adequate for the anticipated construction traffic.
 - It is recommended to explore a potential partnership between the County and the Project owner (EID) to come up with an agreement to complete surface pavement and maintenance of the roadways within the County limits that are impacted by Project construction traffic.

- It is recommended to undertake a geometric assessment for the intersections at Hwy 539 and RR 171, and Hwy 539 and Twp Rd 174, including swept path analysis (see Attachment 5B: TIA Section 5.0).
- This Project requires a development permit approval by the County.
- It is recommended to coordinate with Canadian Pacific Kansas City for the use of the at-grade crossing along Twp Rd 200, if required.
- Off-site developments are not anticipated within the study horizons.

5.5 DANGEROUS GOODS CONSIDERATIONS

The Project has limited plans for the shipping of dangerous goods, as defined under the *Transportation of Dangerous Goods Act* (Government of Canada [GOC], 1992) and *Regulations* (GOC, 2001). Project construction is expected to make use of refuelling trucks, however, which would fall under this legislation. The contractors hired by EID will follow all requirements for the transportation of gasoline (UN 1202), diesel (UN 1203) and any other fuels or substances that fall under Schedule 1 of the Regulations (GOC, 2001). The contractor will be responsible for development and approval of an Emergency Response Assistance Plan (ERAP), for the transportation of these fuels and any other substances that require an ERAP.

5.6 REFERENCES

- Government of Alberta (GOA). (2021). Traffic Impact Assessment Guidelines. Edmonton. Retrieved from <https://open.alberta.ca/publications/traffic-impact-assessment-guidelines#detailed>
- Government of Canada (GOC). (1992). Transportation of Dangerous Goods Act (S.C. 1992, c. 34). *Current to February 18, 2025*. Retrieved March 2025, from <https://laws-lois.justice.gc.ca/eng/acts/t-19.01/>
- GOC. (2001). Transportation of Dangerous Goods Regulations (SOR/2001-286). *Current to February 17, 2025*. Retrieved March 2025, from <https://laws-lois.justice.gc.ca/eng/regulations/sor-2001-286/page-3.html>

Attachment 5

Attachments

Attachment 5A: Alberta Transportation and Economic Corridors Traffic Impact Assessment
Review and Approval 1

Attachment 5B: Snake Lake Reservoir Expansion Traffic Impact Assessment..... 2

Attachment 5A: Alberta Transportation and Economic Corridors Traffic Impact Assessment Review and Approval

Alberta Transportation and Economic Corridors

Traffic Impact Assessment Review

Permit Number :	RPATH0047032	Highway(s):	
Applicant Name:	MPE a division of Englobe jarango@mpe.ca		
Legal Land Location:	RA QS-NW SEC-29 TWP-019 RGE-16 MER-4	Municipality:	County of Newell
Decision By:	Leah Olsen	Issuing Office:	Southern Region / Lethbridge
Issued Date:	December 6, 2024		
Project Scope:	Submission of Traffic Impact Assessment		
Description of Development:	<p>As part of the Snake Lake Reservoir Expansion, the Eastern Irrigation District (EID) is required to complete a provincial Environmental Impact Assessment (EIA) submission, which includes a Traffic Impact Assessment (TIA). All traffic projections, analysis, and recommendations included in the TIA report were prepared by MPE a division of Englobe (MPE) in accordance with Alberta Transportation and Economic Corridors (ATEC) and the County of Newell (County) guidelines. TIA requirements were confirmed by ATEC and the County. The Snake Lake Reservoir Expansion includes 780 hectares (ha) of reservoir expansion area and includes the following tasks:</p> <ul style="list-style-type: none">• Expanding the reservoir by constructing an 8 km earthen berm approximately 3 km to the south and 3 km to the east.• Removing all or a portion of the East Dam, including the road across the top of the dam, which will connect the existing reservoir with the reservoir expansion. <p>The proposed development consists of two phases:</p> <ul style="list-style-type: none">• Phase 1: Distribution of materials from two pits to the construction site. This phase is anticipated to take 3 years, starting in the winter of 2025 with completion at the end of 2027.• Phase 2: Construction (earthworks) of the reservoir. This phase is anticipated to take 3 years, starting in spring of 2026 with completion at the end of 2028. <p>After completion of the Snake Lake Reservoir Expansion, no significant changes in the number of staff working at the site are anticipated; therefore, changes in current traffic patterns and volumes are not anticipated for the long-term horizon.</p>		



This will acknowledge receipt of the above referenced traffic impact assessment (TIA). The department accepts the conclusions and recommendations of the TIA.

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

A Traffic Accommodation Strategy (TAS) will be required for each phase to accommodate the temporary traffic.

Please contact Transportation and Economic Corridors through the [RPATH Portal](#) if you have any questions, additions, or require additional information.



Issued by **Leah Olsen, Development and Planning Tech**, on **December 6, 2024** on behalf of the Minister of Transportation and Economic Corridors pursuant to *Ministerial Order 52/20 – Department of Transportation and Economic Corridors Delegation of Authority*

Attachment 5B: Snake Lake Reservoir Expansion Traffic Impact Assessment



a division of Englobe

Final Report for:

EASTERN IRRIGATION DISTRICT

Snake Lake Reservoir Expansion Traffic Impact Assessment

Date: November 8, 2024
Project Number: 1560-193-00

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www.mpe.ca

Eastern Irrigation District
550 Industrial Road West
P.O. Box 128
Brooks, AB, T1R 1B2

November 8, 2024
File: N:\1560-193-00\L01

Attention: Ryan Gagley, P.L.(Eng), Engineering Manager

Dear Mr. Gagley:

Re: Snake Lake Reservoir Expansion Traffic Impact Assessment

MPE a Division of Englobe (MPE) is pleased to submit our Traffic Impact Assessment Final Report in support of the proposed Snake Lake Reservoir Expansion located within Townships 19 and 20, Ranges 16 and 17, W4M, approximately 15 kilometers (km) southeast of the Town of Bassano and 32 km northwest of the City of Brooks, Alberta.

All traffic projections, analysis, and recommendations included herein were prepared by MPE in accordance with Alberta Transportation and Economic Corridors (ATEC) and the County of Newell (County) guidelines.

We appreciate the opportunity to provide our services for this project. Should you have any questions or require additional information, please contact the undersigned at (780) 486-2000 or jarango@mpe.ca.

Yours truly,

MPE a division of Englobe



Jorge Arango, P.Eng.
Transportation Engineer

CORPORATE AUTHORIZATION

This report has been prepared by MPE a division of Englobe (MPE) under authorization of the Eastern Irrigation District (EID). The material in this report represents the best judgment of MPE given the available information. Any use that a third party makes of this report, or reliance on or decisions made based upon it is the responsibility of the third party. MPE accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or actions taken based upon this report.

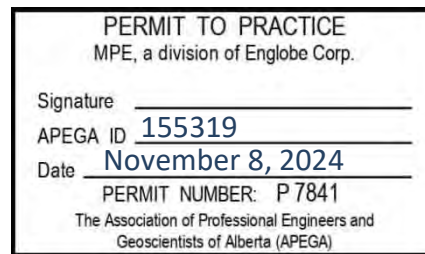
Should any questions arise regarding content of this report, please contact the undersigned.

MPE a division of Englobe (MPE).



November 8, 2024

Jorge Arango, P.Eng.



Professional Seal

Corporate Permit

EXECUTIVE SUMMARY

MPE a division of Englobe (MPE) was retained by Eastern Irrigation District (EID) to prepare a Traffic Impact Assessment (TIA) to support the proposed Snake Lake Reservoir Expansion Project. The Snake Lake Reservoir Expansion includes 780 hectares (ha) of reservoir expansion area and includes the following tasks:

- Expanding the reservoir by constructing an 8 km earthen berm approximately 3 km to the south and 3 km to the east.
- Removing all or a portion of the East Dam, including the road across the top of the dam, which will connect the existing reservoir with the reservoir expansion.

The proposed development consists of two phases:

- Phase 1: Distribution of materials from two pits to the construction site. This phase is anticipated to take 3 years, starting in the winter of 2025 with completion at the end of 2027.
- Phase 2: Construction (earthworks) of the reservoir. This phase is anticipated to take 3 years, starting in spring of 2026 with completion at the end of 2028.

After completion of the Snake Lake Reservoir Expansion, no significant changes in the number of staff working at the site are anticipated; therefore, changes on current traffic patterns and volumes are not anticipated for the long-term horizon.

Phase 1 of the proposed development is anticipated to generate:

- 8 to 24 new trips (4 to 12 in, and 4 to 12 out) during the AM and PM peak hours, and 80 to 240 new daily trips (120 in and 120 out) from Eid Eyremore Pit, from 2025 to 2027. These trips are anticipated to use County roads between the Eid Eyremore Pit and the construction site.
- 4 to 12 new trips (2 to 6 in, and 2 to 6 out) during the AM and PM peak hours, and 40 to 120 new daily trips (20 to 60 in, and 20 to 60 out) from Dennis Dirtworx Pit, from 2025 to 2027. These trips are anticipated to use the ATEC network and study intersections in addition to the County roads connecting to the construction site.

Phase 2 of the proposed development is anticipated to generate:

- 20 new trips (10 in and 10 out) during the AM and PM peak hours, and 180 new daily trips (90 in and 90 out), from 2026 to 2028.

The following are recommendations from this study:

- It is recommended to maintain the study intersection layouts to accommodate the post-development (temporary construction traffic) traffic conditions.
- It is recommended to complete a pavement condition assessment at the study roadways for before and after the development construction and provide roadway maintenance as required.
- It is recommended to develop a traffic accommodation plan during each development phase, to ensure safe and proper accommodation of the temporary post-development construction traffic.

- It is recommended to use the intersection of Hwy 539 and Twp Rd 174 for inbound trips only (Left-turn from Hwy 539 into Twp Rd 174), and the intersection of Hwy 539 and RR 171 for outbound trips only (Right-turn from RR 171 into Hwy 539). Inbound trips are those trips moving from the pit to the construction site, while outbound trips are the opposite

Other Considerations:

- It is recommended to complete a Traffic accommodation strategy (plan) including provisions for traffic detours and public access during the temporary construction traffic conditions, as required by the County.
- It is recommended to provide mitigation measures for dust and noise control along RR 171 to minimize potential impact to the residents, as required by the County.
- It is recommended that the project owner discuss road bans with the County.
- It is recommended to provide on-going maintenance of the project roadways used by the construction traffic (within County limits) to minimize roadway pavement and structural impacts.
- It is recommended to complete a pavement assessment on the project roadways within County limits to ensure roadway structure are adequate for the anticipated construction traffic.
- It is recommended to explore partnership opportunities between the County of Newell and the project owner to explore an agreement to complete surface pavement and maintenance of the roadways within the County limits that are impacted by the construction traffic (i.e., an option for co-funding road paving projects along the County's study road network).
- It is recommended to coordinate with Canadian Pacific Kansas City (CPKC) for the use of the at-grade crossing along Twp Rd 200, if required.

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1.0 INTRODUCTION

As part of the Snake Lake Reservoir Expansion, the Eastern Irrigation District (EID) is required to complete a provincial Environmental Impact Assessment (EIA) submission, which includes a transportation infrastructure analysis, as detailed below. The EIA transportation requirements include the following:

- Prepare a Traffic Impact Assessment as per the latest Transportation and Economic Corridors' *Traffic Impact Assessment Guidelines* (<https://open.alberta.ca/publications/traffic-impact-assessment-guidelines>), including the following:
 - Describe and map the project boundary, internal road network, and any existing or proposed access location to/from the provincial highway system.
 - Discuss the options considered for the proposed highway access locations and provide rationale for selecting the preferred option.
 - Discuss compatibility of the preferred option with Transportation and Economic Corridors' future highway plans.
 - Describe existing and future background traffic and development traffic, and consider the cumulative effects from other existing and planned developments that are or will be using the same highways and highway accesses.
 - Consider potential traffic impacts for all stages of the project (e.g., construction, operations, expansion, shutdown, etc.), and determine any necessary improvements to maintain the safe operation of the highway intersection and access road infrastructure.
 - Provide a schedule for undertaking the necessary improvements prior to commencing the Project.
- Provide a summary of any discussions with Alberta Transportation and Economic Corridors in regard to the project and its traffic impacts.

MPE a division of Englobe (MPE) was retained by the Eastern Irrigation District (EID) to prepare a Traffic Impact Assessment (TIA) to support the proposed infrastructure development. MPE has confirmed the TIA's requirements with both Alberta Transportation and Economic Corridors (ATEC) and the County of Newell (County).

1.1 Project Details Overview

The Snake Lake Reservoir Expansion includes 780 hectares (ha) of reservoir expansion area and includes the following tasks:

- Expanding the reservoir by constructing an 8 km earthen berm approximately 3 km to the south and 3 km to the east.
- Removing all or a portion of the East Dam, including the road across the top of the dam, which will connect the existing reservoir with the reservoir expansion.

The proposed development consists of two phases:

- Phase 1: Distribution of materials from two pits to the construction site. This phase is anticipated to take 3 years, starting in the winter of 2025 with completion at the end of 2027.
- Phase 2: Construction (earthworks) of the reservoir. This phase is anticipated to take 3 years, starting in spring of 2026 with completion at the end of 2028.

After completion of the Snake Lake Reservoir Expansion, no significant changes in the number of staff working at the site are anticipated; therefore, changes in current traffic patterns and volumes are not anticipated for the long-term horizon.

1.2 Project Boundary Description

The project is located within Townships 19 and 20, Ranges 16 and 17, W4M, approximately 15 kilometers (km) southeast of the Town of Bassano and 32 km northwest of the City of Brooks, Alberta. The reservoir is contained by two earth-fill dams; the first along the east end (East Dam) located in Section 31-19-16 W4M, and the second along the west end (West Dam) located in Section 3-20-17 W4M.

The following road segments are anticipated to be part of two routes to provide materials from the material pits to the Snake Lake Reservoir construction site, and one commuting route for the construction site employees, as illustrated in **Appendix A – Site Location and Transportation Network**.

- Truck Traffic Route from Eid Eyremore Pit to the Construction Site during Phase 1.
 - Township Road 182 east from the Eid Eyremore Pit to Range Road 171 (approx. 8.9 km).
 - Range Road 171 from Township Road 182 to Township Road 184 (approx. 3.2 km).
 - Township Road 184 from Range Road 171 to Service Road (approx. 2.3 km).
 - Service road from Township Road 184 along the East Branch Channel to the construction site (approx. 9.9 km).
- Truck Traffic Route from Dennis Dirtworx Pit to the Construction Site during Phase 1.
 - Access through a new road segment connecting to Hwy 845 (approx. 1 km roadway).
 - Highway 845 from the new road segment to Highway 539 (approx. 47.4 km).
 - Highway 539 from Highway 845 to Range Road 171 (approx. 32.3 km).
 - Range Road 171 from Highway 539 to Township Road 184 (approx. 10.0 km).
 - Township Road 184 from Range Road 171 to Service Road (approx. 2.3 km).
 - Service Road from Township Road 184 along East Branch Channel to the construction site (approx. 9.9 km).
- Commuting Route for site employees during Phase 2 (it is assumed that most employees will commute to the site from or through the City of Brooks).
 - Highway 1 from the City of Brooks to Range Road 162 (approx. 18.9 km roadway).
 - Range Road 162 from Highway 1 to Township Road 200 (approx. 1.0 km).
 - Township Road 200 from Range Road 162 to the construction site (approx. 3.3 km).

Based on the above information, the roadways that are expected to accommodate project-related truck traffic include Highway 845, Highway 539, Range Road 171, Township Road 182, Township Road 184, and the Service Road along the East Branch Channel; and the roadways expected to accommodate project-related commute traffic are Highway 1, Range Road 162, and Township Road 200.

Based on discussions with ATEC and the County, the intersections for analysis in this TIA include key intersections along the truck route from the Dennis Dirtworx Pit to the construction site, as this route runs along the provincial road network, and it is anticipated to accommodate project-related truck traffic during the weekday AM and PM peak hours. Staff traffic is anticipated to be negligible during the weekday AM and PM peak hours of analysis. The intersections for analysis in this TIA include:

- Highway 845 and Highway 522
- Highway 845 and Highway 526
- Highway 845 and Highway 529
- Highway 531 and Highway 845
- Highway 539 and Highway 845
- Highway 539 and Range Road 171

Weekday morning (AM) and afternoon (PM) peak hours were identified as the hours of interest for traffic operations on the project roadways and are assessed accordingly in this study. Estimates of daily traffic volumes are also provided.

In consideration of the proposed development phases, and based on discussions with ATEC, the 2027 horizon is selected for traffic analysis. The 2027 horizon corresponds to the peak of construction traffic and includes traffic generated during both Phase 1 and Phase 2 of the development, representing the worst traffic condition scenario.

2.0 EXISTING CONDITIONS

2.1 Existing Transportation Network

Characteristics of the existing transportation network were observed with data collected from Google Earth, as well as gathered from ATEC's Transportation Infrastructure Management System (TIMS) and the County of Newell Public Web Map. The existing transportation network consists of Provincial and Municipal highways and roads. The following roads are considered part of the study area and are described briefly.

- **Highway 845:** is a two-lane undivided highway under the jurisdiction of ATEC connecting Highway 52 at the Town of Raymond to Highway 539 north of the Village of Lomond, Alberta. This highway is classified as a Level 2 service classification. The posted speed limit is 100 km/hr. The typical two-lane cross-section of Hwy 845 has a measured width from 9.0 m to 10.9 m.
 - **Highway 845 and Highway 522/Township Road 140 (Hwy 845 and Hwy 522):** is a four-leg unsignalized intersection with a stop sign on the west leg of Hwy 522 and the east leg of Twp Rd 140. The intersection layout includes one shared left-turn/through lane and one right-turn lane on both the northbound and the southbound approaches, and one shared left-turn/through/right-turn lane on both the westbound and the eastbound approaches. The geometry of this intersection most resembles that of ATEC's standard Type IIId intersection treatment.
 - **Highway 845 and Highway 526/Township Road 142 (Hwy 845 and Hwy 526):** is a four-leg unsignalized intersection with a stop sign on the east leg of Hwy 526 and the west leg of Twp Rd 142. The intersection layout includes one shared left-turn/through lane and one right-turn lane on both the northbound and the southbound approaches, and one shared left-turn/through/right-turn lane on both the westbound and the eastbound approaches. The geometry of this intersection most resembles that of ATEC's standard Type IIId intersection treatment.
 - **Highway 845 and Highway 529/Township Road 152 (Hwy 845 and Hwy 529):** is a four-leg unsignalized intersection with a stop sign on the west leg of Hwy 529 and the east leg of Twp Rd 152. The intersection layout includes one shared left-turn/through lane and one right-turn lane on both the northbound and the southbound approaches, and one shared left-turn/through/right-turn lane on both the westbound and the eastbound approaches. The geometry of this intersection most resembles that of ATEC's standard Type IIId intersection treatment.
 - **Highway 531 and Highway 845 (Hwy 531 and Hwy 845):** is a three-leg unsignalized intersection with a stop sign on the south leg of Hwy 845. The intersection layout includes one shared left-turn/through lane on the westbound approach; one shared through/right-turn lane on the eastbound approach; and one shared left-turn/right-turn lane on the northbound approach. The geometry of this intersection most resembles that of ATEC's standard Type Ia intersection treatment.

- **Highway 539:** is a two-lane undivided highway under the jurisdiction of ATEC connecting Highway 845 north of Village of Lomond and Highway 36 south of the City of Brooks, Alberta. This highway is classified as a Level 3 service classification. The posted speed limit is 100 km/hr. The typical two-lane cross-section of Hwy 539 has a measured width from 9.0 m to 9.9 m.
 - **Highway 539/Township Road 172 and Highway 845/Range Road 201 (Hwy 539 and Hwy 845):** is a four-leg unsignalized intersection with unconventional stop controls at only three legs. The stop signs are only placed on the south leg at Hwy 845, west leg at Twp Rd 172, and north leg at RR 201. The east leg at 539 is free flow. The intersection layout includes one shared left-turn/through lane and one right-turn lane on the westbound and northbound approaches, and one shared left-turn/through/right-turn lane on both the southbound and the eastbound approaches. The geometry of the intersection most resembles that of ATEC's modified standard Type IIc modified intersection treatment (with right-turn bays and acceleration lanes).
- **Range Road 171:** is an undivided gravel Arterial Rural Road under the jurisdiction of the County. The posted speed limit is 80 km/hr. The typical two-lane cross-section of road has a road width of 8.0 m.
 - **Highway 539 and Range Road 171 North Intersection (Hwy 539 and RR 171):** is a three-leg unsignalized intersection with a stop sign on the north leg of RR 171. The intersection layout includes one shared left-turn/through lane on the northbound approach; one shared through/right-turn lane on the southbound approach; and one shared left-turn/right-turn lane on the eastbound approach. The geometry of this intersection most resembles that of ATEC's standard Type Ia modify intersection treatment with RR 171 intersecting in a skew angle on a curved alignment. The unusual intersection geometry may be of concern during the construction phases of the project.
- **Township Road 182:** is an undivided private gravel road classified as Resource Road under the jurisdiction of the County.
- **Township Road 184:** is an undivided gravel Arterial Rural Road. The posted speed limit is 80 km/hr. The typical two-lane cross-section of road has a measured width of 8.0 m.
- **Service Road:** is an undivided private gravel road classified as Resource Road along the East Branch Channel.

The existing lane configuration and traffic controls for each intersection in the study area are illustrated in **Appendix B – Traffic Diagrams**.

2.2 Historical Collision Data Review

Collision data was obtained for the study area intersection from the TIMS Network Expansion Support System (NESS) for the years 2015 to 2019, which is the most recent period that collision data was released by ATEC. Collision rates for the intersection were compared to provincial benchmark values that were established by ATEC using statistical analyses of collision rates at similar intersections around the province. When the actual collision rate exceeds the benchmark value, the risk of collision at an intersection is recognized as being significant, and it is advisable to perform a more detailed safety assessment. Historical collision rates for each study area intersection are summarized in **Table 2.1 - Historical Collision Rates, 2015 to 2019**. Detailed collision summaries are provided in **Appendix C – Traffic Data**.

Table 2.1: Historical Collision Rates, 2015 to 2019

Intersection	Collision Statistic	Actual	Benchmark	Deltas	Safety Issue
Hwy 845 and Hwy 522 (Unsignalized)	Total Rate	169.9	233.7	63.8	No
	Non-animal Rate	84.9	227.9	143.0	
	Collision Cost (\$ x M)	0.012	0.246	0.479	
Hwy 845 and Hwy 526 (Unsignalized)	Total Rate	135.5	172.1	36.6	No
	Non-animal Rate	135.5	163.3	27.8	
	Collision Cost (\$ x M)	0.073	0.246	0.173	
Hwy 845 and Hwy 529 (Unsignalized)	Total Rate	85.5	233.7	148.2	No
	Non-animal Rate	0.0	227.9	227.9	
	Collision Cost (\$ x M)	0.006	0.246	0.240	
Hwy 531 and Hwy 845 (Unsignalized)	Total Rate	0.0	233.7	233.7	No
	Non-animal Rate	0.0	227.9	227.9	
	Collision Cost (\$ x M)	0.0	0.246	0.246	
Hwy 539 and Hwy 845 (Unsignalized)	Total Rate	139.8	400.5	260.7	No
	Non-animal Rate	139.8	393.8	254.0	
	Collision Cost (\$ x M)	0.006	0.246	0.240	
Hwy 539 and RR 171 (Unsignalized)	Total Rate	82.59	233.7	400.5	No
	Non-animal Rate	82.59	227.9	393.8	
	Collision Cost (\$ x M)	0.006	0.246	0.246	

1. Results are shown in **bold and red** where the 'actual' value exceeds the provincial benchmark value.

At the study intersections, few collisions were reported for the years 2015-2019, and collision rates were found to be below the provincial benchmark, with frequency and collision costs below the provincial benchmark.

2.3 Sight Distance Review

Adequate sight distances are critical for safe traffic operations. A site review of the Intersection Sight Distance (ISD) requirements for the study intersections was conducted in accordance with methods outlined in the ATEC Highway Geometric Design Guide¹. ISD is the minimum sight distance required along the main road to permit a vehicle stopped on the minor road approach to safely make a left turn onto the major road. ISD measurements should be made based on the vehicle with the greatest ISD requirement that is expected to use the intersection daily. A semitrailer combination (WB-23) was selected as the design vehicle for each intersection.

Figure 2.1 shows a WB-23 and WB-21 design vehicle, complete with key design dimensions. ISD was also checked for the single unit truck (SU) and passenger car (P) design vehicles. The design speed for the highway was assumed to be 10 km/h higher than the posted speed.

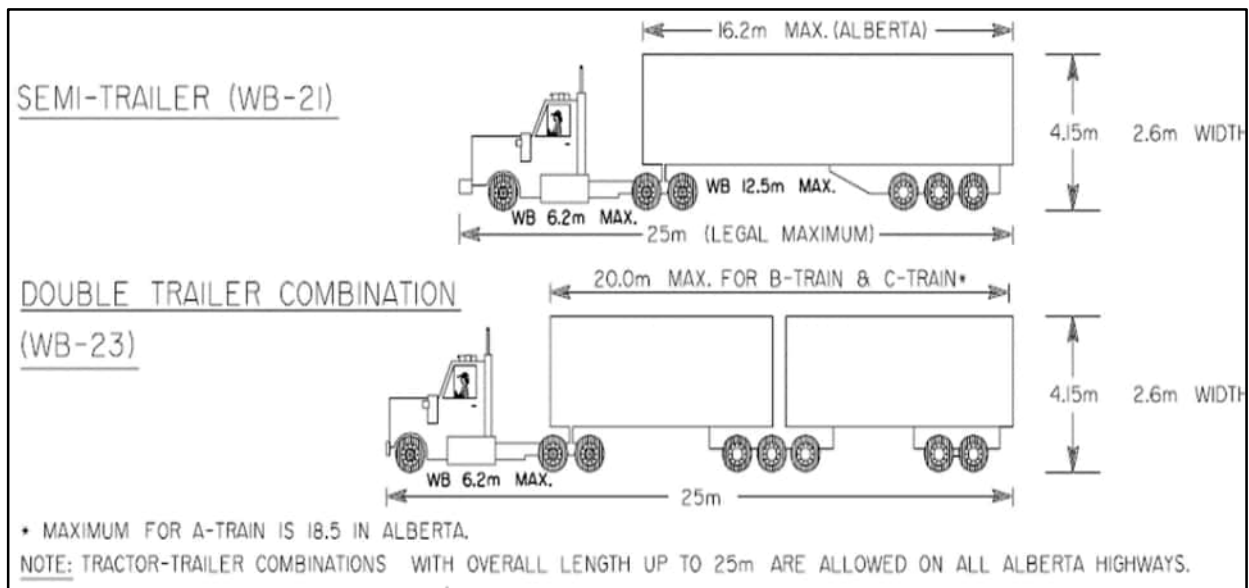


Figure 2.1: Semitrailer Combination (WB-21 and WB-23) Design Vehicle

¹ Alberta Transportation and Economic Corridors, (1999). Highway Geometric Design Guide. Edmonton, AB.

Table 2.2: Intersection Sight Distance (ISD)

Intersection	Major Road (Design Speed)	Design Vehicle on Minor Road	Intersection Sight Distance		Sufficient?
			Required	Available	
Hwy 845 and Hwy 522 Hwy 845 and Hwy 526 Hwy 845 and Hwy 529	Hwy 845 (110 km/h)	P	215 m	N ≥ 580 m	Yes
				S ≥ 580 m	Yes
		SU	325 m	N ≥ 580 m	Yes
				S ≥ 580 m	Yes
		WB-21/WB-23	565 m	N ≥ 580 m	Yes
				S ≥ 580 m	Yes
Hwy 531 and Hwy 845	Hwy 845 (60 km/h)	P	117 m	N/S ≥ 320 m	Yes
				W/E ≥ 320 m	Yes
		SU	175 m	N/S ≥ 320 m	Yes
				W/E ≥ 320 m	Yes
		WB-21/WB-23	307 m	N/S ≥ 320 m	Yes
				W/E ≥ 320 m	Yes
Hwy 539 and Hwy 845	Hwy 539 (110 km/h)	P	215 m	E ≥ 520 m	Yes
		SU	325 m	E ≥ 520 m	Yes
		WB-21/WB-23	565 m	E ≥ 520 m	No
Hwy 539 and RR 171	Hwy 539 (110 km/h)	P	215 m	N ≥ 580 m	Yes
				S ≥ 580 m	Yes
		SU	325 m	N ≥ 580 m	Yes
				S ≥ 580 m	Yes
		WB-21/WB-23	565 m	N ≥ 580 m	Yes
				S ≥ 580 m	Yes

As shown in **Table 2.2 – Intersection Sight Distance (ISD)**, minimum ISD requirements are met at most of the study intersections which includes Hwy 845 and Hwy 522, Hwy 845 and Hwy 526, Hwy 845 and Hwy 529, Hwy 531 and Hwy 845, and Hwy 539 and RR 171. However, the minimum ISD requirements are not met at the study intersection of Hwy 539 and Hwy 845 for the WB-21 and WB-23 design vehicles. At this location, the ISD is limited for the westbound traffic due to a crest approximately 520 m from the intersection; However, there is a warning sign (Important Intersection Ahead) approximately 495 m from the intersection which warns approaching traffic of the intersection ahead. Considering the most recent collision history, it is anticipated that the warning sign is a sufficient countermeasure to compensate for the reduction on the ISD standard.

A sight distance worksheet is provided in **Appendix D – Sight Distance Review**.

3.0 TRAFFIC VOLUMES

3.1 Background Traffic

The volume of traffic on the road network adjacent to the site will change over time whether the proposed development is constructed or not. Establishing background traffic volumes provides a baseline for comparison with post-development (construction) traffic conditions, which includes the proposed development. Background traffic volumes associated with the 2027 study horizon were developed and are shown in **Appendix B – Traffic Diagrams**.

Existing traffic volumes for the intersections of Hwy 845 and Hwy 522, Hwy 845 and Hwy 526, Hwy 845 and Hwy 529, Hwy 531 and Hwy 845, Hwy 539 and Hwy 845 were available from ATEC. Existing traffic volumes for the intersection of Hwy 539 and RR 171 were developed by balancing existing traffic volumes between the adjacent intersections, Hwy 539 and Hwy 845 intersection on the west and Hwy 36 and Hwy 539 intersection on the east.

3.2 Site Traffic (Construction and Staff Traffic)

Due to the nature of the proposed infrastructure development where the anticipated construction traffic is temporal, it can be expected that traffic volumes on Hwy 845, Hwy 539, Range Road 171, Township Road 182, Township Road 184, and the service road along the East Branch Channel will change temporarily from the background traffic data. To accurately estimate the movement and orientation of new vehicles entering/exiting the proposed development site, information regarding the anticipated construction material supply plan and the anticipated construction schedule were used to estimate temporary site traffic.

The anticipated truck traffic during Phase 1 includes daily move of materials between two pit locations and the construction site. The following are the material quantities and estimated number of trips:

- *670,000 tons of sand and bedding gravel from Eid Eyremore Pits located in Sections 1 and 12 Twp 18, Rge 18 W4M:* It is estimated that 16,750 to 22,334 truck trips will be required depending on the size of trucks used to haul. The number of daily trips can vary from 40 to 120 trips in and out depending on the number of trucks, which translates to approximately 4 to 12 truck trips in and out during each peak hour. The estimated duration for the transportation of materials from this Pit to the site is approximately 14 months.
- *490,000 tons of riprap from Dennis Dirtworx Pit to be developed in Section 26 Twp 12 Rge 20 W4M:* It is estimated that 12,250 to 13,334 truck trips will be required depending on the size of trucks used to haul. The number of daily trips can vary from 20 to 60 trips in and out depending on the number of trucks, which translates to approximately 2 to 6 truck trips in and out during each peak hour. The estimated duration for the transportation of materials from this Pit is approximately 19 months.

Based on these assumptions, Phase 1 of the proposed development is anticipated to generate:

- 8 to 24 new trips (4 to 12 in, and 4 to 12 out) during the AM and PM peak hours, and 80 to 240 new daily trips (120 in and 120 out) from the Eid Eyremore Pit, from 2025 to 2027. These trips are anticipated to use County roads between the Eid Eyremore Pit and the construction site.
- 4 to 12 new trips (2 to 6 in, and 2 to 6 out) during the AM and PM peak hours, and 40 to 120 new daily trips (20 to 60 in, and 20 to 60 out) from the Dennis Dirtworx Pit, from 2025 to 2027. These trips are anticipated to use the ATEC network and study intersections in addition to the County roads connecting to the construction site.

