

Wainwright Traffic Study

- Highway 14 from 1 Street to Highway 41
- 23 Avenue from 23 Street to Highway 41
- Highway 41 from 23 Avenue to Highway 14

Prepared for:
Town of Wainwright
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Project #: 4022-001



INVISTEC CONSULTING LTD.

INNOVATION INTEGRITY EXCELLENCE

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- 23 Avenue from 23 Street to Highway 41
- Highway 41 from 23 Avenue to Highway 14

Final Report January 17, 2025

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1. INTRODUCTION

1.1 BACKGROUND

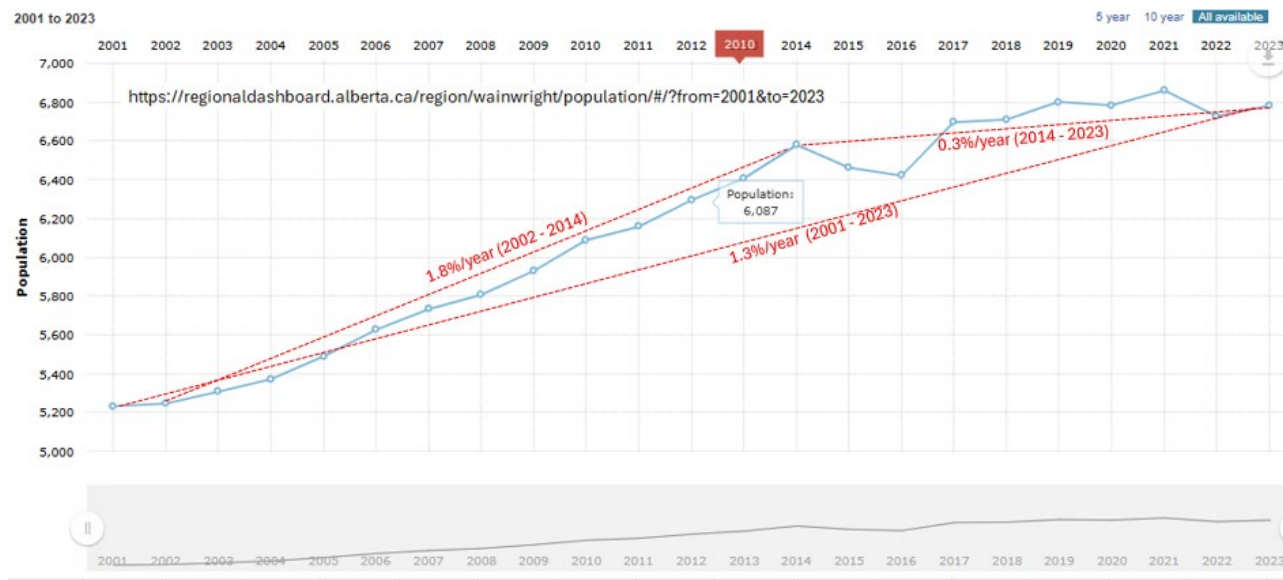
The *Wainwright RCMP Traffic Safety Plan 2022-2024* provides the following detailed introduction on the Town of Wainwright:

“The Town of Wainwright is located on the north side of the Canadian National Railway, 61 kilometers south of Vermilion, in the Battle River valley, along Highway 41, called the Buffalo Trail. Provincial Highway 14 also passes through the town. Wainwright is 206 km southeast of the City of Edmonton on Highway 14, and 69 kilometers west of the Alberta-Saskatchewan border..... Canadian Forces Base Wainwright (CFB Wainwright) is located adjacent to the Town of Wainwright..... The military population on base averages over 1,100 personnel at any given time, and in the summer it grows significantly when hundreds of primary reservists undertake annual training..... The Canadian Forces Base/Area Support Unit (CFB/ASU) Wainwright is very important to the Town of Wainwright..... Military presence in the area is planned to continue to grow in the future..... Agriculture is a very large part of industry within the municipal districts, making up approximately 40% of (Wainwright’s) work force..... The oil and gas industry plays a key part in the operations of local businesses..... since the 1950’s..... Approximately 40% of the oil and gas work force reside in the Town of Wainwright.”

Additional literature research (Safety Report 2017-2019) also reveals that the Town was experiencing considerable growth due to the large Oil and Gas industry in the Hardisty area which is 45 minutes to the southwest of Wainwright..... Several oil and gas companies are now working out of Wainwright. – *Wainwright Traffic Safety Plan 2017-2019*.

In addition, the Wainwright Stampede holds a 3-day event every year. The Stampede ground is located south of 1 Avenue, 200m east of 14 Street..... A covered grandstand was built to seat over 3,500 spectators – June 16, 2023 article on *Whatsyourshare.ca*. (Note: In 2025, the Wainwright Stampede will be held on June 20-22, 2025. It is anticipated that considerable event traffic will travel through the following key intersections in the Town - Highway 14 & 1 Street, Highway 14 & 14 Street, Highway 14 & 27 Street, and potentially also 1 Avenue & Highway 41)

Data from the *Alberta Regional Dashboard* shows that the population of Wainwright in 2023 was 6,782. Over the past 23 years (2001 to 2023), Wainwright has been growing at an annual population growth rate of 1.3%/year. A faster population growth trend was observed between 2002 and 2014 – at 1.8%/year, and a slower population growth trend was observed between 2014 and 2023 – at 0.3%/year). The exhibit below illustrates the population growth trend between 2001 and 2023.



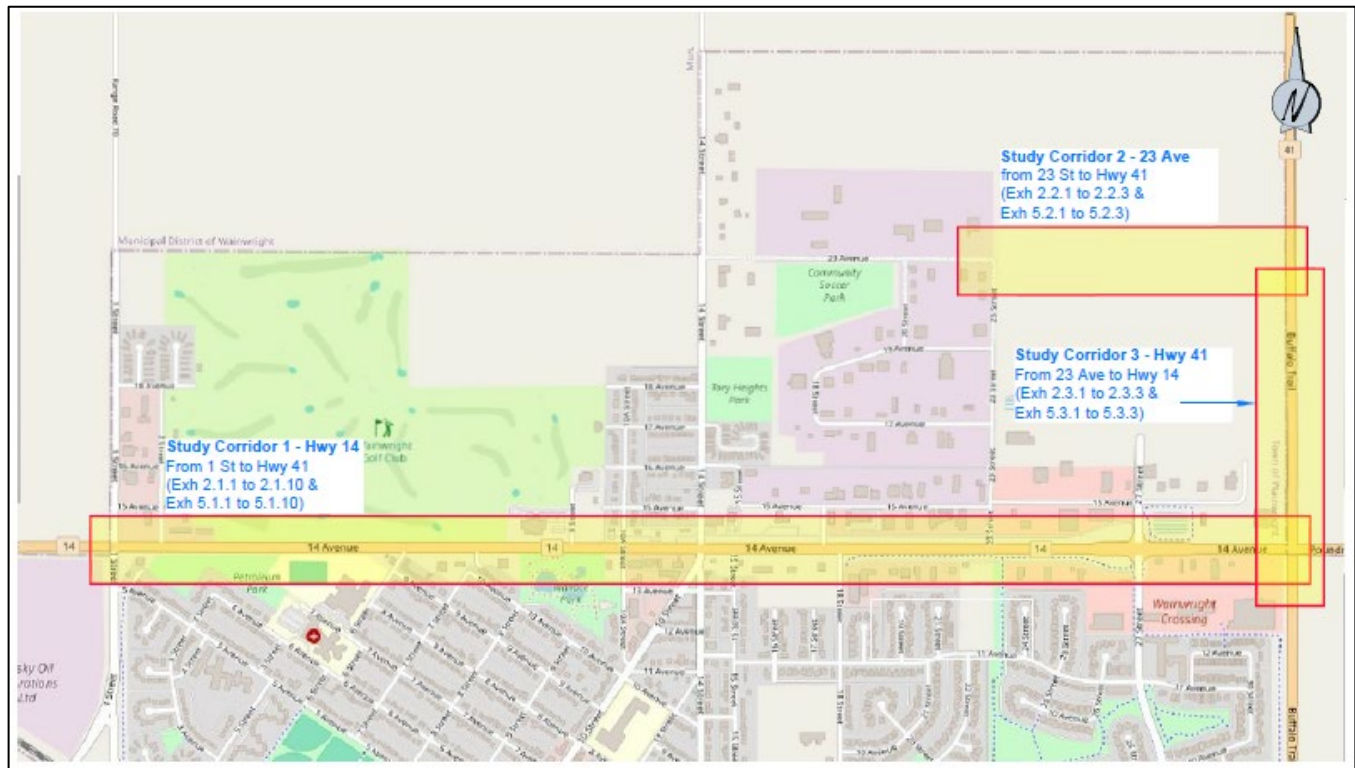
1.2 STUDY AREA / GOALS

Invistec Consulting Ltd. was retained by the Town of Wainwright to carry out a Traffic Study to examine the long-term needs of the full development of the industrial park land west of Highway 41 between Highway 14 and 23 Avenue. For the purpose of this Study, it was assumed that the industrial park land will be fully developed in 20 years.

The main purposes of the Study include:

- **Corridor 1** - Impact of short-term (10-Year) and long-term (20-Year) traffic growth on the intersections along Highway 14 through the Town. There are, in total, 12 intersections and 16 accesses over 3.3 km between 1 Street and Highway 41. A detailed assessment on the intersection and access operations and geometry (to check how they can accommodate the design vehicles) was carried out to come up with a recommended access management strategy on various segments of Highway 14 through Wainwright.
- **Corridor 2** - The proposed road requirement of a new 840m corridor, 23 Avenue, connecting 23 Street to Highway 41. This includes a future intersection to the north extension of 27 Street. Details identified include right-of-way requirements, road widths, location of street appurtenances and trees, and pavement structure (with reference to the Town's Municipal Standards - *Wainwright Municipal Standards*).
- **Corridor 3** - The intersection requirements of the following intersection / Access over 800m on Highway 41 - at 23 Avenue and at 17 Avenue (right-in/right-out). The needs for the two intersection / access were examined. Details identified include intersection type, length of acceleration taper / deceleration taper / parallel lanes / storage lanes, and pavement markings.

The locations of the above three corridors are illustrated below as well as in Exhibit 1 in Appendix A.



The existing layout of the intersections and accesses along **Highway 14 (Corridor 1)** are shown in **Exhibits 2.1.1 to 2.1.10**. Recommendations for improvements at these intersections and accesses are shown in **Exhibits 5.1.1 to 5.1.10**.

The **23 Avenue corridor (Corridor 2, greenfield)** is shown in **Exhibits 2.2.1 to 2.2.3**. The recommended Corridor 2 is shown in **Exhibits 5.2.1 to 5.2.3**.

The **Highway 41 Corridor (Corridor 3)** is shown in **Exhibits 2.3.1 to 2.3.3**. The recommended intersection treatments along the corridor are shown in **Exhibits 5.3.1 to 5.3.3**.

The Study also reviewed the findings and recommendations of past studies completed for the Town. Refer to **Section 2** for a brief discussion of the findings and recommendations from these studies.

A list of the past studies as well as the references and reports / standards / guidelines reviewed in this Study is provided in **Section 1.5**.

1.3 STUDY METHODOLOGY

Corridor 1 – Highway 14 through Wainwright

A thorough assessment was conducted at every single access and intersection along Highway 14. Two design vehicles were identified – WB-21 (Tractor Semi-Trailer, TST, a design vehicle used by the Province for the design of key highway intersections), and I-BUS (Inter-City Highway Buses including Coach Buses and “Greyhound” buses).

A cursory traffic forecasting exercise was undertaken to determine the traffic forecasts resulting from the full development of the industrial park land north of Highway 14 and west of Highway 41. A growth factor was applied to the through traffic on Highway 14 determined by estimating the percent of Highway 14 traffic that can be considered as through traffic.

The intersection analyses undertaken include:



- Intersection capacity analysis using Synchro 12 / SimTraffic software.
- Roundabout capacity analysis using the Highway Capacity Software for 2-lane roundabouts.
- Intersection Type Warrant Analysis (ATEC HGDG) to identify long term intersection type requirements at the 23 Avenue & Highway 41 intersection.
- Traffic signal warrant analysis (TAC Procedures).
- Roundabout layout (footprint) requirements for the Highway 14 & 1 Street intersection.
- Review of the traffic signal operation and controller database for the Highway 14 / 27 Street intersection traffic signal and the Highway 14 / 14 Street intersection traffic signal.
- Detailed design vehicle swept path checks for every intersection and access on Highway 14 for the existing intersection / access layout as well as a potential intersection layout under the Two-Way-Left-Turn-Lane access management concept.
- The 2019 to 2023 collision data on Highway 14 were examined and collision diagrams were prepared.
- The outcome of the above assessments helped identify the most suitable intersection upgrading requirements and access treatments.
- The assessments also helped evaluate the potential impacts of closing off two service road connections at (1) the north leg of 18 Street connecting to the North Service Road of Highway 14, and at (2) the south leg of 23 Street connecting to the South Service Road (13 Avenue) of Highway 14.

Corridor 2 – 23 Avenue from 23 Street to Highway 41

- Reviewed the projected intersection traffic volumes to determine the intersection layout requirements at 23 Avenue / 23 Street, 23 Avenue / 27 Street, and 23 Avenue / Highway 41.
- Reviewed the Town's Municipal Development Standards to identify the cross-section requirements both along 23 Avenue and at the three intersections on 23 Avenue.
- Identify if any intersection improvements are needed at the 23 Avenue/23 Street intersection.

Corridor 3 – Highway 41 from 23 Avenue to Highway 14

- Carried out intersection type warrants (Alberta Transportation & Economic Corridor Warrant Procedures) to determine the design requirements for the 23 Avenue/Highway 41 intersection. The assessment was based on the warrants calculated for the long-term 20-Year horizon.
- Results of the intersection operation analysis on Highway 14 were also used to determine if the Right-In/Right-Out access on Highway 41 (at 17 Avenue) may be needed to provide relief to the intersections on Highway 14.

1.4 REPORT ORGANIZATION

This Report contains five sections:

Section 1 provides an **introduction of the Study**, with topics such as Study Area, Background, Study Objective, Study Methodology, as well as a summary of the Report Organization. The Section concludes with a list of the reference materials and reports reviewed in the process of undertaking this Study.

Section 2 provides an **overview of the study locations and issues identified**. The key focus is on the geometry and access issues on every intersection and access along Corridor 1 (Highway 14 through Wainwright). The Section concludes with a list for issues identified for both Corridor 2 (23 Avenue) and Corridor 3 (Highway 41).



Section 3 focuses on the short-term (10-Year) and longer-term (20-Year) **operating conditions and improvement requirements** for all key intersections along Highway 14 through Wainwright. The Section includes a collision analysis on collision data provided by the Province on Highway 14, as well as a detailed assessment on the truck traffic at key intersections along Highway 14. The truck traffic assessment provides the needed input for key considerations for intersection improvement needs and access management decisions (especially for confirming if WB-21 should be used as the design vehicle for the intersection, deciding related to access closure and other access treatments, as well as determining impacts on potential closure of connections to service roads on both sides of Highway 14).

Section 4 examines the **intersection and access requirements** of every intersection and access along Highway 14 through Wainwright. Besides the **“Do-Nothing” Option**, two key access management strategies are discussed – Two-Way-Left-Turn-Lane Option (TWLTL Option) and **Service Road Option**. The implication of the two-way-left-turn lane on the accommodation of various design vehicles are examined at all intersections and accesses with detailed Design Vehicle Swept Path analysis for both the existing and proposed TWLTL option. As for access treatment, the options discussed include **“Do-Nothing” Option**, **Access Modification Option** (e.g. Convert to Right-In/Right-Out), **Access Consolidation Option**, and **Access Relocation Option**, **Alternative Access Option** and **Access Closure Option**.

Section 5 provides the **conclusions and recommendations for the improvements needed** at each of the three corridors (Corridor 1 – Highway 14 through Wainwright; Corridor 2 – 23 Avenue from 23 Street to Highway 41; and Corridor 3 – Highway 41 from 23 Avenue to Highway 14).

1.5 REFERENCE MATERIALS / REPORT REVIEWED

The following references and reports were reviewed as part of the Project tasks:

- 1) *Hwy 14:14 – 4 km of Hwy 833 to Hwy 41* – July 16, 2024 Meeting Minutes, prepared by *Morrison Hershfield*, for *Alberta Transportation & Economic Corridors (ATEC)*
- 2) *Highway 14 Access Management Study* – 2013 Public Information Session Posters, prepared by *Associated Engineering*, for *Alberta Transportation*
- 3) *“Highway 14 Due for Improvements”* – June 2013 News Article from *The Star*
- 4) *Town of Wainwright Municipal Development Plan*, Bylaw No 2021-14, *Town of Wainwright*
- 5) *Town of Wainwright Municipal Development Standards* – current standards (as of 2024), *Town of Wainwright*
- 6) *Town of Wainwright Traffic Safety Plan* – 2017 - 2019, and 2022 - 2024, prepared by *RCMP-Wainwright*
- 7) *Town of Wainwright Industrial Park Area Structure Plan* – March 2, 2015, prepared by *Select Engineering* for the *Town of Wainwright*
- 8) *2021 Wainwright Regional Growth Study* – November 2022, prepared by *ISL / Metro Economics / Nichols Applied Management* for the *Town of Wainwright*
- 9) *Highway Geometric Design Guide* – Chapter D – At-Grade Intersections (including Intersection Type Warrants for 2-Lane Highways), Chapter I, Access Management Guidelines, Chapter G – 3R/4R Geometric Design Guidelines, October 2005, prepared by *Alberta Infrastructure and Transportation*.
- 10) *Geometric Design Guide for Canadian Roads* – Chapter 8, Access, prepared by *Transportation Association of Canada (TAC)*
- 11) *Access Management Manual* – *Transportation Research Board (TRB)* – Chapter 2 – Effects of Access Management, Chapter 11 – Medians and Continuous Two-Way Left-Turn Lanes



- 12) *Safety Evaluation of Centre Two-Way Left-Turn Lanes on Two-Lane Roads*, FHWA-HRT-08-046, prepared in 2008 by *Federal Highway Administration (FHWA), US Department of Transportation*
- 13) *Safety and Operational Characteristics of Two-Way Left-Turn Lanes*, prepared in 2006 by *Minnesota DOT (MinDOT) and Local Road Research Board (LRRB)*
- 14) *Design Bulletin #68/2012, Roundabout Design Guideline on Provincial Highways*, Amended in 2016 by *Alberta Transportation*, supplemented by *Memorandum on Truck Accommodation at Multi-Lane Roundabouts*, prepared by *Ourston Roundabout Engineering for Alberta Transportation*
- 15) *Alberta Traffic Collision Statistics 2021*, prepared by *Traffic Safety Section of Alberta Transportation and Economic Corridors (ATEC)*
- 16) *Highway Pavement Marking Guide*, prepared in 2003 by *Alberta Transportation*
- 17) *Highway Safety Manual (HSM)*, Chapter 10, Predictive Method for Rural Two-Lane Two-Way Roads, Chapter 14 – Intersections, and Chapter 16, Special Facilities and Geometric Situations (including TWLTL Treatments), prepared in 2010 by *American Association of State Highway and Transportation Officials (AASHTO)*
- 18) *TMV and ATR Data from Alberta Transportation Traffic Counts Map – 2023*
- 19) *Additional TMV Data gathered by Town of Wainwright (Hwy 14 & 15 St; 13 Ave & 27 St) – 2022*
- 20) *“Stories of Albera: Wainwright Stampede”*, June 16, 2023 article on the *WhatsYourShare.ca* website
- 21) *Historical Population Data from 2001 to 2023, Regional Dashboard.*
- 22) *Trips and Parking Generation Rates for Land Uses in Small Towns in Alberta*, prepared in 2005 by *Bunt & Associates for Centre for Transportation Engineering & Planning (C-TEP)*



2. STUDY LOCATIONS AND ISSUES

2.1 CORRIDOR 1 – INTERSECTIONS AND ACCESSES ON HIGHWAY 14 FROM 1 STREET TO HIGHWAY 41

Exhibits 2.1.1 to 2.1.10 in Appendix B illustrate the existing highway intersection and access layout from 1 Street to Highway 41. Illustrated on the exhibits are the existing lane markings, access / intersection geometry and access / intersection numbers (bold red number in red circle). The table below summarizes the list of intersections and accesses and the adjacent landmarks accessed by the intersections / accesses. Issues identified by this Study as well as by the other transportation related studies are listed on an access by access and intersection by intersection basis.

Intersection / Access Number	Exhibiti No
Access 1 - 1 St	Exhibit 2.1.1
Access 2 - Trail Contracting	Exhibit 2.1.1
Access 3 - 2 St	Exhibit 2.1.1
Access 4 - Petroleum Park	Exhibit 2.1.2
Access 5 - ESSO	Exhibit 2.1.3
Access 6 - 6 St	Exhibit 2.1.3
Access 7 - Bison Motel	Exhibit 2.1.3
Access 8 - Boston Pizza, Subway	Exhibit 2.1.3
Access 9 - MD of Wainwright	Exhibit 2.1.4
Access 10 - 9 St	Exhibit 2.1.4
Access 11 - KFC	Exhibit 2.1.5
Access 12 - 10A St	Exhibit 2.1.5
Access 13, 14 - Esthetic Studio / Pizza	Exhibit 2.1.5
Access 15, 16 - Esthetic Studio, Jeb's Joint	Exhibit 2.1.5
Access 17, 18 - Fas Gas / Vacant Lot (SWC)	Exhibit 2.1.5
Access 19 - 14 St	Exhibit 2.1.6
Access 20 - 15 St	Exhibit 2.1.6
Access 21 - EMCO Yard	Exhibit 2.1.6
Access 22 - Seed Cleaning Plant	Exhibit 2.1.6
Access 23 & 24 - 18 St	Exhibit 2.1.7
Access 25 & 26 - 23 St	Exhibit 2.1.8
Access 27 - 27 St (including 13 Ave/27 St)	Exhibit 2.1.9
Access 28 - Hwy 14 & Hwy 41	Exhibit 2.1.10



2.1.1 EXHIBIT 2.1.1 – ACCESS 1, 2 & 3



Issues at Access 1 – 1 Street

- Long delays on south leg of 1 St. Sharp peaks in AM peak, Noon peak, and PM peak. Delay will get worse with ongoing expansion of CFB Wainwright. Congestion during Wainwright Stampede anticipated to be severe.
- Sightline issues for eastbound and westbound left-turns (negative offsetting left-turn lanes)
- Lack of right turn bays for both eastbound and westbound directions
- Lane markings not clear or cannot be seen for westbound traffic. Lack of pavement arrows. Only a small lane designation sign (60cmx60cm) facing westbound traffic.
- Need traffic signal or roundabout to improve intersection operation.
- Can accommodate a WB-21 design vehicle (see Section 4)
- 3 collisions over 5 years (see Section 3.2, Collision Analysis)
- Issues identified in *Morrison Hershfield Meeting Minutes* – (1) very busy AM, Noon, and PM Peak Periods; (2) Lots of military convoys.

Issues at Access 2 – Trail General Contracting Access

- Double solid yellow line on Highway 14 means westbound left-turn into the Access or northbound left-turn out of the Access will need to cross a solid yellow line (movements prohibited)
- Eastbound right turns into the Access need to turn from the only through lane for eastbound traffic (probably turn right from the wide shoulder)
- Access is quite wide (25m)
- Only an I-BUS design vehicle can be accommodated (see Section 4)
- Issue identified in *Morrison Hershfield Meeting Minutes* – build up of gravel along edges of shoulder

Issues at Access 3 – 2 Street

- Eastbound left turns into 2 Street need to turn from the only through lane for eastbound traffic
- Westbound right turns into 2 Street need to turn from the only through lane for westbound traffic
- Can accommodate a WB-21 design vehicle (See Section 4)



- Issue identified in *Morrison Hershfield Meeting Minutes* – northeast corner prone to flooding

2.1.2 EXHIBIT 2.1.2 – ACCESS 4



Issues at Access 4 – Petroleum Park Access

- Eastbound right turns into the Access need to turn from the only through lane for eastbound traffic (probably turn right from the wide shoulder)
- Westbound left turns into the Access need to turn from the only through lane for westbound traffic
- Only an I-BUS design vehicle can be accommodated (see Section 4)

**2.1.3 EXHIBIT 2.1.3 – ACCESS 5, 6, 7, 8****Issues at Access 5 – ESSO Access**

- Eastbound right turns into the Access need to turn from the only through lane for eastbound traffic (probably turn right from the wide shoulder)
- Westbound left turns into the Access need to turn from the only through lane for westbound traffic
- Access is quite wide (>35m) and is at an acute angle of 37 degrees
- A WB-21 design vehicle can be accommodated between the Access and Highway 14 West (right-turn), and for inbound from Highway 14 East (left-turn). However, due to the acute angle of the Access, only I-BUS can be accommodated for the outbound right-turn from the Access. WB-21 desiring to turn right towards Highway 14 East will need to exit via the 6 Street Access (Access 6) (see Section 4)

Issues at Access 6 – 6 Street

- Eastbound right turns into 6 Street need to turn from the only through lane for eastbound traffic (probably turn right from the wide shoulder)
- Westbound left turns into 6 Street need to turn from the only through lane for westbound traffic
- 6 Street is at an acute angle - at 53 degrees. As a result, only an I-BUS design vehicle can be accommodated (See Section 4)
- 2 collisions over 5 years. Collisions were related to left turns. (see Section 3.2, Collision Analysis)
- Issue identified in *Morrison Hershfield Meeting Minutes* – Skew angle

Issues at Access 7 – Bison Motel Access

- Eastbound right turns into the Access need to turn from the only through lane for eastbound traffic (probably turn right from the wide shoulder)
- Westbound left turns into the Access need to turn from the only through lane for westbound traffic



- Access is very wide at 49m with a streetlight pole in the middle. The wide openings may be used by WB-21 to turn around on site (**Not sure. To be verified**)
- Semi-trailer trucks were found parked along the wide shoulder of the eastbound lanes of Highway 14
- Can accommodate a WB-21 design vehicle (See Section 4)
- Issue identified in *Morrison Hershfield Meeting Minutes* – access too wide. Suggest narrowing it down by either concrete barriers or delineators

Issues at Access 8 – Boston Pizza / Subway Access

- Eastbound right turns into the Access need to turn from the only through lane for eastbound traffic (probably turn right from the wide shoulder)
- Westbound left turns into the Access need to turn from the only through lane for westbound traffic
- Only an I-BUS design vehicle can be accommodated (see Section 4)

2.1.4 EXHIBIT 2.1.4 – ACCESS 9, 10




Issues at Access 9 – MD of Wainwright Office Access

- Eastbound right turns into the Access need to turn from the only through lane for eastbound traffic (probably turn right from the wide shoulder)
- Westbound left turns into the Access need to turn from the only through lane for westbound traffic
- Only an I-BUS design vehicle can be accommodated (see Section 4)

Issues at Access 10 – 9 Street

- Westbound right turns into 9 Street need to turn from the only through lane for westbound traffic (probably turn right from the wide shoulder)
- Eastbound left turns into 9 Street need to turn from the only through lane for eastbound traffic
- Only an I-BUS design vehicle can be accommodated (see Section 4)

**2.1.5 EXHIBIT 2.1.5 – ACCESS 11, 12, 13, 14, 15, 16, 17, 18**

	
Issues at Access 11 – KFC Access	
<ul style="list-style-type: none">- Westbound right turns into the Access need to turn from the only through lane for westbound traffic (probably turn right from the wide shoulder)- Eastbound left turns into the Access need to turn from the only through lane for eastbound traffic- Only an I-BUS design vehicle can be accommodated (see Section 4)- Issue identified in the <i>Morrison Hershfield Meeting Minutes</i> – consider closing KFC access and provide alternative access through a shared service road concept (connecting to 9 Street)	
Issues at Access 12 – 10A Street	
<ul style="list-style-type: none">- Eastbound left-turn/through/right-turn at 10A Street are made through a single eastbound lane. Right turns likely utilize the shoulder.- Westbound left-turn/through/right-turn at 10A Street are made through a single eastbound lane. Right turns likely utilize the shoulder.- Can accommodate a WB-21 design vehicle (See Section 4)- Issue identified in the <i>Morrison Hershfield Meeting Minutes</i> – need to connect zebra crosswalk to existing sidewalks	
Issues at Access 13 – Royal Pizza / Domino Pizza Access	
<ul style="list-style-type: none">- Very wide shoulder for eastbound direction. Eastbound traffic entering the Access probably utilizing the shoulder to make the right turn- Westbound left turns cannot turn into the Access – would cross the solid yellow centre line- Left turns exiting movement from the Access cannot be made – cannot cross solid yellow centre line- Essentially a Right-In/Right-Out Access- Only an I-BUS design vehicle can be accommodated (see Section 4)	
Issues at Access 14 – Esthetics Studio West Access	
<ul style="list-style-type: none">- Westbound traffic entering the Access needs to turn from the only through lane for westbound traffic (probably utilizing the shoulder partially to make the right turn now)- Eastbound left turn cannot turn into the Access – Cannot cross the solid yellow centre line	



<ul style="list-style-type: none"> - Left-turn exiting movement from the Access cannot be made - cannot cross the solid yellow centre line - Essentially a Right-In/Right-Out Access - Can accommodate a I-BUS design vehicle in one direction only (only in or out). One of the Esthetic Studio accesses (Access 14 or Access 15) could be removed or closed (See Section 4)
Issues at Access 15 – Esthetics Studio East Access <ul style="list-style-type: none"> - This access is very close to Access 14 – centrelines of Access 14 and Access 15 are only 28m apart. Can remove or close either Access 14 or Access 15 - Westbound traffic entering the Access needs to turn from the only through lane for westbound traffic - Eastbound left turns cannot turn into the Access – cannot cross the solid yellow centre line - Left turns exiting movement from the Access cannot be made – cannot cross the solid yellow centre line - Can only accommodate an I-BUS design vehicle one direction at a time (in or out only). One of the two Esthetic Studio accesses (Access 14 or Access 15) could be removed (See Section 4)
Issues at Access 16 – Jeb’s Joint Access <ul style="list-style-type: none"> - This access is quite close to Access 13 – centrelines of Access 13 and Access 16 are 40m apart. - Eastbound traffic entering the Access needs to turn from the eastbound right turn lane - Westbound left turns cannot turn into the Access – cannot cross the solid yellow centre line - Left turns exiting movement from the Access cannot be made – cannot cross the solid yellow centre line - Essentially a Right-In/Right-Out Access - Can only accommodate a I-BUS design vehicle one direction at a time (in or out only) (see Section 4) - Issues identified in the <i>Morrison Hershfield Meeting Minutes</i> – (1) excess shoulder width in eastbound lane, (2) need better delineation of eastbound lanes
Issues at Access 17 – Vacant Building Access (southwest corner of Highway 14 & 14 Street intersection) <ul style="list-style-type: none"> - This access is quite close to Access 16 – centrelines of Access 16 and Access 17 are 36m apart. - Eastbound traffic entering the Access needs turns from the eastbound right turn lane - Westbound left-turn cannot turn into the Access – cannot cross the solid yellow centre line - Left turns exiting movement from the Access cannot be made – cannot cross the solid yellow centre line - Essentially a Right-In/Right-Out Access - Can accommodate an inbound WB-21 design vehicle, but not outbound (see Section 4) - Issues identified in the <i>Morrison Hershfield Meeting Minutes</i> – (1) excess shoulder width in eastbound lane, (2) need better delineation of eastbound lanes
Issues at Access 18 – Fas Gas Plus Access <ul style="list-style-type: none"> - Westbound traffic entering the Access needs to turn from the only through lane for westbound traffic (probably utilizing the shoulder partially to make the right turn now)



- Eastbound left-turn cannot turn into the Access - cannot cross the solid yellow centre line
- Left turns exiting movement from the Access cannot be made - cannot cross the solid yellow centre line
- Essentially a Right-In/Right-Out Access
- Can accommodate an outbound WB-21 design vehicle, but not inbound (see Section 4)

2.1.6 EXHIBIT 2.1.6 – ACCESS 19, 20, 21



Issues at Access 19 – 14 Street

- Outer separation (distance between the highway and the service road) is quite narrow (approximately 18m). WB-21 cannot make a U-Turn from Highway 14 westbound at 14 Street to North Service Road eastbound). Will need to widen northwest corner and northeast corner (see Section 4)
- Narrow north leg – has limited capacity and is prone to traffic congestion
- Queues on north leg can block the service road intersection
- Intersection geometry is tight. Opposing left turns may be interlocking if both left turning vehicles are WB-21 (all four left turns)
- No left-turn bays at north and south legs. If the right turn bay at the south leg is converted to a shared through/right-turn lane, may result in longer queues in the curb lane at the south leg
- Traffic Signal – lack of left-turn signal phases; signal timing deficiencies – only 1 timing program resulting – not responsive to traffic demand changes at different times of the day; inadequate clearance intervals
- 5 collisions over 5 years. 3 related to weekday peak periods, 4 related to Snow / Icy Road. 3 rearend collisions (see Section 3.2, Collision Analysis)
- No westbound right turn bay at this major intersection

Issues at Access 20 – 15 Street

- Eastbound right turns into 15 Street are made through a single eastbound lane



- Westbound left turns cannot turn into 15 Street – cannot cross solid yellow centre line
- Left-turn exiting movement from 15 Street cannot be made – cannot cross solid yellow centre line
- Essentially a right-in/right-out access
- Can accommodate I-BUS design vehicle. Some overlap of turn paths for WB-21. (see Section 4)
- Issues identified in the *Morrison Hershfield Meeting Minutes* – (1) left-turn crossing solid yellow line, (2) safety issue – potential rearend collisions

Issues at Access 21 – EMCON Yard Access

- Eastbound right-turns in the Access are made through a single eastbound lane (probably utilizing the shoulder to make the right turn)
- Westbound left-turn cannot turn into the Access – cannot cross solid yellow centre line
- Left turn exiting movement from the Access cannot be made – cannot cross solid yellow centre line
- Essentially a right-in/right-out access
- Can accommodate WB-21 design vehicle (see Section 4)

2.1.7 EXHIBIT 2.1.7 – ACCESS 22, 23 (18 STREET NORTH), 24 (18 STREET SOUTH)



Issues at Access 22 – Wainwright Seed Cleaning Plant Access

- Eastbound right-turns into the Access are made through a single eastbound lane (probably utilizing the shoulder to make the right turn)
- Westbound left-turn cannot turn into the Access – cannot cross solid yellow centre line



- Left-turn exiting movement from the Access cannot be made – cannot cross solid yellow centre line
- Essentially a right-in/right-out access
- Can accommodate WB-21 design vehicle. Although there is a slight overlap in swept paths, it is not likely to have WB-21 entering and exiting the Access at the same time (see Section 4)

Issues at Access 23 – North Leg of 18 Street

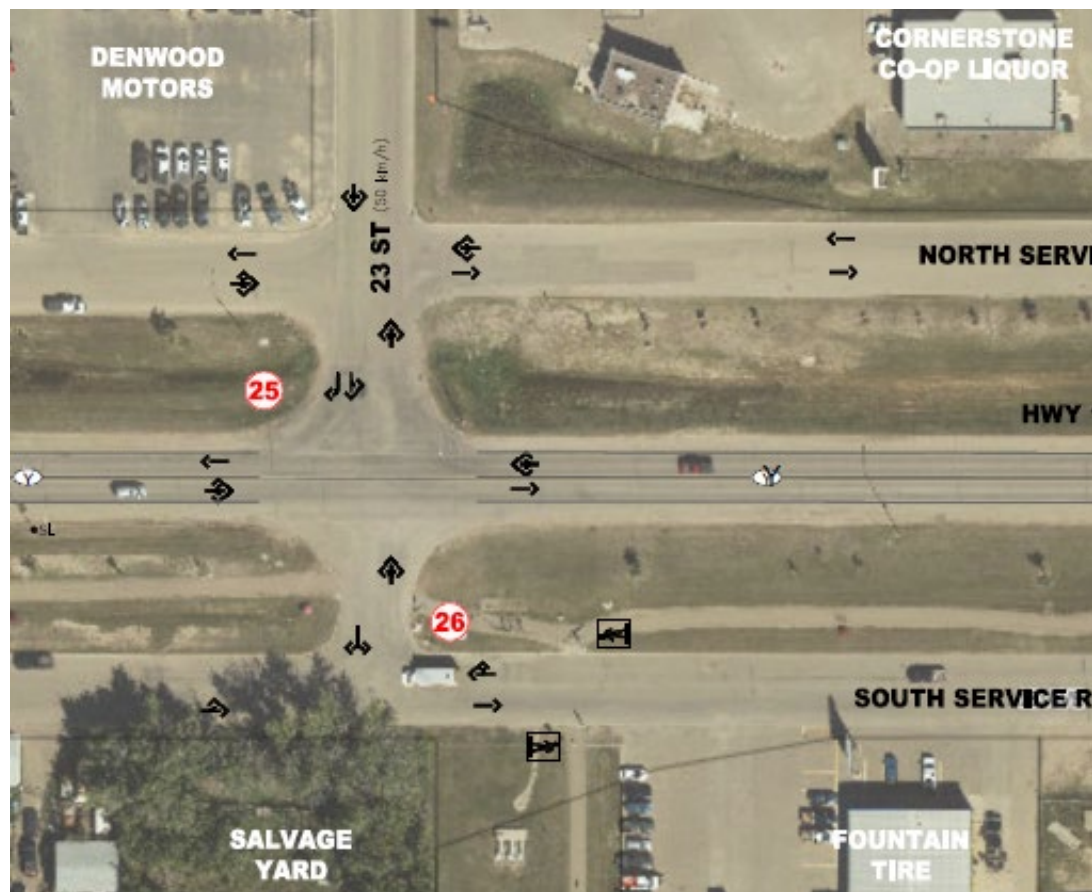
- Outer separation is too narrow. WB-21 cannot make a U-turn from Highway 14 westbound at 18 Street North to North Service Road eastbound.
- Westbound traffic entering 18 Street North need to turn from the only through lane for westbound traffic (probably utilizing the shoulder to make the right turn)
- Eastbound left-turn into 18 Street North needs to turn from the only through lane for eastbound traffic
- Offsetting North and South legs of 18 Street
- Low volumes using 18 Street North. Closing of this access can be considered – especially when the volumes of semi-trailer trucks entering and exiting 18 Street North are very low (see Section 3.4)
- Issue identified in the *Morrison Hershfield Meeting Minutes* - offsetting north and south legs of 18 Street

Issues at Access 24 – South Leg of 18 Street

- Eastbound traffic entering 18 Street South need to turn from the only through lane for eastbound traffic (probably utilizing the shoulder to make the right turn)
- Westbound left-turn into 18 Street South needs to turn from the only through lane for westbound traffic
- Offsetting north and south legs of 18 Street
- Very wide intersection – confusing for motorists – although no collisions between 2019 and 2023
- Can accommodate WB-21 design vehicle but, due to the substantial width of the south leg, a median is desirable to separate the northbound and southbound traffic. If a median is added, it will be necessary to widen the southeast corner outer separation
- May potentially consider a right turn bay (for eastbound traffic turning into 18 Street South)
- Issues identified in the *Morrison Hershfield Meeting Minutes* - (1) offsetting north and south legs of 18 Street, (2) very wide south leg. May consider adding a pork chop island



2.1.8 EXHIBIT 2.1.8 – ACCESS 25 (23 STREET NORTH), 26 (23 STREET SOUTH)



Issues at Access 25 – North Leg of 23 Street

- Outer separation is narrow (approximately 20m at the west leg, and 23m at the west leg). WB-21 cannot make a U-turn from Highway 14 westbound to North Service Road eastbound
- Westbound traffic entering 23 Street North needs to turn from the only through lane for westbound traffic (probably utilizing the shoulder to make the right turn now)
- Eastbound left-turn into the site needs to turn from the only through lane for eastbound traffic
- North Leg is narrow – cannot accommodate a car and a truck side-by-side
- Intersection geometry is tight – need to widen northwest and northeast corners to accommodate WB-21 (see Section 4)
- Intersection geometry is tight – opposing left turns will be interlocking (both northbound/southbound and eastbound/westbound)
- May require widening at northwest corner and southeast corner outer separation to accommodate WB-21 design vehicle
- Lack of westbound right turn bay
- 3 collisions over 5 years – 2 weekday peak periods. 2 related to left turns. 1 related to side-swipe between left-turning vehicle and a right turning vehicle
- Issue identified by Morrison Hershfield study – queue on 23 Street may block the North Service Road; (2) could use an eastbound left-turn bay
- Issue identified by the Town – (1) long wait time for southbound traffic; (2) could use a westbound right turn bay



Issues at Access 26 – South Leg of 23 Street

- Outer separation is too narrow (11m). A WB-21 design vehicle cannot make a U-turn from Highway 14 eastbound at 23 Street South to South Service Road westbound
- Eastbound traffic entering 23 Street South needs to turn from the only through lane for eastbound traffic (probably utilizing the shoulder to make the right turn now)
- Westbound left turns into 23 Street South need to turn from the only through lane for westbound traffic
- Intersection geometry is tight – need to widen southeast corner to accommodate WB-21 design vehicle
- Intersection geometry is tight – opposing left turns will be interlocking (both northbound/southbound left turns and eastbound/westbound left turns)
- Low volumes using 23 Street South. Closing of this access can be considered – especially when the volumes of semi-trailer trucks entering and exiting 23 Street South are low (see Section 3.4)
- Issue identified in the *Morrison Hershfield Meeting Minutes* – may consider closing the south leg of 23 Street. This is supported by the Town.

2.1.9 EXHIBIT 2.1.9 – ACCESS 27 (27 STREET)



Issues at Access 27 – 27 Street (including the service road intersection to the south)

- Congested south leg – need northbound left-turn signal (flashing green arrow)
- Congested commercial site access across from 13 Avenue / Highway 14 South Service Road (Wainwright Crossing access)
- Traffic camera detection issue - not pointing to the correct detection zones on the road (signal pole was hit, which might have affected the aiming of the traffic camera).



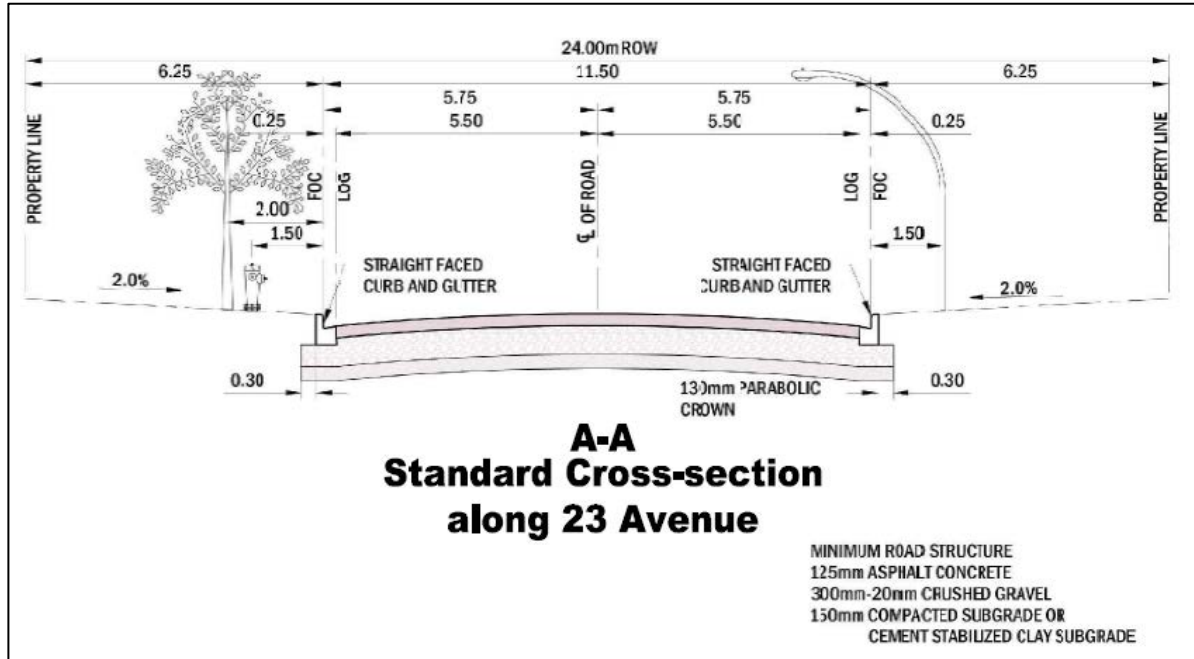
- Signal timing programming issues need to be addressed. (preliminary proposed timing changes have been prepared but will require further field investigation and detailed traffic operational analysis to confirm the scale of the timing changes needed)
- Tight intersection – tight opposing left turns in all four directions
- The close proximity of Highway 14 and the South Service Road (13 Avenue) resulting in complex operation in the southbound departure lane (from Highway 14 to 13 Avenue / South Service Road), and additional sightline issues making it difficult for eastbound traffic on 13 Avenue to enter 27 Street. Special right turn signal (green arrow) should be considered to control right turns from Highway 14 eastbound to 27 Street southbound in a safer manner by reducing potential conflicts due to the weaving traffic movements. The introduction of the right turn signal will require a longer eastbound right turn bay to provide more storage for the eastbound right-turn vehicles stopped in the right turn lane (while facing a red signal). Simulation for this signal control was checked but more detailed operational assessments will be needed to prepare the required detailed signal timing design and signal phasing assignment.
- Poor operation when Highway 14 wide loads are passing through the intersection – pinch points. Need to stop 2-way traffic for a few hundred metres on Highway 14 to allow wide load to pass through
- 7 collisions over 5 years. 5 in 2021, with 2 weekday peak period collisions; 5 collisions related to left-turns; 1 collision occurred on a snowy/ice road day, 1 rearend collisions and 3 injury collisions. (see Section 3.2, Collision Analysis)
- Intersection can accommodate WB-21 design vehicle in all traffic movements between Highway 14, 27 Street and the South Service Road / 13 Avenue (see Section 4)
- Issues identified in the *Morrison Hershfield Meeting Minutes* – (1) long centre medians along Highway 14 were hit by vehicles and removing the centre median may need to be considered; (2) very long east/west signal green phase; (3) major sightline issue for eastbound traffic exiting from 13 Avenue

2.2 CORRIDOR 2 – 23 AVENUE FROM 23 STREET TO HIGHWAY 41

Refer to Exhibits 2.2.1 to 2.2.3 in Appendix B, which show the 23 Avenue corridor from 23 Street to Highway 41.

Issues

1. 23 Avenue will follow the same alignment as the existing 23 Avenue west of 23 Street.
2. Curb return radius at the southwest corner of the 23 Avenue / 23 Street intersection is undersized and may require widening.
3. 27 Street in the long term will extend to the north to intersect with 23 Avenue.
4. 23 Avenue will need to be constructed as an arterial road that can accommodate industrial park traffic. It is expected that 23 Avenue will have a posted speed limit of 60 km/h.
5. 23 Avenue will require a right-of-way of 24m and a pavement width of 11m. The north edge of the proposed right-of-way is located just south of the quarter-section line.
6. The cross-section of 23 Avenue will need to meet the requirements shown in the Town's Standard Drawing 3-02 for a 24.0 m Arterial ROW, as shown below:



2.3 CORRIDOR 3 – HIGHWAY 41 FROM 23 AVENUE TO HIGHWAY 14

Refer to **Exhibits 2.3.1 to 2.3.3 in Appendix B**, which show the Highway 41 corridor from 23 Street to Highway 14.

Issues

1. There is an existing field access to a farm east of Highway 41, across from the proposed but located slightly north of the proposed 23 Avenue alignment. It is anticipated that the location of this field access may be adjusted to line up with the proposed 23 Avenue alignment at the west leg of the intersection.
2. The intersection type of the proposed 23 Avenue/Highway 41 intersection would be determined based on the projected long-term volumes (Year 20 volumes). Warrant charts in Chapter D of the Alberta Transportation and Economic Corridors Highway Geometric Design Guide will be used for this warrant analysis. (see Section 3.6)
3. It is expected that the posted speed limit of Highway 41 at 23 Avenue will remain at 100 km/h.
4. Lighting assessment has not been carried out. It is anticipated that a lighting assessment will be carried out when the intersection construction is being planned and designed.
5. It is assumed that the 23 Avenue extension and the 23 Avenue / Highway 41 intersection will be required when the industrial land is 50% developed (based on the results of intersection analysis in Section 3) – which is further assumed to take place in 10 years.
6. The need for an extra access will be dependent on the operating conditions of the Highway 14 intersections at 23 Street and 27 Street. This will need to be determined when there are more developments in the industrial park. It is expected that having an additional access (as a right-in/right-out access) near 17 Avenue will provide relief in the level of traffic demands at the Highway 14 intersections – resulting in less congested intersections on Highway 14.
7. The Highway 14 / Highway 41 intersection is currently stop-controlled for traffic on Highway 41. It is expected that further traffic control and / or geometry or lane



configuration changes may be needed as traffic volumes on Highway 14 and Highway 41 increase. The intersection operation assessment is provided in Section 3.



3. INTERSECTION ASSESSMENTS

3.1 METHODOLOGY

The methodology for the intersection assessments covered in this section is as follows:

1. **Collision Analysis** (Section 3.2)
 - a. Obtained collision records for Highway 14 through Wainwright (2019 to 2023).
 - b. Prepared collision diagrams and prepared summary tables.
2. **Traffic Counts** (Section 3.3)
 - a. Obtained 2023 Highway 14 traffic counts (100th highest hour AM and PM peak hour volumes).
 - i. At 1 Street, 9 St, 10A St, 14 Street, 18 Street, 23 Street, and 27 Street.
 - b. Supplemented with traffic counts collected in 2022:
 - i. Highway 14 at 15 Street, and Highway 41; and 13 Avenue & 27 Street.
3. **Background Traffic** (Section 3.3)
 - a. Estimated through traffic volumes on Highway 14 based on the above traffic counts.
 - b. Checked historical Highway 14 traffic volume and Wainwright population growth to identify growth factor to be applied to the background traffic volumes on Highway 14.
4. **Truck Volumes** (Section 3.4)
 - a. Examined the ATEC traffic counts in detail to determine the level of truck traffic at the key Highway 14 intersections.
5. **Traffic Forecasts** (Section 3.5)
 - a. Reviewed planning documents to obtain future population horizons in the long term.
 - b. Created traffic zones as well as future residential zones in Wainwright based on information from the planning documents.
 - c. Based on the traffic volumes gathered above, compare to the trip generation rates obtained from industrial parks elsewhere (trip generation rates from the Nisku Industrial Park and the Acheson Industrial Park were determined, trip generation rates observed from small towns in Alberta from a C-TEP study were also used).
 - d. Carried out trip generation analysis to determine short term (10 year, or 50% development of the industrial park land north of Highway 14 and west of Highway 41), and long term (20 year, or full development of the industrial park land).
 - e. Distributed future traffic volumes based on trip distribution parameters from traffic counts and between the various traffic zones (both internal and external zones).
 - f. Assigned traffic volumes for the short and long term horizons (10 year and 20 year).
6. **Design Traffic Volumes** (Section 3.5) – Short Term (10 Year) and Long Term (20 Year).
7. **Intersection Analysis** (Section 3.6) – the following analysis were carried out
 - a. ATEC Intersection Type Warrant Analysis – carried out for the 23 Avenue / Highway 41 intersection (for Long Term horizon).
 - b. Roundabout Capacity Analysis – carried out for the Highway 14 / 1 Street intersection (for Long Term horizon).
 - c. TAC Traffic Signal Warrant Analysis – carried out for Highway 14 intersections at 1 St, 10A Street, 15 Street, 18 Street, 23 Street, and Highway 41; as well as for the 23 Avenue/Highway 41 intersection.
 - d. Synchro and SimTraffic analyses were carried out for all intersections along Highway 14 and Highway 41. SimTraffic was used to double check unsignalized intersections with a poor Synchro level of service to see if the simulated intersection operation was acceptable (i.e. no long queues and vehicles clearing the intersection in a timely manner).
 - e. In carrying out the short-term intersection assessments, the key goal was to provide the minimal improvements that would result in acceptable operations.
 - f. In carrying out the long-term intersection assessments, the key goal was to determine if the improvements implemented for the short-term would still result in acceptable operations in the long-term. This will determine if further improvements would be needed beyond the short-term horizon.



3.2 COLLISION ANALYSIS

The following exhibits illustrate the collision diagrams at the key intersections on Highway 14:

Highway 14 & 1 Street	Highway 14 & 6 Street	Highway 14 & 14 Street
Highway 14 & 23 Street	Highway 14 & 27 Street	Highway 14 & Highway 41

The collision records and the larger scale collision diagrams are provided in **Appendix C**.

The tables on the following page summarize the collision statistics by location for:

- Year
- Time / Date
- Collision Type

The statistics show that almost half of all collisions occurred during weekday peak periods – indicating that intersection safety decreases when the intersections are more congested. The statistics also show that more than half of all collisions involved a left-turning vehicle (rear-end left-turning vehicles in front and left-turn cross path collisions). This shows that treatments to accommodate left turning movements will likely result in marked improvements in traffic safety.



Collision Statistics by Year and Collision Location (2019 to 2023)							
Year	Hwy 14 & 1 St	Hwy 14 & 6 St	Hwy 14 & 14 St	Hwy 14 & 23 St	Hwy 14 & 27 St	Hwy 14 & Hwy 41	Sum
2019	1	1	2	1	1	3	9
2020		1		2	1	1	5
2021	1		2		5		8
2022			1				1
2023							0
SUM	2	2	5	3	7	4	23

Collision Statistics by Weekday Peak Periods & Off Peak Periods and Collision Location (2019 to 2023)								
Day/ Time of Collision=	Hwy 14 & 1 St	Hwy 14 & 6 St	Hwy 14 & 14 St	Hwy 14 & 23 St	Hwy 14 & 27 St	Hwy 14 & Hwy 41	Sum	
Weekday, Peak Periods	2		3	2	2	2	11	48%
Weekend, Weekday Off Peaks		2	2	1	5	2	12	52%
SUM	2	2	5	3	7	4	23	100%
Related to SNOW/ Icy Road		1	4	1	1		7	30%
Injury Collisions			1	1	3	1	6	26%
Animal			1				1	4%
Driver Sleepy						1	1	4%

Collision Statistics by Collision Type and Collision Location (2019 to 2023)								
Pre-Crash Manoeuvre	Hwy 14 & 1 St	Hwy 14 & 6 St	Hwy 14 & 14 St	Hwy 14 & 23 St	Hwy 14 & 27 St	Hwy 14 & Hwy 41	Sum	
Rear-end Collision	1		3		1	1	6	26%
Rear-end Left-Turning Vehicle In Front	1	1		2	1	2	7	31%
Left Turn Cross Path		1			4		5	22%
Side Swipe (Left turn side swipe vehicle to the right)				1			1	4%
Run Off Road			1		1	1	3	13%
Right-Angle Collision			1				1	4%
SUM	2	2	5	3	7	4	23	100%



3.3 TRAFFIC COUNTS

2022 and 2023 traffic counts from the *ATEC website* and 2022 Town traffic count collection are provided in **Appendix D**.

The exhibit below shows the raw 2022 / 2023 traffic counts at key intersections on Highway 14. A larger scale exhibit is provided in **Appendix D**.

TEC Traffic Counts - 2023 AM 100th Highest Hour Estimates (10a St, 15 St & Hwy 41 are 2022 data)																																											
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2023 PM 100th Highest Hour Estimates (10a St, 15 St & Hwy 41 are 2022 data)</th></tr> <tr><td><div><div><div>0</div><div>14</div><div>10</div><div>↕</div><div>0</div><div>↗</div><div>71</div><div>↙</div><div>34</div><div>↕</div><div>51</div><div>34</div><div>233</div><div>Hwy 14 & 1 St</div><div>V₁₀₀ - PM</div><div>14</div><div>104</div><div>61</div></div></div><div><div><div>6</div><div>6</div><div>4</div><div>↕</div><div>13</div><div>↗</div><div>342</div><div>↙</div><div>20</div><div>↕</div><div>11</div><div>5</div><div>11</div><div>Hwy 14 & 10a St</div><div>V₁₀₀ - PM</div><div>0</div><div>258</div><div>4</div></div></div><div><div><div>11</div><div>31</div><div>27</div><div>↕</div><div>27</div><div>↗</div><div>317</div><div>↙</div><div>65</div><div>↕</div><div>57</div><div>50</div><div>229</div><div>Hwy 14 & 14 St</div><div>V₁₀₀ - PM</div><div>19</div><div>217</div><div>149</div></div></div><div><div><div></div><div></div><div></div><div>↕</div><div></div><div>↗</div><div></div><div>↙</div><div></div><div>↕</div><div>7</div><div>15</div><div>Hwy 14 & 15 St</div><div>V₁₀₀ - 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PM</div><div>3</div><div>137</div><div>10</div></div></div><tr><td>2023 Raw Data</td><td>Σ 626</td><td>2022 Raw Data</td><td>Σ 680</td><td>2023 Raw Data</td><td>Σ 1199</td><td>2022 Raw Data</td><td>Σ 992</td><td>2023 Raw Data</td><td>Σ 1098</td><td>2023 Raw Data</td><td>Σ 1087</td><td>2023 Raw Data</td><td>Σ 1298</td><td>2022 Raw Data</td><td>Σ 560</td></tr></td></tr>	2023 Raw Data	Σ 614	2022 Raw Data	Σ 677	2023 Raw Data	Σ 1198	2022 Raw Data	Σ 983	2023 Raw Data	Σ 1093	2023 Raw Data	Σ 1090	2023 Raw Data	Σ 1300	2022 Raw Data	Σ 574	TEC Traffic Counts - 2023 PM 100th Highest Hour Estimates (10a St, 15 St & Hwy 41 are 2022 data)										<div><div><div>0</div><div>14</div><div>10</div><div>↕</div><div>0</div><div>↗</div><div>71</div><div>↙</div><div>34</div><div>↕</div><div>51</div><div>34</div><div>233</div><div>Hwy 14 & 1 St</div><div>V₁₀₀ - PM</div><div>14</div><div>104</div><div>61</div></div></div> <div><div><div>6</div><div>6</div><div>4</div><div>↕</div><div>13</div><div>↗</div><div>342</div><div>↙</div><div>20</div><div>↕</div><div>11</div><div>5</div><div>11</div><div>Hwy 14 & 10a St</div><div>V₁₀₀ - 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3.4 TRUCK VOLUMES

The exhibit below shows the peak hour truck volumes and percentage truck volumes at the various Highway 14 intersections. A larger scale exhibit is provided in **Appendix D**.

TEC Traffic Counts - 2023 AM 100th Highest Hour - Tractor Trailer Volumes (10a St, 15 St & Hwy 41 are 2022 data)											
1 St to 18 St				23 St to 27 St							
Total SB 1 0 Total NB				Total SB 10 5 Total NB							
				23 St				27 St			
				5 SB NB 0				5 SB NB 5			
1 St to 27 St											
Total SB 11				5 Total NB							
2023 Data	2022 Data		2023 Data Total SB 0		2022 Data		2023 Data 5 Total NB		2023 Data		2022 Data
1 St to 27 St											
TEC Traffic Counts - 2023 PM 100th Highest Hour - Tractor Trailer Volumes (10a St, 15 St & Hwy 41 are 2022 data)											
1 St to 18 St				23 St to 27 St							
Total SB 0 0 Total NB				Total SB 0 8 Total NB							
				23 St				27 St			
				0 SB NB 4				0 SB NB 4			
1 St to 27 St											
Total SB 0				8 Total NB							
2023 Data	2022 Data		2023 Data Total SB 7		2022 Data		2023 Data 8 Total NB		2023 Data		2022 Data
1 St to 27 St											

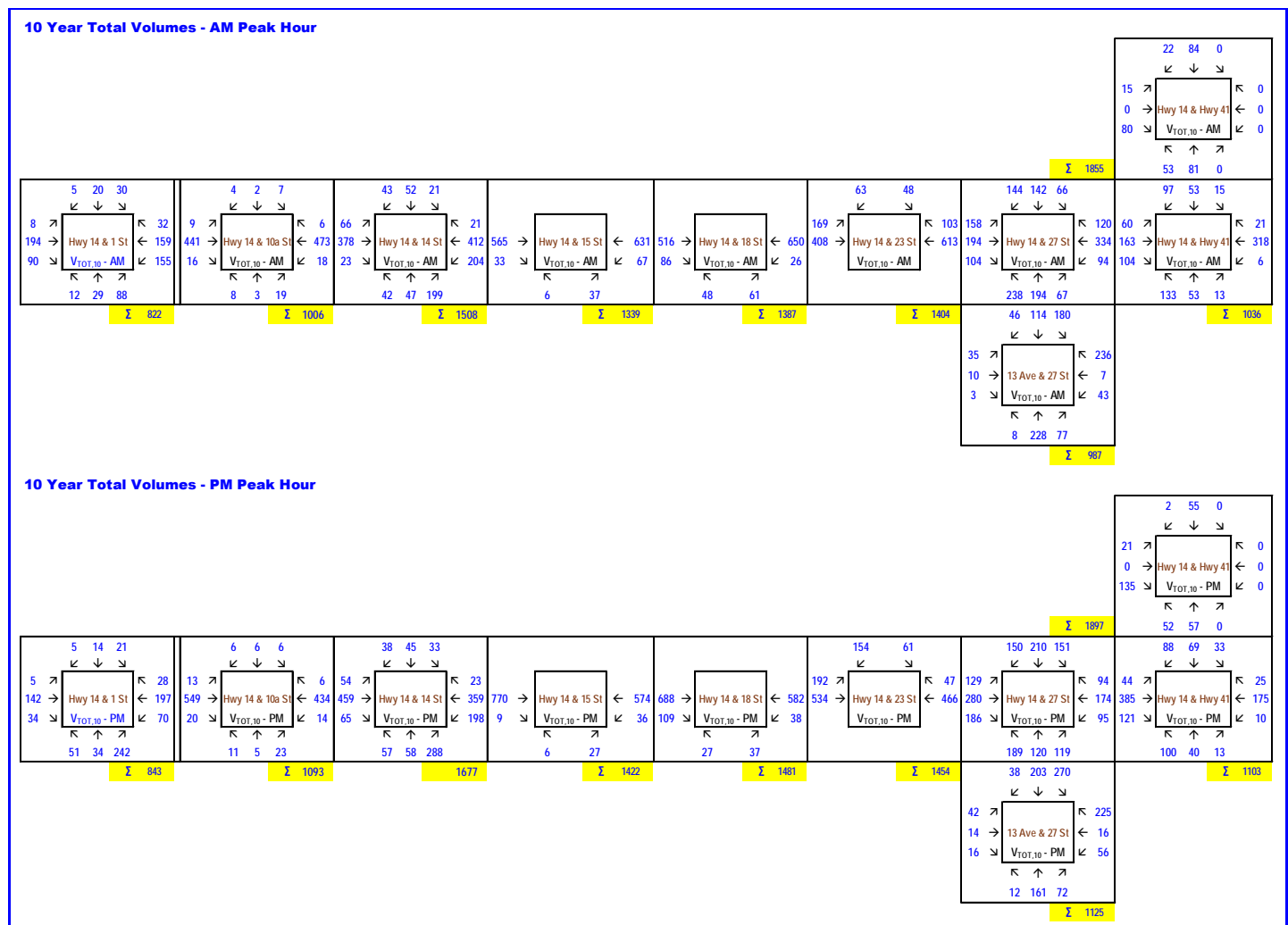


3.5 TRAFFIC FORECASTS

The following exhibits show the 10-Year and 20-Year total Traffic volumes at the various Highway 14 intersections. Larger scale exhibits as well as for the background Traffic and development traffic in 10 Years and 20 Years are provided in **Appendix E**. Note that traffic volume adjustments were made to reflect the following changes at the 18 Street and 23 Street intersections:

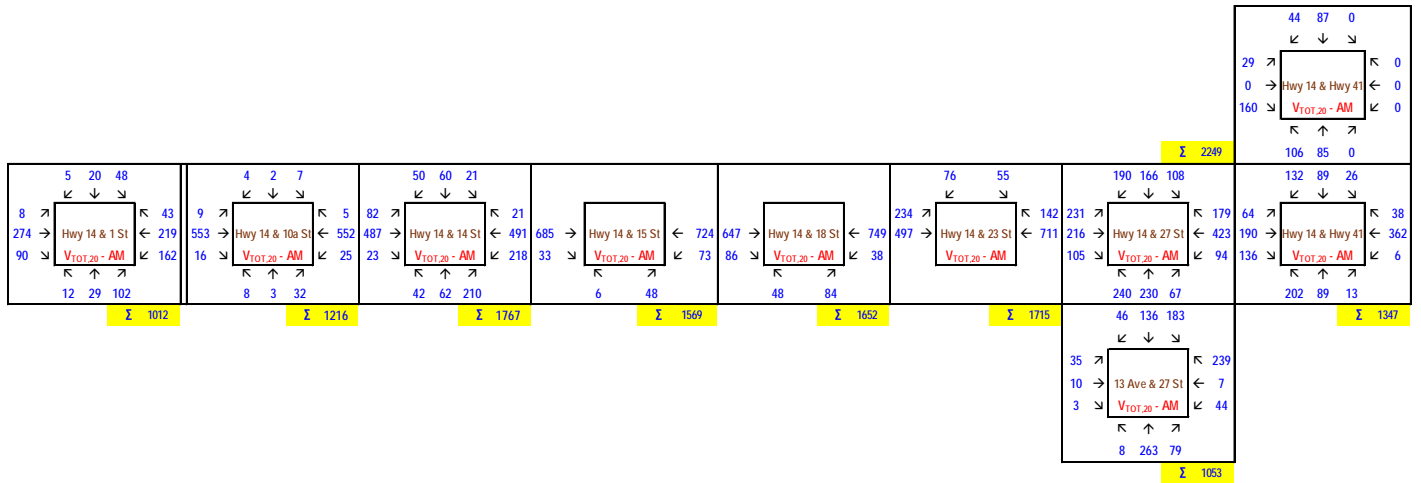
- At 18 Street, the connection to the North Service Road would be closed.
- At 23 Street, the connection to the South Service Road would be closed.