Regarding the construction worker traffic during Phase 2, it is anticipated that the earthworks will require between 50 to 60 pieces of equipment that would operate from April 1 to November 30. With engineers and project management staff, approximately 80 people are anticipated on site. Smaller crews (10 to 20 people) are anticipated during the winter months. The construction work-day schedule is from 7:00 AM to 6:00 PM. Therefore, it is anticipated that the staff arrive and leave the site before the AM peak hour and after the PM peak hour, respectively. For the purpose of this analysis, a conservative estimate of ten (10) entering and ten (10) exiting vehicles during each peak hour are anticipated. Finally, it is assumed that most workers will come from and/or through the City of Brooks.

Based on these assumptions, Phase 2 of the proposed development is anticipated to generate 20 new trips (10 in and 10 out) during the AM and PM peak hours, and 180 new daily trips (90 in and 90 out), from 2026 to 2028.

The assumed trip distribution for the construction traffic and staff traffic is illustrated on **Appendix E – Distribution of Construction Traffic** and details provided on **Appendix B – Traffic Diagrams**. For the purpose of traffic forecasting, the high end of the trip generation range has been assumed.

3.3 Post-Development Traffic (With Construction Traffic)

2027 post-development traffic volumes were obtained by combining site traffic (construction and staff traffic) with background traffic and are representative of traffic conditions at the proposed development during the construction stage. It is noted that after the completion of the Snake Lake Reservoir Expansion, no significant changes to the number of staff working at the site is anticipated and the traffic volumes and traffic patterns are anticipated to return to those observed for the background traffic. Post-development traffic volumes associated with the 2027 study horizon are shown in **Appendix B – Traffic Diagrams**.

4.0 TRAFFIC ANALYSIS

4.1 Turn Lane Warrant Review

Turn lane warrant analysis was undertaken in accordance with the ATEC Highway Geometric Design Guide. Typically, the purpose of a turn lane warrant analysis is to determine the appropriate left and right turn treatment for the study intersections based on the study horizon traffic conditions. It is noted that in this case, the 2027 post-development traffic conditions are temporary, and traffic volumes will resume to background traffic conditions after the construction is completed. A schematic drawing showing standard ATEC intersection treatments along with detailed worksheets for the turn lane analysis are provided in **Appendix F – Turn Lane Warrants**. Turn warrant analysis was undertaken for the 2027 post-development traffic conditions (with construction traffic) assuming the existing traffic controls remain unchanged.

4.1.1 Left Turn Warrant

The left turn warrant considers the operational and safety impacts of left turning vehicles on the highway. When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left turning vehicle may be delayed by, or exposed to, a collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard. Therefore, inputs in the left turn warrant include the opposing volume, advancing volume, and the number of left turning vehicles.

Table 4.1: Left Turn Warrant Summary

Intersection	Movement	Analysis Period	Traffic Conditions	Left Turn Warrant ²	Additional Storage (m)	
					S	St
Hwy 845 & Hwy 522	NB-L	2027	PD	Type I	N/A	N/A
	SB-L	2027	PD	Type I	N/A	N/A
Hwy 845 & Hwy 526	NB-L	2027	PD	Type I (Type III)	N/A	N/A
	SB-L	2027	PD	Type I (Type III)	N/A	N/A
Hwy 845 & Hwy 529	NB-L	2027	PD	Type I (Type II)	N/A	N/A
	SB-L	2027	PD	Type I (Type II)	N/A	N/A
Hwy 531 & Hwy 845	WB-L	2027	PD	Type I	N/A	N/A
Hwy 539 & Hwy 845	WB-L	2027	PD	Type I (Type II)	N/A	N/A
Hwy 539 & RR 171	EB-L	2027	PD	Type I	N/A	N/A

EB = Eastbound; **WB** = Westbound; **NB** = Northbound; **SB** = Southbound; **L** = Left; **T** = Through; **R** = Right; **BG** = Background; **PD** = Post-Development; **N/A** = Not Applicable; **S** = Additional storage length required in addition to the standard storage length provided in a Type IV intersection treatment; **S_t** = Additional storage length required for trucks for a Type IV intersection treatment.

- Results are shown in **bold and red** where the warrant indicates that the existing left turn treatment is inadequate and may require improvements.
- Left-Turn Warrant based on peak hour volumes (ATEC Highway Geometric Design Guide, D-7.6 figures). In addition, the Left-Turn Warrant based on AADT volumes is provided in brackets (ATEC Highway Geometric Design Guide, D-7.4 figure), if applicable.

As shown in **Table 4.1 – Left Turn Warrant Summary** for all the study intersections, an upgrade of the existing left-turn treatments is not warranted under 2027 post-development traffic conditions. Further upgrades to the current intersection layouts are not anticipated based on the temporary construction traffic by 2027.

4.1.2 Right Turn Warrant

Right turning vehicles can cause interference to through movements in the advancing lane as they decelerate and turn. To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, the following three conditions must all be met:

1. Main (or through) road AADT ≥ 1800
2. Intersecting road AADT ≥ 900
3. Right turn daily traffic volume ≥ 360 for the movement in question

As with the left turn warrant analysis, it was assumed that the existing traffic controls remain in place for analysis period. Results of the analysis are summarized in **Table 4.2 – Right Turn Warrant Summary**.

Table 4.2: Right Turn Warrant Summary

Intersection	Movement	Analysis Period	Traffic Conditions	Right Turn Warrant Met
Hwy 845 & Hwy 522	NB-R	2027	Post-Development	No
	SB-R	2027	Post-Development	No
Hwy 845 & Hwy 526	NB-R	2027	Post-Development	No
	SB-R	2027	Post-Development	No
Hwy 845 & Hwy 529	NB-R	2027	Post-Development	No
	SB-R	2027	Post-Development	No
Hwy 531 & Hwy 845	EB-R	2027	Post-Development	No
Hwy 539 & Hwy 845	WB-R	2027	Post-Development	No
Hwy 529 & RR 171	WB-R	2027	Post-Development	No

EB = Eastbound; **WB** = Westbound; **NB** = Northbound; **SB** = Southbound; **L** = Left; **T** = Through; **R** = Right

Results are shown in **bold and red** where the warrant indicates that the existing right turn treatment is inadequate and may require improvements.

Assuming that existing traffic controls remain in place at the study intersections, upgrades to the current intersection layouts to provide auxiliary right-turn lanes are not warranted for all study intersections under 2027 post-development traffic conditions (temporary construction traffic).

5.0 SWEPT PATH ANALYSIS

A swept path analysis was conducted for the intersections of Hwy 539 and RR 171, and Hwy 539 and Twp Rd 174 to confirm if the intersection layouts can accommodate the anticipated design vehicle. Both intersections have been identified as having unusual layout geometry and both connect the Provincial with the County road network. This analysis simulates the turning movements of the design vehicle to ensure it can maneuver through the intersections. A semitrailer combination (WB-23) was selected as the design vehicle for the analysis. For the analysis, inbound trips are those trips moving from the pit to the construction site, while outbound trips are the opposite. A schematic drawing showing the swept path analysis is provided in **Appendix G – Swept Path Analysis**.

The analysis shows that the design vehicle can turn at both intersections, although there is overlap of the opposite lane in three cases. Allowing only one direction at a time (either inbound or outbound) at each intersection may improve vehicle accommodation. The swept path analysis indicated the following:

- At the intersection of Hwy 539 and RR 171 the inbound trips (Left-turn from Hwy 539 into RR 171) are accommodated, while the outbound trips (Right-turn from RR 171 into Hwy 539) require overlapping the opposite lane on RR 171.
- At the intersection of Hwy 539 and Twp Rd 174 the inbound trips (Left-turn from Hwy 539 into Twp Rd 174) require overlapping the opposite lane at Twp Rd 174. Similarly, the outbound trips (Right-turn from Twp Rd 174 into Hwy 539) require overlapping the opposite lane on both roadways, Twp Rd 174 and Hwy 539.

It is recommended to separate the construction site's inbound and outbound trips at these two intersections as follows:

- Site inbound trips should be allowed only at the intersection of Hwy 539 and Twp Rd 174 (Left-turn from Hwy 539 into Twp Rd 174). This intersection appears to provide conspicuity to the conflicting traffic movements, lessening the risk of collisions due to the turning movements overlapping the opposite lane. In addition, the design vehicle would only overlap the opposite lane at Twp Rd 174.
- Site outbound trips should be allowed only at the intersection of Hwy 539 and RR 171 (Right-turn from RR 171 into Hwy 539). This intersection appears to provide conspicuity to the conflicting traffic movements, lessening the risk of collisions due to the turning movements overlapping the opposite lane. In addition, the design vehicle would only overlap the opposite lane at RR 171.

Other countermeasures may include temporarily reducing the posted speed along Hwy 539 and providing temporary advance warning signs to indicate the entrance/exit of heavy vehicles (Truck entrance sign WC-8).

6.0 COUNTY OF NEWELL REQUIREMENTS

On August 12, 2024, MPE held a meeting with County of Newell to discuss and review the County's specific requirements for this project. A Traffic Impact Assessment is not required by the County; however, a development permit is required. The following are key items identified in the meeting:

- General information:
 - Township Road (Twp Rd) 182, Twp Rd 200, Range Road (RR) 162, and the Service Road along East Branch Channel are private roads used as oil field trails and are not maintained by the County.
 - The study area has minimal residences.
 - The County plans to pave RR 171 and Twp Rd 182.
 - The County is planning for future maintenance of Twp Rd 184.
- County traffic considerations for the project:
 - There are no traffic concerns; therefore, the County does not require a Traffic Impact Assessment.
 - The County suggests completing the turn warrant analysis for the intersection of Hwy 539 and RR 171.
- Other County considerations:
 - The County will require a Traffic accommodation strategy (plan) including provisions for traffic detours and public access during the temporary construction traffic conditions.
 - The County requires mitigation measures for dust and noise control along RR 171 to minimize potential impact to the residents.
 - The project owner should discuss road bans with the County.
 - The County requires to provide on-going maintenance of the project roadways used by the construction traffic (within County limits) to minimize roadway pavement and structural impacts.
 - It is recommended to complete a pavement assessment on the project roadways within County limits to ensure roadway structures are adequate for the anticipated construction traffic.
 - It is recommended to explore a potential partnership between the County and the project owner to come up with an agreement to complete surface pavement and maintenance of the roadways within the County limits that are impacted by the construction traffic.
 - It is recommended to undertake a geometric assessment for the intersections at Hwy 539 and RR 171, and Hwy 539 and Twp Rd 174, including swept path analysis.
 - This project requires a development permit approval by the County.
 - It is recommended to coordinate with Canadian Pacific Kansas City (CPKC) for the use of the at-grade crossing along Twp Rd 200, if required.

7.0 CONCLUSIONS

7.1 Findings

Key findings of the study are as follows:

- Intersection Geometry:
 - The geometry of the Hwy 539 and RR 171 intersection most resembles that of ATEC's standard Type Ia modified intersection treatment with RR 171 intersecting in a skew angle on a curved alignment. The unusual intersection geometry may be of concern during the construction phases of the project.
- Intersection Sight Distance:
 - Adequate Intersection Sight Distance (ISD) were found at the intersections of Hwy 845 and Hwy 522, Hwy 845 and Hwy 526, Hwy 845 and Hwy 529, Hwy 531 and Hwy 845, and Hwy 539 and RR 171.
 - Minimal requirements for Intersection Sight Distance (ISD) are not met for the east leg of the intersection of Hwy 539 and Hwy 845, for the WB-21 and WB-23 design vehicles. However, there is a warning sign (Important Intersection Ahead) approximately 495 m from the intersection which warns approaching traffic of the intersection ahead. Considering the most recent collision history, it is anticipated that the warning sign is a sufficient countermeasure to compensate for the reduction on the ISD standard.
- Historical Collision Data Review:
 - Collision rates were found to be below the provincial benchmark, with frequency and collision costs well below the provincial benchmark for all study intersections.
- Traffic Volumes (Temporary Construction Traffic):
 - Phase 1 of the proposed development is anticipated to generate:
 - 8 to 24 new trips (4 to 12 in, and 4 to 12 out) during the AM and PM peak hours, and 80 to 240 new daily trips (120 in and 120 out) from Eid Eyremore Pit, from 2025 to 2027. These trips are anticipated to use County roads between the Eid Eyremore Pit and the construction site.
 - 4 to 12 new trips (2 to 6 in, and 2 to 6 out) during the AM and PM peak hours, and 40 to 120 new daily trips (20 to 60 in, and 20 to 60 out) from Dennis Dirtworx Pit, from 2025 to 2027. These trips are anticipated to use the ATEC network and study intersections in addition to the County roads connecting to the construction site.
 - Phase 2 of the proposed development is anticipated to generate:
 - 20 new trips (10 in and 10 out) during the AM and PM peak hours, and 180 new daily trips (90 in and 90 out), from 2026 to 2028.

- Turn Lane Warrant Analysis:
 - For all the study intersections, an upgrade of the existing left-turn treatments is not warranted under 2027 post-development traffic conditions. Further upgrades to the current intersection layouts are not anticipated based on the temporary construction traffic by 2027.
 - Upgrades to the current intersection layouts to provide auxiliary right-turn lanes are not warranted for all study intersections under 2027 post-development traffic conditions (temporary construction traffic).
- Swept Path Analysis:
 - At the intersection of Hwy 539 and RR 171 the inbound trips (Left-turn from Hwy 539 into RR 171) are accommodated, while the outbound trips (Right-turn from RR 171 into Hwy 539) require overlapping the opposite lane on RR 171.
 - At the intersection of Hwy 539 and Twp Rd 174 the inbound trips (Left-turn from Hwy 539 into Twp Rd 174) require overlapping the opposite lane at Twp Rd 174. Similarly, the outbound trips (Right-turn from Twp Rd 174 into Hwy 539) require overlapping the opposite lane on both roadways, Twp Rd 174 and Hwy 539.
 - Potential countermeasures include: (a) allocate the site inbound trips to only one of both intersections and the site outbound trips to the other one; (b) temporarily reduce the posted speed along Hwy 539; and (c) provide temporary advance warning signs to indicate the entrance/exit of heavy vehicles (Truck entrance sign WC-8). Inbound trips are those trips moving from the pit to the construction site, while outbound trips are the opposite.
- County of Newell (County) Considerations:
 - There are no traffic concerns; therefore, the County does not require a Traffic Impact Assessment.
 - The County will require a Traffic accommodation strategy (plan) including provisions for traffic detours and public access during the temporary construction traffic conditions.
 - The County requires mitigation measures for dust and noise control along RR 171 to minimize potential impact to the residents.
 - The project owner shall request the County reverse the banning initiative on the project roads during the construction schedule.
 - This project requires a development permit approval by the County.

7.2 Recommendations

Based on these findings, the following recommendations are made:

- It is recommended to maintain the study intersection layouts to accommodate the post-development (temporary construction traffic) traffic conditions.
- It is recommended to complete a pavement condition assessment at the study roadways for before and after the development construction and provide roadway maintenance as required.

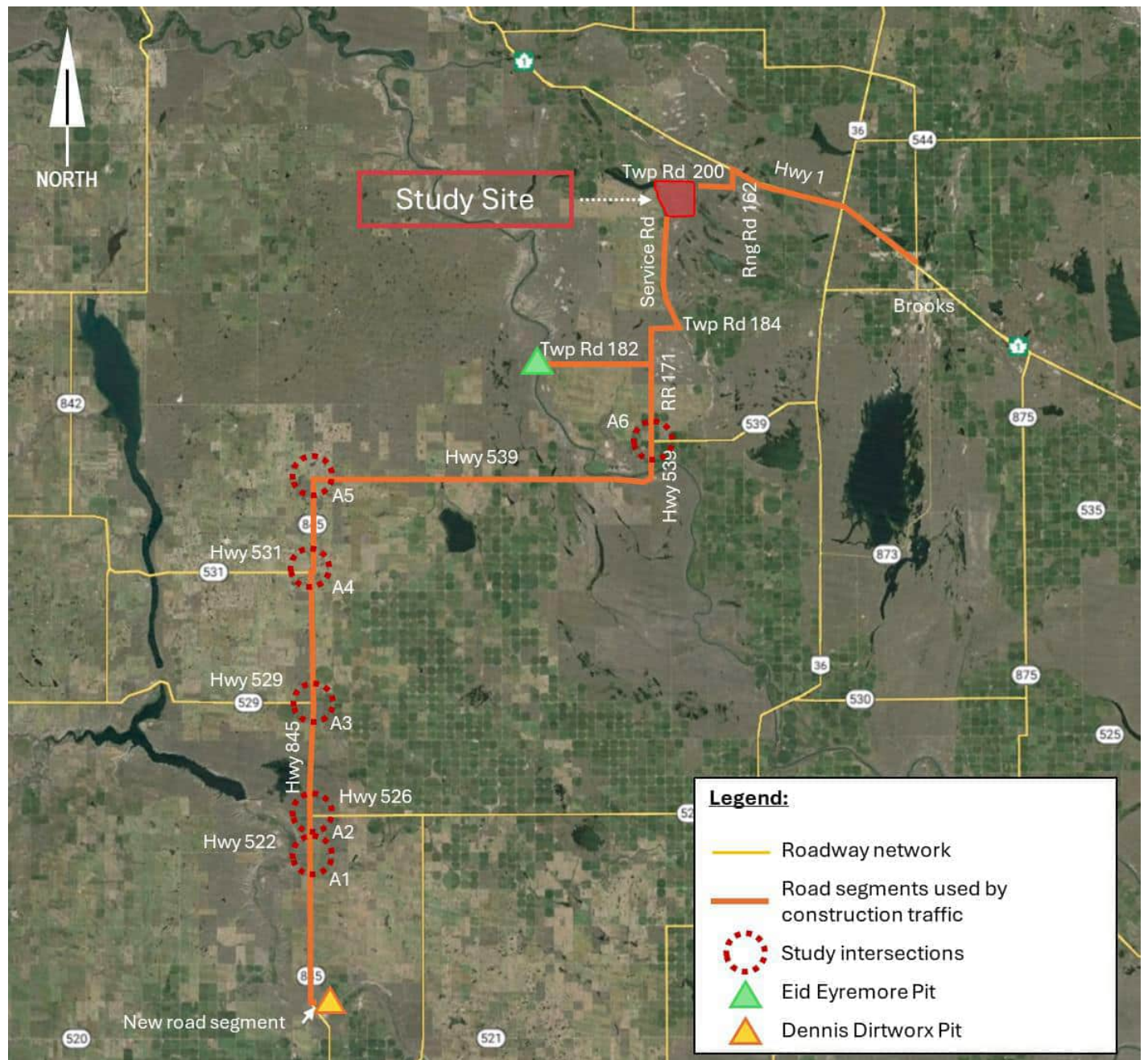
- It is recommended to develop a traffic accommodation plan during each development phase, to ensure safe and proper accommodation of the temporary post-development construction traffic.
- It is recommended to use the intersection of Hwy 539 and Twp Rd 174 for inbound trips only (Left-turn from Hwy 539 into Twp Rd 174), and the intersection of Hwy 539 and RR 171 for outbound trips only (Right-turn from RR 171 into Hwy 539).

Other considerations:

- It is recommended to complete a Traffic accommodation strategy (plan) including provisions for traffic detours and public access during the temporary construction traffic conditions, as required by the County.
- It is recommended to provide mitigation measures for dust and noise control along RR 171 to minimize potential impact to the residents, as required by the County.
- It is recommended that the project owner discuss road bans with the County.
- It is recommended to provide on-going maintenance of the project roadways used by the construction traffic (within County limits) to minimize roadway pavement and structural impacts.
- It is recommended to complete a pavement assessment on the project roadways within County limits to ensure roadway structures are adequate for the anticipated construction traffic.
- It is recommended to explore partnership opportunities between the County of Newell and the project owner to explore an agreement to complete surface pavement and maintenance of the roadways within the County limits that are impacted by the construction traffic (i.e., an option for co-funding road paving projects along the County's study road network).
- It is recommended to coordinate with Canadian Pacific Kansas City (CPKC) for the use of the at-grade crossing along Twp Rd 200, if required.

APPENDIX A

Location and Site Plan



a division of Englobe

EASTERN IRRIGATION DISTRICT

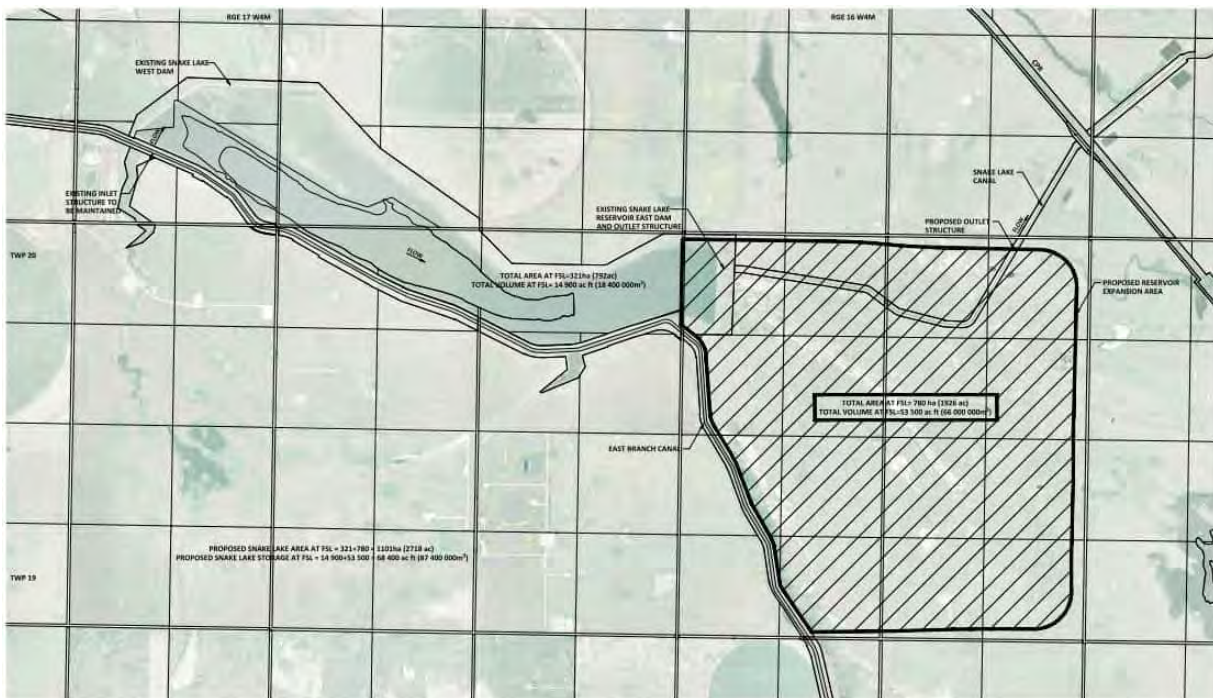
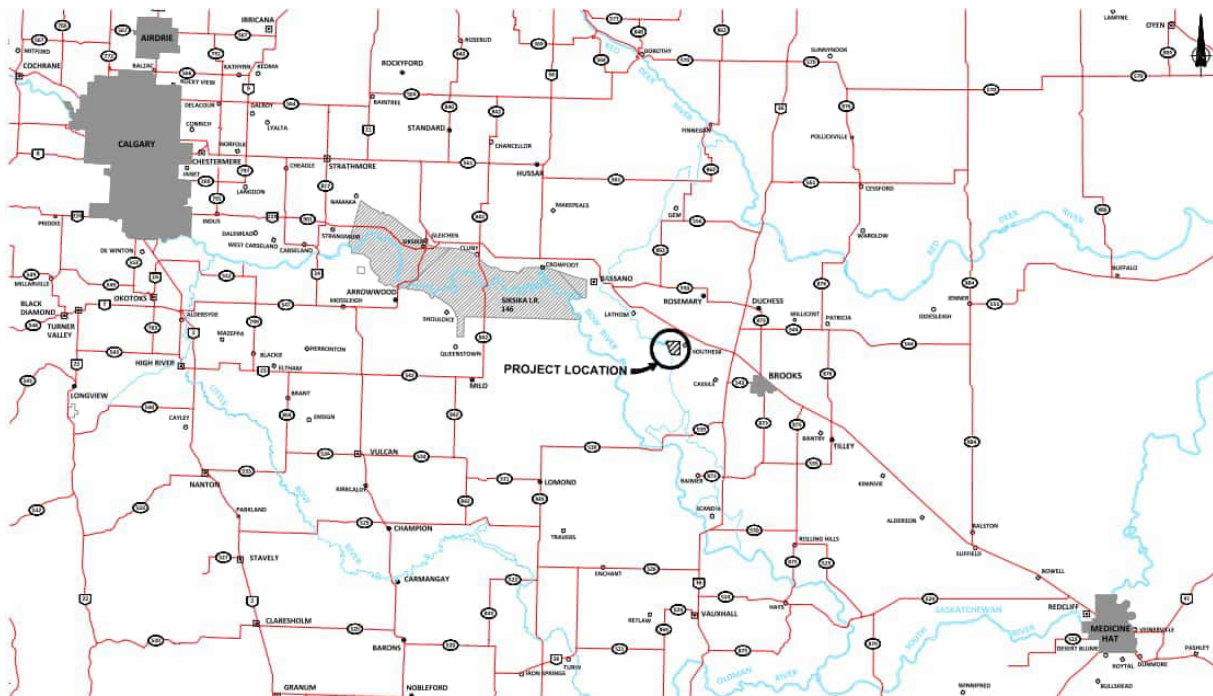
Snake Lake Reservoir Expansion
Traffic Impact Assessment
Site Location and Transportation
Network

SCALE: NTS

DATE: October 15,
2024

JOB: 1560-193-00

FIGURE: A1



**EASTERN IRRIGATION DISTRICT
SNAKE LAKE RESERVOIR EXPANSION
TRAFFIC IMPACT ASSESSMENT
LOCATION AND SITE PLAN**

SCALE: NTS

DATE: October 15,
2024

JOB: 1560-193-00

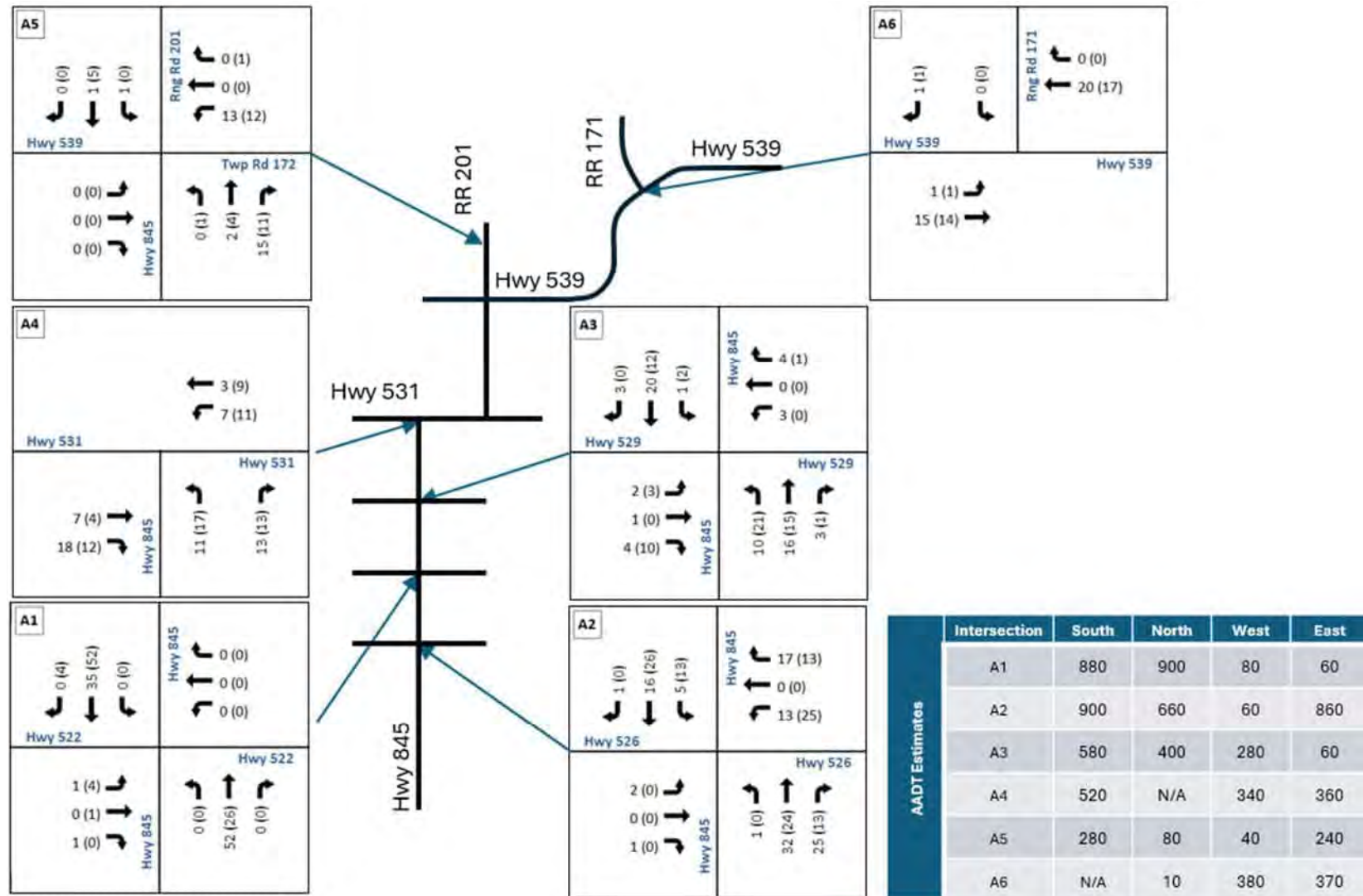
FIGURE: A2

APPENDIX B

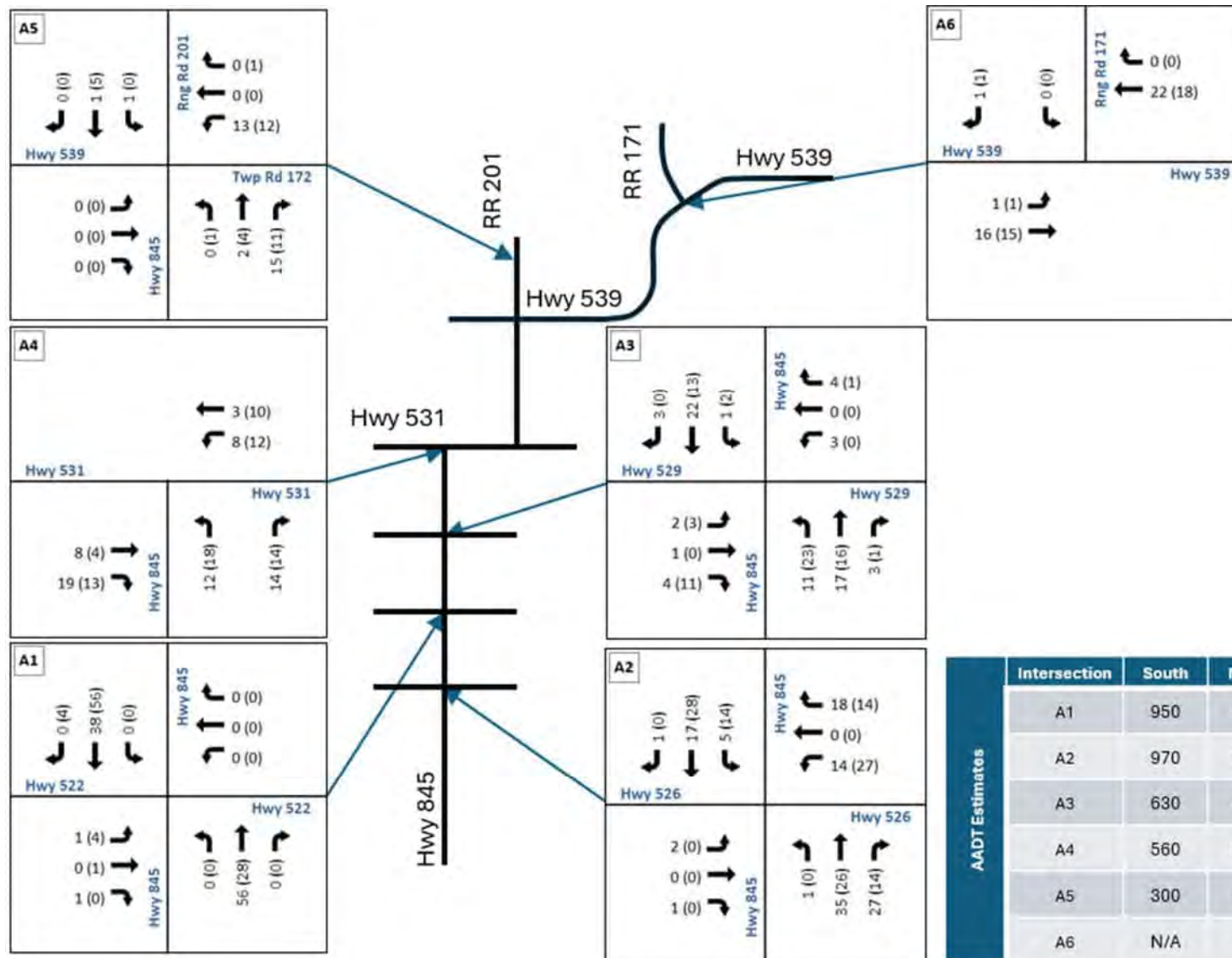
Traffic Diagrams

Format for traffic volumes is **AM PEAK HOUR (PM PEAK HOUR)**

2023 EXISTING TRAFFIC:



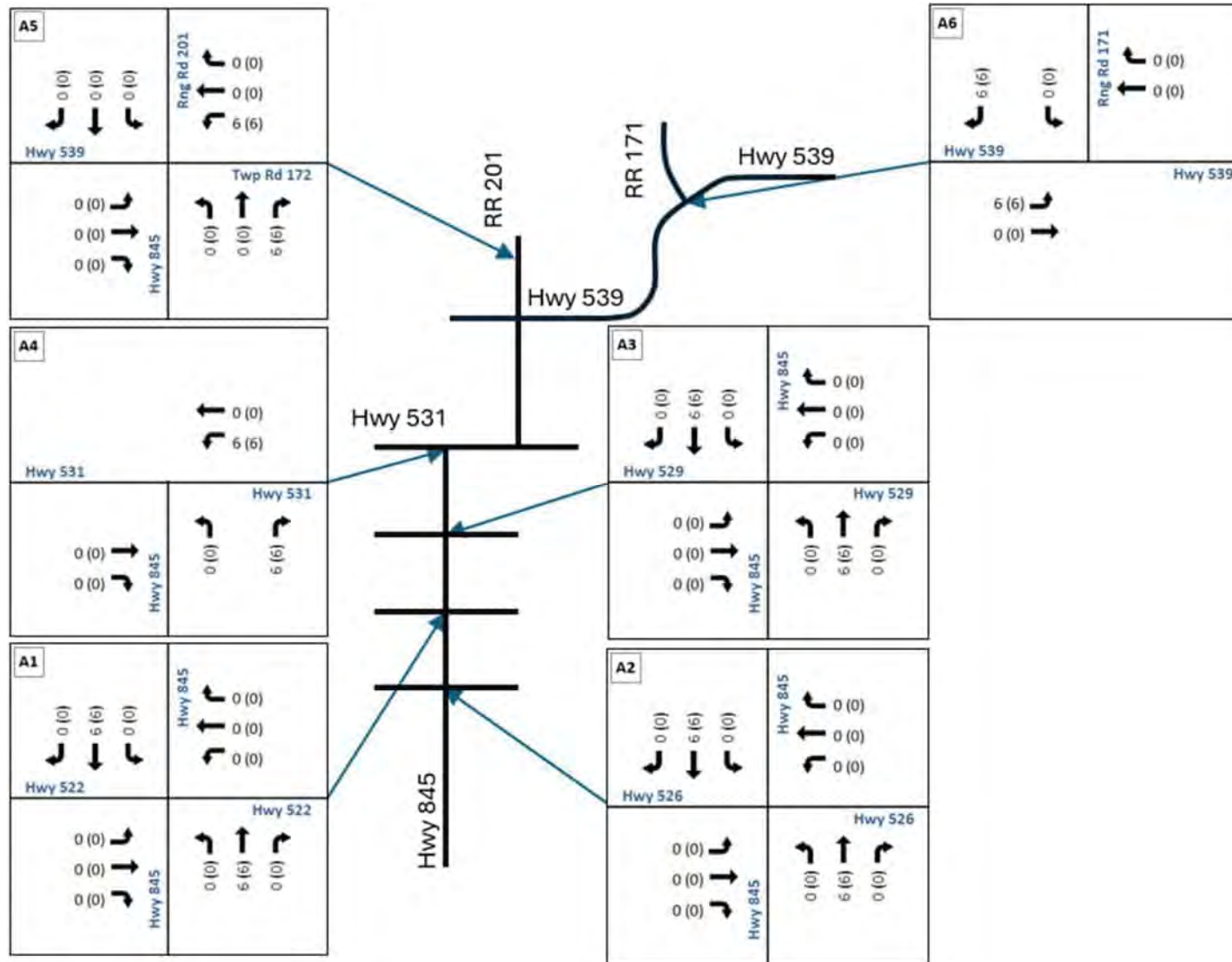
2027 BACKGROUND TRAFFIC:



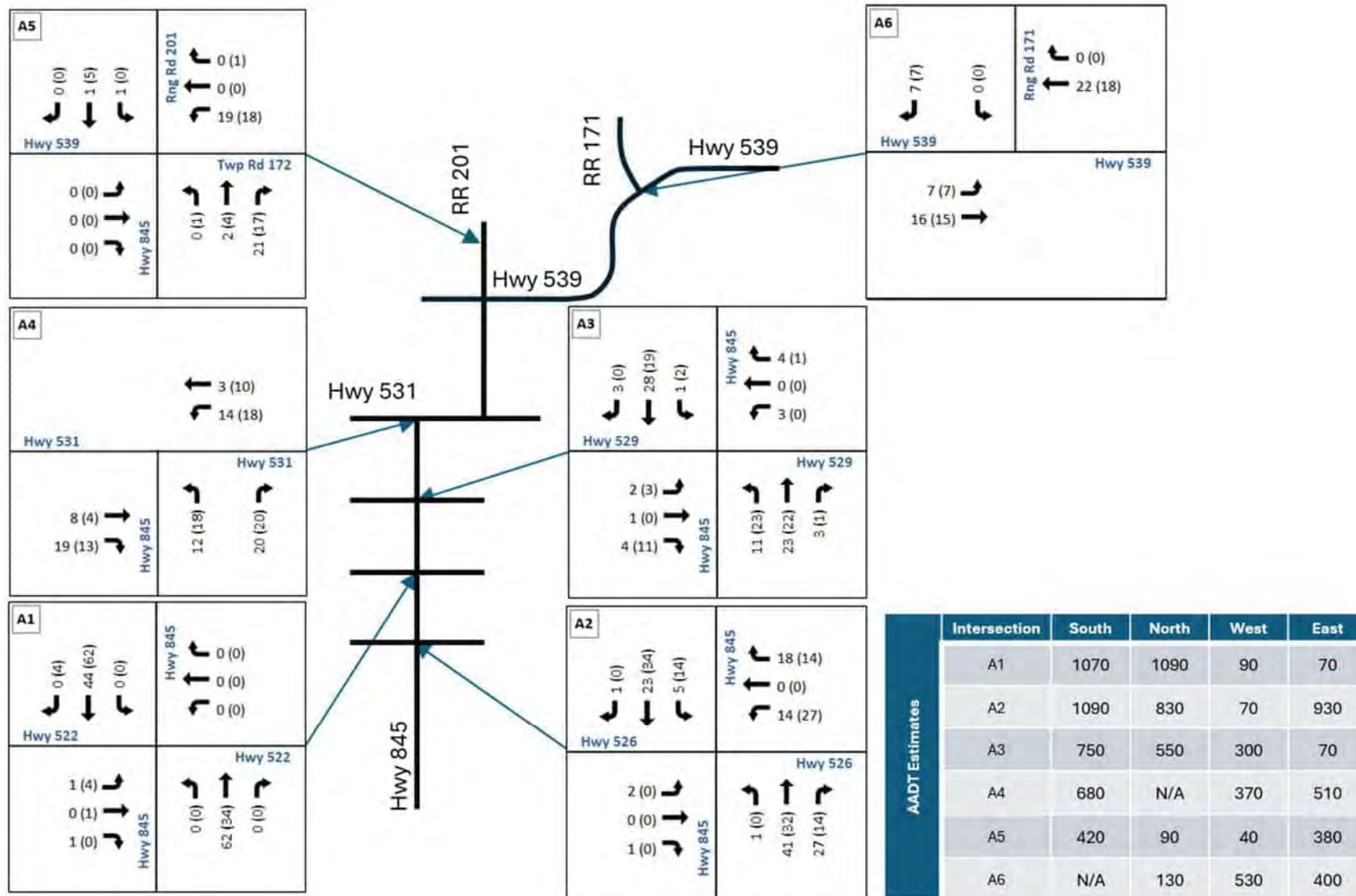
	Intersection	South	North	West	East
AADT Estimates	A1	950	970	90	70
	A2	970	710	70	930
	A3	630	430	300	70
	A4	560	N/A	370	390
	A5	300	90	40	260
	A6	N/A	10	410	400

SITE TRAFFIC

2027 HORIZON – SITE TRIPS:



2027 POST-DEVELOPMENT TRAFFIC (WITH CONSTRUCTION TRAFFIC)



TRAFFIC VOLUMES

A1: HIGHWAY 845 AND HIGHWAY 522

Horizon Year	Type of Trip	Time Period	Movement Volumes												Intersection Leg ADT Estimates			
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	South	North	West	East
2023 Existing	Existing	AM Peak	0	52	0	0	35	0	1	0	1	0	0	0	88	88	2	0
		PM Peak	0	26	0	0	52	4	4	1	0	0	0	0	78	86	9	1
		Weekday	10	420	10	10	420	20	20	10	10	10	10	10	880	900	80	60
2027 Phase I	Background	AM Peak	0	56	0	0	38	0	1	0	1	0	0	0	95	95	2	0
		PM Peak	0	28	0	0	56	4	4	1	0	0	0	0	84	92	9	1
		Weekday	11	454	11	11	454	22	22	11	11	11	11	11	950	970	90	70
	Site Trips Phase I	AM Peak	0	6	0	0	6	0	0	0	0	0	0	0	12	12	0	0
		PM Peak	0	6	0	0	6	0	0	0	0	0	0	0	12	12	0	0
		Weekday	0	60	0	0	60	0	0	0	0	0	0	0	120	120	0	0
	Post-Development (with construction traffic)	AM Peak	0	62	0	0	44	0	1	0	1	0	0	0	107	107	2	0
		PM Peak	0	34	0	0	62	4	4	1	0	0	0	0	96	104	9	1
		Weekday	11	514	11	11	514	22	22	11	11	11	11	11	1070	1090	90	70

A2: HIGHWAY 845 AND HIGHWAY 526

Horizon Year	Type of Trip	Time Period	Movement Volumes												Intersection Leg ADT Estimates			
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	South	North	West	East
2023 Existing	Existing	AM Peak	1	32	25	5	16	1	2	0	1	13	0	17	88	73	5	60
		PM Peak	0	24	13	13	26	0	0	0	0	25	0	13	88	76	0	64
		Weekday	10	170	270	150	170	10	10	10	10	270	10	150	900	660	60	860
2027 Phase I	Background	AM Peak	1	35	27	5	17	1	2	0	1	14	0	18	95	78	5	64
		PM Peak	0	26	14	14	28	0	0	0	0	27	0	14	95	82	0	69
		Weekday	11	184	292	162	184	11	11	11	11	292	11	162	970	710	70	930
	Site Trips Phase I	AM Peak	0	6	0	0	6	0	0	0	0	0	0	0	12	12	0	0
		PM Peak	0	6	0	0	6	0	0	0	0	0	0	0	12	12	0	0
		Weekday	0	60	0	0	60	0	0	0	0	0	0	0	120	120	0	0
	Post-Development (with construction traffic)	AM Peak	1	41	27	5	23	1	2	0	1	14	0	18	107	90	5	64
		PM Peak	0	32	14	14	34	0	0	0	0	27	0	14	107	94	0	69
		Weekday	11	244	292	162	244	11	11	11	11	292	11	162	1090	830	70	930

A3: HIGHWAY 845 AND HIGHWAY 529

Horizon Year	Type of Trip	Time Period	Movement Volumes												Intersection Leg ADT Estimates			
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	South	North	West	East
2023 Existing	Existing	AM Peak	10	16	3	1	20	3	2	1	4	3	0	4	56	46	20	12
		PM Peak	21	15	1	2	12	0	3	0	10	0	0	1	59	33	34	4
		Weekday	110	170	10	10	170	20	20	10	110	10	10	10	580	400	280	60
2027 Phase I	Background	AM Peak	11	17	3	1	22	3	2	1	4	3	0	4	60	49	21	12
		PM Peak	23	16	1	2	13	0	3	0	11	0	0	1	64	35	37	4
		Weekday	119	184	11	11	184	22	22	11	119	11	11	11	630	430	300	70
	Site Trips Phase I	AM Peak	0	6	0	0	6	0	0	0	0	0	0	0	12	12	0	0
		PM Peak	0	6	0	0	6	0	0	0	0	0	0	0	12	12	0	0
		Weekday	0	60	0	0	60	0	0	0	0	0	0	0	120	120	0	0
	Post-Development (with construction traffic)	AM Peak	11	23	3	1	28	3	2	1	4	3	0	4	72	61	21	12
		PM Peak	23	22	1	2	19	0	3	0	11	0	0	1	76	47	37	4
		Weekday	119	244	11	11	244	22	22	11	119	11	11	11	750	550	300	70

A4: HIGHWAY 531 AND HIGHWAY 845

Horizon Year	Type of Trip	Time Period	Movement Volumes												Intersection Leg ADT Estimates			
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	South	North	West	East
2023 Existing	Existing	AM Peak	11	0	13	0	0	0	0	7	18	7	3	0	49	0	39	30
		PM Peak	17	0	13	0	0	0	0	4	12	11	9	0	53	0	42	37
		Weekday	130	0	140	0	0	0	0	50	120	130	40	0	520	0	340	360
2027 Phase I	Background	AM Peak	12	0	14	0	0	0	0	8	19	8	3	0	53	0	42	33
		PM Peak	18	0	14	0	0	0	0	4	13	12	10	0	57	0	45	40
		Weekday	140	0	151	0	0	0	0	54	130	140	43	0	560	0	370	390
	Site Trips Phase I	AM Peak	0	0	6	0	0	0	0	0	0	6	0	0	12	0	0	12
		PM Peak	0	0	6	0	0	0	0	0	0	6	0	0	12	0	0	12
		Weekday	0	0	60	0	0	0	0	0	0	60	0	0	120	0	0	120
	Post-Development (with construction traffic)	AM Peak	12	0	20	0	0	0	0	8	19	14	3	0	65	0	42	45
		PM Peak	18	0	20	0	0	0	0	4	13	18	10	0	69	0	45	52
		Weekday	140	0	211	0	0	0	0	54	130	200	43	0	680	0	370	510

A5: HIGHWAY 539 AND HIGHWAY 845

Horizon Year	Type of Trip	Time Period	Movement Volumes												Intersection Leg ADT Estimates			
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	South	North	West	East
2023 Existing	Existing	AM Peak	0	2	14	1	1	0	0	0	0	12	0	0	29	4	0	27
		PM Peak	1	4	10	0	5	0	0	0	0	11	0	1	31	10	1	22
		Weekday	10	30	100	10	30	0	0	10	10	100	10	10	280	80	40	240
2027 Phase I	Background	AM Peak	0	2	15	1	1	0	0	0	0	13	0	0	31	4	0	29
		PM Peak	1	4	11	0	5	0	0	0	0	12	0	1	33	10	1	24
		Weekday	11	32	108	11	32	0	0	11	11	108	11	11	300	90	40	260
	Site Trips Phase I	AM Peak	0	0	6	0	0	0	0	0	0	6	0	0	12	0	0	12
		PM Peak	0	0	6	0	0	0	0	0	0	6	0	0	12	0	0	12
		Weekday	0	0	60	0	0	0	0	0	0	60	0	0	120	0	0	120
	Post-Development (with construction traffic)	AM Peak	0	2	21	1	1	0	0	0	0	19	0	0	43	4	0	41
		PM Peak	1	4	17	0	5	0	0	0	0	18	0	1	45	10	1	36
		Weekday	11	32	168	11	32	0	0	11	11	168	11	11	420	90	40	380

A6: HIGHWAY 539 AND RANGE ROAD 171

Horizon Year	Type of Trip	Time Period	Movement Volumes												Intersection Leg ADT Estimates			
			NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	South	North	West	East
2023 Existing	Existing	AM Peak	0	0	0	0	0	1	1	15	0	0	20	0	0	2	37	35
		PM Peak	0	0	0	0	0	1	1	14	0	0	17	0	0	2	33	31
		Weekday	0	0	0	0	0	5	5	185	0	0	185	0	0	10	380	370
2027 Phase I	Background	AM Peak	0	0	0	0	0	1	1	16	0	0	22	0	0	2	40	38
		PM Peak	0	0	0	0	0	1	1	15	0	0	18	0	0	2	35	33
		Weekday	0	0	0	0	0	5	5	200	0	0	200	0	0	10	410	400
	Site Trips Phase I	AM Peak	0	0	0	0	0	6	6	0	0	0	0	0	0	12	12	0
		PM Peak	0	0	0	0	0	6	6	0	0	0	0	0	0	12	12	0
		Weekday	0	0	0	0	0	60	60	0	0	0	0	0	0	120	120	0
	Post-Development (with construction traffic)	AM Peak	0	0	0	0	0	7	7	16	0	0	22	0	0	14	52	38
		PM Peak	0	0	0	0	0	7	7	15	0	0	18	0	0	14	47	33
		Weekday	0	0	0	0	0	65	65	200	0	0	200	0	0	130	530	400

APPENDIX C

Traffic Data

Roadway Summary

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Segments included within the Report

LRS	Length
845:06 C1 5.500 - 21.200	15.700
845:08 C1 0.000 - 32.600	32.600
Total	48.300

Length of Roadway (in Km) by Service Class

Service Class	Length
LV 2	48.300

Length of Paved and Gravel Roads (in Km)

Surface	Length
PAVED	48.300
Total	48.300

Collision Summary for years 2015-2019

	Total	Non Animal
Collision Rate in C/100MVKM	87.45	31.35
# of Fatal Collisions	0	0
# of Injury Collisions	6	6
# of Property Damage Only Collisions	47	13
Total # of collisions	53	19

Existing Width and Curve Summary

	Typical	Weighted	Max	Min	Total
Existing Width	10.60	9.8	10.60	9.00	
Existing WAADT	945.00	641	945.00	321.00	
Growth Rate %	1.0	1.1	1.8	0.8	
Speed	100		100	50	
Horizontal Curve Radius			3,300	395	6
Vertical Curve k (Crest)			880	22	45
Vertical Curve k (Sag)			570	35	44

Paving History

	Typical Year	Average Year	Max Year	Min Year
Last Paved	1995	1975	1998	0

Multilane Report

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Report Notes

Number of results found	10
4 Lane - Lv 1	7500
4 Lane - Lv 2	9300
4 Lane - Lv 3	11200
4 Lane - Lv 4	11200
6 Lane	31000
8 Lane	50000

Growth Rate in %

Collision Cost in \$/km (M) over 5 years

Collision Rate in C/100MVKM

Collision rate is calculated as (sum total collisions over 5 years * 100 Mil) / (sum of AADT history for the same 5 years * 365.25 * length (km))

Collision cost is calculated as (sum of collisions involving a fatality * \$9,120,367) + (sum of collisions involving a serious injury * \$66,744) + (sum of collisions involving a minor injury * \$66,744) + (sum of the property damage only collisions * \$5,851)/km)

LRS	Len	Serv Class	# Lanes	WAADT		LOS		Growth Rate	NESS Sched		4 lane		6 lane		8 lane		Notes	Region
				Year 0	Year 20	Year 0	Year 20		1st Work Year	WAADT	Need Year	WAADT	Need Year	WAADT	Need Year	WAADT		
522:02 C1 0.000 - 11.512	11.512	LV 4	2	71	82	A	A	0.79										1
526:02 C1 0.000 - 9.754	9.754	LV 3	2	782	599	B	A	-1.14										1
529:04 C1 19.569 - 39.291	19.722	LV 3	2	345	399	A	A	0.79										1
531:02 C1 5.220 - 17.865	12.645	LV 3	2	356	411	A	A	0.79										1
539:02 C1 0.000 - 29.821	29.821	LV 3	2	249	337	A	A	1.84										1
845:06 C1 0.000 - 21.207	21.207	LV 2	2	945	1,091	A	A	0.79										1
845:08 C1 0.000 - 3.234	3.234	LV 2	2	853	986	A	A	0.79										1
845:08 C1 3.234 - 13.032	9.798	LV 2	2	589	681	A	A	0.79										1
845:08 C1 13.032 - 24.377	11.345	LV 2	2	437	505	A	A	0.79										1
845:08 C1 24.377 - 32.637	8.26	LV 2	2	321	436	A	A	1.84										1

Intersection Report

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Report Notes

Number of results found 7

The number of collisions in this report are collisions at and near the intersection and are collisions within the intersection polygon in TIMS

For details on individual collisions, see the "Collision Details" section within Excel report

The Signalization Work Activity Trigger is Traffic Score (TS) > 79 or TS >= 60 with 5 or more angle collisions

Interchange Trigger - Signalization trigger met on Level 1 divided highway with 100+ km/h, or left turn volume >= 700 vehicles per hour

Collision Cost in \$ (M) over 5 years

Collision Rate in C/100MEV

Intersection collision rate is calculated as (sum of intersection collisions over 5 years * 100 Mil) / (sum of AADT entering over 5 years * 365.25)

Collision cost is calculated as (sum of collisions involving a fatality * \$9,120,367) + (sum of collisions involving a serious injury * \$66,744) + (sum of collisions involving a minor injury * \$66,744) + (sum of the property damage only collisions * \$5,851)

Va, Vo and VI in VPH

LT & RT Length in m

Pk = Peak Hour

Year LT = Scheduled Year of Left Turn Lane Construction

Year LTR = Scheduled Year of Left Turn Lane Reconstruction

Year RT = Scheduled Year of Right Turn Lane Construction

Year RTR = Scheduled Year of Right Turn Lane Reconstruction

INT #:1283 Location: HIGHWAY 845:06 AND 845:08 AND 522:02 Lv 2 Work Activity Summary Lv 3 Work Activity Summary	Major Road Details										TMD Ref: 110100					Veh/day		Growth																	
	Int. Type: AG					Posted Speed: 100					Maj Rd: 845-NB/SB					840		0.8%																	
	Service Class: LV 2					Lit: N Sig: N Div: N Radius:					Min Rd: 522-WB/EB					80		0.8%																	
	Collision Frequency										Collision Rate					Collision Cost																			
	Total		Fatal		Inj		Non-An		Total		BM		Non-An		BM		Cost (in \$M)		BM																
	2		0		0		1		169.9		233.7		84.9		227.9		0.012		0.246																
	Approach		LT Lane		LT Len		LT BM		RT Lane		RT Len		RT BM		Chan		Yr LT		Vo		VI		BM		Va		Undiv BM		Pk		Yr RT		RT AADT		Yr Chan
845-NB								Y		107		190		N																10					
845-SB								Y		145		190		N																20					
Yr Signal				TS		Ang. Coll		Yr IC		TS		LT vph		Yr Light.				Day		Night		N/D Col%		Near VC											
				4		0												1		1		100.00		Y											

TIMS Network Expansion Support System (NESS)
TIMS Geometric Report

<div>INT #:1612LRS: 845:08 C1 3.234</div> <div>Location: HIGHWAY 845:08 AND 526:02</div> <div>Lv 2 Work Activity SummaryLv 3 Work Activity Summary</div>	Major Road Details										TMD Ref: 111110				Veh/day		Growth				
	Int. Type: TYPE 2A		Posted Speed: 100				Maj Rd: 845-SB/NB				840		0.8%								
	Service Class: LV 2		Lit: N Sig: N Div: N Radius:				Min Rd: 526-EB/WB				800		-1.1%								
	Collision Frequency										Collision Rate				Collision Cost						
	Total 2		Fatal 0		Inj 1		Non-An 2		Total 135.5		BM 172.1		Non-An 135.5		BM 163.3		Cost (in \$M) 0.073		BM 0.246		
Approach	LT Lane	LT Len	LT BM	RT Lane	RT Len	RT BM	Chan	Yr LT	Vo	VI	BM	Va	Undiv BM	Pk	Yr RT	RT AADT	Yr Chan				
845-SB				Y	116	190	N									10					
845-NB				Y	111	190	N									250					
Yr Signal		TS 5		Ang. Coll 0		Yr IC		TS		LT vph		Yr Light.		Day 2		Night 0		N/D Col% 0.00		Near VC	

<div>INT #:21506LRS: 845:08 C1 9.753</div> <div>Location: HIGHWAY 845:08 AND TOWNSHIP ROAD 150</div> <div>Lv 2 Work Activity SummaryLv 3 Work Activity Summary</div>	Major Road Details										TMD Ref:				Veh/day		Growth				
	Int. Type: AG		Posted Speed: 100				Maj Rd: 845				589		0.8%								
	Service Class: LV 2		Lit: N Sig: N Div: N Radius:				Min Rd:														
	Collision Frequency										Collision Rate				Collision Cost						
	Total 0		Fatal 0		Inj 0		Non-An 0		Total 0.0		BM 172.1		Non-An 0.0		BM 163.3		Cost (in \$M) 0.000		BM 0.246		
Approach	LT Lane	LT Len	LT BM	RT Lane	RT Len	RT BM	Chan	Yr LT	Vo	VI	BM	Va	Undiv BM	Pk	Yr RT	RT AADT	Yr Chan				
845																					
845																					
Yr Signal		TS		Ang. Coll 0		Yr IC		TS		LT vph		Yr Light.		Day 0		Night 0		N/D Col%		Near VC	

<div>INT #:1698LRS: 845:08 C1 13.033</div> <div>Location: HIGHWAY 845:08 AND 529:04</div> <div>Lv 2 Work Activity SummaryLv 3 Work Activity Summary</div>	Major Road Details										TMD Ref: 110120				Veh/day		Growth				
	Int. Type: AG		Posted Speed: 100				Maj Rd: 845-SB/NB				540		0.8%								
	Service Class: LV 2		Lit: N Sig: N Div: N Radius:				Min Rd: 529-WB/EB				260		0.8%								
	Collision Frequency										Collision Rate				Collision Cost						
	Total 1		Fatal 0		Inj 0		Non-An 0		Total 85.5		BM 233.7		Non-An 0.0		BM 227.9		Cost (in \$M) 0.006		BM 0.246		
Approach	LT Lane	LT Len	LT BM	RT Lane	RT Len	RT BM	Chan	Yr LT	Vo	VI	BM	Va	Undiv BM	Pk	Yr RT	RT AADT	Yr Chan				
845-SB																20					
845-NB				Y	97	190	N									10					
Yr Signal		TS 2		Ang. Coll 0		Yr IC		TS		LT vph		Yr Light.		Day 0		Night 1		N/D Col%		Near VC Y	

<div>INT #:4155</div> <div>LRS: 845:08 C1 24.378</div> <div>Location: HIGHWAY 531:02 AND 845:08</div> <div>Lv 2 Work Activity Summary</div> <div>Lv 3 Work Activity Summary</div> <div>2018 TYPE 2 INTERSECTION IMPROVEMENT</div>	Major Road Details												TMD Ref: 109140				Veh/day		Growth	
	Int. Type: AG		Posted Speed: 100						Maj Rd: 845-SB/EB						500		0.8%			
	Service Class: LV 2		Lit: N Sig: N Div: N Radius:						Min Rd: 531-WB/NB						320		0.8%			
	Collision Frequency						Collision Rate						Collision Cost							
	Total 0		Fatal 0		Inj 0		Non-An 0		Total 0.0		BM 233.7		Non-An 0.0		BM 227.9		Cost (in \$M) 0.000		BM 0.246	
Approach		LT Lane	LT Len	LT BM	RT Lane	RT Len	RT BM	Chan	Yr LT	Vo	VI	BM	Va	Undiv BM	Pk	Yr RT	RT AADT	Yr Chan		
845-SB																				
845-EB																				
Yr Signal		TS 2		Ang. Coll 0		Yr IC		TS		LT vph		Yr Light.		Day 0		Night 0		N/D Col%	Near VC Y	

<div>INT #:21514</div> <div>LRS: 845:08 C1 24.530</div> <div>Location: HIGHWAY 845:08 AND TOWNSHIP ROAD 163</div> <div>Lv 2 Work Activity Summary</div> <div>Lv 3 Work Activity Summary</div>	Major Road Details												TMD Ref:				Veh/day		Growth	
	Int. Type: AG		Posted Speed: 100						Maj Rd: 845						321		1.8%			
	Service Class: LV 2		Lit: N Sig: N Div: N Radius:						Min Rd:											
	Collision Frequency						Collision Rate						Collision Cost							
	Total 0		Fatal 0		Inj 0		Non-An 0		Total 0.0		BM 233.7		Non-An 0.0		BM 227.9		Cost (in \$M) 0.000		BM 0.246	
Approach		LT Lane	LT Len	LT BM	RT Lane	RT Len	RT BM	Chan	Yr LT	Vo	VI	BM	Va	Undiv BM	Pk	Yr RT	RT AADT	Yr Chan		
845																				
845																				
Yr Signal		TS 0		Ang. Coll 0		Yr IC		TS		LT vph		Yr Light.		Day 0		Night 0		N/D Col%	Near VC Y	

<div>INT #:1709</div> <div>LRS: 845:08 C1 32.637</div> <div>Location: HIGHWAY 845:08 AND 539:02</div> <div>Lv 2 Work Activity Summary</div> <div>Lv 3 Work Activity Summary</div>	Major Road Details												TMD Ref: 111150				Veh/day		Growth	
	Int. Type: AG		Posted Speed: 100						Maj Rd: 845-SB						280		1.8%			
	Service Class: LV 2		Lit: N Sig: N Div: N Radius:						Min Rd: 539-EB/NB						240		1.8%			
	Collision Frequency						Collision Rate						Collision Cost							
	Total 1		Fatal 0		Inj 0		Non-An 1		Total 139.8		BM 400.5		Non-An 139.8		BM 393.8		Cost (in \$M) 0.006		BM 0.246	
Approach		LT Lane	LT Len	LT BM	RT Lane	RT Len	RT BM	Chan	Yr LT	Vo	VI	BM	Va	Undiv BM	Pk	Yr RT	RT AADT	Yr Chan		
845-SB																				
845																	100			
Yr Signal		TS 1		Ang. Coll 0		Yr IC		TS		LT vph		Yr Light.		Day 0		Night 1		N/D Col%	Near VC Y	

Intersection Access

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LRS	Access Type	Access Count	Road Side	Int #	Int Type	Speed	Roadside Class	MD Name	Distance Last Access	Distance Last Public
522:02 C1 11.512	HWY			1283	AG	80	RCU	M.D. OF TABER	0.127	2.071
526:02 C1 0.000	HWY			1612	TYPE 2A	100	RCU	M.D. OF TABER		
529:04 C1 39.291	HWY			1698	AG	100	RCU	VULCAN COUNTY	0.162	1.631
531:02 C1 17.821	FIELD	1	L			100	RCU	VULCAN COUNTY	0.068	
531:02 C1 17.865	HWY			4155	AG	100	RCU	VULCAN COUNTY	0.044	0.181
539:02 C1 0.000	MUNICIPAL ROAD	1	L	1709	AG	100	RCU	VULCAN COUNTY		
539:02 C1 0.071	OTHER	1	L			100	RCU	VULCAN COUNTY	0.071	
845:06 C1 6.754	UTILITY/RESOURCE	1	L			100	RAU	COUNTY OF LETHBRIDGE	2.169	
845:06 C1 6.767	UTILITY/RESOURCE	1	R			100	RAU	COUNTY OF LETHBRIDGE	0.013	
845:06 C1 7.512	FARM	2	R&L			100	RAU	COUNTY OF LETHBRIDGE	0.745	
845:06 C1 8.242	FIELD	1	L			100	RAU	COUNTY OF LETHBRIDGE	0.730	
845:06 C1 8.257	FIELD	1	R			100	RAU	COUNTY OF LETHBRIDGE	0.015	
845:06 C1 9.858	FIELD	1	R			100	RAU	COUNTY OF LETHBRIDGE	1.601	
845:06 C1 9.875	FIELD	1	L			100	RAU	COUNTY OF LETHBRIDGE	0.017	
845:06 C1 10.677	FIELD	1	R			100	RAU	COUNTY OF LETHBRIDGE	0.802	
845:06 C1 11.256	FIELD	2	R&L			100	RAU	COUNTY OF LETHBRIDGE	0.579	
845:06 C1 11.492	MUNICIPAL ROAD	2	R&L	21501	AG	100	RAU	COUNTY OF LETHBRIDGE	0.236	7.098
845:06 C1 11.750	FARM	1	L			100	RAU	COUNTY OF LETHBRIDGE	0.258	
845:06 C1 13.098	FIELD	1	L			100	RAU	COUNTY OF LETHBRIDGE	1.348	
845:06 C1 13.116	FIELD	1	R			100	RAU	COUNTY OF LETHBRIDGE	0.018	
845:06 C1 13.422	FIELD	1	L			100	RAU	COUNTY OF LETHBRIDGE	0.306	
845:06 C1 14.733	MUNICIPAL ROAD	2	R&L	21502	AG	100	RAU	COUNTY OF LETHBRIDGE	1.311	3.241
845:06 C1 16.356	FIELD	2	R&L			100	RAU	COUNTY OF LETHBRIDGE	1.623	
845:06 C1 17.049	FIELD	2	R&L			100	RAU	COUNTY OF LETHBRIDGE	0.693	
845:06 C1 17.978	MUNICIPAL ROAD	2	R&L	21503	AG	100	RAU	COUNTY OF LETHBRIDGE	0.929	3.245
845:06 C1 18.798	FIELD	1	R			100	RAU	COUNTY OF LETHBRIDGE	0.820	
845:06 C1 18.948	FIELD	1	L			100	RAU	COUNTY OF LETHBRIDGE	0.150	
845:06 C1 19.598	FIELD	1	R			100	RAU	COUNTY OF LETHBRIDGE	0.650	
845:06 C1 19.987	FIELD	1	L			100	RAU	COUNTY OF LETHBRIDGE	0.389	
845:06 C1 20.986	FIELD					100	RAU	COUNTY OF LETHBRIDGE	0.999	
845:08 C1 0.000	MUNICIPAL ROAD	1	R	1283	AG	100	RAU	M.D. OF TABER	0.221	3.229
845:08 C1 1.604	FIELD	1	R			100	RAU	M.D. OF TABER	1.604	
845:08 C1 1.616	FIELD	1	L			100	RAU	M.D. OF TABER	0.012	
845:08 C1 3.234	MUNICIPAL ROAD	1	L	1612	TYPE 2A	100	RAU	M.D. OF TABER	1.618	3.234
845:08 C1 4.040	FIELD	1	R			100	RAU	M.D. OF TABER	0.806	
845:08 C1 5.179	MUNICIPAL ROAD	1	L	21504	AG	100	RAU	M.D. OF TABER	1.139	1.945
845:08 C1 6.046	FIELD	1	R			100	RAU	M.D. OF TABER	0.867	
845:08 C1 6.472	MUNICIPAL ROAD	2	R&L	21505	AG	100	RAU	VULCAN COUNTY	0.426	1.293
845:08 C1 7.395	FIELD	1	R			100	RAU	VULCAN COUNTY	0.923	
845:08 C1 7.464	FIELD	1	R			100	RAU	VULCAN COUNTY	0.069	
845:08 C1 8.089	FIELD	1	R			100	RAU	VULCAN COUNTY	0.625	
845:08 C1 8.406	FIELD	1	R			100	RAU	VULCAN COUNTY	0.317	

The information provided herein is considered 'calculated data' for network screening purposes, based on the best available information within the TIMS inventory at the time of publishing. Project level engineering assessment is required to further develop the identified locations into strategies and engineering solutions for programming purposes.