Traffic volumes using the closed connections were re-assigned to use the adjacent Highway 14 intersections.

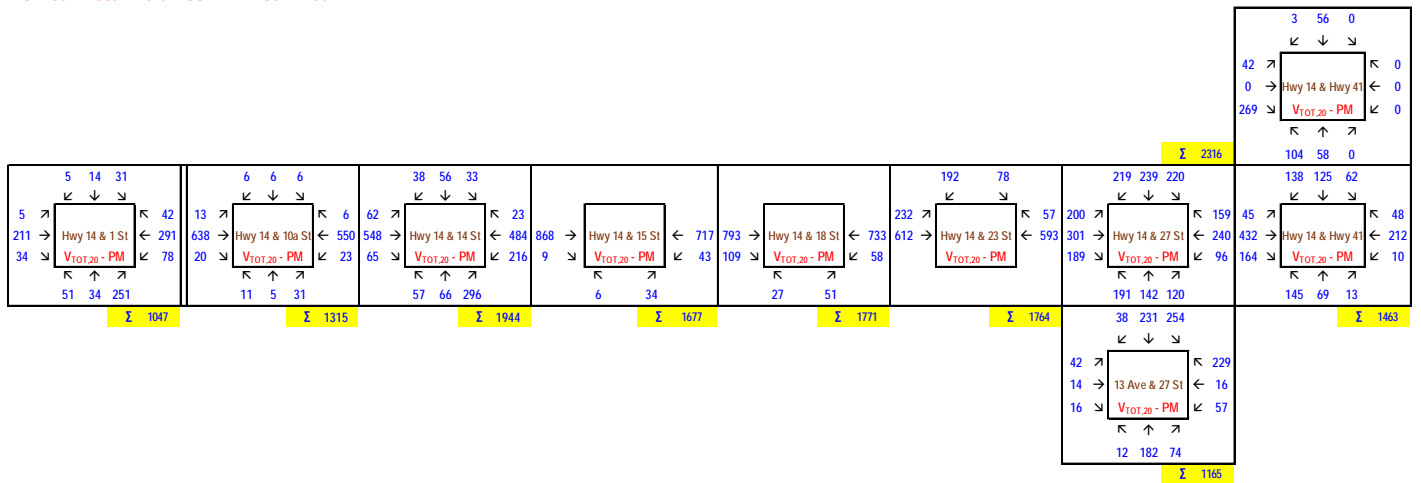




20 Year Total Volumes - AM Peak Hour



20 Year Total Volumes - PM Peak Hour

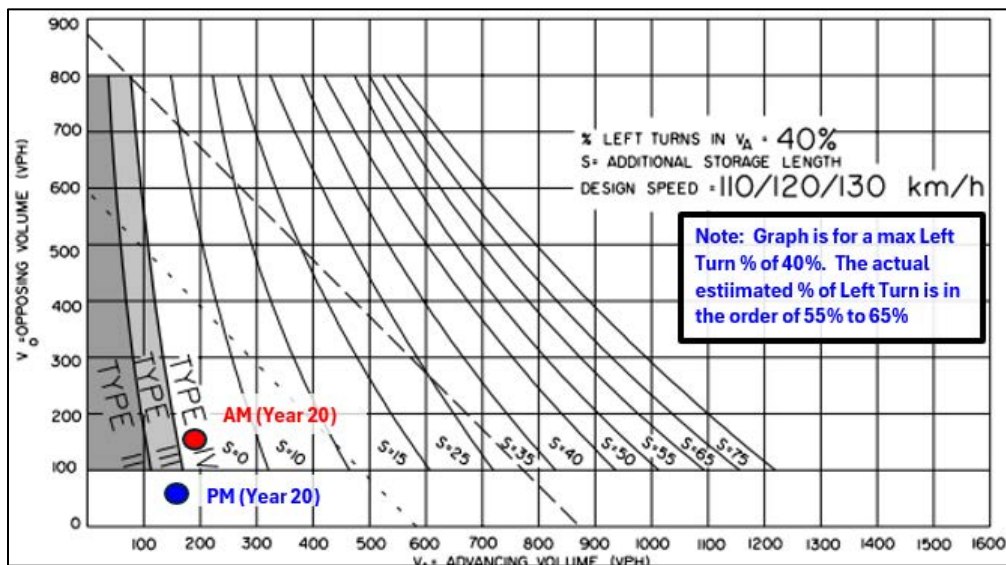




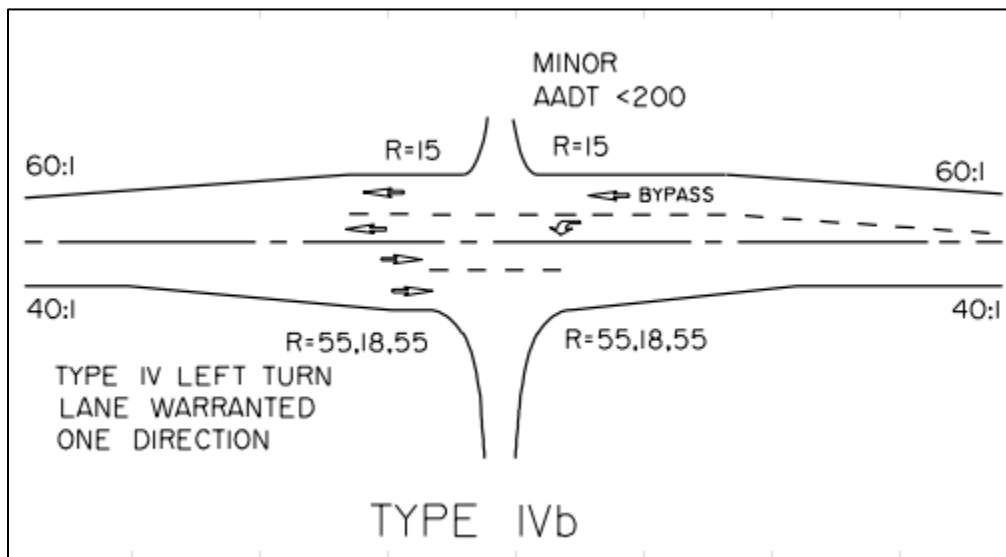
3.6 INTERSECTION ANALYSIS

3.6.1 INTERSECTION TYPE WARRANT

The *ATEC procedures* for checking warrants for intersection types for 2-lane highway intersections were carried out for the 20-Year horizon AM and PM volumes at the 23 Avenue & Highway 41 intersection. The resulting warrant charts are as follows:



The warrant analysis shows that a Type IV intersection is needed at the 23 Avenue & Highway 41 intersection. A typical Type IVb intersection suitable for the intersection is as follows:





3.6.2 TRAFFIC SIGNAL WARRANT

The following table summarizes the results of the *Transportation Association of Canada (TAC)* traffic signal warrant analysis carried out for the various key intersections for the existing horizon (2023 data), 10-Year horizon, and 20-Year horizon. The traffic signal warrant results are provided in **Appendix F**.

Traffic Signal Warrants			
Traffic Volumes	Hwy 14/1 St	Hwy 14/18 St	Hwy 14/23 St
2023 Counts	22 pts	21 pts	39 pts
10 Year	39 pts	44 pts	69 pts
20 Year	123 pts	56 pts	108 pts

The above traffic signal warrant analysis results indicate that a traffic signal is needed at 1 Street and 23 Street in the long-term (20-Year). However, the traffic signal warrant analysis is misleading due to the following factors:

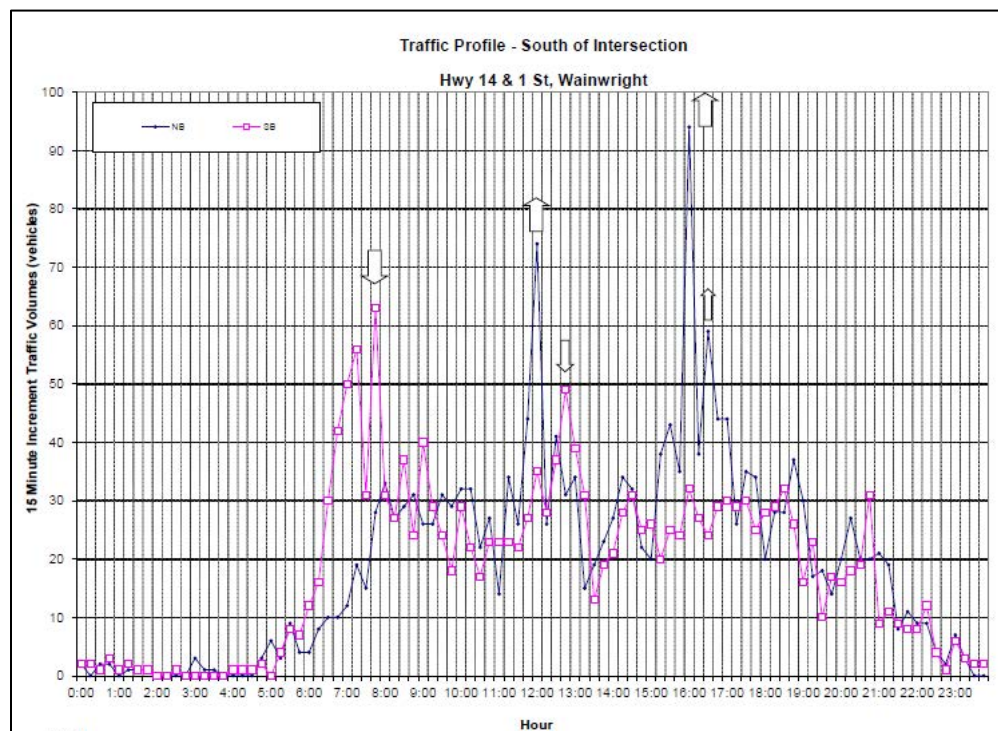
23 Street

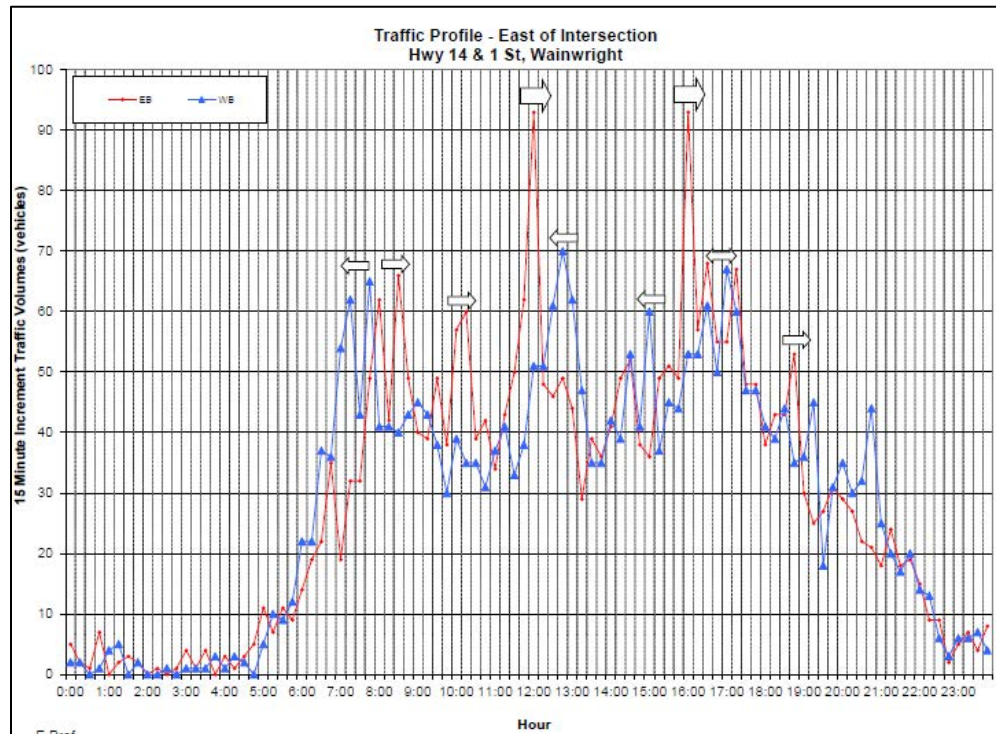
- Heavy trucks using the intersection will experience considerably high levels of delay due to the gap acceptance characteristics of trucks.

1 Street

- The traffic peaks sharply routinely at 1 Street, primarily due to the activities at CFB Wainwright
- Convoys regularly pass through the intersection resulting in considerable delays at the intersection.
- Delays and queues anticipated to be substantially longer during the Wainwright Stampede event.

The following traffic profiles show the peaks of the approach traffic at the east leg and south leg of the intersection:





3.6.3 ROUNDABOUT CAPACITY ANALYSIS

The *Highway Capacity Software (HCS)* was used to assess how the Highway 14 / 1 Street intersection would operate if a roundabout was constructed. Based on the result of a single-lane roundabout layout, the results of the roundabout operation at Year 20 are as follows. The HCS roundabout capacity analysis results are provided in **Appendix G**.

Roundabout Analysis (HCS) - for Highway 14 & 1 Street		
		Highway 14/1 St (EB/WB/NB/SB LOS)
20 Year Volumes	AM	B / A / A / A
	PM	A / A / B / A
20 Year Volumes + 20%	AM	C / B / A / A
	PM	A / B / C / A

The HCS analysis shows that a single lane roundabout would operate adequately in Year 20. Therefore, it can be concluded that a roundabout can be a viable solution to accommodate long term traffic growth. The following exhibit illustrates how a roundabout layout would look like at the Highway 14 & 1 Street intersection. The exhibit shows that the roundabout option would require considerable right-of-way. In addition, it will affect the access to the properties at the northeast and southeast quadrant considerably. The roundabout shown would have an inscribed circle diameter of approximately 55m, with a 7m truck apron and a 7m circulatory roadway. Such dimensions are needed as Highway 14 is a high load corridor and ATEC requires that a roundabout on a high load corridor has the ability to be upgraded to a 2-lane roundabout. A similar roundabout in Leduc County (at Highway 19 and Highway 60) costed approximately \$5 to \$6 million.



3.6.4 INTERSECTION CAPACITY ANALYSIS

Synchro analysis was carried out for the following intersections:

- Highway 14 & 1 Street (existing – as unsignalized intersection, 10-Year and beyond – as signalized intersection)
- Highway 14 & 10A Street (as unsignalized intersection)
- Highway 14 & 14 Street (as signalized intersection)
- Highway 14 & 15 Street (as unsignalized intersection)
- Highway 14 & 18 Street (as unsignalized intersection)
- Highway 14 & 23 Street (existing – as unsignalized intersection, 10-Year and beyond – as signalized intersection)
- Highway 14 & 27 Street (as signalized intersection)
- Highway 14 & Highway 41 (existing and 10-Year – as unsignalized intersection, 20-Year – as signalized intersection)
- 13 Avenue & 27 Street (as both unsignalized intersection and signalized intersection)
- 23 Avenue & Highway 41 (as unsignalized intersection)

Refer to the intersection lane configuration shown in **Exhibits 5.1.a to 5.1.10**, as well as **Exhibit 5.3.3**. (see **Appendix H**)

The Synchro run results were carried out based on the following intersection geometry and traffic control. These intersection geometries and traffic controls were determined by trying various layout and control combinations until the design with the optimal operations was determined.

- 1) Highway 14 & 1 Street
 - a. With signalization and the intersection lane configuration changes (with some widening), the intersection will operate adequately by Year 20
 - b. With left- and right-turn channelization on Highway 14
- 2) Highway 14 & 10A Street
 - a. The intersection will operate adequately without traffic signals
 - b. Highway 14 with TWLTL at the 10A Street intersection



- 3) Highway 14 & 14 Street
 - a. With the signal phasing and intersection lane configuration changes, the intersection will operate adequately by Year 20
 - b. With left- and right-turn channelization on Highway 14
- 4) Highway 14 & 15 Street
 - a. The intersection will operate adequately without traffic signals
 - b. Highway 14 with TWLTL at the 15 Street intersection
- 5) Highway 14 & 18 Street
 - a. Although Synchro runs showed failed operations in Year 20, traffic simulation runs demonstrated that the intersection will operate adequately without traffic signals in Year 20
 - b. With north leg of 18 Street closed
 - c. With left-turn channelization at 18 Street
- 6) Highway 14 & 23 Street
 - a. With signalization, the intersection will have acceptable operation by Year 20.
 - b. With south leg of 23 Street closed
 - c. With left- and right-turn channelization on Highway 14
- 7) Highway 14 & 27 Street
 - a. With signal phasing changes, the intersection will have acceptable operations. – (1) left-turn phases for all 4 directions, (2) right-turn signal for eastbound right turn movement on Highway 14
 - b. In Year 20, with traffic signal at 13 Avenue & 27 Street
- 8) Highway 14 & Highway 41
 - a. Convert from 2-way stop to 4-way stop in Year 10.
 - b. Install traffic signal by Year 20, with left-turn channelization on all 4 legs
- 9) 13 Avenue & 27 Street
 - a. In Year 20, install traffic signal
- 10) 23 Avenue & Highway 41
 - a. The intersection will operate adequately without traffic signals

The results of the Synchro analysis are summarized below. Synchro run results and LOS tables are provided in **Appendix I**.

		Hwy 14/1 St	Hwy 14/10A St	Hwy 14/14 St	Hwy 14/15 St	Hwy 14/18 St	Hwy 14/23 St	Hwy 14/27 St	13 Ave/27 St	Hwy 14/Hwy 41	23 Ave/Hwy 41
Synchro Analysis - 2023 Counts											
Synchro - Unsignalized	AM	C/D	C/B		D/B	D/B	E/B		B/E/C/B	B/C/C/B	n/a
	PM	C/C	C/B		C/C	D/B	E/B		B/E/C/C	B/D/C/B	n/a
Synchro - Signalized	AM			B/B/D/D				C/C/C/D			
	PM			D/C/C/B				C/C/C/D			
Synchro Analysis - 2023 Counts + Add 20% Volumes											
Synchro - Unsignalized	AM	C/D	C/B		B	D	E		C/B	A/A/C/B	n/a
	PM	D/C	C/C		C	E	F		E/D	A/A/C/B	n/a
Synchro - Signalized	AM			B/B/D/D				C/C/C/D			
	PM			D/C/C/B				C/C/C/D			
Synchro Analysis - 2033 (10 Year)											
Synchro - Unsignalized	AM		B/B		C/C	D/B			D/B	C/D/C/B	A/A
	PM		B/B		C/C	E/C			F/C	E/C/C/B	A/A
Synchro - Signalized	AM	B/A/B/B		B/B/D/D			A/B/D	C/C/C/D			
	PM	B/A/B/B		C/C/C/C			A/B/D	C/C/C/D			
Synchro Analysis - 2043 (20 Year)											
Synchro - Unsignalized	AM		C/C		C/C	E/C			D/D		B/B
	PM		C/C		C/D	F/C			F/F		B/B
Synchro - Signalized	AM	B/A/B/C		C/C/C/C			C/B/D	C/C/D/D		B/C/C/D	
	PM	B/A/B/B		C/C/C/D			A/B/D	C/C/D/D		B/C/C/D	



4. ACCESS MANAGEMENT ASSESSMENTS (HIGHWAY 14 FROM 1 STREET TO HIGHWAY 41)

4.1 DESIGN VEHICLES

In evaluating the accesses and intersection operations, the Vehicle Tracking program was used with the following design vehicles:

- **WB-21: Tractor Semi-Trailers**
 - o for all key intersections where highway trucks are expected
- **I-BUS: Intercity Buses or Coach Buses**
 - o for minor intersections or accesses where highway trucks volumes are either not expected or very low.

4.2 ACCESS TREATMENT OPTIONS

There are a number of access treatment options that were considered at various locations along Highway 14. Depending on the location and site context, one of the following access treatment options would be deemed the most appropriate option for that particular access location.

1. Do-Nothing Option (i.e. Existing intersection layout and access treatment)
2. Access Modification (e.g. convert to right-in/right-out)
3. Access Consolidation (merge two accesses into one, or joint access)
4. Access Relocation / Alternative Access (Move access location)
5. Access Closure

4.3 CORRIDOR ACCESS MANAGEMENT OPTIONS

A number of access management options were considered for the Highway 14 corridor.

1. Do-Nothing Option / Existing Condition / Traditional Access Management Measures – Raised or Painted Median
2. Two-Way-Left-Turn-Lane Option
3. Service Road Option

4.3.1 DO-NOTHING / EXISTING CONDITIONS / TRADITIONAL ACCESS MANAGEMENT MEASURES – RAISED OR PAINTED MEDIAN

These measures include:

- Centre median limiting all-directional accesses in mid-blocks
- Full left- and right-turn channelization
- Potential closure of accesses or conversion to right-in/right-out access if effective access management cannot be achieved
- Often combined with access modification, access consolidation, and access relocation

4.3.2 TWO-WAY-LEFT-TURN LANE OPTION (TWLTL)

For corridors with multiple accesses and intersections, TWLTL is often an effective option to improve traffic safety and operational efficiency along a 2-lane corridor.

The following two tables (Table 8.1.2 and 8.1.3) were copied from Chapter 8, Access, of the *TAC Geometric Design Guide for Canadian Roads*. The tables show that TWLTL has a measurable advantage over an undivided road on the reduction in collision rates by total access points per kilometre (Table 8.1.2) and by ADT (average daily traffic volumes).



Table 8.1.2: Effect of Median Type on Collision Rates by Number of Access Points

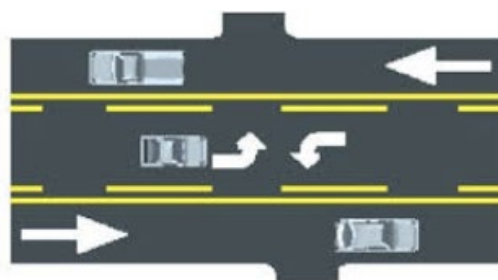
Total Access Points Per Kilometre ^A	Collisions Per Million Vehicle Kilometres Per Year		
	Undivided	Two-Way Left Turn Lane	Raised Median
≤ 12	2.4	2.1	1.8
12 - 24	4.5	3.7	3.2
24 - 37	5.8	4.9	4.2
> 37	6.6	5.7	5.1
All	5.6	4.3	3.5

A: Includes both signalized and un-signalized access points

Table 8.1.3: Effect of Median Type on Collision Rates by ADT

ADT	Collisions Per Kilometre Per Year		
	Undivided	Two-Way Left Turn Lane	Raised Median
10,000	30	24	20
20,000	78	37	34
30,000	118	57	48
40,000	157	70	53

The most common type of TWLTL are 3-lane and 5-lane TWLTLs. For Highway 14 through Wainwright, the 3-lane TWLTL is the candidate for access management improvements. The typical layout of a 3-lane TWLTL is as follows:



The crash modification factor (CMF) vs access points per km for TWLTLs is illustrated in Figure 8.6.2 in the TAC document:

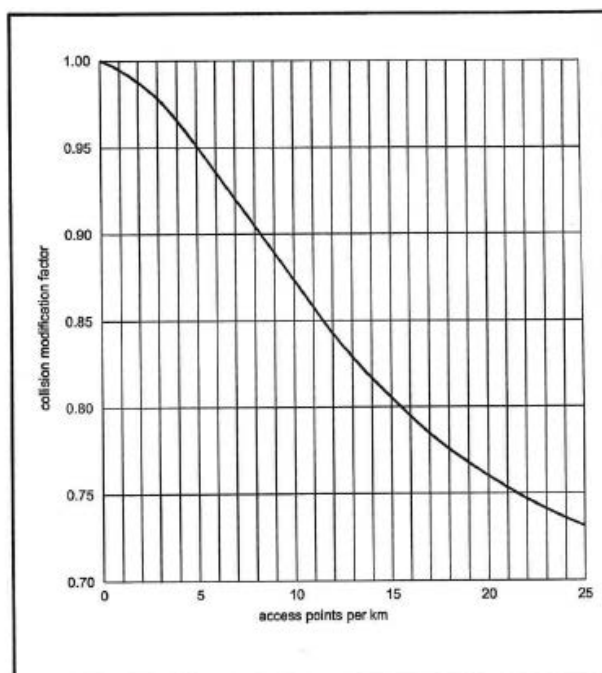


Figure 8.6.2: Collision Modification Factor vs. Access Points per km for TWLTLs



4.3.3 SERVICE ROAD OPTION

Figure 8.7.3 and 8.7.5 of the *TAC Geometric Design Guide For Canadian Roads* illustrate the concept of service road for crossroads with ≤ 200 vpd and > 5000 vpd.

The biggest challenges of the service road concept are right-of-way requirements and operational problems at service road intersections with cross streets. Along Highway 14, the following cross-streets currently have less than 2000 vpd traffic volumes – 10A Street (510 vpd), north leg of 14 Street (1,730 vpd), and 15 Street (810 vpd). For these level of cross street traffic volumes, a 24m outer separation will be needed. However, if the service road intersection is required to accommodate WB-21 design vehicle without taking up the entire pavement area of the service road approach, wider outer separation of at least 30m will be needed.

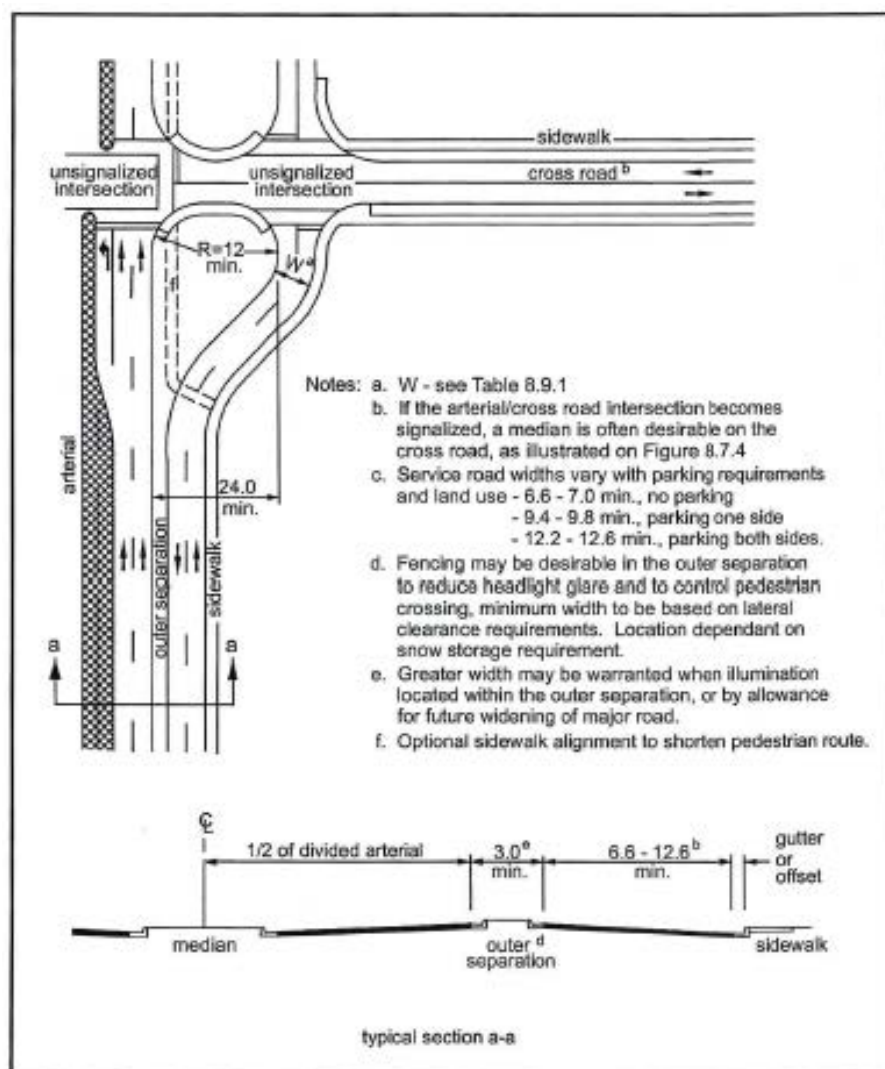


Figure 8.7.3: Two-Way Service Road / Cross Road Intersection Treatment, Cross Road Volumes ≤ 2000 veh/d, Unsignalized Intersection

For cross-streets that currently have more than 5000 vpd traffic volumes, a traffic signal may be needed at the crossroad / service road intersection. In these cases, much larger outer separation will



be needed. The dimension shown in the exhibit above is 45m minimum. However, depending on the required turn bay storage length, longer separation may be needed.

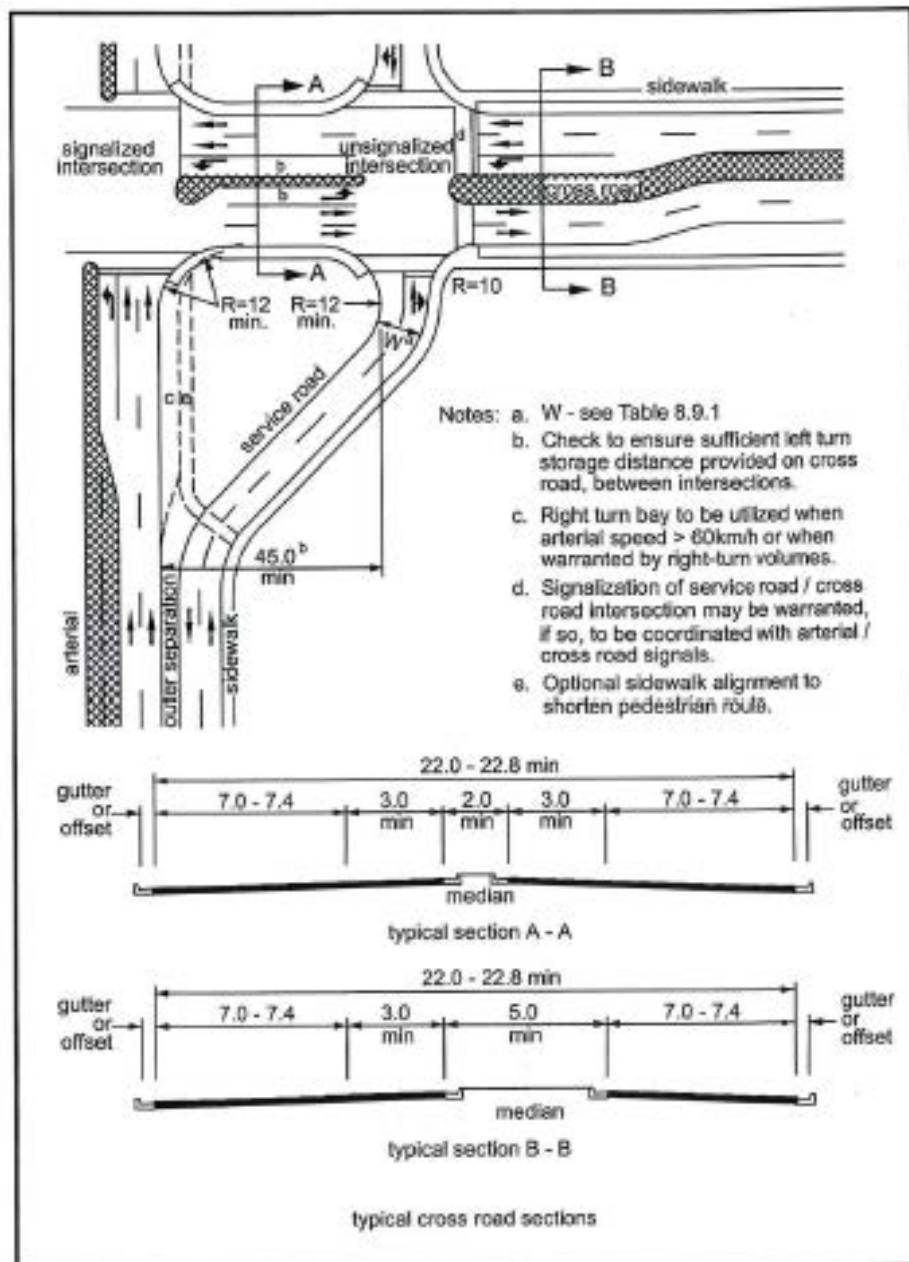


Figure 8.7.5: Two-Way Service Road / Cross Road Intersection Treatment, Cross Road Volumes > 5000 veh/d, Signalized Intersection

The following two exhibits show a potential service road option along 2 segments of the Highway 14 corridor through Wainwright.

Segment 1 - Between Esso Access and 9 Street

The exhibit shows that the service road concept will have considerable impacts on the sites south of Highway 14 at the bulbing at both ends – at the Esso site and at Wallace Park.



Segment 2 - Between 10A Street and 14 Street

This option is essentially a shared access / access consolidation option. The design seems constrained and the resulting outer separation is very narrow – probably cannot accommodate an I-BUS design vehicle.



The service road option is ruled out due to its large right-of-way requirements. Further work was done to explore the viability of the TWLTL concept in the next section.



4.4 DETAILED ASSESSMENT OF THE TWLTL OPTION

Multiple swept path analyses were carried out at both the existing 2-lane undivided Highway 14 option and the 3-lane TWLTL option. The 2-lane undivided highway has wider shoulders while the 3-lane TWLTL option has a 1.5m shoulder.

The detailed swept path analysis results are provided in **Appendix J**. The table below summarizes the result of the swept path analysis, showing which design vehicle can be accommodated at the various accesses and intersections. The swept path analysis also help identify the intersection widening needed to accommodate the swept paths of the design vehicles.

Intersection / Access	Existing		TWLTL / Future	
	WB-21	I-BUS	WB-21	I-BUS
Access 1 - 1 St	WB-21		WB-21	
Access 2 - Trail Contracting		I-BUS		I-BUS
Access 3 - 2 St	WB-21		WB-21	
Access 4 - Petroleum Park		I-BUS		I-BUS
Access 5 - ESSO	WB-21	I-BUS	WB-21	I-BUS
Access 6 - 6 St		I-BUS		I-BUS
Access 7 - Bison Motel	? WB-21		? WB-21	
Access 8 - Boston Pizza, Subway		I-BUS		I-BUS
Access 9 - MD of Wainwright		I-BUS		I-BUS
Access 10 - 9 St		I-BUS		I-BUS
Access 11 - KFC		I-BUS		I-BUS
Access 12 - 10A St	WB-21	I-BUS	WB-21	I-BUS
Access 13, 14 - Esthetic Studio / Pizza		? I-BUS		? I-BUS
Access 15, 16 - Esthetic Studio, Jeb's Joint		? I-BUS		? I-BUS
Access 17, 18 - Fas Gas / Vacant Lot (SWC)	WB-21		WB-21	
Access 19 - 14 St	WB-21		WB-21	
Access 20 - 15 St		I-BUS		I-BUS
Access 21 - EMCO Yard	WB-21		WB-21	
Access 22 - Seed Cleaning Plant	WB-21		WB-21	
Access 24 - 18 St	WB-21		WB-21	
Access 26 - 23 St	WB-21		WB-21	
Access 27 - 27 St (including 13 Ave/27 St)	WB-21		WB-21	
Access 28 - Hwy 14 & Hwy 41	WB-21		WB-21	
23 Ave & 23 St	n/a		WB-21	
23 Ave & Hwy 41	n/a		WB-21	
19 Ave & Hwy 41	n/a		WB-21	

A detailed discussion on the design vehicle swept path check are provided below and bigger scale tables are included in **Appendix J**.

For each access or intersection the results of swept path check for the existing intersection layout are presented for either the WB-21 or the I-BUS design vehicles. Remarks are provided outlining why swept paths presented work or do not work. Based on this assessment, the design vehicle at each access or intersection are identified.

Similar swept path assessments were performed for the same accesses and intersections based on a TWLTL layout on Highway 14. Again, detailed remarks are provided outlining why the swept paths presented work or do not work. In addition, comments are provided on the potential widening needed so that the design vehicle swept paths can be accommodated.

**Design Vehicle Swept Path Check - Accesses / Intersections along Highway 14 through Wainwright**

Site	Access / Intersection	Design Veh - Existing		Remarks	Design Veh - TWLTL		Remarks
		IN	OUT		IN	OUT	
1	1 St (N&S)	WB-21	WB-21	Exhibit EX 1.1, 1.2, 1.3 - The following location is tight for WB-21 Design Vehicle: Exh EX 1.1 - N Leg too narrow, need to widen N Leg; Exh EX 1.3 - May need to widen NEC.	WB-21	WB-21	Exhibit TWLTL 1.1, 1.2, 1.3 - The following location is tight for WB-21 Design Vehicle: Exh TWLTL 1.1 - N Leg too narrow, need to widen N Leg; Exh TWLTL 1.2 - May need Stopboxes; Exh TWLTL 1.3 - May need to widen NEC.
2	Access (s) to Trail General Contracting	I-BUS	I-BUS	Exhibit EX 2.1, 2.2 - Access can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 2.1, 2.2 - Access can accommodate I-BUS Design Vehicle
3	2 St (N)	WB-21	WB-21	Exhibit EX 3.1, 3.2 - The following location is tight for WB-21 Design Vehicle: Exh EX 3.1 - tight for concurrent EBLT/SBRT, may need to widen NEC; Exh EX 3.2 - tight for concurrent WBRT/SBLT; may need to widen NEC.	WB-21	WB-21	Exhibit TWLTL 2.1, 2.2 - The following location is tight for WB-21 Design Vehicle: Exh TWLTL 3.1 - tight for concurrent EBLT/SBRT, may need to widen NWC; Exh TWLTL 3.2 - tight for concurrent WBRT/SBLT; may need to widen NEC.
4	Access (S) to Petroleum Park	I-BUS	I-BUS	Exhibit EX 4.1, 4.2 - Access can accommodate I-BUS Design Vehicle. Some overlaps in opposing swept paths within the site - acceptable as occurrences expected to be infrequent.	I-BUS	I-BUS	Exhibit TWLTL 4.1, 4.2 - Access can accommodate I-BUS Design Vehicle. Some overlaps in opposing swept paths within the site - acceptable as occurrences expected to be infrequent.
5	Access (S) to ESSO	WB-21	WB-21 (RT out to Hwy 14 via Site E Access @14 St)	Exhibit EX 5.1, 5.2 - Access can accommodate WB-21 Design Vehicle, except for NBRT exiting the site at an acute angle - too tight even for I-BUS. I-BUS making this exiting movement would need to take up a large part of the site access to make the wide turn	WB-21	WB-21 (RT out to Hwy 14 via Site E Access @14 St)	Exhibit TWLTL 5.1, 5.2 - Access can accommodate WB-21 Design Vehicle, except for NBRT exiting the site at an acute angle - too tight even for I-BUS. I-BUS making this exiting movement would need to take up a large part of the site access to make the wide turn



Design Vehicle Swept Path Check - Accesses / Intersections along Highway 14 through Wainwright

Site	Access / Intersection	Design Veh - Existing		Remarks	Design Veh - TWLTL		Remarks
		IN	OUT		IN	OUT	
6	6 St (S)	I-BUS	I-BUS	Exhibit EX 6.1, 6.2, 6.3 - Intersection can accommodate I-BUS Design Vehicle. WB-21 can enter ESSO (at SWC) from the east via 6 St (EBLT, Zig-Zag) and exit ESSO to the east also via 6 St (NBRT, Zig-Zag)	I-BUS	I-BUS	Exhibit TWLTL 6.1, 6.3 - Intersection can accommodate I-BUS Design Vehicle. WB-21 can enter ESSO (at SWC) from the east via 6 St (EBLT, Zig-Zag) and exit ESSO to the east also via 6 St (NBRT, Zig-Zag)
7	Access to Bison Motel	I-BUS	I-BUS	Did not prepare exhibit or swept path check (Should consider narrowing down site access which currently consists of a 24m west access and a 15m east access. Desirable to narrow down the west access to around 12m. Closure of the east access should be considered.	I-BUS	I-BUS	Did not prepare exhibit or swept path check (Should consider narrowing down site access which currently consists of a 24m west access and a 15m east access. Desirable to narrow down the west access to around 12m. Closure of the east access should be considered.
8	Access (S) to Boston Pizza / Subway	I-BUS	I-BUS	Exhibit EX 8.1, 8.2 - Access can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 8.1, 8.2 - Access can accommodate I-BUS Design Vehicle
9	Access (S) to MD of Wainwright	I-BUS	I-BUS	Exhibit EX 9.1, 9.2 - Access can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 9.1, 9.2 - Access can accommodate I-BUS Design Vehicle
10	9 St (N)	I-BUS	I-BUS	Exhibit EX 10.1, 10.2 - Intersection can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 10.1, 10.2 - Intersection can accommodate I-BUS Design Vehicle
11	Access (N) to KFC	I-BUS	I-BUS	Exhibit EX 11.1, 11.2 - Access can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 11.1, 11.2 - Access can accommodate I-BUS Design Vehicle
12	10a St (N/S)	I-BUS	I-BUS	Exhibit EX 12.4, 12.5, 12.6 - Intersection can accommodate I-BUS Design Vehicle. Exhibit EX 12.1, 12.2, 12.3 - need to increase corner radii (all 4 corners) if want to accommodate WB-21, or WB-21 will need to make wide right turns, taking up most of 10a St	I-BUS	I-BUS	Exhibit TWLTL 12.4, 12.5, 12.6 - Intersection can accommodate I-BUS Design Vehicle. Exhibit TWLTL 12.1, 12.2, 12.3 - need to increase corner radii (all 4 corners) if want to accommodate WB-21, or WB-21 will need to make wide right turns, taking up most of 10a St

**Design Vehicle Swept Path Check - Accesses / Intersections along Highway 14 through Wainwright**

Site	Access / Intersection	Design Veh - Existing		Remarks	Design Veh - TWLTL		Remarks
		IN	OUT		IN	OUT	
13	Access (S) to Royal Pizza / Domino	I-BUS	I-BUS	Did not prepare exhibit or swept path check	I-BUS	I-BUS	Did not prepare exhibit or swept path check
14	West Access (N) to Esthetics	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check (Consider closing either West or East Access)	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check (Consider closing either West or East Access)
15	East Access (N) to Esthetics	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check (Consider closing either West or East Access)	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check (Consider closing either West or East Access)
16	Access (S) to Jebb's Joint	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check
17	Access (S) to Husky Vacant Site (Right-In/Right-Out Proposed)	WB-21 (via Hwy 14 or 14 St)	WB-21 (via 14 St)	Exhibit EX 17.1 - WB-21 can access Site from Hwy 14 West either through the North Access (zig-zag) or the East Access (U-Turn from Hwy 14, via 14 St). Can exit from Site to Hwy 14 by making a right turn from the North Access, or via the East Access on 14 St and then left or right at 14 St	n/a	n/a	n/a
18	Access (N) to Fas Gas Plus (Right-In/Right-Out Proposed)	WB-21	WB-21	Exhibit EX 18.1, 18.2 - Exhibit 18.1 - WB-21 can exit FAS GAS to Hwy 14 West through the South Access. Exhibit EX 18.2 - WB-21 can enter FAS GAS from Hwy 14 E either through the South Access (U-Turn) or the East Access (Zig-Zag from Hwy 14, via 14 St).	n/a	n/a	n/a



Design Vehicle Swept Path Check - Accesses / Intersections along Highway 14 through Wainwright

Site	Access / Intersection	Design Veh - Existing		Remarks	Design Veh - TWLTL		Remarks
		IN	OUT		IN	OUT	
19	14 St (N/S)	WB-21	WB-21	Exhibit B1X, B2X, B3X, B4X, B5X. Exhibit B1X - Need to widen N Leg to provide 2 SB lanes; Assign LT lane at N & S Legs; Move Stopline back at all 4 Legs. Exhibit B4X & B5X - Create WBRT Lane. Widen East Outer Separation (NEC) to accommodate Zig-Zag from Hwy 14 EB to NE Service Rd EB, and may need to widen north edge of NE Service Rd to accommodate U-Turn from Hy 14 WB-to-SE Service Rd EB.	WB-21	WB-21	n/a
20	15 St (S)	I-BUS	I-BUS	Exhibit EX 20.1, 20.2 - Intersection can accommodate I-BUS Design Vehicle. It is too narrow for WB-21. WB-21 will need to make a wide turn for making either a right or left turn into 15 St, taking up most of the width of 15 St.	I-BUS	I-BUS	Exhibit TWLTL 20.1, 20.2 - Intersection can accommodate I-BUS Design Vehicle. It is too narrow for WB-21. WB-21 will need to make a wide turn for making either a right or left turn into 15 St, taking up most of the width of 15 St.
21	Access (S) to EMCON Hwy Maintenance	1-direction for WB-21	1-direction for WB-21	Exhibit EX 21.1, 21.2 - Access can accommodate one-directional travel of a WB-21 Design Vehicle. Acceptable as it is unlikely to have two WB-21 trucks entering and exiting at the same time	1-direction for WB-21	1-direction for WB-21	Exhibit TWLTL 21.1, 21.2 - Access can accommodate one-directional travel of a WB-21 Design Vehicle. Acceptable as it is unlikely to have two WB-21 trucks entering and exiting at the same time
22	Access (S) to Wainwright Seed Cleaning Plant	1-direction for WB-21	1-direction for WB-21	Exhibit EX 22.1, 22.2 - Access can accommodate one-directional travel of a WB-21 Design Vehicle. Acceptable as it is unlikely to have two WB-21 trucks entering and exiting at the same time	1-direction for WB-21	1-direction for WB-21	Exhibit TWLTL 22.1, 22.2 - Access can accommodate one-directional travel of a WB-21 Design Vehicle. Acceptable as it is unlikely to have two WB-21 trucks entering and exiting at the same time
23	18 St (N) (Closure proposed)	n/a	n/a	n/a	n/a	n/a	n/a

Site	Access / Intersection	To/From 23 St		Remarks	To/From North Service Rd		Remarks
24	18 St (S)	WB-21	WB-21	Exhibit EX 24.1, 24.2 - Intersection can accommodate WB-21 Design Vehicle	n/a	n/a	Exhibit TWLTL 24.1, 24.2 - Intersection can accommodate WB-21 Design Vehicle
25	23 St (N)	WB-21	WB-21	Turn Path ALC-A1, A2, C1-X. Exh ALC-A2 ALC-C1-X - Need to widen NWC and East Outer Separation (NEC).	n/a	n/a	Turn Path ALC-B1, B4-X, C5-X, D3-X, D4-X. Exh ALC-B1 & ALC-D3X - Need to widen East Outer Separation (NEC). Exh ALC-B4-X - Need to widen East Outer Separation and NWC. Exh ALC-C5X - Need to widen West Outer Separation. Exh ALC-D4X - Need to widen East & West
26	23 St (S) - (Closure Proposed)	n/a	n/a	n/a	n/a	n/a	n/a



Site	Access / Intersection	To/From 27 St		Remarks	To/From North Service Road and 13		Remarks
		WB-21	WB-21		n/a	n/a	
27	27 St (N&S)			Exhibit 1, 2. Exhibit 1 - Shows Hwy 14 WBRT swept path will clear the proposed centre median at the South Leg. Also shows adequate separation between the EBLT and WBLT swept paths. Exhibit 2 - shows 27 St NBLT swept path can clear the Centre Median north median nose. Also shows adequate separation between the NBLT and SBLT swept paths.			Exhibit 1, 2, 3, 4, 5. Exhibit 1 - shows swept path of LT trucks from 27 St to NW Service Road. Also shows truck making a U-Turn from the E Leg of 13 Ave to Hwy 14 EB, and truck making a Right Turn from 27 St to the W Leg of 13 Ave. Exhibit 2 - shows concurrent NBLT and EBRT of trucks turning at the 27 St/NW Service Road junction. Also shows Zig-Zag turns of truck from Hwy 14 EB to 13 Ave EB. Also shows trucks turning right from 13 Ave (W) to 27 St (S). Exhibit 3 - shows the following U-Turns: EB from NW Service Road U-Turn to WN on Hwy 14; EB from Hwy 14 U-Turn to WB on 13 Ave (WB); EB on 13 Ave (W) U-Turn to Hwy 14 WB. Exhibit 4 - shows U-Turn: Hwy 14 EB U-Turn to EB on 13 Ave (E). Also shows opposing left turns at the 13 Ave/27 St junction. Exhibit 5 - shows Zig-Zag movement from NW Service Road Zig-Zag to Hwy 14 EB. Also shows Zig-Zag movement from W leg of 13 Ave Zig-Zag to Hwy 14 EB. Also shows opposing EBLT and WBLT for trucks turning at 13 Ave/27 St junction, as well as concurrent WBLT from 13 Ave (E) to 27 St (S), and NBRT from 27 St (S) to 13 Ave (E)

4.5 ACCESS MANAGEMENT OPTIONS SELECTED

Based on the results of the intersection analysis in Section 3 and the access analysis in Section 4.4, the following access management recommendations are provided at the following segments of Highway 14 through Wainwright. Refer to Exhibit 5.1.1 to 5.1.10 in **Appendix H** for details.

4.5.1 INTERSECTION WITH NARROW MEDIAN/ TRADITIONAL LEFT & RIGHT TURN CHANNELIZATION

- 1 Street intersection (Access 1)
- 14 Street intersection (Access 19)
- 18 Street intersection (Access 24)
- 23 Street intersection (Access 25)
- 27 Street intersection (Access 27)

4.5.2 INTERSECTION WITH RAISED MEDIAN

- South leg of Highway 14/27 Street intersection

4.5.3 ACCESS CLOSURE / ACCESS CONSOLIDATION

- Access 14 or 15 – Esthetic Studio Access to be consolidated or one access closed

4.5.4 CONVERT ACCESS TO RIGHT-IN/RIGHT-OUT

- Access 17 – KFC Access
- Access 18 – Access to Hwy 14/14 St SWC Vacant Lot



4.5.5 NARROW DOWN ACCESS

- o Access 7 – Bison Motel Access
- o Access 13 – Royal Pizza / Domino Pizza Access

4.5.6 INTERSECTION WIDENING

- o Access 1 – 1 Street
- o Access 12 – 10A Street
- o Access 19 – 14 Street
- o Access 24 – 18 Street
- o Access 25 – 23 Street
- o Access 27 – 27 Street

4.5.7 HIGHWAY 14 SEGMENT WITH TWLTL

- o From Access 2 (Trail Contracting) to Access 4 (Petroleum Park access)
- o From Access 4 (Petroleum Park Access) to 100m west of Access 19 (14 Street)
- o From Access 20 (15 Street) to Access 24 (18 Street)



5. CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS AND RECOMMENDATIONS – CORRIDOR 1

The following are the reduced size exhibits for the recommendations along Corridor 1. The larger-scale exhibits are provided in Appendix H.