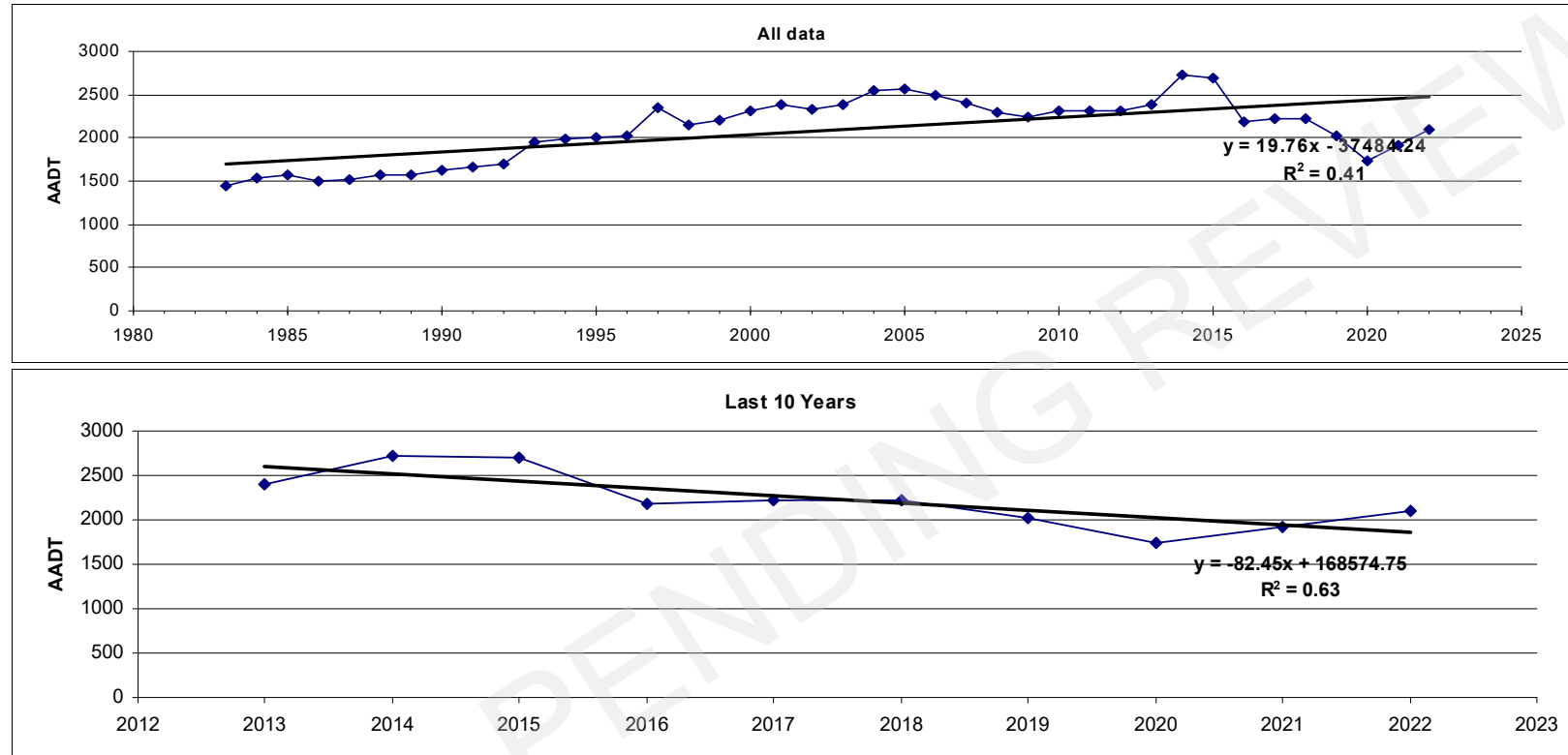
TIMS Network Expansion Support System (NESS)
TIMS Geometric Report

LRS	Access Type	Access Count	Road Side	Int #	Int Type	Speed	Roadside Class	MD Name	Distance Last Access	Distance Last Public
845:08 C1 9.439	FIELD	1	L			100	RAU	VULCAN COUNTY	1.033	
845:08 C1 9.714	MUNICIPAL ROAD	1	L			100	RAU	VULCAN COUNTY	0.275	3.242
845:08 C1 9.753	MUNICIPAL ROAD	1	R	21506	AG	100	RAU	VULCAN COUNTY	0.039	0.039
845:08 C1 10.434	FARM	1	R			100	RAU	VULCAN COUNTY	0.681	
845:08 C1 10.629	FIELD	1	L			100	RAU	VULCAN COUNTY	0.195	
845:08 C1 11.202	FIELD	1	L			100	RAU	VULCAN COUNTY	0.573	
845:08 C1 11.408	FIELD	1	R			100	RAU	VULCAN COUNTY	0.206	
845:08 C1 12.210	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.802	
845:08 C1 12.398	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.188	
845:08 C1 12.579	FIELD	1	L			100	RAU	VULCAN COUNTY	0.181	
845:08 C1 12.606	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.027	
845:08 C1 12.647	FIELD	1	R			100	RAU	VULCAN COUNTY	0.041	
845:08 C1 13.032	MUNICIPAL ROAD	1	R	1698	AG	100	RAU	VULCAN COUNTY	0.385	3.279
845:08 C1 13.085	UTILITY/RESOURCE	1	L			100	RAU	VULCAN COUNTY	0.053	
845:08 C1 13.277	FIELD	1	R			100	RAU	VULCAN COUNTY	0.192	
845:08 C1 13.848	FIELD	1	R			100	RAU	VULCAN COUNTY	0.571	
845:08 C1 13.869	FIELD	1	L			100	RAU	VULCAN COUNTY	0.021	
845:08 C1 14.272	FIELD	1	R			100	RAU	VULCAN COUNTY	0.403	
845:08 C1 14.549	FIELD	1	L			100	RAU	VULCAN COUNTY	0.277	
845:08 C1 14.736	FARM	1	L			100	RAU	VULCAN COUNTY	0.187	
845:08 C1 14.776	FIELD	1	L			100	RAU	VULCAN COUNTY	0.040	
845:08 C1 15.468	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.692	
845:08 C1 16.271	MUNICIPAL ROAD	2	R&L	21507	AG	100	RAU	VULCAN COUNTY	0.803	3.239
845:08 C1 17.220	FIELD	1	L			100	RAU	VULCAN COUNTY	0.949	
845:08 C1 17.888	FIELD	1	R			100	RAU	VULCAN COUNTY	0.668	
845:08 C1 18.687	FARM	2	R&L			100	RAU	VULCAN COUNTY	0.799	
845:08 C1 19.510	MUNICIPAL ROAD	2	R&L	21508	AG	100	RAU	VULCAN COUNTY	0.823	3.239
845:08 C1 19.927	FIELD	1	L			100	RAU	VULCAN COUNTY	0.417	
845:08 C1 20.327	FIELD	1	R			100	RAU	VULCAN COUNTY	0.400	
845:08 C1 20.702	FARM	2	R&L			100	RAU	VULCAN COUNTY	0.375	
845:08 C1 21.136	FIELD	1	L			100	RAU	VULCAN COUNTY	0.434	
845:08 C1 21.323	FIELD	1	L			100	RAU	VULCAN COUNTY	0.187	
845:08 C1 21.453	FARM	1	R			100	RAU	VULCAN COUNTY	0.130	
845:08 C1 21.536	FIELD	1	L			100	RAU	VULCAN COUNTY	0.083	
845:08 C1 21.725	FIELD	1	L			100	RAU	VULCAN COUNTY	0.189	
845:08 C1 21.929	FIELD	1	R			100	RAU	VULCAN COUNTY	0.204	
845:08 C1 21.944	UTILITY/RESOURCE	1	L			100	RAU	VULCAN COUNTY	0.015	
845:08 C1 22.025	FIELD	1	L			100	RAU	VULCAN COUNTY	0.081	
845:08 C1 22.745	MUNICIPAL ROAD	2	R&L	21509	AG	100	RAU	VULCAN COUNTY	0.720	3.235
845:08 C1 23.209	FIELD	1	L			100	RAU	VULCAN COUNTY	0.464	
845:08 C1 23.559	FARM	1	R			100	RAU	VULCAN COUNTY	0.350	
845:08 C1 23.593	FARM	1	L			50	RAU	LOMOND	0.034	
845:08 C1 23.644	BUSINESS/INDUSTRIAL	1	R			50	RAU	LOMOND	0.051	
845:08 C1 23.726	BUSINESS/INDUSTRIAL	1	L			50	RAU	LOMOND	0.082	
845:08 C1 23.754	BUSINESS/INDUSTRIAL	1	R			50	RAU	LOMOND	0.028	

TIMS Network Expansion Support System (NESS)
TIMS Geometric Report

LRS	Access Type	Access Count	Road Side	Int #	Int Type	Speed	Roadside Class	MD Name	Distance Last Access	Distance Last Public
845:08 C1 23.791	BUSINESS/INDUSTRIAL	2	R&L			50	RAU	LOMOND	0.037	
845:08 C1 23.825	BUSINESS/INDUSTRIAL	1	L			50	RAU	LOMOND	0.034	
845:08 C1 23.849	MUNICIPAL ROAD	2	R&L	21510	AG	50	RAU	LOMOND	0.024	1.104
845:08 C1 23.912	BUSINESS/INDUSTRIAL	2	R&L			50	RAU	LOMOND	0.063	
845:08 C1 23.947	MUNICIPAL ROAD	1	L	21511	AG	50	RAU	LOMOND	0.035	0.098
845:08 C1 23.998	BUSINESS/INDUSTRIAL	1	R			50	RAU	LOMOND	0.051	
845:08 C1 24.053	MUNICIPAL ROAD	1	L	21512	AG	50	RAU	LOMOND	0.055	0.106
845:08 C1 24.135	BUSINESS/INDUSTRIAL	1	R			50	RAU	LOMOND	0.082	
845:08 C1 24.156	MUNICIPAL ROAD	1	L	21513	AG	50	RAU	LOMOND	0.021	0.103
845:08 C1 24.257	BUSINESS/INDUSTRIAL	2	R&L			50	RAU	LOMOND	0.101	
845:08 C1 24.377	HWY			4155	AG	100	RAU	VULCAN COUNTY	0.120	0.221
845:08 C1 24.530	MUNICIPAL ROAD	2	R&L	21514	AG	100	RAU	VULCAN COUNTY	0.153	0.153
845:08 C1 25.030	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.500	
845:08 C1 25.239	FARM	1	L			100	RAU	VULCAN COUNTY	0.209	
845:08 C1 25.341	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.102	
845:08 C1 25.519	FARM	1	L			100	RAU	VULCAN COUNTY	0.178	
845:08 C1 25.669	FIELD	1	L			100	RAU	VULCAN COUNTY	0.150	
845:08 C1 26.166	MUNICIPAL ROAD	2	R&L	26704	AG	100	RAU	VULCAN COUNTY	0.497	1.636
845:08 C1 26.439	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.273	
845:08 C1 27.770	FARM	1	R			100	RAU	VULCAN COUNTY	1.331	
845:08 C1 27.866	FIELD	1	L			100	RAU	VULCAN COUNTY	0.096	
845:08 C1 28.578	FIELD	1	R			100	RAU	VULCAN COUNTY	0.712	
845:08 C1 29.399	MUNICIPAL ROAD	2	R&L	21515	AG	100	RAU	VULCAN COUNTY	0.821	3.233
845:08 C1 29.727	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.328	
845:08 C1 30.461	FARM	2	R&L			100	RAU	VULCAN COUNTY	0.734	
845:08 C1 30.803	FIELD	1	L			100	RAU	VULCAN COUNTY	0.342	
845:08 C1 31.027	FIELD	2	R&L			100	RAU	VULCAN COUNTY	0.224	
845:08 C1 32.214	FIELD	1	R			100	RAU	VULCAN COUNTY	1.187	
845:08 C1 32.541	FIELD	1	L			100	RAU	VULCAN COUNTY	0.327	
845:08 C1 32.637	MUNICIPAL ROAD	1	L	1709	AG	100	RAU	VULCAN COUNTY	0.096	3.238

ATR NUMBER: 60360610 36:06:C1 km 35.206 11.3 KM S OF 1 & 36 BROOKS



Growth rate	Since	Two points	Diff to historical	linear regression	Diff to historical	r square	Year	AADT	ASDT	% diff
Historical:	1983	0.79		0.8		0.405	2022	2,093	2,276	8.7
20 yrs:	2003	-0.75	-1.54	-1.26	-2.06	0.389	2021	1,924	2,074	7.8
10 yrs:	2013	-1.59	-2.38	-4.45	-5.25	0.628	2020	1,736	1,878	8.2
5 yrs:	2018	-1.62	-2.41	-1.93	-2.73	0.101	2019	2,024	2,173	7.4
							2018	2,229	2,417	8.4
							2017	2,214	2,420	9.3
							2016	2,190	2,330	6.4
							2015	2,698	2,939	8.9
							2014	2,727	3,060	12.2
							2013	2,392	2,695	12.7
Other Calculation		Two points	Diff to historical	linear regression	Diff to historical	r square				
Start yr:										
End yr:										
# yr:										

TIMS Network Expansion Support System (NESS) TIMS Geometric Report

INT # **1283-1**

INT type AT GRADE - TYPE UNKNOWN

Region: SOUTHERN REGION

INT Effective Date: 01-Oct-00

Location: **HIGHWAY 845:06 AND 845:08 AND 522:02**

Classification: LV 2

Signalized: N

Last paved yr: 1998

Divided: N

Posted speed: 100

Lit: N

Last paved road name: 845

TM number: 110100

NESS Safety Calculations (2015 - 2019)

	Actual	BM	Deltas
Total rate:	169.895	233.7	63.8
Non animal rate:	84.947	227.9	143
Collision cost (\$ x M):	0.012	0.246	0.234

Total (ani + non ani)	Non-animal	2015	2016	2017	2018	2019
# Daytime: 1	Daytime				1	
# Nighttime: 1	Nighttime					
	Unknown					

Modify Outliners for Non Animal Collision					
	2015	2016	2017	2018	2019
F and Maj Inj.	0	0	0	0	0
Min. Inj.	0	0	0	0	0
Non ani	0	0	0	0.3	0

Three Similar Collisions Over Five Yrs Period

(excluding off road and animal collision)

Year:

Prim. evt.:

Collision Frequency Over Last 15 Yrs

Severity - non ani. 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

FATAL																0
MAJOR																0
MINOR																0
PDO													1			1
TOTAL	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	2
TOTAL-non ani.	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Collision Summary Last 5 Yrs (2015 - 2019)

(Non animal collisions)

Month	Freq	Hour	AM	PM	Weekday	Freq
Jan:		0:			Mon:	
Feb: 1		1:		1	Tue:	
Mar:		2:			Wed:	
Apr:		3:			Thu:	
May:		4:			Fri: 1	
Jun:		5:			Sat:	
Jul:		6:			Sun:	
Aug:		7:			unknown:	
Sep:		8:				
Oct:		9:				
Nov:		10:				
Dec:		11:				
unknown:		unknown:				

Collision event 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

ANIMAL	1											1				1
BACKING																0
HEAD ON																0
LEFT TURN:ACROSS PATH																0
OFF ROAD LEFT													1			1
OFF ROAD RIGHT																0
OTHER																0
PASSING:LEFT TURN																0
PASSING:RIGHT TURN																0
PEDESTRIAN																0
REAR END																0
RIGHT ANGLE																0
SIDESWIPE:OPP DIR																0
SIDESWIPE:SAME DIR																0
STRUCK OBJECT																0
UNKNOWN																0

INT polygon yr: 31-Mar-2023

*The number of collision in this report are collisions at and near the intersection and is calculated using intersection polygon in TIMS.

*Cost of PDO collision had increased from \$1,000 to \$2,000 in 2011

INT # 1612-1

INT type TYPE 2A

Region: SOUTHERN REGION

INT Effective Date: 01-Oct-00

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Location: **HIGHWAY 845:08 AND 526:02**

Classification: LV 2

Signalized: N

Last paved yr: 1998

Divided: N

Posted speed: 100

Lit: N

Last paved road name: 526

TM number: 111110

NESS Safety Calculations (2015 - 2019)

	Actual	BM	Deltas
Total rate:	135.47	172.1	36.6
Non animal rate:	135.47	163.3	27.8
Collision cost (\$ x M):	0.073	0.246	0.173

Total (ani + non ani)	Non-animal	2015	2016	2017	2018	2019
# Daytime: 2	Daytime	1		1		
# Nighttime: 0	Nighttime					
	Unknown					

Modify Outliners for Non Animal Collision					
	2015	2016	2017	2018	2019
F and Maj Inj.	0	0	0	0	0
Min. Inj.	0.3	0	0	0	0
Non ani	0.3	0	1	0	0

Three Similar Collisions Over Five Yrs Period

(excluding off road and animal collision)

Year:

Prim. evt.:

Collision Frequency Over Last 15 Yrs

Severity - non ani. 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 **Last 5 yrs**

FATAL																0
MAJOR																0
MINOR										1						1
PDO												1				1
TOTAL	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	2
TOTAL-non ani.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2

Collision Summary Last 5 Yrs (2015 - 2019)

(Non animal collisions)

Month	Freq	Hour	AM	PM	Weekday	Freq
Jan:		0:			Mon:	
Feb:		1:			Tue:	
Mar:		2:		1	Wed:	1
Apr:		3:		1	Thu:	
May:		4:			Fri:	1
Jun:		5:			Sat:	
Jul:		6:			Sun:	
Aug:	1	7:			unknown:	
Sep:		8:				
Oct:	1	9:				
Nov:		10:				
Dec:		11:				
unknown:		unknown:				

Collision event 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 **Last 5 yrs**

ANIMAL	1															0
BACKING																0
HEAD ON																0
LEFT TURN:ACROSS PATH																0
OFF ROAD LEFT																0
OFF ROAD RIGHT										1		1				2
OTHER																0
PASSING:LEFT TURN																0
PASSING:RIGHT TURN																0
PEDESTRIAN																0
REAR END																0
RIGHT ANGLE																0
SIDESWIPE:OPP DIR																0
SIDESWIPE:SAME DIR																0
STRUCK OBJECT																0
UNKNOWN																0

INT polygon yr: 31-Mar-2023

*The number of collision in this report are collisions at and near the intersection and is calculated using intersection polygon in TIMS.

*Cost of PDO collision had increased from \$1,000 to \$2,000 in 2011

TIMS Network Expansion Support System (NESS)

TIMS Geometric Report

INT # **1698-2**

INT type AT GRADE - TYPE UNKNOWN

Region: SOUTHERN REGION

INT Effective Date: 18-Sep-12

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Location: **HIGHWAY 845:08 AND 529:04**

Classification: LV 2

Signalized: N

Last paved yr: 2012

Divided: N

Posted speed: 100

Lit: N

Last paved road name: 529

TM number: 110120

NESS Safety Calculations (2015 - 2019)

	Actual	BM	Deltas
Total rate:	85.478	233.7	148.2
Non animal rate:	0	227.9	227.9
Collision cost (\$ x M):	0.006	0.246	0.24

Total (ani + non ani)	Non-animal	2015	2016	2017	2018	2019
# Daytime: 0	Daytime					
# Nighttime: 1	Nighttime					
	Unknown					

Modify Outliners for Non Animal Collision					
	2015	2016	2017	2018	2019
F and Maj Inj.	0	0	0	0	0
Min. Inj.	0	0	0	0	0
Non ani	0	0	0	0	0

Three Similar Collisions Over Five Yrs Period

(excluding off road and animal collision)

Year:

Prim. evt.:

Collision Frequency Over Last 15 Yrs

Severity - non ani. 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

FATAL																0
MAJOR																0
MINOR																0
PDO				1					1							0
TOTAL	0	0	0	1	0	0	0	0	2	0	0	0	0	1		1
TOTAL-non ani.	0	0	0	1	0	0	0	0	1	0	0	0	0	0		0

Collision Summary Last 5 Yrs (2015 - 2019)

(Non animal collisions)

Month	Freq	Hour	AM	PM	Weekday	Freq
Jan:		0:			Mon:	
Feb:		1:			Tue:	
Mar:		2:			Wed:	
Apr:		3:			Thu:	
May:		4:			Fri:	
Jun:		5:			Sat:	
Jul:		6:			Sun:	
Aug:		7:			unknown:	
Sep:		8:				
Oct:		9:				
Nov:		10:				
Dec:		11:				
unknown:		unknown:				

Collision event 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

ANIMAL									1					1		1
BACKING																0
HEAD ON																0
LEFT TURN:ACROSS PATH																0
OFF ROAD LEFT																0
OFF ROAD RIGHT				1					1							0
OTHER																0
PASSING:LEFT TURN																0
PASSING:RIGHT TURN																0
PEDESTRIAN																0
REAR END																0
RIGHT ANGLE																0
SIDESWIPE:OPP DIR																0
SIDESWIPE:SAME DIR																0
STRUCK OBJECT																0
UNKNOWN																0

INT polygon yr: 31-Mar-2023

*The number of collision in this report are collisions at and near the intersection and is calculated using intersection polygon in TIMS.

*Cost of PDO collision had increased from \$1,000 to \$2,000 in 2011

TIMS Network Expansion Support System (NESS) TIMS Geometric Report

INT # **4155-1**

INT type AT GRADE - TYPE UNKNOWN

Region: SOUTHERN REGION

INT Effective Date: 01-Oct-00

Location: **HIGHWAY 531:02 AND 845:08**

Classification: LV 2

Signalized: N

Last paved yr: 2001

Divided: N

Posted speed: 100

Lit: N

Last paved road name: 531

TM number: 109140

NESS Safety Calculations (2015 - 2019)

	Actual	BM	Deltas
Total rate:	0	233.7	233.7
Non animal rate:	0	227.9	227.9
Collision cost (\$ x M):	0	0.246	0.246

Total (ani + non ani)	Non-animal	2015	2016	2017	2018	2019
# Daytime: 0	Daytime					
# Nighttime: 0	Nighttime					
	Unknown					

Modify Outliners for Non Animal Collision

	2015	2016	2017	2018	2019
F and Maj Inj.	0	0	0	0	0
Min. Inj.	0	0	0	0	0
Non ani	0	0	0	0	0

Three Similar Collisions Over Five Yrs Period

(excluding off road and animal collision)

Year:

Prim. evt.:

Collision Frequency Over Last 15 Yrs

Severity - non ani. 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL-non ani.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Collision Summary Last 5 Yrs (2015 - 2019)

(Non animal collisions)

Month	Freq	Hour	AM	PM	Weekday	Freq
Jan:		0:			Mon:	
Feb:		1:			Tue:	
Mar:		2:			Wed:	
Apr:		3:			Thu:	
May:		4:			Fri:	
Jun:		5:			Sat:	
Jul:		6:			Sun:	
Aug:		7:			unknown:	
Sep:		8:				
Oct:		9:				
Nov:		10:				
Dec:		11:				
unknown:		unknown:				

INT polygon yr: 31-Mar-2023

*The number of collision in this report are collisions at and near the intersection and is calculated using intersection polygon in TIMS.

*Cost of PDO collision had increased from \$1,000 to \$2,000 in 2011

INT # 1709-1

INT type AT GRADE - TYPE UNKNOWN

Region: SOUTHERN REGION

INT Effective Date: 01-Oct-00

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Location: **HIGHWAY 845:08 AND 539:02**

Classification: LV 2

Signalized: N

Last paved yr: 1998

Divided: N

Posted speed: 100

Lit: N

Last paved road name: 539

TM number: 111150

NESS Safety Calculations (2015 - 2019)

	Actual	BM	Deltas
Total rate:	139.829	400.5	260.7
Non animal rate:	139.829	393.8	254
Collision cost (\$ x M):	0.006	0.246	0.24

Total (ani + non ani)	Non-animal	2015	2016	2017	2018	2019
# Daytime: 0	Daytime					
# Nighttime: 1	Nighttime				1	
	Unknown					

Modify Outliners for Non Animal Collision					
	2015	2016	2017	2018	2019
F and Maj Inj.	0	0	0	0	0
Min. Inj.	0	0	0	0	0
Non ani	0	0	0	0.3	0

Three Similar Collisions Over Five Yrs Period

(excluding off road and animal collision)

Year:

Prim. evt.:

Collision Frequency Over Last 15 Yrs

Severity - non ani. 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 **Last 5 yrs**

FATAL																0
MAJOR			1													0
MINOR			1													0
PDO				1									1			1
TOTAL	0	0	2	1	0	0	0	0	0	0	0	0	0	1	0	1
TOTAL-non ani.	0	0	2	1	0	0	0	0	0	0	0	0	0	1	0	1

Collision Summary Last 5 Yrs (2015 - 2019)

(Non animal collisions)

Month	Freq	Hour	AM	PM	Weekday	Freq
Jan:		0:			Mon:	
Feb:		1:			Tue:	
Mar:		2:			Wed:	1
Apr:		3:			Thu:	
May:		4:			Fri:	
Jun:		5:			Sat:	
Jul:		6:			Sun:	
Aug:		7:			unknown:	
Sep:		8:				
Oct:		9:		1		
Nov:		10:				
Dec:	1	11:				
unknown:		unknown:				

Collision event 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 **Last 5 yrs**

ANIMAL																0
BACKING																0
HEAD ON																0
LEFT TURN:ACROSS PATH																0
OFF ROAD LEFT			1													0
OFF ROAD RIGHT				1	1											0
OTHER																0
PASSING:LEFT TURN																0
PASSING:RIGHT TURN																0
PEDESTRIAN																0
REAR END																0
RIGHT ANGLE																0
SIDESWIPE:OPP DIR																0
SIDESWIPE:SAME DIR																0
STRUCK OBJECT													1			1
UNKNOWN																0

INT polygon yr: 31-Mar-2023

*The number of collision in this report are collisions at and near the intersection and is calculated using intersection polygon in TIMS.

*Cost of PDO collision had increased from \$1,000 to \$2,000 in 2011

Roadway Summary

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Segments included within the Report

LRS	Length
539:02 C1 0.000 - 29.800	29.800
539:04 C1 0.000 - 4.200	4.200
Total	34.000

Length of Roadway (in Km) by Service Class

Service Class	Length
LV 3	34.000

Length of Paved and Gravel Roads (in Km)

Surface	Length
PAVED	34.000
Total	34.000

Collision Summary for years 2015-2019

	Total	Non Animal
Collision Rate in C/100MVKM	118.00	28.32
# of Fatal Collisions	0	0
# of Injury Collisions	2	2
# of Property Damage Only Collisions	23	4
Total # of collisions	25	6

Existing Width and Curve Summary

	Typical	Weighted	Max	Min	Total
Existing Width	9.00	8.8	9.50	7.60	
Existing WAADT	249.00	281	508.00	249.00	
Growth Rate %	1.4	1.8	1.8	0.8	
Speed	100		100	100	
Horizontal Curve Radius			5,500	407	9
Vertical Curve k (Crest)			380	55	36
Vertical Curve k (Sag)			480	36	36

Paving History

	Typical Year	Average Year	Max Year	Min Year
Last Paved	1998	1986	2005	0

Multilane Report

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Report Notes

Number of results found	2
4 Lane - Lv 1	7500
4 Lane - Lv 2	9300
4 Lane - Lv 3	11200
4 Lane - Lv 4	11200
6 Lane	31000
8 Lane	50000

Growth Rate in %

Collision Cost in \$/km (M) over 5 years

Collision Rate in C/100MVKM

Collision rate is calculated as (sum total collisions over 5 years * 100 Mil) / (sum of AADT history for the same 5 years * 365.25 * length (km))

Collision cost is calculated as (sum of collisions involving a fatality * \$9,120,367) + (sum of collisions involving a serious injury * \$66,744) + (sum of collisions involving a minor injury * \$66,744) + (sum of the property damage only collisions * \$5,851)/km)

				WAADT		LOS			NESS Sched		4 lane		6 lane		8 lane			Region
LRS	Len	Serv Class	# Lanes	Year 0	Year 20	Year 0	Year 20	Growth Rate	1st Work Year	WAADT	Need Year	WAADT	Need Year	WAADT	Need Year	WAADT	Notes	
539:02 C1 0.000 - 29.821	29.821	LV 3	2	249	337	A	A	1.84										1
539:04 C1 0.000 - 18.079	18.079	LV 3	2	508	587	A	A	0.79										1

Intersection Report

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Report Notes

Number of results found 3

The number of collisions in this report are collisions at and near the intersection and are collisions within the intersection polygon in TIMS

For details on individual collisions, see the "Collision Details" section within Excel report

The Signalization Work Activity Trigger is Traffic Score (TS) > 79 or TS >= 60 with 5 or more angle collisions

Interchange Trigger - Signalization trigger met on Level 1 divided highway with 100+ km/h, or left turn volume >= 700 vehicles per hour

Collision Cost in \$ (M) over 5 years

Collision Rate in C/100MEV

Intersection collision rate is calculated as (sum of intersection collisions over 5 years * 100 Mil) / (sum of AADT entering over 5 years * 365.25)

Collision cost is calculated as (sum of collisions involving a fatality * \$9,120,367) + (sum of collisions involving a serious injury * \$66,744) + (sum of collisions involving a minor injury * \$66,744) + (sum of the property damage only collisions * \$5,851)

Va, Vo and VI in VPH

LT & RT Length in m

Pk = Peak Hour

Year LT = Scheduled Year of Left Turn Lane Construction

Year LTR = Scheduled Year of Left Turn Lane Reconstruction

Year RT = Scheduled Year of Right Turn Lane Construction

Year RTR = Scheduled Year of Right Turn Lane Reconstruction

<div>INT #:26721</div> <div>LRS: 539:02 C1 8.135</div> <div>Location: HIGHWAY 539:02 AND RANGE ROAD 195</div> <div><div>Lv 2 Work Activity Summary</div><div>Lv 3 Work Activity Summary</div></div>	Major Road Details										TMD Ref:				Veh/day		Growth																			
	Int. Type: AG Service Class: LV 3										Posted Speed: 100 Lit: N Sig: N Div: N Radius:				Maj Rd: 539 Min Rd:				249 1.8%																	
	Collision Frequency										Collision Rate						Collision Cost																			
	Total 0		Fatal 0		Inj 0		Non-An 0		Total 0.0		BM 400.5		Non-An 0.0		BM 393.8		Cost (in \$M) 0.000		BM 0.246																	
	Approach		LT Lane		LT Len		LT BM		RT Lane		RT Len		RT BM		Chan		Yr LT		Vo		VI		BM		Va		Undiv BM		Pk		Yr RT		RT AADT		Yr Chan	
	539																																			
539																																				
Yr Signal				TS		Ang. Coll 0		Yr IC		TS		LT vph		Yr Light.				Day 0		Night 0		N/D Col%		Near VC Y												

TIMS Network Expansion Support System (NESS)
TIMS Geometric Report

<div>INT #:15889</div> <div>LRS: 539:04 C1 2.564</div> <div>Location: HIGHWAY 539:04 AND RANGE ROAD 171</div> <div>Lv 2 Work Activity Summary</div> <div>Lv 3 Work Activity Summary</div>	Major Road Details										TMD Ref:		Veh/day	Growth						
	Int. Type: AG		Posted Speed: 100						Maj Rd: 539				508	0.8%						
	Service Class: LV 3		Lit: N Sig: N Div: N Radius: 407.00						Min Rd:											
	Collision Frequency														Collision Rate				Collision Cost	
	Total 1	Fatal 0	Inj 0	Non-An 1			Total 82.6	BM 233.7	Non-An 82.6	BM 227.9	Cost (in \$M) 0.006	BM 0.246								
Approach	LT Lane	LT Len	LT BM	RT Lane	RT Len	RT BM	Chan	Yr LT	Vo	VI	BM	Va	Undiv BM	Pk	Yr RT	RT AADT	Yr Chan			
539																				
539																				
Yr Signal		TS	Ang. Coll 0		Yr IC		TS	LT vph		Yr Light.		Day 0	Night 1	N/D Col%		Near VC Y				

<div>INT #:3958</div> <div>LRS: 539:04 C1 2.934</div> <div>Location: HIGHWAY 539:04 AND TOWNSHIP ROAD 174</div> <div>Lv 2 Work Activity Summary</div> <div>Lv 3 Work Activity Summary</div>	Major Road Details										TMD Ref:		Veh/day	Growth						
	Int. Type: TYPE 1A		Posted Speed: 100						Maj Rd: 539				508	0.8%						
	Service Class: LV 3		Lit: N Sig: N Div: N Radius: 407.00						Min Rd:											
	Collision Frequency														Collision Rate				Collision Cost	
	Total 0	Fatal 0	Inj 0	Non-An 0			Total 0.0	BM 233.7	Non-An 0.0	BM 227.9	Cost (in \$M) 0.000	BM 0.246								
Approach	LT Lane	LT Len	LT BM	RT Lane	RT Len	RT BM	Chan	Yr LT	Vo	VI	BM	Va	Undiv BM	Pk	Yr RT	RT AADT	Yr Chan			
539																				
539																				
Yr Signal		TS	Ang. Coll 0		Yr IC		TS	LT vph		Yr Light.		Day 0	Night 0	N/D Col%		Near VC				

Intersection Access

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LRS	Access Type	Access Count	Road Side	Int #	Int Type	Speed	Roadside Class	MD Name	Distance Last Access	Distance Last Public
539:02 C1 0.000	MUNICIPAL ROAD	1	L	1709	AG	100	RCU	VULCAN COUNTY		
539:02 C1 0.071	OTHER	1	L			100	RCU	VULCAN COUNTY	0.071	
539:02 C1 0.503	FIELD	1	R			100	RCU	VULCAN COUNTY	0.432	
539:02 C1 0.811	FIELD	1	L			100	RCU	VULCAN COUNTY	0.308	
539:02 C1 1.419	FIELD	1	R			100	RCU	VULCAN COUNTY	0.608	
539:02 C1 1.624	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.205	
539:02 C1 2.018	FIELD	1	L			100	RCU	VULCAN COUNTY	0.394	
539:02 C1 2.250	FIELD	1	R			100	RCU	VULCAN COUNTY	0.232	
539:02 C1 2.643	FIELD	1	R			100	RCU	VULCAN COUNTY	0.393	
539:02 C1 2.867	FIELD	1	L			100	RCU	VULCAN COUNTY	0.224	
539:02 C1 3.150	FIELD	1	R			100	RCU	VULCAN COUNTY	0.283	
539:02 C1 3.255	MUNICIPAL ROAD	2	R&L	26720	AG	100	RCU	VULCAN COUNTY	0.105	3.255
539:02 C1 4.083	FIELD	1	R			100	RCU	VULCAN COUNTY	0.828	
539:02 C1 4.139	OTHER	1	L			100	RCU	VULCAN COUNTY	0.056	
539:02 C1 4.877	MUNICIPAL ROAD	2	R&L	15869	AG	100	RCU	VULCAN COUNTY	0.738	1.622
539:02 C1 5.584	FIELD	1	R			100	RCU	VULCAN COUNTY	0.707	
539:02 C1 6.485	FIELD	1	R			100	RCU	VULCAN COUNTY	0.901	
539:02 C1 6.499	MUNICIPAL ROAD	2	R&L	15870	AG	100	RCU	VULCAN COUNTY	0.014	1.622
539:02 C1 7.479	FIELD	1	L			100	RCU	VULCAN COUNTY	0.980	
539:02 C1 7.966	FARM	2	R&L			100	RCU	VULCAN COUNTY	0.487	
539:02 C1 8.135	MUNICIPAL ROAD	2	R&L	26721	AG	100	RCU	VULCAN COUNTY	0.169	1.636
539:02 C1 9.740	FIELD	1	R			100	RCU	VULCAN COUNTY	1.605	
539:02 C1 9.760	MUNICIPAL ROAD	2	R&L	15871	AG	100	RCU	VULCAN COUNTY	0.020	1.625
539:02 C1 9.970	FIELD	1	L			100	RCU	VULCAN COUNTY	0.210	
539:02 C1 10.156	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.186	
539:02 C1 10.464	FIELD	1	L			100	RCU	VULCAN COUNTY	0.308	
539:02 C1 10.565	MUNICIPAL ROAD	1	R	15872	AG	100	RCU	VULCAN COUNTY	0.101	0.805
539:02 C1 10.637	FIELD	1	L			100	RCU	VULCAN COUNTY	0.072	
539:02 C1 10.749	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.112	
539:02 C1 11.344	FIELD	1	R			100	RCU	VULCAN COUNTY	0.595	
539:02 C1 11.389	MUNICIPAL ROAD	2	R&L	15873	AG	100	RCU	VULCAN COUNTY	0.045	0.824
539:02 C1 11.957	FIELD	1	L			100	RCU	VULCAN COUNTY	0.568	
539:02 C1 12.186	FIELD	1	R			100	RCU	VULCAN COUNTY	0.229	
539:02 C1 13.014	MUNICIPAL ROAD	2	R&L	15874	AG	100	RCU	VULCAN COUNTY	0.828	1.625
539:02 C1 13.530	FIELD	1	L			100	RCU	VULCAN COUNTY	0.516	
539:02 C1 13.832	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.302	
539:02 C1 14.648	MUNICIPAL ROAD	2	R&L	15875	AG	100	RCU	VULCAN COUNTY	0.816	1.634
539:02 C1 14.724	FARM	1	L			100	RCU	VULCAN COUNTY	0.076	
539:02 C1 15.050	FIELD	1	R			100	RCU	VULCAN COUNTY	0.326	
539:02 C1 15.477	FIELD	1	L			100	RCU	VULCAN COUNTY	0.427	
539:02 C1 15.679	FIELD	1	R			100	RCU	VULCAN COUNTY	0.202	
539:02 C1 15.704	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.025	

The information provided herein is considered 'calculated data' for network screening purposes, based on the best available information within the TIMS inventory at the time of publishing. Project level engineering assessment is required to further develop the identified locations into strategies and engineering solutions for programming purposes.

TIMS Network Expansion Support System (NESS)
TIMS Geometric Report

LRS	Access Type	Access Count	Road Side	Int #	Int Type	Speed	Roadside Class	MD Name	Distance Last Access	Distance Last Public
539:02 C1 15.781	FARM	1	R			100	RCU	VULCAN COUNTY	0.077	
539:02 C1 15.831	FARM	1	L			100	RCU	VULCAN COUNTY	0.050	
539:02 C1 15.922	FIELD	1	L			100	RCU	VULCAN COUNTY	0.091	
539:02 C1 16.279	MUNICIPAL ROAD	2	R&L	15876	AG	100	RCU	VULCAN COUNTY	0.357	1.631
539:02 C1 16.869	FARM	1	R			100	RCU	VULCAN COUNTY	0.590	
539:02 C1 16.931	FIELD	1	R			100	RCU	VULCAN COUNTY	0.062	
539:02 C1 17.394	MUNICIPAL ROAD	1	R	15877	AG	100	RCU	VULCAN COUNTY	0.463	1.115
539:02 C1 17.888	FIELD	1	L			100	RCU	VULCAN COUNTY	0.494	
539:02 C1 17.903	MUNICIPAL ROAD	2	R&L	15878	AG	100	RCU	VULCAN COUNTY	0.015	0.509
539:02 C1 18.722	MUNICIPAL ROAD	1	R	15879	AG	100	RCU	VULCAN COUNTY	0.819	0.819
539:02 C1 19.532	MUNICIPAL ROAD	2	R&L	15880	AG	100	RCU	VULCAN COUNTY	0.810	0.810
539:02 C1 19.559	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.027	
539:02 C1 19.888	FIELD	1	R			100	RCU	VULCAN COUNTY	0.329	
539:02 C1 20.220	MUNICIPAL ROAD	1	R	15881	AG	100	RCU	VULCAN COUNTY	0.332	0.688
539:02 C1 20.373	FIELD	1	L			100	RCU	VULCAN COUNTY	0.153	
539:02 C1 21.164	MUNICIPAL ROAD	2	R&L	26713	AG	100	RCU	VULCAN COUNTY	0.791	0.944
539:02 C1 21.187	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.023	
539:02 C1 21.549	FIELD	1	R			100	RCU	VULCAN COUNTY	0.362	
539:02 C1 22.291	FIELD	1	L			100	RCU	VULCAN COUNTY	0.742	
539:02 C1 22.497	MUNICIPAL ROAD	1	L	15882	AG	100	RCU	VULCAN COUNTY	0.206	1.333
539:02 C1 23.068	MUNICIPAL ROAD	1	L	15883	AG	100	RCU	VULCAN COUNTY	0.571	0.571
539:02 C1 23.418	MUNICIPAL ROAD	1	R	15884	AG	100	RCU	VULCAN COUNTY	0.350	0.350
539:02 C1 24.431	MUNICIPAL ROAD	1	R	26722	AG	100	RCU	VULCAN COUNTY	1.013	1.013
539:02 C1 25.044	FIELD	1	L			100	RCU	VULCAN COUNTY	0.613	
539:02 C1 25.568	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.524	
539:02 C1 26.056	MUNICIPAL ROAD	2	R&L	15885	AG	100	RCU	VULCAN COUNTY	0.488	1.625
539:02 C1 26.621	MUNICIPAL ROAD	1	R	15886	AG	100	RCU	VULCAN COUNTY	0.565	0.565
539:02 C1 27.227	FIELD	2	R&L			100	RCU	VULCAN COUNTY	0.606	
539:02 C1 29.008	MUNICIPAL ROAD	2	R&L	2759	TYPE 2B	100	RCU	VULCAN COUNTY	1.781	2.387
539:02 C1 29.295	MUNICIPAL ROAD	1	R	26723	AG	100	RCU	VULCAN COUNTY	0.287	0.287
539:04 C1 0.395	FIELD	1	L			100	RCU	COUNTY OF NEWELL	0.921	
539:04 C1 0.414	MUNICIPAL ROAD	1	R	15888	AG	100	RCU	COUNTY OF NEWELL	0.019	1.414
539:04 C1 0.500	MUNICIPAL ROAD	1	L	4469	TYPE 2A	100	RCU	COUNTY OF NEWELL	0.086	0.086
539:04 C1 0.712	FARM	1	L			100	RCU	COUNTY OF NEWELL	0.212	
539:04 C1 0.761	MUNICIPAL ROAD	1	R			100	RCU	COUNTY OF NEWELL	0.049	0.261
539:04 C1 1.230	FIELD	2	R&L			100	RCU	COUNTY OF NEWELL	0.469	
539:04 C1 1.499	FIELD	1	L			100	RCU	COUNTY OF NEWELL	0.269	
539:04 C1 2.014	FIELD	2	R&L			100	RCU	COUNTY OF NEWELL	0.515	
539:04 C1 2.074	FARM	1	L			100	RCU	COUNTY OF NEWELL	0.060	
539:04 C1 2.565	MUNICIPAL ROAD	1	L			100	RCU	COUNTY OF NEWELL	0.491	1.804
539:04 C1 2.749	MUNICIPAL ROAD			15889	AG	100	RCU	COUNTY OF NEWELL	0.184	0.184
539:04 C1 2.905	MUNICIPAL ROAD	1	L			100	RCU	COUNTY OF NEWELL	0.156	0.156
539:04 C1 2.934	MUNICIPAL ROAD			3958	TYPE 1A	100	RCU	COUNTY OF NEWELL	0.029	0.029
539:04 C1 3.319	FIELD	1	R			100	RCU	COUNTY OF NEWELL	0.385	
539:04 C1 3.474	MUNICIPAL ROAD	1	L	15890	AG	100	RCU	COUNTY OF NEWELL	0.155	0.540

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LRS	Access Type	Access Count	Road Side	Int #	Int Type	Speed	Roadside Class	MD Name	Distance Last Access	Distance Last Public
539:04 C1 3.713	FARM	2	R&L			100	RCU	COUNTY OF NEWELL	0.239	
539:04 C1 3.886	FARM	1	L			100	RCU	COUNTY OF NEWELL	0.173	

DRAFT - PENDING REVIEW

TIMS Network Expansion Support System (NESS)

TIMS Geometric Report

INT # **15889-1**

INT type AT GRADE - TYPE UNKNOWN

Region: SOUTHERN REGION

INT Effective Date: 01-Oct-00

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Location: **HIGHWAY 539:04 AND RANGE ROAD 171**

Classification: LV 3

Signalized: N

Last paved yr: 2000

Divided: N

Posted speed: 100

Lit: N

Last paved road name: 539

TM number:

NESS Safety Calculations (2015 - 2019)

	Actual	BM	Deltas
Total rate:	82.59	233.7	151.1
Non animal rate:	82.59	227.9	145.3
Collision cost (\$ x M):	0.006	0.246	0.24

Total (ani + non ani)	Non-animal	2015	2016	2017	2018	2019
# Daytime: 0	Daytime					
# Nighttime: 1	Nighttime				1	
	Unknown					

Modify Outliners for Non Animal Collision					
	2015	2016	2017	2018	2019
F and Maj Inj.	0	0	0	0	0
Min. Inj.	0	0	0	0	0
Non ani	0	0	0	0.3	0

Three Similar Collisions Over Five Yrs Period

(excluding off road and animal collision)

Year:

Prim. evt.:

Collision Frequency Over Last 15 Yrs

Severity - non ani. 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

FATAL																0
MAJOR																0
MINOR																0
PDO 1														1		1
TOTAL	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
TOTAL-non ani.	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1

Collision Summary Last 5 Yrs (2015 - 2019)

(Non animal collisions)

Month	Freq	Hour	AM	PM	Weekday	Freq
Jan:		0:			Mon:	1
Feb:		1:			Tue:	
Mar:		2:			Wed:	
Apr:		3:			Thu:	
May:		4:			Fri:	
Jun:		5:			Sat:	
Jul:		6:		1	Sun:	
Aug:		7:			unknown:	
Sep:		8:				
Oct:		9:				
Nov:	1	10:				
Dec:		11:				
unknown:		unknown:				

Collision event 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

ANIMAL																0
BACKING																0
HEAD ON																0
LEFT TURN:ACROSS PATH																0
OFF ROAD LEFT																0
OFF ROAD RIGHT													1			1
OTHER																0
PASSING:LEFT TURN																0
PASSING:RIGHT TURN																0
PEDESTRIAN																0
REAR END																0
RIGHT ANGLE 1																0
SIDESWIPE:OPP DIR																0
SIDESWIPE:SAME DIR																0
STRUCK OBJECT																0
UNKNOWN																0

INT polygon yr: 31-Mar-2023

*The number of collision in this report are collisions at and near the intersection and is calculated using intersection polygon in TIMS.

*Cost of PDO collision had increased from \$1,000 to \$2,000 in 2011

TIMS Network Expansion Support System (NESS) TIMS Geometric Report

INT # **3958-1**

INT type TYPE 1A

Region: SOUTHERN REGION

INT Effective Date: 01-Oct-00

Location: **HIGHWAY 539:04 AND TOWNSHIP ROAD 174**

Classification: LV 3

Signalized: N

Last paved yr: 2000

Divided: N

Posted speed: 100

Lit: N

Last paved road name: 539

TM number:

NESS Safety Calculations (2015 - 2019)

	Actual	BM	Deltas
Total rate:	0	233.7	233.7
Non animal rate:	0	227.9	227.9
Collision cost (\$ x M):	0	0.246	0.246

Total (ani + non ani)	Non-animal	2015	2016	2017	2018	2019
# Daytime: 0	Daytime					
# Nighttime: 0	Nighttime					
	Unknown					

Modify Outliners for Non Animal Collision					
	2015	2016	2017	2018	2019
F and Maj Inj.	0	0	0	0	0
Min. Inj.	0	0	0	0	0
Non ani	0	0	0	0	0

Three Similar Collisions Over Five Yrs Period

(excluding off road and animal collision)

Year:

Prim. evt.:

Collision Frequency Over Last 15 Yrs

Severity - non ani. 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

FATAL																0
MAJOR			1													0
MINOR																0
PDO																0
TOTAL	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL-non ani.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

Collision Summary Last 5 Yrs (2015 - 2019)

(Non animal collisions)

Month	Freq	Hour	AM	PM	Weekday	Freq
Jan:		0:			Mon:	
Feb:		1:			Tue:	
Mar:		2:			Wed:	
Apr:		3:			Thu:	
May:		4:			Fri:	
Jun:		5:			Sat:	
Jul:		6:			Sun:	
Aug:		7:			unknown:	
Sep:		8:				
Oct:		9:				
Nov:		10:				
Dec:		11:				
unknown:		unknown:				

Collision event 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Last 5 yrs

ANIMAL																0
BACKING																0
HEAD ON																0
LEFT TURN:ACROSS PATH																0
OFF ROAD LEFT																0
OFF ROAD RIGHT			1													0
OTHER																0
PASSING:LEFT TURN																0
PASSING:RIGHT TURN																0
PEDESTRIAN																0
REAR END																0
RIGHT ANGLE																0
SIDESWIPE:OPP DIR																0
SIDESWIPE:SAME DIR																0
STRUCK OBJECT																0
UNKNOWN																0

INT polygon yr: 31-Mar-2023

*The number of collision in this report are collisions at and near the intersection and is calculated using intersection polygon in TIMS.

*Cost of PDO collision had increased from \$1,000 to \$2,000 in 2011

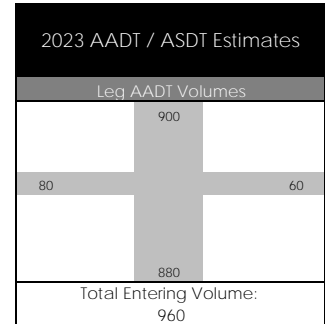
Reference Number:
110100

Intersection of:
522 & 845 SW OF ENCHANT

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	597	66.3%
	B: Recreational Vehicle	15	1.7%
	C: Bus	0	0.0%
	D: Single Unit Truck	62	6.9%
	E: Tractor Trailer Unit	226	25.1%
		AADT	900
		ASDT	1,090

From North			
450			
	Right	Thru	Left
	20	420	10
A	15	279	10
B	0	4	0
C	0	0	0
D	4	28	0
E	1	109	0

To North	
450	
A	293
B	11
C	0
D	30
E	116



To West	
40	
A	35
B	0
C	0
D	4
E	1

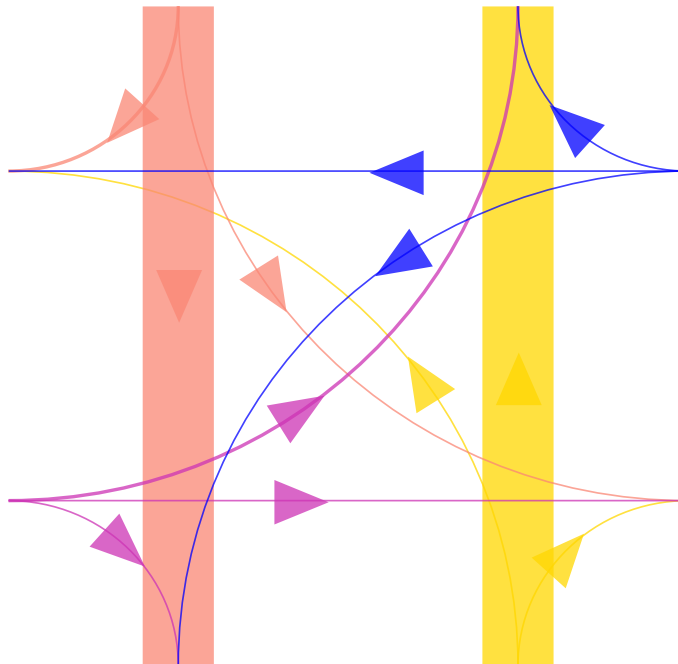
West On: 522	Volume	%
	A	68 85.0%
	B	3 3.8%
	C	0 0.0%
	D	8 10.0%
	E	1 1.3%
		AADT 80
		ASDT 90

From West			
40			
	Left	Thru	Right
	20	10	10
A	14	10	9
B	3	0	0
C	0	0	0
D	3	0	1
E	0	0	0

From East			
30			
	Left	Thru	Right
	10	10	10
A	10	10	10
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

East On: Twp Rd 140	Vehicle Type	Volume	%
	A	60	100.0%
	B	0	0.0%
	C	0	0.0%
	D	0	0.0%
	E	0	0.0%
		AADT 60	
		ASDT 60	

To East	
30	
A	30
B	0
C	0
D	0
E	0



ABBREVIATIONS:

AADT: Annual Average Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from January 1 to December 31 (inclusive), 365 days.

ASDT: Average Summer Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from May 1 to September 30 (inclusive), 153 days.

To South	
440	
A	298
B	4
C	0
D	29
E	109

From South			
440			
	Left	Thru	Right
	10	420	10
A	10	269	10
B	0	8	0
C	0	0	0
D	0	27	0
E	0	116	0

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	587	66.7%
	B: Recreational Vehicle	12	1.4%
	C: Bus	0	0.0%
	D: Single Unit Truck	56	6.4%
	E: Tractor Trailer Unit	225	25.6%
		AADT 880	
		ASDT 1,020	

NOTE:
Coloured line thickness corresponds to turning movement volume.

Reference Number:
110100

Intersection of:
522 & 845 SW OF ENCHANT

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	66	75.0%
	B: Recreational Vehicle	1	1.1%
	C: Bus	0	0.0%
	D: Single Unit Truck	5	5.7%
	E: Tractor Trailer Unit	16	18.2%
		AM	88

From North			
	Right	Thru	Left
	0	35	0
A	0	29	0
B	0	1	0
C	0	0	0
D	0	1	0
E	0	4	0

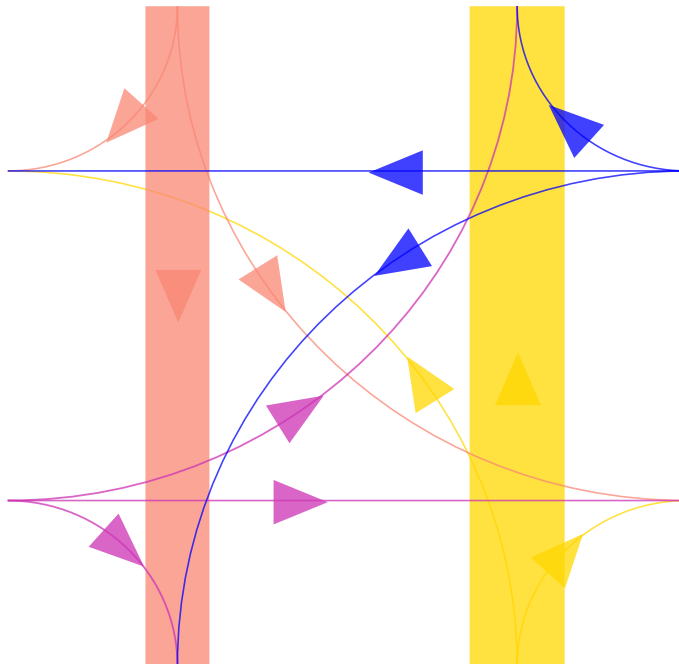
To North		
		53
A		37
B		0
C		0
D		4
E		12

2023 AM 100th Highest Hour Estimates		
Leg AM Volumes		
	88	
2		0
	88	
Total Entering Volume: 89		

To West	
	0
A	0
B	0
C	0
D	0
E	0

West On: 522	Volume	%
	A	2 100.0%
	B	0 0.0%
	C	0 0.0%
	D	0 0.0%
	E	0 0.0%
		AM

From West			
	Left	Thru	Right
	1	0	1
A	1	0	1
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0



From East			
	Left	Thru	Right
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

Vehicle Type		East On: Two Rd 140
A	0 -	
B	0 -	
C	0 -	
D	0 -	
E	0 -	
		AM

To East	
	0
A	0
B	0
C	0
D	0
E	0

To South	
	36
A	30
B	1
C	0
D	1
E	4

From South			
	Left	Thru	Right
	0	52	0
A	0	36	0
B	0	0	0
C	0	0	0
D	0	4	0
E	0	12	0

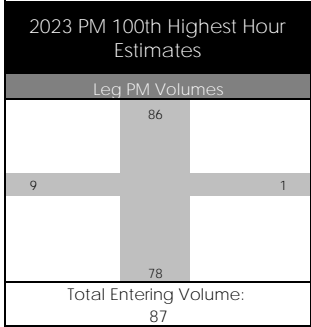
South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	66	75.0%
	B: Recreational Vehicle	1	1.1%
	C: Bus	0	0.0%
	D: Single Unit Truck	5	5.7%
	E: Tractor Trailer Unit	16	18.2%
		AM	88

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
110100

Intersection of:
522 & 845 SW OF ENCHANT

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	60	69.8%
	B: Recreational Vehicle	1	1.2%
	C: Bus	0	0.0%
	D: Single Unit Truck	5	5.8%
	E: Tractor Trailer Unit	20	23.3%
		PM	86



	From North		
	Right	Thru	Left
	4	52	0
	A	2	36
	B	0	0
	C	0	0
	D	2	1
	E	0	15

	To North		
	Right	Thru	Left
	30		
	A	22	
	B	1	
	C	0	
	D	2	
	E	5	

	To West		
	Right	Thru	Left
	4		
	A	2	
	B	0	
	C	0	
	D	2	
	E	0	

West On: 522	Vehicle Type	Volume	%
	A	5	55.6%
	B	1	11.1%
	C	0	0.0%
	D	3	33.3%
	E	0	0.0%
		PM	9

	From West		
	Left	Thru	Right
	4	1	0
	A	2	1
	B	1	0
	C	0	0
	D	1	0
	E	0	0

	From East		
	Left	Thru	Right
	0	0	0
	A	0	0
	B	0	0
	C	0	0
	D	0	0
	E	0	0

East On: Twp Rd 140	Vehicle Type	Volume	%
	A	1	100.0%
	B	0	0.0%
	C	0	0.0%
	D	0	0.0%
	E	0	0.0%
		PM	1

	To East		
	Right	Thru	Left
	1		
	A	1	
	B	0	
	C	0	
	D	0	
	E	0	

	To South		
	Right	Thru	Left
	52		
	A	36	
	B	0	
	C	0	
	D	1	
	E	15	

	From South		
	Left	Thru	Right
	0	26	0
	A	0	20
	B	0	0
	C	0	0
	D	0	1
	E	0	5

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	56	71.8%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	2	2.6%
	E: Tractor Trailer Unit	20	25.6%
		PM	78

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:

111110

Intersection of:

526 & 845 SW OF TRAVERS

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	417	63.2%
	B: Recreational Vehicle	7	1.1%
	C: Bus	0	0.0%
	D: Single Unit Truck	34	5.2%
	E: Tractor Trailer Unit	202	30.6%
	AADT	660	
	ASDT	790	

From North			
	330		
	Right	Thru	Left
	10	170	150
A	10	89	109
B	0	2	3
C	0	0	0
D	0	5	10
E	0	74	28

To North			
	330		
	Right	Thru	Left
A			
B			
C			
D			
E			

2023 AADT / ASDT Estimates

Leg AADT Volumes			
	660		
60		860	
	900		
Total Entering Volume:			
1,240			

To West			
	30		
	Right	Thru	Left
A			
B			
C			
D			
E			

West On: Twp Rd 142	Volume	%
A	57	95.0%
B	0	0.0%
C	0	0.0%
D	0	0.0%
E	3	5.0%
AADT	60	
ASDT	60	

From West			
	30		
	Left	Thru	Right
	10	10	10
A	9	10	10
B	0	0	0
C	0	0	0
D	0	0	0
E	1	0	0

From East			
	430		
	Left	Thru	Right
	270	10	150
A	151	8	114
B	2	0	1
C	0	0	0
D	30	0	14
E	87	2	21

East On: 526	Vehicle Type	Volume	%
	A: Passenger Vehicle	542	63.0%
	B: Recreational Vehicle	10	1.2%
	C: Bus	0	0.0%
	D: Single Unit Truck	63	7.3%
	E: Tractor Trailer Unit	245	28.5%
	AADT	860	
	ASDT	1,030	

To East			
	430		
	Left	Thru	Right
A			
B			
C			
D			
E			

To South			
	450		
	Left	Thru	Right
	10	170	270
A	10	86	150
B	0	1	4
C	0	0	0
D	0	5	9
E	0	78	107

From South			
	450		
	Left	Thru	Right
	10	170	270
A	10	86	150
B	0	1	4
C	0	0	0
D	0	5	9
E	0	78	107

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	496	55.1%
	B: Recreational Vehicle	9	1.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	49	5.4%
	E: Tractor Trailer Unit	346	38.4%
	AADT	900	
	ASDT	1,070	

ABBREVIATIONS:

AADT: Annual Average Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from January 1 to December 31 (inclusive), 365 days.

ASDT: Average Summer Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from May 1 to September 30 (inclusive), 153 days.

NOTE:

Coloured line thickness corresponds to turning movement volume.