Exhibit 5.1.1 – Access 1, 2, 3

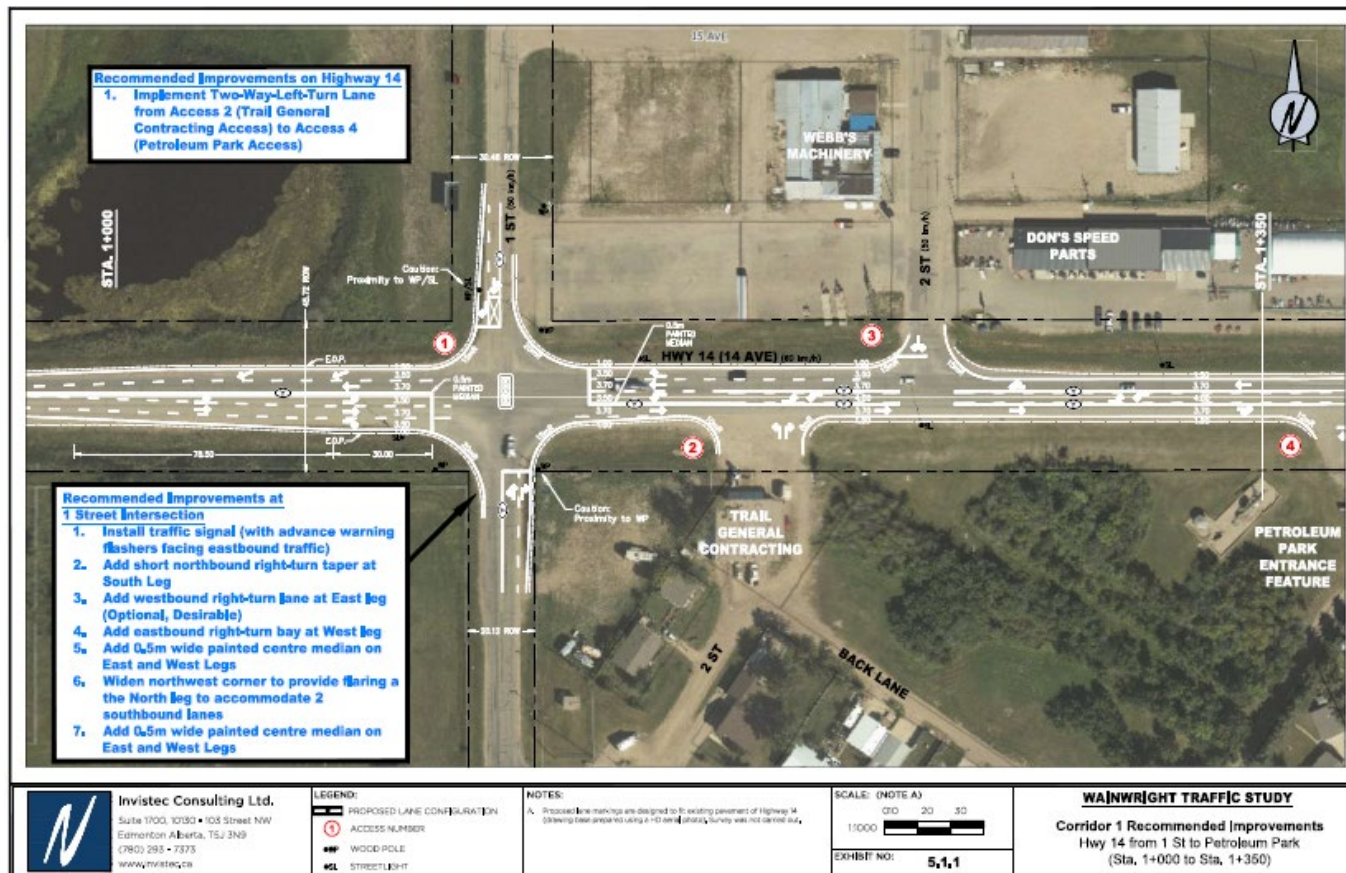




Exhibit 5.1.2 – Access 4

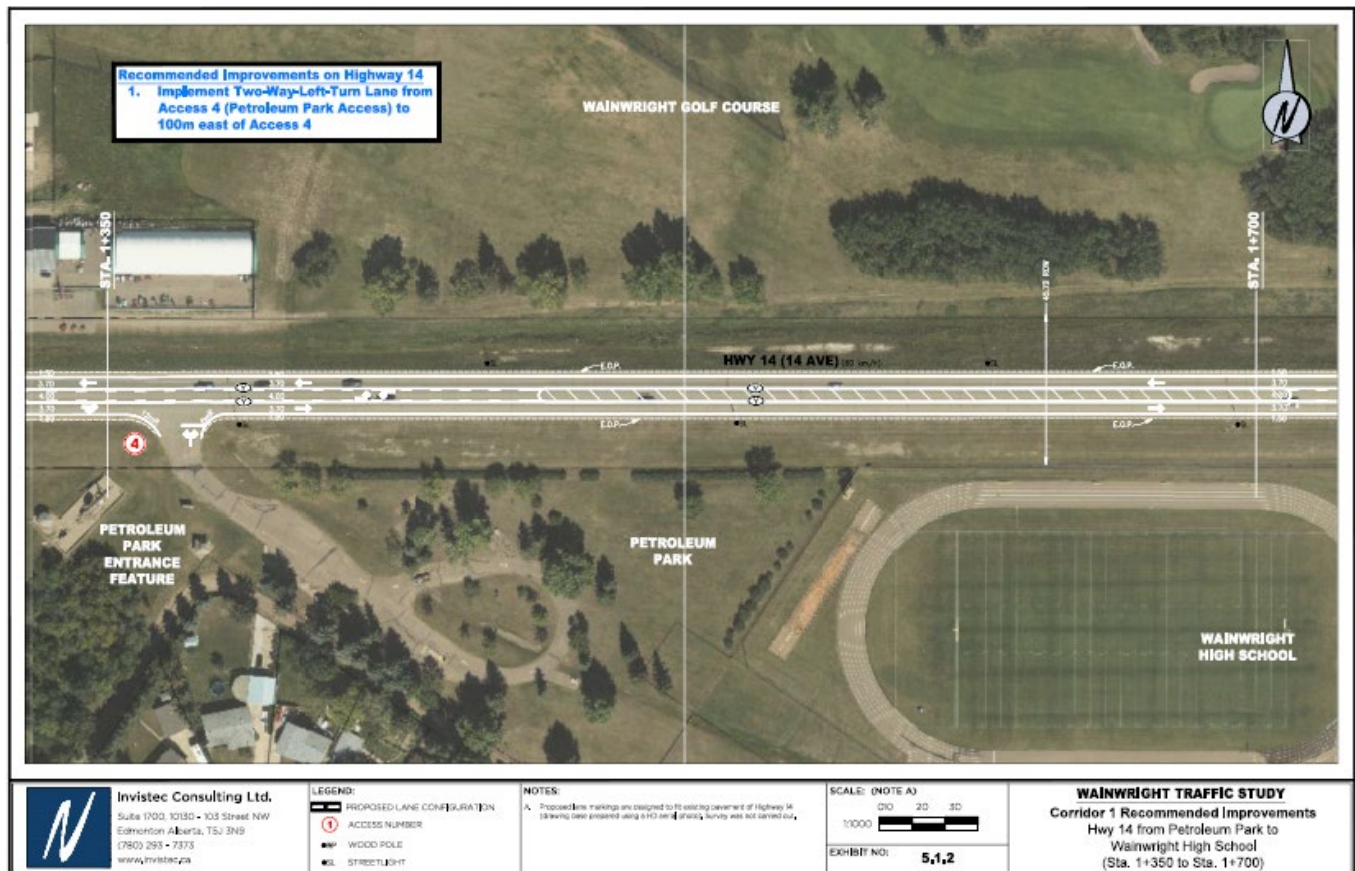




Exhibit 5.1.3 – Access 5, 6, 7, 8

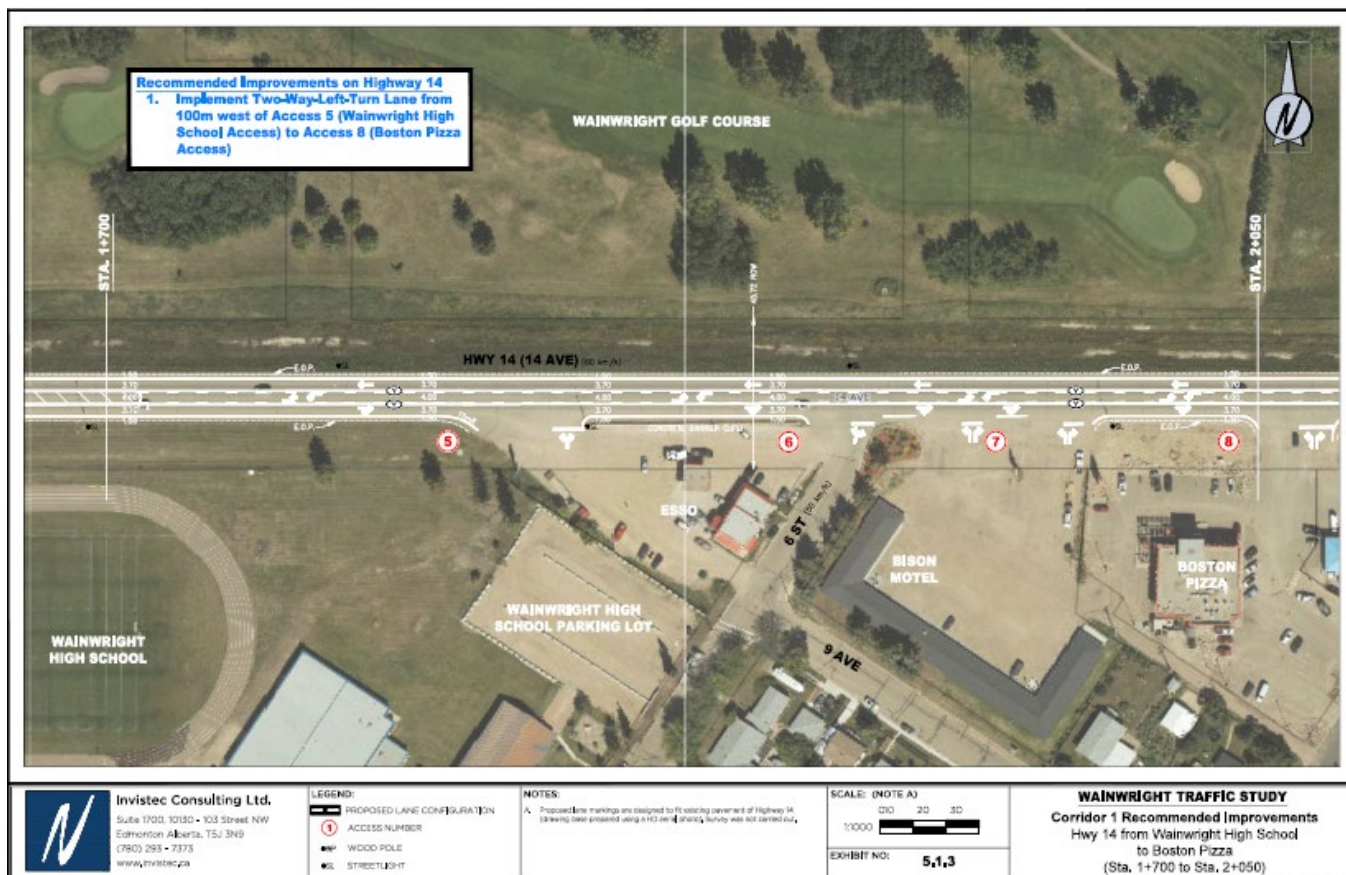




Exhibit 5.1.4 – Access 8, 9, 10

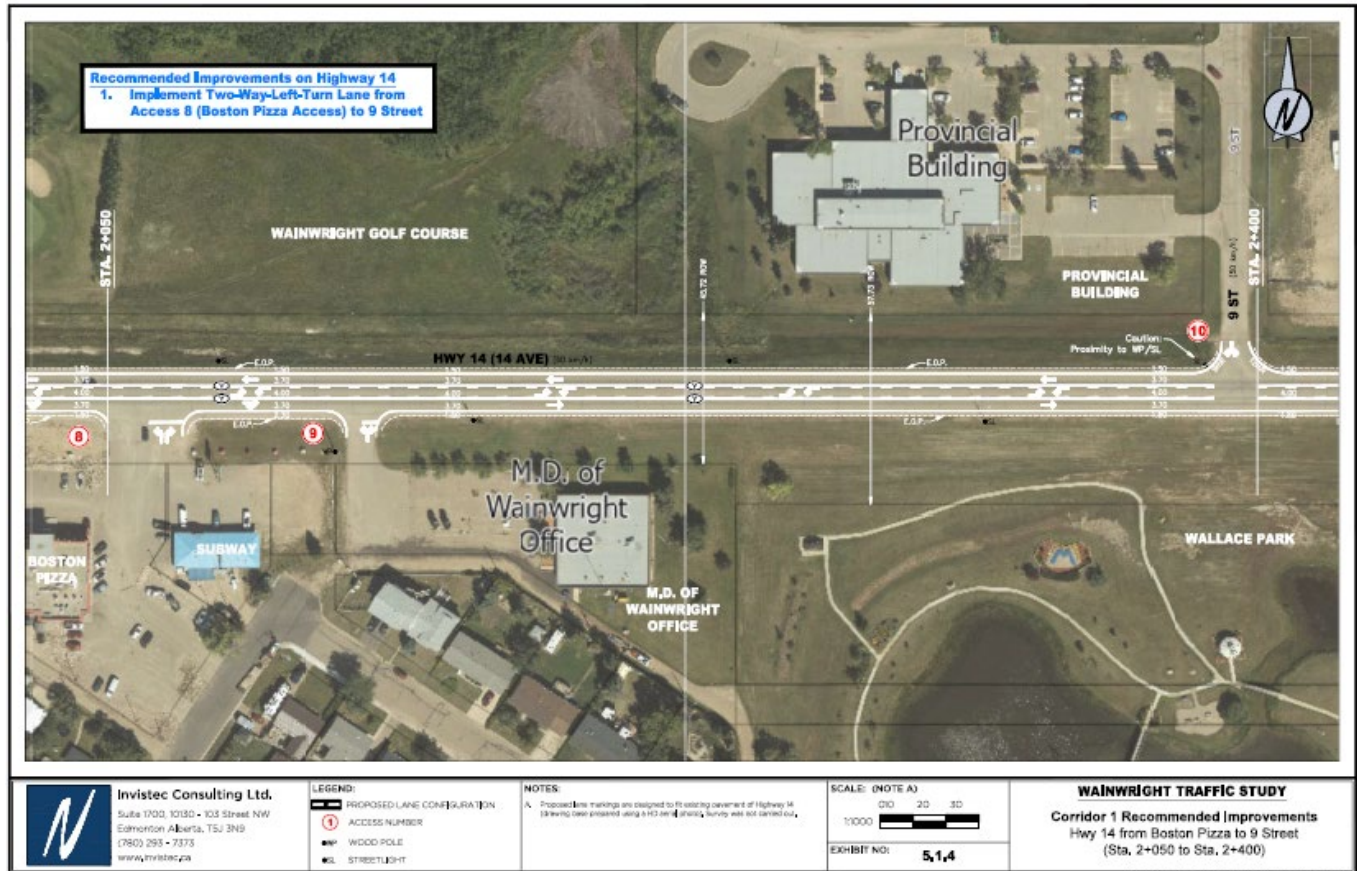




Exhibit 5.1.5 – Access 11, 12, 13, 14, 15, 16, 17, 18

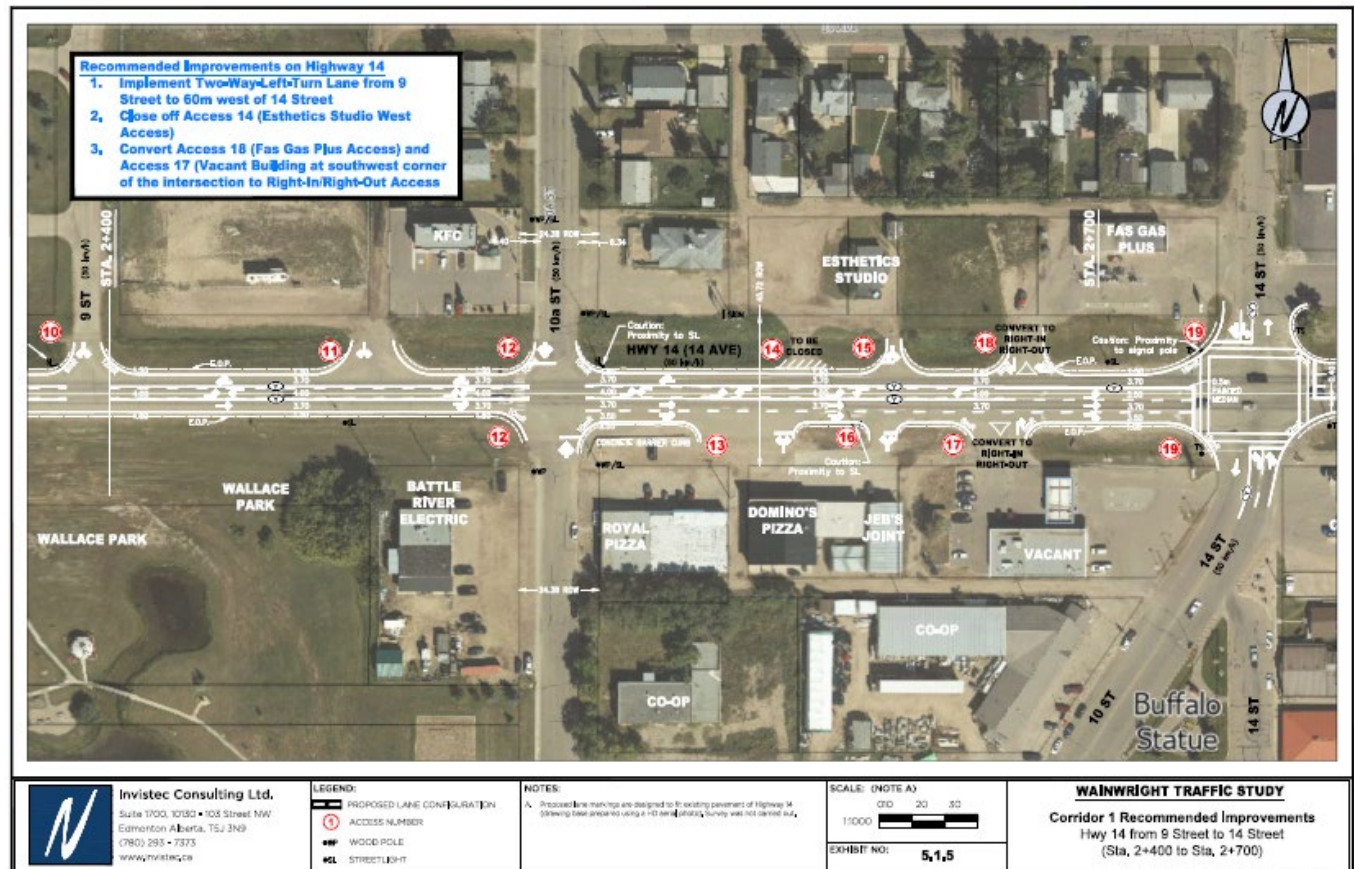




Exhibit 5.1.6 – Access 9, 20, 21, 22

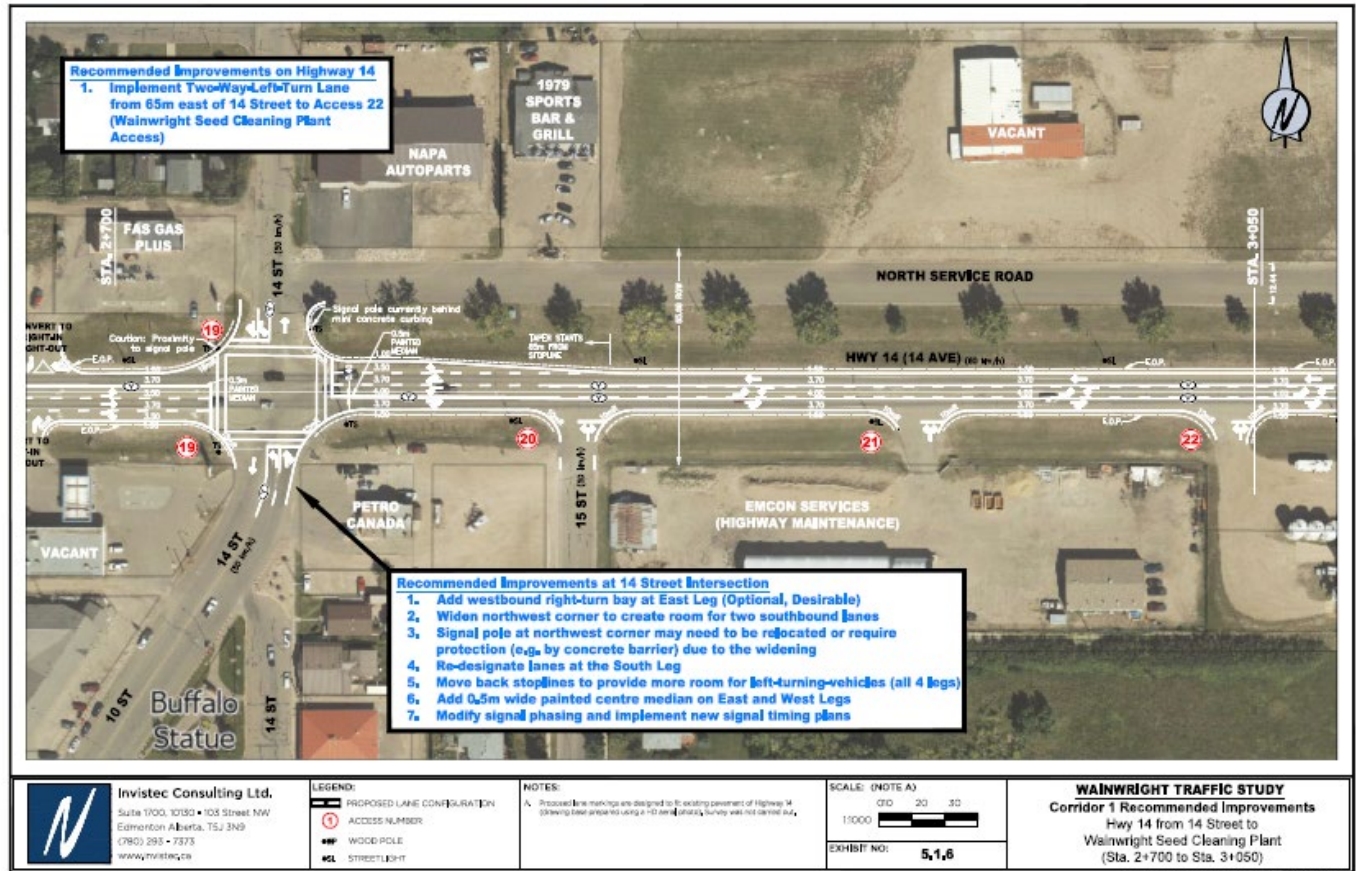




Exhibit 5.1.7 - Access 24

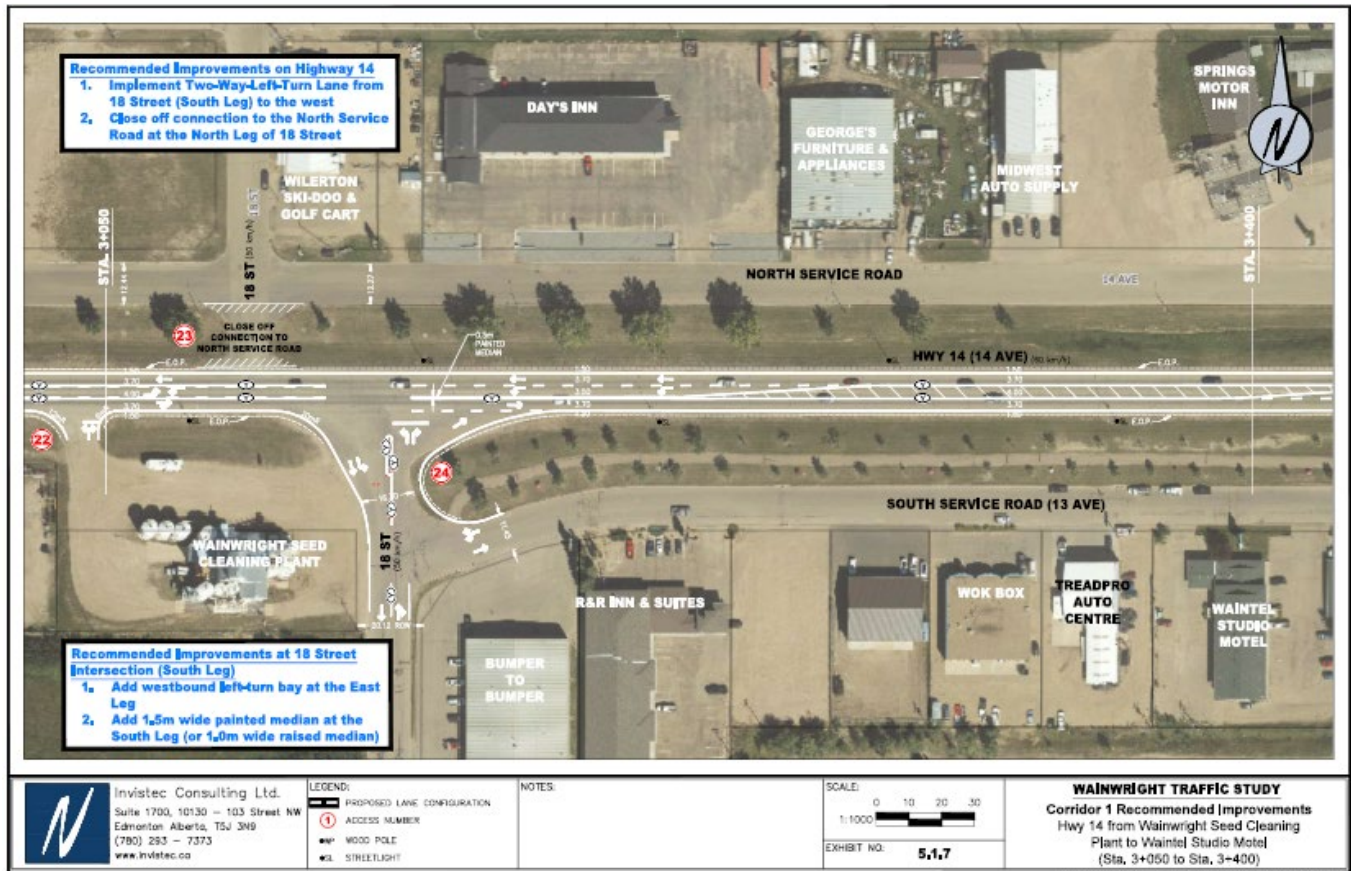




Exhibit 5.1.8 – Access 25

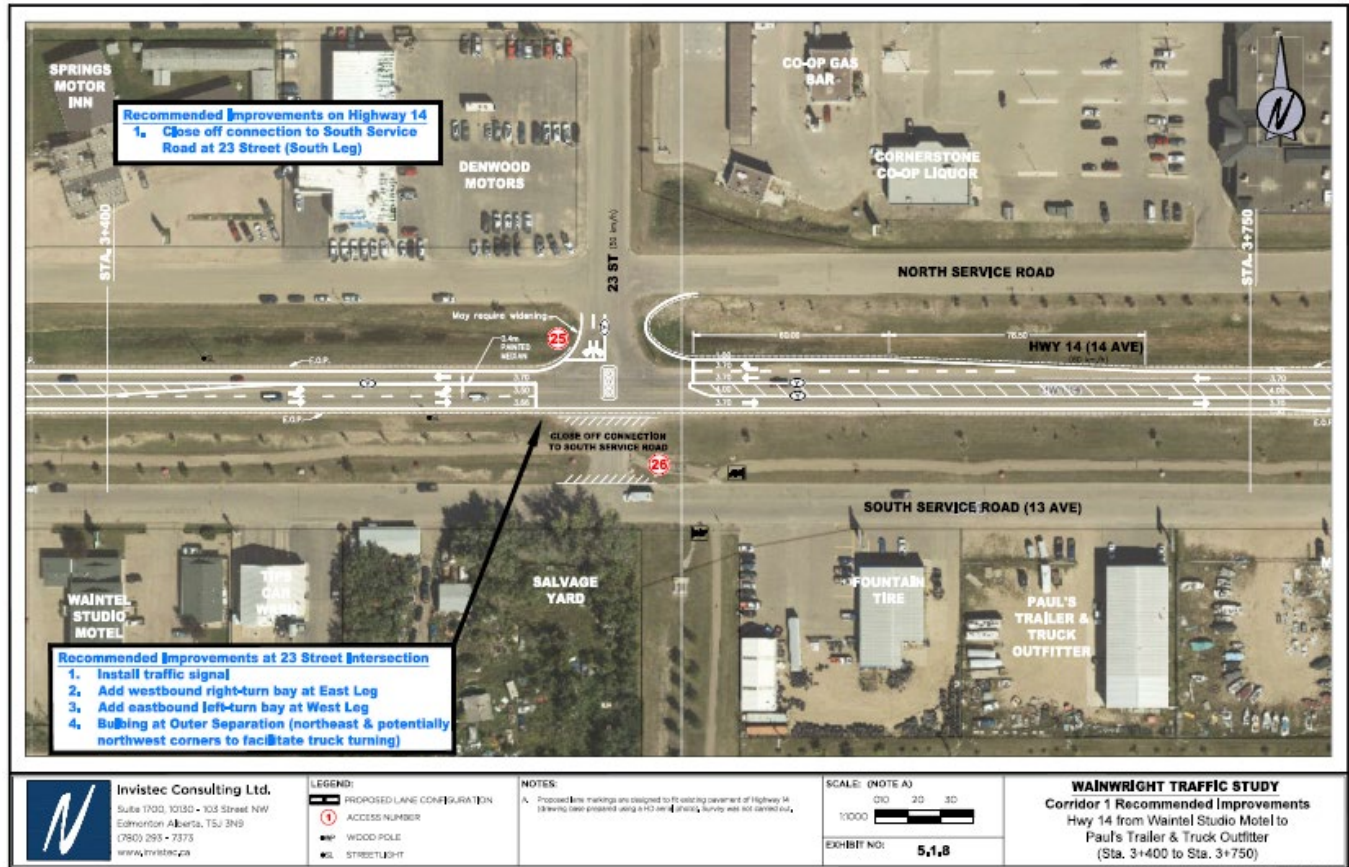




Exhibit 5.1.9 – Access 27

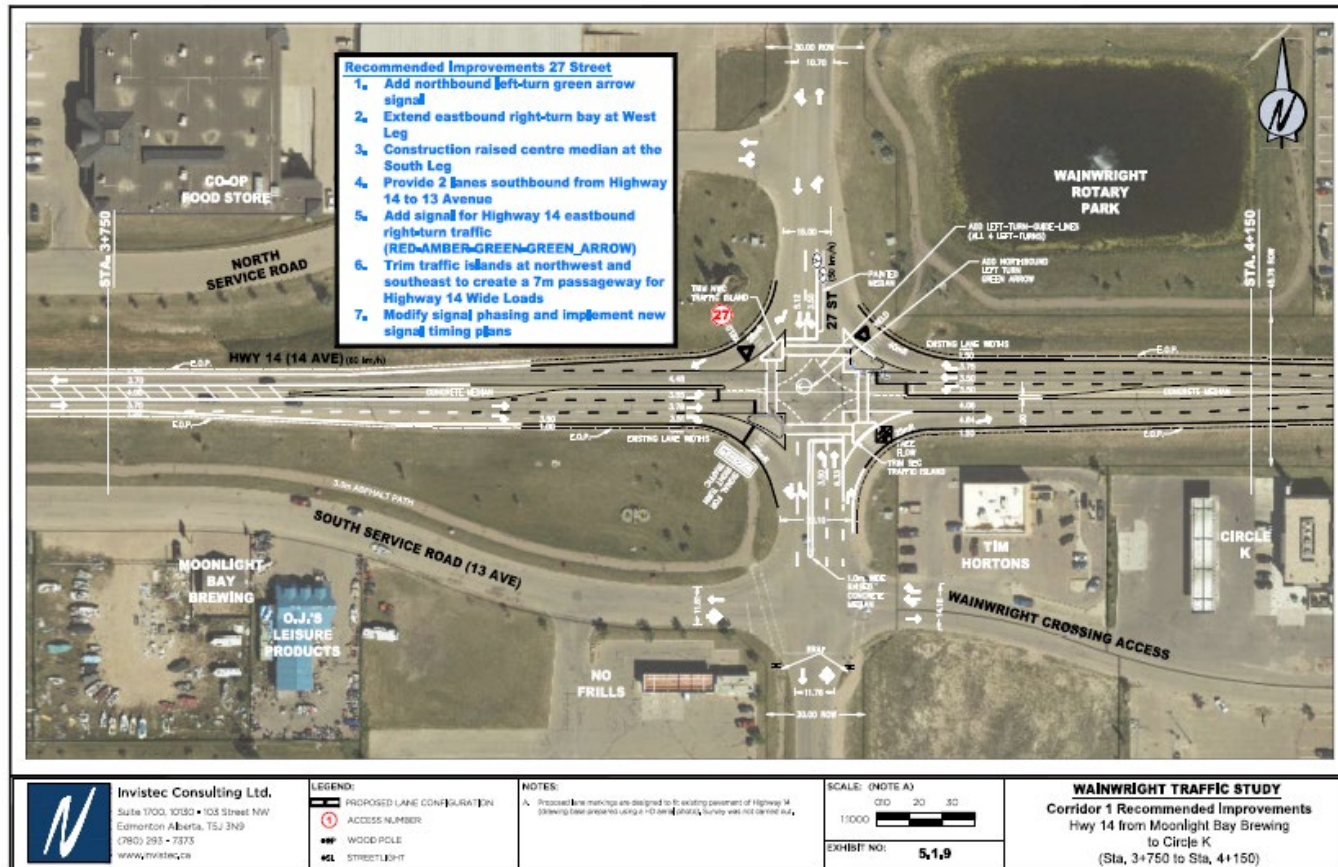
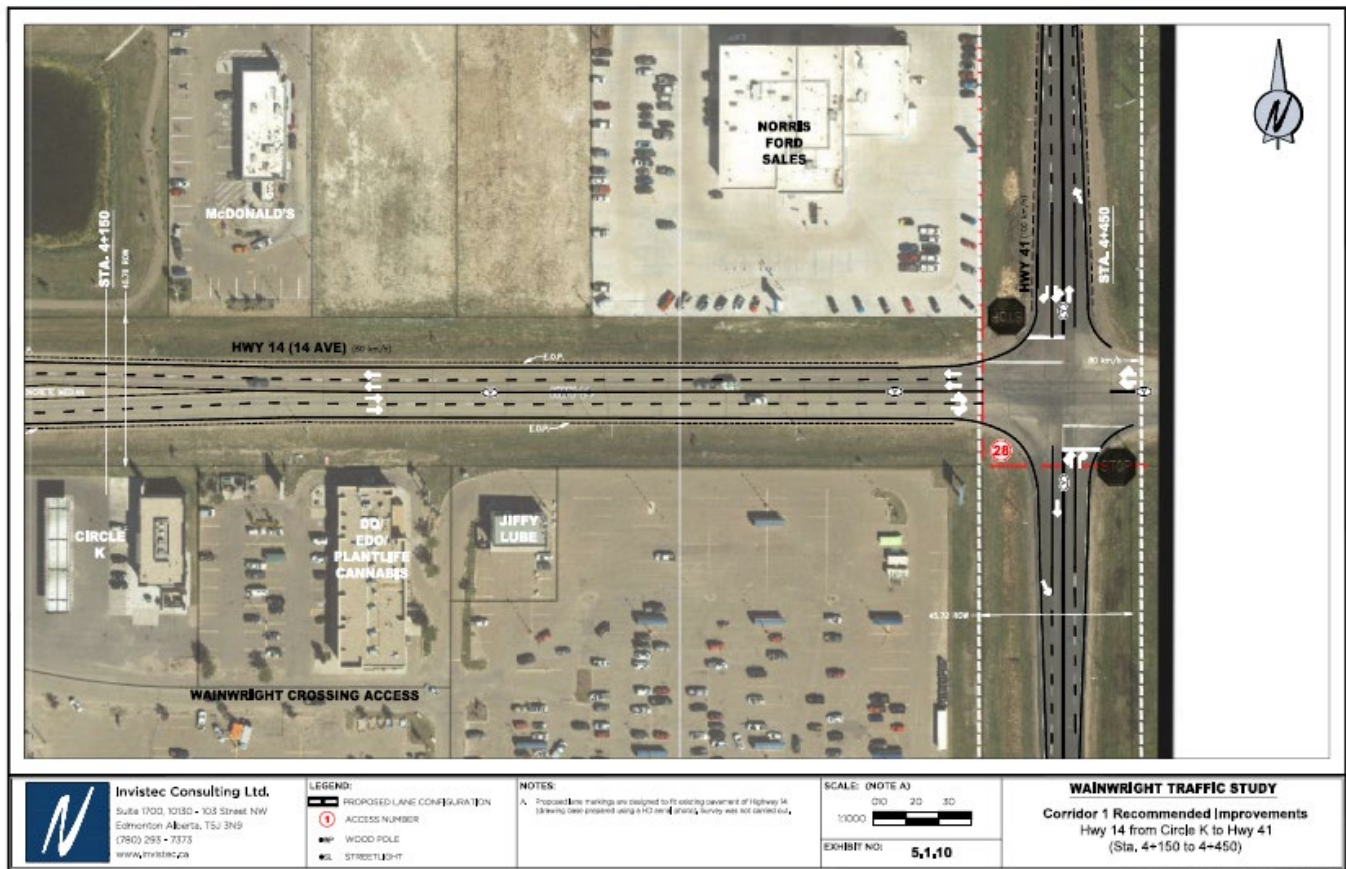




Exhibit 5.110 – Access 28





5.2 CONCLUSIONS & RECOMMENDATIONS – CORRIDOR 2

The following are the reduced size exhibits for the recommendations along Corridor 2. The larger scale exhibits are provided in **Appendix H**.

Exhibit 5.2.1 – 23 Ave & 23 St Intersection

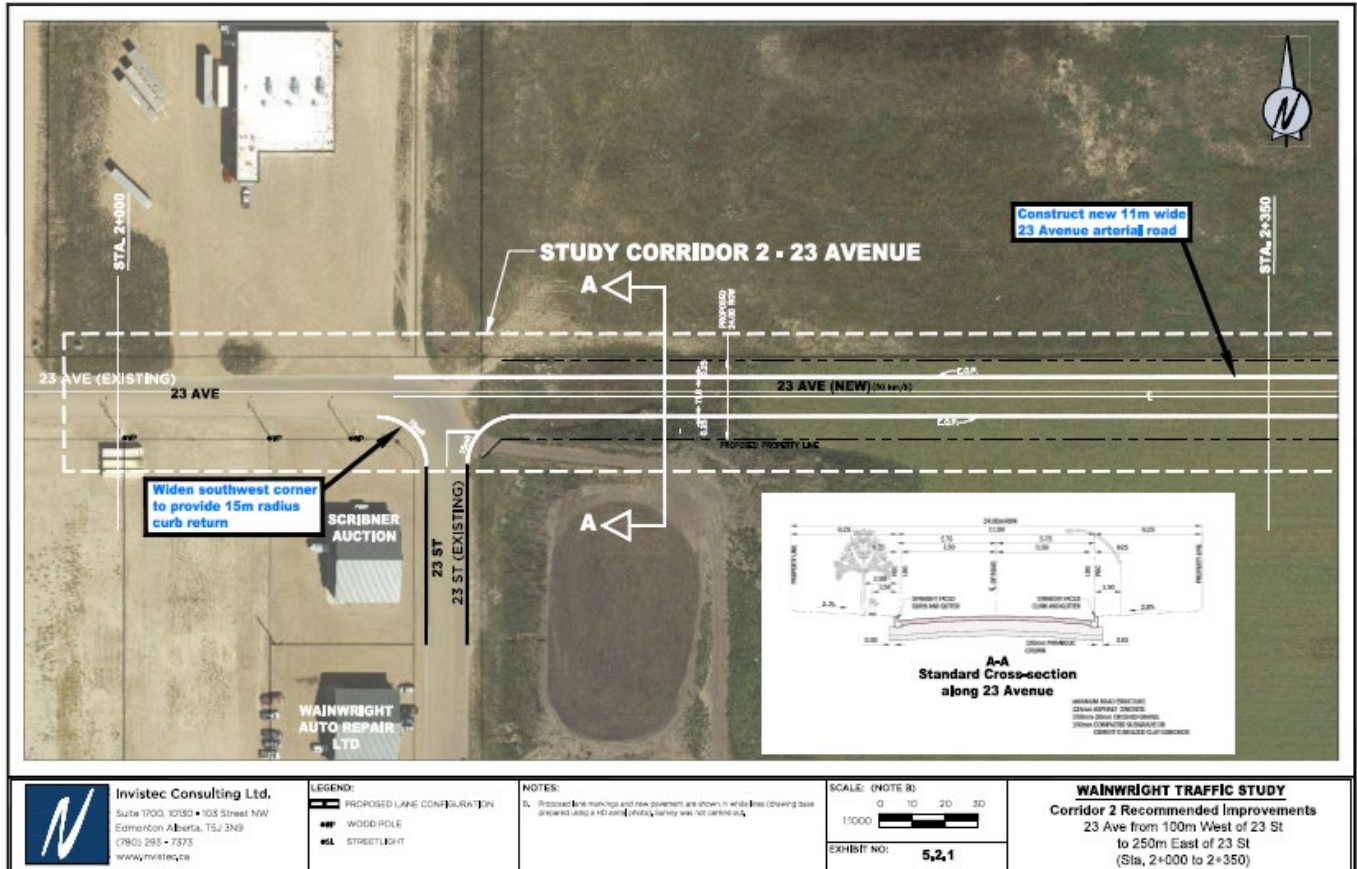




Exhibit 5.2.27 - 23 Ave & 27 St Intersection

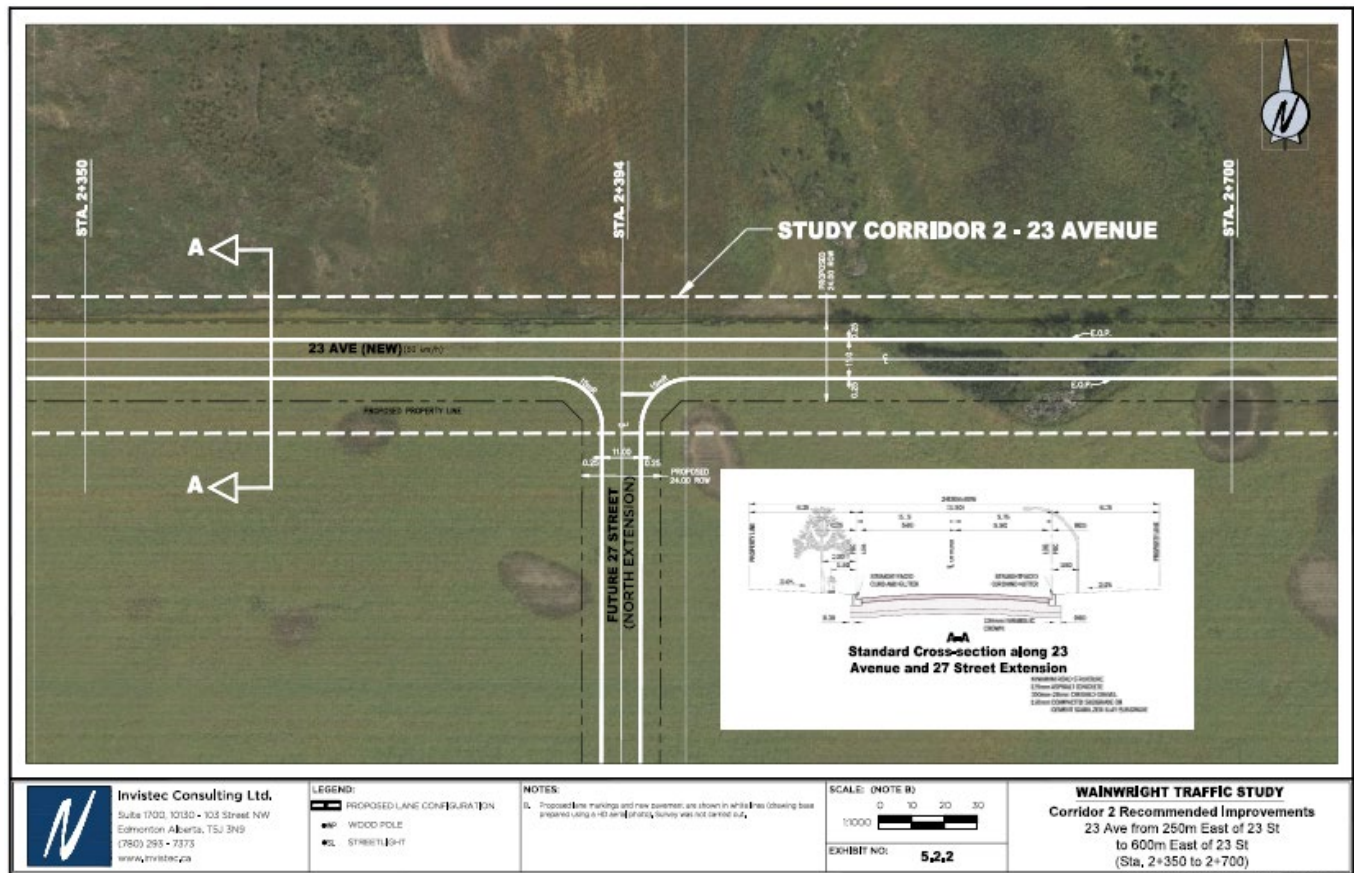
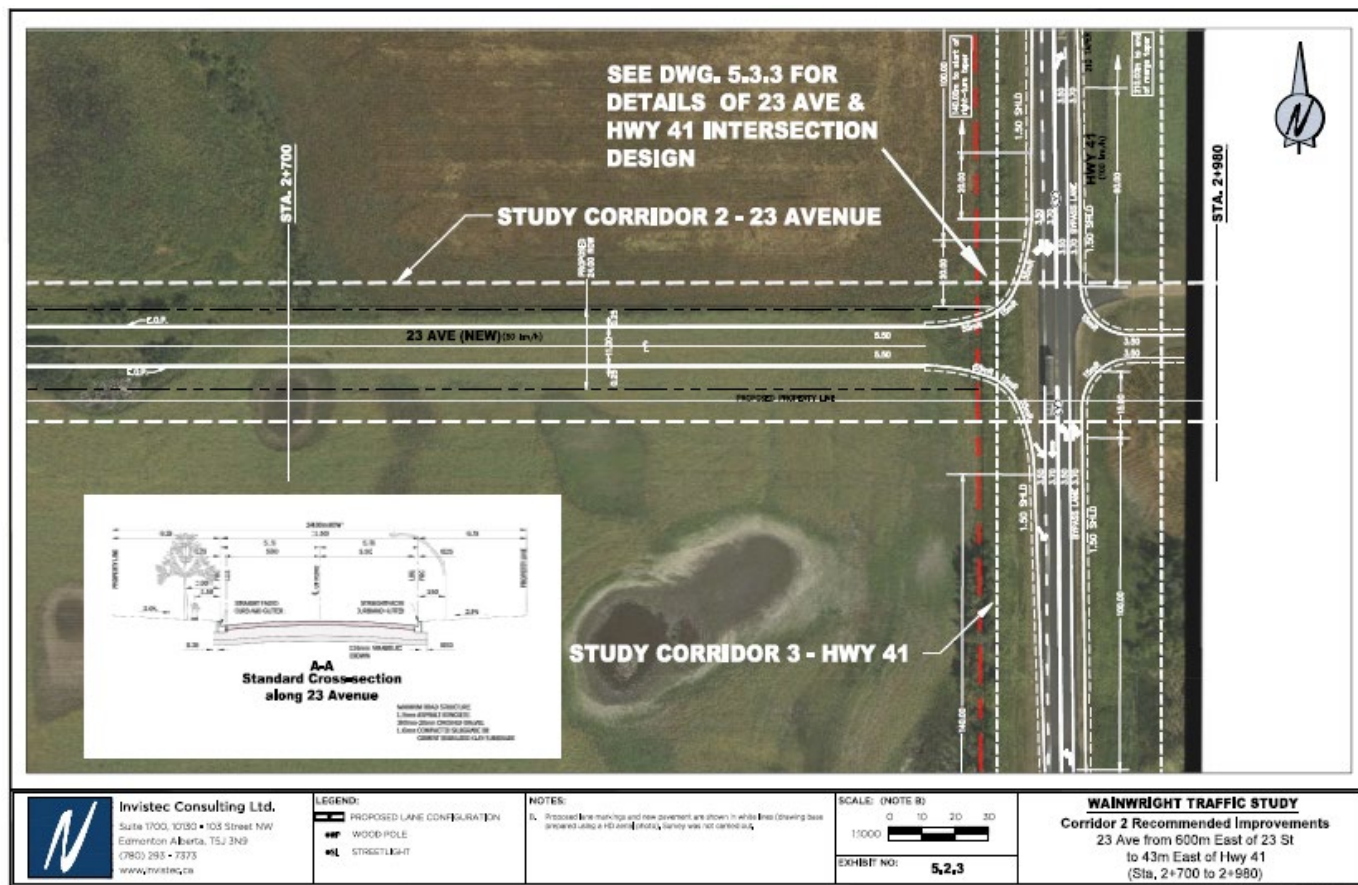




Exhibit 5.2.3 – 23 Ave & 27 St Intersection





5.3 CONCLUSIONS & RECOMMENDATIONS – CORRIDOR 3

The following are the reduced size exhibits for the recommendations along Corridor 3. The larger scale exhibits are provided in **Appendix H**.

Exhibit 5.31 – Highway 14 & Highway 41

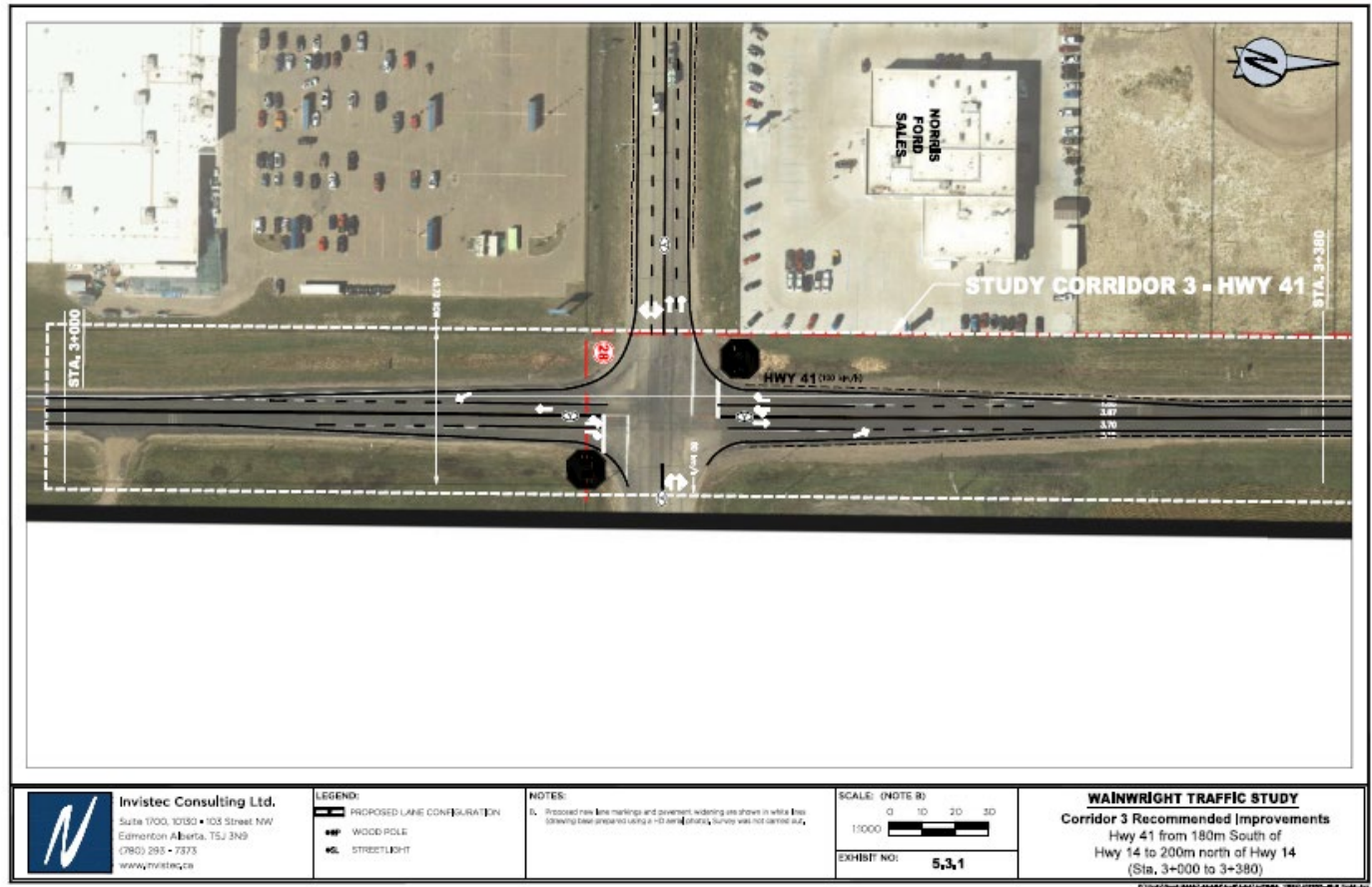
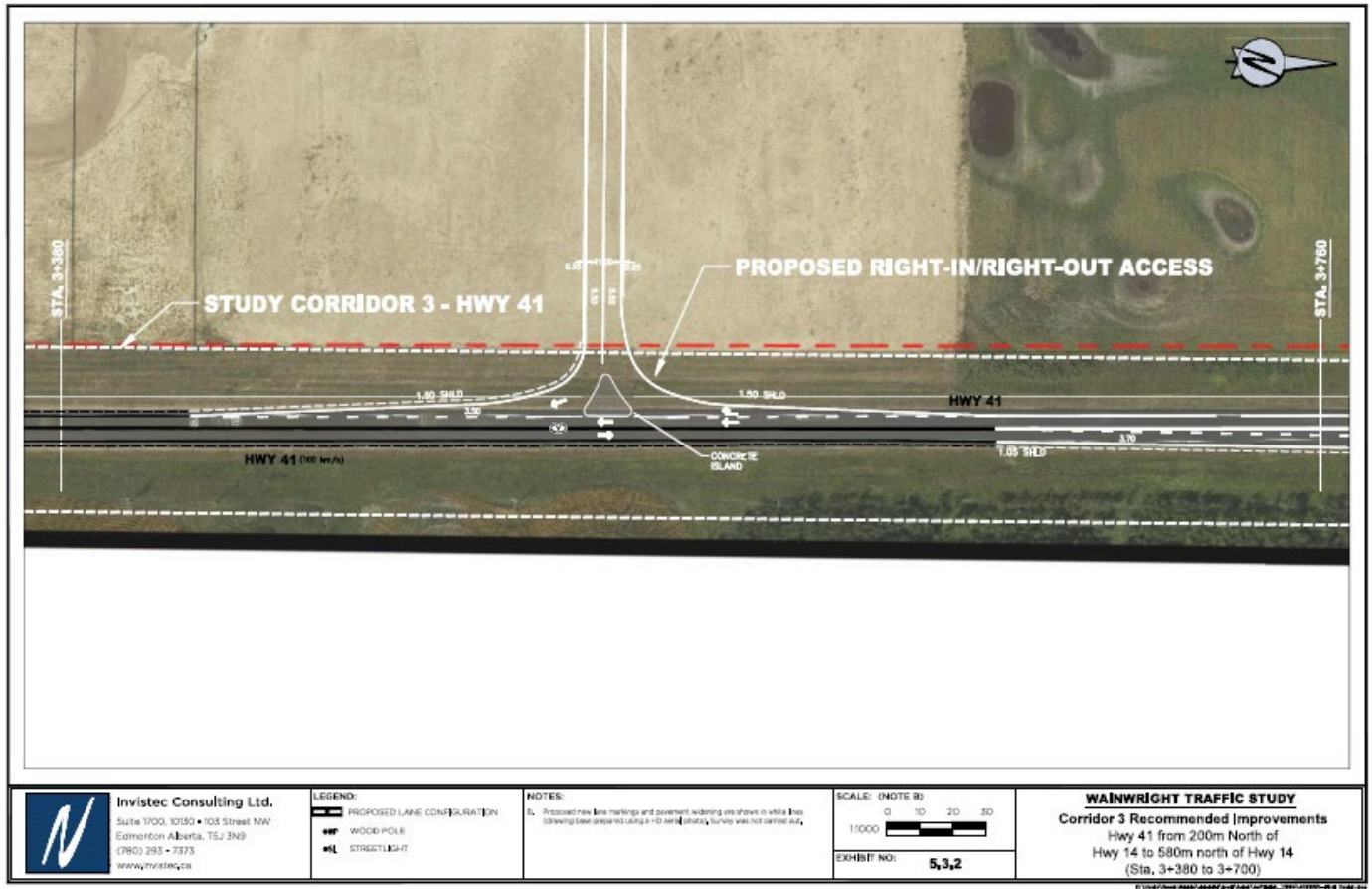




Exhibit 5.32 -117 Avenue & Highway 41



[illegible]



5.4 CONCLUSIONS & RECOMMENDATIONS – ACCESSES AND INTERSECTIONS

In this section, side-by-side comparisons are provided for each intersection / access along Highway 14, as well as a couple of intersections along 23 Avenue, showing the difference between the existing and proposed layouts.

Existing Layout - 1: Hwy 14 & 1 St



Proposed Layout - 1: Hwy 14 & 1 St



Intersection improvements at Highway 14 & 1 Street (Access 1) include:

1. Install traffic signal with advance warning flashers facing eastbound traffic
2. Add short northbound right-turn taper at south leg
3. Add westbound right-turn lane at east leg
4. Add eastbound right-turn lane at west leg
5. Add 0.5m-wide painted centre median on east and west legs
6. Widen northwest corner to provide flaring at the north leg to accommodate two southbound lanes

Existing Layout - 2: Trail Contracting Access



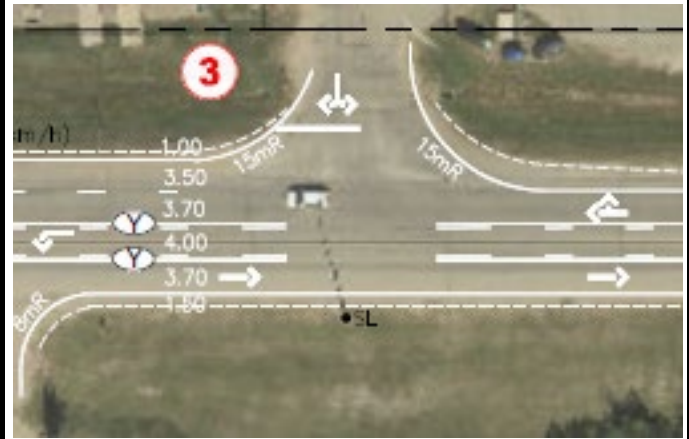
Proposed Layout - 2: Trail Contracting Access



Existing Layout - 3: 2 St



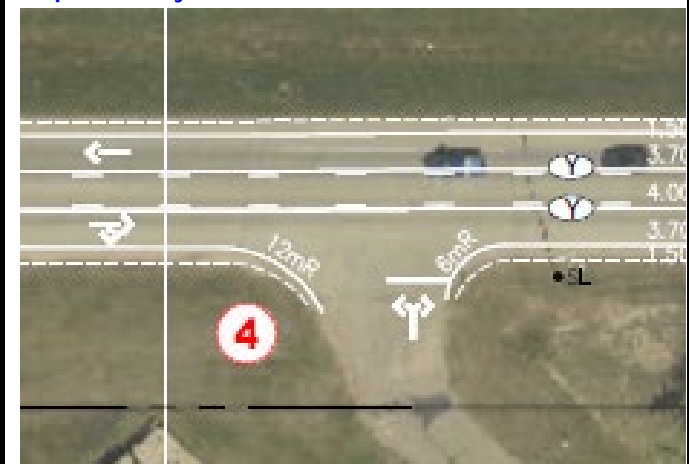
Proposed Layout - 3: 2 St



Existing Layout - 4: Petroleum Park Access



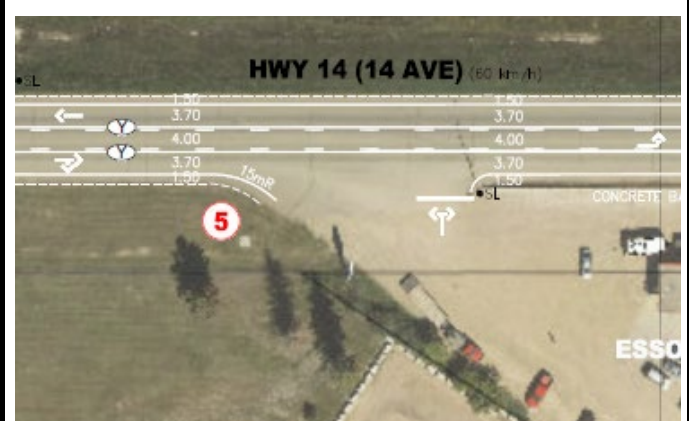
Proposed Layout - 4: Petroleum Park Access



Existing Layout - 5: Esso Access



Proposed Layout - 5: Esso Access





Existing Layout - 6: 6 St



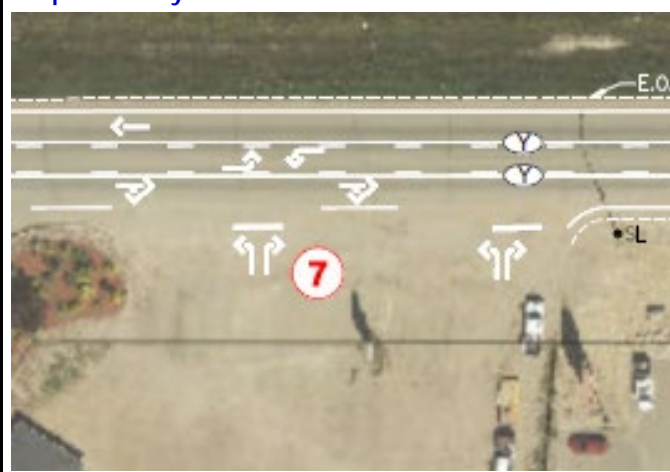
Proposed Layout - 6: 6 St



Existing Layout - 7: Bison Motel Access



Proposed Layout - 7: Bison Motel Access

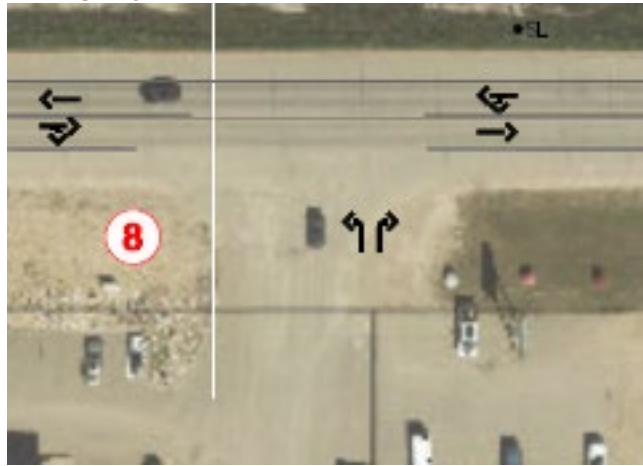


Intersection improvements at Highway 14 & Bison Motel Access (Access 7) include:

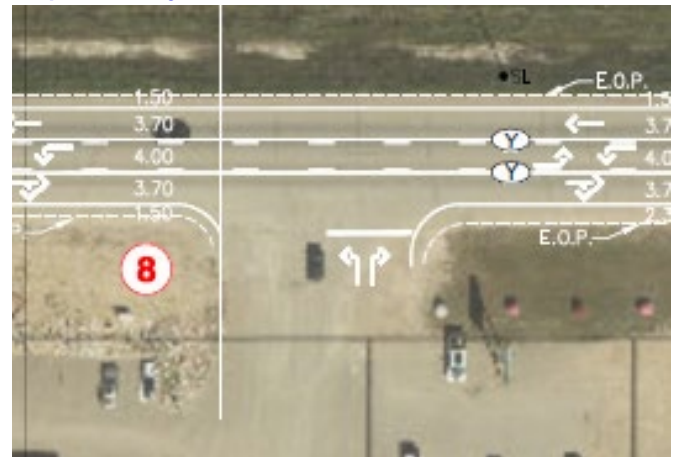
1. Narrow down the wide access. Perhaps close either the east half or west half of the current access.



Existing Layout - 8: Boston Pizza Access



Proposed Layout - 8: Boston Pizza Access





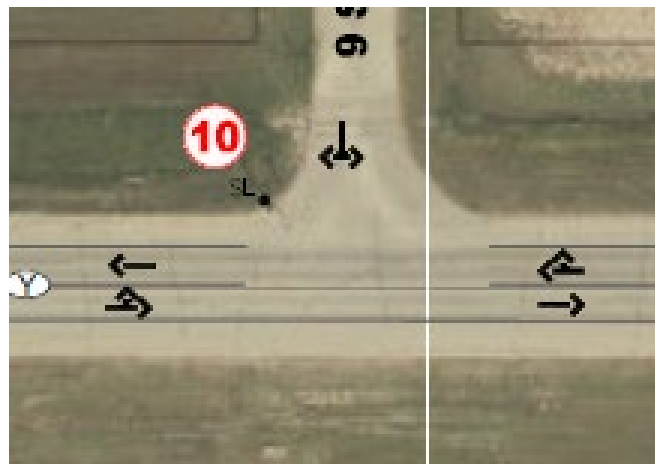
Existing Layout - 9: MD of Wainwright Access



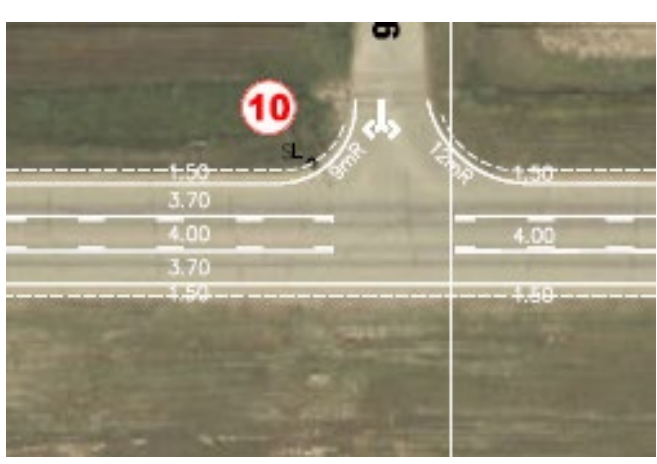
Proposed Layout - 9: MD of Wainwright Access



Existing Layout - 10: 9 St



Proposed Layout - 10: 9 St



Existing Layout - 11: KFC Access



Proposed Layout - 11: KFC Access

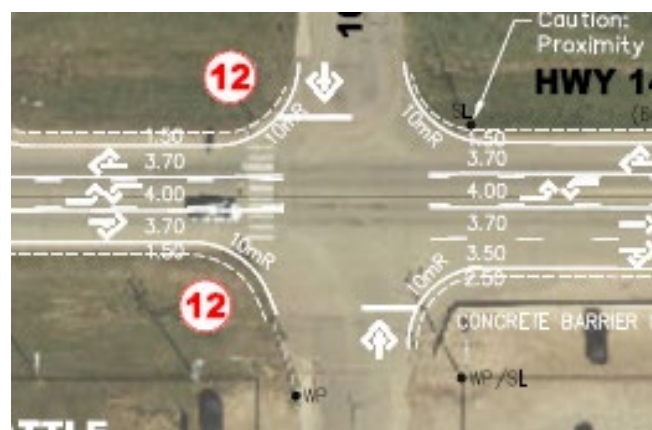




Existing Layout - 12: 10A St



Proposed Layout - 12: 10A St



Existing Layout - 13/14: Commercial Site Accesses



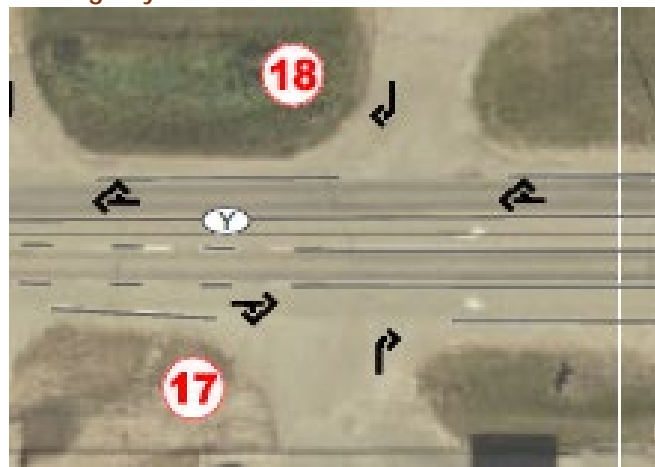
Proposed Layout - 13/14: Commercial Site Accesses



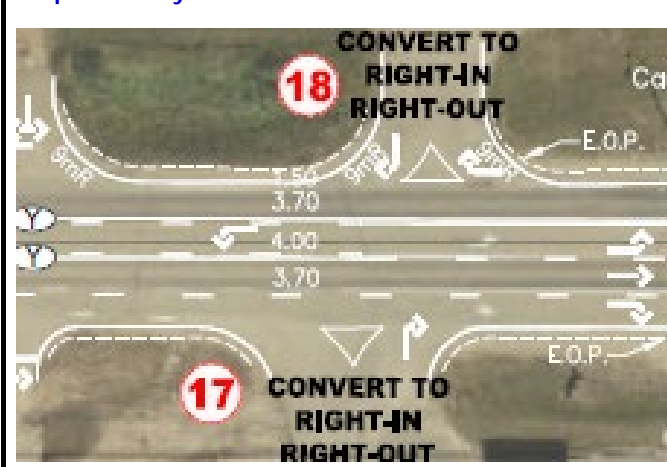
Intersection improvements at Highway 14 & Esthetic Studio Access (Access 14) include:

1. Close off either Access 13 or Access 14

Existing Layout - 17/18: Commercial Site Accesses



Proposed Layout - 17/18: Commercial Site Accesses

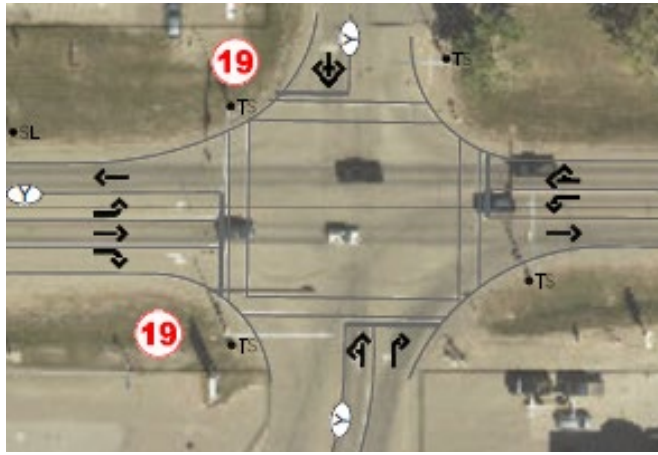




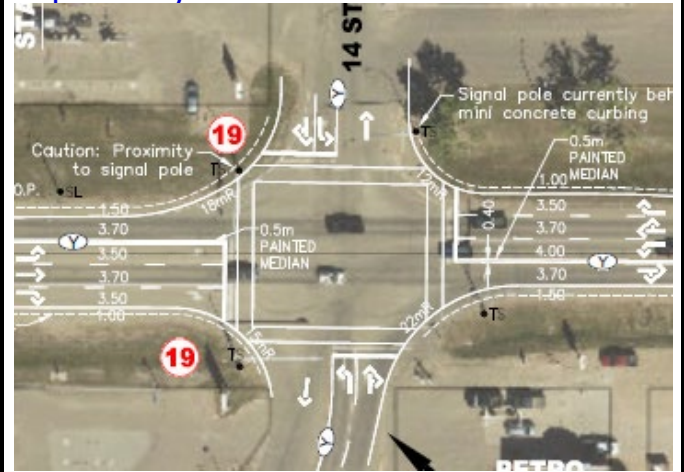
Intersection improvements at Highway 14 & KFC / Vacant Lot Access (Access 17 & 18) include:

1. Convert both accesses into right-in/right-out accesses
2. Start TWLTL from west of these two accesses and extend to the west
3. Provide left-turn lane + through lane + right-turn lane from these two accesses to 14 Street
4. Provide a 0.5m-wide double yellow painted centre median

Existing Layout - 19: 14 St



Proposed Layout - 19: 14 St



Intersection improvements at Highway 14 & 14 Street (Access 19) include:

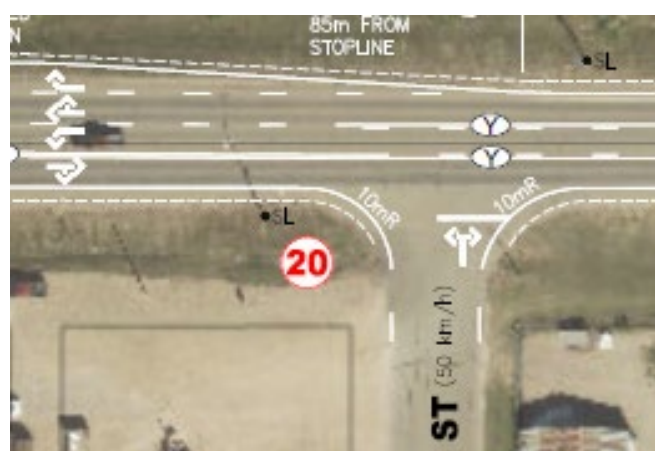
1. Add westbound tight-turn bay at east leg
2. Widen northwest corner to create room for two southbound lanes
3. Signal pole at northwest corner may need to be relocated or require protection (e.g. by concrete barrier) due to the widening
4. Re-designate lanes at the south leg
5. Move back stop lines to provide more room for left-turning vehicles (all four legs)
6. Add 0.5m-wide painted centre median on east and west legs
7. Modify signal phasing and implement new signal timing plans
8. Additional widening at the north edge of the North Service Road so that the swept path of a WB-21 design vehicle making a wide U-turn can be accommodated (westbound Highway 14 traffic making a U-turn to go eastbound on North Service Road)



Existing Layout - 20: 15 St



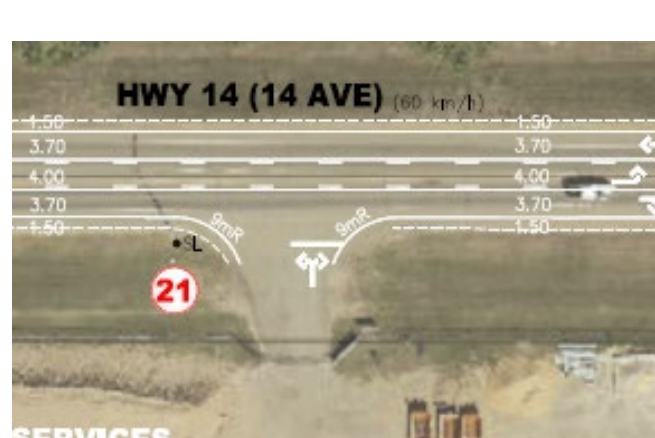
Proposed Layout - 20: 15 St



Existing Layout - 21: EMCON Services Access



Proposed Layout - 21: EMCON Services Access



Existing Layout - 22: Seed Cleansing Plant Access

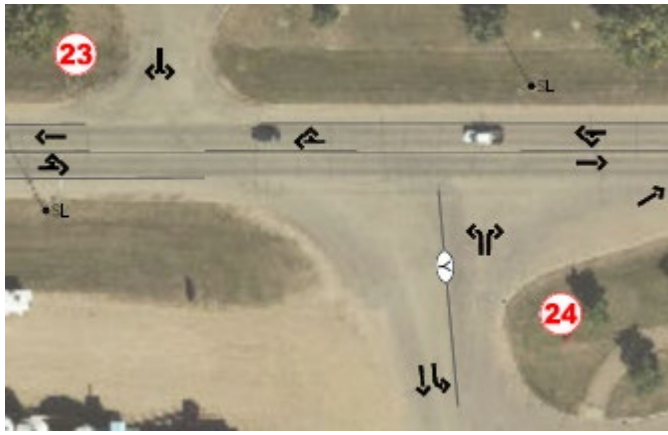


Proposed Layout - 22: Seed Cleansing Plant Access





Existing Layout - 23/24: 18 St (North & South)



Proposed Layout - 23/24: 18 St (North & South)



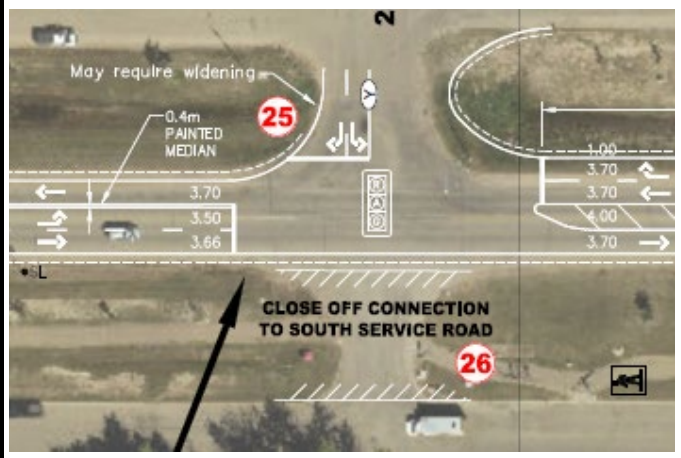
Intersection improvements at Highway 14 & 18 Street (Access 23 & 24) include:

1. Close off connection to the North Service Road at the north leg of 18 Street
2. Add westbound left-turn bay at the east leg with a 0.5m-wide painted centre median
3. Add 1.5m-wide painted centre median at the south leg (or a 1.0m-wide raised median)
4. Widen the southeast corner of the intersection to provide room for WB-21 swept paths

Existing Layout - 25/26: 23 St (North & South)

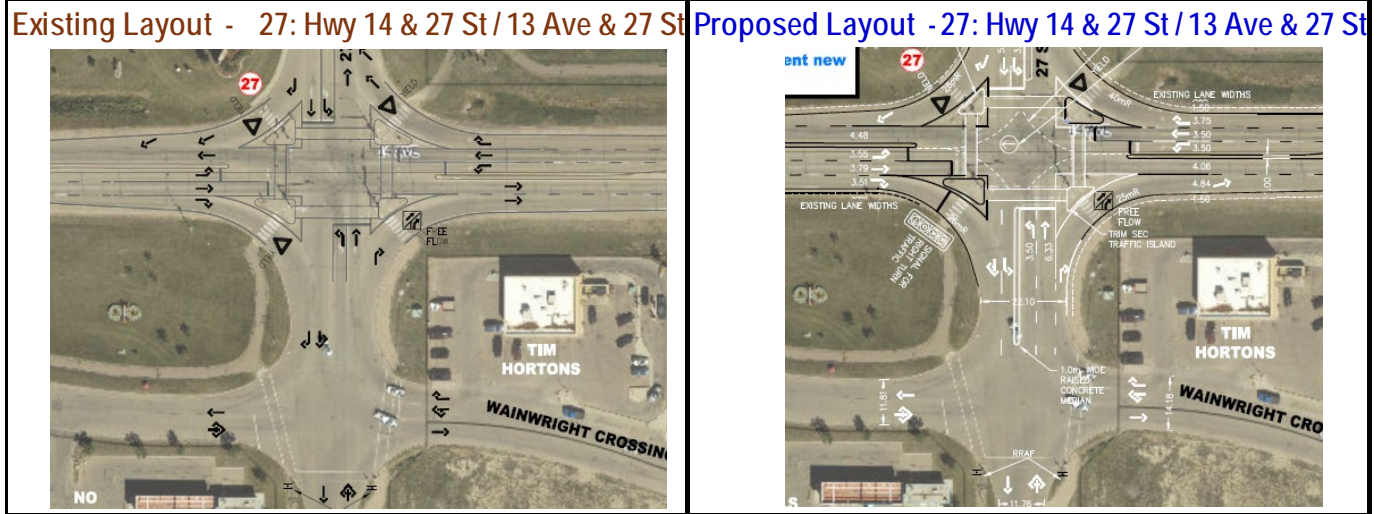


Proposed Layout - 25/26: 23 St (North & South)



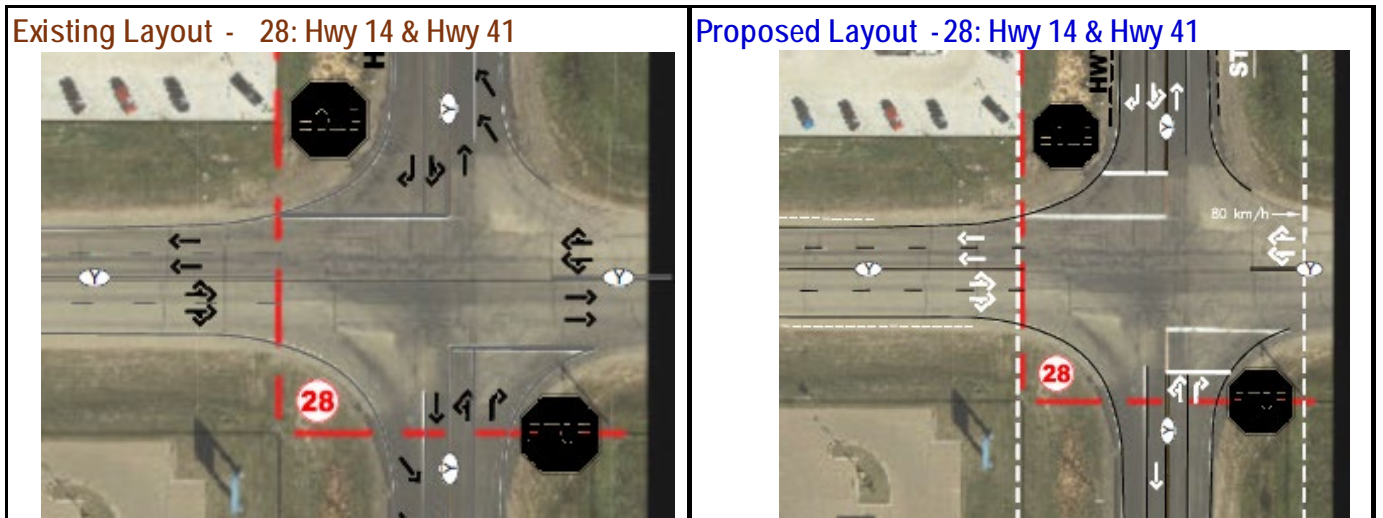
Intersection improvements at Highway 14 & 23 Street (Access 25 & 26) include:

1. Close off connection to the South Service Road (13 Avenue) at the south leg of 23 Street
2. Install traffic signal
3. Add westbound right-turn bay at the East Leg
4. Add eastbound left-turn bay at the West Leg with a 0.5m wide painted centre median
5. Bulbing at outer separation (northeast & potentially northwest corners to facilitate truck turning)
6. May consider shifting the centreline of Highway 14 slightly to the south within the vicinity of the 23 Street intersection (from east of 18 Street to west of 27 Street) so that WB-21 design vehicle can have enough room for U-turns between the North Service Road and the Highway 14 westbound lane



Intersection improvements at Highway 14 & 27 Street (Access 27) include:

1. Add northbound left-turn green arrow signal
2. Extend eastbound right-turn bay at west leg
3. Construct raised centre median at the south leg (approximately 1m-wide)
4. Provide two lanes southbound from Highway 14 to 13 Avenue (with 20cm-wide 3m:3m line/gap dashed white)
5. Add signal for Highway 14 eastbound right-turn traffic (RED-AMBER-GREEN-GREEN-ARROW). May need to create new camera detection zone in the eastbound right turn bay (detailed signal design including logic programming to be prepared in the detailed design stage)
6. Trim traffic island at northwest and southeast corners to create a 7m passageway for wide loads on Highway 14 (e.g. such as farm equipment, single wide / double wide prefab homes)
7. Modify signal phasing and implement new signal timing plans

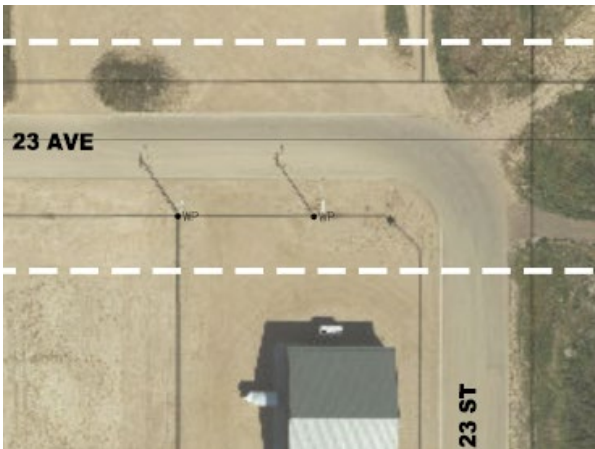


Intersection improvements at Highway 14 & Highway 41 (Access 28) include:

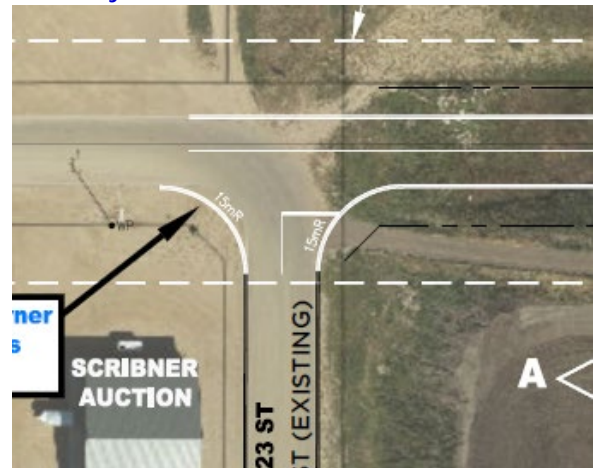
1. Potentially convert to 4-way stop when intersection operation deteriorates with excessive delays to Highway 41 traffic (as traffic volumes increase at this intersection)
2. In the long-term, signalization of this intersection will eventually be needed. At that time, lane configurations at all four legs will also need to be modified (to provide left-turn lanes as well as potentially add right-turn bays)



Existing Layout - 23 Ave & 23 St



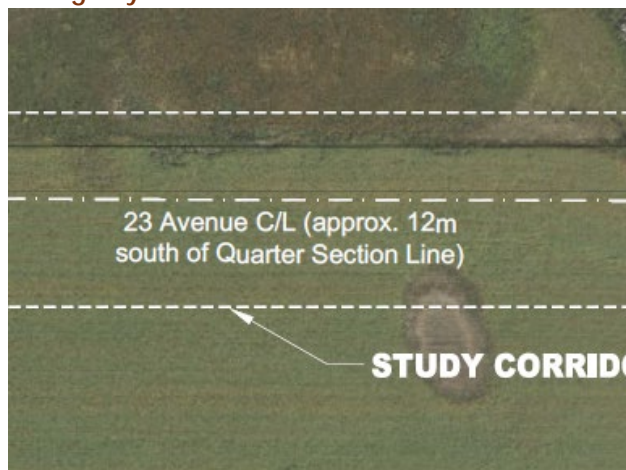
Proposed Layout - 23 Ave & 23 St



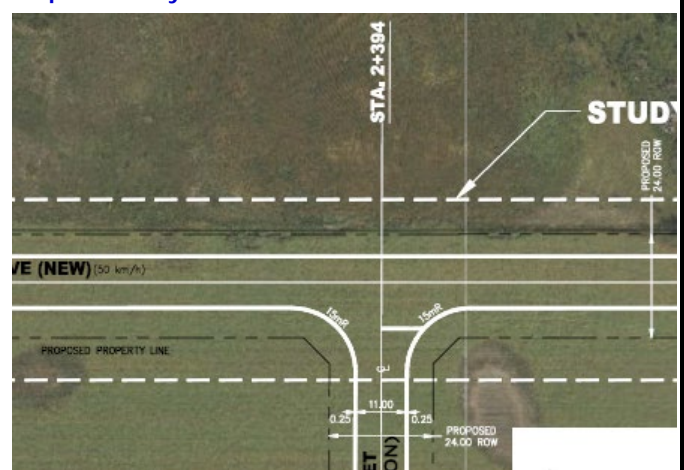
Intersection improvements at 23 Avenue & 23 Street include:

1. Increase the curb return radius at the southwest corner to accommodate swept path of WB-21 design vehicle

Existing Layout - 23 Ave & 27 St



Proposed Layout - 23 Ave & 27 St



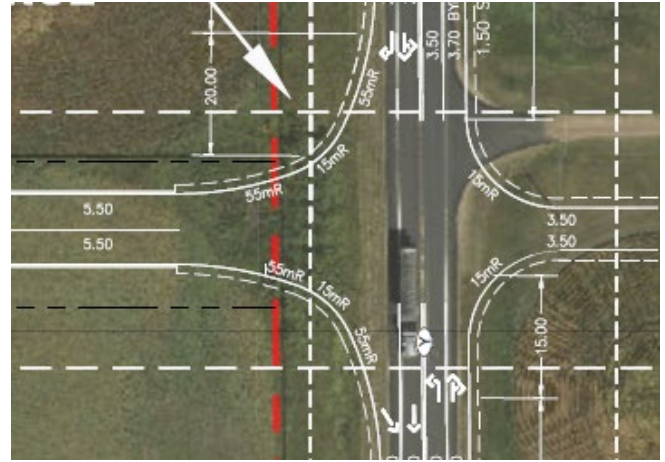
Construct new intersection at 23 Avenue & 27 Street, including:

1. Construct a new T-intersection to connect to the north extension of 27 Street.
2. Right-of-way of 27 Street to match the existing 27 Street right-of-way further south
3. Curb return radii to be 15m to accommodate WB-21 Swept paths

Existing Layout - 23 Ave & Hwy 41



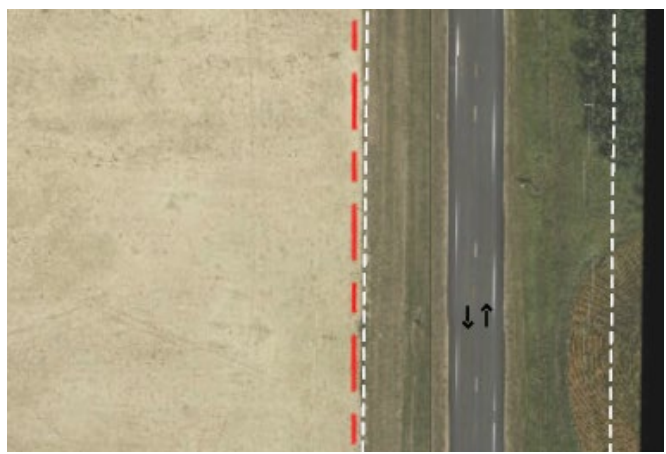
Proposed Layout - 23 Ave & Hwy 41



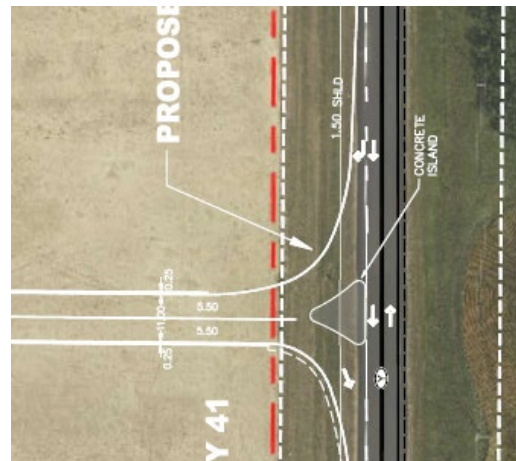
Construct new Type IVb Intersection at **23 Avenue & Highway 41**, including:

1. Traffic signal not required
2. Lighting requirement to be determined at planning and design stage.
3. Re-align field access east of Highway 41
4. Timeline for this intersection is between 10 and 20 years, or when the 23 Street or 27 Street intersections are approaching capacity (i.e. long delay and queues)

Existing Layout - 17 Ave & Hwy 41



Proposed Layout - 17 Ave & Hwy 41



Construct new right-in/right-out (RI/RO) Access at **17 Avenue & Highway 41**, including:

1. Traffic signal not required
2. Timeline for this RI/RO Access is between 10 and 20 years, or when the 23 Street or 27 Street intersections are approaching capacity (i.e. long delay and queues)

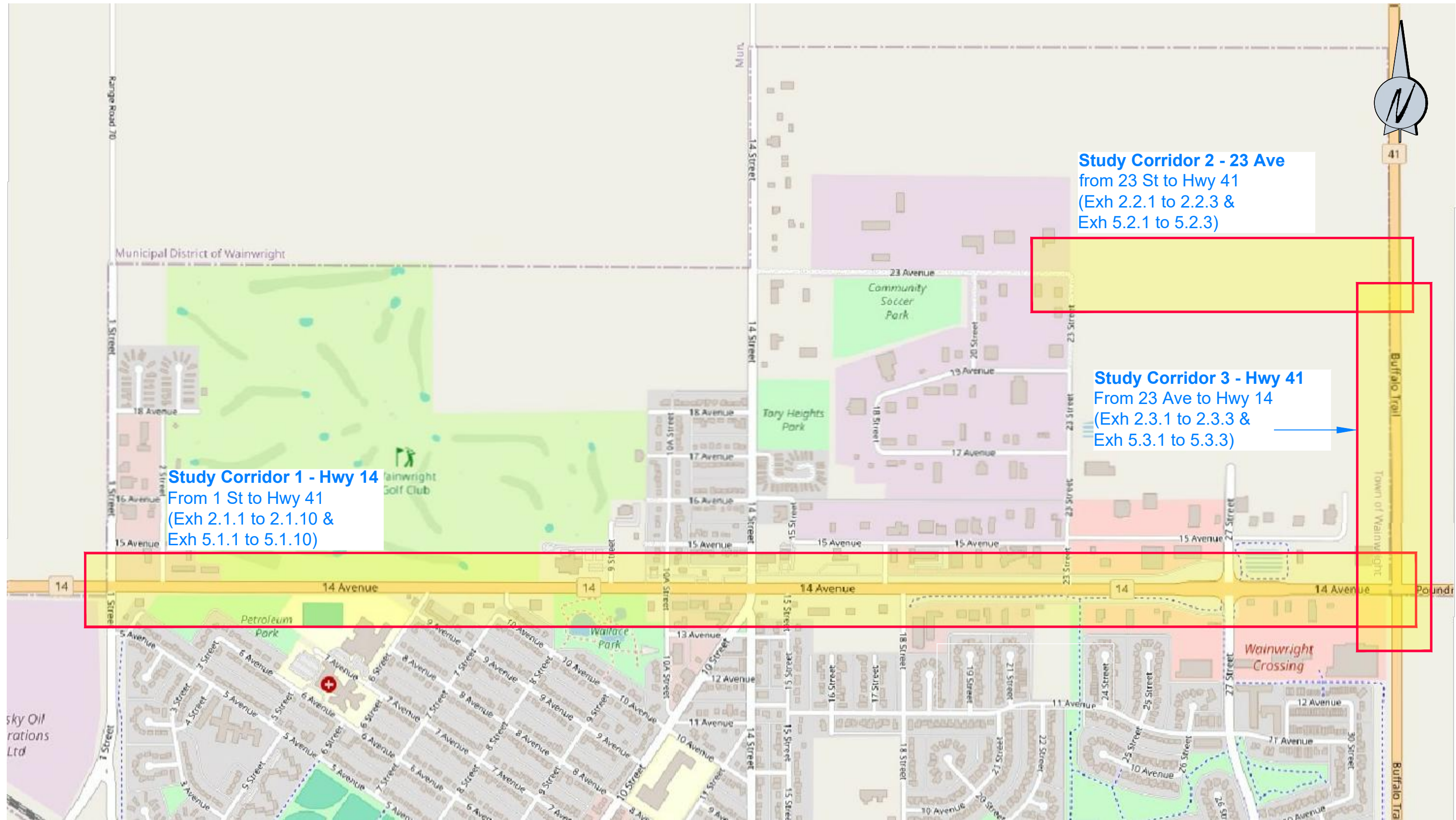
5.5 ADDITIONAL COMMENTS RELATED TO OVERLAYING FOR HIGHWAY 14

The overall pavement width will be reduced with the overlay (refer to 3R/4R calculations). As a result, to achieve the 1.5m shoulder width in the TWLTL option, or to provide even wider shoulders, additional widening will need to be considered.



Appendix A

Exhibit 1 – Study Corridors



Study Corridor 1 - Hwy 14
From 1 St to Hwy 41
(Exh 2.1.1 to 2.1.10 &
Exh 5.1.1 to 5.1.10)

Study Corridor 2 - 23 Ave
from 23 St to Hwy 41
(Exh 2.2.1 to 2.2.3 &
Exh 5.2.1 to 5.2.3)

Study Corridor 3 - Hwy 41
From 23 Ave to Hwy 14
(Exh 2.3.1 to 2.3.3 &
Exh 5.3.1 to 5.3.3)



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LEGEND:

NOTES:

SCALE:

EXHIBIT NO: **1.1**

WAINWRIGHT TRAFFIC STUDY
Study Area / Study Corridors



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Appendix B

Chapter 2 Exhibits



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - ACCESS NUMBER
 - WOOD POLE
 - STREETLIGHT

NOTES:
1. Lane markings shown were prepared using a high definition aerial photo. Survey was not carried out.

SCALE: (NOTE 1)
0 10 20 30
1:1000

EXHIBIT NO: **2.1.1**





WAINWRIGHT TRAFFIC STUDY

Study Corridor 1
Hwy 14 from 1 St to Petroleum Park
(Sta. 1+000 to Sta. 1+350)



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LEGEND:

-  EXISTING LANE CONFIGURATION
-  ACCESS NUMBER
-  WOOD POLE
-  STREETLIGHT

NOTES:

1. Lane markings shown were prepared using a high definition aerial photo. Survey was not carried out.

SCALE: (NOTE 1)



EXHIBIT NO:

2.1.2

WAINWRIGHT TRAFFIC STUDY





Study Corridor 1

Hwy 14 from Petroleum Park to
Wainwright High School
(Sta. 1+350 to Sta. 1+700)



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LEGEND:

-  EXISTING LANE CONFIGURATION
-  ACCESS NUMBER
-  WOOD POLE
-  STREETLIGHT

NOTES:

- Lane markings shown were prepared using a high definition aerial photo. Survey was not carried out.

SCALE: (NOTE 1)



EXHIBIT NO:

2.1.3

WAINWRIGHT TRAFFIC STUDY

Study Corridor 1
Hwy 14 from Wainwright High School
to Boston Pizza
(Sta. 1+700 to Sta. 2+050)



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - ACCESS NUMBER
 - WOOD POLE
 - STREETLIGHT

NOTES:
1. Lane markings shown were prepared using a high definition aerial photo.
Survey was not carried out.

SCALE: (NOTE 1)
0 10 20 30
1:1000

EXHIBIT NO: **2.1.4**

WAINWRIGHT TRAFFIC STUDY

Study Corridor 1
Hwy 14 from Boston Pizza to 9 Street
(Sta. 2+050 to Sta. 2+400)



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - ACCESS NUMBER
 - WOOD POLE
 - STREETLIGHT

NOTES:
1. Lane markings shown were prepared using a high definition aerial photo.
Survey was not carried out.

SCALE: (NOTE 1)
0 10 20 30
1:1000

EXHIBIT NO: 2.1.5

WAINWRIGHT TRAFFIC STUDY

Study Corridor 1
Hwy 14 from 9 Street to 14 Street
(Sta. 2+400 to Sta. 2+700)



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - ACCESS NUMBER
 - WOOD POLE
 - STREETLIGHT

NOTES:
1. Lane markings shown were prepared using a high definition aerial photo.
Survey was not carried out.

SCALE: (NOTE 1)
0 10 20 30
1:1000
EXHIBIT NO: **2.1.6**

WAINWRIGHT TRAFFIC STUDY
Study Corridor 1
Hwy 14 from 14 Street to
Wainwright Seed Cleaning Plant
(Sta. 2+700 to Sta. 3+050)



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - ACCESS NUMBER
 - WOOD POLE
 - STREETLIGHT

NOTES:
1. Lane markings shown were prepared using a high definition aerial photo.
Survey was not carried out.

SCALE: (NOTE 1)
0 10 20 30
1:1000

EXHIBIT NO: **2.1.7**

WAINWRIGHT TRAFFIC STUDY
Study Corridor 1
Hwy 14 from Wainwright Seed Cleaning
Plant to Waintel Studio Motel
(Sta. 3+050 to Sta. 3+400)



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - ACCESS NUMBER
 - WOOD POLE
 - STREETLIGHT

NOTES:
1. Lane markings shown were prepared using a high definition aerial photo.
Survey was not carried out.

SCALE: (NOTE 1)
0 10 20 30
1:1000

EXHIBIT NO: 2.1.8

WAINWRIGHT TRAFFIC STUDY
Study Corridor 1
Hwy 14 from Waitel Studio Motel to
Paul's Trailer & Truck Outfitter
(Sta. 3+400 to Sta. 3+750)



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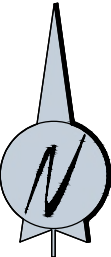
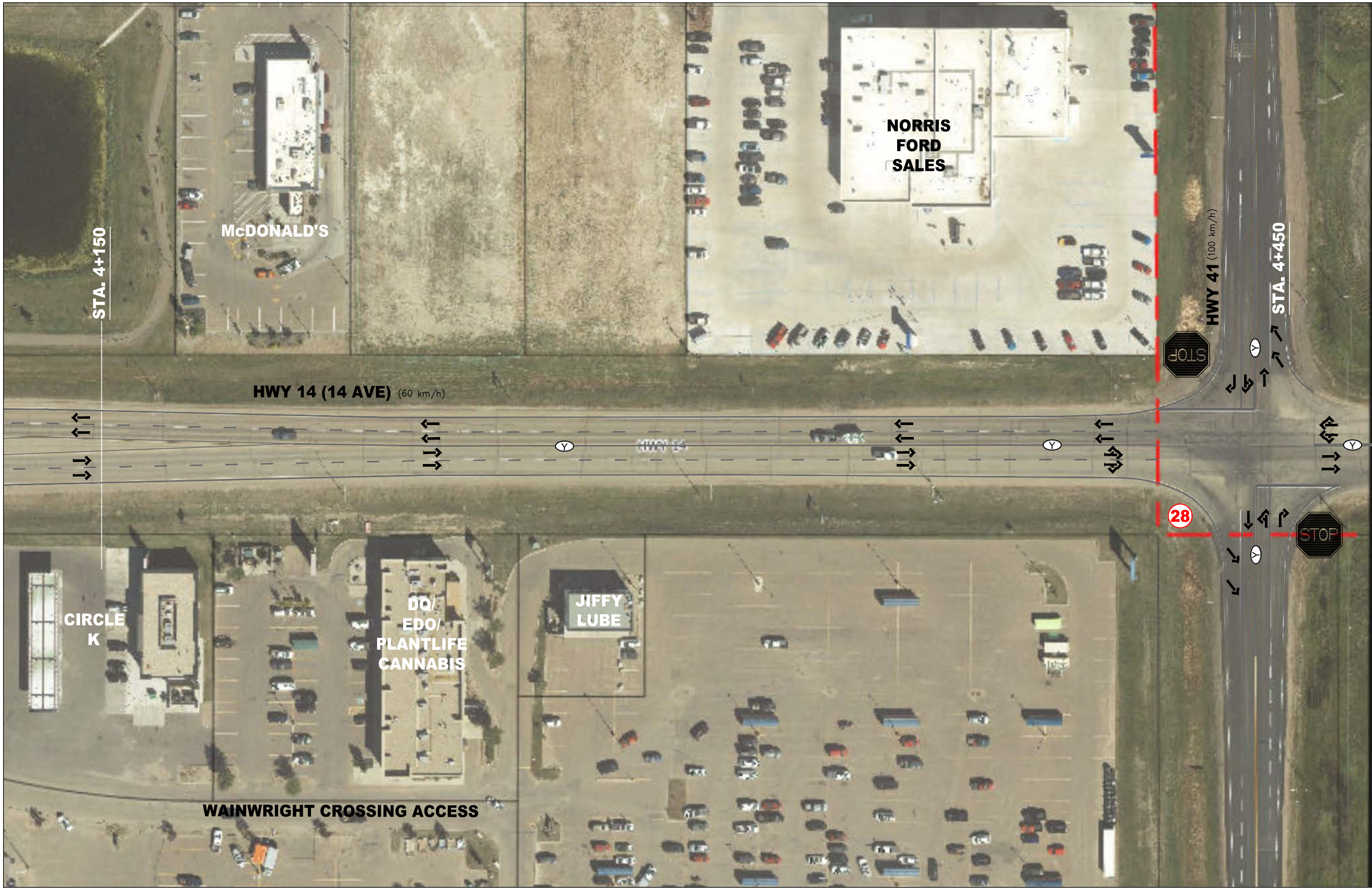
- LEGEND:**
- EXISTING LANE CONFIGURATION
 - ACCESS NUMBER
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:
1. Lane markings shown were prepared using a high definition aerial photo.
Survey was not carried out.

SCALE: (NOTE 1)
0 10 20 30
1:1000

EXHIBIT NO: 2.1.9

WAINWRIGHT TRAFFIC STUDY
Study Corridor 1
Hwy 14 from Moonlight Bay Brewing
to Circle K
(Sta. 3+750 to Sta. 4+150)



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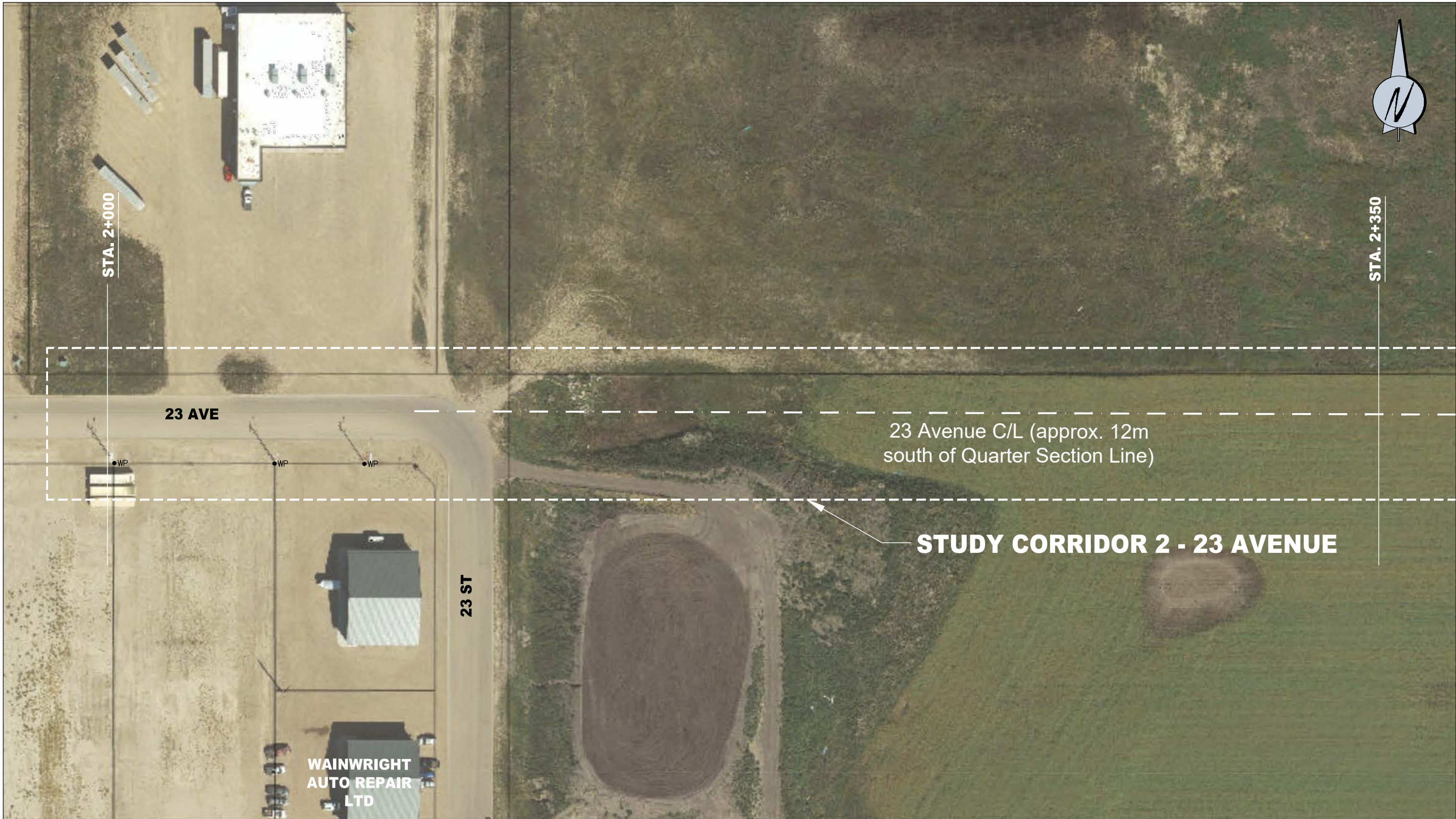
- LEGEND:**
- EXISTING LANE CONFIGURATION
 - ACCESS NUMBER
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:
1. Lane markings shown were prepared using a high definition aerial photo.
Survey was not carried out.

SCALE: (NOTE 1)
0 10 20 30
1:1000

EXHIBIT NO: **2.1.10**

WAINWRIGHT TRAFFIC STUDY
Study Corridor 1
Hwy 14 from Circle K to Hwy 41
(Sta. 4+150 to 4+450)



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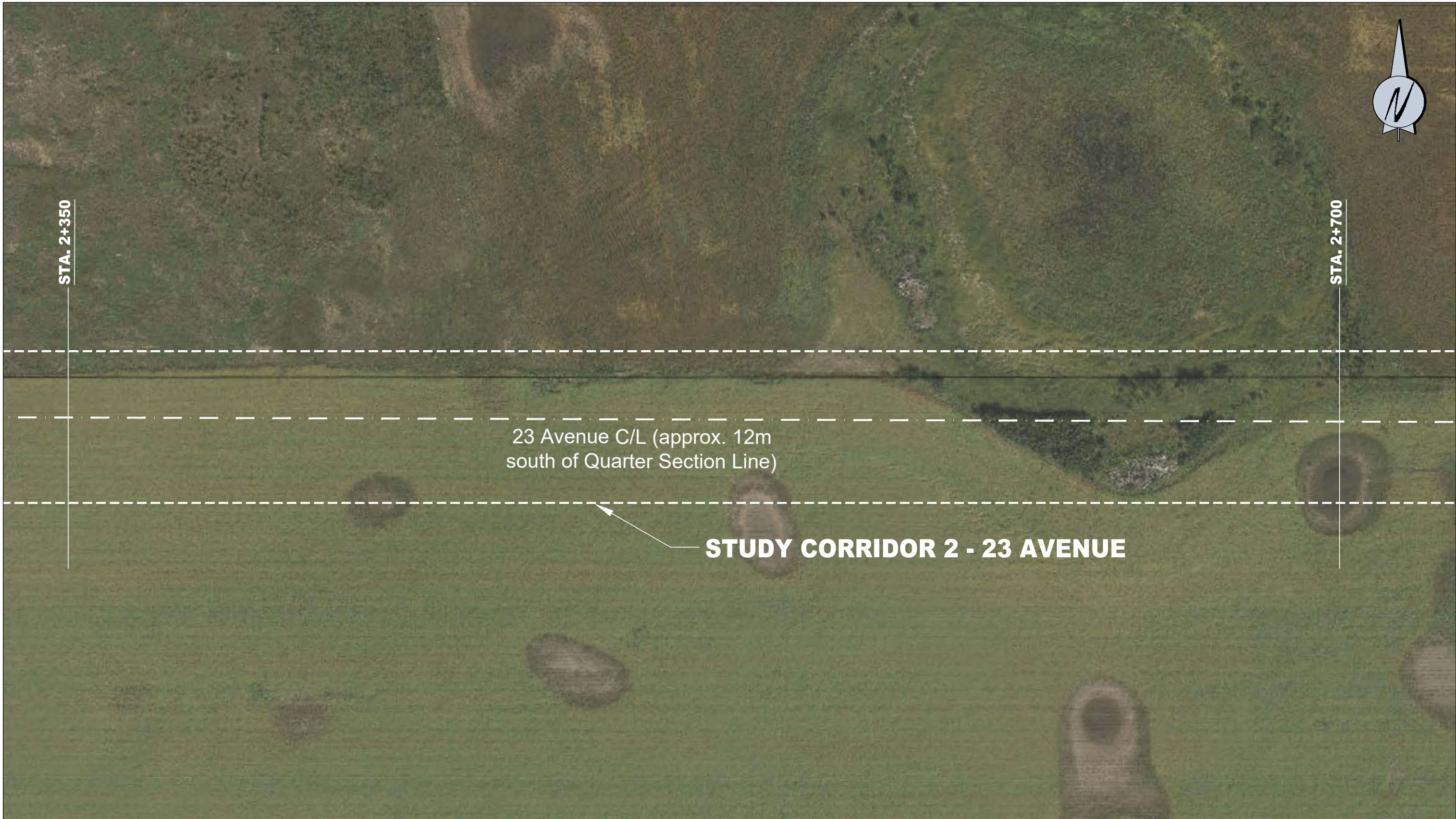
- LEGEND:**
- EXISTING LANE CONFIGURATION
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:

SCALE:
1:1000

EXHIBIT NO: 2.2.1

WAINWRIGHT TRAFFIC STUDY
Study Corridor 2
23 Ave from 100m West of 23 St
to 250m East of 23 St
(Sta. 2+000 to 2+350)



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LEGEND:

-  EXISTING LANE CONFIGURATION
- WP WOOD POLE
- SL STREETLIGHT

NOTES:

SCALE:

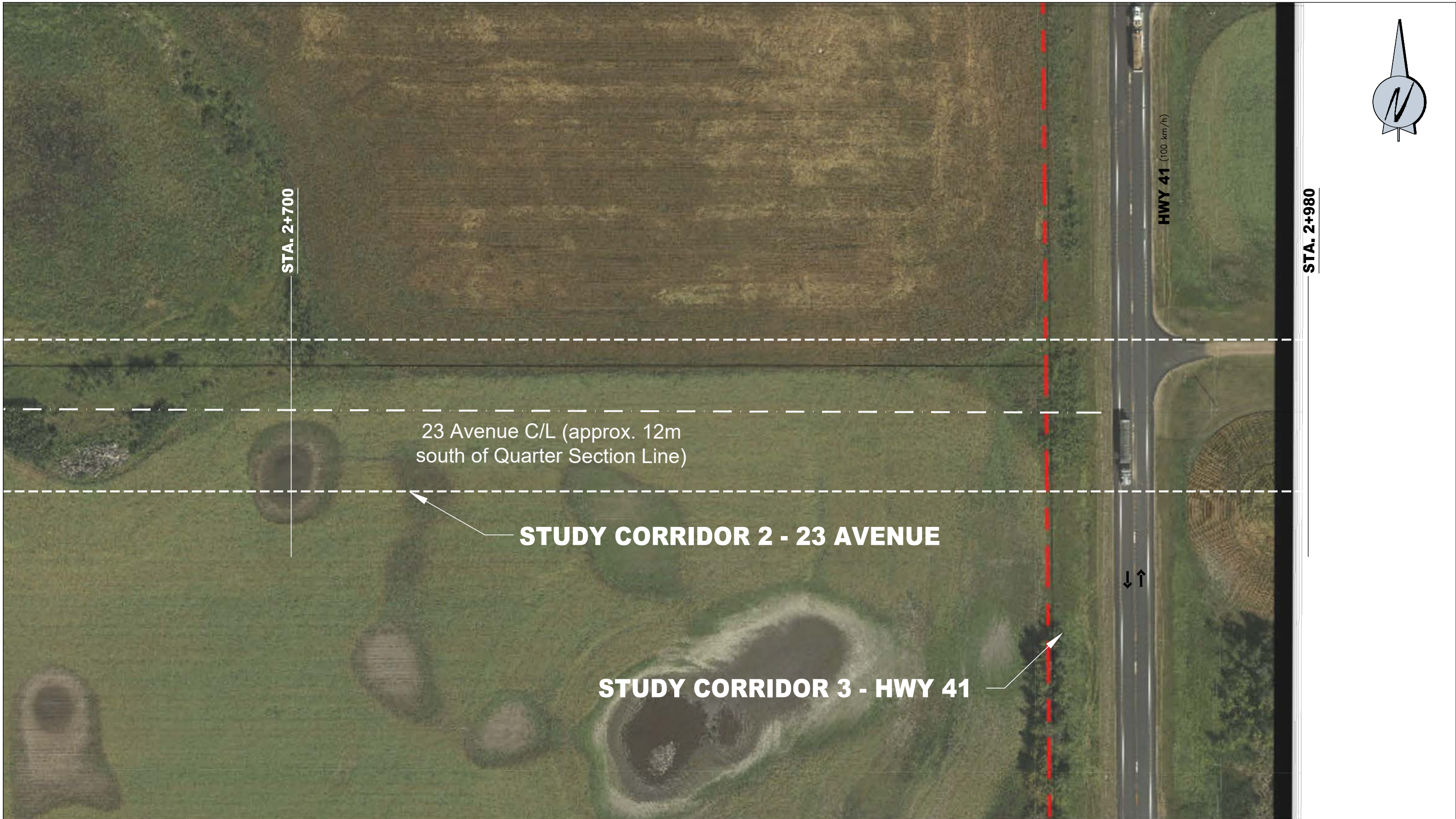


EXHIBIT NO:

2.2.2

WAINWRIGHT TRAFFIC STUDY

Study Corridor 2
23 Ave from 250m East of 23 St
to 600m East of 23 St
(Sta. 2+350 to 2+700)



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:

SCALE:
1:1000
0 10 20 30
EXHIBIT NO: 2.2.3

WAINWRIGHT TRAFFIC STUDY
Study Corridor 2
23 Ave from 600m East of 23 St
to 43m East of Hwy 41
(Sta. 2+700 to 2+980)



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - WP WOOD POLE
 - SL STREETLIGHT

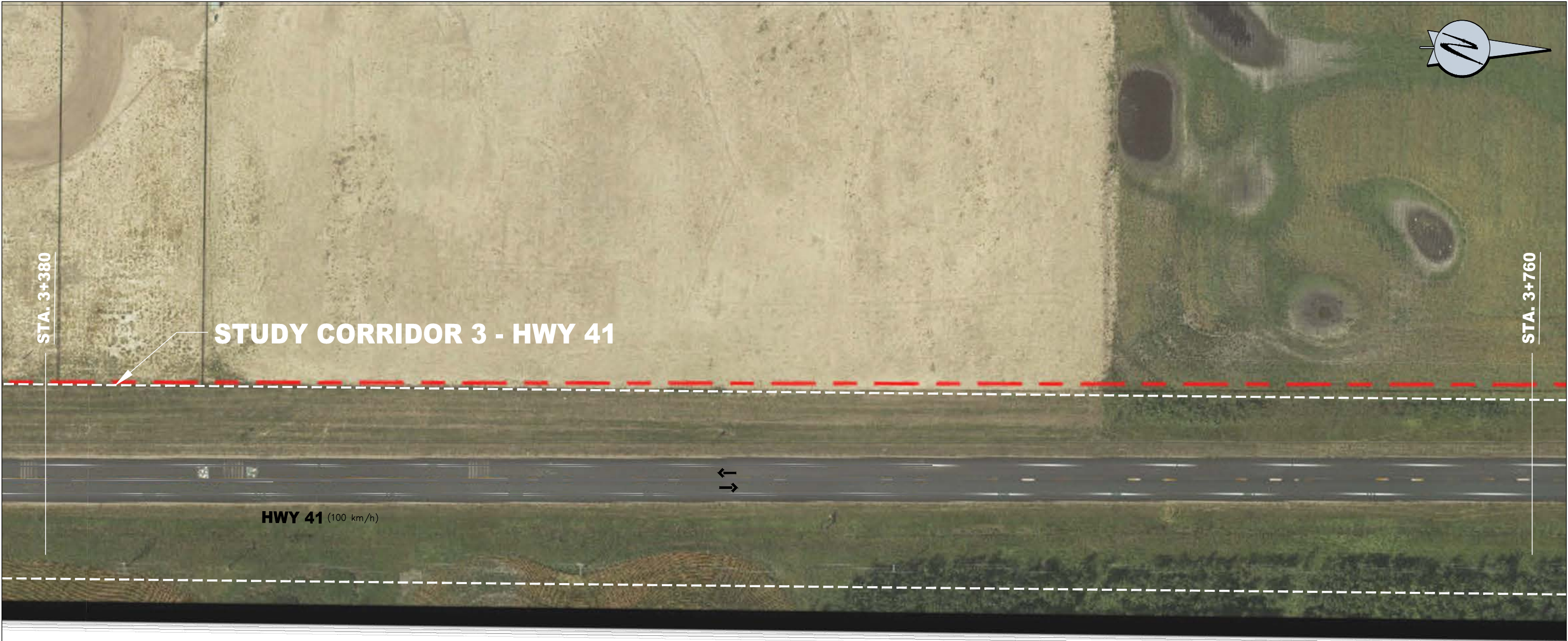
NOTES:

SCALE:


0 10 20 30
1:1000

EXHIBIT NO: 2.3.1

WAINWRIGHT TRAFFIC STUDY
Study Corridor 3
Hwy 41 from 180m South of
Hwy 14 to 200m north of Hwy 14
(Sta. 3+000 to 3+380)



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- LEGEND:**
-  EXISTING LANE CONFIGURATION
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:

SCALE:

0 10 20 30


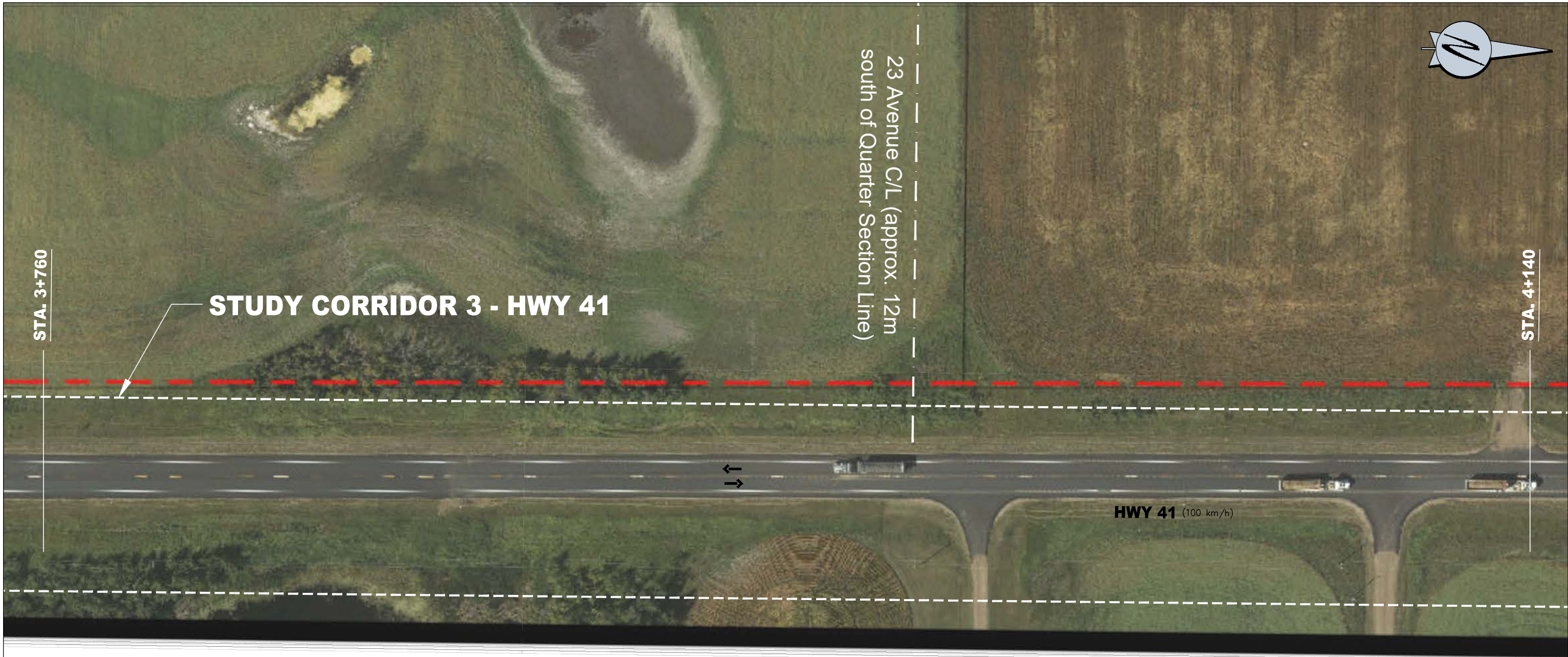
1:1000 

EXHIBIT NO: 2.3.2

WAINWRIGHT TRAFFIC STUDY

Study Corridor 3
Hwy 41 from 200m North of
Hwy 14 to 580m north of Hwy 14
(Sta. 3+380 to 3+700)



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- LEGEND:**
- EXISTING LANE CONFIGURATION
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:

SCALE:

0 10 20 30
1:1000

EXHIBIT NO: 2.3.3

WAINWRIGHT TRAFFIC STUDY
Study Corridor 3
Hwy 41 from 200m North of
Hwy 14 to 580m north of Hwy 14
(Sta. 3+700 to 4+140)

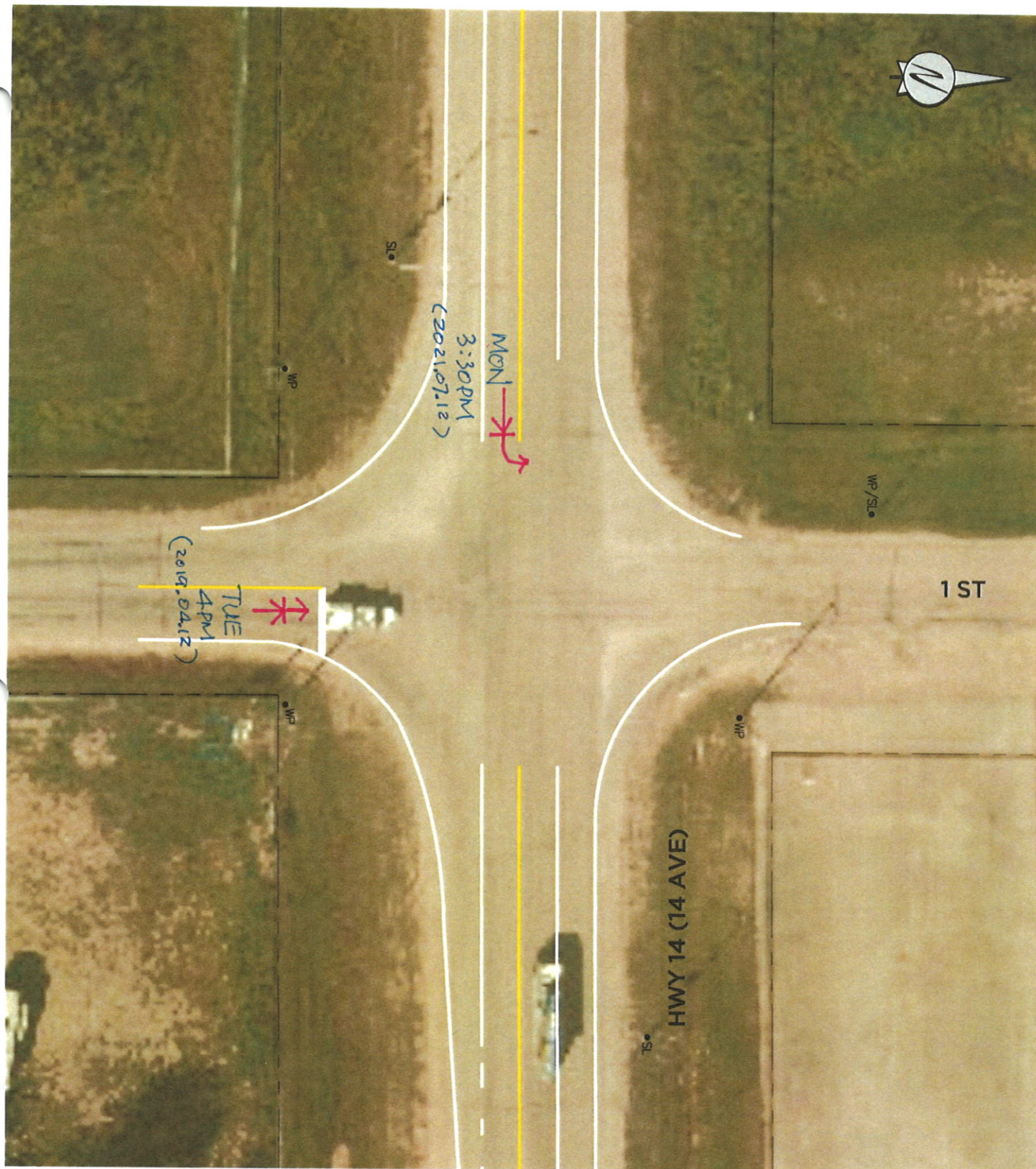


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Appendix C

Collision Records and Diagrams



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TOWN OF WAINWRIGHT
TRAFFIC IMPACT ASSESSMENT
HIGHWAY 14 (14 AVENUE)
COLLISION DIAGRAM
1st STREET

(2019-2023)

TOTAL: 2 COLLISIONS



0 5 10 15 20 25
1:500



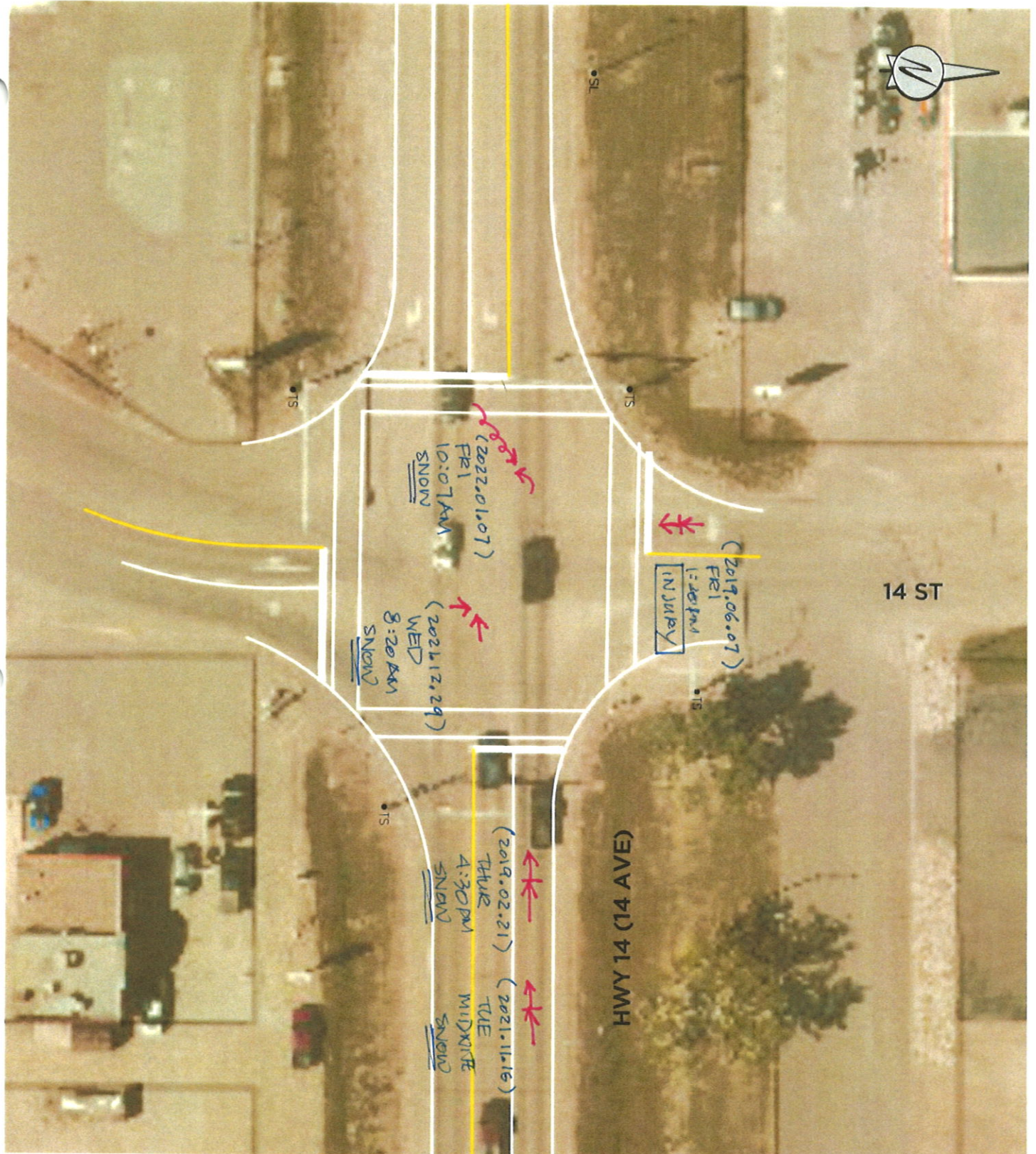
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TOWN OF WAINWRIGHT
TRAFFIC IMPACT ASSESSMENT
HIGHWAY 14 (14 AVENUE)
COLLISION DIAGRAM
6th STREET

(2019-2023)

TOTAL = 2 COLLISIONS



0 5 10 15 20 25
1:500



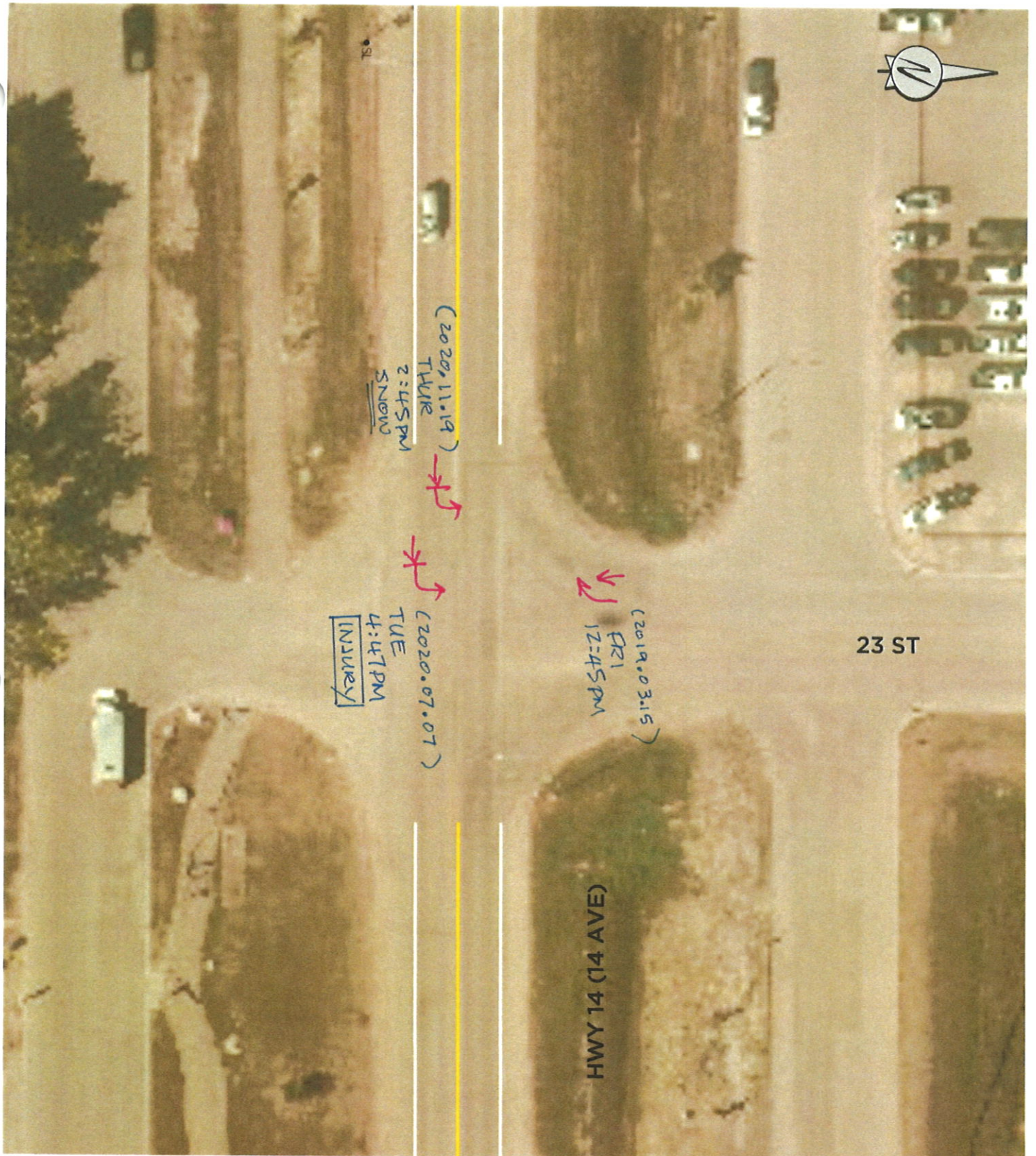
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TOWN OF WAINWRIGHT
TRAFFIC IMPACT ASSESSMENT
HIGHWAY 14 (14 AVENUE)
COLLISION DIAGRAM
14th STREET

(2019-2023)

TOTAL : 5 COLLISIONS



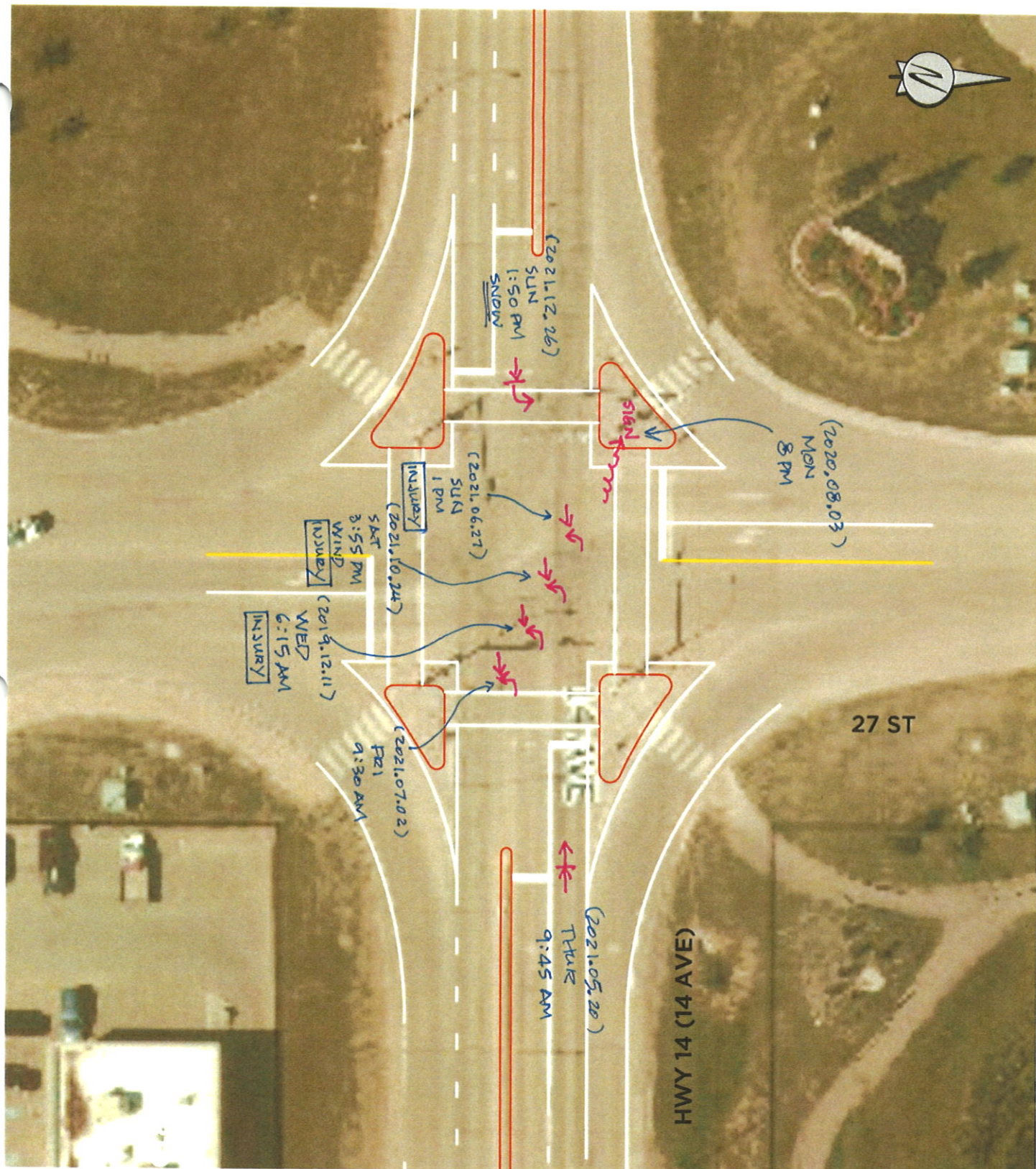
Invistec Consulting Ltd.