Reference Number:
111110

Intersection of:
526 & 845 SW OF TRAVERS

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	55	75.3%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	3	4.1%
	E: Tractor Trailer Unit	15	20.5%
		AM	73

From North			
22			
	Right	Thru	Left
	1	16	5
A	1	15	5
B	0	0	0
C	0	0	0
D	0	0	0
E	0	1	0

To North	
51	
A	34
B	0
C	0
D	3
E	14

2023 AM 100th Highest Hour Estimates			
Leg AM Volumes			
	73		
5			60
		88	
Total Entering Volume: 113			

To West	
2	
A	2
B	0
C	0
D	0
E	0

West On: Twp Rd 142	Volume	%
	A	5 100.0%
	B	0 0.0%
	C	0 0.0%
	D	0 0.0%
	E	0 0.0%
AM	5	

From West			
3			
	Left	Thru	Right
	2	0	1
A	2	0	1
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

From East			
30			
	Left	Thru	Right
	13	0	17
A	7	0	14
B	0	0	0
C	0	0	0
D	0	0	3
E	6	0	0

Vehicle Type			East On: 526
A	37	61.7%	
B	0	0.0%	
C	0	0.0%	
D	7	11.7%	
E	16	26.7%	
AM	60		

To East	
30	
A	16
B	0
C	0
D	4
E	10

To South	
30	
A	23
B	0
C	0
D	0
E	7

From South			
58			
	Left	Thru	Right
	1	32	25
A	1	18	11
B	0	0	0
C	0	0	0
D	0	0	4
E	0	14	10

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	53	60.2%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	4	4.5%
	E: Tractor Trailer Unit	31	35.2%
		AM	88

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
111110

Intersection of:
526 & 845 SW OF TRAVERS

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	49	64.5%
	B: Recreational Vehicle	1	1.3%
	C: Bus	0	0.0%
	D: Single Unit Truck	2	2.6%
	E: Tractor Trailer Unit	24	31.6%
		PM	76

2023 PM 100th Highest Hour Estimates			
Leg PM Volumes			
		76	
0			64
		88	
Total Entering Volume: 114			

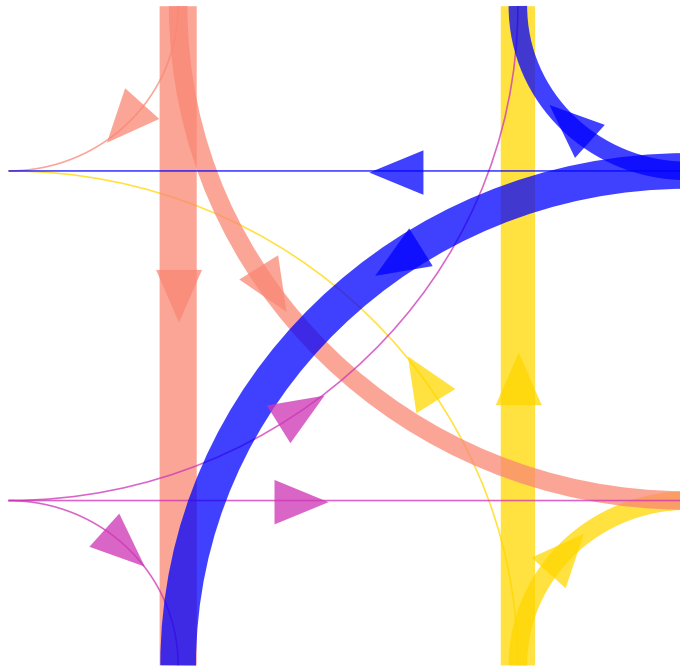
From North			
39			
	Right	Thru	Left
	0	26	13
A	0	15	10
B	0	1	0
C	0	0	0
D	0	2	0
E	0	8	3

To North	
37	
A	24
B	0
C	0
D	0
E	13

To West	
0	
A	0
B	0
C	0
D	0
E	0

West On: Twp Rd 142	Volume	%	
	A	0	-
	B	0	-
	C	0	-
	D	0	-
	E	0	-
PM	0		

From West			
0			
	Left	Thru	Right
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0



From East			
38			
	Left	Thru	Right
	25	0	13
A	8	0	11
B	1	0	0
C	0	0	0
D	12	0	0
E	4	0	2

Vehicle Type			
	A	34	53.1%
	B	2	3.1%
	C	0	0.0%
	D	12	18.8%
	E	16	25.0%
		PM	64

To East	
26	
A	15
B	1
C	0
D	0
E	10

To South	
51	
A	23
B	2
C	0
D	14
E	12

From South			
37			
	Left	Thru	Right
	0	24	13
A	0	13	5
B	0	0	1
C	0	0	0
D	0	0	0
E	0	11	7

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	41	46.6%
	B: Recreational Vehicle	3	3.4%
	C: Bus	0	0.0%
	D: Single Unit Truck	14	15.9%
	E: Tractor Trailer Unit	30	34.1%
		PM	88

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
110120

Intersection of:
529 & 845 NW OF TRAVERS

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	352	88.0%
	B: Recreational Vehicle	12	3.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	7	1.8%
	E: Tractor Trailer Unit	29	7.3%
		AADT	380
		ASDT	460

From North			
200			
	Right	Thru	Left
	20	170	10
A	16	150	10
B	1	5	0
C	0	0	0
D	2	2	0
E	1	13	0

To North	
190	
A	176
B	6
C	0
D	3
E	15

2023 AADT / ASDT Estimates

Leg AADT Volumes		
380		
280		60
	580	
Total Entering Volume: 660		

To West	
140	
A	78
B	17
C	0
D	10
E	35

West On: 529	Volume	%
	A	187 66.8%
	B	19 6.8%
	C	0 0.0%
	D	12 4.3%
	E	62 22.1%
AADT	280	
ASDT	340	

From West			
140			
	Left	Thru	Right
	20	10	110
A	14	8	87
B	1	0	1
C	0	0	0
D	1	0	1
E	4	2	21

From East			
30			
	Left	Thru	Right
	10	10	10
A	8	0	10
B	0	0	0
C	0	0	0
D	0	0	0
E	2	10	0

East On: Twp Rd 152	Vehicle Type	Volume	%
	A	42	70.0%
	B	0	0.0%
	C	0	0.0%
	D	0	0.0%
	E	18	30.0%
		AADT	60
		ASDT	90

To East	
30	
A	24
B	0
C	0
D	0
E	6

To South	
290	
A	245
B	6
C	0
D	3
E	36

From South			
290			
	Left	Thru	Right
	110	170	10
A	62	152	6
B	16	5	0
C	0	0	0
D	8	2	0
E	24	11	4

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	465	80.2%
	B: Recreational Vehicle	27	4.7%
	C: Bus	0	0.0%
	D: Single Unit Truck	13	2.2%
	E: Tractor Trailer Unit	75	12.9%
		AADT	580
		ASDT	720

ABBREVIATIONS:

AADT: Annual Average Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from January 1 to December 31 (inclusive), 365 days.

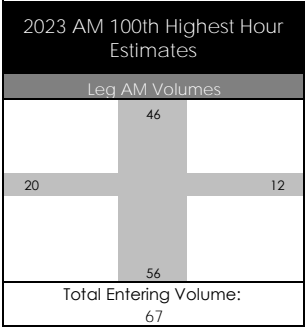
ASDT: Average Summer Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from May 1 to September 30 (inclusive), 153 days.

NOTE:
Coloured line thickness corresponds to turning movement volume.

Reference Number:
110120

Intersection of:
529 & 845 NW OF TRAVERS

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	35	76.1%
	B: Recreational Vehicle	1	2.2%
	C: Bus	0	0.0%
	D: Single Unit Truck	1	2.2%
	E: Tractor Trailer Unit	9	19.6%
		AM	46



	From North		
	Right	Thru	Left
	3	20	1
A	3	16	1
B	0	0	0
C	0	0	0
D	0	0	0
E	0	4	0

	To North		
	Right	Thru	Left
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

	To West		
	Right	Thru	Left
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

West On: 529	Volume		%
	A	13	65.0%
	B	1	5.0%
	C	0	0.0%
	D	0	0.0%
	E	6	30.0%
	AM		20

	From West		
	Left	Thru	Right
	2	1	4
A	0	1	3
B	1	0	0
C	0	0	0
D	0	0	0
E	1	0	1

	From East		
	Left	Thru	Right
	3	0	4
A	3	0	4
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

East On: Twp Rd 152	Vehicle Type	Volume	%
	A	12	100.0%
	B	0	0.0%
	C	0	0.0%
	D	0	0.0%
	E	0	0.0%
		AM	12

	To East		
	Right	Thru	Left
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

	To South		
	Right	Thru	Left
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

	From South		
	Left	Thru	Right
	10	16	3
A	6	11	3
B	0	0	0
C	0	0	0
D	0	1	0
E	4	4	0

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	42	75.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	1	1.8%
	E: Tractor Trailer Unit	13	23.2%
		AM	56

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
110120

Intersection of:
529 & 845 NW OF TRAVERS

North On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	26	78.8%
	B: Recreational Vehicle	3	9.1%
	C: Bus	0	0.0%
	D: Single Unit Truck	2	6.1%
	E: Tractor Trailer Unit	2	6.1%
		PM	33

2023 PM 100th Highest Hour Estimates			
Leg PM Volumes			
	33		
34		4	
	59		
Total Entering Volume: 65			

From North			
	Right	Thru	Left
	0	12	2
A	0	7	2
B	0	3	0
C	0	0	0
D	0	1	0
E	0	1	0

To North	
	19
A	17
B	0
C	0
D	1
E	1

To West	
	21
A	15
B	5
C	0
D	1
E	0

West On: 529	Volume	%
	A	27 79.4%
	B	5 14.7%
	C	0 0.0%
	D	2 5.9%
	E	0 0.0%
		PM 34

From West			
	Left	Thru	Right
	3	0	10
A	2	0	10
B	0	0	0
C	0	0	0
D	1	0	0
E	0	0	0

From East			
	Left	Thru	Right
	0	0	1
A	0	0	1
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

East On: Twp Rd 152	Vehicle Type	Volume	%
	A	4	100.0%
	B	0	0.0%
	C	0	0.0%
	D	0	0.0%
	E	0	0.0%
		PM 4	

To East	
	3
A	3
B	0
C	0
D	0
E	0

To South	
	22
A	17
B	3
C	0
D	1
E	1

From South			
	Left	Thru	Right
	21	15	1
A	15	14	1
B	5	0	0
C	0	0	0
D	1	0	0
E	0	1	0

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	47	79.7%
	B: Recreational Vehicle	8	13.6%
	C: Bus	0	0.0%
	D: Single Unit Truck	2	3.4%
	E: Tractor Trailer Unit	2	3.4%
		PM	59

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
109140
Intersection of:
531 & 845 LOMOND

North On:	Vehicle Type	Volume	%
	A: Passenger Vehicle	0	-
	B: Recreational Vehicle	0	-
	C: Bus	0	-
	D: Single Unit Truck	0	-
	E: Tractor Trailer Unit	0	-
	AADT	0	
	ASDT	0	

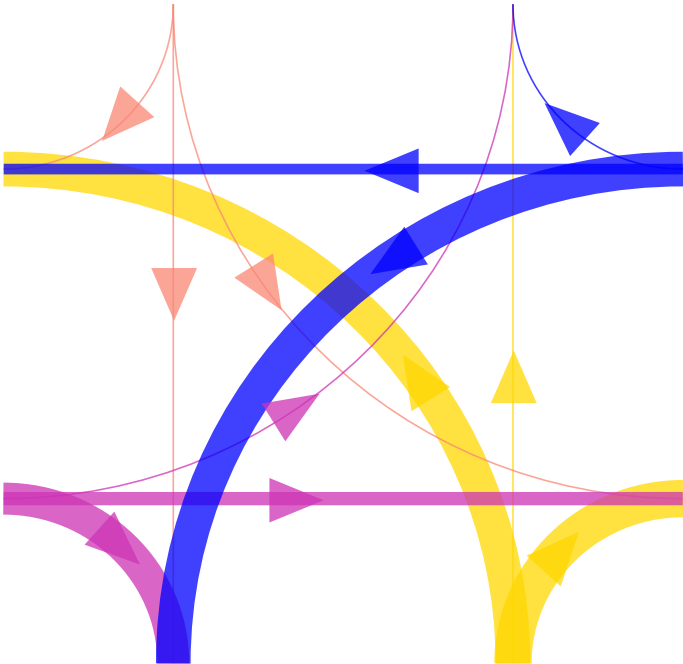
From North				To North			
0				0			
	Right	Thru	Left		Right	Thru	Left
A	0	0	0	A	0	0	0
B	0	0	0	B	0	0	0
C	0	0	0	C	0	0	0
D	0	0	0	D	0	0	0
E	0	0	0	E	0	0	0

2023 AADT / ASDT Estimates			
Leg AADT Volumes			
	0		
340			360
	520		
Total Entering Volume:			
610			

To West			
170			
A	121		
B	3		
C	3		
D	18		
E	25		

West On: 531	Volume	%
A	244	71.8%
B	6	1.8%
C	7	2.1%
D	33	9.7%
E	50	14.7%
AADT	340	
ASDT	410	

From West			
170			
	Left	Thru	Right
A	0	37	86
B	0	0	3
C	0	1	3
D	0	4	11
E	0	8	17



From East			
170			
Left	Thru	Right	
130	40	0	
95	27	0	A
4	0	0	B
1	1	0	C
11	4	0	D
19	8	0	E

Vehicle Type			East On: 845
A	262	72.8%	
B	5	1.4%	
C	6	1.7%	
D	29	8.1%	
E	58	16.1%	
AADT	360		
ASDT	430		

To East			
190			
A	140		
B	1		
C	4		
D	14		
E	31		

ABBREVIATIONS:

AADT: Annual Average Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from January 1 to December 31 (inclusive), 365 days.

ASDT: Average Summer Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from May 1 to September 30 (inclusive), 153 days.

To South			
250			
A	181		
B	7		
C	4		
D	22		
E	36		

From South			
270			
	Left	Thru	Right
A	130	0	140
B	94	0	103
C	3	0	1
D	2	0	3
E	14	0	10
	17	0	23

South On: 845	Vehicle Type	Volume	%
A	Passenger Vehicle	378	72.7%
B	Recreational Vehicle	11	2.1%
C	Bus	9	1.7%
D	Single Unit Truck	46	8.8%
E	Tractor Trailer Unit	76	14.6%
AADT	520		
ASDT	610		

NOTE:
Coloured line thickness corresponds to turning movement volume.

Reference Number:
109140

Intersection of:
531 & 845 LOMOND

North On:	Vehicle Type	Volume	%
	A: Passenger Vehicle	0	-
	B: Recreational Vehicle	0	-
	C: Bus	0	-
	D: Single Unit Truck	0	-
	E: Tractor Trailer Unit	0	-
		AM	0

	From North		
	Right	Thru	Left
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

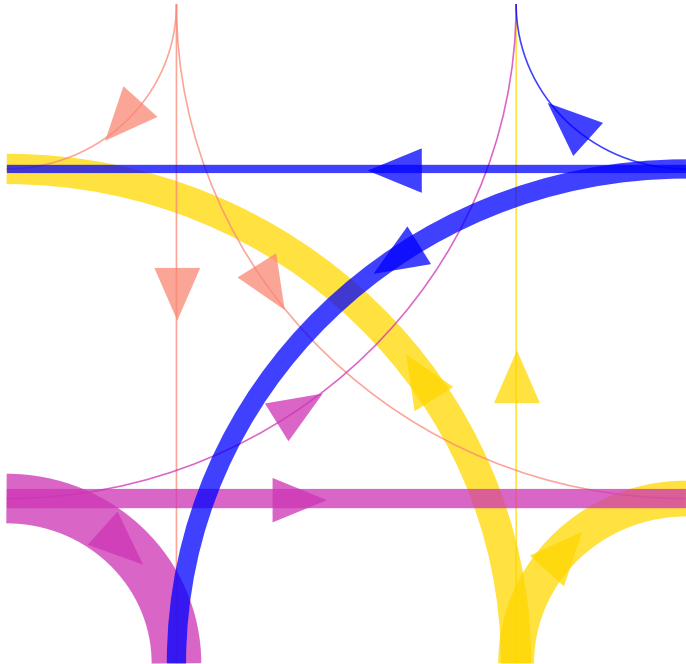
	To North		
	Right	Thru	Left
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

2023 AM 100th Highest Hour Estimates			
Leg AM Volumes			
	0		
39			30
	49		
Total Entering Volume: 59			

	To West		
	Right	Thru	Left
	14		
A	9		
B	1		
C	0		
D	0		
E	4		

West On: 531	Volume	%
	A	30 76.9%
	B	1 2.6%
	C	0 0.0%
	D	0 0.0%
	E	8 20.5%
		AM 39

	From West		
	Left	Thru	Right
	0	7	18
A	0	6	15
B	0	0	0
C	0	0	0
D	0	0	0
E	0	1	3



	From East		
	Left	Thru	Right
	7	3	0
A	7	2	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	1	0

East On: 845	Vehicle Type	Volume	%
	A	28	93.3%
	B	0	0.0%
	C	0	0.0%
	D	0	0.0%
	E	2	6.7%
		AM 30	

	To East		
	Right	Thru	Left
	20		
A	19		
B	0		
C	0		
D	0		
E	1		

	To South		
	Right	Thru	Left
	25		
A	22		
B	0		
C	0		
D	0		
E	3		

	From South		
	Left	Thru	Right
	11	0	13
A	7	0	13
B	1	0	0
C	0	0	0
D	0	0	0
E	3	0	0

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	42	85.7%
	B: Recreational Vehicle	1	2.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	6	12.2%
		AM 49	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
109140
Intersection of:
531 & 845 LOMOND

North On:	Vehicle Type	Volume	%
	A: Passenger Vehicle	0	-
	B: Recreational Vehicle	0	-
	C: Bus	0	-
	D: Single Unit Truck	0	-
	E: Tractor Trailer Unit	0	-
	PM	0	

2023 PM 100th Highest Hour Estimates			
Leg PM Volumes			
	0		
42		37	
	53		
Total Entering Volume:			
66			

From North			
	Right	Thru	Left
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

To North			
	Right	Thru	Left
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

To West			
	Right	Thru	Left
	14	0	0
A	0	0	0
B	2	0	0
C	4	0	0
D	6	0	0
E	0	0	0

West On: 531	Volume	%
A	20	47.6%
B	0	0.0%
C	4	9.5%
D	10	23.8%
E	8	19.0%
PM	42	

From West			
	Right	Thru	Left
	0	4	12
A	0	4	2
B	0	0	0
C	0	0	2
D	0	0	6
E	0	0	2

From East			
	Left	Thru	Right
	11	9	0
A	8	4	0
B	0	0	0
C	0	1	0
D	1	2	0
E	2	2	0

East On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	25	67.6%
	B: Recreational Vehicle	0	0.0%
	C: Bus	2	5.4%
	D: Single Unit Truck	5	13.5%
	E: Tractor Trailer Unit	5	13.5%
PM	37		

To East			
	Right	Thru	Left
	13	0	0
A	0	0	0
B	1	0	0
C	2	0	0
D	1	0	0
E	0	0	0

To South			
	Right	Thru	Left
	10	0	0
A	0	0	0
B	2	0	0
C	7	0	0
D	4	0	0
E	0	0	0

From South			
	Left	Thru	Right
	17	0	13
A	10	0	9
B	0	0	0
C	1	0	1
D	2	0	2
E	4	0	1

South On: 845	Vehicle Type	Volume	%
	A: Passenger Vehicle	29	54.7%
	B: Recreational Vehicle	0	0.0%
	C: Bus	4	7.5%
	D: Single Unit Truck	11	20.8%
	E: Tractor Trailer Unit	9	17.0%
PM	53		

NOTE:
Coloured line thickness corresponds to turning movement volume.

Reference Number:

111150

Intersection of:

539 & 845 N OF LOMOND

Vehicle Type	Volume	%
A: Passenger Vehicle	46	57.5%
B: Recreational Vehicle	0	0.0%
C: Bus	0	0.0%
D: Single Unit Truck	4	5.0%
E: Tractor Trailer Unit	30	37.5%
AADT	80	
ASDT	90	

From North			
	Right	Thru	Left
	0	30	10
A	0	13	7
B	0	0	0
C	0	0	0
D	0	0	0
E	0	17	3

To North			
	Right	Thru	Left
		40	
A		26	
B		0	
C		0	
D		4	
E		10	

2023 AADT / ASDT Estimates

Leg AADT Volumes			
	80		
40		240	
	280		
Total Entering Volume:			
320			

To West			
	Right	Thru	Left
		20	
A		15	
B		0	
C		3	
D		0	
E		2	

Volume			
	Volume	%	
A	22	55.0%	
B	0	0.0%	
C	8	20.0%	
D	0	0.0%	
E	10	25.0%	
AADT	40		
ASDT	50		

From West			
	Left	Thru	Right
	0	10	10
A	0	0	7
B	0	0	0
C	0	5	0
D	0	0	0
E	0	5	3

From East			
	Left	Thru	Right
	100	10	10
A	74	8	7
B	0	0	0
C	0	2	0
D	1	0	3
E	25	0	0

Vehicle Type			
	Volume	%	
A	176	73.3%	
B	1	0.4%	
C	8	3.3%	
D	5	2.1%	
E	50	20.8%	
AADT	240		
ASDT	290		

To East			
	Left	Thru	Right
		120	
A		87	
B		1	
C		6	
D		1	
E		25	

To South			
	Left	Thru	Right
		140	
A		94	
B		0	
C		0	
D		1	
E		45	

From South			
	Left	Thru	Right
	10	30	100
A	7	19	80
B	0	0	1
C	1	0	1
D	0	1	1
E	2	10	17

Vehicle Type	Volume	%
A: Passenger Vehicle	200	71.4%
B: Recreational Vehicle	1	0.4%
C: Bus	2	0.7%
D: Single Unit Truck	3	1.1%
E: Tractor Trailer Unit	74	26.4%
AADT	280	
ASDT	320	

ABBREVIATIONS:

AADT: Annual Average Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from January 1 to December 31 (inclusive), 365 days.

ASDT: Average Summer Daily Traffic.
Average daily traffic expressed as vehicles per day for the period from May 1 to September 30 (inclusive), 153 days.

NOTE:
Coloured line thickness corresponds to turning movement volume.

Reference Number:
111150

Intersection of:
539 & 845 N OF LOMOND

North On : Rge Rd 201	Vehicle Type		Volume	%
	A: Passenger Vehicle		2	50.0%
	B: Recreational Vehicle		0	0.0%
	C: Bus		0	0.0%
	D: Single Unit Truck		0	0.0%
	E: Tractor Trailer Unit		2	50.0%
AM			4	

2023 AM 100th Highest Hour Estimates		
Leg AM Volumes		
	4	
0		27
	29	
Total Entering Volume: 30		

From North			
2			
Right	Thru	Left	
0	1	1	
A	0	0	1
B	0	0	0
C	0	0	0
D	0	0	0
E	0	1	0

To North			
2			
A	1		
B	0		
C	0		
D	0		
E	1		

To West			
0			
A	0		
B	0		
C	0		
D	0		
E	0		

West On: Twp Rd 172	Volume		%
	A	0	-
	B	0	-
	C	0	-
	D	0	-
	E	0	-
AM		0	

From West			
0			
Left	Thru	Right	
0	0	0	
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

From East			
12			
Left	Thru	Right	
12	0	0	
11	0	0	A
0	0	0	B
0	0	0	C
1	0	0	D
0	0	0	E

Vehicle Type			East On: 539
A	22	81.5%	
B	0	0.0%	
C	1	3.7%	
D	1	3.7%	
E	3	11.1%	
AM	27		

To East			
15			
11			A
0			B
1			C
0			D
3			E

To South			
13			
A	11		
B	0		
C	0		
D	1		
E	1		

From South			
16			
Left	Thru	Right	
0	2	14	
A	0	1	10
B	0	0	0
C	0	0	1
D	0	0	0
E	0	1	3

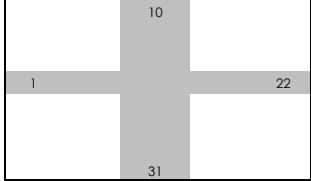
South On: 845	Vehicle Type		Volume	%
	A: Passenger Vehicle		22	75.9%
	B: Recreational Vehicle		0	0.0%
	C: Bus		1	3.4%
	D: Single Unit Truck		1	3.4%
	E: Tractor Trailer Unit		5	17.2%
AM			29	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
111150

Intersection of:
539 & 845 N OF LOMOND

North On: Rge Rd 201	Vehicle Type		Volume	%
	A: Passenger Vehicle		6	60.0%
	B: Recreational Vehicle		0	0.0%
	C: Bus		0	0.0%
	D: Single Unit Truck		1	10.0%
	E: Tractor Trailer Unit		3	30.0%
PM			10	

2023 PM 100th Highest Hour Estimates			
Leg PM Volumes			
			
Total Entering Volume: 32			

From North			
5			
	Right	Thru	Left
	0	5	0
A	0	3	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	2	0

To North			
5			
A	3		
B	0		
C	0		
D	1		
E	1		

To West			
1			
A	0		
B	0		
C	0		
D	0		
E	1		

West On: Twp Rd 172	Volume		%
	A	0	0.0%
	B	0	0.0%
	C	0	0.0%
	D	0	0.0%
	E	1	100.0%
PM		1	

From West			
0			
	Left	Thru	Right
	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

From East			
12			
	Left	Thru	Right
	11	0	1
A	8	0	0
B	0	0	0
C	0	0	0
D	0	0	1
E	3	0	0

Vehicle Type			East On: 539
A	16	72.7%	
B	0	0.0%	
C	0	0.0%	
D	1	4.5%	
E	5	22.7%	
PM	22		

To East			
10			
A	8		
B	0		
C	0		
D	0		
E	2		

To South			
16			
A	11		
B	0		
C	0		
D	0		
E	5		

From South			
15			
	Left	Thru	Right
	1	4	10
A	0	3	8
B	0	0	0
C	0	0	0
D	0	0	0
E	1	1	2

South On: 845	Vehicle Type		Volume	%
	A: Passenger Vehicle		22	71.0%
	B: Recreational Vehicle		0	0.0%
	C: Bus		0	0.0%
	D: Single Unit Truck		0	0.0%
	E: Tractor Trailer Unit		9	29.0%
PM			31	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

APPENDIX D

Sight Distance Review

$D = \frac{V(J + 1)}{3.6}$
 LEVEL CONDITIONS
 APPLY ADJUSTMENT FACTOR FOR GRADE AND SKEW

D = REQUIRED SIGHT DISTANCE ALONG MAJOR TWO-LANE HIGHWAY IN METRES

1. To determine the sight distance requirements at an intersection, the designer should select the longest vehicle or vehicle with the greatest I.S.D. need, that uses the intersection on a regular basis, i.e., daily. Because of the various eye heights, the I.S.D. available for several design vehicles may have to be checked.
2. The usefulness of intersection sight distances in excess of 500m has been debated and will be the subject of future research into gap acceptance by large trucks on rural highways in Alberta. Changes to this table may be made based on that research.

- THE I.S.D.'s SHOWN IN THIS FIGURE ARE BASED ON THE DISTANCE TRAVELLED AT DESIGN SPEED DURING A CRITICAL TIME (SHOWN ON THE FIGURE IN SECONDS). THE CRITICAL TIME INCLUDES THE TIME TAKEN FOR THE MANOEUVRE (LEFT TURN FROM THE MINOR ROAD) PLUS 2 SECONDS FOR PERCEPTION/REACTION TIME.

- THE INTERSECTION SIGHT DISTANCE AVAILABLE IS TO BE DETERMINED USING AN EYE HEIGHT (BASED ON THE DESIGN VEHICLE) LOCATED AT THE JUNCTION AND AN OBJECT HEIGHT OF 1.3m (REPRESENTING THE ROOF OF A PASSENGER VEHICLE) ON THE THROUGH ALIGNMENT. THE EYE HEIGHTS TO BE USED ARE SHOWN IN FIGURE D-5a.

Design Vehicle	Eye Height	Required Sight Distance (D)
P	1.05m (3.4')	117m (384')
SU	1.80m (5.9')	175m (574')
WB-21	2.10m (6.9')	307m (1007')
WB-23	2.10m (6.9')	307m (1007')

* THIS CHART IS BASED ON CRITERIA USED BY AASHTO FOR "SIGHT DISTANCE" AT STOP LOCATIONS. THE SET OF CRITERIA IS DESCRIBED AS CASE WB IN THE AASHTO PUBLICATION "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, 1994"



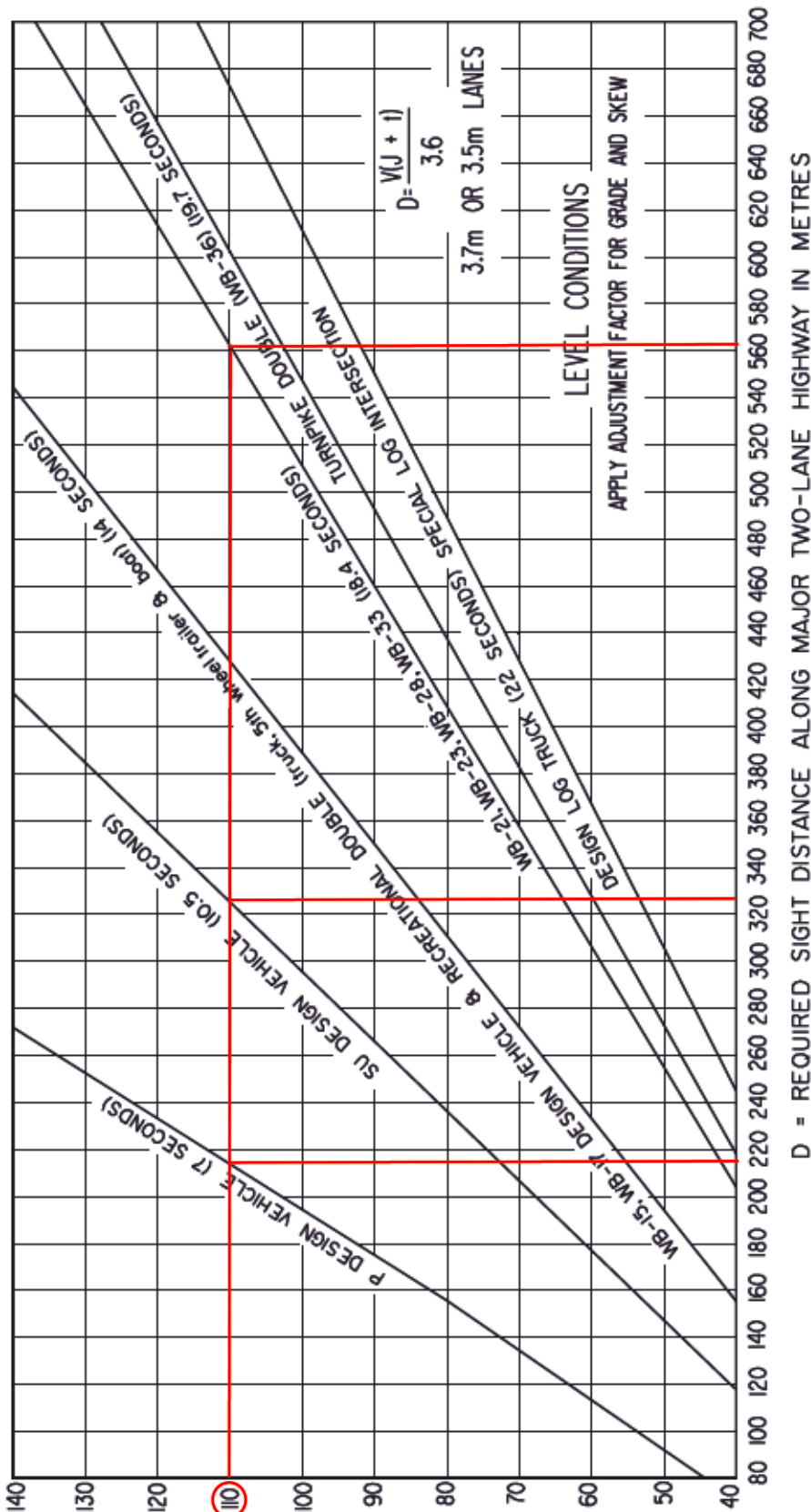
REVISIONS	No.  BY		DATE
	No.  BY BK	ADDED NOTE	DATE AUG / 99
D-34		AT-GRADE INTERSECTIONS	

FIGURE D-4.2.2.2 SIGHT DISTANCES FOR LEFT TURN ONTO HIGHWAY *



NOTES:

1. To determine the sight distance requirements at an intersection, the designer should select the longest vehicle or vehicle with the greatest I.S.D. need, that uses the intersection on a regular basis, i.e., daily. Because of the various eye heights, the I.S.D. available for several design vehicles may have to be checked.
2. The usefulness of intersection sight distances in excess of 500m has been debated and will be the subject of future research into gap acceptance by large trucks on rural highways in Alberta. Changes to this table may be made based on that research.

* INTERSECTION SIGHT DISTANCE (I.S.D.)

- THE I.S.D.'s SHOWN IN THIS FIGURE ARE BASED ON THE DISTANCE TRAVELLED AT DESIGN SPEED DURING A CRITICAL TIME (SHOWN ON THE FIGURE IN SECONDS). THE CRITICAL TIME INCLUDES THE TIME TAKEN FOR THE MANOEUVRE (LEFT TURN FROM THE MINOR ROAD) PLUS 2 SECONDS FOR PERCEPTION/REACTION TIME.
- THE INTERSECTION SIGHT DISTANCE AVAILABLE IS TO BE DETERMINED USING AN EYE HEIGHT (BASED ON THE DESIGN VEHICLE) LOCATED AT THE JUNCTION AND AN OBJECT HEIGHT OF 1.3m (REPRESENTING THE ROOF OF A PASSENGER VEHICLE) ON THE THROUGH ALIGNMENT. THE EYE HEIGHTS TO BE USED ARE SHOWN IN FIGURE D-5a.