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TOWN OF WAINWRIGHT
TRAFFIC IMPACT ASSESSMENT
HIGHWAY 14 (14 AVENUE)
COLLISION DIAGRAM
23rd STREET

(2019-2023)

TOTAL: 3 COLLISIONS



0 5 10 15 20 25
1:500

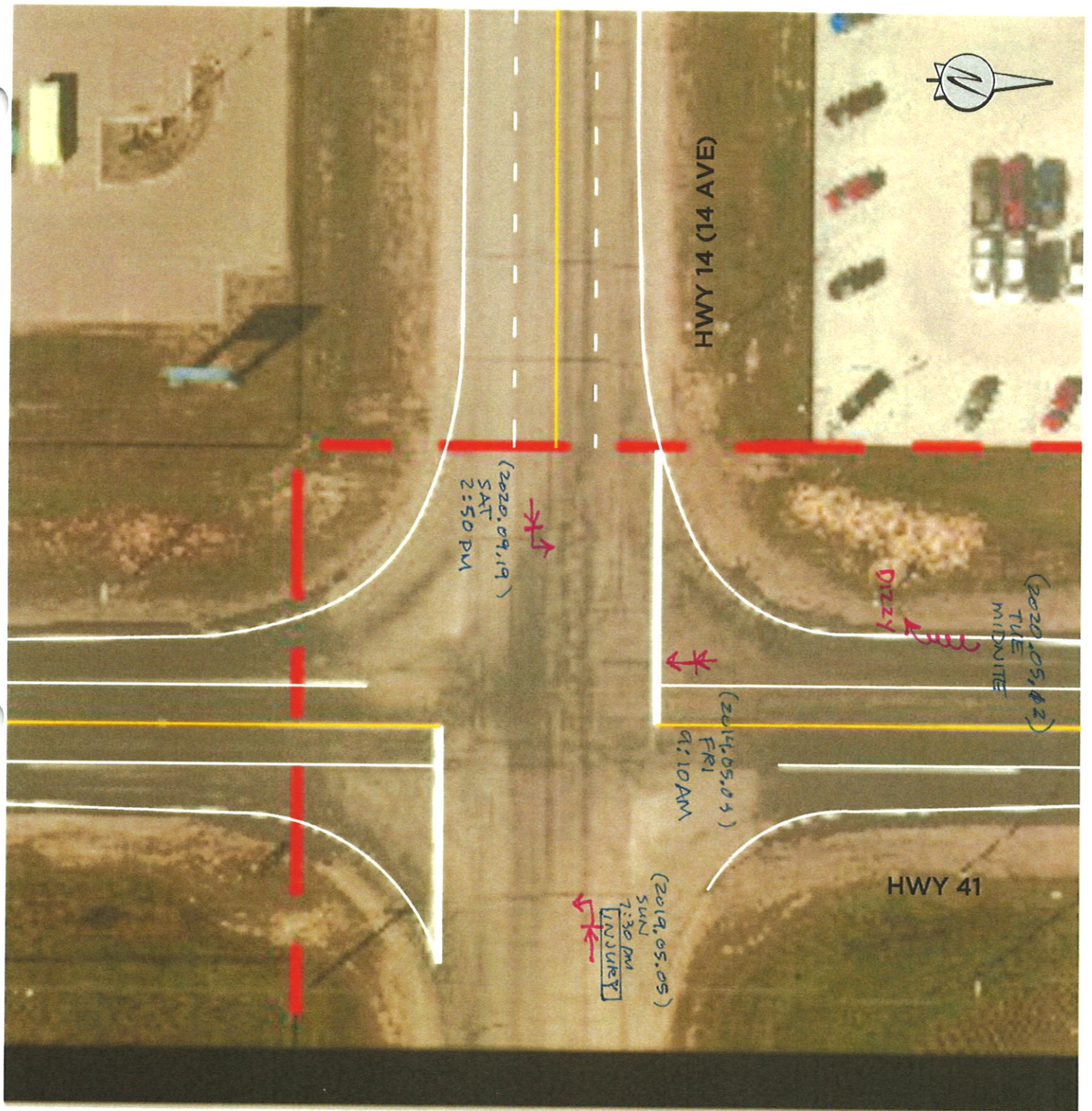


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TOWN OF WAINWRIGHT
TRAFFIC IMPACT ASSESSMENT
HIGHWAY 14 (14 AVENUE)
COLLISION DIAGRAM
27th STREET

(2019-2023)

TOTAL: 7 COLLISIONS



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10130 - 103 Street, 17th Floor
Edmonton Alberta, T5J 3N9
780-984 - 1816
www.invistec.ca

TOWN OF WAINWRIGHT
TRAFFIC IMPACT ASSESSMENT
HIGHWAY 14 (14 AVENUE)
COLLISION DIAGRAM
HIGHWAY 41

(2019-2023)

TOTAL: 4 COLLISIONS

Collisions between 2019 and 2023* - Sorted by Date

#	Year	KM_POST	X-St	Date	Time	Environ Conditions	Surface Conditions	Severity	COLLISION_DESCRIPTION
1	2019	42.072	14 St	2019.02.21	4:30 PM	Clear	Slush/ Snow/ Ice	PDO	Driver 1 stopped at red lights on Highway 14 and 10 Street (14 Street) when vehicle 2 pulled up behind vehicle 1 and stopped. A 3rd vehicle coming up behind vehicle 2 slid on ice and ran into the back of vehicle 2 which hit the back of vehicle 1. Damage to vehicle 1 and 2. No damage to vehicle 3.
2	2019	42.876	23 St	2019.03.15	12:45 PM	Clear	Dry	PDO	Vehicle 1 southbound on 23 Street stopped at Highway 14 to turn right to go westbound on Highway 14. Vehicle 2 pulled into the space to the right of the stopped semi thinking he was going straight, when Vehicle 1 started to turn right and damaged the drivers side of the vehicle.
3	2019	40.445	1 St	2019.04.02	4:00 PM	Clear	Dry	PDO	Driver 1 was stopped at the intersection of 1 Street and Highway 14 when Driver 2 pulled up and stopped behind Driver 1. Driver 2 thought the first vehicle had started to move and struck the back of the vehicle causing damage.
4	2019	39.582	Hwy 41	2019.05.03	9:10 AM	Clear	Dry	PDO	D1 was stopped at the stop sign at Highway 41 and 14 when D2 pulled up behind vehicle and stopped. D2 thought other vehicle was proceeding to turn and started moving and struck the back of D1.
5	2020	43.689	Hwy 41	2019.05.05	7:30 PM	Clear	Dry	Injury	Object #1 travelling East on Hwy #14 approaching Hwy #41 . Object hand signalled to turn right, South onto Hwy 41. Object #2 travelling behind Object #1, did not see the hand signal and him turn, striking the back of Object #1.
6	2019	42.082	14 St	2019.06.07	1:20 PM	Clear	Dry	Injury	Driver 1 reported she was stopped facing South waiting for a truck to pass when she was struck from behind by Driver 2 causing damage to her vehicle.
7	2019	41.256	6 St	2019.09.20	1:00 PM	Clear	Dry	PDO	Driver 1 travelling westbound on Highway 14 to turn left on to 6 Street when Driver 2 was stopped at the stop sign to turn left on to Highway 14 when the vehicles struck. Driver 1 front drivers side tire with Driver 2 front drivers side.
8	2019	43.294	27 St	2019.12.11	6:15 AM	Clear	Dry	Injury	Object 1 WB, turning left SB in the path of EB Object 2, causing collision
9	2020	43.718	Hwy 41	2020.05.12	0:20 AM	Clear	Dry	PDO	Driver 1, driving Southbound on Highway 41 near Wainwright. Driver felt dizzy, and rolled semi into Westbound ditch.
10	2020	42.875	23 St	2020.07.07	4:47 PM	Clear	Dry	Injury	Driver 1 was stopped at the intersection of Highway 14 and 23 Street to turn left onto 23 Street when Driver 2 ran into the back of the SUV causing damage.
11	2020	43.298	27 St	2020.08.03	8:00 PM	Clear	Dry	PDO	Vehicle travelling west bound on highway 14 entering into Wainwright at the intersection of 27 street . Vehicle was too far over to the right side of his driving lane and went onto the median colliding with the "Stop Line" sign and destroying the sign/pole.
12	2920	41.882	Hwy 41	2020.09.19	2:50 PM	Clear	Dry	PDO	Driver 1 stopped behind another vehicle turning north off of Highway 14 when she was rear ended by Driver 2 causing damage to both vehicles.
13	2020	42.876	23 St	2020.11.19	2:45 PM	Snow	Slush/ Snow/ Ice	PDO	Driver 1 was turning North onto 23rd Street and slid into Object 1 because of the icy road conditions at the time.
14	2020	41.255	6 St	2020.11.20	2:00 PM	Clear	Slush/ Snow/ Ice	PDO	Vehicle 1 travelling West on Highway 14, slowed down to turn South onto 6 Street . Vehicle 2 travelling West on Highway 14 noticed Vehicle 1 slow down quickly to turn. Vehicle 2 tried to stop but slid on Highway into the back of Vehicle 1.
15	2021	43.3	27 St	2021.05.20	9:45 AM	Clear	Dry	PDO	Driver 1 stopped at intersection at a Red light. Driver 2 rear ended Driver 1.
16	2021	43.295	27 St	2021.07.02	9:30 AM	Clear	Dry	PDO	Object # 1 travelling East on Hwy #14 entering intersection. Object #2 travelling West on Hwy #14 and turned south (left) in front of Object #1 causing Object #1 to strike the front passengers side of Object #2.

Collisions between 2019 and 2023* - Sorted by Date

#	Year	KM_POST	X-St	Date	Time	Environ Conditions	Surface Conditions	Severity	COLLISION_DESCRIPTION
17	2021	40.44	1 St	2021.07.12	3:30 PM	Clear	Dry	PDO	D1 travelling eastbound on Highway 14 to turn left (north) onto 1 street when D2 who was following a red SUV behind D1, SUV swerved over to the right lane and D2 didn't see that D1 was turning left and tried to avoid hitting him but just got the back corner of trailer causing damage. Minor Damage to the Trailer which has been fixed. Damage Sticker issued to Kenlar. . NFAR CH
18	2021	43.291	27 St	2021.10.24	3:55 PM	High Wind	Dry	Injury	V1 travelling east bound on highway 14 at the intersection of 27 street . V1 turned left across the path of the oncoming V2 who was going eastbound on highway 14. Both vehicles had green lights but V1 proceeded to turn before it was safe to do so. V2 swerved to avoid collision with V1 but clipped the rear bumper.
19	2021	42.07	14 St	2021.11.16	0:00 AM	Snow	Slush/ Snow/ Ice	PDO	subject 1 driving a white car hit subject 2 driving a silver truck in intersection. Subject 1 did not stop at the intersection when traffic control lights were not functioning. Subject 1 did not slow down, yield or stop causing subject 2 to get hit in the intersection.
20	2021	43.292	27 St	2021.12.26	1:50 PM	Clear	Slush/ Snow/ Ice	PDO	MOTLEY was stopped at a red light on Highway 14 waiting to turn left onto 27 Street when BAYER came up behind him and due to the ice on the road BAYER was not able to stop and struck the back of the vehicle trailer hitch.
21	2021	42.071	14 St	2021.12.29	8:20 AM	Clear	Slush/ Snow/ Ice	PDO	Two vehicle MVC at Highway 14 and 10 Street (14 Street). BORGES travelling westbound on Highway 14 when NICHOLSON travelling northbound on 10th Street entered the intersection with a red light and struck BORGES vehicle. BORGES vehicle ended up in the north ditch close to Fas Gas. No injuries. Both vehicles towed. CN arranged their own tow.
22	2021	43.291	27 St	2021/06.27	1:00 PM	Clear	Dry	Injury	V1 travelling eastbound on hwy 14 going through the intersection at 27 street in Wainwright. V2 was going westbound on hwy 14 and turned to go southbound right in front of V1. V1 had no time to react and collided with V2. V1 travelling 60-65 km/h just prior to impact. Light was green when vehicles approached intersection and it turned yellow the moment before impact.
23	2022	42.072	14 St	2022.01.07	10:07 AM	Clear	Slush/ Snow/ Ice	PDO	Vehicle 1 travelling North on 10 Street (14 Street) approaching lights at intersection, light turned as Vehicle 1 was going through. Vehicle 1 tried to speed up to get through intersection and started to slide. Vehicle 2 was stopped at the light waiting to turn South onto 10 Street. Vehicle 1 slid into the front driver side of Vehicle 2 causing damage to both vehicles.

*2023 data is preliminary as of 2024-07-03.

Locations are selected based on the following highway control section setup

1) plot.HIGHWAY = '14' AND Control_Section = 14 AND KM_POST BETWEEN 40.410 AND 43.72

or 2) plot.HIGHWAY = '41' AND Control_Section = 16 AND KM_POST BETWEEN 37.936 AND 39.68



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Appendix D

Intersection Traffic Counts (2022 & 2023)

TEC Traffic Counts - 2023 AM 100th Highest Hour Estimates (10a St, 15 St & Hwy 41 are 2022 data)

<div> <div>0 10 12</div> <div>8 ↗ 114 → 90 ↘</div> <div> <div>↖ 20</div> <div>Hwy 14 & 1 St</div> <div>↖ 98</div> </div> <div> <div>↖ 147</div> <div>V₁₀₀ - AM</div> <div>↖ 12 29 74</div> </div> </div>	<div> <div>4 2 7</div> <div>9 ↗ 329 → 16 ↘</div> <div> <div>↖ 4</div> <div>Hwy 14 & 10a St</div> <div>↖ 282</div> </div> <div> <div>↖ 8</div> <div>V₁₀₀ - AM</div> <div>↖ 8 3 5</div> </div> </div>	<div> <div>21 37 21</div> <div>11 ↗ 273 → 21 ↘</div> <div> <div>↖ 21</div> <div>Hwy 14 & 14 St</div> <div>↖ 347</div> </div> <div> <div>↖ 189</div> <div>V₁₀₀ - AM</div> <div>↖ 42 26 189</div> </div> </div>	<div> <div></div> <div>415 → 3 ↘</div> <div> <div></div> <div>Hwy 14 & 15 St</div> <div>↖ 493</div> </div> <div> <div>↖ 45</div> <div>V₁₀₀ - AM</div> <div>↖ 5 22</div> </div> </div>	<div> <div>14 14 5</div> <div>38 ↗ 379 → 52 ↘</div> <div> <div>↖ 9</div> <div>Hwy 14 & 18 St</div> <div>↖ 483</div> </div> <div> <div>↖ 14</div> <div>V₁₀₀ - AM</div> <div>↖ 38 9 38</div> </div> </div>	<div> <div>49 15 34</div> <div>103 ↗ 324 → 34 ↘</div> <div> <div>↖ 54</div> <div>Hwy 14 & 23 St</div> <div>↖ 432</div> </div> <div> <div>↖ 10</div> <div>V₁₀₀ - AM</div> <div>↖ 10 15 10</div> </div> </div>	<div> <div>97 97 23</div> <div>84 ↗ 69 → 102 ↘</div> <div> <div>↖ 60</div> <div>Hwy 14 & 27 St</div> <div>↖ 254</div> </div> <div> <div>↖ 83</div> <div>V₁₀₀ - AM</div> <div>↖ 236 139 56</div> </div> </div>	<div> <div>61 17 3</div> <div>57 ↗ 122 → 69 ↘</div> <div> <div>↖ 6</div> <div>Hwy 14 & Hwy 41</div> <div>↖ 141</div> </div> <div> <div>↖ 6</div> <div>V₁₀₀ - AM</div> <div>↖ 62 17 13</div> </div> </div>
2023 Raw Data Σ 614	2022 Raw Data Σ 677	2023 Raw Data Σ 1198	2022 Raw Data Σ 983	2023 Raw Data Σ 1093	2023 Raw Data Σ 1090	2023 Raw Data Σ 1300	2022 Raw Data Σ 574

TEC Traffic Counts - 2023 PM 100th Highest Hour Estimates (10a St, 15 St & Hwy 41 are 2022 data)

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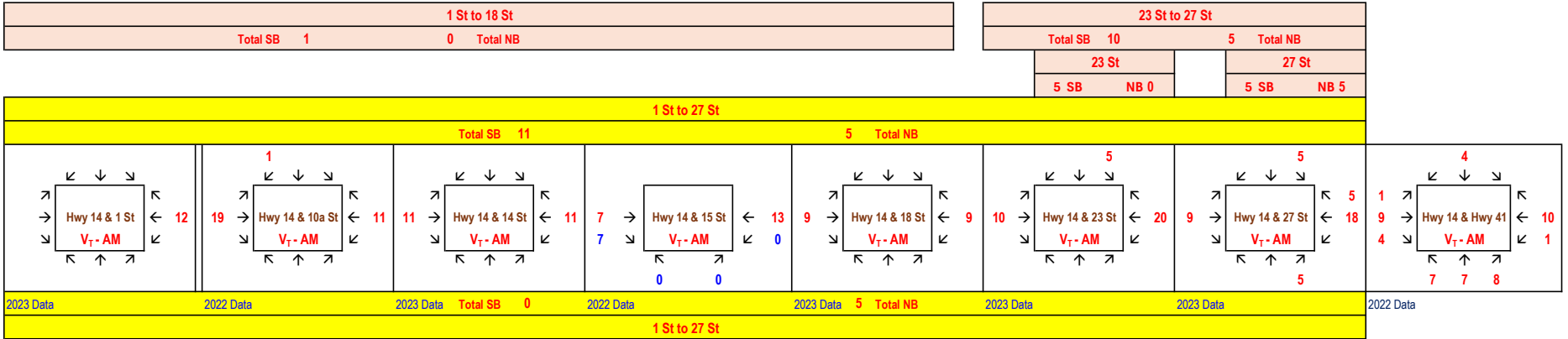
TEC Traffic Counts - 2023 AM 100th Highest Hour Estimates (10a St, 15 St & Hwy 41 are 2022 data) - Adjusted for closure of N Leg @ 18 ST & S Leg @ 23 St

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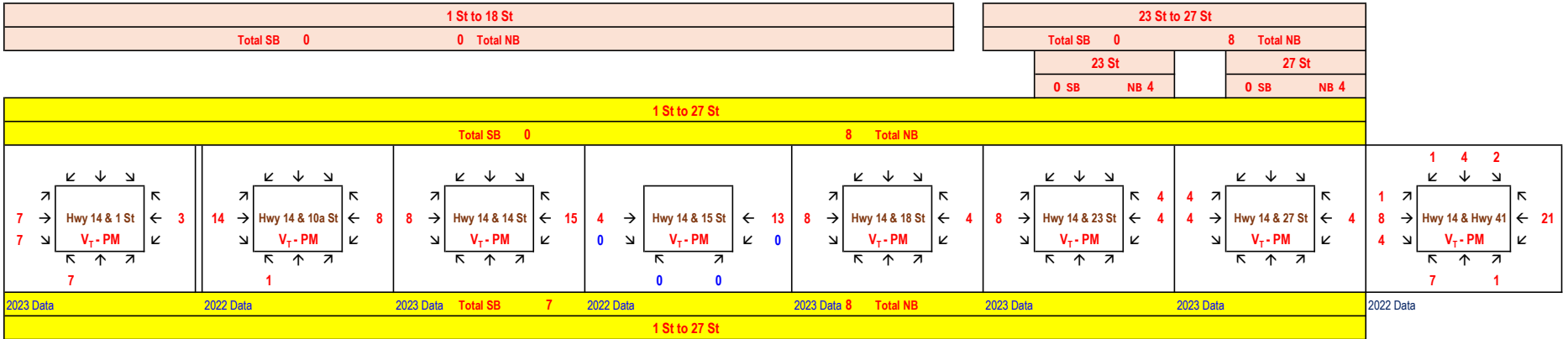
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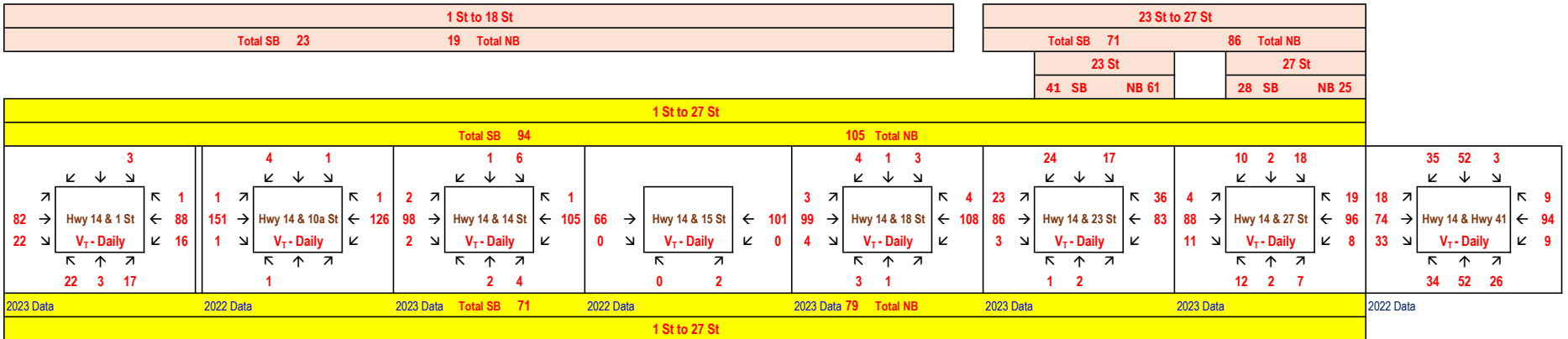
TEC Traffic Counts - 2023 AM 100th Highest Hour - Tractor Trailer Volumes (10a St, 15 St & Hwy 41 are 2022 data)



TEC Traffic Counts - 2023 PM 100th Highest Hour - Tractor Trailer Volumes (10a St, 15 St & Hwy 41 are 2022 data)



TEC Traffic Counts - Daily Tractor Trailer Volumes



Reference Number:
997167

Intersection of:
14 & RGE RD 70 1 ST, WAINWRIGHT

North On: 1 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	89	100.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	0	0.0%
		AM	89

From North			
32			
	Right	Thru	Left
	0	20	12
A	0	20	12
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

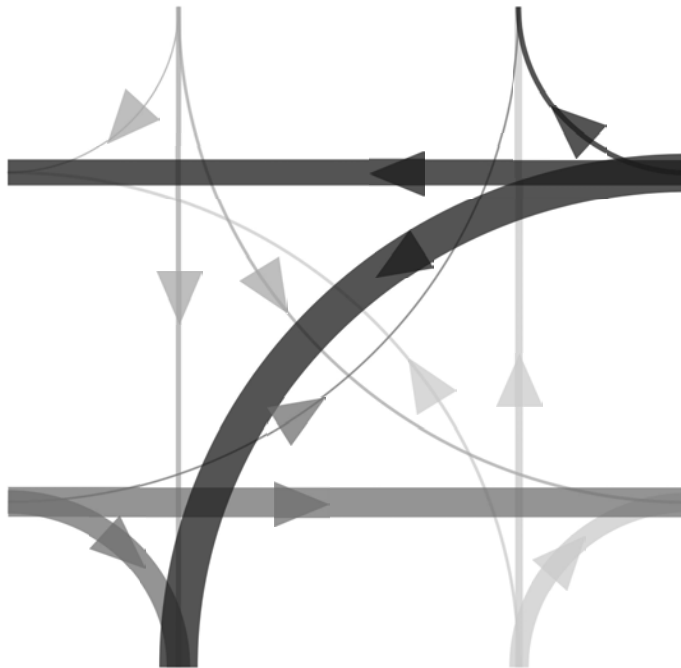
To North			
57			
A	57		
B	0		
C	0		
D	0		
E	0		

2023 AM 100th Highest Hour Estimates		
Leg AM Volumes		
322	89	465
	372	
Total Entering Volume: 624		

To West	
110	
A	98
B	0
C	0
D	0
E	12

West On: 14	Volume	%
	A	306 95.0%
	B	0 0.0%
	C	4 1.2%
	D	0 0.0%
	E	12 3.7%
		AM 322

From West			
212			
	Left	Thru	Right
	8	114	90
A	8	110	90
B	0	0	0
C	0	4	0
D	0	0	0
E	0	0	0



From East			
265			
	Left	Thru	Right
	147	98	20
A	143	86	20
B	0	0	0
C	0	0	0
D	4	0	0
E	0	12	0

Vehicle Type	Volume	%
	A	445 95.7%
	B	0 0.0%
	C	4 0.9%
	D	4 0.9%
	E	12 2.6%
		AM 465

To East	
200	
A	196
B	0
C	4
D	0
E	0

To South	
257	
A	253
B	0
C	0
D	4
E	0

From South			
115			
	Left	Thru	Right
	12	29	74
A	12	29	74
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

South On: 1 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	368	98.9%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	4	1.1%
	E: Tractor Trailer Unit	0	0.0%
		AM	372

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
997167

Intersection of:
14 & RGE RD 70 1 ST, WAINWRIGHT

North On: 1 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	72	100.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	0	0.0%
PM		72	

From North			
24			
	Right	Thru	Left
	0	14	10
A	0	14	10
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

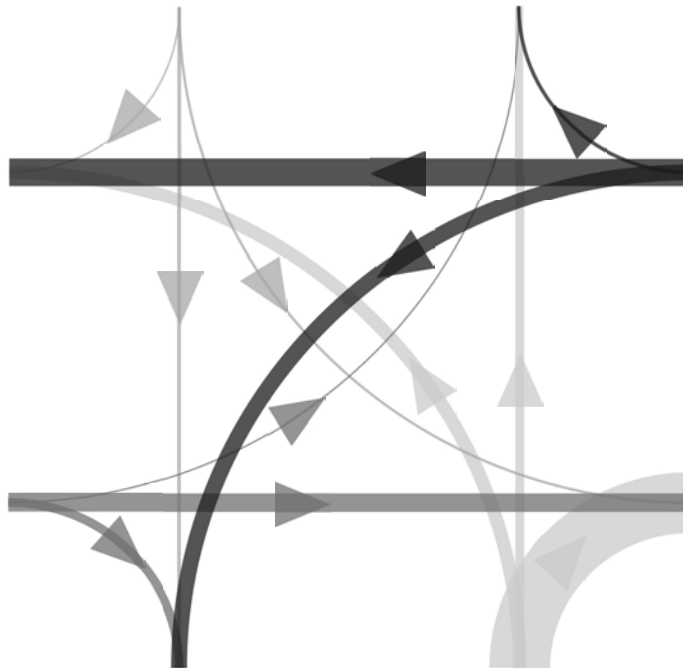
To North	
48	
A	48
B	0
C	0
D	0
E	0

2023 PM 100th Highest Hour Estimates		
Leg PM Volumes		
	72	
260		493
	427	
Total Entering Volume: 626		

To West	
155	
A	142
B	0
C	0
D	3
E	10

West On: 14	Volume	%
	A	230 88.5%
	B	0 0.0%
	C	0 0.0%
	D	6 2.3%
	E	24 9.2%
PM		260

From West			
105			
	Left	Thru	Right
	0	71	34
A	0	61	27
B	0	0	0
C	0	0	0
D	0	3	0
E	0	7	7



From East			
179			
	Left	Thru	Right
	61	104	14
A	58	98	14
B	0	0	0
C	0	0	0
D	3	3	0
E	0	3	0

East On: 14	Vehicle Type	Volume	%
	A	474	96.1%
	B	0	0.0%
	C	0	0.0%
	D	9	1.8%
	E	10	2.0%
PM		493	

To East	
314	
A	304
B	0
C	0
D	3
E	7

To South	
109	
A	99
B	0
C	0
D	3
E	7

From South			
318			
	Left	Thru	Right
	51	34	233
A	44	34	233
B	0	0	0
C	0	0	0
D	0	0	0
E	7	0	0

South On: 1 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	410	96.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	3	0.7%
	E: Tractor Trailer Unit	14	3.3%
PM		427	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
990215

Intersection of:
14 & 10A ST IN WAINWRIGHT 31-44-6-
402100000

North On: 10A St	Vehicle Type	Volume	%
	A: Passenger Vehicle	33	97.1%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	1	2.9%
	E: Tractor Trailer Unit	0	0.0%
PM		34	

2023 PM 100th Highest Hour Estimates		
Leg PM Volumes		
650	34	619
	57	
Total Entering Volume: 680		

	From North		
	16		
	Right	Thru	Left
	6	6	4
	A	6	5
	B	0	0
C	0	0	0
D	0	1	0
E	0	0	0

	To North		
	18		
	A	18	
	B	0	
	C	0	
	D	0	
E	0	0	

	To West		
	275		
	A	255	
	B	7	
	C	0	
	D	4	
E	9	0	

West On: 14	Volume	%
	A	602
	B	13
	C	0
	D	12
	E	23
PM		650

	From West		
	Left	Thru	Right
	13	342	20
	A	13	314
	B	0	6
	C	0	0
D	0	8	0
E	0	14	0

	From East		
	Left	Thru	Right
	4	258	0
	A	4	239
	B	0	7
	C	0	0
D	0	4	0
E	0	8	0

East On: 14	Vehicle Type	Volume	%
	A	572	92.4%
	B	13	2.1%
	C	0	0.0%
	D	12	1.9%
	E	22	3.6%
PM		619	

	To East		
	357		
	A	329	
	B	6	
	C	0	
	D	8	
E	14	0	

	To South		
	30		
	A	29	
	B	0	
	C	0	
	D	1	
E	0	0	

	From South		
	Left	Thru	Right
	11	5	11
	A	10	5
	B	0	0
	C	0	0
D	0	0	0
E	1	0	0

South On: 10A St	Vehicle Type	Volume	%
	A: Passenger Vehicle	55	96.5%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	1	1.8%
	E: Tractor Trailer Unit	1	1.8%
PM		57	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
990214

Intersection of:
14 & RGE RD 60 10 ST, WAINWRIGHT

North On: 14 ST	Vehicle Type			Volume	%
	A: Passenger Vehicle			132	96.4%
	B: Recreational Vehicle			0	0.0%
	C: Bus			0	0.0%
	D: Single Unit Truck			5	3.6%
	E: Tractor Trailer Unit			0	0.0%

AM 137

From North			
79			
	Right	Thru	Left
	21	37	21
A	21	37	21
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

To North		
58		
A	53	
B	0	
C	0	
D	5	
E	0	

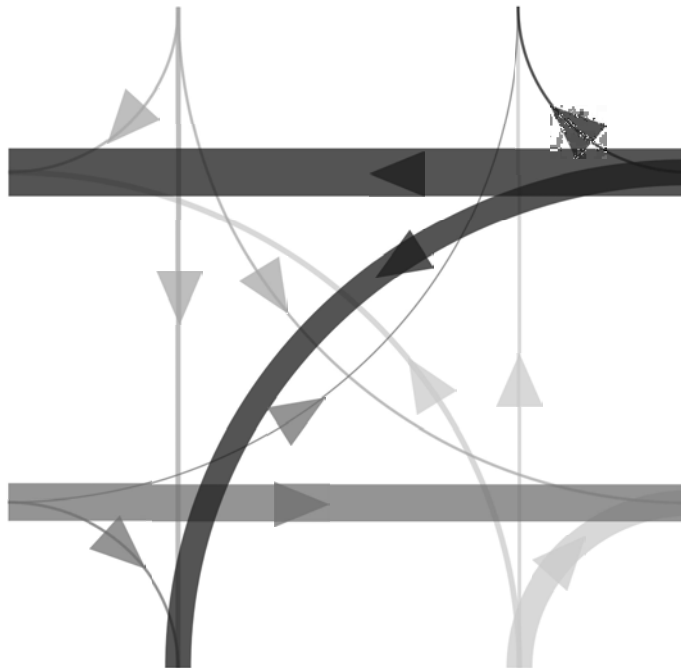
2023 AM 100th Highest Hour Estimates		
Leg AM Volumes		
137		1,040
715		
	504	
Total Entering Volume: 1,198		

To West		
410		
A	383	
B	0	
C	0	
D	16	
E	11	

West On: 14	Volume			%
	A	667	93.3%	
	B	5	0.7%	
	C	0	0.0%	
	D	21	2.9%	
	E	22	3.1%	

AM 715

From West			
305			
	Left	Thru	Right
	11	273	21
A	11	252	21
B	0	5	0
C	0	0	0
D	0	5	0
E	0	11	0



From East			
557			
	Left	Thru	Right
	189	347	21
A	189	320	16
B	0	0	0
C	0	0	0
D	0	16	5
E	0	11	0

Vehicle Type	Volume			%
	A	987	94.9%	
	B	5	0.5%	
	C	0	0.0%	
	D	26	2.5%	
	E	22	2.1%	

AM 1,040

To East		
483		
A	462	
B	5	
C	0	
D	5	
E	11	

To South		
247		
A	247	
B	0	
C	0	
D	0	
E	0	

From South			
257			
	Left	Thru	Right
	42	26	189
A	42	26	189
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

South On: 10 ST/14 ST	Vehicle Type			Volume	%
	A: Passenger Vehicle			504	100.0%
	B: Recreational Vehicle			0	0.0%
	C: Bus			0	0.0%
	D: Single Unit Truck			0	0.0%
	E: Tractor Trailer Unit			0	0.0%

AM 504

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
990214

Intersection of:
14 & RGE RD 60 10 ST, WAINWRIGHT

North On: 14 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	161	97.6%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	4	2.4%
	E: Tractor Trailer Unit	0	0.0%
PM		165	

2023 PM 100th Highest Hour Estimates		
Leg PM Volumes		
694	165	958
	581	
Total Entering Volume: 1,199		

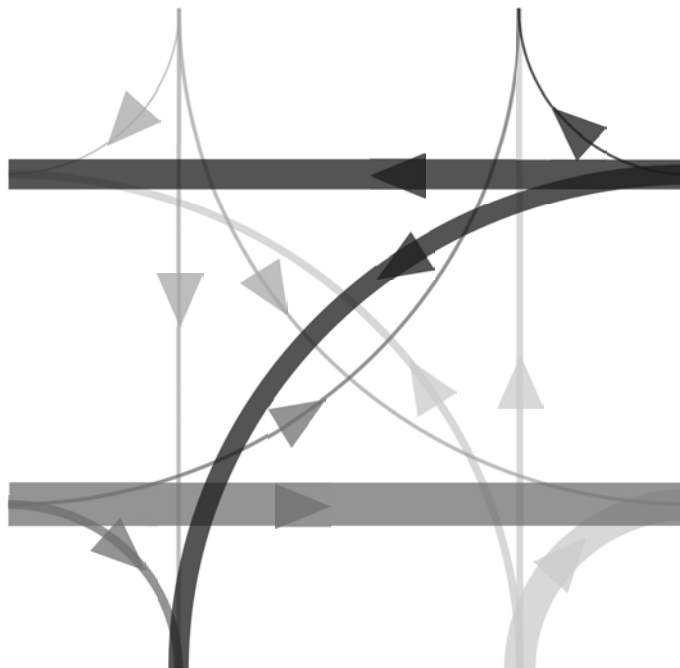
From North			
69			
	Right	Thru	Left
	11	31	27
A	11	31	27
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

To North	
96	
A	92
B	0
C	0
D	4
E	0

To West	
285	
A	270
B	0
C	0
D	0
E	15

West On: 14	Volume	%
	A	651 93.8%
	B	0 0.0%
	C	8 1.2%
	D	12 1.7%
	E	23 3.3%
PM		694

From West			
409			
	Left	Thru	Right
	27	317	65
A	23	301	57
B	0	0	0
C	0	0	8
D	4	8	0
E	0	8	0



From East			
385			
	Left	Thru	Right
	149	217	19
A	145	202	19
B	4	0	0
C	0	0	0
D	0	0	0
E	0	15	0

Vehicle Type	Volume	%
	A	923 96.3%
	B	4 0.4%
	C	0 0.0%
	D	8 0.8%
	E	23 2.4%
PM		958

To East	
573	
A	557
B	0
C	0
D	8
E	8

To South	
245	
A	233
B	4
C	8
D	0
E	0

From South			
336			
	Left	Thru	Right
	57	50	229
A	57	50	229
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

South On: 10 ST/14 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	569	97.9%
	B: Recreational Vehicle	4	0.7%
	C: Bus	8	1.4%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	0	0.0%
PM		581	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
70000468

Intersection of:
14 & 18 ST WAINWRIGHT

North On: 18 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	89	100.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	0	0.0%
AM		89	

From North			
33			
	Right	Thru	Left
	14	14	5
A	14	14	5
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

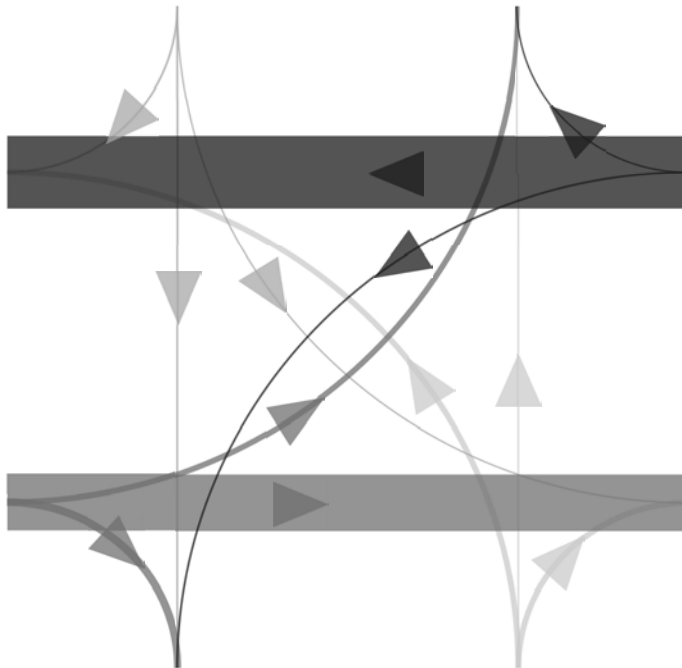
To North		
56		
A	56	
B	0	
C	0	
D	0	
E	0	

2023 AM 100th Highest Hour Estimates		
Leg AM Volumes		
89		
1,004		928
	165	
Total Entering Volume: 1,093		

To West	
535	
498	
0	
0	
28	
9	

West On: 14	Volume	%
	A	944 94.0%
	B	5 0.5%
	C	0 0.0%
	D	37 3.7%
	E	18 1.8%
AM		1,004

From West			
469			
	Left	Thru	Right
	38	379	52
A	38	356	52
B	0	5	0
C	0	0	0
D	0	9	0
E	0	9	0



From East			
506			
	Left	Thru	Right
	14	483	9
A	14	446	9
B	0	0	0
C	0	0	0
D	0	28	0
E	0	9	0

East On: 14	Vehicle Type	Volume	%
	A	868	93.5%
	B	5	0.5%
	C	0	0.0%
	D	37	4.0%
	E	18	1.9%
AM		928	

To East	
422	
399	
5	
0	
9	
9	

To South	
80	
80	
0	
0	
0	
0	

From South			
85			
	Left	Thru	Right
	38	9	38
A	38	9	38
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

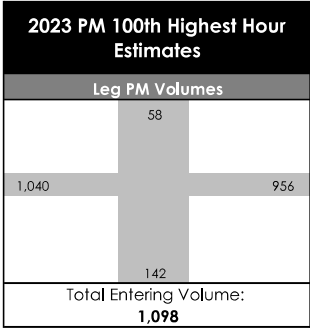
South On: 18 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	165	100.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	0	0.0%
AM		165	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
70000468

Intersection of:
14 & 18 ST WAINWRIGHT

North On: 18 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	54	93.1%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	4	6.9%
	E: Tractor Trailer Unit	0	0.0%
PM		58	



From North			
39			
	Right	Thru	Left
	27	4	8
A	27	4	8
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

To North	
19	
A	15
B	0
C	0
D	4
E	0

To West	
367	
A	359
B	0
C	0
D	4
E	4

West On: 14	Volume	%
	A	1,008 96.9%
	B	4 0.4%
	C	0 0.0%
	D	16 1.5%
	E	12 1.2%
PM		1,040

From West			
673			
	Left	Thru	Right
	19	585	69
A	15	565	69
B	0	4	0
C	0	0	0
D	4	8	0
E	0	8	0

From East			
340			
	Left	Thru	Right
	23	317	0
A	23	309	0
B	0	0	0
C	0	0	0
D	0	4	0
E	0	4	0

East On: 14	Vehicle Type	Volume	%
	A	928	97.1%
	B	4	0.4%
	C	0	0.0%
	D	12	1.3%
	E	12	1.3%
PM		956	

To East	
616	
A	596
B	4
C	0
D	8
E	8

To South	
96	
A	96
B	0
C	0
D	0
E	0

From South			
46			
	Left	Thru	Right
	23	0	23
A	23	0	23
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

South On: 18 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	142	100.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	0	0.0%
PM		142	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

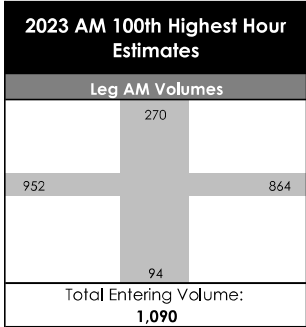
Reference Number:
70000469

Intersection of:
14 & 23 ST WAINWRIGHT

North On: 23 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	250	92.6%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	15	5.6%
	E: Tractor Trailer Unit	5	1.9%
		AM	270

From North			
98			
	Right	Thru	Left
	49	15	34
A	44	15	24
B	0	0	0
C	0	0	0
D	5	0	5
E	0	0	5

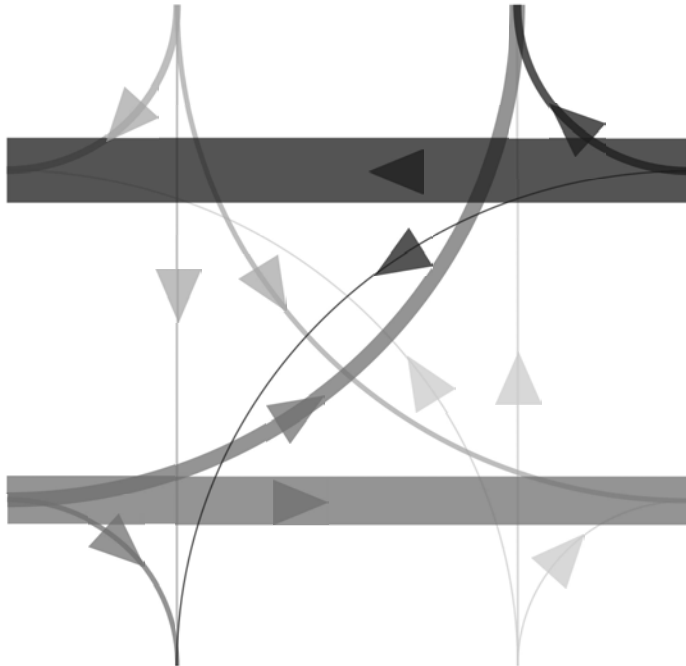
To North			
172			
	A	B	C
A	167	0	0
B	0	0	0
C	0	0	0
D	5	0	0
E	0	0	0



To West	
491	
A	451
B	0
C	0
D	20
E	20

West On: 14	Volume	%
	A	892 93.7%
	B	5 0.5%
	C	0 0.0%
	D	25 2.6%
	E	30 3.2%
AM	952	

From West			
461			
	Left	Thru	Right
	103	309	29
A	103	309	29
B	0	5	0
C	0	0	0
D	0	0	5
E	0	10	0



From East			
496			
	Left	Thru	Right
	10	432	54
A	10	397	49
B	0	0	0
C	0	0	0
D	0	15	5
E	0	20	0

East On: 14	Vehicle Type	Volume	%
	A	794	91.9%
	B	5	0.6%
	C	0	0.0%
	D	30	3.5%
	E	35	4.1%
		AM	864

To East	
368	
A	338
B	5
C	0
D	10
E	15

To South	
59	
A	54
B	0
C	0
D	5
E	0

From South			
35			
	Left	Thru	Right
	10	15	10
A	10	15	5
B	0	0	0
C	0	0	0
D	0	0	5
E	0	0	0

South On: 23 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	84	89.4%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	10	10.6%
	E: Tractor Trailer Unit	0	0.0%
		AM	94

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
70000469

Intersection of:
14 & 23 ST WAINWRIGHT

North On: 23 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	350	97.8%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	4	1.1%
	E: Tractor Trailer Unit	4	1.1%
PM		358	

2023 PM 100th Highest Hour Estimates		
Leg PM Volumes		
	358	
987		757
	72	
Total Entering Volume: 1,087		

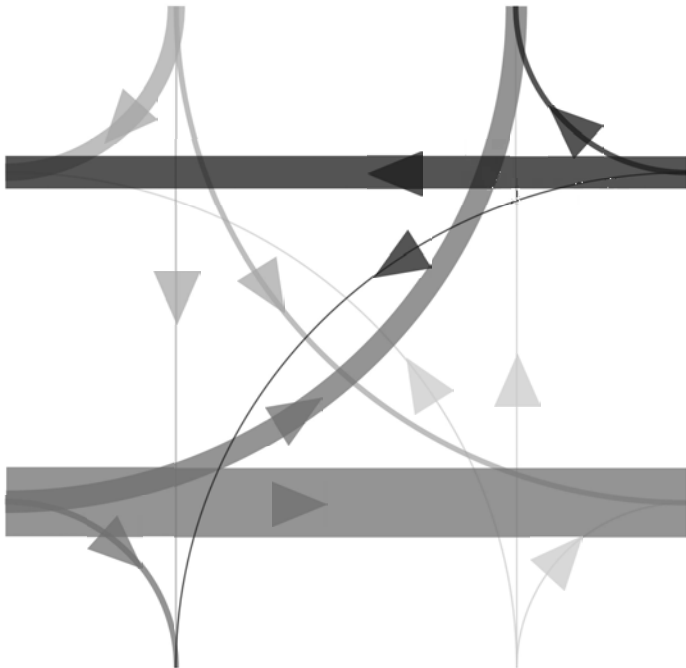
From North			
163			
	Right	Thru	Left
	115	12	36
A	115	12	36
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

To North	
195	
A	187
B	0
C	0
D	4
E	4

To West	
334	
A	326
B	0
C	0
D	4
E	4

West On: 14	Volume	%
	A	959 97.2%
	B	4 0.4%
	C	0 0.0%
	D	12 1.2%
	E	12 1.2%
PM		987

From West			
653			
	Left	Thru	Right
	151	462	40
A	147	446	40
B	0	4	0
C	0	0	0
D	4	4	0
E	0	8	0



From East			
251			
	Left	Thru	Right
	0	215	36
A	0	207	32
B	0	0	0
C	0	0	0
D	0	4	0
E	0	4	4

East On: 14	Vehicle Type	Volume	%
	A	729	96.3%
	B	4	0.5%
	C	0	0.0%
	D	8	1.1%
	E	16	2.1%
PM		757	

To East	
506	
A	490
B	4
C	0
D	4
E	8

To South	
52	
A	52
B	0
C	0
D	0
E	0

From South			
20			
	Left	Thru	Right
	4	8	8
A	4	8	8
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

South On: 23 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	72	100.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	0	0.0%
PM		72	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
70001007

Intersection of:
14 & 27 ST WAINWRIGHT

North On: 27 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	485	97.0%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	5	1.0%
	E: Tractor Trailer Unit	10	2.0%
		AM	500

From North			
217			
	Right	Thru	Left
	97	97	23
A	97	97	18
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	5

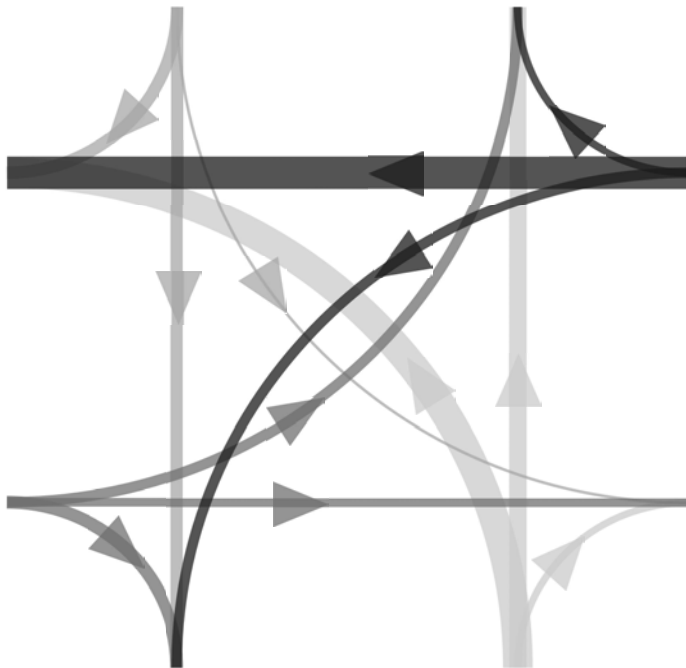
To North	
283	
A	273
B	0
C	0
D	5
E	5

2023 AM 100th Highest Hour Estimates		
Leg AM Volumes		
500		
842		545
713		
Total Entering Volume: 1,300		

To West	
587	
A	564
B	0
C	0
D	5
E	18

West On: 14	Volume	%
	A	805 95.6%
	B	0 0.0%
	C	0 0.0%
	D	10 1.2%
	E	27 3.2%
		AM 842

From West			
255			
	Left	Thru	Right
	84	69	102
A	79	60	102
B	0	0	0
C	0	0	0
D	5	0	0
E	0	9	0



From East			
397			
	Left	Thru	Right
	83	231	60
A	83	231	55
B	0	0	0
C	0	0	0
D	0	5	0
E	0	18	5

East On: 14	Vehicle Type	Volume	%
	A	498	91.4%
	B	0	0.0%
	C	0	0.0%
	D	5	0.9%
	E	42	7.7%
		AM 545	

To East	
148	
A	129
B	0
C	0
D	0
E	19

To South	
282	
A	282
B	0
C	0
D	0
E	0

From South			
431			
	Left	Thru	Right
	236	139	56
A	236	139	51
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	5

South On: 27 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	708	99.3%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	5	0.7%
		AM	713

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
70001007

Intersection of:
14 & 27 ST WAINWRIGHT

North On: 27 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	497	98.4%
	B: Recreational Vehicle	4	0.8%
	C: Bus	0	0.0%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	4	0.8%
		PM	505

2023 PM 100th Highest Hour Estimates		
Leg PM Volumes		
	505	
727		533
	831	
Total Entering Volume: 1,298		

From North			
329			
	Right	Thru	Left
	81	167	81
A	81	167	77
B	0	0	4
C	0	0	0
D	0	0	0
E	0	0	0

To North	
176	
A	172
B	0
C	0
D	0
E	4

To West	
357	
A	345
B	0
C	4
D	4
E	4

West On: 14	Volume	%
	A	695 95.6%
	B	8 1.1%
	C	8 1.1%
	D	4 0.6%
	E	12 1.7%
		PM 727

From West			
370			
	Left	Thru	Right
	57	130	183
A	53	118	179
B	0	8	0
C	0	0	4
D	0	0	0
E	4	4	0

From East			
212			
	Left	Thru	Right
	94	89	29
A	94	77	29
B	0	0	0
C	0	4	0
D	0	4	0
E	0	4	0

East On: 14	Vehicle Type	Volume	%
	A	505	94.7%
	B	12	2.3%
	C	4	0.8%
	D	4	0.8%
	E	8	1.5%
		PM 533	

To East	
321	
A	305
B	12
C	0
D	0
E	4

To South	
444	
A	440
B	0
C	4
D	0
E	0

From South			
387			
	Left	Thru	Right
	187	90	110
A	187	90	110
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0

South On: 27 ST	Vehicle Type	Volume	%
	A: Passenger Vehicle	827	99.5%
	B: Recreational Vehicle	0	0.0%
	C: Bus	4	0.5%
	D: Single Unit Truck	0	0.0%
	E: Tractor Trailer Unit	0	0.0%
		PM 831	

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
132380

Intersection of:
14 & 41 E OF WAINWRIGHT

North On: 41	Vehicle Type	Volume	%
	A: Passenger Vehicle	140	88.1%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	7	4.4%
	E: Tractor Trailer Unit	12	7.5%
		AM	159

From North			
81			
	Right	Thru	Left
	61	17	3
A	60	10	3
B	0	0	0
C	0	0	0
D	1	3	0
E	0	4	0

To North	
78	
A	67
B	0
C	0
D	3
E	8

2023 AM 100th Highest Hour Estimates			
Leg AM Volumes			
	159		
512			289
	184		
Total Entering Volume: 572			

To West	
264	
A	234
B	4
C	0
D	9
E	17

West On: 14	Volume	%
	A	454 88.7%
	B	8 1.6%
	C	0 0.0%
	D	19 3.7%
	E	31 6.1%
		AM 512

From West			
248			
	Left	Thru	Right
	57	122	69
A	53	108	59
B	0	4	0
C	0	0	0
D	3	1	6
E	1	9	4

From East			
151			
	Left	Thru	Right
	6	141	4
A	4	126	4
B	0	4	0
C	0	0	0
D	1	1	0
E	1	10	0

Vehicle Type		
	A	249 86.2%
	B	8 2.8%
	C	0 0.0%
	D	4 1.4%
	E	28 9.7%
		AM 289

To East	
138	
A	115
B	4
C	0
D	2
E	17

To South	
92	
A	73
B	0
C	0
D	10
E	9

From South			
92			
	Left	Thru	Right
	62	17	13
A	48	10	4
B	0	0	0
C	0	0	0
D	7	0	1
E	7	7	8

South On: 41	Vehicle Type	Volume	%
	A: Passenger Vehicle	135	73.4%
	B: Recreational Vehicle	0	0.0%
	C: Bus	0	0.0%
	D: Single Unit Truck	18	9.8%
	E: Tractor Trailer Unit	31	16.8%
		AM	184

NOTE:
Coloured line thickness
corresponds to turning
movement volume.

Reference Number:
132380

Intersection of:
14 & 41 E OF WAINWRIGHT

North On: 41	Vehicle Type	Volume	%
	A: Passenger Vehicle	97	87.4%
	B: Recreational Vehicle	2	1.8%
	C: Bus	0	0.0%
	D: Single Unit Truck	4	3.6%
	E: Tractor Trailer Unit	8	7.2%
		PM	111

2023 PM 100th Highest Hour Estimates			
Leg PM Volumes			
		111	
508			321
		180	
Total Entering Volume: 560			

From North			
54			
	Right	Thru	Left
	38	13	3
A	35	9	2
B	0	0	0
C	0	0	0
D	1	0	0
E	2	4	1

To North	
57	
A	51
B	2
C	0
D	3
E	1

To West	
231	
A	189
B	6
C	0
D	6
E	30

West On: 14	Volume	%
	A	445 87.6%
	B	10 2.0%
	C	0 0.0%
	D	10 2.0%
	E	43 8.5%
		PM 508

From West			
277			
	Left	Thru	Right
	44	155	78
A	40	144	72
B	1	2	1
C	0	0	0
D	2	1	1
E	1	8	4

From East			
150			
	Left	Thru	Right
	10	137	3
A	9	110	2
B	0	4	1
C	0	0	0
D	1	2	0
E	0	21	0

Vehicle Type			East On: 14
A	278	86.6%	
B	7	2.2%	
C	0	0.0%	
D	5	1.6%	
E	31	9.7%	
PM	321		

To East	
171	
A	157
B	2
C	0
D	2
E	10

To South	
101	
A	90
B	1
C	0
D	2
E	8

From South			
79			
	Left	Thru	Right
	56	10	13
A	44	9	11
B	2	0	0
C	0	0	0
D	3	1	1
E	7	0	1

South On: 41	Vehicle Type	Volume	%
	A: Passenger Vehicle	154	85.6%
	B: Recreational Vehicle	3	1.7%
	C: Bus	0	0.0%
	D: Single Unit Truck	7	3.9%
	E: Tractor Trailer Unit	16	8.9%
PM		180	

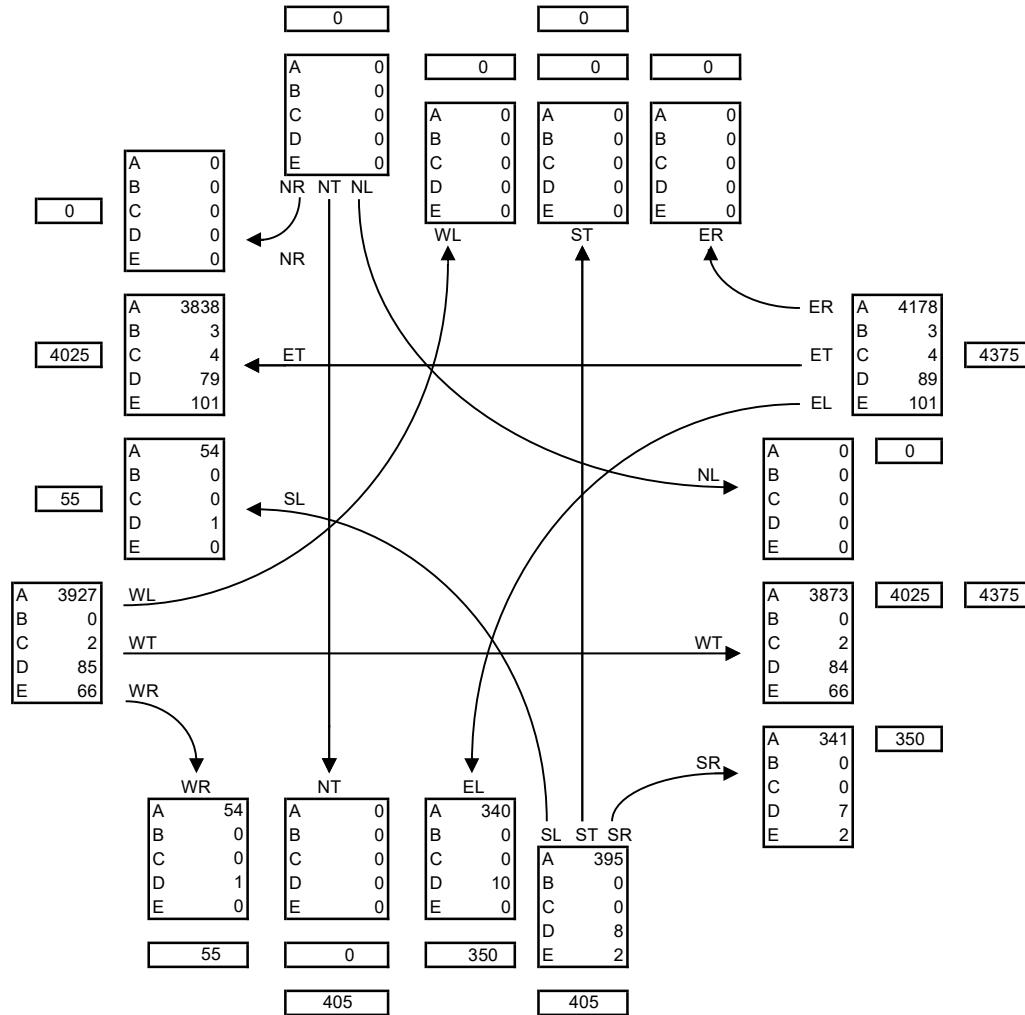
NOTE:
Coloured line thickness
corresponds to turning
movement volume.

TURNING MOVEMENT SUMMARY DIAGRAM

INTERSECTION OF: HIGHWAY 14 & 15 STREET, WAINWRIGHT

2022 AADT & ASDT ESTIMATES

WEST ON		HWY 14	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		7819	95.82
B: RECREATION VEHICLES		3	0.04
C: BUSES		6	0.07
D: SINGLE UNIT TRUCKS		165	2.02
E: TRACTOR TRAILER COMB.		167	2.05
ASDT	9180	AADT	8160



TURNING MOVEMENT ABBREVIATIONS

NL : TRAFFIC FROM NORTH TURNING LEFT
 NT : TRAFFIC FROM NORTH PROCEEDING THROUGH
 NR : TRAFFIC FROM NORTH TURNING RIGHT
 SL : TRAFFIC FROM SOUTH TURNING LEFT
 ST : TRAFFIC FROM SOUTH PROCEEDING THROUGH
 SR : TRAFFIC FROM SOUTH TURNING RIGHT
 EL : TRAFFIC FROM EAST TURNING LEFT
 ET : TRAFFIC FROM EAST PROCEEDING THROUGH
 ER : TRAFFIC FROM EAST TURNING RIGHT
 WL : TRAFFIC FROM WEST TURNING LEFT
 WT : TRAFFIC FROM WEST PROCEEDING THROUGH
 WR : TRAFFIC FROM WEST TURNING RIGHT

SOUTH ON		15 STREET	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		789	97.41
B: RECREATION VEHICLES		0	0.00
C: BUSES		0	0.00
D: SINGLE UNIT TRUCKS		19	2.35
E: TRACTOR TRAILER COMB.		2	0.25
ASDT	910	AADT	810

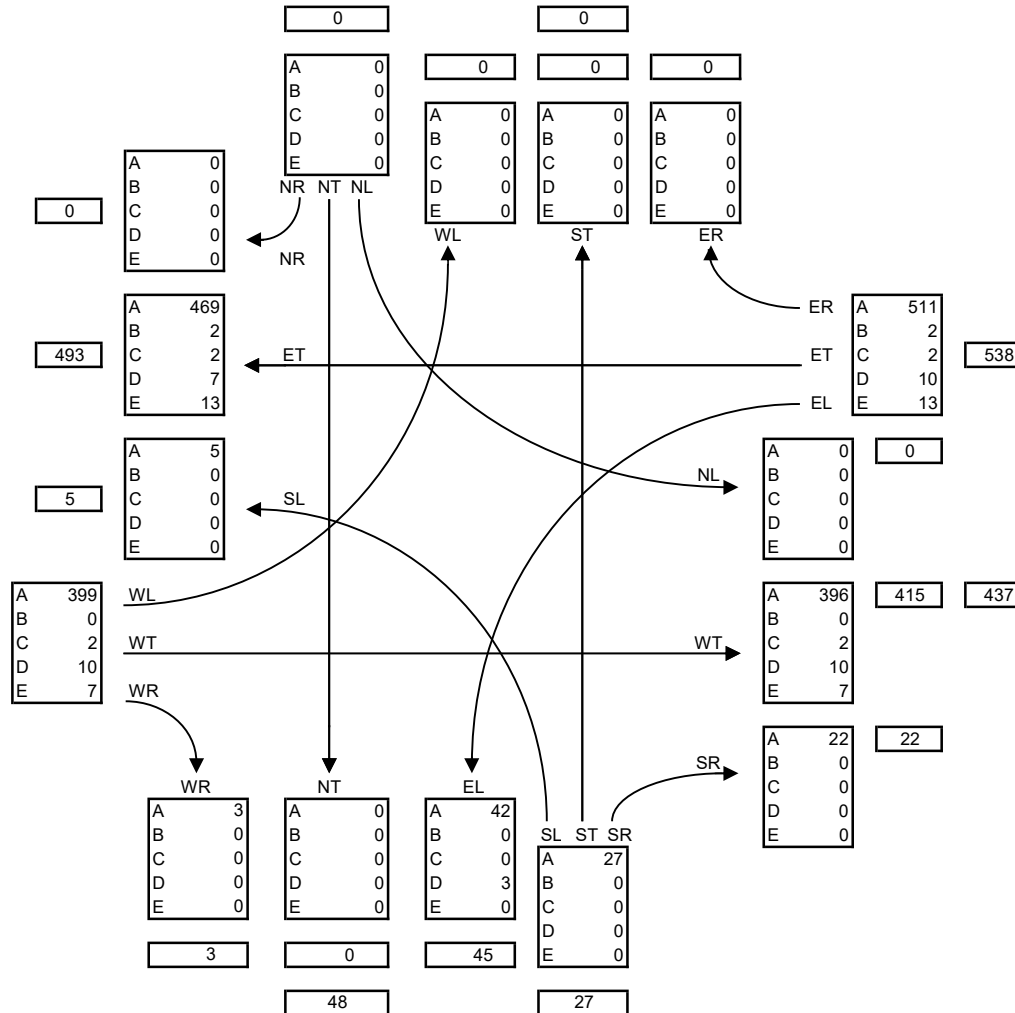
EAST ON		HWY 14	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		8392	0.00
B: RECREATION VEHICLES		3	0.00
C: BUSES		6	0.00
D: SINGLE UNIT TRUCKS		180	0.00
E: TRACTOR TRAILER COMB.		169	0.00
ASDT	9850	AADT	8750

TURNING MOVEMENT SUMMARY DIAGRAM

INTERSECTION OF: HIGHWAY 14 & 15 STREET, WAINWRIGHT

2022 AM 100TH HIGHEST HOUR TRAFFIC VOLUMES

WEST ON		HWY 14	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		873	95.31
B: RECREATION VEHICLES		2	0.22
C: BUSES		4	0.44
D: SINGLE UNIT TRUCKS		17	1.86
E: TRACTOR TRAILER COMB.		20	2.18
TOTAL		916	



TURNING MOVEMENT ABBREVIATIONS

NL : TRAFFIC FROM NORTH TURNING LEFT
 NT : TRAFFIC FROM NORTH PROCEEDING THROUGH
 NR : TRAFFIC FROM NORTH TURNING RIGHT
 SL : TRAFFIC FROM SOUTH TURNING LEFT
 ST : TRAFFIC FROM SOUTH PROCEEDING THROUGH
 SR : TRAFFIC FROM SOUTH TURNING RIGHT
 EL : TRAFFIC FROM EAST TURNING LEFT
 ET : TRAFFIC FROM EAST PROCEEDING THROUGH
 ER : TRAFFIC FROM EAST TURNING RIGHT
 WL : TRAFFIC FROM WEST TURNING LEFT
 WT : TRAFFIC FROM WEST PROCEEDING THROUGH
 WR : TRAFFIC FROM WEST TURNING RIGHT

SOUTH ON		15 STREET	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		72	96.00
B: RECREATION VEHICLES		0	0.00
C: BUSES		0	0.00
D: SINGLE UNIT TRUCKS		3	4.00
E: TRACTOR TRAILER COMB.		0	0.00
TOTAL		75	

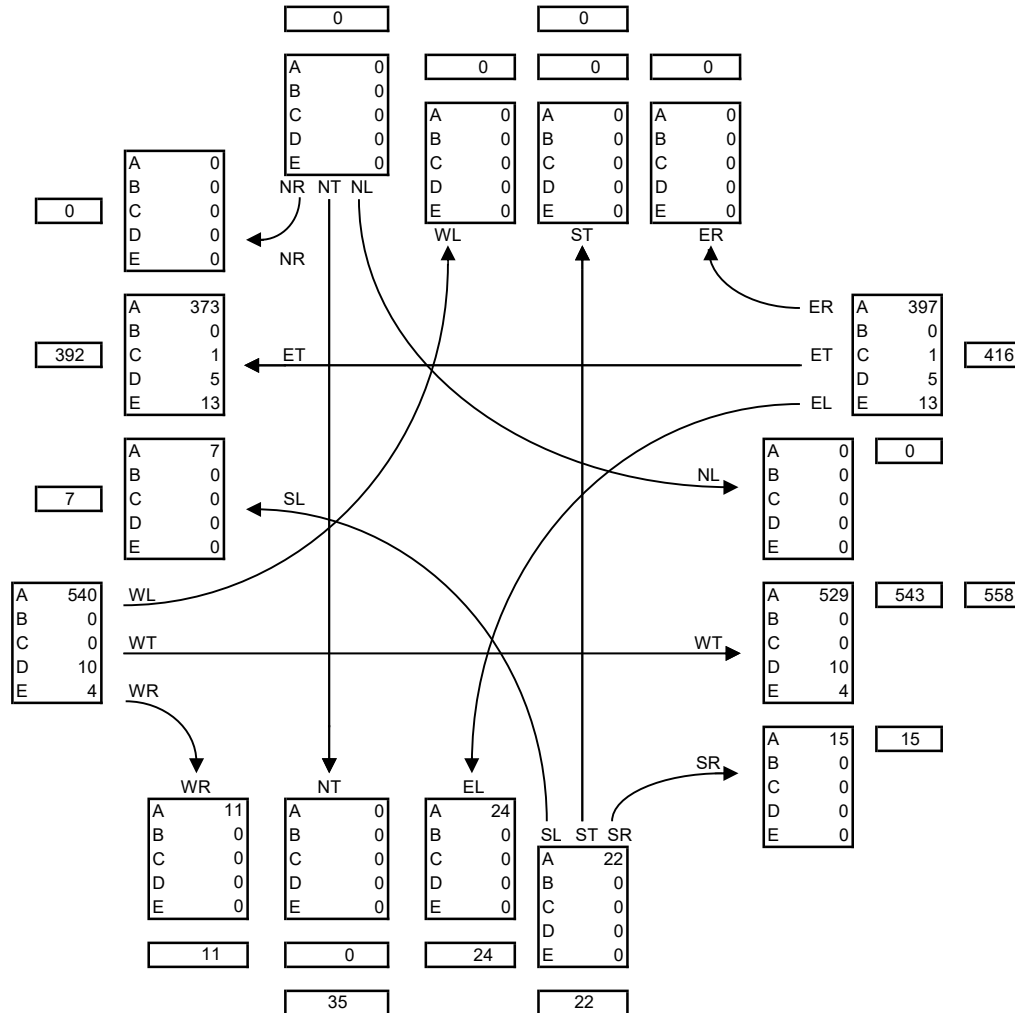
EAST ON		HWY 14	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		929	95.28
B: RECREATION VEHICLES		2	0.21
C: BUSES		4	0.41
D: SINGLE UNIT TRUCKS		20	2.05
E: TRACTOR TRAILER COMB.		20	2.05
TOTAL		975	

TURNING MOVEMENT SUMMARY DIAGRAM

INTERSECTION OF: HIGHWAY 14 & 15 STREET, WAINWRIGHT

2022 PM 100TH HIGHEST HOUR TRAFFIC VOLUMES

WEST ON		HWY 14	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		920	96.54
B: RECREATION VEHICLES		0	0.00
C: BUSES		1	0.10
D: SINGLE UNIT TRUCKS		15	1.57
E: TRACTOR TRAILER COMB.		17	1.78
TOTAL		953	



TURNING MOVEMENT ABBREVIATIONS

NL : TRAFFIC FROM NORTH TURNING LEFT
 NT : TRAFFIC FROM NORTH PROCEEDING THROUGH
 NR : TRAFFIC FROM NORTH TURNING RIGHT
 SL : TRAFFIC FROM SOUTH TURNING LEFT
 ST : TRAFFIC FROM SOUTH PROCEEDING THROUGH
 SR : TRAFFIC FROM SOUTH TURNING RIGHT
 EL : TRAFFIC FROM EAST TURNING LEFT
 ET : TRAFFIC FROM EAST PROCEEDING THROUGH
 ER : TRAFFIC FROM EAST TURNING RIGHT
 WL : TRAFFIC FROM WEST TURNING LEFT
 WT : TRAFFIC FROM WEST PROCEEDING THROUGH
 WR : TRAFFIC FROM WEST TURNING RIGHT

SOUTH ON		15 STREET	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		57	100.00
B: RECREATION VEHICLES		0	0.00
C: BUSES		0	0.00
D: SINGLE UNIT TRUCKS		0	0.00
E: TRACTOR TRAILER COMB.		0	0.00
TOTAL		57	

EAST ON		HWY 14	
VEH TYPE		VOL	%
A: PASSENGER VEHICLES		941	96.61
B: RECREATION VEHICLES		0	0.00
C: BUSES		1	0.10
D: SINGLE UNIT TRUCKS		15	1.54
E: TRACTOR TRAILER COMB.		17	1.75
TOTAL		974	



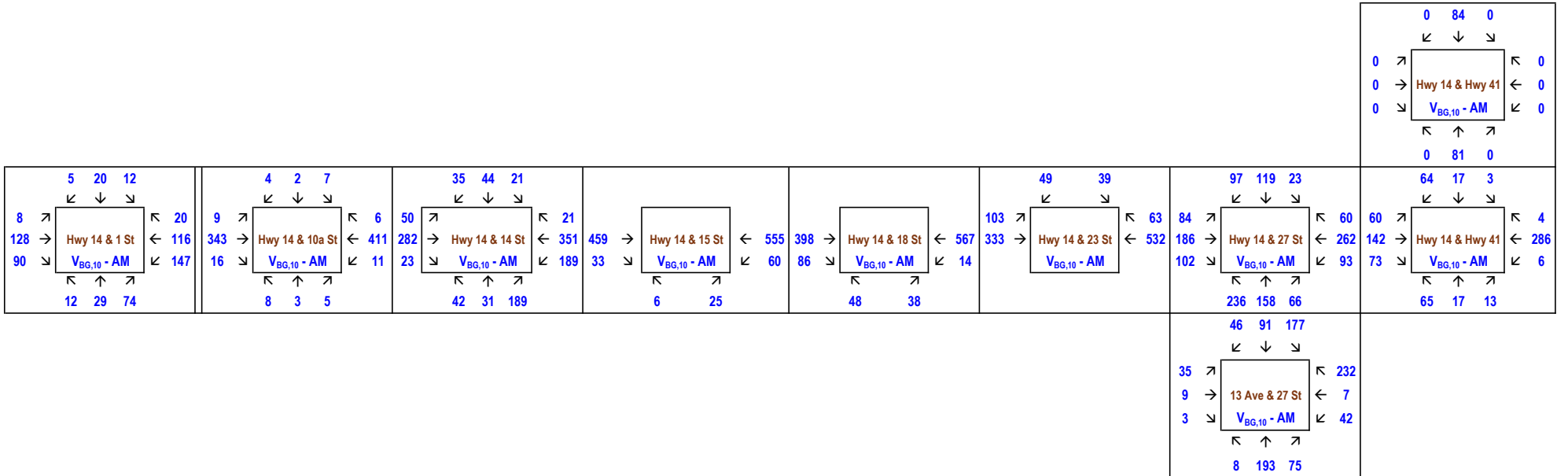
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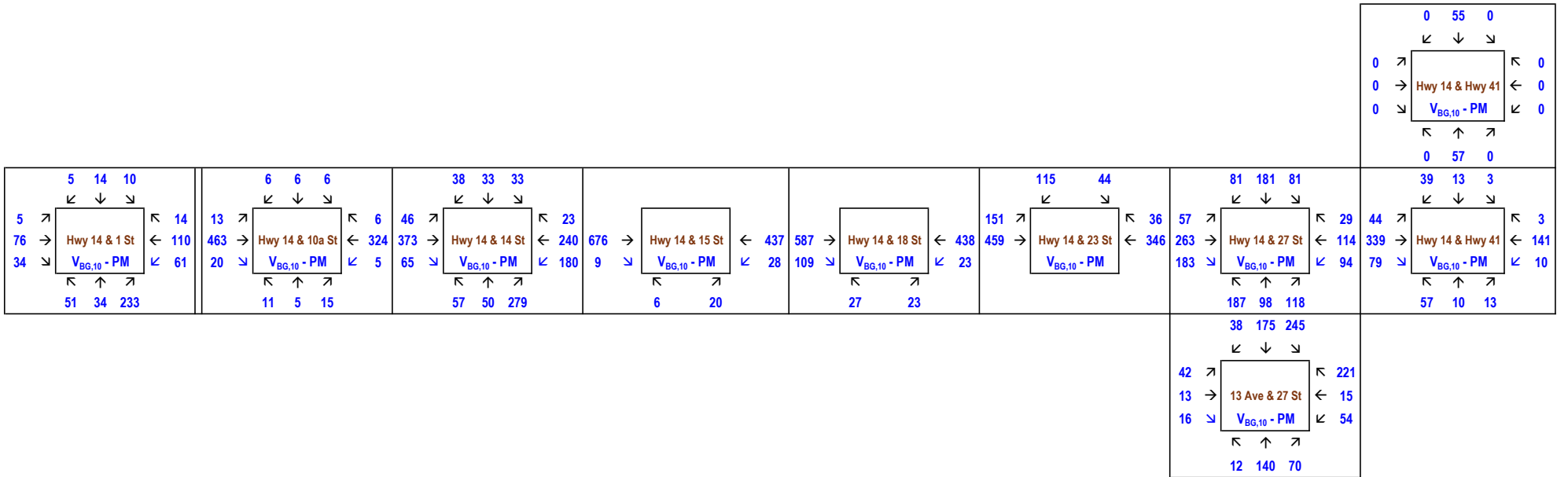
Appendix E

10 Year & 20 Year Traffic Forecasts

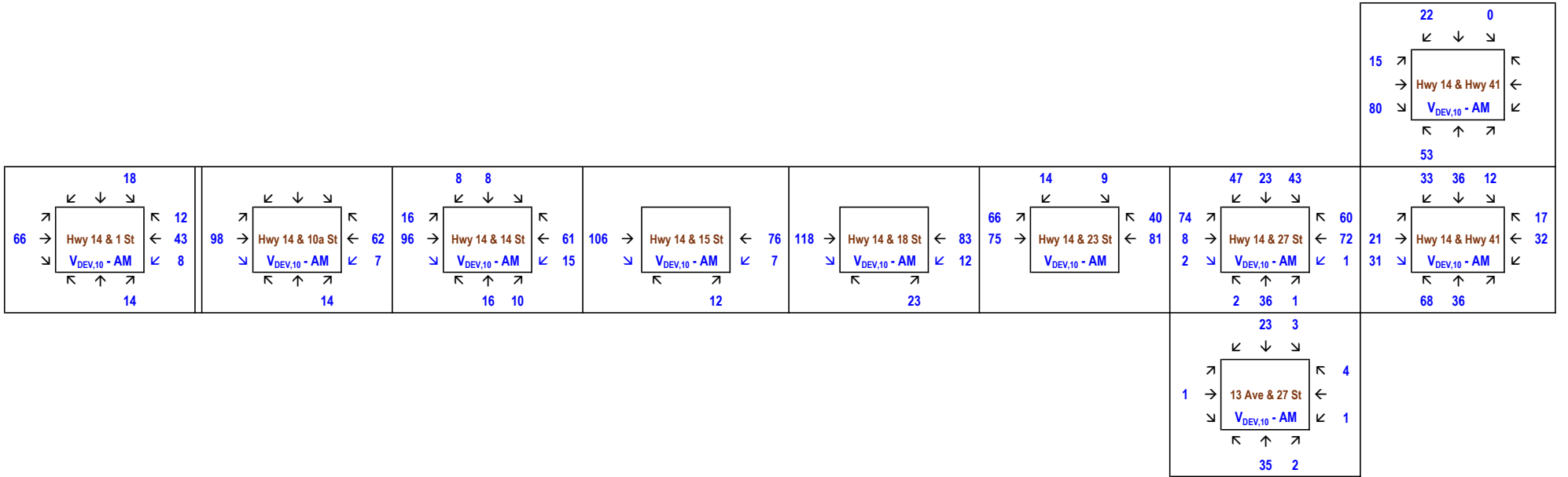
10 Year Background Volumes - AM Peak Hour (Balanced)



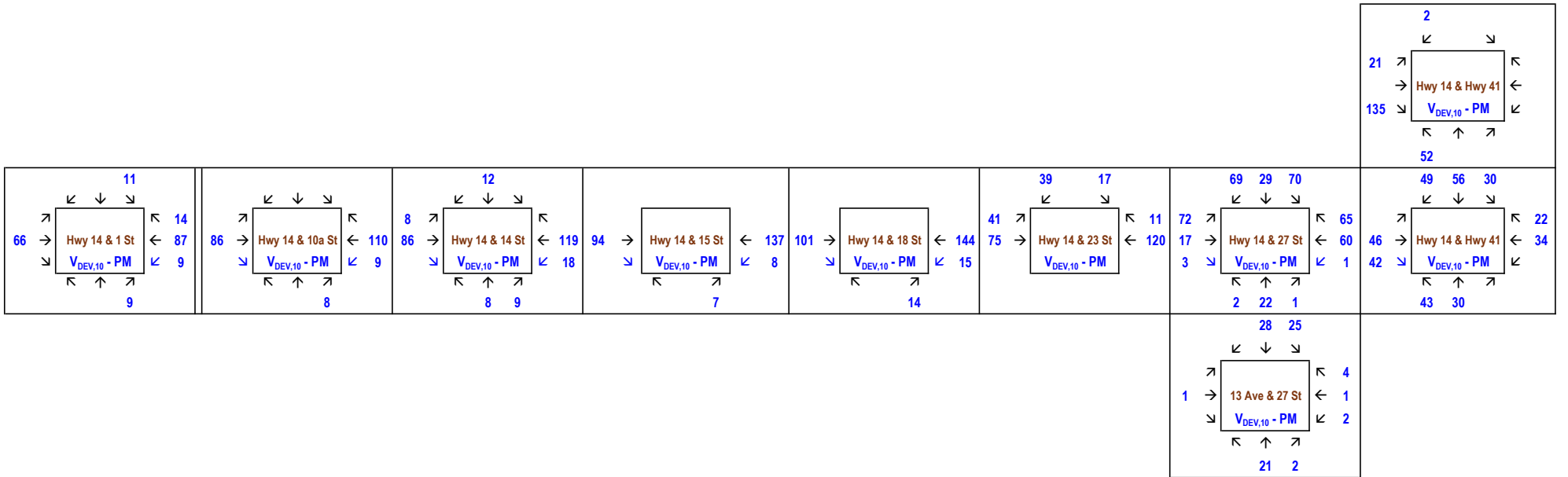
10 Year Background Volumes - PM Peak Hour (Balanced)



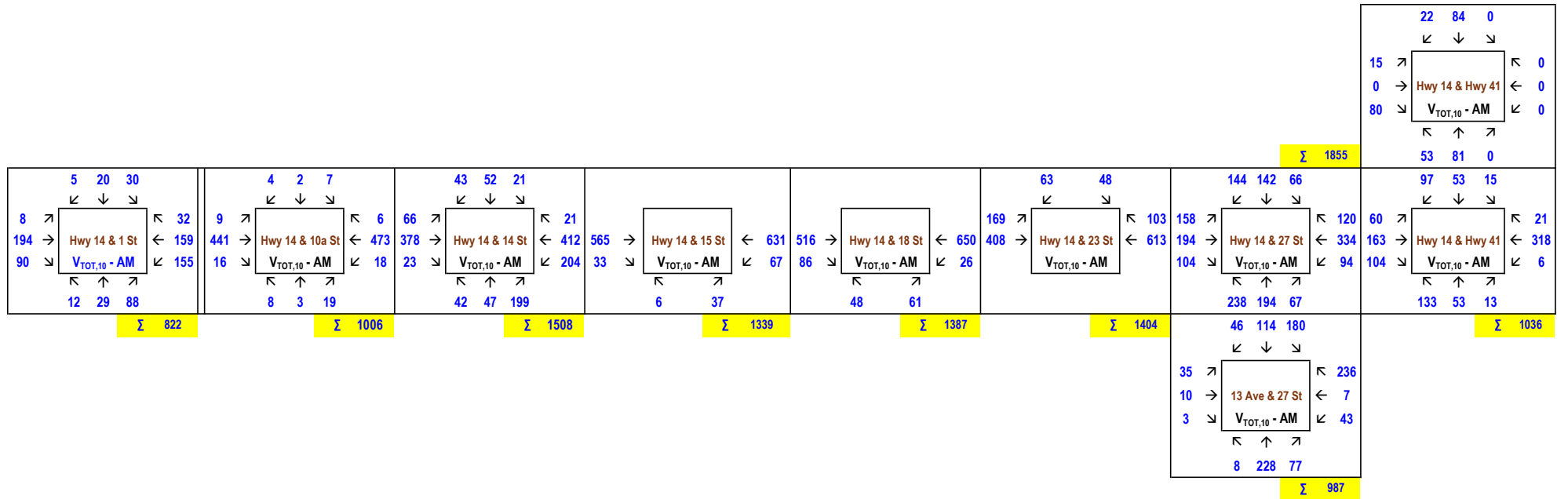
10 Year Development Volumes - AM Peak Hour



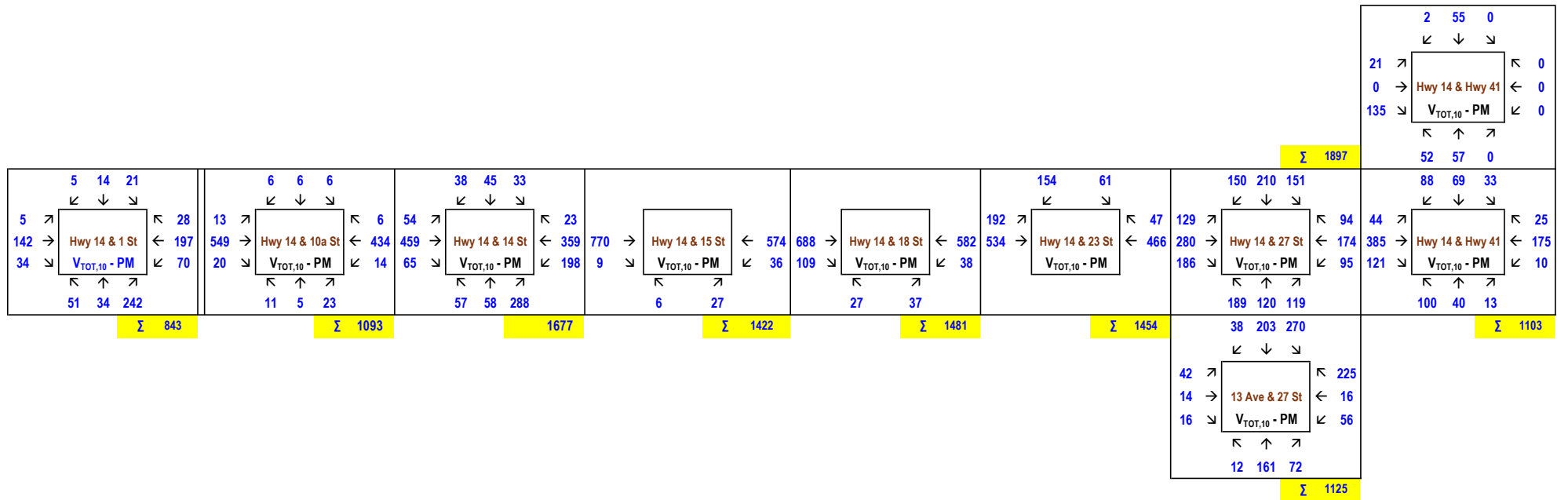
10 Year Development Volumes - PM Peak Hour



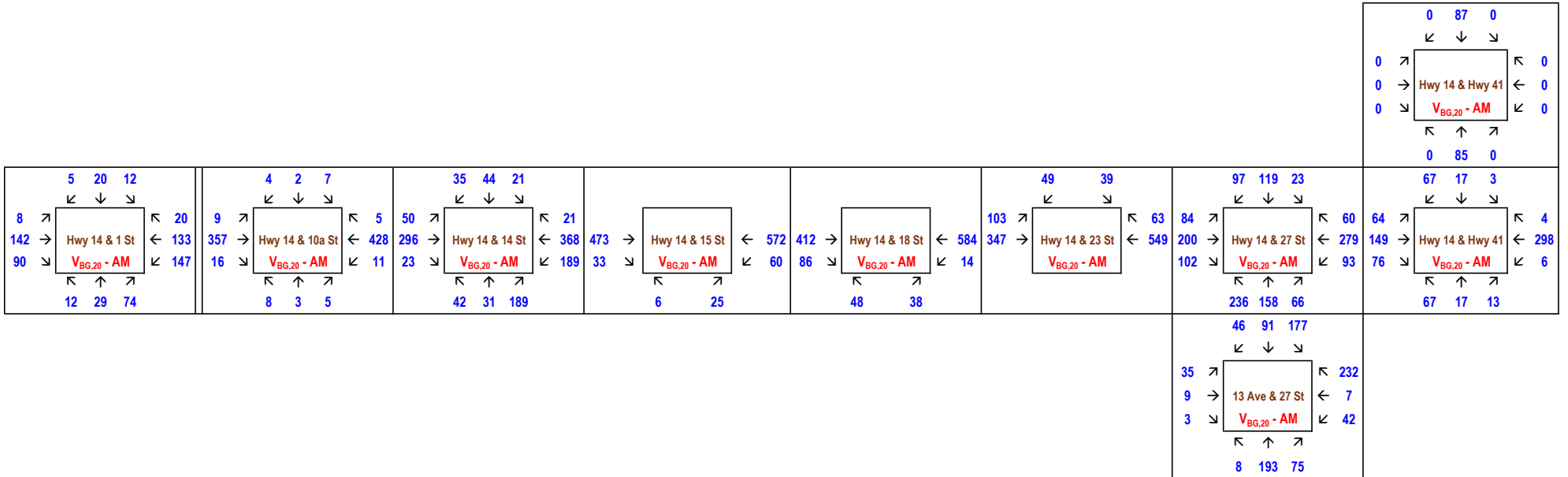
10 Year Total Volumes - AM Peak Hour



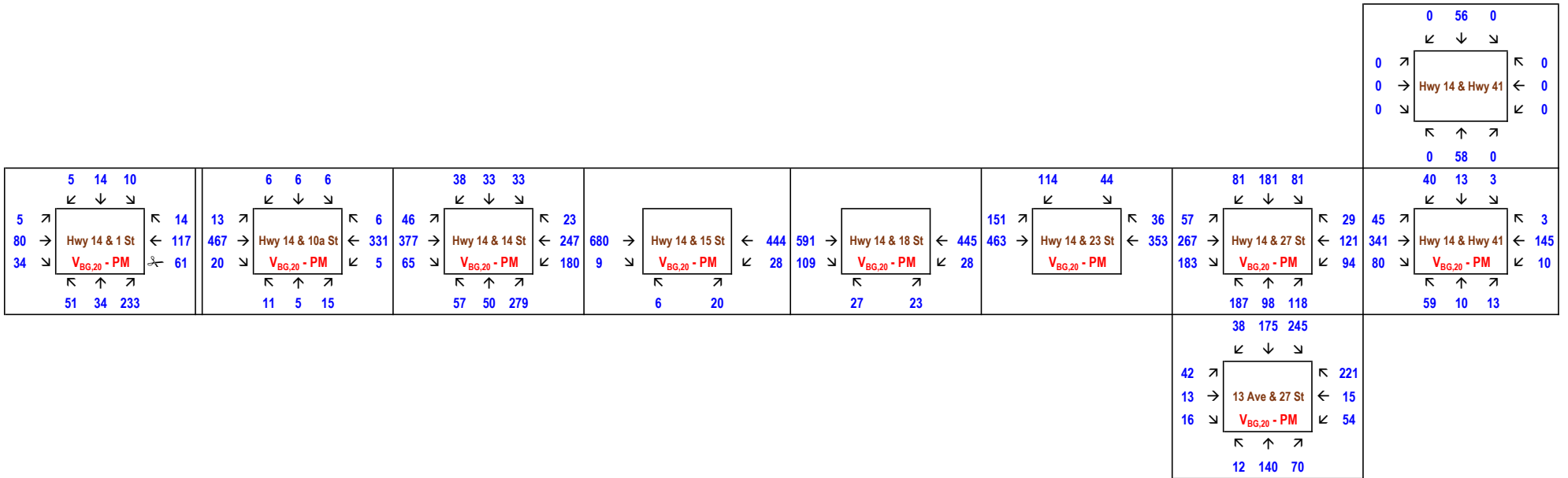
10 Year Total Volumes - PM Peak Hour



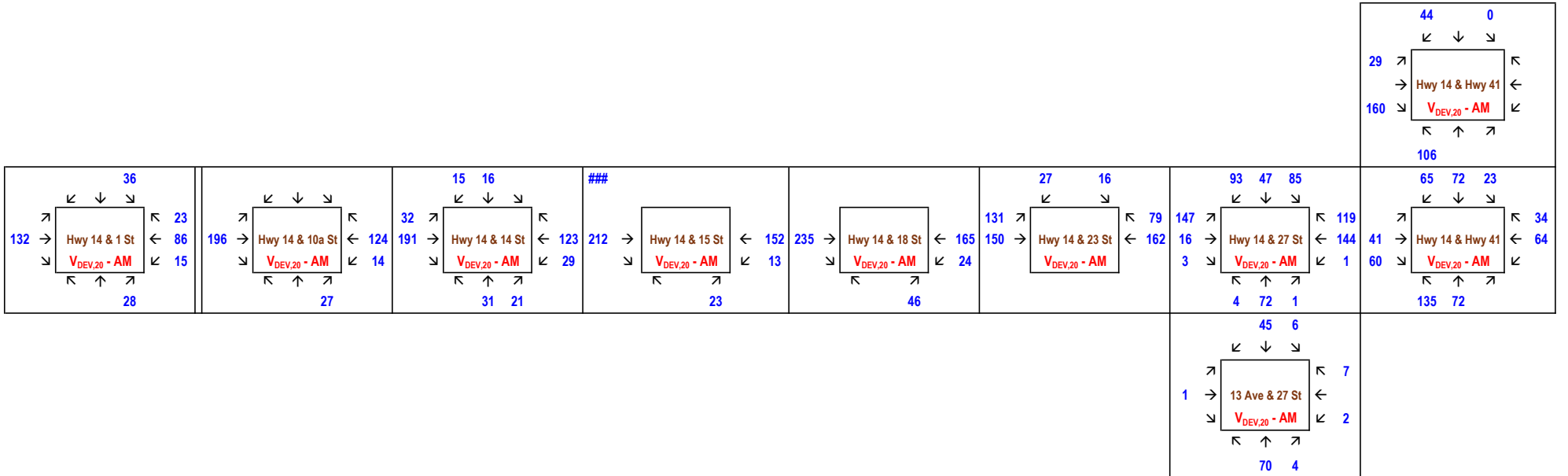
20 Year Background Volumes - AM Peak Hour (Balanced)



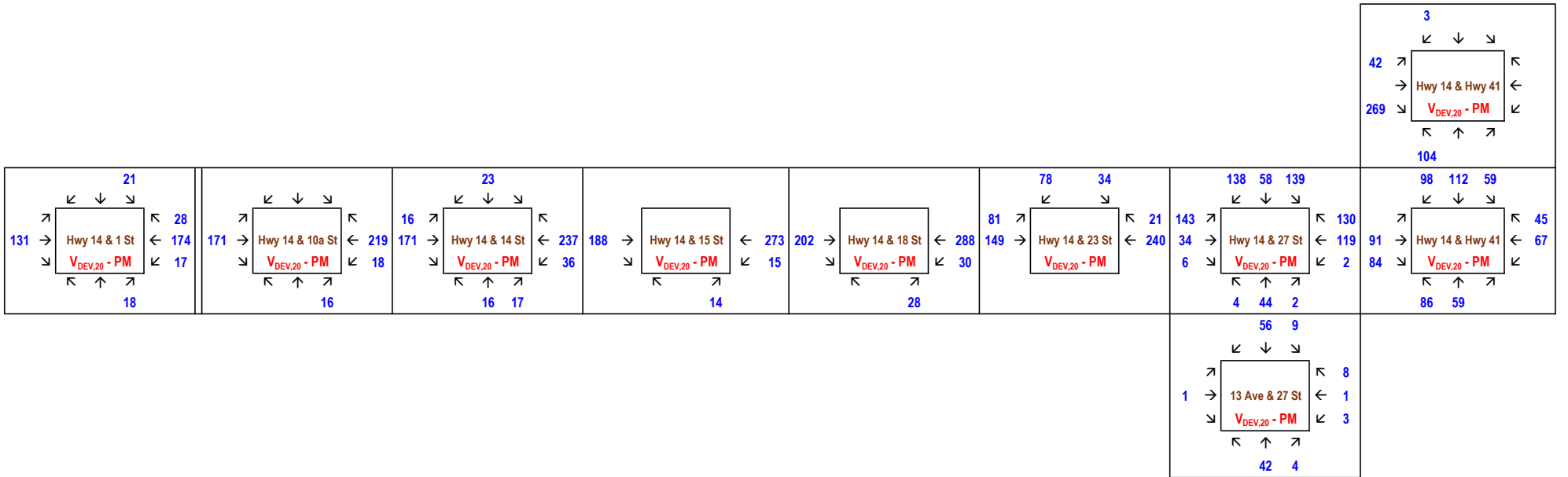
20 Year Background Volumes - PM Peak Hour (Balanced)



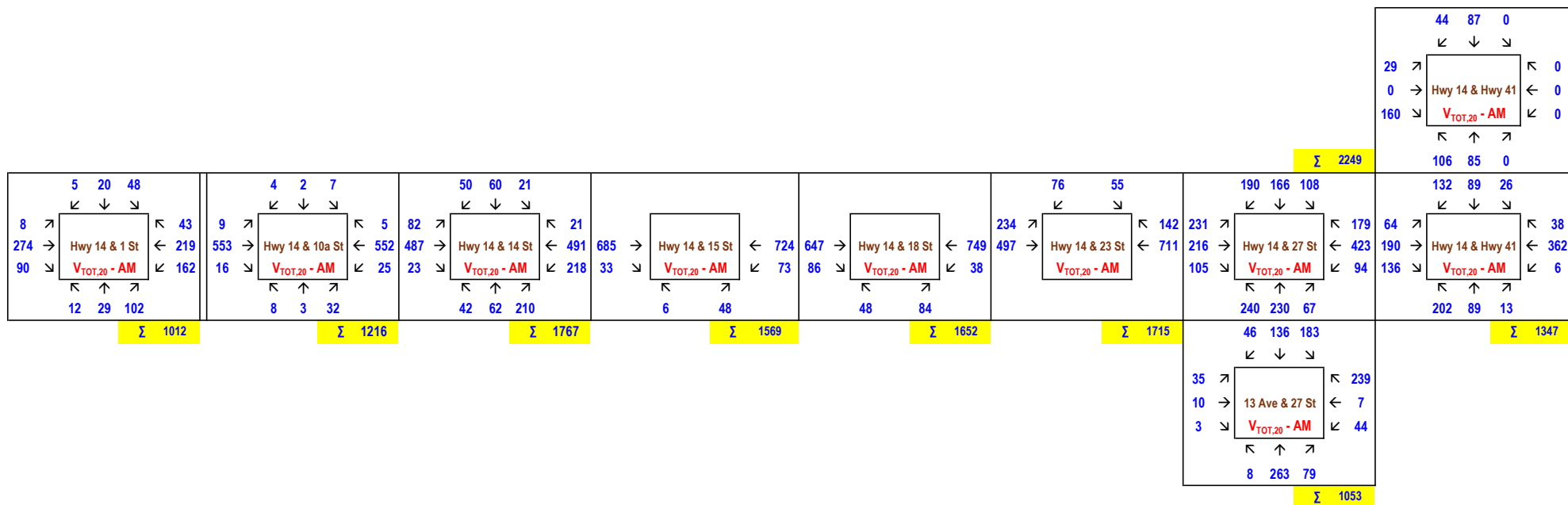
20 Year Development Volumes - AM Peak Hour



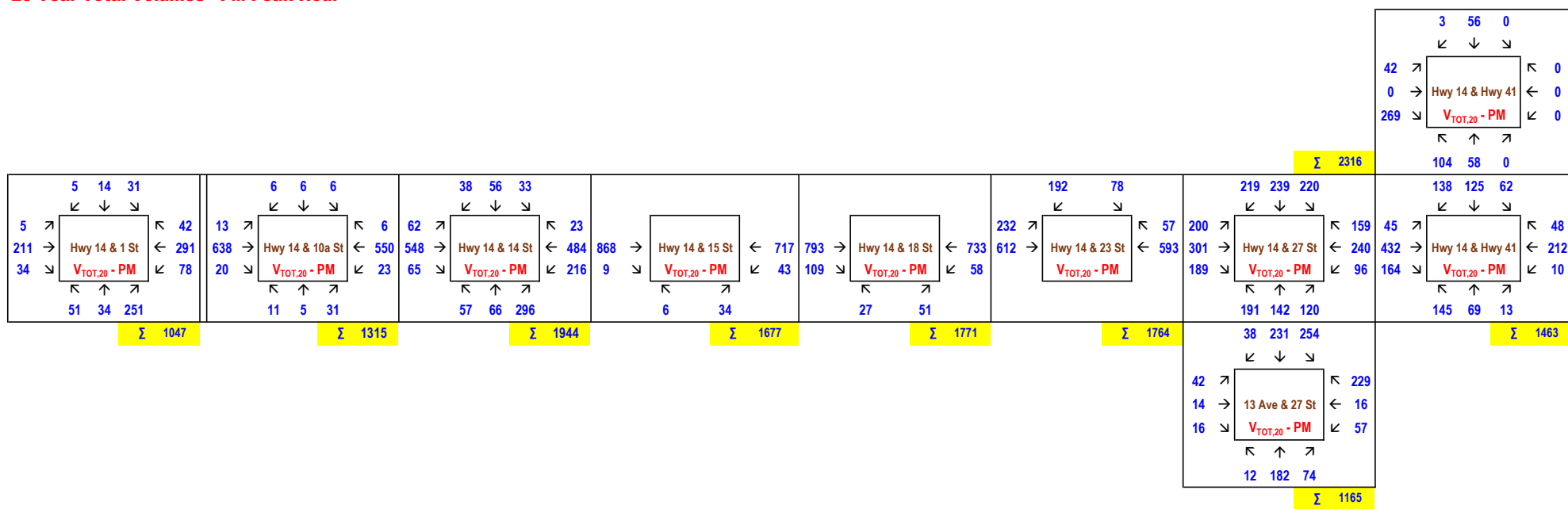
20 Year Development Volumes - PM Peak Hour



20 Year Total Volumes - AM Peak Hour



20 Year Total Volumes - PM Peak Hour



Acheson Industrial Park Trip Generation Rates



Screenline Volumes:

	AM - In	AM - Out	AM - Total	PM - IN	PM - OUT	PM - Total
1	235 trips	305 trips	540 trips	111 trips	471 trips	582 trips
2	422 trips	10 trips	432 trips	48 trips	100 trips	148 trips
Sum	657 trips	315 trips	972 trips	159 trips	571 trips	730 trips

Acheson Industrial Park Trip Generation Rates:

	AM - In	AM - Out	AM - Total	PM - IN	PM - OUT	PM - Total
1	1.08 trips/ha	1.41 trips/ha	2.49 trips/ha	0.51 trips/ha	2.17 trips/ha	2.68 trips/ha
2	1.95 trips/ha	0.05 trips/ha	1.99 trips/ha	0.22 trips/ha	0.46 trips/ha	0.68 trips/ha
Sum	3.03 trips/ha	1.45 trips/ha	4.48 trips/ha	0.73 trips/ha	2.63 trips/ha	3.37 trips/ha

Acheson Industrial Rates

AM Inbound	3.03 trips/ha
AM Outbound	1.45 trips/ha
PM Inbound	0.73 trips/ha
PM Outbound	2.63 trips/ha

Rural Rate	0.7	Rural Rate	0.6
Rural Rate (Light Industrial)	1	Rural Rate (Light Industrial)	1

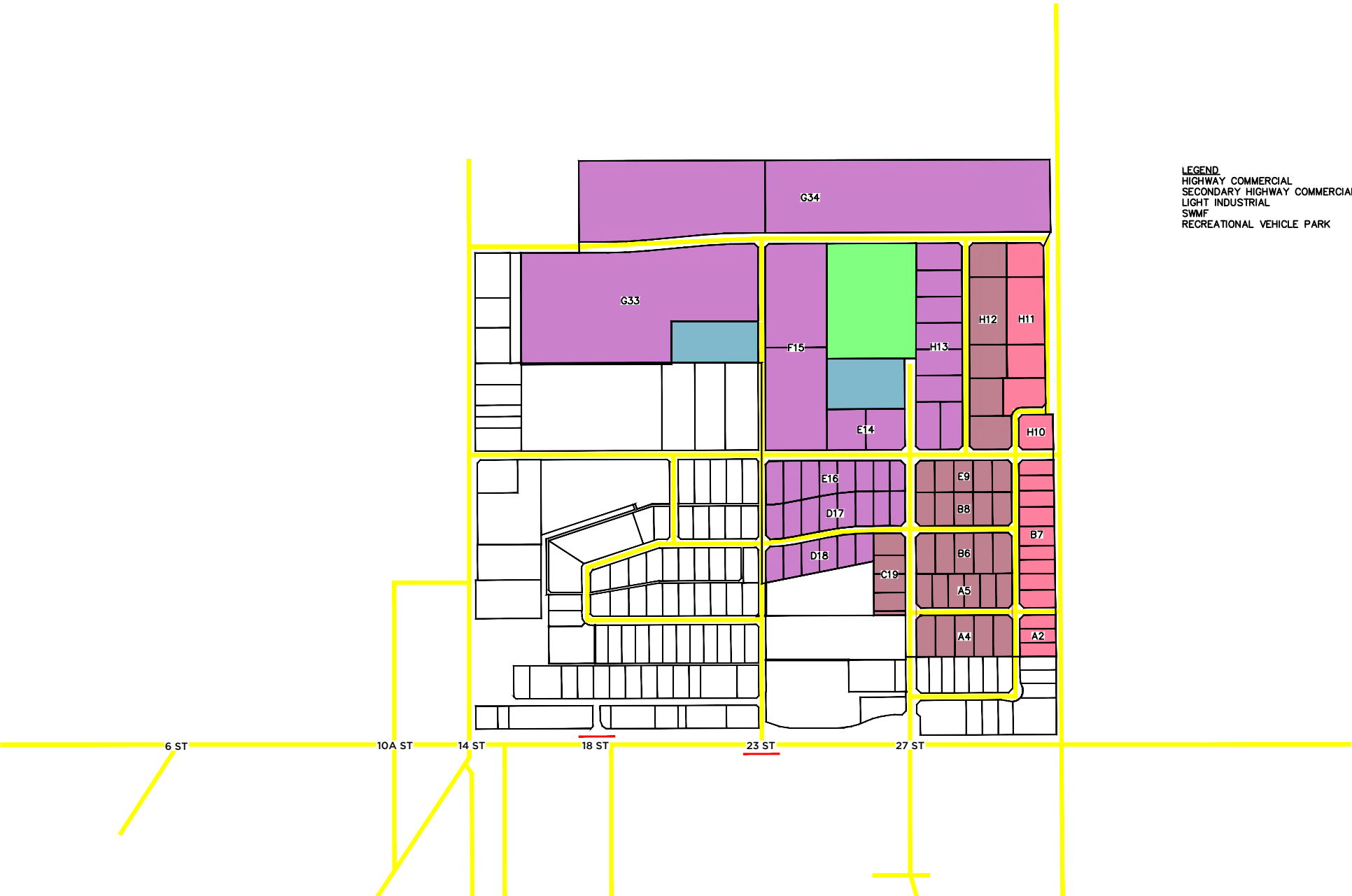
Land Use	Area (m ²)	GFA (sq. ft)	FAR	AM Peak Hour				PM Peak Hour				Source		
				Trip Rate	Inbound	Outbound	Trip Rate	Inbound	Outbound					
Existing Industrial Park	459096	45.9 ha			139 trips	145%	67 trips		34 trips	121 trips				
Ford Dealership	2450	26,375		1.30	73%	25 trips	27%	9 trips	1.45	40%	15 trips	60%	23 trips	ITE LUC 840
McDonald's	381	4,097		26.58	51%	55 trips	49%	53 trips	21.15	52%	45 trips	48%	42 trips	C-TEP
Car & Truck Wash		7 stalls		3.88	63%	17 trips	37%	10 trips	3.32	49%	11 trips	51%	12 trips	ITE LUC 947
Veterinary Medical Center of Eastern Alberta	708	7,622		2.55	67%	13 trips	33%	6 trips	2.12	40%	6 trips	60%	10 trips	ITE LUC 640
Agriculture Financial Service Corporation	1923	20,699		1.02	93%	20 trips	7%	1 trips	0.78	9%	1 trips	91%	15 trips	ITE LUC 714
Hall & Company, Chartered Professional Accountants	572	6,158		1.30	88%	7 trips	12%	1 trips	1.06	15%	1 trips	85%	6 trips	ITE LUC 710
Mark's	1316	14,162		0.70	80%	8 trips	20%	2 trips	2.47	51%	18 trips	49%	17 trips	ITE LUC 876
A&W	220	2,372		26.58	51%	32 trips	49%	31 trips	21.15	52%	26 trips	48%	24 trips	C-TEP
Ramada by Wyndham Wainwright		83 rooms		0.36	56%	17 trips	44%	13 trips	0.33	51%	14 trips	49%	13 trips	C-TEP
The Brick	2377	25,583		0.18	71%	3 trips	29%	1 trips	0.31	47%	4 trips	53%	4 trips	ITE LUC 890
Co-op Food Store	3364	36,210		2.00	59%	43 trips	41%	30 trips	5.37	50%	97 trips	50%	97 trips	ITE LUC 850
Cornerstone Co-op Gas Bar Wainwright		10 pumps		3.60	50%	18 trips	50%	18 trips	4.18	50%	21 trips	50%	21 trips	ITE LUC 944
Cornerstone Co-op Liquor Wainwright	503	5,414		0.21	79%	1 trips	21%	0 trips	4.99	50%	13 trips	50%	13 trips	ITE LUC 899
Co-op Home & Agro Centre	1369	14,736		1.11	62%	10 trips	38%	6 trips	1.35	46%	9 trips	54%	11 trips	ITE LUC 812
Co-op Cardlock		7 pumps		9.78	50%	34 trips	50%	34 trips	9.25	50%	32 trips	50%	32 trips	ITE LUC 950
Denwood Motors	1273	13,698		1.30	73%	13 trips	27%	5 trips	1.45	40%	8 trips	60%	12 trips	ITE LUC 840
Springs Motor Inn		39 rooms		0.22	37%	3 trips	63%	5 trips	0.20	54%	4 trips	46%	4 trips	C-TEP
Midwest Auto Supply Wainwright	337	3,633		1.76	55%	4 trips	45%	3 trips	2.94	48%	5 trips	52%	6 trips	ITE LUC 843
Days Inn by Wyndham Wainwright		48 rooms		0.22	53%	6 trips	47%	5 trips	0.20	49%	5 trips	51%	5 trips	C-TEP
Willerton Ski-Doo & Golf Cart LTD	489	5,259		0.32	85%	1 trips	15%	0 trips	0.46	31%	1 trips	69%	2 trips	ITE LUC 842
1979 Sports Bar & Grill	463	4,983		7.36	55%	20 trips	45%	16 trips	5.63	61%	17 trips	39%	11 trips	C-TEP
NAPA Auto Parts - Ignite Distribution Ltd	742	7,982		1.76	55%	8 trips	45%	6 trips	2.94	48%	11 trips	52%	12 trips	ITE LUC 843
Total					497 trips	322 trips			398 trips	513 trips				
					819 trips				911 trips					

Area of HWY commercial	24.72	ha
HWY commercial AM Inbound Trip Rate	14.5	trips/ha
HWY commercial AM Outbound Trip Rate	10.3	trips/ha
HWY commercial PM Inbound Trip Rate	14.7	trips/ha
HWY commercial PM Outbound Trip Rate	15.9	trips/ha

	Acheson	Traffic Counts	Factor
AM Inbound	497 trips	511 trips	1.03
AM Outbound	322 trips	348 trips	1.08
PM Inbound	398 trips	390 trips	0.98
PM Outbound	513 trips	531 trips	1.04
Total	1730 trips	1780 trips	



LEGEND
HIGHWAY COMMERCIAL
SECONDARY HIGHWAY COMMERCIAL
LIGHT INDUSTRIAL
SWMF
RECREATIONAL VEHICLE PARK



Trip Generation - AM (20-year) (including Dollarama & RIRO)

AM Outbound Trip Generation

Lot	Area	Trip Rate	Outbound Trips	Outbound Trips
A2	1.3 ha	10.3 trips/ha	14 vph	80 vph
A4	3.5 ha	10.3 trips/ha	36 vph	
A5	2.9 ha	10.3 trips/ha	30 vph	
B6	3.4 ha	10.3 trips/ha	35 vph	111 vph
B7	4.6 ha	10.3 trips/ha	47 vph	
B8	2.8 ha	10.3 trips/ha	29 vph	
C19	2.3 ha	10.3 trips/ha	24 vph	24 vph
D17	4.3 ha	1.5 trips/ha	6 vph	10 vph
D18	3.1 ha	1.5 trips/ha	4 vph	
E9	2.7 ha	10.3 trips/ha	28 vph	38 vph
E14	2.8 ha	1.5 trips/ha	4 vph	
E16	4.3 ha	1.5 trips/ha	6 vph	
F15	11.1 ha	1.5 trips/ha	16 vph	16 vph
G33	20.4 ha	1.5 trips/ha	30 vph	75 vph
G34	30.7 ha	1.5 trips/ha	45 vph	
H10	1.0 ha	10.3 trips/ha	11 vph	151 vph
H11	5.6 ha	10.3 trips/ha	58 vph	
H12	6.8 ha	10.3 trips/ha	70 vph	
H13	8.4 ha	1.5 trips/ha	12 vph	
122.0 ha			505 trips	505 trips

AM Inbound Trip Generation

Lot	Area	Trip Rate	Inbound Trips	Inbound Trips
A2	1.3 ha	14.5 trips/ha	19 vph	112 vph
A4	3.5 ha	14.5 trips/ha	51 vph	
A5	2.9 ha	14.5 trips/ha	42 vph	
B6	3.4 ha	14.5 trips/ha	50 vph	157 vph
B7	4.6 ha	14.5 trips/ha	66 vph	
B8	2.8 ha	14.5 trips/ha	41 vph	
C19	2.3 ha	14.5 trips/ha	33 vph	33 vph
D17	4.3 ha	3.0 trips/ha	13 vph	22 vph
D18	3.1 ha	3.0 trips/ha	9 vph	
E9	2.7 ha	14.5 trips/ha	39 vph	60 vph
E14	2.8 ha	3.0 trips/ha	8 vph	
E16	4.3 ha	3.0 trips/ha	13 vph	
F15	11.1 ha	3.0 trips/ha	34 vph	34 vph
G33	20.4 ha	3.0 trips/ha	62 vph	155 vph
G34	30.7 ha	3.0 trips/ha	93 vph	
H10	1.0 ha	14.5 trips/ha	15 vph	219 vph
H11	5.6 ha	14.5 trips/ha	81 vph	
H12	6.8 ha	14.5 trips/ha	98 vph	
H13	8.4 ha	3.0 trips/ha	25 vph	
122.0 ha			792 trips	792 trips

Area 1219807 m2
Area diff. 150173 m2

AM		External Zones				Wainwright Zones						
Zone	Outbound Trips	H14 West	H41N	H41E	H41S	R1	R2	R3	R4	R5	R6	R7
		16%	6%	12%	7%	4%	5%	13%	9%	9%	12%	7%
A	80 vph	13 vph	5 vph	10 vph	5 vph	4 vph	4 vph	11 vph	7 vph	7 vph	10 vph	6 vph
B	111 vph	18 vph	6 vph	14 vph	8 vph	5 vph	5 vph	15 vph	10 vph	10 vph	14 vph	8 vph
C	24 vph	4 vph	1 vph	3 vph	2 vph	1 vph	1 vph	3 vph	2 vph	2 vph	3 vph	2 vph
D	10 vph	2 vph	1 vph	1 vph	1 vph	0 vph	0 vph	1 vph	1 vph	1 vph	1 vph	1 vph
E	38 vph	6 vph	2 vph	5 vph	3 vph	2 vph	2 vph	5 vph	3 vph	3 vph	5 vph	3 vph
F	16 vph	3 vph	1 vph	2 vph	1 vph	1 vph	1 vph	2 vph	1 vph	1 vph	2 vph	1 vph
G	75 vph	12 vph	4 vph	9 vph	5 vph	3 vph	3 vph	10 vph	6 vph	7 vph	9 vph	5 vph
H	151 vph	25 vph	9 vph	18 vph	10 vph	7 vph	7 vph	20 vph	13 vph	13 vph	18 vph	10 vph
505 trips		83 trips	29 trips	62 trips	35 trips	23 trips	23 trips	67 trips	43 trips	44 trips	62 trips	36 trips

AM		External Zones				Wainwright Zones						
Zone	Inbound Trips	H14 West	H41N	H41E	H41S	R1	R2	R3	R4	R5	R6	R7
		19%	5%	11%	5%	5%	5%	14%	9%	9%	12%	7%
A	112 vph	18 vph	6 vph	14 vph	8 vph	5 vph	5 vph	15 vph	10 vph	10 vph	14 vph	8 vph
B	157 vph	26 vph	9 vph	19 vph	11 vph	7 vph	7 vph	21 vph	14 vph	14 vph	19 vph	11 vph
C	33 vph	5 vph	2 vph	4 vph	2 vph	1 vph	2 vph	4 vph	3 vph	3 vph	4 vph	2 vph
D	22 vph	4 vph	1 vph	3 vph	2 vph	1 vph	1 vph	3 vph	2 vph	2 vph	3 vph	2 vph
E	60 vph	10 vph	3 vph	7 vph	4 vph	3 vph	3 vph	8 vph	5 vph	5 vph	7 vph	4 vph
F	34 vph	6 vph	2 vph	4 vph	2 vph	2 vph	2 vph	5 vph	3 vph	3 vph	4 vph	2 vph
G	155 vph	25 vph	9 vph	19 vph	11 vph	7 vph	7 vph	21 vph	13 vph	14 vph	19 vph	11 vph
H	219 vph	36 vph	12 vph	27 vph	15 vph	10 vph	10 vph	29 vph	19 vph	19 vph	27 vph	15 vph
792 trips		130 trips	44 trips	97 trips	55 trips	36 trips	37 trips	106 trips	69 trips	70 trips	97 trips	55 trips