Design Vehicle	Eye Height	Required Sight Distance (D)
P	1.05m (3.4')	215m (705')
SU	1.80m (5.9')	325m (1066')
WB-21	2.10m (6.9')	565m (1854')
WB-23	2.10m (6.9')	565m (1854')

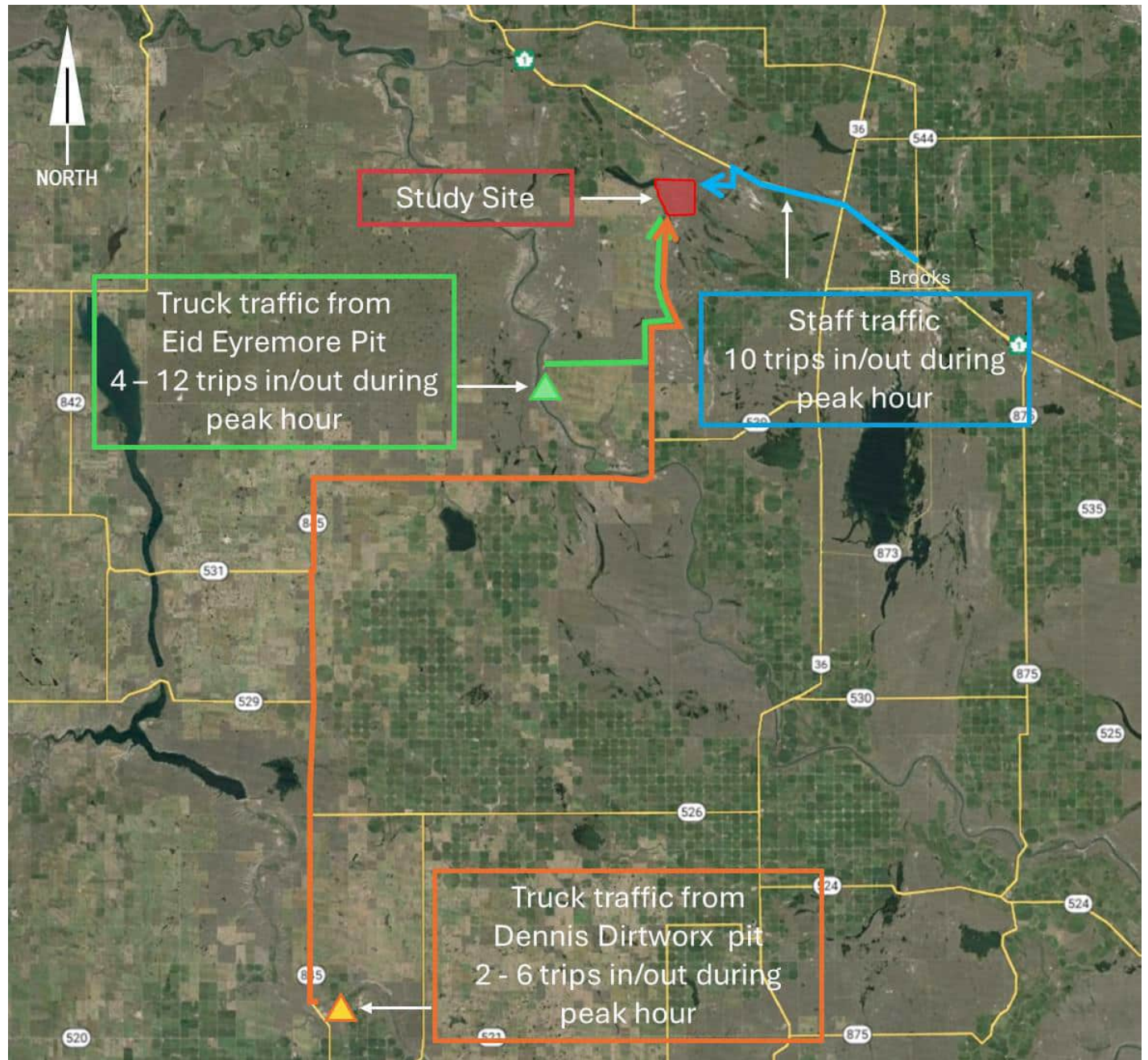
△ V = DESIGN SPEED ON MAJOR HIGHWAY IN km/h

* THIS CHART IS BASED ON CRITERIA USED BY AASHTO FOR "SIGHT DISTANCE" AT STOP LOCATIONS. THE SET OF CRITERIA IS DESCRIBED AS CASE WB IN THE AASHTO PUBLICATION "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, 1994"

REVISIONS	No. △ BY	DATE
	No. △ BY BK	DATE
	ADDED NOTE	AUG / 99

APPENDIX E

Distribution of Construction Traffic



a division of Englobe

EASTERN IRRIGATION DISTRICT

SNAKE LAKE RESERVOIR EXPANSION

TRAFFIC IMPACT ASSESSMENT

DISTRIBUTION OF TRUCK TRAFFIC DURING PEAK HOURS

SCALE: NTS

DATE: October 15, 2024

JOB: 1560-193-00

FIGURE: E1

APPENDIX F

Turn Lane Warrants

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: **2027**
Traffic Conditions: **2027 Post Development**

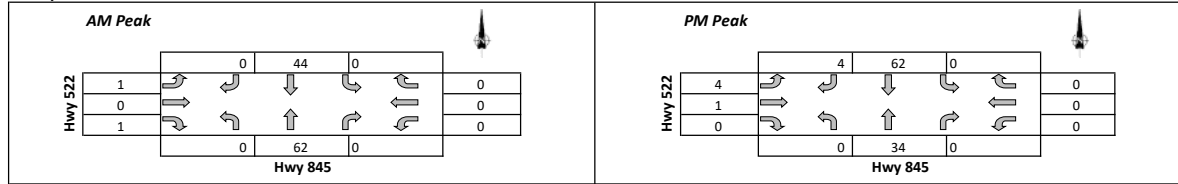
Analysis Date: **23/07/2024**
Analyst: **AB**

INTERSECTION

Main Street: **Hwy 845**
Side Street: **Hwy 522**
Design Speed: **110 km/h**

Direction (EW or NS): **NS**
Direction (EW or NS): **EW**

Hourly Intersection Volumes

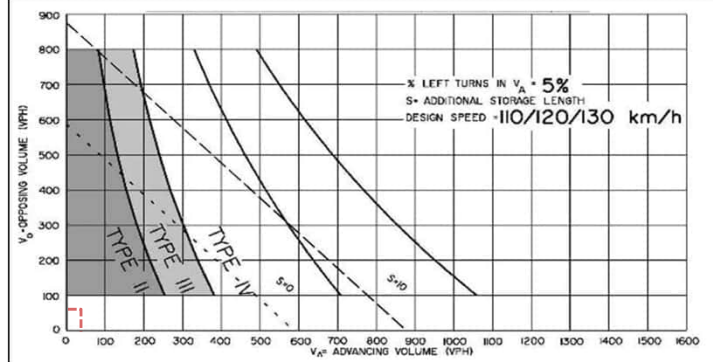
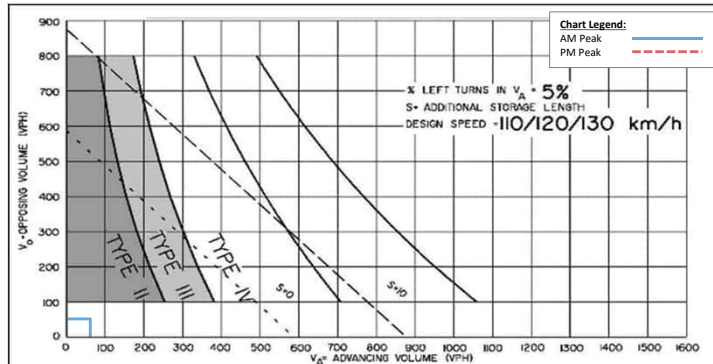


Warrant for Left Turn Lane (Hwy 845)

When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
NB	AM Peak	0	62	0%	44	5%	D-7.6-7a	Type I
NB	PM Peak	0	34	0%	66	5%	D-7.6-7a	Type I



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D-7.6a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

Direction: Hwy 845 NB		Hwy 845 SB	
Condition	Estimated Value	Condition	Estimated Value
a. Main Road (Hwy 845) AADT \geq 1800	1070	a. Main Road (Hwy 845) AADT \geq 1800	1090
b. Intersecting Road (Hwy 522) AADT \geq 900	90	b. Intersecting Road (Hwy 522) AADT \geq 900	90
c. Right-Turn Daily Traffic \geq 360	11	c. Right-Turn Daily Traffic \geq 360	22
Result: An exclusive right-turn lane is NOT warranted		Direction Hwy 845 NB	
An exclusive right-turn lane is NOT warranted		Direction Hwy 845 SB	

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: **2027**
Traffic Conditions: **2027 Post Development**

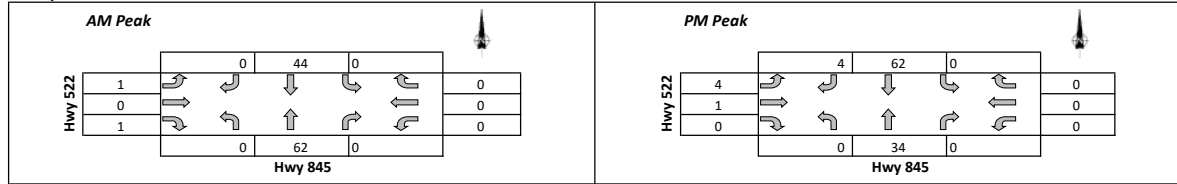
Analysis Date: **23/07/2024**
Analyst: **AB**

INTERSECTION

Main Street: **Hwy 845**
Side Street: **Hwy 522**
Design Speed: **110 km/h**

Direction (EW or NS): **NS**
Direction (EW or NS): **EW**

Hourly Intersection Volumes

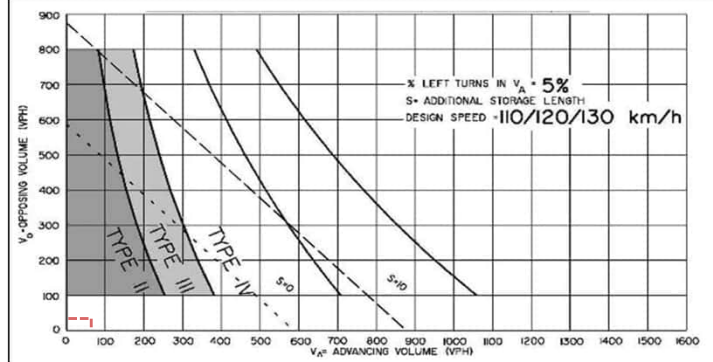
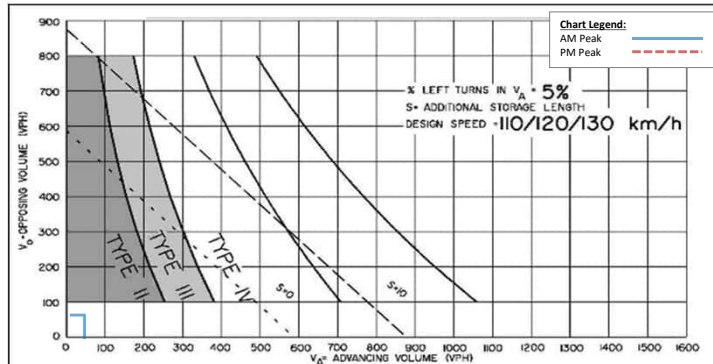


Warrant for Left Turn Lane (Hwy 845)

When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
SB	AM Peak	0	44	0%	62	5%	D-7.6-7a	Type I
SB	PM Peak	0	66	0%	34	5%	D-7.6-7a	Type I



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D.7.6a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

Direction: Hwy 845 NB			Hwy 845 SB		
Condition	Estimated Value	Condition Met?	Estimated Value	Condition Met?	
a. Main Road (Hwy 845) AADT \geq 1800	1070	FALSE	1090	FALSE	
b. Intersecting Road (Hwy 522) AADT \geq 900	90	FALSE	90	FALSE	
c. Right-Turn Daily Traffic \geq 360	11	FALSE	22	FALSE	
Result: An exclusive right-turn lane is NOT warranted			Direction Hwy 845 NB		
An exclusive right-turn lane is NOT warranted			Direction Hwy 845 SB		

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: **2027**
Traffic Conditions: **2027 Post Development**

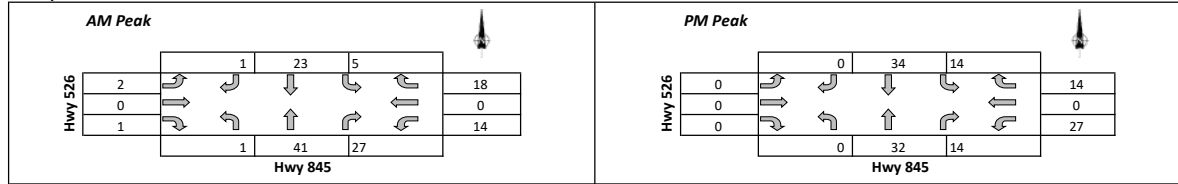
Analysis Date: **23/07/2024**
Analyst: **AB**

INTERSECTION

Main Street: **Hwy 845**
Side Street: **Hwy 526**
Design Speed: **110 km/h**

Direction (EW or NS): **NS**
Direction (EW or NS): **EW**

Hourly Intersection Volumes

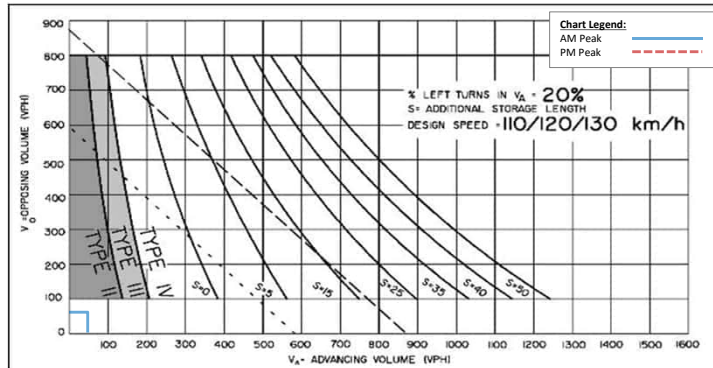


Warrant for Left Turn Lane (Hwy 845)

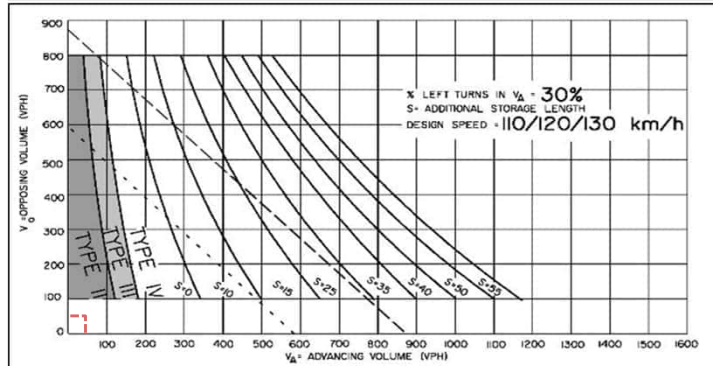
When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
SB	AM Peak	5	29	17%	69	20%	D-7.6-7b	Type I
SB	PM Peak	14	48	29%	46	30%	D-7.6-7c	Type I



Note:
Based on AADT volumes, this intersection requires a Type III



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D-7.6a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

Direction: Hwy 845 NB			Hwy 845 SB		
Condition	Estimated Value	Condition Met?	Estimated Value	Condition Met?	
a. Main Road (Hwy 845) AADT ≥ 1800	1090	FALSE	830	FALSE	
b. Intersecting Road (Hwy 526) AADT ≥ 900	930	TRUE	930	TRUE	
c. Right-Turn Daily Traffic ≥ 360	292	FALSE	11	FALSE	
Result: An exclusive right-turn lane is NOT warranted			Direction Hwy 845 NB		
An exclusive right-turn lane is NOT warranted			Direction Hwy 845 SB		

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: **2027**
Traffic Conditions: **2027 Post Development**

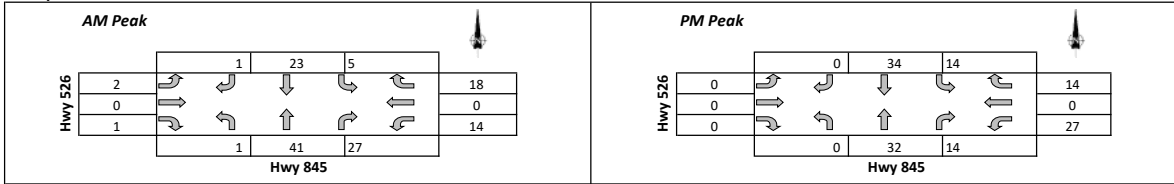
Analysis Date: **23/07/2024**
Analyst: **AB**

INTERSECTION

Main Street: **Hwy 845**
Side Street: **Hwy 526**
Design Speed: **110 km/h**

Direction (EW or NS): **NS**
Direction (EW or NS): **EW**

Hourly Intersection Volumes

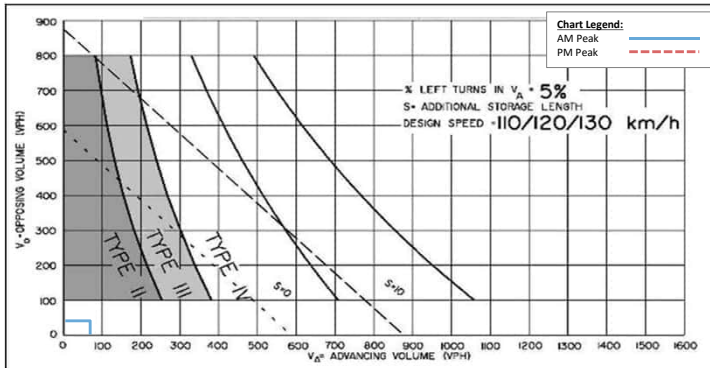


Warrant for Left Turn Lane (Hwy 845)

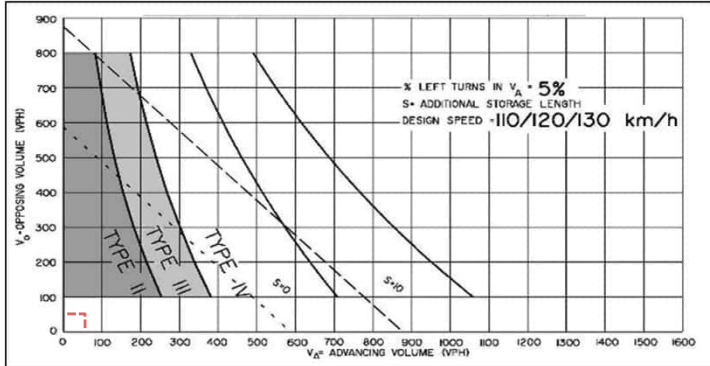
When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
NB	AM Peak	1	69	1%	29	5%	D-7.6-7a	Type I
NB	PM Peak	0	46	0%	48	5%	D-7.6-7a	Type I



Note:
Based on AADT volumes, this intersection requires a Type III



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D-7.6a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

Direction: Hwy 845 NB		Hwy 845 SB	
Condition	Estimated Value	Condition	Estimated Value
a. Main Road (Hwy 845) AADT ≥ 1800	1090	Condition	830
b. Intersecting Road (Hwy 526) AADT ≥ 900	930	Met?	FALSE
c. Right-Turn Daily Traffic ≥ 360	292	Met?	FALSE

Result: An exclusive right-turn lane is NOT warranted

An exclusive right-turn lane is NOT warranted

Direction Hwy 845 NB

Direction Hwy 845 SB

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: 2027
Traffic Conditions: 2027 Post Development

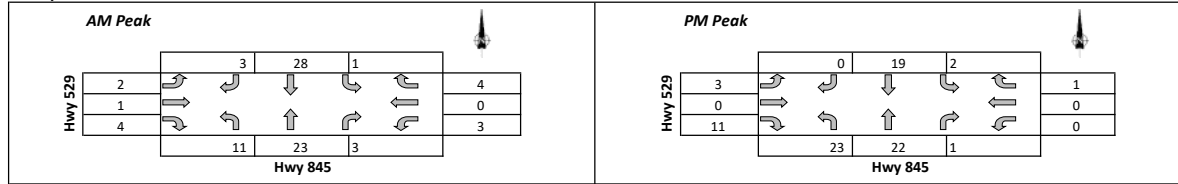
Analysis Date: 23/07/2024
Analyst: AB

INTERSECTION

Main Street: Hwy 845
Side Street: Hwy 529
Design Speed: 110 km/h

Direction (EW or NS): NS
Direction (EW or NS): EW

Hourly Intersection Volumes

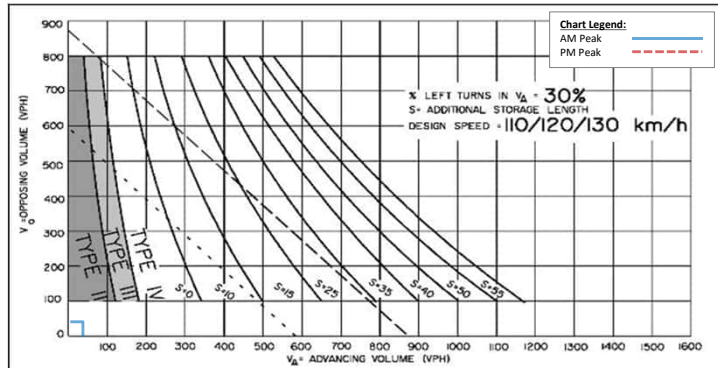


Warrant for Left Turn Lane (Hwy 845)

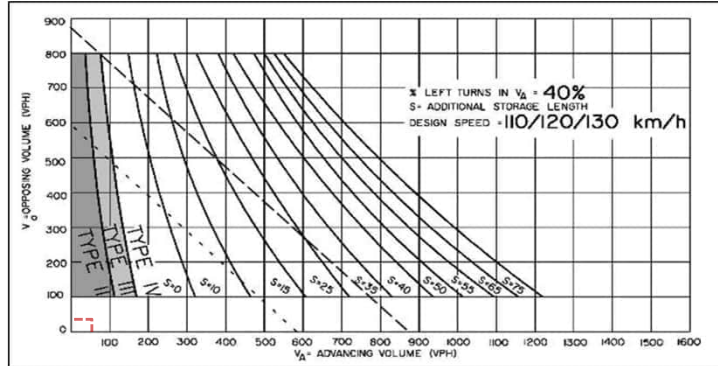
When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
NB	AM Peak	11	37	30%	32	30%	D-7.6-7c	Type I
NB	PM Peak	23	46	50%	21	40%	D-7.6-7d	Type I



Note:
Based on AADT volumes, this intersection requires a Type II



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D-7.6a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

Direction: Hwy 845 NB		Hwy 845 SB	
Condition	Estimated Value	Condition	Estimated Value
a. Main Road (Hwy 845) AADT \geq 1800	750	Condition	550
b. Intersecting Road (Hwy 529) AADT \geq 900	300	Met?	FALSE
c. Right-Turn Daily Traffic \geq 360	11	Met?	FALSE
Result: An exclusive right-turn lane is NOT warranted		Direction	Hwy 845 NB
An exclusive right-turn lane is NOT warranted		Direction	Hwy 845 SB

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: **2027**
Traffic Conditions: **2027 Post Development**

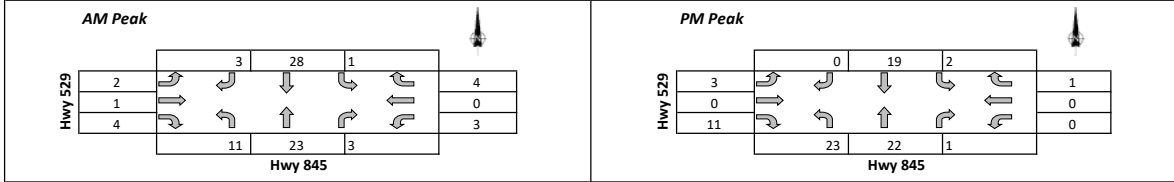
Analysis Date: **23/07/2024**
Analyst: **AB**

INTERSECTION

Main Street: **Hwy 845**
Side Street: **Hwy 529**
Design Speed: **110 km/h**

Direction (EW or NS): **NS**
Direction (EW or NS): **EW**

Hourly Intersection Volumes

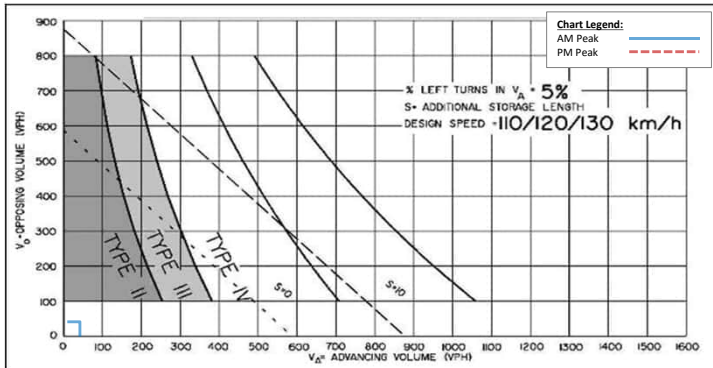


Warrant for Left Turn Lane (Hwy 845)

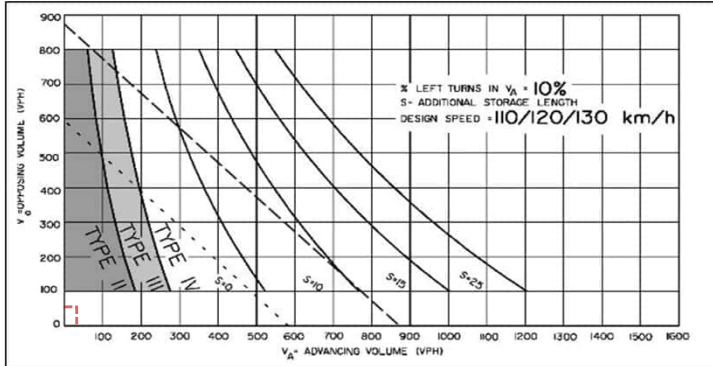
When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
SB	AM Peak	1	32	3%	37	5%	D-7.6-7a	Type I
SB	PM Peak	2	21	10%	46	10%	D-7.6-7a	Type I



Note:
Based on AADT volumes, this intersection requires a Type II



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D-7.6a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

Direction: Hwy 845 NB		Hwy 845 SB	
Condition	Estimated Value	Condition	Estimated Value
a. Main Road (Hwy 845) AADT ≥ 1800	750	Condition Met?	550
b. Intersecting Road (Hwy 529) AADT ≥ 900	300	Condition Met?	300
c. Right-Turn Daily Traffic ≥ 360	11	Condition Met?	22
Result: An exclusive right-turn lane is NOT warranted		Direction	Hwy 845 NB
An exclusive right-turn lane is NOT warranted		Direction	Hwy 845 SB

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: 2027
Traffic Conditions: 2027 Post Development

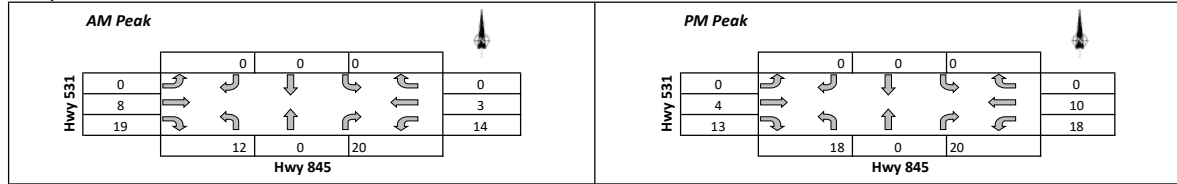
Analysis Date: 23/07/2024
Analyst: AB

INTERSECTION

Main Street: Hwy 531
Side Street: Hwy 845
Design Speed: 60 km/h

Direction (EW or NS): EW
Direction (EW or NS): NS

Hourly Intersection Volumes

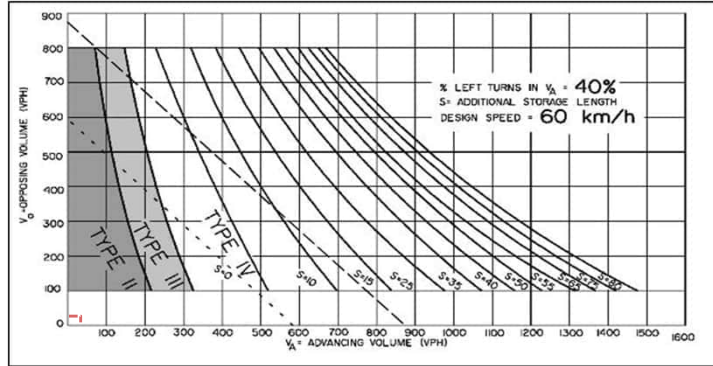
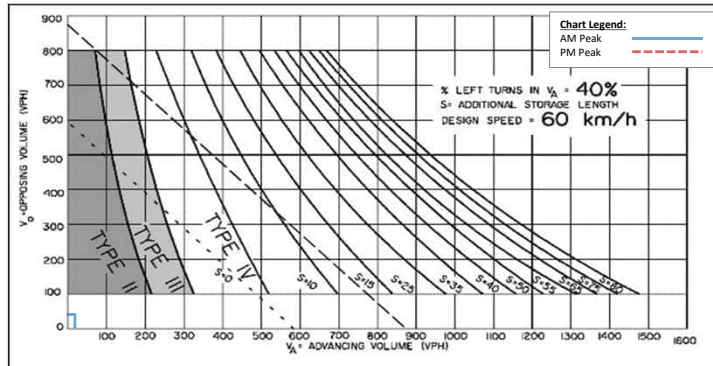


Warrant for Left Turn Lane (Hwy 531)

When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
WB	AM Peak	14	17	82%	27	40%	D-7.6-2d	Type I
WB	PM Peak	18	28	64%	17	40%	D-7.6-2d	Type I



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D-7.6a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

Direction: Hwy 531 WB		Hwy 531 EB	
Condition	Estimated Value	Condition	Estimated Value
a. Main Road (Hwy 531) AADT \geq 1800	510	Condition	370
b. Intersecting Road (Hwy 845) AADT \geq 900	680	Value	680
c. Right-Turn Daily Traffic \geq 360	0	Condition	130
		Value	
Result: An exclusive right-turn lane is NOT warranted		Direction Hwy 531 WB	
An exclusive right-turn lane is NOT warranted		Direction Hwy 531 EB	

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: **2027**
Traffic Conditions: **2027 Post Development**

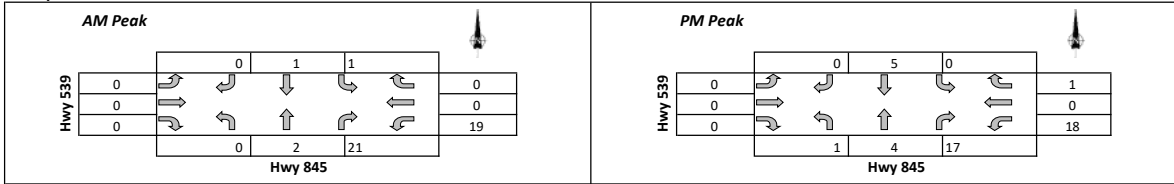
Analysis Date: **23/07/2024**
Analyst: **AB**

INTERSECTION

Main Street: **Hwy 539**
Side Street: **Hwy 845**
Design Speed: **110 km/h**

Direction (EW or NS): **EW**
Direction (EW or NS): **NS**

Hourly Intersection Volumes

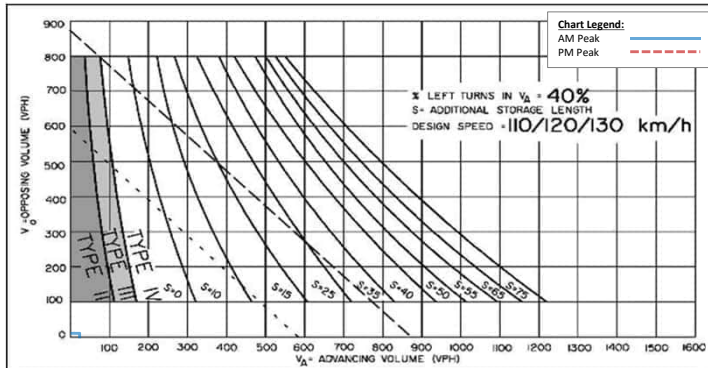


Warrant for Left Turn Lane (Hwy 539)

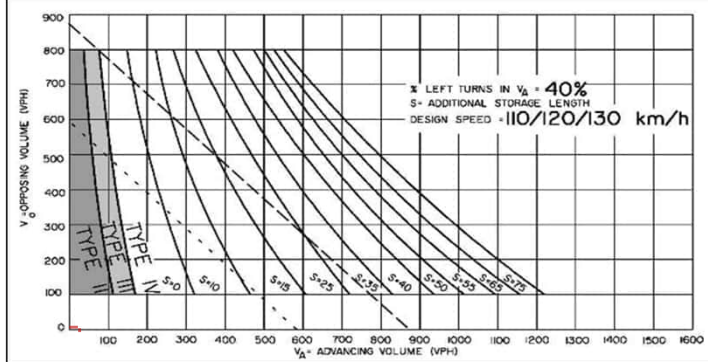
When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
WB	AM Peak	19	19	100%	0	40%	D-7.6-7d	Type I
WB	PM Peak	18	19	95%	0	40%	D-7.6-7d	Type I



Note:
Based on AADT volumes, this intersection requires a Type II



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D.7.5a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

Direction: Hwy 539 WB			Hwy 539 EB		
Condition	Estimated Value	Condition Met?	Condition	Estimated Value	Condition Met?
a. Main Road (Hwy 539) AADT ≥ 1800	380	FALSE		40	FALSE
b. Intersecting Road (Hwy 845) AADT ≥ 900	420	FALSE		420	FALSE
c. Right-Turn Daily Traffic ≥ 360	11	FALSE		11	FALSE
Result: An exclusive right-turn lane is NOT warranted			Direction Hwy 539 WB		
An exclusive right-turn lane is NOT warranted			Direction Hwy 539 EB		

Alberta Transportation Turn Lane Warrant Analysis

ANALYSIS DETAILS

Analysis Horizon: 2027
Traffic Conditions: 2027 Post Development

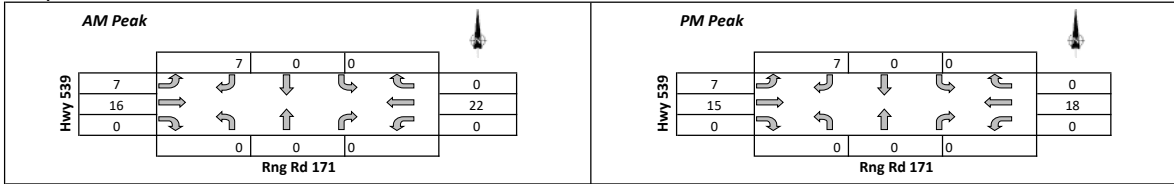
Analysis Date: 23/07/2024
Analyst: AB

INTERSECTION

Main Street: Hwy 539
Side Street: Rng Rd 171
Design Speed: 110 km/h

Direction (EW or NS): EW
Direction (EW or NS): NS

Hourly Intersection Volumes

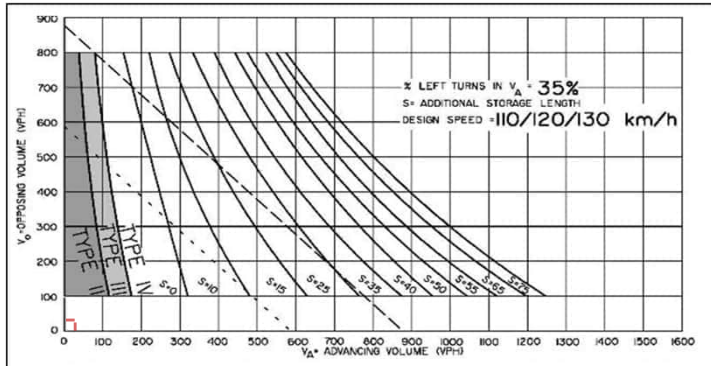
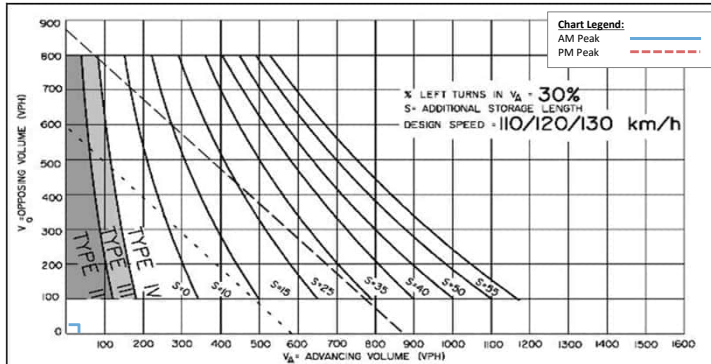


Warrant for Left Turn Lane (Hwy 539)

When making a left turn onto the side street, a turning vehicle may be delayed by a vehicle or vehicles in the opposing stream. Through vehicles in the advancing stream following the left-turning vehicle may be delayed by, or exposed to collision with the turning vehicle. The interference caused by the standing left turning vehicles in the through advancing traffic can reduce capacity and create a safety hazard.