Trip Generation - PM (20-year) (including Dollarama & RIRO)

PM Outbound Trip Generation

Lot	Area	Trip Rate	Outbound Trips	Outbound Trips
A2	1.3 ha	15.9 trips/ha	20.9 vph	122 vph
A4	3.5 ha	15.9 trips/ha	55.5 vph	
A5	2.9 ha	15.9 trips/ha	45.6 vph	
B6	3.4 ha	15.9 trips/ha	54.2 vph	
B7	4.6 ha	15.9 trips/ha	72.6 vph	171 vph
B8	2.8 ha	15.9 trips/ha	44.6 vph	
C19	2.3 ha	15.9 trips/ha	36.1 vph	
D17	4.3 ha	2.6 trips/ha	11.2 vph	19 vph
D18	3.1 ha	2.6 trips/ha	8.1 vph	
E9	2.7 ha	15.9 trips/ha	42.5 vph	61 vph
E14	2.8 ha	2.6 trips/ha	7.4 vph	
E16	4.3 ha	2.6 trips/ha	11.2 vph	
F15	11.1 ha	2.6 trips/ha	29.3 vph	29 vph
G33	20.4 ha	2.6 trips/ha	53.8 vph	135 vph
G34	30.7 ha	2.6 trips/ha	80.8 vph	
H10	1.0 ha	15.9 trips/ha	16.4 vph	235 vph
H11	5.6 ha	15.9 trips/ha	89.2 vph	
H12	6.8 ha	15.9 trips/ha	107.2 vph	
H13	8.4 ha	2.6 trips/ha	22.0 vph	
122.0 ha		809 trips		809 trips

PM Inbound Trip Generation

Lot	Area	Trip Rate	Inbound Trips	Inbound Trips
A2	1.3 ha	14.7 trips/ha	19.4 vph	113 vph
A4	3.5 ha	14.7 trips/ha	51.6 vph	
A5	2.9 ha	14.7 trips/ha	42.4 vph	
B6	3.4 ha	14.7 trips/ha	50.4 vph	159 vph
B7	4.6 ha	14.7 trips/ha	67.4 vph	
B8	2.8 ha	14.7 trips/ha	41.4 vph	
C19	2.3 ha	14.7 trips/ha	33.6 vph	
D17	4.3 ha	0.7 trips/ha	3.1 vph	5 vph
D18	3.1 ha	0.7 trips/ha	2.2 vph	
E9	2.7 ha	14.7 trips/ha	39.4 vph	45 vph
E14	2.8 ha	0.7 trips/ha	2.0 vph	
E16	4.3 ha	0.7 trips/ha	3.1 vph	
F15	11.1 ha	0.7 trips/ha	8.1 vph	8 vph
G33	20.4 ha	0.7 trips/ha	14.9 vph	37 vph
G34	30.7 ha	0.7 trips/ha	22.4 vph	
H10	1.0 ha	14.7 trips/ha	15.3 vph	204 vph
H11	5.6 ha	14.7 trips/ha	82.8 vph	
H12	6.8 ha	14.7 trips/ha	99.5 vph	
H13	8.4 ha	0.7 trips/ha	6.1 vph	
122.0 ha		605 trips		605 trips

Area 1219807 m2
Area diff. 150173 m2

PM		External Zones				Wainwright Zones						
Zone	Outbound Trips	H14 West	H41N	H41E	H41S	R1	R2	R3	R4	R5	R6	R7
		21%	5%	18%	9%	3%	4%	11%	7%	7%	10%	5%
A	122 vph	26 vph	6 vph	22 vph	11 vph	4 vph	4 vph	13 vph	8 vph	8 vph	12 vph	7 vph
B	171 vph	36 vph	9 vph	31 vph	16 vph	6 vph	6 vph	18 vph	12 vph	12 vph	16 vph	9 vph
C	36 vph	8 vph	2 vph	7 vph	3 vph	1 vph	1 vph	4 vph	2 vph	3 vph	3 vph	2 vph
D	19 vph	4 vph	1 vph	4 vph	2 vph	1 vph	1 vph	2 vph	1 vph	1 vph	2 vph	1 vph
E	61 vph	13 vph	3 vph	11 vph	6 vph	2 vph	2 vph	6 vph	4 vph	4 vph	6 vph	3 vph
F	29 vph	6 vph	2 vph	5 vph	3 vph	1 vph	1 vph	3 vph	2 vph	2 vph	3 vph	2 vph
G	135 vph	28 vph	7 vph	25 vph	12 vph	5 vph	5 vph	14 vph	9 vph	9 vph	13 vph	7 vph
H	235 vph	49 vph	12 vph	43 vph	22 vph	8 vph	8 vph	25 vph	16 vph	16 vph	22 vph	13 vph
809 trips		170 trips	42 trips	148 trips	75 trips	28 trips	28 trips	85 trips	54 trips	55 trips	77 trips	44 trips

PM		External Zones				Wainwright Zones						
Zone	Inbound Trips	H14 West	H41N	H41E	H41S	R1	R2	R3	R4	R5	R6	R7
		7%	2%	8%	3%	6%	6%	18%	12%	12%	16%	9%
A	113 vph	24 vph	6 vph	21 vph	10 vph	4 vph	4 vph	12 vph	8 vph	8 vph	11 vph	6 vph
B	159 vph	33 vph	8 vph	29 vph	15 vph	6 vph	6 vph	17 vph	11 vph	11 vph	15 vph	9 vph
C	34 vph	7 vph	2 vph	6 vph	3 vph	1 vph	1 vph	4 vph	2 vph	2 vph	3 vph	2 vph
D	5 vph	1 vph	0 vph	1 vph	0 vph	0 vph	0 vph	1 vph	0 vph	0 vph	1 vph	0 vph
E	45 vph	9 vph	2 vph	8 vph	4 vph	2 vph	2 vph	5 vph	3 vph	3 vph	4 vph	2 vph
F	8 vph	2 vph	0 vph	1 vph	1 vph	0 vph	0 vph	1 vph	1 vph	1 vph	1 vph	0 vph
G	37 vph	8 vph	2 vph	7 vph	3 vph	1 vph	1 vph	4 vph	3 vph	3 vph	4 vph	2 vph
H	204 vph	43 vph	11 vph	37 vph	19 vph	7 vph	7 vph	22 vph	14 vph	14 vph	19 vph	11 vph
605 trips		127 trips	31 trips	110 trips	55 trips	21 trips	21 trips	66 trips	42 trips	42 trips	58 trips	32 trips

100%
121 vph
171 vph
36 vph
20 vph
60 vph
30 vph
134 vph
234 vph
807 trips

100%
114 vph
160 vph
33 vph
4 vph
44 vph
8 vph
38 vph
204 vph
606 trips

Trip Generation - AM - 20-year (including Dollarama & without RIRO)

AM Outbound Trip Generation

Lot	Area	Trip Rate	Outbound Trips	Outbound Trips
A2	1.3 ha	10.3 trips/ha	14 vph	80 vph
A4	3.5 ha	10.3 trips/ha	36 vph	
A5	2.9 ha	10.3 trips/ha	30 vph	
B6	3.4 ha	10.3 trips/ha	35 vph	111 vph
B7	4.6 ha	10.3 trips/ha	47 vph	
B8	2.8 ha	10.3 trips/ha	29 vph	
C19	2.3 ha	10.3 trips/ha	24 vph	24 vph
D17	4.3 ha	1.5 trips/ha	6 vph	10 vph
D18	3.1 ha	1.5 trips/ha	4 vph	
E9	2.7 ha	10.3 trips/ha	28 vph	38 vph
E14	2.8 ha	1.5 trips/ha	4 vph	
E16	4.3 ha	1.5 trips/ha	6 vph	
F15	11.1 ha	1.5 trips/ha	16 vph	16 vph
G33	20.4 ha	1.5 trips/ha	30 vph	75 vph
G34	30.7 ha	1.5 trips/ha	45 vph	
H10	1.0 ha	10.3 trips/ha	11 vph	151 vph
H11	5.6 ha	10.3 trips/ha	58 vph	
H12	6.8 ha	10.3 trips/ha	70 vph	
H13	8.4 ha	1.5 trips/ha	12 vph	
122.0 ha			505 trips	505 trips

AM Inbound Trip Generation

Lot	Area	Trip Rate	Inbound Trips	Inbound Trips
A2	1.3 ha	14.5 trips/ha	19 vph	112 vph
A4	3.5 ha	14.5 trips/ha	51 vph	
A5	2.9 ha	14.5 trips/ha	42 vph	
B6	3.4 ha	14.5 trips/ha	50 vph	157 vph
B7	4.6 ha	14.5 trips/ha	66 vph	
B8	2.8 ha	14.5 trips/ha	41 vph	
C19	2.3 ha	14.5 trips/ha	33 vph	33 vph
D17	4.3 ha	3.0 trips/ha	13 vph	22 vph
D18	3.1 ha	3.0 trips/ha	9 vph	
E9	2.7 ha	14.5 trips/ha	39 vph	60 vph
E14	2.8 ha	3.0 trips/ha	8 vph	
E16	4.3 ha	3.0 trips/ha	13 vph	
F15	11.1 ha	3.0 trips/ha	34 vph	34 vph
G33	20.4 ha	3.0 trips/ha	62 vph	155 vph
G34	30.7 ha	3.0 trips/ha	93 vph	
H10	1.0 ha	14.5 trips/ha	15 vph	219 vph
H11	5.6 ha	14.5 trips/ha	81 vph	
H12	6.8 ha	14.5 trips/ha	98 vph	
H13	8.4 ha	3.0 trips/ha	25 vph	
122.0 ha			792 trips	792 trips

Area 1219807 m2
Area diff. 150173 m2

AM		External Zones				Wainwright Zones						
Zone	Outbound Trips	H14 West 16%	H41N 6%	H41E 12%	H41S 7%	R1 4%	R2 5%	R3 13%	R4 9%	R5 9%	R6 12%	R7 7%
A	80 vph	13 vph	5 vph	10 vph	5 vph	4 vph	4 vph	11 vph	7 vph	7 vph	10 vph	6 vph
B	111 vph	18 vph	6 vph	14 vph	8 vph	5 vph	5 vph	15 vph	10 vph	10 vph	14 vph	8 vph
C	24 vph	4 vph	1 vph	3 vph	2 vph	1 vph	1 vph	3 vph	2 vph	2 vph	3 vph	2 vph
D	10 vph	2 vph	1 vph	1 vph	1 vph	0 vph	0 vph	1 vph	1 vph	1 vph	1 vph	1 vph
E	38 vph	6 vph	2 vph	5 vph	3 vph	2 vph	2 vph	5 vph	3 vph	3 vph	5 vph	3 vph
F	16 vph	3 vph	1 vph	2 vph	1 vph	1 vph	1 vph	2 vph	1 vph	1 vph	2 vph	1 vph
G	75 vph	12 vph	4 vph	9 vph	5 vph	3 vph	3 vph	10 vph	6 vph	7 vph	9 vph	5 vph
H	151 vph	25 vph	9 vph	18 vph	10 vph	7 vph	7 vph	20 vph	13 vph	13 vph	18 vph	10 vph
505 trips		83 trips	29 trips	62 trips	35 trips	23 trips	23 trips	67 trips	43 trips	44 trips	62 trips	36 trips

AM		External Zones				Wainwright Zones						
Zone	Inbound Trips	H14 West 19%	H41N 5%	H41E 11%	H41S 5%	R1 5%	R2 5%	R3 14%	R4 9%	R5 9%	R6 12%	R7 7%
A	112 vph	18 vph	6 vph	14 vph	8 vph	5 vph	5 vph	15 vph	10 vph	10 vph	14 vph	8 vph
B	157 vph	26 vph	9 vph	19 vph	11 vph	7 vph	7 vph	21 vph	14 vph	14 vph	19 vph	11 vph
C	33 vph	5 vph	2 vph	4 vph	2 vph	1 vph	2 vph	4 vph	3 vph	3 vph	4 vph	2 vph
D	22 vph	4 vph	1 vph	3 vph	2 vph	1 vph	1 vph	3 vph	2 vph	2 vph	3 vph	2 vph
E	60 vph	10 vph	3 vph	7 vph	4 vph	3 vph	3 vph	8 vph	5 vph	5 vph	7 vph	4 vph
F	34 vph	6 vph	2 vph	4 vph	2 vph	2 vph	2 vph	5 vph	3 vph	3 vph	4 vph	2 vph
G	155 vph	25 vph	9 vph	19 vph	11 vph	7 vph	7 vph	21 vph	13 vph	14 vph	19 vph	11 vph
H	219 vph	36 vph	12 vph	27 vph	15 vph	10 vph	10 vph	29 vph	19 vph	19 vph	27 vph	15 vph
792 trips		130 trips	44 trips	97 trips	55 trips	36 trips	37 trips	106 trips	69 trips	70 trips	97 trips	55 trips

100%
82 vph
113 vph
24 vph
10 vph
39 vph
16 vph
73 vph
150 vph
508 trips

100%
113 vph
158 vph
32 vph
24 vph
59 vph
35 vph
156 vph
219 vph
797 trips

Trip Generation - PM - 20-year (including Dollarama & without RIRO)

PM Outbound Trip Generation

Lot	Area	Trip Rate	Outbound Trips	Outbound Trips
A2	1.3 ha	15.9 trips/ha	20.9 vph	122 vph
A4	3.5 ha	15.9 trips/ha	55.5 vph	
A5	2.9 ha	15.9 trips/ha	45.6 vph	
B6	3.4 ha	15.9 trips/ha	54.2 vph	
B7	4.6 ha	15.9 trips/ha	72.6 vph	171 vph
B8	2.8 ha	15.9 trips/ha	44.6 vph	
C19	2.3 ha	15.9 trips/ha	36.1 vph	
D17	4.3 ha	2.6 trips/ha	11.2 vph	
D18	3.1 ha	2.6 trips/ha	8.1 vph	19 vph
E9	2.7 ha	15.9 trips/ha	42.5 vph	
E14	2.8 ha	2.6 trips/ha	7.4 vph	
E16	4.3 ha	2.6 trips/ha	11.2 vph	
F15	11.1 ha	2.6 trips/ha	29.3 vph	29 vph
G33	20.4 ha	2.6 trips/ha	53.8 vph	
G34	30.7 ha	2.6 trips/ha	80.8 vph	
H10	1.0 ha	15.9 trips/ha	16.4 vph	
H11	5.6 ha	15.9 trips/ha	89.2 vph	235 vph
H12	6.8 ha	15.9 trips/ha	107.2 vph	
H13	8.4 ha	2.6 trips/ha	22.0 vph	
122.0 ha			809 trips	809 trips

PM Inbound Trip Generation

Lot	Area	Trip Rate	Inbound Trips	Inbound Trips
A2	1.3 ha	14.7 trips/ha	19.4 vph	113 vph
A4	3.5 ha	14.7 trips/ha	51.6 vph	
A5	2.9 ha	14.7 trips/ha	42.4 vph	
B6	3.4 ha	14.7 trips/ha	50.4 vph	
B7	4.6 ha	14.7 trips/ha	67.4 vph	159 vph
B8	2.8 ha	14.7 trips/ha	41.4 vph	
C19	2.3 ha	14.7 trips/ha	33.6 vph	
D17	4.3 ha	0.7 trips/ha	3.1 vph	
D18	3.1 ha	0.7 trips/ha	2.2 vph	5 vph
E9	2.7 ha	14.7 trips/ha	39.4 vph	
E14	2.8 ha	0.7 trips/ha	2.0 vph	
E16	4.3 ha	0.7 trips/ha	3.1 vph	
F15	11.1 ha	0.7 trips/ha	8.1 vph	8 vph
G33	20.4 ha	0.7 trips/ha	14.9 vph	
G34	30.7 ha	0.7 trips/ha	22.4 vph	
H10	1.0 ha	14.7 trips/ha	15.3 vph	
H11	5.6 ha	14.7 trips/ha	82.8 vph	204 vph
H12	6.8 ha	14.7 trips/ha	99.5 vph	
H13	8.4 ha	0.7 trips/ha	6.1 vph	
122.0 ha			605 trips	605 trips

Area 1219807 m2
Area diff. 150173 m2

PM		External Zones				Wainwright Zones						
Zone	Outbound Trips	H14 West 21%	H41N 5%	H41E 18%	H41S 9%	R1 3%	R2 4%	R3 11%	R4 7%	R5 7%	R6 10%	R7 5%
A	122 vph	26 vph	6 vph	22 vph	11 vph	4 vph	4 vph	13 vph	8 vph	8 vph	12 vph	7 vph
B	171 vph	36 vph	9 vph	31 vph	16 vph	6 vph	6 vph	18 vph	12 vph	12 vph	16 vph	9 vph
C	36 vph	8 vph	2 vph	7 vph	3 vph	1 vph	1 vph	4 vph	2 vph	3 vph	3 vph	2 vph
D	19 vph	4 vph	1 vph	4 vph	2 vph	1 vph	1 vph	2 vph	1 vph	1 vph	2 vph	1 vph
E	61 vph	13 vph	3 vph	11 vph	6 vph	2 vph	2 vph	6 vph	4 vph	4 vph	6 vph	3 vph
F	29 vph	6 vph	2 vph	5 vph	3 vph	1 vph	1 vph	3 vph	2 vph	2 vph	3 vph	2 vph
G	135 vph	28 vph	7 vph	25 vph	12 vph	5 vph	5 vph	14 vph	9 vph	9 vph	13 vph	7 vph
H	235 vph	49 vph	12 vph	43 vph	22 vph	8 vph	8 vph	25 vph	16 vph	16 vph	22 vph	13 vph
809 trips		170 trips	42 trips	148 trips	75 trips	28 trips	28 trips	85 trips	54 trips	55 trips	77 trips	44 trips

PM		External Zones				Wainwright Zones						
Zone	Inbound Trips	H14 West 7%	H41N 2%	H41E 8%	H41S 3%	R1 6%	R2 6%	R3 18%	R4 12%	R5 12%	R6 16%	R7 9%
A	113 vph	24 vph	6 vph	21 vph	10 vph	4 vph	4 vph	12 vph	8 vph	8 vph	11 vph	6 vph
B	159 vph	33 vph	8 vph	29 vph	15 vph	6 vph	6 vph	17 vph	11 vph	11 vph	15 vph	9 vph
C	34 vph	7 vph	2 vph	6 vph	3 vph	1 vph	1 vph	4 vph	2 vph	2 vph	3 vph	2 vph
D	5 vph	1 vph	0 vph	1 vph	0 vph	0 vph	0 vph	1 vph	0 vph	0 vph	1 vph	0 vph
E	45 vph	9 vph	2 vph	8 vph	4 vph	2 vph	2 vph	5 vph	3 vph	3 vph	4 vph	2 vph
F	8 vph	2 vph	0 vph	1 vph	1 vph	0 vph	0 vph	1 vph	1 vph	1 vph	1 vph	0 vph
G	37 vph	8 vph	2 vph	7 vph	3 vph	1 vph	1 vph	4 vph	3 vph	3 vph	4 vph	2 vph
H	204 vph	43 vph	11 vph	37 vph	19 vph	7 vph	7 vph	22 vph	14 vph	14 vph	19 vph	11 vph
605 trips		127 trips	31 trips	110 trips	55 trips	21 trips	21 trips	66 trips	42 trips	42 trips	58 trips	32 trips

100%
121 vph
171 vph
36 vph
20 vph
60 vph
30 vph
134 vph
234 vph
807 trips

100%
114 vph
160 vph
33 vph
4 vph
44 vph
8 vph
38 vph
204 vph
606 trips



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Appendix F

Traffic Signal Warrant Analysis Results

Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 14	Direction (EW or NS)	EW
Side Street (name)	1 Street	Direction (EW or NS)	NS
Quadrant / Int #		Comments	2023 AT Raw Data

for Warrant Calculation
Results, please hit 'Page
Down'

Road Authority:	Town of Wainwright
City:	Town of Wainwright
Analysis Date:	2024 Dec 04, Wed
Count Date:	2023 Jun 15, Thu
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB		1			1		9,999	2
Highway 14	EB		1			1		1,630	2
1 Street	NB				1				
1 Street	SB				1				

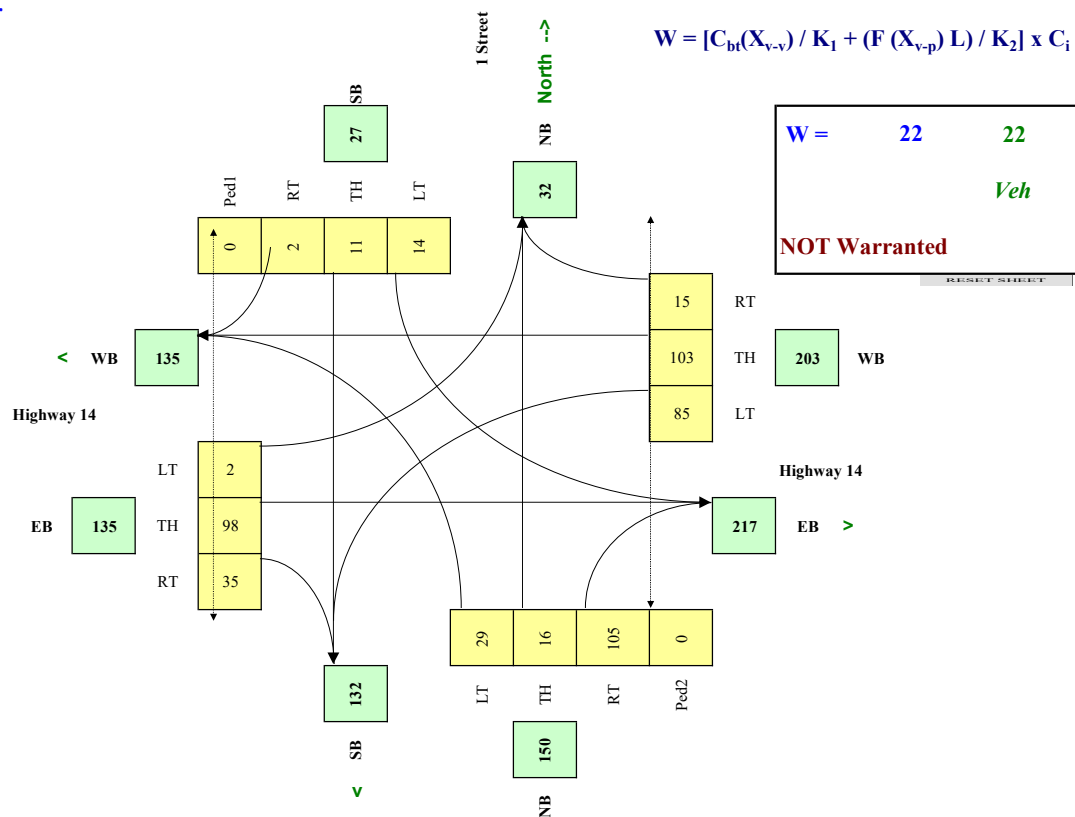
Are the 1 Street NB right turns significantly impeded by through movements? (y/n) n
Are the 1 Street SB right turns significantly impeded by through movements? (y/n) n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	4.0%	n	0.0
1 Street	NS		2.0%	n	

Set Peak Hours														Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
Traffic Input														W Side	E Side	N Side	S Side
		NB			SB			WB				EB					
		LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT				
7:15 - 8:15		15	8	72	13	19	2	112	87	12	3	90	50				
8:15 - 9:15		18	10	85	19	11	0	77	81	11	1	93	40				
11:15 - 12:15		28	14	136	8	10	2	68	80	15	3	104	29				
12:15 - 13:15		37	12	83	16	9	2	114	113	17	1	88	30				
15:30 - 16:30		37	27	146	11	12	3	66	115	14	1	93	30				
16:30 - 17:30		41	25	107	16	6	2	74	144	20	0	122	32				
Total (6-hour peak)		176	96	629	83	67	11	511	620	89	9	590	211	0	0	0	0
Average (6-hour peak)		29	16	105	14	11	2	85	103	15	2	98	35	0	0	0	0

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Average 6-hour Peak Turning Movements



Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 14	Direction (EW or NS)	EW
Side Street (name)	1 Street	Direction (EW or NS)	NS
Quadrant / Int #		Comments	10-Year - GF 1.33

for Warrant Calculation
Results, please hit 'Page
Down'

Road Authority:	Town of Wainwright
City:	Town of Wainwright
Analysis Date:	2024 Dec 04, Wed
Count Date:	2023 Jun 15, Thu
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB		1			1		9,999	2
Highway 14	EB		1			1		1,630	2
1 Street	NB				1				
1 Street	SB				1				

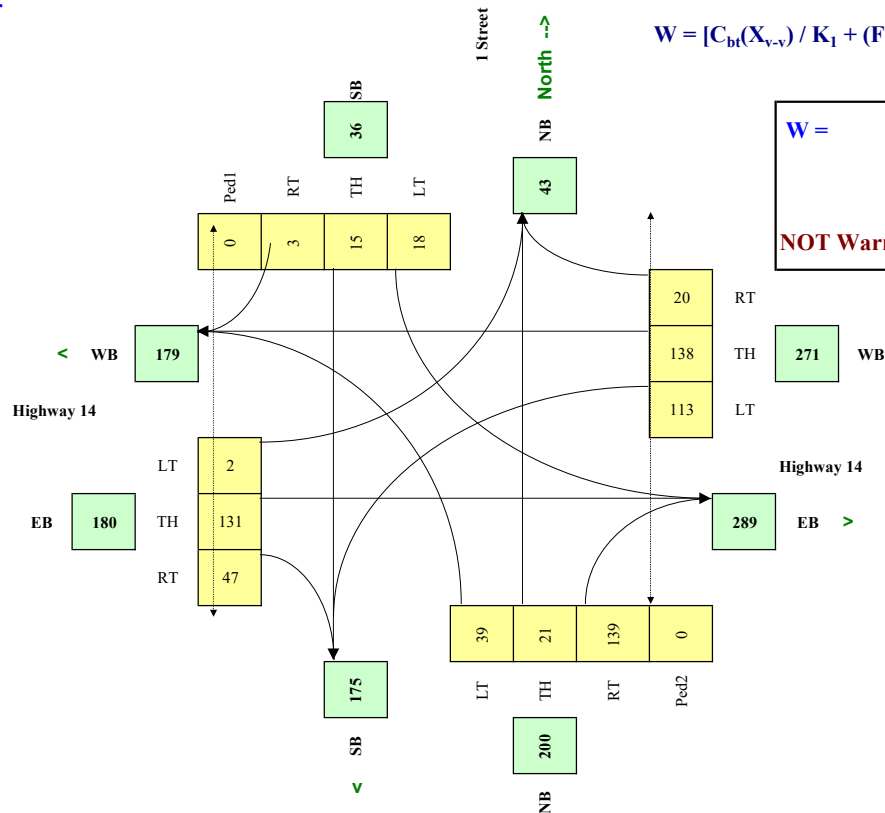
Are the 1 Street NB right turns significantly impeded by through movements? (y/n) n
Are the 1 Street SB right turns significantly impeded by through movements? (y/n) n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	4.0%	n	0.0
1 Street	NS		2.0%	n	

Set Peak Hours														Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
Traffic Input		NB			SB			WB			EB			W Side	E Side	N Side	S Side
		LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT				
7:15 - 8:15		20	11	96	17	25	3	149	116	16	4	120	67				
8:15 - 9:15		24	13	113	25	15	0	102	108	15	1	124	53				
11:15 - 12:15		37	19	181	11	13	3	90	106	20	4	138	39				
12:15 - 13:15		49	16	110	21	12	3	152	150	23	1	117	40				
15:30 - 16:30		49	36	194	15	16	4	88	153	19	1	124	40				
16:30 - 17:30		55	33	142	21	8	3	98	192	27	0	162	43				
Total (6-hour peak)		234	128	836	110	89	16	679	825	120	11	785	282	0	0	0	0
Average (6-hour peak)		39	21	139	18	15	3	113	138	20	2	131	47	0	0	0	0

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p})L) / K_2] \times C_i$$

W =	39	39	0
		Veh	Ped
NOT Warranted			

Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 14	Direction (EW or NS)	EW
Side Street (name)	1 Street	Direction (EW or NS)	NS
Quadrant / Int #		Comments	20-Year - GF 2.31

for Warrant Calculation Results, please hit 'Page Down'

Road Authority:	Town of Wainwright
City:	Town of Wainwright
Analysis Date:	2024 Dec 04, Wed
Count Date:	2023 Jun 15, Thu
Date Entry Format:	(yyyy-mm-dd)

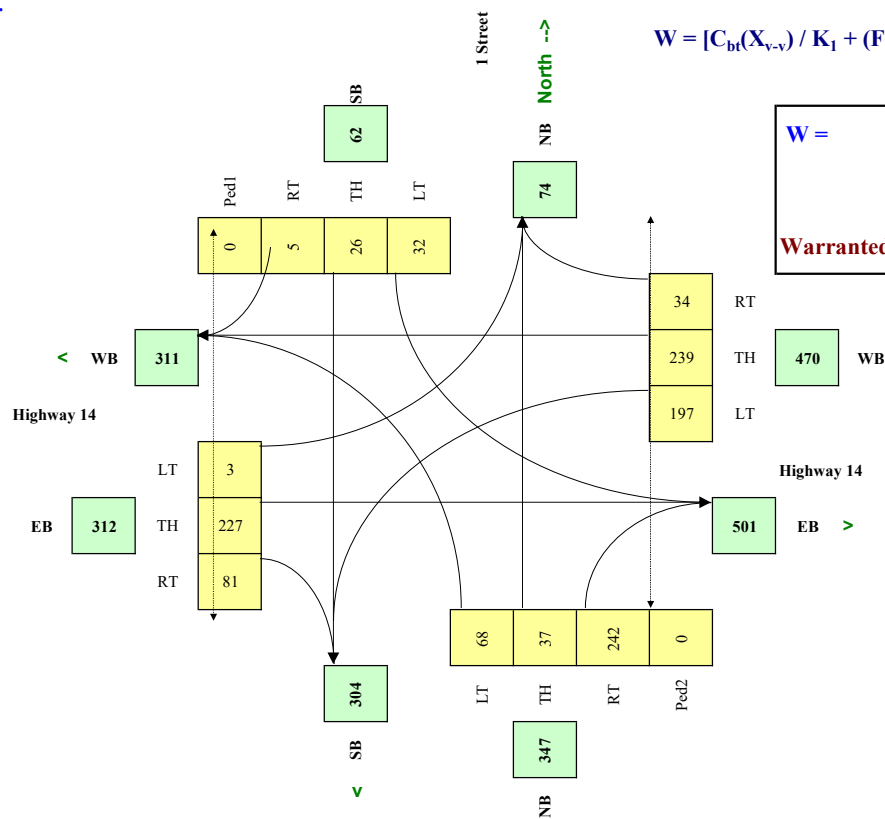
Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB		1			1		9,999	2
Highway 14	EB		1			1		1,630	2
1 Street	NB				1				
1 Street	SB				1				
Are the 1 Street NB right turns significantly impeded by through movements? (y/n)									n
Are the 1 Street SB right turns significantly impeded by through movements? (y/n)									n

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	4.0%	n	0.0
1 Street	NS		2.0%	n	

Set Peak Hours													Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
Traffic Input	NB			SB			WB			EB			W Side	E Side	N Side	S Side
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT				
7:15 - 8:15	35	18	166	30	44	5	259	201	28	7	208	116				
8:15 - 9:15	42	23	196	44	25	0	178	187	25	2	215	92				
11:15 - 12:15	65	32	314	18	23	5	157	185	35	7	240	67				
12:15 - 13:15	85	28	192	37	21	5	263	261	39	2	203	69				
15:30 - 16:30	85	62	337	25	28	7	152	266	32	2	215	69				
16:30 - 17:30	95	58	247	37	14	5	171	333	46	0	282	74				
Total (6-hour peak)	407	221	1,452	191	155	27	1,180	1,433	205	20	1,363	487	0	0	0	0
Average (6-hour peak)	68	37	242	32	26	5	197	239	34	3	227	81	0	0	0	0

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p})L) / K_2] \times C_i$$

W =	123	123	0
		Veh	Ped
Warranted			

Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 14	Direction (EW or NS)	EW
Side Street (name)	18 Street	Direction (EW or NS)	NS
Quadrant / Int #		Comments	2023 AT Raw Data

for Warrant Calculation Results, please hit 'Page Down'

Road Authority:	Town of Wainwright
City:	Town of Wainwright
Analysis Date:	2024 Dec 04, Wed
Count Date:	2023 Jun 15, Thu
Date Entry Format:	(yyyy-mm-dd)

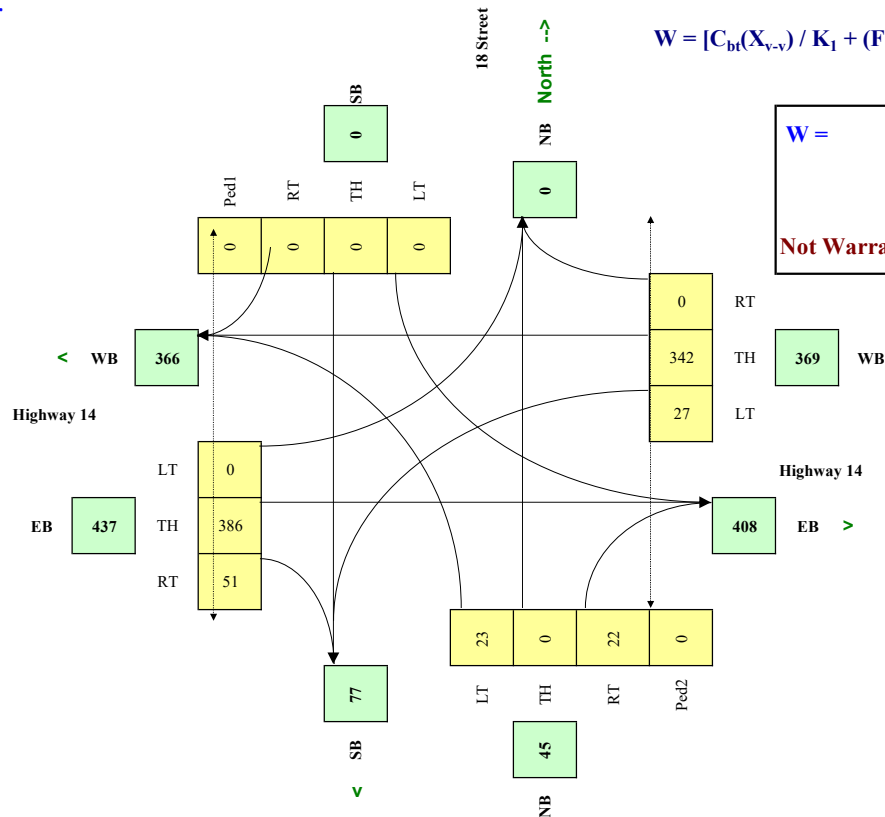
Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB		1					415	1
Highway 14	EB					1		385	1
18 Street	NB	1					1		
18 Street	SB								

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	2.0%	n	0.0
18 Street	NS		0.0%	n	

Set Peak Hours													Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
Traffic Input													W Side	E Side	N Side	S Side
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT				
	25		24				16	324			296	42				
	23		22				27	281			324	44				
	19		19				26	408			417	48				
	30		27				26	343			356	45				
	25		23				30	313			468	57				
	17		16				35	385			456	67				
Total (6-hour peak)	139	0	131	0	0	0	160	2,054	0	0	2,317	303	0	0	0	0
Average (6-hour peak)	23	0	22	0	0	0	27	342	0	0	386	51	0	0	0	0

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p})L) / K_2] \times C_i$$

W =	21	21	0
		Veh	Ped
Not Warranted - Vs<75			

Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 14	Direction (EW or NS)	EW
Side Street (name)	18 Street	Direction (EW or NS)	NS
Quadrant / Int #		Comments	10-Year - GF 1.42

for Warrant Calculation Results, please hit 'Page Down'

Road Authority:	Town of Wainwright
City:	Town of Wainwright
Analysis Date:	2024 Dec 04, Wed
Count Date:	2023 Jun 15, Thu
Date Entry Format:	(yyyy-mm-dd)

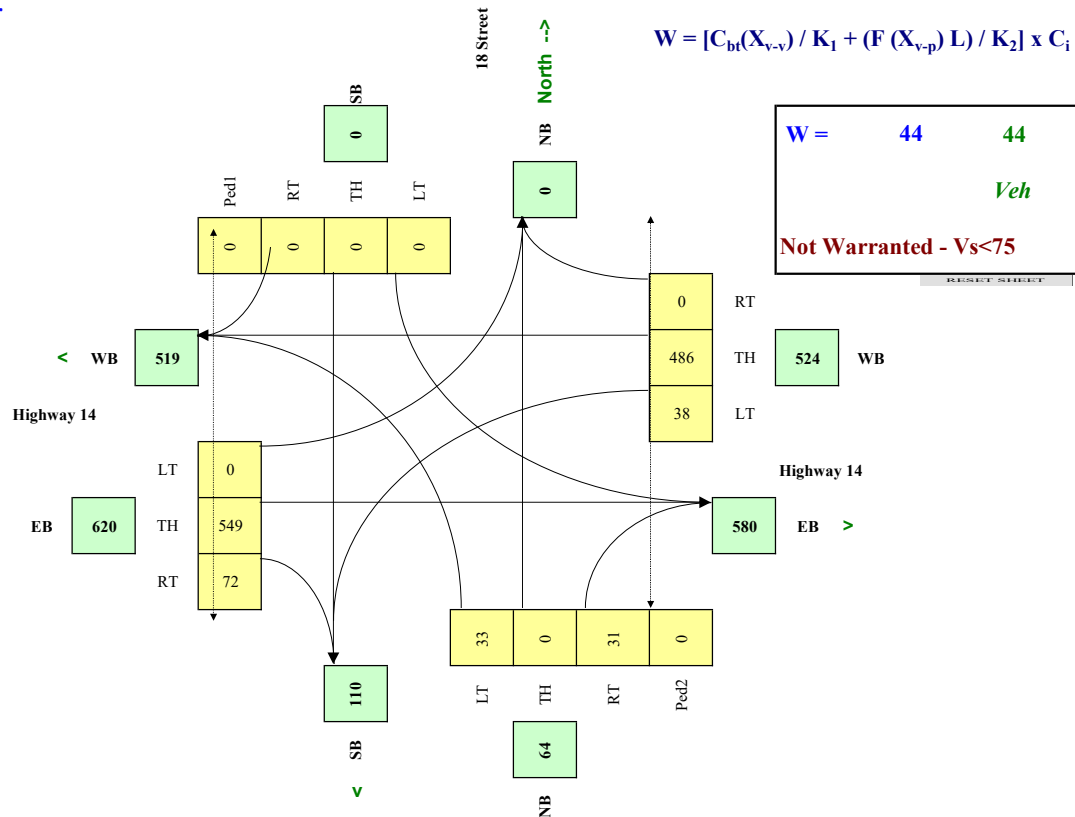
Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB		1					415	1
Highway 14	EB					1		385	1
18 Street	NB	1					1		
18 Street	SB								

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	4.0%	n	0.0
18 Street	NS		2.0%	n	

Set Peak Hours														Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
Traffic Input		NB		SB		WB		EB						W Side	E Side	N Side	S Side
		LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT				
7:15 - 8:15		36		34				23	460			420	60				
8:15 - 9:15		33		31				38	399			460	62				
11:15 - 12:15		27		27				37	579			592	68				
12:15 - 13:15		43		38				37	487			506	64				
15:30 - 16:30		36		33				43	444			665	81				
16:30 - 17:30		24		23				50	547			648	95				
Total (6-hour peak)		199	0	186	0	0	0	228	2,916	0	0	3,291	430	0	0	0	0
Average (6-hour peak)		33	0	31	0	0	0	38	486	0	0	549	72	0	0	0	0

Average 6-hour Peak Turning Movements



Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 14	Direction (EW or NS)	EW
Side Street (name)	18 Street	Direction (EW or NS)	NS
Quadrant / Int #		Comments	10-Year - GF 1.60

for Warrant Calculation Results, please hit 'Page Down'

Road Authority:	Town of Wainwright
City:	Town of Wainwright
Analysis Date:	2024 Dec 04, Wed
Count Date:	2023 Jun 15, Thu
Date Entry Format:	(yyyy-mm-dd)

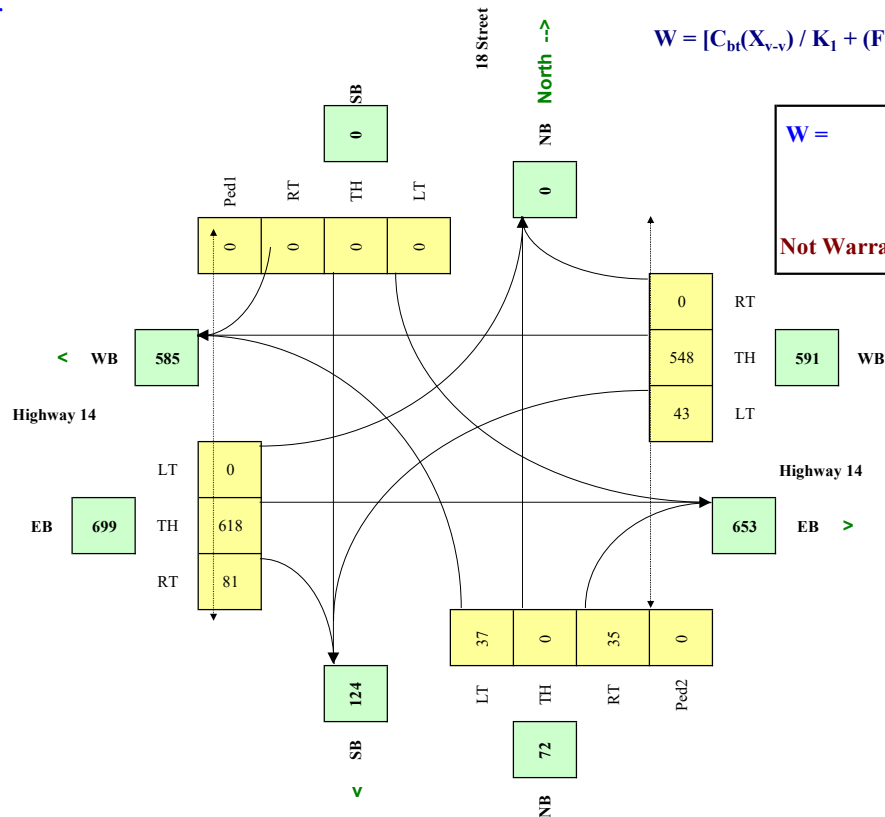
Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB		1					415	1
Highway 14	EB					1		385	1
18 Street	NB	1					1		
18 Street	SB								

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	2.0%	n	0.0
18 Street	NS		0.0%	n	

Set Peak Hours													Ped1	Ped2	Ped3	Ped4
Traffic Input	NB			SB			WB			EB			NS	NS	EW	EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:15 - 8:15	40		38				26	518			474	67				
8:15 - 9:15	37		35				43	450			518	70				
11:15 - 12:15	30		30				42	653			667	77				
12:15 - 13:15	48		43				42	549			570	72				
15:30 - 16:30	40		37				48	501			749	91				
16:30 - 17:30	27		26				56	616			730	107				
Total (6-hour peak)	222	0	209	0	0	0	257	3,287	0	0	3,708	484	0	0	0	0
Average (6-hour peak)	37	0	35	0	0	0	43	548	0	0	618	81	0	0	0	0

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p})L) / K_2] \times C_i$$

W =	56	56	0
		Veh	Ped
Not Warranted - Vs<75			

Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 14	Direction (EW or NS)	EW
Side Street (name)	23 Street	Direction (EW or NS)	NS
Quadrant / Int #		Comments	2023 AT Raw Data

for Warrant Calculation Results, please hit 'Page Down'

Road Authority:	Town of Wainwright
City:	Town of Wainwright
Analysis Date:	2024 Dec 04, Wed
Count Date:	2023 Jun 15, Thu
Date Entry Format:	(yyyy-mm-dd)

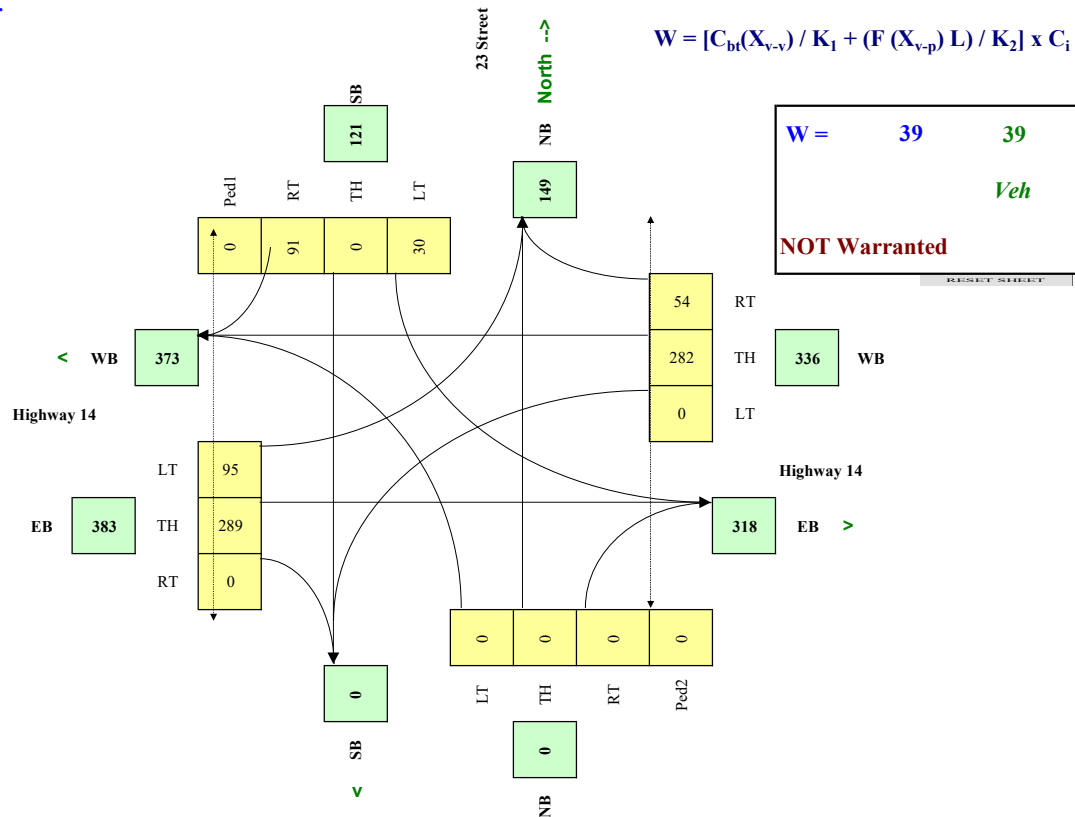
Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB					1		415	1
Highway 14	EB		1					415	1
23 Street	NB								
23 Street	SB	1					1		

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	2.0%	n	0.0
23 Street	NS		0.0%	n	

Set Peak Hours														Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
Traffic Input														W Side	E Side	N Side	S Side
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT					
				25		54		319	59	92	236						
				22		63		258	70	69	222						
				27		106		255	42	97	316						
				29		105		322	57	100	266						
				38		107		238	49	119	351						
				37		110		300	47	91	340						
Total (6-hour peak)	0	0	0	178	0	545	0	1,692	324	568	1,731	0	0	0	0	0	0
Average (6-hour peak)	0	0	0	30	0	91	0	282	54	95	289	0	0	0	0	0	0

Average 6-hour Peak Turning Movements



Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)

Highway 14

Side Street (name)

23 Street

Quadrant / Int #

Comments

Direction (EW or NS)

EW

Direction (EW or NS)

NS

10-Year - GF 1.30

Road Authority:

Town of Wainwright

City:

Town of Wainwright

Analysis Date:

2024 Dec 04, Wed

Count Date:

2023 Jun 15, Thu

Date Entry Format:

(yyyy-mm-dd)

for Warrant Calculation
Results, please hit 'Page
Down'

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB					1		415	1
Highway 14	EB		1					415	1
23 Street	NB								
23 Street	SB	1					1		

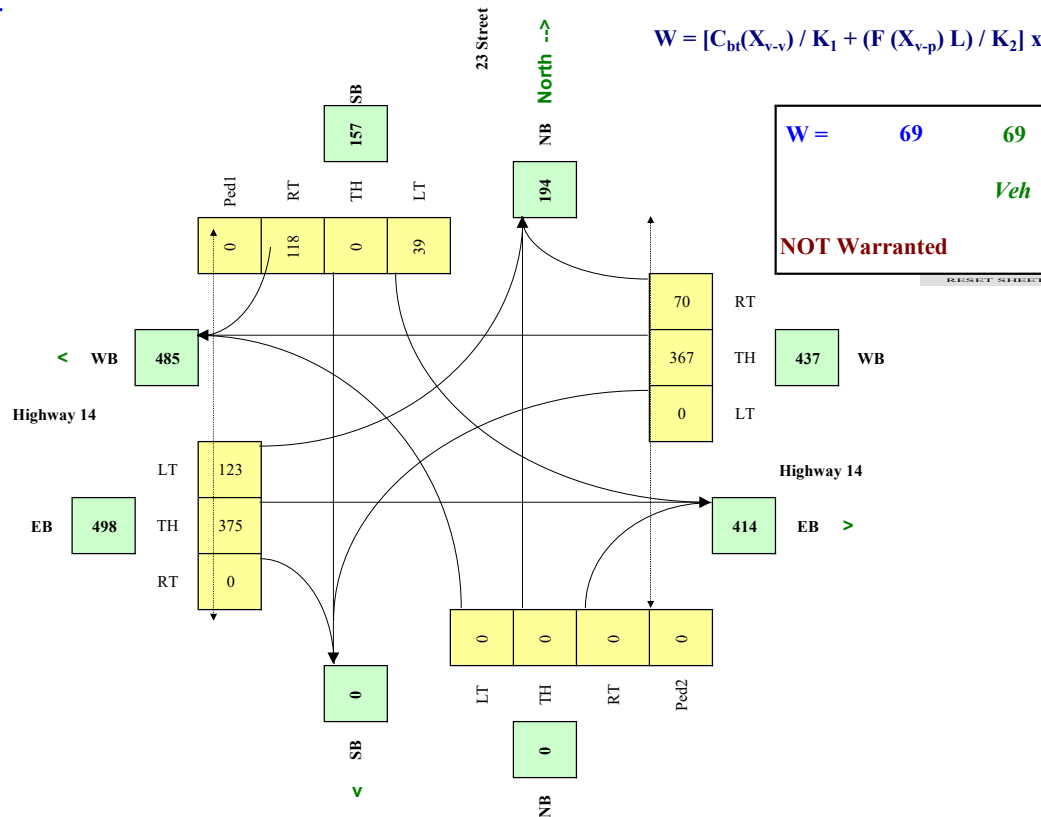
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	2.0%	n	0.0
23 Street	NS		0.0%	n	

Set Peak Hours													Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
NB				SB			WB			EB			W Side	E Side	N Side	S Side
LT	Th	RT		LT	Th	RT	LT	Th	RT	LT	Th	RT				
				33		70		415	77	120	307					
				29		82		335	91	90	289					
				35		138		332	55	126	411					
				38		137		419	74	130	346					
				49		139		309	64	155	456					
				48		143		390	61	118	442					
Total (6-hour peak)	0	0	0	232	0	709	0	2,200	422	739	2,251	0	0	0	0	0
Average (6-hour peak)	0	0	0	39	0	118	0	367	70	123	375	0	0	0	0	0

Average 6-hour
Peak Turning
Movements

$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p})L) / K_2] \times C_i$$



Town of Wainwright Canadian Matrix Traffic Signal Warrant Analysis

Main Street (name)	Highway 14	Direction (EW or NS)	EW
Side Street (name)	23 Street	Direction (EW or NS)	NS
Quadrant / Int #		Comments	20-Year - GF 1.60

for Warrant Calculation Results, please hit 'Page Down'

Road Authority:	Town of Wainwright
City:	Town of Wainwright
Analysis Date:	2024 Dec 04, Wed
Count Date:	2023 Jun 15, Thu
Date Entry Format:	(yyyy-mm-dd)

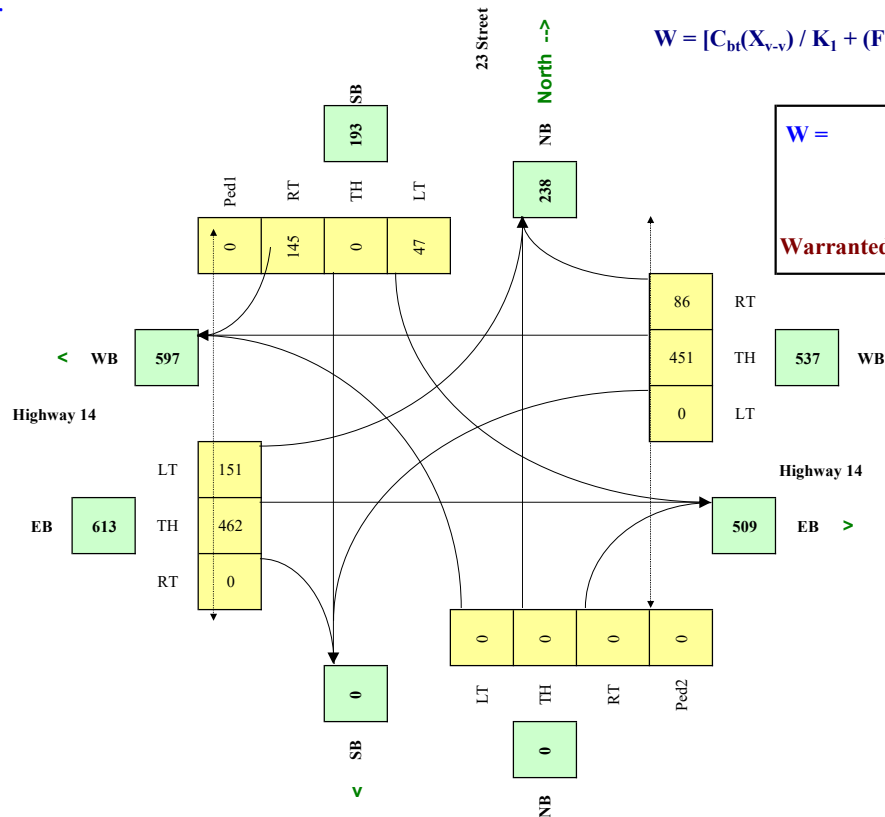
Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	UpStream Signal (m)	# of Thru Lanes
Highway 14	WB					1		415	1
Highway 14	EB		1					415	1
23 Street	NB								
23 Street	SB	1					1		

Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	6,800
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Highway 14	EW	50	2.0%	n	0.0
23 Street	NS		0.0%	n	

Set Peak Hours													Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
Traffic Input													W Side	E Side	N Side	S Side
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT				
				40		86		510	94	147	378					
				35		101		413	112	110	355					
				43		170		408	67	155	506					
				46		168		515	91	160	426					
				61		171		381	78	190	562					
				59		176		480	75	146	544					
Total (6-hour peak)	0	0	0	284	0	872	0	2,707	517	908	2,771	0	0	0	0	0
Average (6-hour peak)	0	0	0	47	0	145	0	451	86	151	462	0	0	0	0	0

Average 6-hour Peak Turning Movements



$$W = [C_{bt}(X_{v-v}) / K_1 + (F(X_{v-p})L) / K_2] \times C_i$$



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Appendix G

HCS Analysis Results (Roundabouts, Highway 14 & 1 Street)

HCS Roundabouts Report

General Information	
1. Name of the Project	2. Date of Submission
3. Project Lead	4. Project Sponsor
5. Project Objectives	6. Project Scope
7. Project Risks	8. Project Budget
9. Project Status	10. Project Next Steps

Site Information

Analyst	Invistec Consulting Ltd.		Intersection	
Agency or Co.	Town of Wainwright		E/W Street Name	Hwy 14
Date Performed	12/23/2024		N/S Street Name	1 St
Analysis Year	2043		Analysis Time Period, hrs	1.00
Time Analyzed	AM Peak Hour		Peak Hour Factor	0.70
Project Description	Wainwright Traffic Study		Jurisdiction	TEC

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	8	274	90	0	162	219	43	0	12	29	102	0	48	20	5
Percent Heavy Vehicles, %	0	5	5	5	0	5	5	5	0	5	5	5	0	5	5	5
Flow Rate (v _{PCE}), pc/h	0	12	411	135	0	243	329	64	0	18	44	153	0	72	30	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		558			636			215			110	
Entry Volume, veh/h		531			606			205			105	
Circulating Flow (v_c), pc/h	345			74			495			590		
Exiting Flow (v_{ex}), pc/h	636			355			120			408		
Capacity (C_{pce}), pc/h		971			1280			833			756	
Capacity (c), veh/h		924			1219			793			720	
v/c Ratio (x)		0.57			0.50			0.26			0.15	

Delay and Level of Service	
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
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Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.0			8.3			7.4			6.6	
Lane LOS		B			A			A			A	
95% Queue Length, Q ₉₅ (veh)		4.0			2.9			1.0			0.5	
95% Queue Length, Q ₉₅ (m)		31.70			22.98			7.92			3.96	
Approach Delay, s/veh LOS	12.0	B		8.3	A		7.4	A		6.6	A	
Intersection Delay, s/veh LOS	9.4						A					

HCS Roundabouts Report

General Information	Site Information
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General Information	Site Information
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Analyst	Invistec Consulting Ltd.		Intersection	
Agency or Co.	Town of Wainwright		E/W Street Name	Hwy 14
Date Performed	12/23/2024		N/S Street Name	1 St
Analysis Year	2043		Analysis Time Period, hrs	1.00
Time Analyzed	PM Peak Hour		Peak Hour Factor	0.70
Project Description	Wainwright Traffic Study		Jurisdiction	TEC

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	5	212	34	0	78	291	42	0	51	34	251	0	31	14	5
Percent Heavy Vehicles, %	0	5	5	5	0	5	5	5	0	5	5	5	0	5	5	5
Flow Rate (v _{PCE}), pc/h	0	8	318	51	0	117	437	63	0	77	51	377	0	47	21	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		377			617			505			76	
Entry Volume, veh/h		359			588			481			72	
Circulating Flow (v_c), pc/h	185			136			373			631		
Exiting Flow (v_{ex}), pc/h	742			522			122			189		
Capacity (C_{pce}), pc/h		1143			1201			943			725	
Capacity (c), veh/h		1088			1144			898			691	
v/c Ratio (x)		0.33			0.51			0.54			0.10	

Delay and Level of Service	
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Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.6			9.0			11.3			6.3	
Lane LOS		A			A			B			A	
95% Queue Length, Q ₉₅ (veh)		1.5			3.1			3.4			0.4	
95% Queue Length, Q ₉₅ (m)		11.89			24.57			26.94			3.17	
Approach Delay, s/veh LOS	6.6	A		9.0	A		11.3	B		6.3	A	
Intersection Delay, s/veh LOS	9.0						A					

HCS Roundabouts Report

General Information	Site Information
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General Information	Site Information
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Analyst	Invistec Consulting Ltd.		Intersection	
Agency or Co.	Town of Wainwright		E/W Street Name	Hwy 14
Date Performed	12/23/2024		N/S Street Name	1 St
Analysis Year	2043		Analysis Time Period, hrs	1.00
Time Analyzed	AM Peak Hour		Peak Hour Factor	0.70
Project Description	Wainwright Traffic Study		Jurisdiction	TEC

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	10	329	108	0	194	263	52	0	14	35	122	0	58	24	6
Percent Heavy Vehicles, %	0	5	5	5	0	5	5	5	0	5	5	5	0	5	5	5
Flow Rate (v _{PCE}), pc/h	0	15	494	162	0	291	395	78	0	21	52	183	0	87	36	9
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		671			764			256			132	
Entry Volume, veh/h		639			728			244			126	
Circulating Flow (v_c), pc/h	414			88			596			707		
Exiting Flow (v_{ex}), pc/h	764			425			145			489		
Capacity (C_{pce}), pc/h		905			1262			751			671	
Capacity (c), veh/h		862			1201			716			639	
v/c Ratio (x)		0.74			0.61			0.34			0.20	

Delay and Level of Service	
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Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		19.6			10.6			9.3			8.0	
Lane LOS		C			B			A			A	
95% Queue Length, Q ₉₅ (veh)		8.0			4.5			1.5			0.7	
95% Queue Length, Q ₉₅ (m)		63.40			35.66			11.89			5.55	
Approach Delay, s/veh LOS	19.6	C		10.6	B		9.3	A		8.0	A	
Intersection Delay, s/veh LOS	13.5						B					

HCS Roundabouts Report

General Information	Site Information
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General Information	Site Information
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Analyst	Invistec Consulting Ltd.		Intersection	
Agency or Co.	Town of Wainwright		E/W Street Name	Hwy 14
Date Performed	12/23/2024		N/S Street Name	1 St
Analysis Year	2043		Analysis Time Period, hrs	1.00
Time Analyzed	PM Peak Hour		Peak Hour Factor	0.70
Project Description	Wainwright Traffic Study		Jurisdiction	TEC

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	6	254	41	0	94	349	50	0	61	41	301	0	37	17	6
Percent Heavy Vehicles, %	0	5	5	5	0	5	5	5	0	5	5	5	0	5	5	5
Flow Rate (v_{PCE}), pc/h	0	9	381	62	0	141	524	75	0	92	62	452	0	56	26	9
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		452			740			606			91	
Entry Volume, veh/h		430			705			577			87	
Circulating Flow (v_c), pc/h	223			163			446			757		
Exiting Flow (v_{ex}), pc/h	889			625			146			229		
Capacity (C_{pce}), pc/h		1099			1169			876			638	
Capacity (c), veh/h		1047			1113			834			607	
v/c Ratio (x)		0.41			0.63			0.69			0.14	

Delay and Level of Service	
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Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.9			11.9			17.3			7.6	
Lane LOS		A			B			C			A	
95% Queue Length, Q ₉₅ (veh)		2.1			5.1			6.4			0.5	
95% Queue Length, Q ₉₅ (m)		16.64			40.42			50.72			3.96	
Approach Delay, s/veh LOS	7.9	A		11.9	B		17.3	C		7.6	A	
Intersection Delay, s/veh LOS	12.5						B					



Appendix G

HCS Analysis Results (Roundabouts, Highway 14 & 1 Street)

HCS Roundabouts Report

General Information	
1. Name of the Project:	...
2. Project Number:	...
3. Date of Submission:	...
4. Author(s):	...
5. Title of the Project:	...
6. Abstract:	...
7. Introduction:	...
8. Methodology:	...
9. Results:	...
10. Conclusion:	...
11. References:	...
12. Appendix:	...
13. Bibliography:	...
14. Glossary:	...
15. Index:	...
16. Summary:	...
17. Acknowledgments:	...
18. Declaration:	...
19. Certificate:	...
20. Other:	...