The amount of interference is dependent on the opposing volume (V_o), advancing volume (V_a), and the number of left-turning vehicles (V_l). The proportion of left turning vehicles (L) is used when entering the appropriate design chart in the Alberta Transportation Highway Geometric Design Guide.

Direction	Period	V_l	V_a	L	V_o	Chart L	Chart Reference	Treatment Warranted
EB	AM Peak	7	23	30%	22	30%	D-7.6-7c	Type I
EB	PM Peak	7	22	32%	18	35%	D-7.6-7d	Type I



S = Additional storage length required, that is, in addition to what is shown on the appropriate Type IV standard drawing. Designers should check additional storage requirements for trucks, also see Table D-7.6a.
- - - Traffic signals may be warranted in rural areas, or urban areas, with restricted flow.
--- Traffic signals may be warranted in "free flow" urban areas.
Notes:
1. The traffic signal warrant lines are provided for reference only. For detailed analysis of the requirements for signals, contact Roadway Engineering Branch.
2. Warrant for Type I treatment is shown in Figure D-7.4.

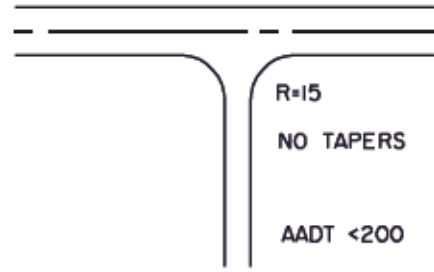
Warrant for Right Turn Lane

To warrant an exclusive right turn lane at a two-lane highway intersection in Alberta, three conditions must be met as shown below. All three conditions must be met for the right turn lane to be warranted.

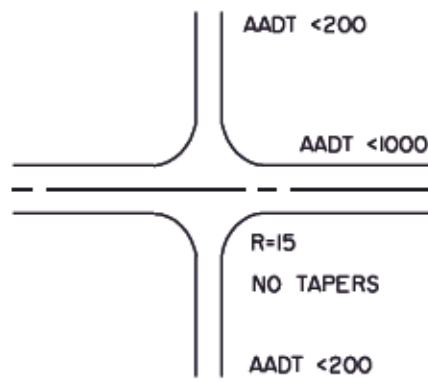
Direction: Hwy 539 WB		Hwy 539 EB	
Condition	Estimated Value	Condition	Estimated Value
a. Main Road (Hwy 539) AADT \geq 1800	400	Condition	530
b. Intersecting Road (Rng Rd 171) AADT \geq 900	130	Met?	FALSE
c. Right-Turn Daily Traffic \geq 360	0	Met?	FALSE
Result: An exclusive right-turn lane is NOT warranted		Direction	Hwy 539 WB
An exclusive right-turn lane is NOT warranted		Direction	Hwy 539 EB

TYPE I's

AADT <1000

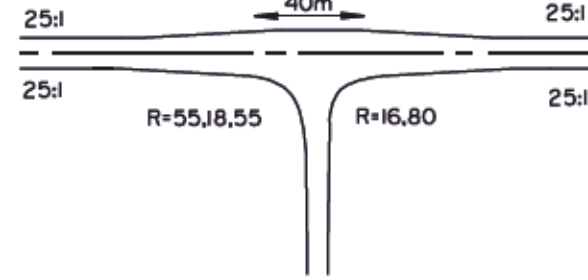


TYPE Ia

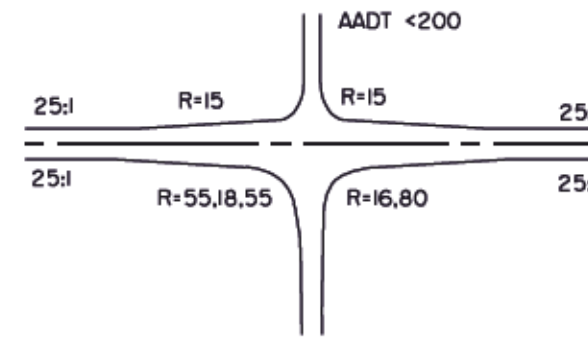


TYPE Ib

TYPE II's



TYPE IIa

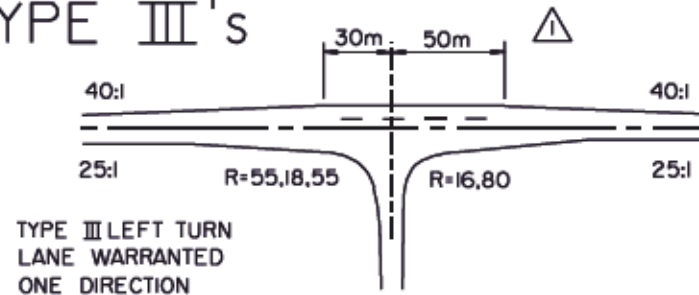


TYPE IIb

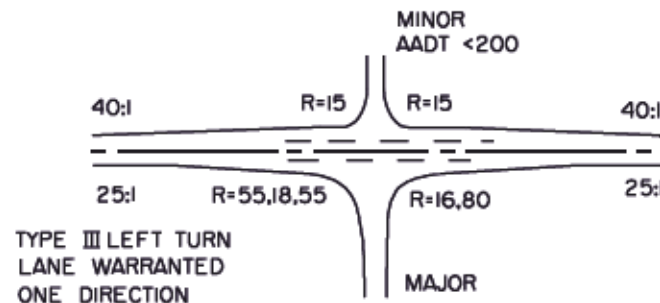


TYPE IIc

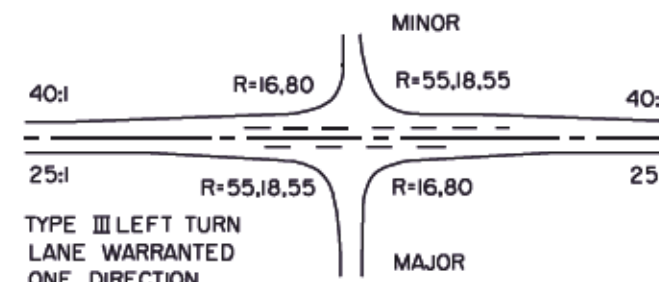
TYPE III's



TYPE IIIa



TYPE IIIb

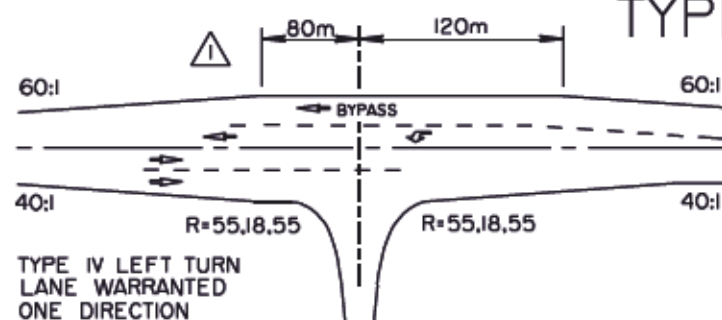


TYPE IIIc

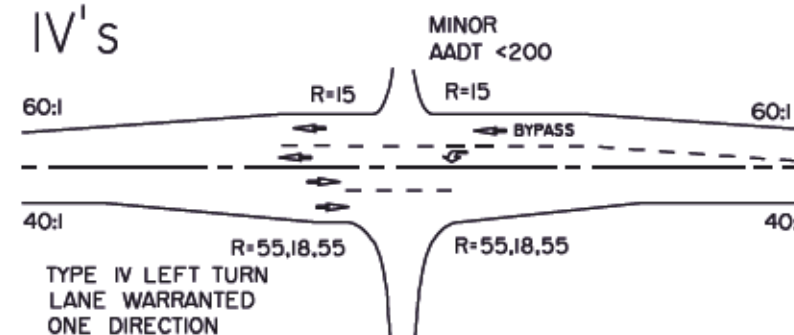


TYPE IIId

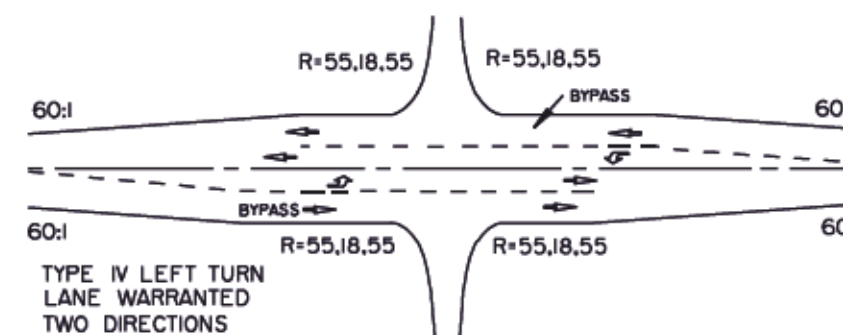
TYPE IV's



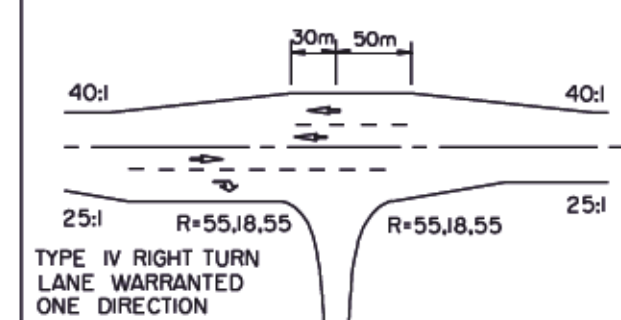
TYPE IVa



TYPE IVb



TYPE IVc



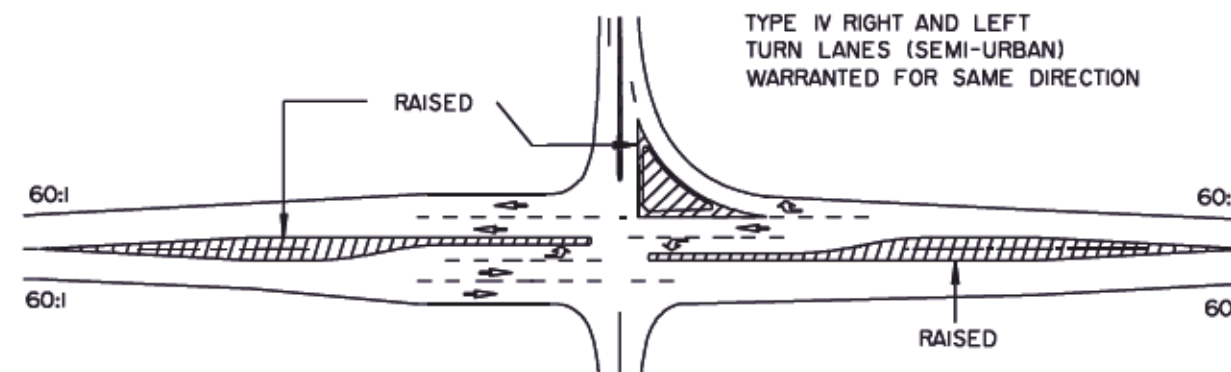
TYPE IVd

TYPE V's

NOTE: Construction of Type V intersections require Departmental referral and approval.



TYPE Vb



TYPE Vc

- NOTES:
1. This is not a pavement marking drawing.
 2. This figure depicts the typical layouts used for at-grade intersections. Detailed design considerations may dictate some

minor alterations for particular intersections. The tapers shown here are typical for a 110 km/h design speed on the main highway.

△			
△	REVISED LANE DIMENSIONS	TDN	06/98
No.	REVISIONS	BY	DATE

Alberta
INFRASTRUCTURE

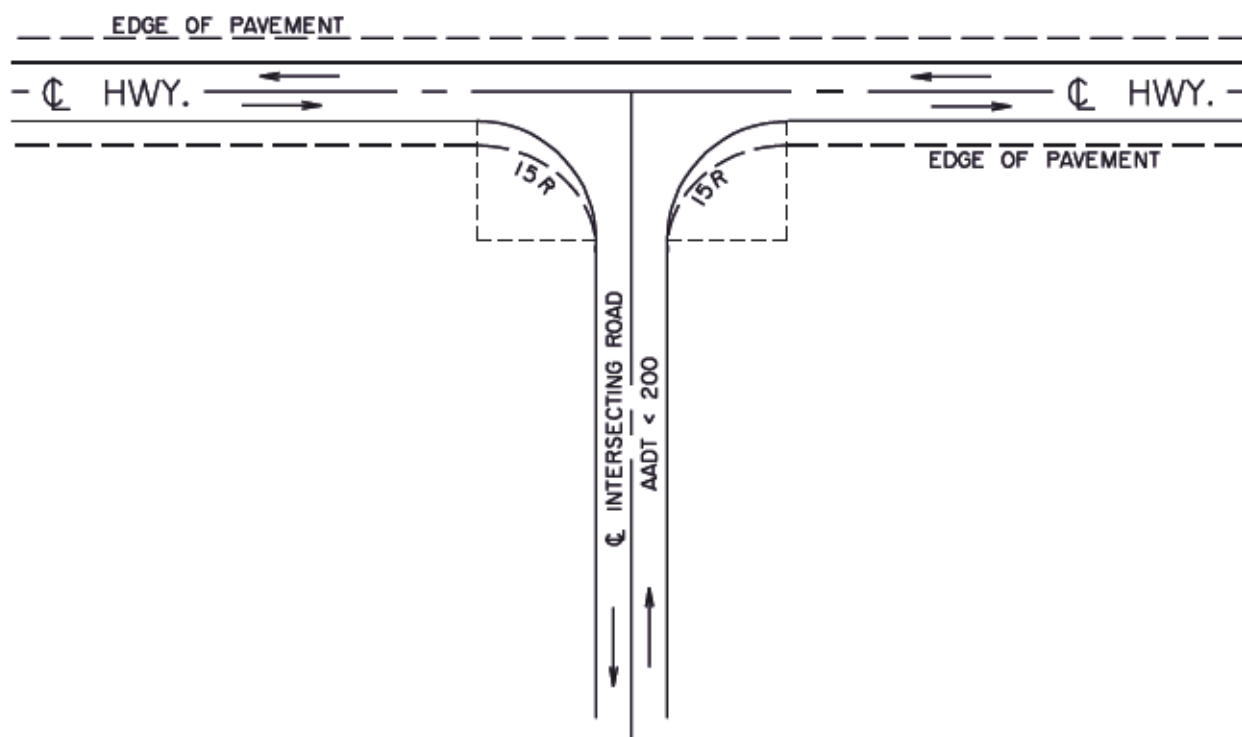
FIGURE
D-7.5

Date: APRIL 1995

**STANDARD AT-GRADE
INTERSECTION LAYOUTS
FOR TWO-LANE HIGHWAYS**

Prepared By: LT Checked By: B.K. Scale: N.T.S. PAGE D-III

FIGURE D-7a INTERSECTION TREATMENT (TYPE 1a)
(Two-Lane Highway)

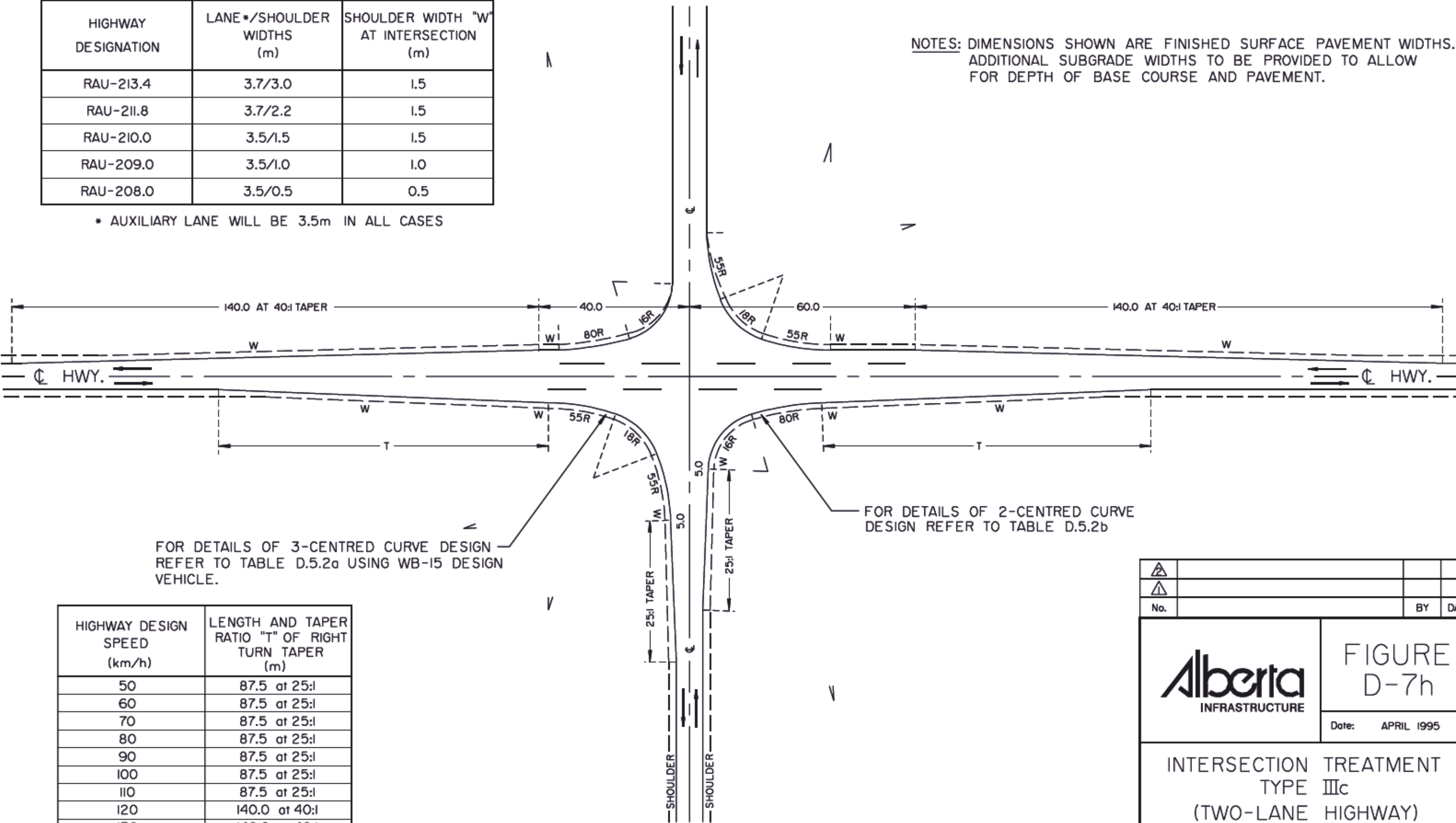


NOTE: ALL DIMENSIONS SHOWN ARE FOR FINISHED PAVEMENT SURFACES.
ADDITIONAL SUBGRADE WIDTHS TO BE PROVIDED TO ALLOW FOR
DEPTH OF BASE COURSE AND PAVEMENT.

HIGHWAY DESIGNATION	LANE */SHOULDER WIDTHS (m)	SHOULDER WIDTH "W" AT INTERSECTION (m)
RAU-213.4	3.7/3.0	1.5
RAU-211.8	3.7/2.2	1.5
RAU-210.0	3.5/1.5	1.5
RAU-209.0	3.5/1.0	1.0
RAU-208.0	3.5/0.5	0.5

* AUXILIARY LANE WILL BE 3.5m IN ALL CASES

NOTES: DIMENSIONS SHOWN ARE FINISHED SURFACE PAVEMENT WIDTHS.
ADDITIONAL SUBGRADE WIDTHS TO BE PROVIDED TO ALLOW FOR DEPTH OF BASE COURSE AND PAVEMENT.



FOR DETAILS OF 3-CENTRED CURVE DESIGN
REFER TO TABLE D.5.2a USING WB-15 DESIGN
VEHICLE.

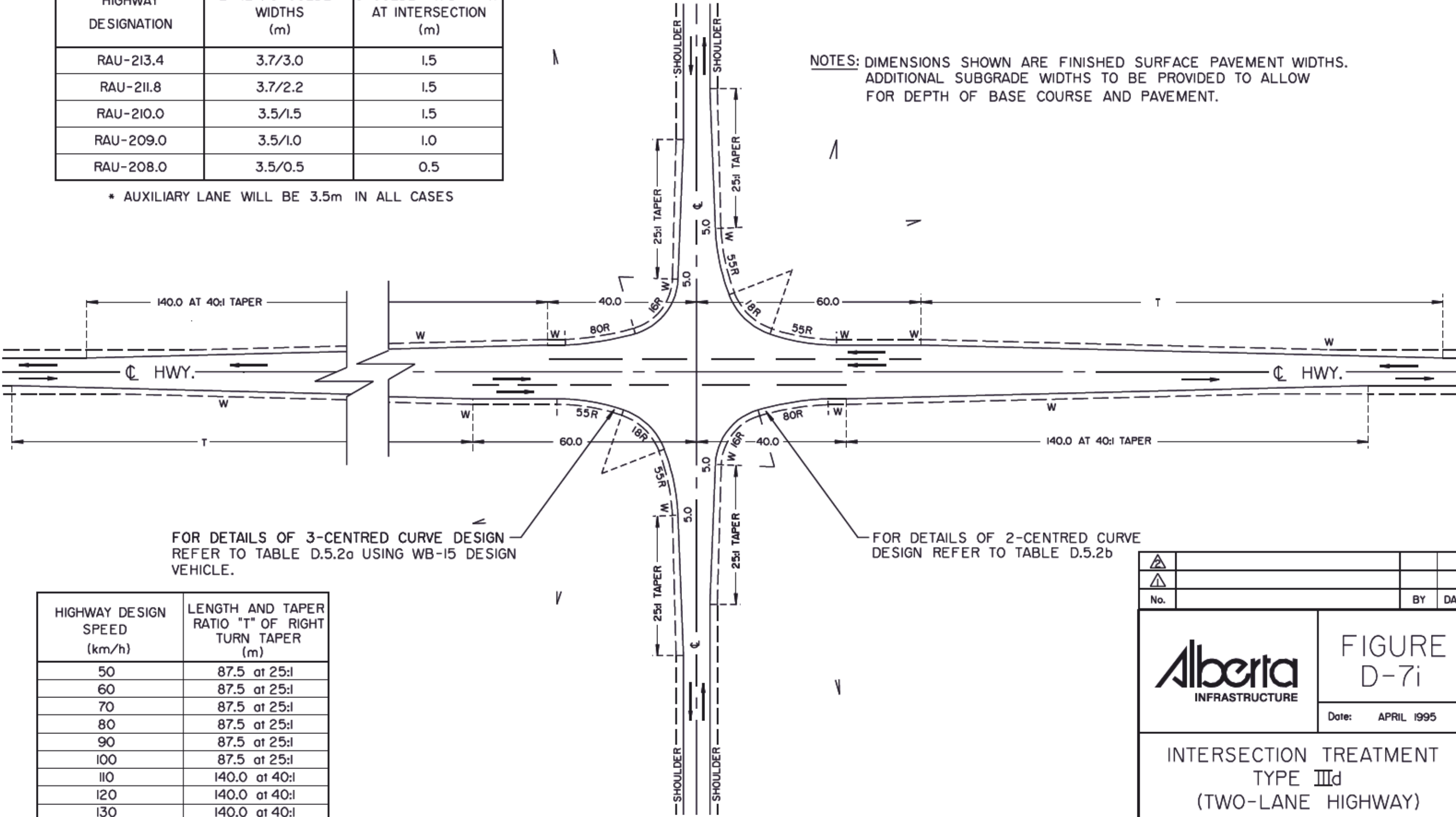
FOR DETAILS OF 2-CENTRED CURVE
DESIGN REFER TO TABLE D.5.2b

HIGHWAY DESIGN SPEED (km/h)	LENGTH AND TAPER RATIO "T" OF RIGHT TURN TAPER (m)
50	87.5 at 25:1
60	87.5 at 25:1
70	87.5 at 25:1
80	87.5 at 25:1
90	87.5 at 25:1
100	87.5 at 25:1
110	87.5 at 25:1
120	140.0 at 40:1
130	140.0 at 40:1

No.		BY		DATE	
Alberta INFRASTRUCTURE		FIGURE D-7h			
		Date: APRIL 1995			
INTERSECTION TREATMENT TYPE IIIc (TWO-LANE HIGHWAY)					
Prepared By: R.T.	Checked By: B.K.	Scale: N.T.S.	PAGE D-127		

HIGHWAY DESIGNATION	LANE */SHOULDER WIDTHS (m)	SHOULDER WIDTH "W" AT INTERSECTION (m)
RAU-213.4	3.7/3.0	1.5
RAU-211.8	3.7/2.2	1.5
RAU-210.0	3.5/1.5	1.5
RAU-209.0	3.5/1.0	1.0
RAU-208.0	3.5/0.5	0.5

* AUXILIARY LANE WILL BE 3.5m IN ALL CASES

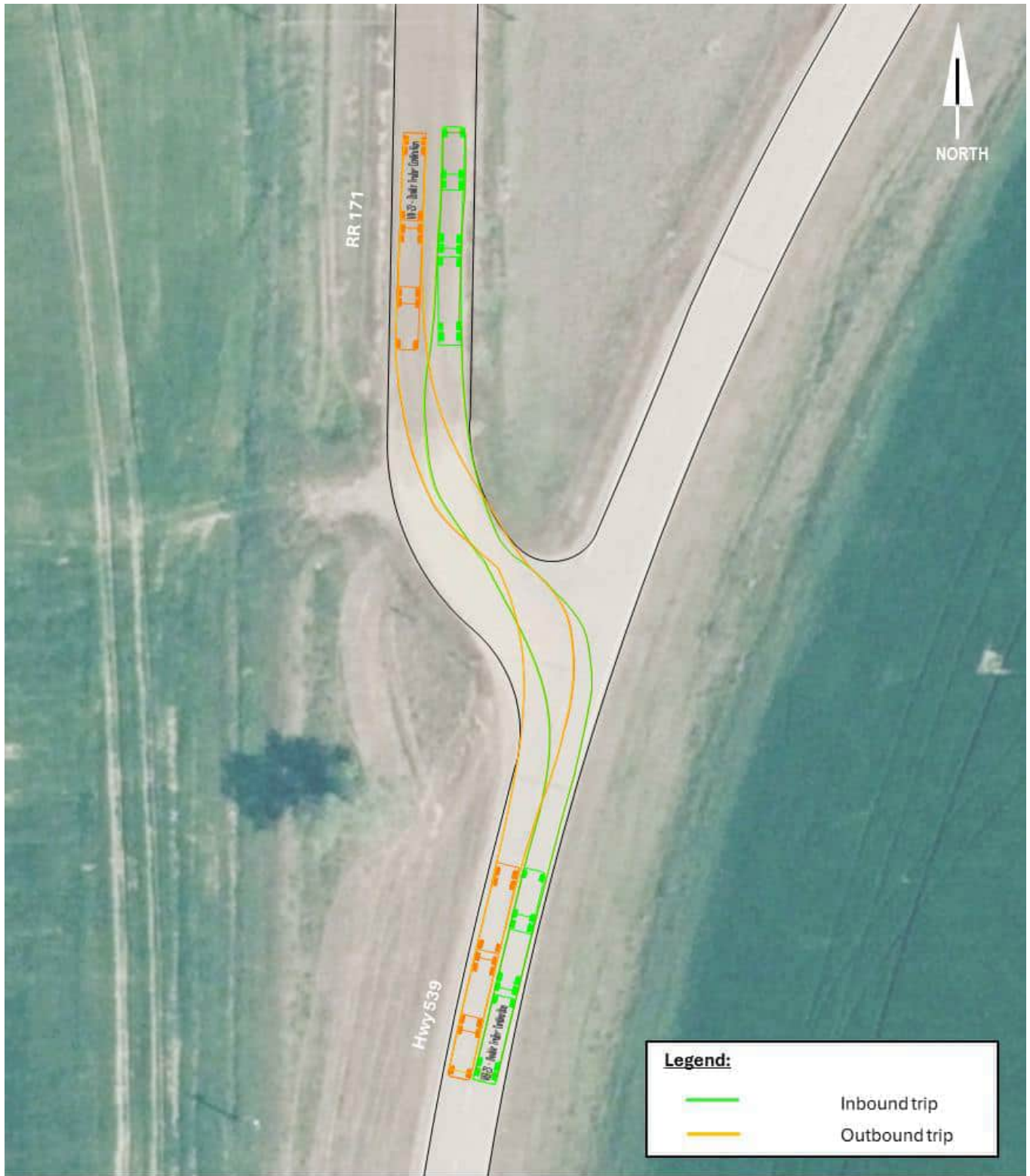


HIGHWAY DESIGN SPEED (km/h)	LENGTH AND TAPER RATIO "T" OF RIGHT TURN TAPER (m)
50	87.5 at 25:1
60	87.5 at 25:1
70	87.5 at 25:1
80	87.5 at 25:1
90	87.5 at 25:1
100	87.5 at 25:1
110	140.0 at 40:1
120	140.0 at 40:1
130	140.0 at 40:1

	FIGURE D-7i	
	Date: APRIL 1995	
INTERSECTION TREATMENT TYPE III d (TWO-LANE HIGHWAY)		
Prepared By: Cgk	Checked By: B.K.	Scale: N.T.S.
PAGE D-129		

APPENDIX G

Swept Path Analysis



a division of Englobe

EASTERN IRRIGATION DISTRICT

SNAKE LAKE RESERVOIR EXPANSION

TRAFFIC IMPACT ASSESSMENT

SWEPT PATH ANALYSIS

HWY 539 AND RR 171

SCALE: NTS

DATE: October 30, 2024

JOB: 1560-193-00

FIGURE: G1



EASTERN IRRIGATION DISTRICT
SNAKE LAKE RESERVOIR EXPANSION
TRAFFIC IMPACT ASSESSMENT
SWEEP PATH ANALYSIS
HWY 539 AND TWP RD 174

SCALE: NTS

DATE: October 30, 2024

JOB: 1560-193-00

FIGURE: G2