Site Information

Analyst	Invistec Consulting Ltd.		Intersection	
Agency or Co.	Town of Wainwright		E/W Street Name	Hwy 14
Date Performed	12/23/2024		N/S Street Name	1 St
Analysis Year	2043		Analysis Time Period, hrs	1.00
Time Analyzed	AM Peak Hour		Peak Hour Factor	0.70
Project Description	Wainwright Traffic Study		Jurisdiction	TEC

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	8	274	90	0	162	219	43	0	12	29	102	0	48	20	5
Percent Heavy Vehicles, %	0	5	5	5	0	5	5	5	0	5	5	5	0	5	5	5
Flow Rate (v _{PCE}), pc/h	0	12	411	135	0	243	329	64	0	18	44	153	0	72	30	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		558			636			215			110	
Entry Volume, veh/h		531			606			205			105	
Circulating Flow (v_c), pc/h	345			74			495			590		
Exiting Flow (v_{ex}), pc/h	636			355			120			408		
Capacity (C_{pce}), pc/h		971			1280			833			756	
Capacity (c), veh/h		924			1219			793			720	
v/c Ratio (x)		0.57			0.50			0.26			0.15	

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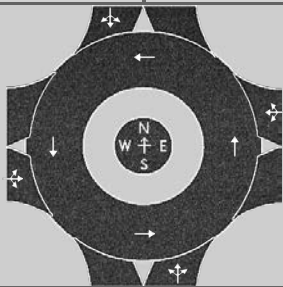
Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.0			8.3			7.4			6.6	
Lane LOS		B			A			A			A	
95% Queue Length, Q ₉₅ (veh)		4.0			2.9			1.0			0.5	
95% Queue Length, Q ₉₅ (m)		31.70			22.98			7.92			3.96	
Approach Delay, s/veh LOS	12.0	B		8.3	A		7.4	A		6.6	A	
Intersection Delay, s/veh LOS	9.4						A					

HCS Roundabouts Report

General Information	Site Information
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General Information	Site Information
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Analyst	Invistec Consulting Ltd.		Intersection	
Agency or Co.	Town of Wainwright		E/W Street Name	Hwy 14
Date Performed	12/23/2024		N/S Street Name	1 St
Analysis Year	2043		Analysis Time Period, hrs	1.00
Time Analyzed	PM Peak Hour		Peak Hour Factor	0.70
Project Description	Wainwright Traffic Study		Jurisdiction	TEC



Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	5	212	34	0	78	291	42	0	51	34	251	0	31	14	5
Percent Heavy Vehicles, %	0	5	5	5	0	5	5	5	0	5	5	5	0	5	5	5
Flow Rate (v _{PCE}), pc/h	0	8	318	51	0	117	437	63	0	77	51	377	0	47	21	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		377			617			505			76	
Entry Volume, veh/h		359			588			481			72	
Circulating Flow (v_c), pc/h	185			136			373			631		
Exiting Flow (v_{ex}), pc/h	742			522			122			189		
Capacity (C_{pce}), pc/h		1143			1201			943			725	
Capacity (c), veh/h		1088			1144			898			691	
v/c Ratio (x)		0.33			0.51			0.54			0.10	

Delay and Level of Service	
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Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.6			9.0			11.3			6.3	
Lane LOS		A			A			B			A	
95% Queue Length, Q ₉₅ (veh)		1.5			3.1			3.4			0.4	
95% Queue Length, Q ₉₅ (m)		11.89			24.57			26.94			3.17	
Approach Delay, s/veh LOS	6.6	A		9.0	A		11.3	B		6.3	A	
Intersection Delay, s/veh LOS	9.0						A					

HCS Roundabouts Report

General Information	Site Information
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General Information	Site Information
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Analyst	Invistec Consulting Ltd.		Intersection	
Agency or Co.	Town of Wainwright		E/W Street Name	Hwy 14
Date Performed	12/23/2024		N/S Street Name	1 St
Analysis Year	2043		Analysis Time Period, hrs	1.00
Time Analyzed	AM Peak Hour		Peak Hour Factor	0.70
Project Description	Wainwright Traffic Study		Jurisdiction	TEC

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	10	329	108	0	194	263	52	0	14	35	122	0	58	24	6
Percent Heavy Vehicles, %	0	5	5	5	0	5	5	5	0	5	5	5	0	5	5	5
Flow Rate (v_{PCE}), pc/h	0	15	494	162	0	291	395	78	0	21	52	183	0	87	36	9
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		671			764			256			132	
Entry Volume, veh/h		639			728			244			126	
Circulating Flow (v_c), pc/h	414			88			596			707		
Exiting Flow (v_{ex}), pc/h	764			425			145			489		
Capacity (C_{pce}), pc/h		905			1262			751			671	
Capacity (c), veh/h		862			1201			716			639	
v/c Ratio (x)		0.74			0.61			0.34			0.20	

Delay and Level of Service	
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100	100

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		19.6			10.6			9.3			8.0	
Lane LOS		C			B			A			A	
95% Queue Length, Q ₉₅ (veh)		8.0			4.5			1.5			0.7	
95% Queue Length, Q ₉₅ (m)		63.40			35.66			11.89			5.55	
Approach Delay, s/veh LOS	19.6	C		10.6	B		9.3	A		8.0	A	
Intersection Delay, s/veh LOS	13.5						B					

HCS Roundabouts Report

General Information	Site Information
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General Information	Site Information
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Analyst	Invistec Consulting Ltd.		Intersection	
Agency or Co.	Town of Wainwright		E/W Street Name	Hwy 14
Date Performed	12/23/2024		N/S Street Name	1 St
Analysis Year	2043		Analysis Time Period, hrs	1.00
Time Analyzed	PM Peak Hour		Peak Hour Factor	0.70
Project Description	Wainwright Traffic Study		Jurisdiction	TEC

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	6	254	41	0	94	349	50	0	61	41	301	0	37	17	6
Percent Heavy Vehicles, %	0	5	5	5	0	5	5	5	0	5	5	5	0	5	5	5
Flow Rate (v_{PCE}), pc/h	0	9	381	62	0	141	524	75	0	92	62	452	0	56	26	9
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			
Proportion of CAVs, %	0															

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway, s		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway, s		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		452			740			606			91	
Entry Volume, veh/h		430			705			577			87	
Circulating Flow (v_c), pc/h	223			163			446			757		
Exiting Flow (v_{ex}), pc/h	889			625			146			229		
Capacity (C_{pce}), pc/h		1099			1169			876			638	
Capacity (c), veh/h		1047			1113			834			607	
v/c Ratio (x)		0.41			0.63			0.69			0.14	

Delay and Level of Service	
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Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.9			11.9			17.3			7.6	
Lane LOS		A			B			C			A	
95% Queue Length, Q ₉₅ (veh)		2.1			5.1			6.4			0.5	
95% Queue Length, Q ₉₅ (m)		16.64			40.42			50.72			3.96	
Approach Delay, s/veh LOS	7.9	A		11.9	B		17.3	C		7.6	A	
Intersection Delay, s/veh LOS	12.5						B					



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Appendix H

Chapter 5 Exhibits



- Recommended Improvements on Highway 14**
1. Implement Two-Way-Left-Turn Lane from Access 2 (Trail General Contracting Access) to Access 4 (Petroleum Park Access)

- Recommended Improvements at 1 Street Intersection**
1. Install traffic signal (with advance warning flashers facing eastbound traffic)
 2. Add short northbound right-turn taper at South Leg
 3. Add westbound right-turn lane at East leg (Optional, Desirable)
 4. Add eastbound right-turn bay at West leg
 5. Add 0.5m wide painted centre median on East and West Legs
 6. Widen northwest corner to provide flaring a the North leg to accommodate 2 southbound lanes
 7. Add 0.5m wide painted centre median on East and West Legs



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - ACCESS NUMBER
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:

A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE A)

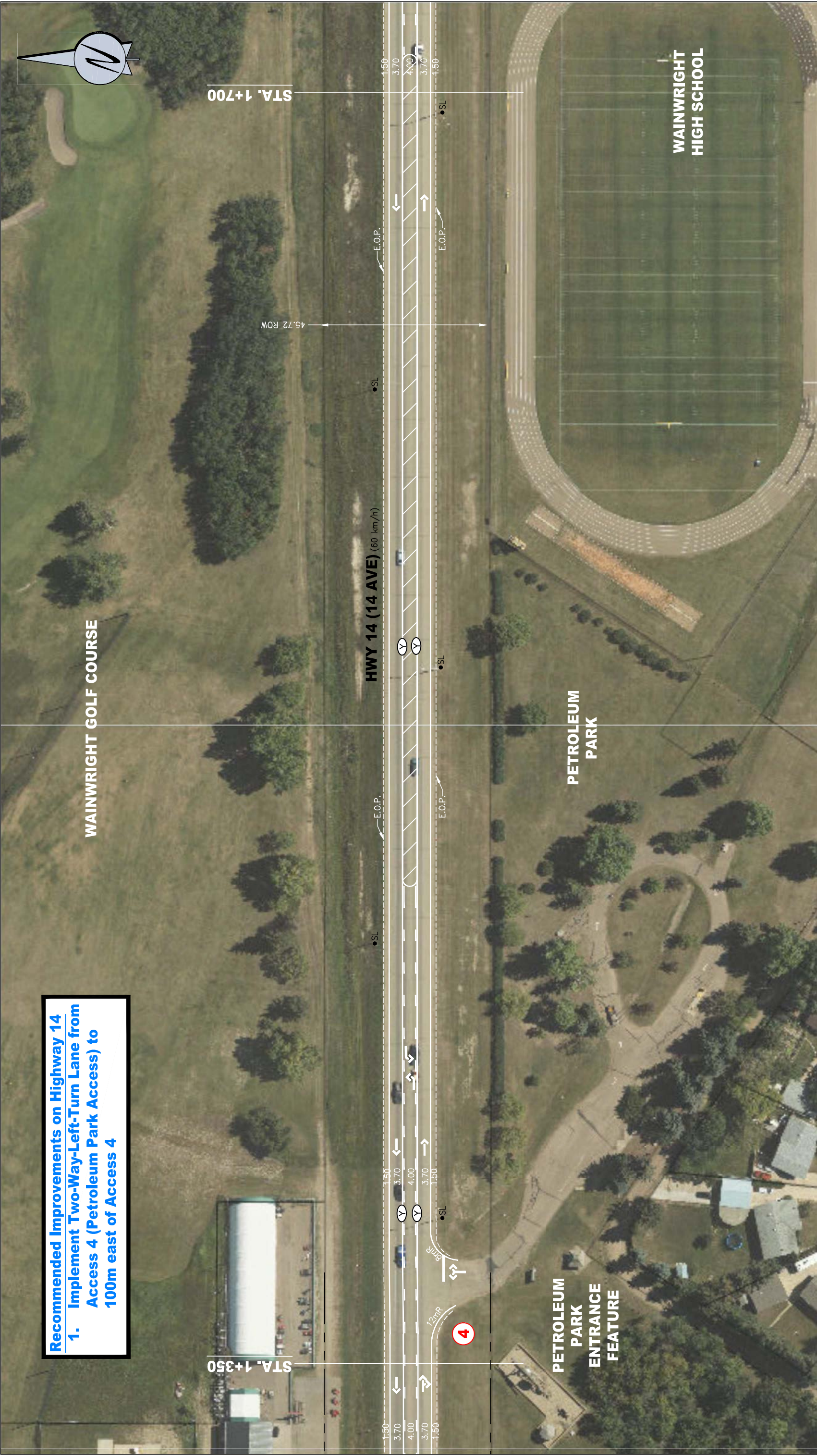
0/0 20 30

1:1000

EXHIBIT NO: 5.1.1

WAINWRIGHT TRAFFIC STUDY

Corridor 1 Recommended Improvements
Hwy 14 from 1 St to Petroleum Park
(Sta. 1+000 to Sta. 1+350)



Recommended Improvements on Highway 14
1. Implement Two-Way-Left-Turn Lane from Access 4 (Petroleum Park Access) to 100m east of Access 4



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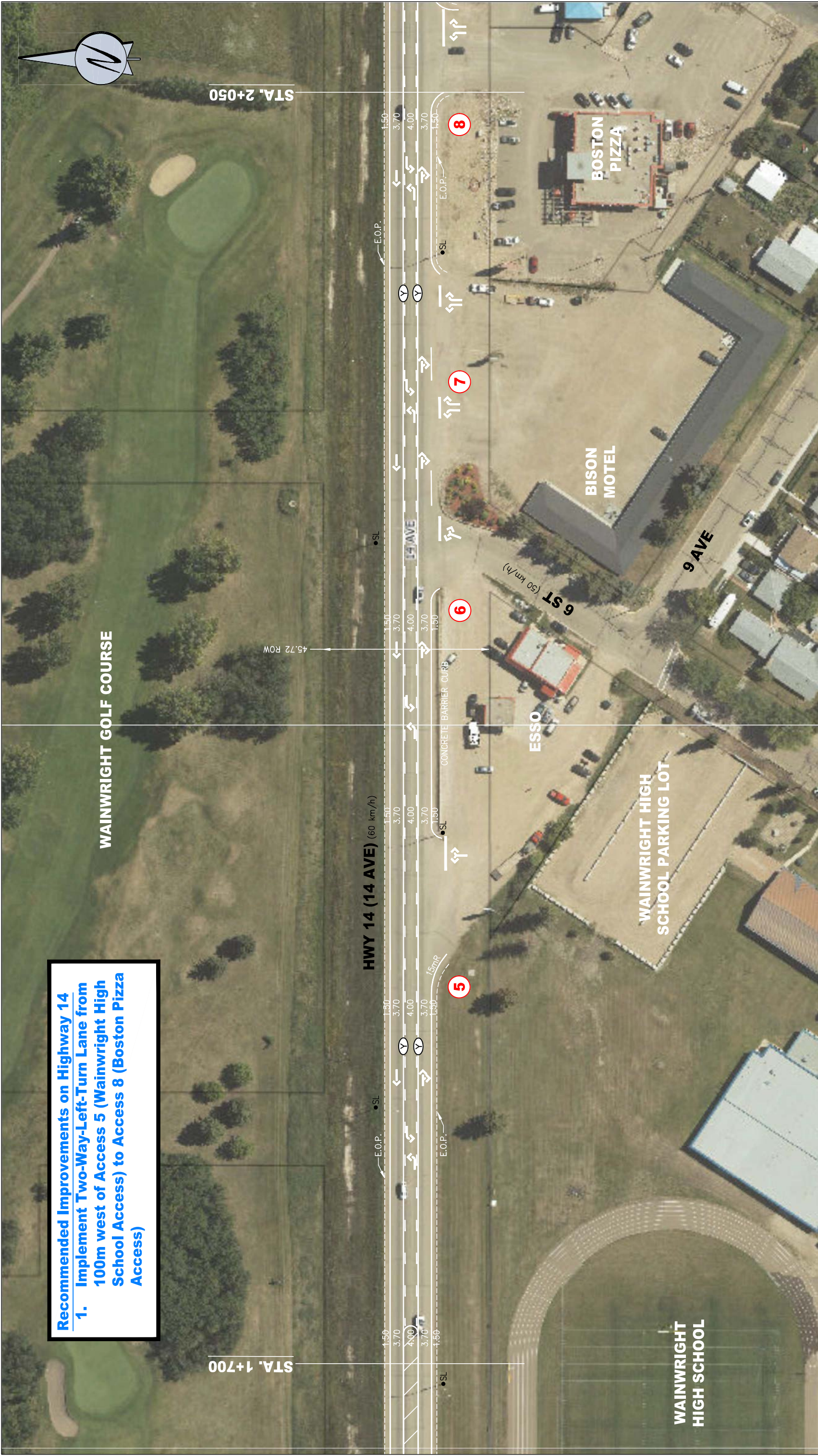
LEGEND:
— PROPOSED LANE CONFIGURATION
① ACCESS NUMBER
● WP WOOD POLE
● SL STREETLIGHT

NOTES:
A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.




SCALE: (NOTE A)
010 20 30
1:1000
EXHIBIT NO: 5.1.2

WAINWRIGHT TRAFFIC STUDY
Corridor 1 Recommended Improvements
Hwy 14 from Petroleum Park to Wainwright High School
(Sta. 1+350 to Sta. 1+700)


Recommended Improvements on Highway 14
1. Implement Two-Way-Left-Turn Lane from 100m west of Access 5 (Wainwright High School Access) to Access 8 (Boston Pizza Access)



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LEGEND:	PROPOSED LANE CONFIGURATION
	ACCESS NUMBER
	WOOD POLE
	STREETLIGHT

NOTES:
A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE A)	010	20	30
1:1000			
EXHIBIT NO:	5.1.3		

WAINWRIGHT TRAFFIC STUDY

Corridor 1 Recommended Improvements
Hwy 14 from Wainwright High School
to Boston Pizza
(Sta. 1+700 to Sta. 2+050)

Recommended Improvements on Highway 14

1. Implement Two-Way-Left-Turn Lane from Access 8 (Boston Pizza Access) to 9 Street



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LEGEND:	PROPOSED LANE CONFIGURATION
	PROPOSED LANE CONFIGURATION
	ACCESS NUMBER
	WOOD POLE
	STREETLIGHT

NOTES:

A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE A)	010 20 30
1:1000	
EXHIBIT NO:	5.1.4

WAINWRIGHT TRAFFIC STUDY

Corridor 1 Recommended Improvements
Hwy 14 from Boston Pizza to 9 Street
(Sta. 2+050 to Sta. 2+400)

Recommended Improvements on Highway 14

- 1. Implement Two-Way-Left-Turn Lane from 9 Street to 60m west of 14 Street
- 2. Close off Access 14 (Esthetics Studio West Access)
- 3. Convert Access 18 (Fas Gas Plus Access) and Access 17 (Vacant Building at southwest corner of the intersection to Right-In/Right-Out Access



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - ACCESS NUMBER
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:

A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE A)



EXHIBIT NO:

5.1.5

WAINWRIGHT TRAFFIC STUDY

Corridor 1 Recommended Improvements
Hwy 14 from 9 Street to 14 Street
(Sta. 2+400 to Sta. 2+700)

Recommended Improvements on Highway 14
1. Implement Two-Way-Left-Turn Lane
from 65m east of 14 Street to Access 22
(Wainwright Seed Cleaning Plant
Access)



- Recommended Improvements at 14 Street Intersection**
1. Add westbound right-turn bay at East Leg (Optional, Desirable)
 2. Widen northwest corner to create room for two southbound lanes
 3. Signal pole at northwest corner may need to be relocated or require protection (e.g. by concrete barrier) due to the widening
 4. Re-designate lanes at the South Leg
 5. Move back stoplines to provide more room for left-turning-vehicles (all 4 legs)
 6. Add 0.5m wide painted centre median on East and West Legs
 7. Modify signal phasing and implement new signal timing plans



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - ACCESS NUMBER
 - WP WOOD POLE
 - SL STREETLIGHT

NOTES:

A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE A)

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EXHIBIT NO: 5.1.6

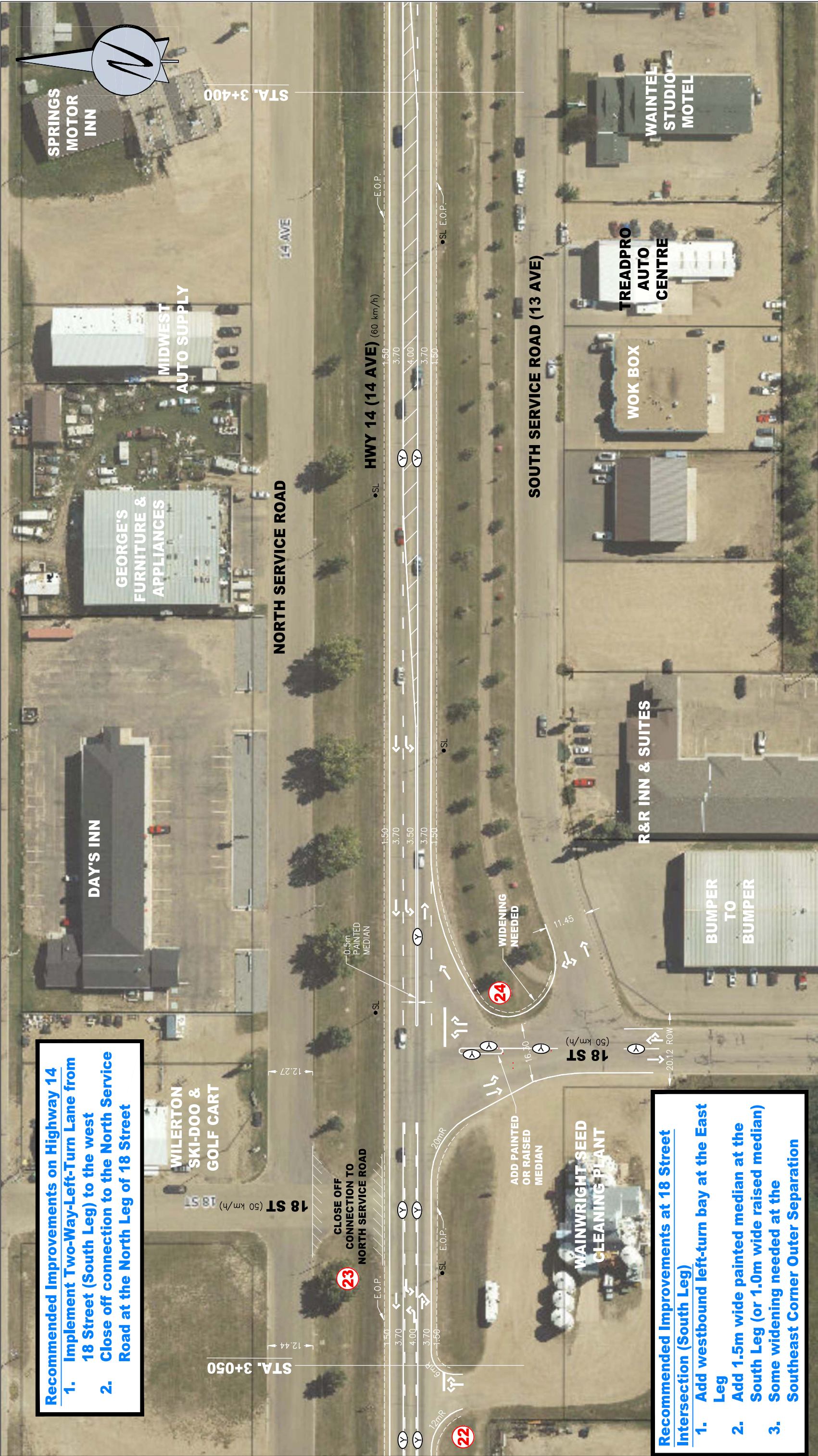
WAINWRIGHT TRAFFIC STUDY

Corridor 1 Recommended Improvements
Hwy 14 from 14 Street to
Wainwright Seed Cleaning Plant
(Sta. 2+700 to Sta. 3+050)

- Recommended Improvements on Highway 14
1.

Implement Two-Way-Left-Turn Lane from 18 Street (South Leg) to the west
2.

Close off connection to the North Service Road at the North Leg of 18 Street



- Recommended Improvements at 18 Street Intersection (South Leg)
1.

Add westbound left-turn bay at the East Leg
2.

Add 1.5m wide painted median at the South Leg (or 1.0m wide raised median)
3.

Some widening needed at the Southeast Corner Outer Separation



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LEGEND:

	PROPOSED LANE CONFIGURATION
	ACCESS NUMBER
	WP
	WOOD POLE
	SL
	STREET/LIGHT

NOTES:

SCALE:

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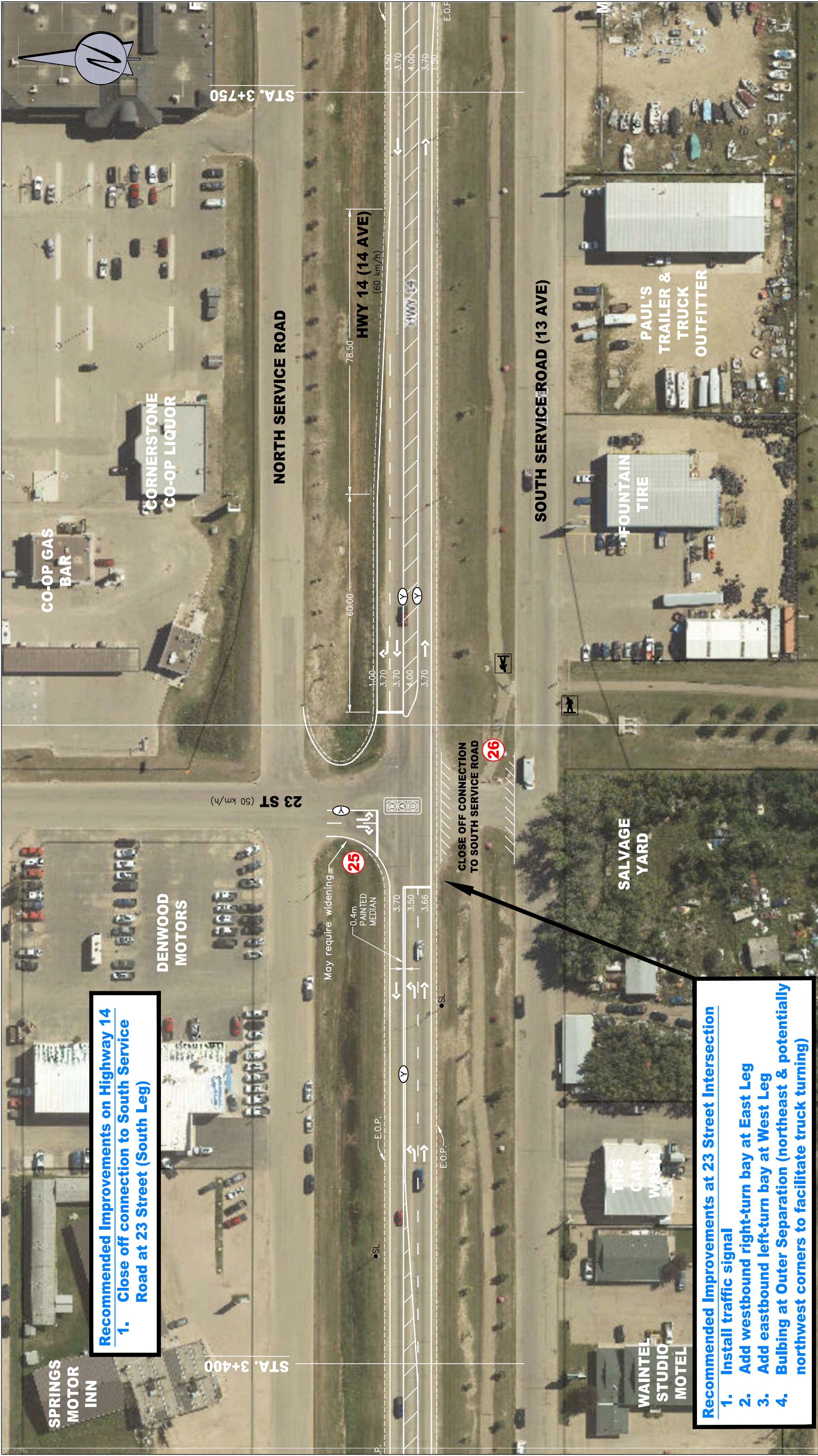
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EXHIBIT NO: 5.1.7

WAINWRIGHT TRAFFIC STUDY

Corridor 1 Recommended Improvements

Hwy 14 from Wainwright Seed Cleaning Plant to Waintel Studio Motel
(Sta. 3+050 to Sta. 3+400)



Recommended Improvements on Highway 14
1. Close off connection to South Service Road at 23 Street (South Leg)

Recommended Improvements at 23 Street Intersection
1. Install traffic signal
2. Add westbound right-turn bay at East Leg
3. Add eastbound left-turn bay at West Leg
4. Bulbing at Outer Separation (northeast & potentially northwest corners to facilitate truck turning)



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LEGEND:
— PROPOSED LANE CONFIGURATION
① ACCESS NUMBER
● WP WOOD POLE
● SL STREETLIGHT

NOTES:
A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE A)
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EXHIBIT NO: 5.1.8

WAINWRIGHT TRAFFIC STUDY
Corridor 1 Recommended Improvements
Hwy 14 from Waintel Studio Motel to Paul's Trailer & Truck Outfitter (Sta. 3+400 to Sta. 3+750)



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - ACCESS NUMBER
 - WOOD POLE
 - STREETLIGHT

NOTES:

A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE A)

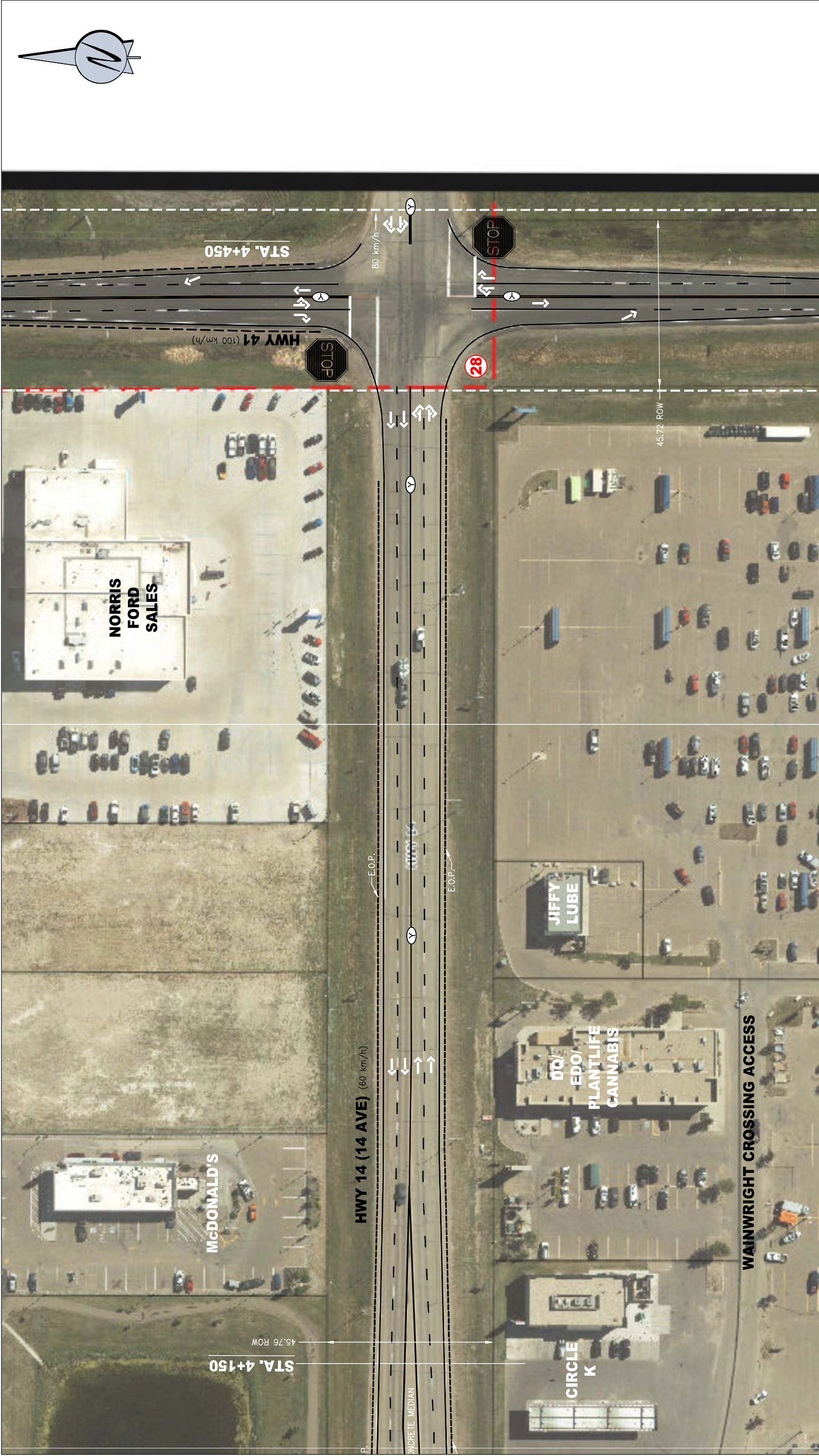
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EXHIBIT NO: 5.1.9

WAINWRIGHT TRAFFIC STUDY

Corridor 1 Recommended Improvements
Hwy 14 from Moonlight Bay Brewing
to Circle K
(Sta. 3+750 to Sta. 4+150)



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - ACCESS NUMBER
 - WOOD POLE
 - STREETLIGHT

NOTES:

A. Proposed lane markings are designed to fit existing pavement of Highway 14 (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE A)

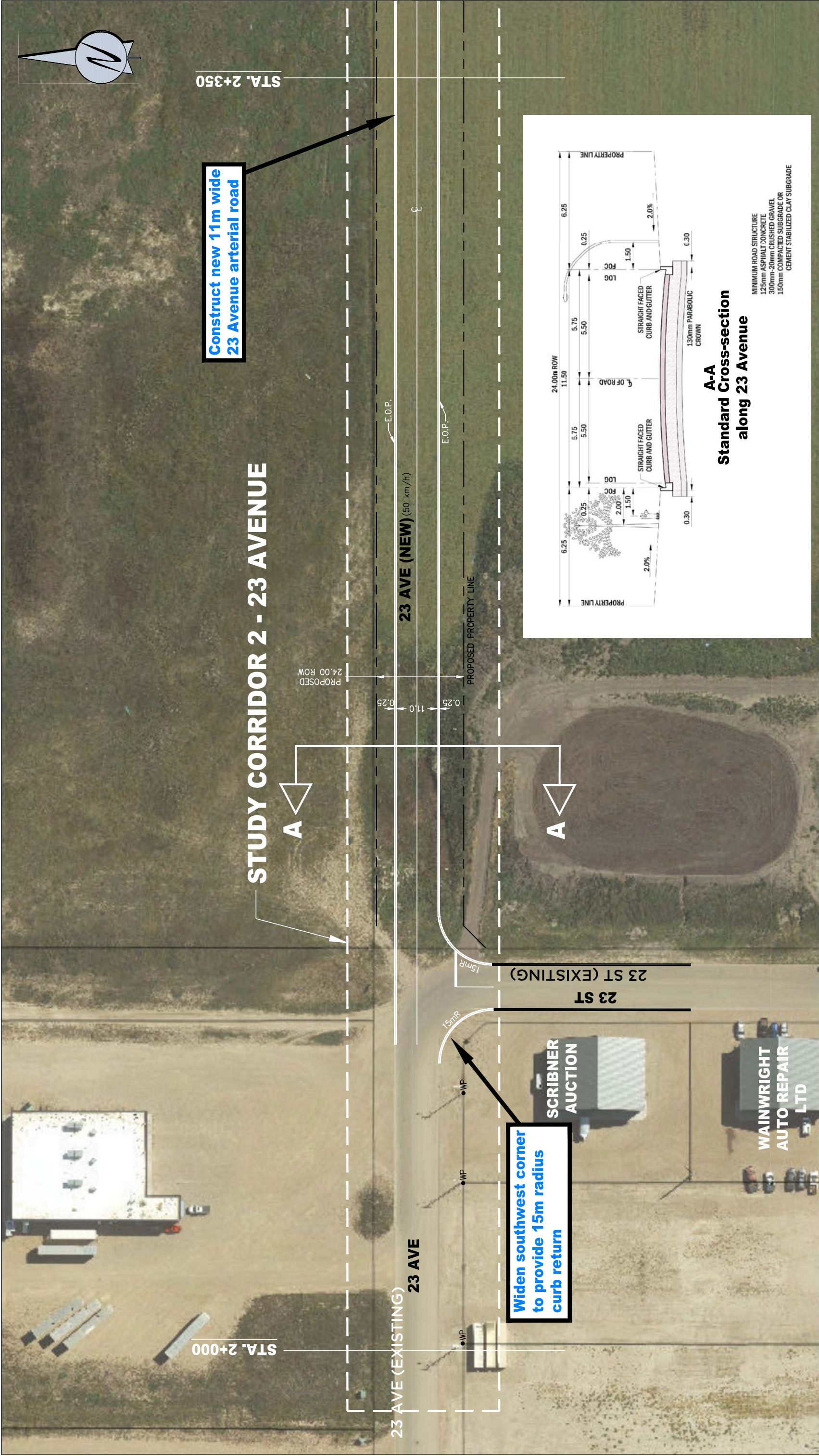
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EXHIBIT NO: 5-1.10

WAINWRIGHT TRAFFIC STUDY

Corridor 1 Recommended Improvements
Hwy 14 from Circle K to Hwy 41
(Sta. 4+150 to 4+450)



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - WOOD POLE
 - STREETLIGHT

NOTES:

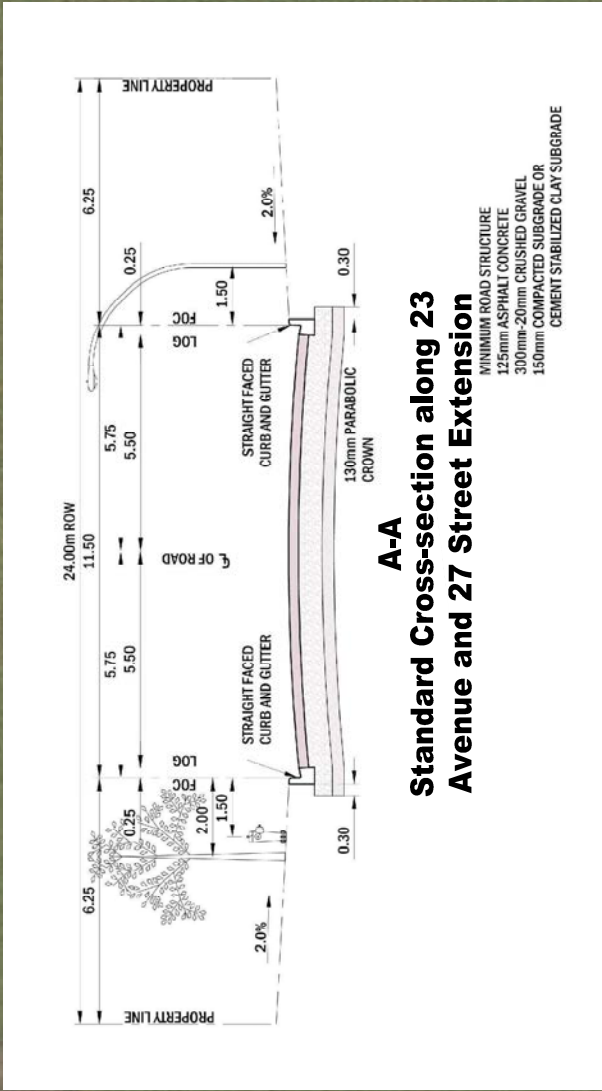
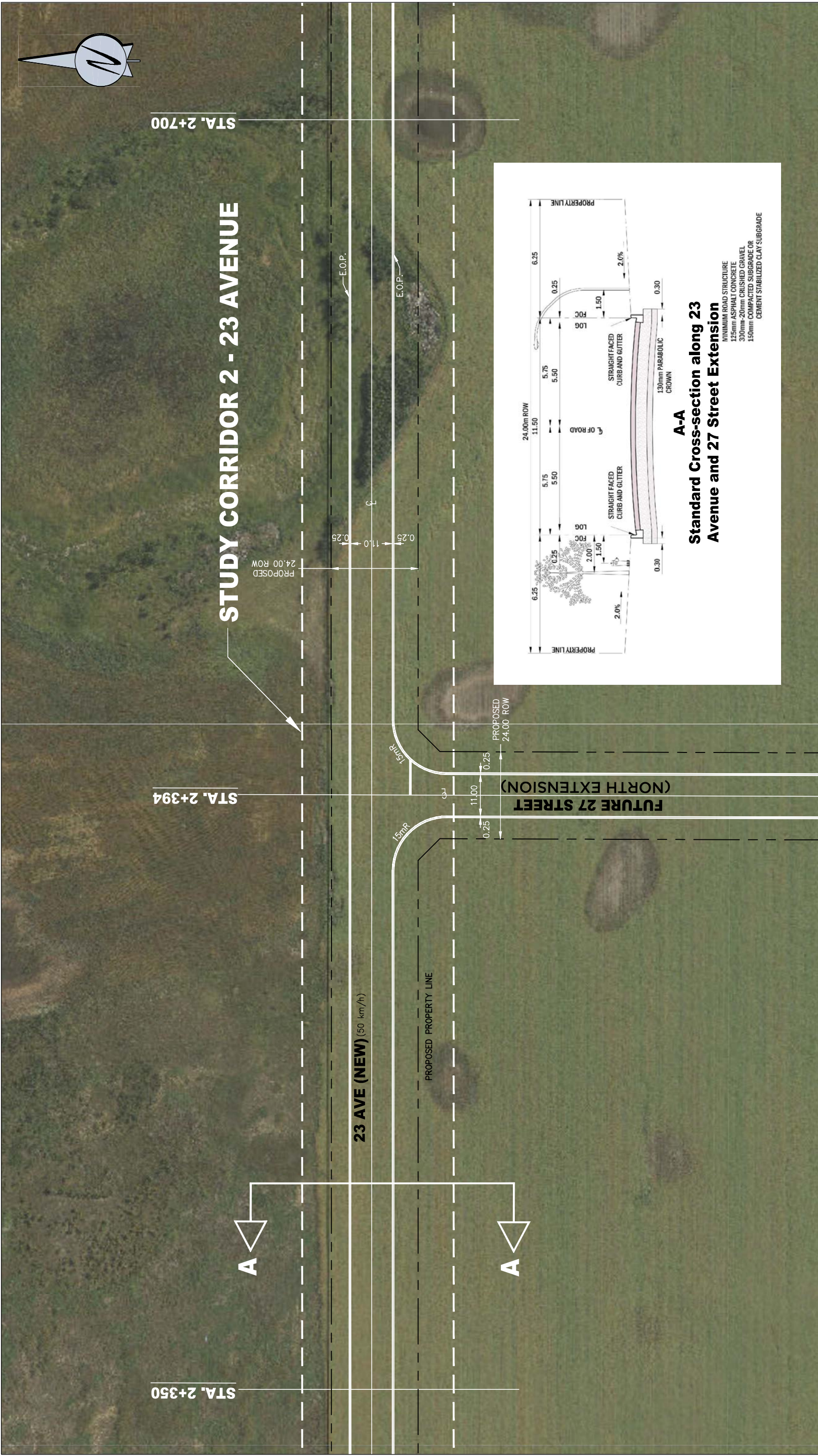
B. Proposed lane markings and new pavement are shown in white lines (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE B)
0 10 20 30
1:1000

EXHIBIT NO: 5.2.1

WAINWRIGHT TRAFFIC STUDY

Corridor 2 Recommended Improvements
23 Ave from 100m West of 23 St
to 250m East of 23 St
(Sta. 2+000 to 2+350)



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - WOOD POLE
 - STREETLIGHT

NOTES:

B. Proposed lane markings and new pavement are shown in white lines (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE B)

0 10 20 30

1:1000

EXHIBIT NO: 5.2.2

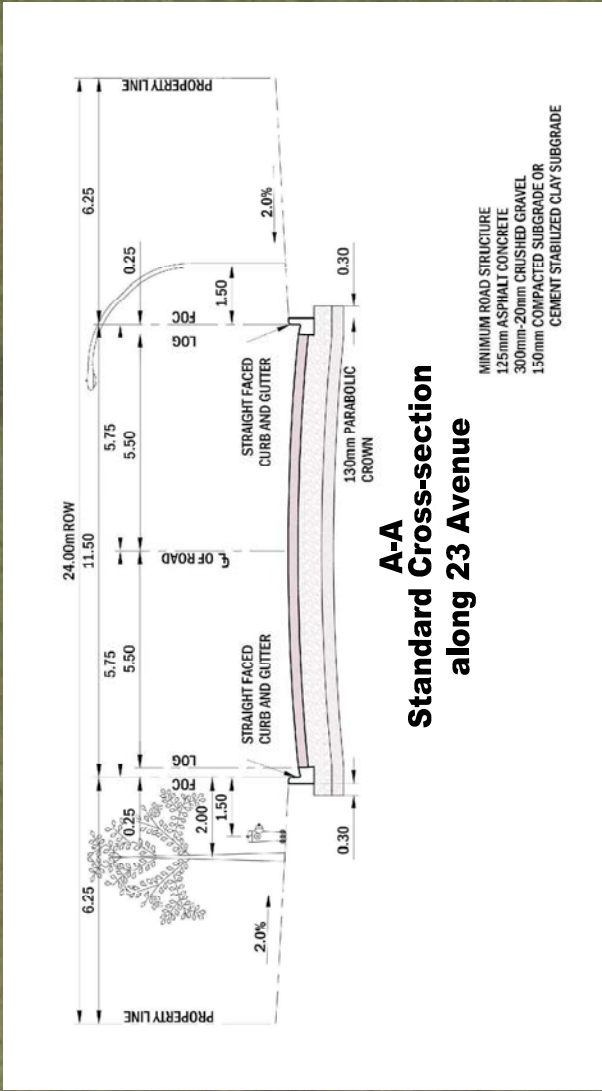
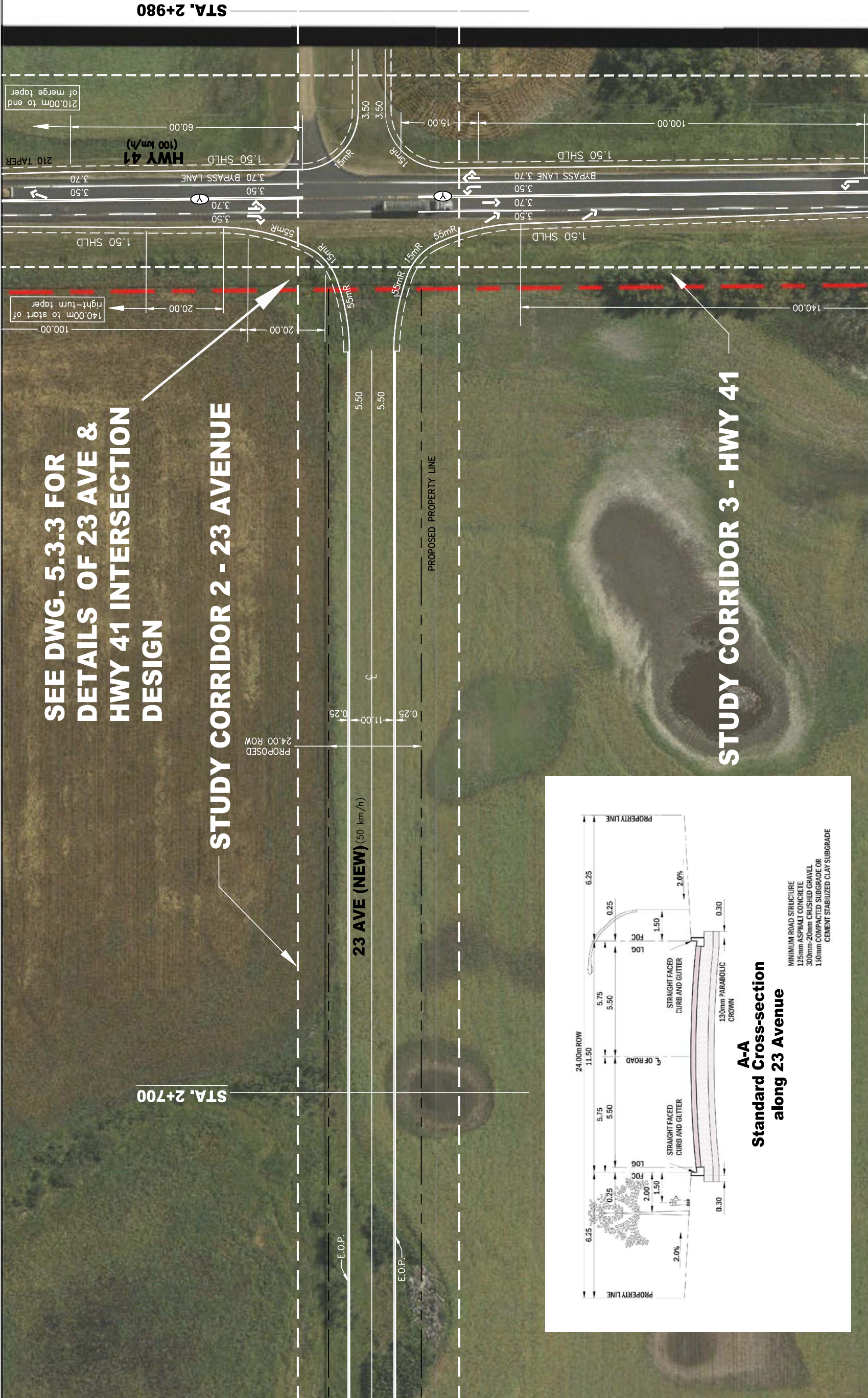
WAINWRIGHT TRAFFIC STUDY

Corridor 2 Recommended Improvements
23 Ave from 250m East of 23 St
to 600m East of 23 St
(Sta. 2+350 to 2+700)

SEE DWG. 5.3.3 FOR
DETAILS OF 23 AVE &
HWY 41 INTERSECTION
DESIGN

STUDY CORRIDOR 2 - 23 AVENUE

STUDY CORRIDOR 3 - HWY 41



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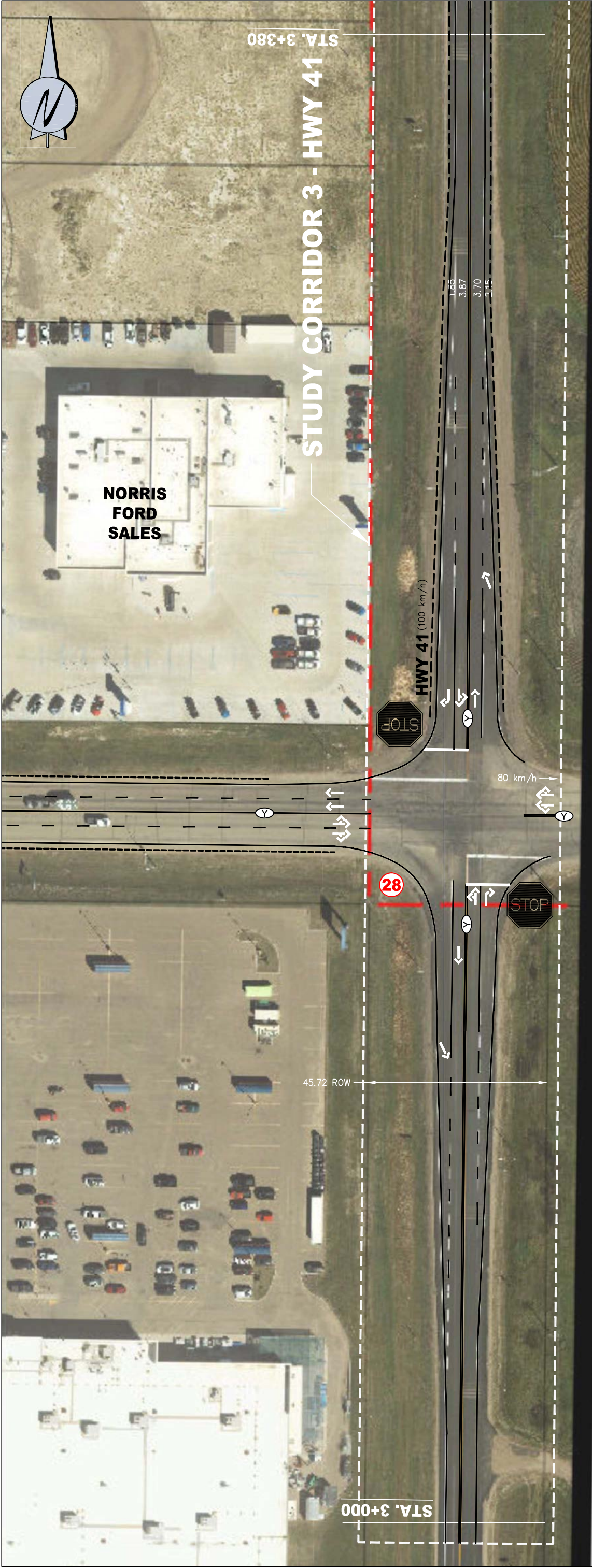
LEGEND:
PROPOSED LANE CONFIGURATION
WP WOOD POLE
SL STREETLIGHT

NOTES:
B. Proposed lane markings and new pavement are shown in white lines (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE B)
0 10 20 30
1:1000

EXHIBIT NO: 5.2.3

WAINWRIGHT TRAFFIC STUDY
Corridor 2 Recommended Improvements
23 Ave from 600m East of 23 St
to 43m East of Hwy 41
(Sta. 2+700 to 2+980)



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - WOOD POLE
 - STREETLIGHT

NOTES:

B. Proposed new lane markings and pavement widening are shown in white lines (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE B)

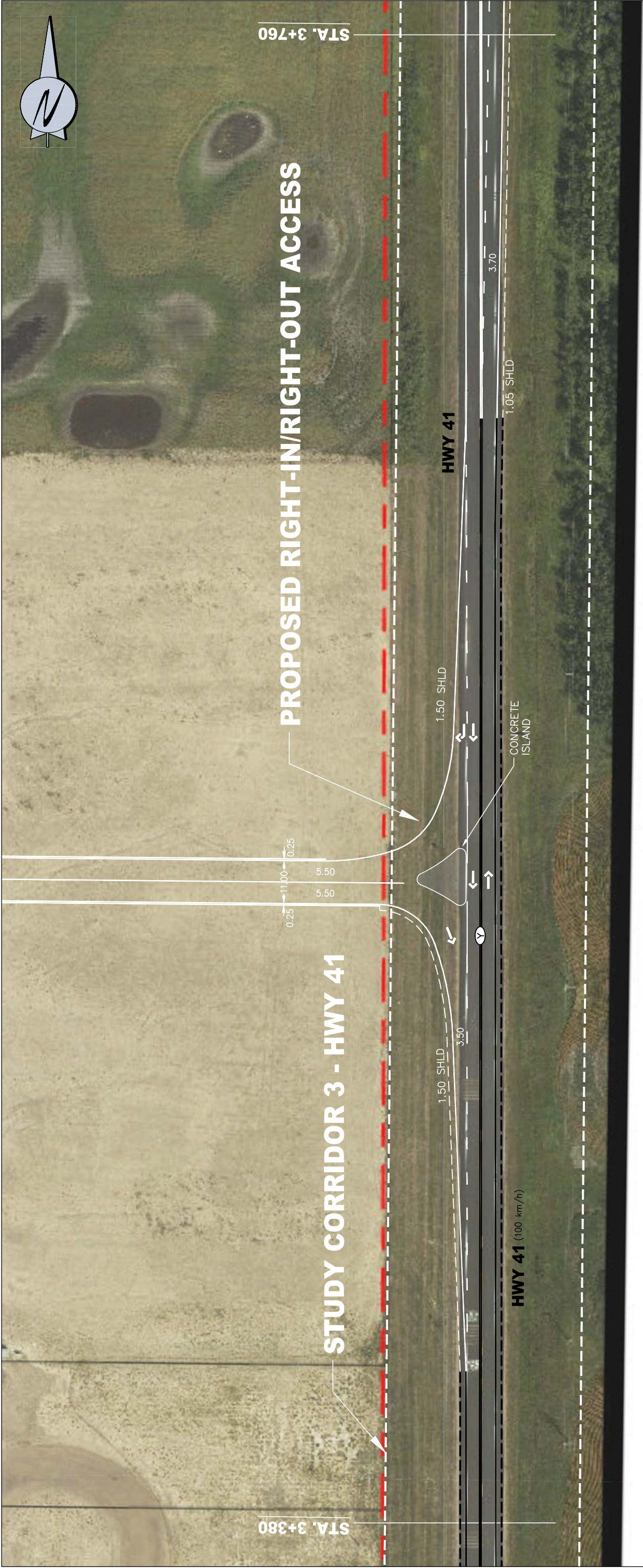
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EXHIBIT NO: 5.3.1

WAINWRIGHT TRAFFIC STUDY

Corridor 3 Recommended Improvements
Hwy 41 from 180m South of
Hwy 14 to 200m north of Hwy 14
(Sta. 3+000 to 3+380)



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- LEGEND:**
- PROPOSED LANE CONFIGURATION
 - WOOD POLE
 - STREETLIGHT

NOTES:

B. Proposed new lane markings and pavement widening are shown in white lines (drawing base prepared using a HD aerial photo). Survey was not carried out.

SCALE: (NOTE B)

0 10 20 30

1:1000

EXHIBIT NO: 5.3.2

WAINWRIGHT TRAFFIC STUDY

Corridor 3 Recommended Improvements
Hwy 41 from 200m North of Hwy 14 to 580m north of Hwy 14 (Sta. 3+380 to 3+700)



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Appendix I

Swept Path Analysis

Design Vehicle Swept Path Check - Accesses / Intersections along Highway 14 through Wainwright

Site	Access / Intersection	Design Veh - Existing		Remarks	Design Veh - TWLTL		Remarks
		IN	OUT		IN	OUT	
1	1 St (N&S)	WB-21	WB-21	Exhibit EX 1.1, 1.2, 1.3 - The following location is tight for WB-21 Design Vehicle: Exh EX 1.1 - N Leg too narrow, need to widen N Leg; Exh EX 1.3 - May need to widen NEC.	WB-21	WB-21	Exhibit TWLTL 1.1, 1.2, 1.3 - The following location is tight for WB-21 Design Vehicle: Exh TWLTL 1.1 - N Leg too narrow, need to widen N Leg; Exh TWLTL 1.2 - May need Stopboxes; Exh TWLTL 1.3 - May need to widen NEC.
2	Access (s) to Trail General Contracting	I-BUS	I-BUS	Exhibit EX 2.1, 2.2 - Access can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 2.1, 2.2 - Access can accommodate I-BUS Design Vehicle
3	2 St (N)	WB-21	WB-21	Exhibit EX 3.1, 3.2 - The following location is tight for WB-21 Design Vehicle : Exh EX 3.1 - tight for concurrent EBLT/SBRT, may need to widen NEC; Exh EX 3.2 - tight for concurrent WBRT/SBLT; may need to widen NEC.	WB-21	WB-21	Exhibit TWLTL 2.1, 2.2 - The following location is tight for WB-21 Design Vehicle: Exh TWLTL 3.1 - tight for concurrent EBLT/SBRT, may need to widen NWC; Exh TWLTL 3.2 - tight for concurrent WBRT/SBLT; may need to widen NEC.
4	Access (S) to Petroleum Park	I-BUS	I-BUS	Exhibit EX 4.1, 4.2 - Access can accommodate I-BUS Design Vehicle. Some overlaps in opposing swept paths within the site - acceptable as occurrences expected to be infrequent.	I-BUS	I-BUS	Exhibit TWLTL 4.1, 4.2 - Access can accommodate I-BUS Design Vehicle. Some overlaps in opposing swept paths within the site - acceptable as occurrences expected to be infrequent.
5	Access (S) to ESSO	WB-21	WB-21 (RT out to Hwy 14 via Site E Access @14 St)	Exhibit EX 5.1, 5.2 - Access can accommodate WB-21 Design Vehicle, except for NBRT exiting the site at an acute angle - too tight even for I-BUS. I-BUS making this exiting movement would need to take up a large part of the site access to make the wide turn	WB-21	WB-21 (RT out to Hwy 14 via Site E Access @14 St)	Exhibit TWLTL 5.1, 5.2 - Access can accommodate WB-21 Design Vehicle, except for NBRT exiting the site at an acute angle - too tight even for I-BUS. I-BUS making this exiting movement would need to take up a large part of the site access to make the wide turn

Design Vehicle Swept Path Check - Accesses / Intersections along Highway 14 through Wainwright

Site	Access / Intersection	Design Veh - Existing		Remarks	Design Veh - TWLTL		Remarks
		IN	OUT		IN	OUT	
6	6 St (S)	I-BUS	I-BUS	Exhibit EX 6.1, 6.2, 6.3 - Intersection can accommodate I-BUS Design Vehicle. WB-21 can enter ESSO (at SWC) from the east via 6 St (EBLT, Zig-Zag) and exit ESSO to the east also via 6 St (NBRT, Zig-Zag)	I-BUS	I-BUS	Exhibit TWLTL 6.1, 6.3 - Intersection can accommodate I-BUS Design Vehicle. WB-21 can enter ESSO (at SWC) from the east via 6 St (EBLT, Zig-Zag) and exit ESSO to the east also via 6 St (NBRT, Zig-Zag)
7	Access to Bison Motel	I-BUS	I-BUS	Did not prepare exhibit or swept path check (Should consider narrowing down site access which currently consists of a 24m west access and a 15m east access. Desirable to narrow down the west access to around 12m. Closure of the east access should be considered.	I-BUS	I-BUS	Did not prepare exhibit or swept path check (Should consider narrowing down site access which currently consists of a 24m west access and a 15m east access. Desirable to narrow down the west access to around 12m. Closure of the east access should be considered.
8	Access (S) to Boston Pizza / Subway	I-BUS	I-BUS	Exhibit EX 8.1, 8.2 - Access can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 8.1, 8.2 - Access can accommodate I-BUS Design Vehicle
9	Access (S) to MD of Wainwright	I-BUS	I-BUS	Exhibit EX 9.1, 9.2 - Access can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 9.1, 9.2 - Access can accommodate I-BUS Design Vehicle
10	9 St (N)	I-BUS	I-BUS	Exhibit EX 10.1, 10.2 - Intersection can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 10.1, 10.2 - Intersection can accommodate I-BUS Design Vehicle
11	Access (N) to KFC	I-BUS	I-BUS	Exhibit EX 11.1, 11.2 - Access can accommodate I-BUS Design Vehicle	I-BUS	I-BUS	Exhibit TWLTL 11.1, 11.2 - Access can accommodate I-BUS Design Vehicle
12	10a St (N/S)	I-BUS	I-BUS	Exhibit EX 12.4, 12.5, 12.6 - Intersection can accommodate I-BUS Design Vehicle. Exhibit EX 12.1, 12.2, 12.3 - need to increase corner radii (all 4 corners) if want to accommodate WB-21, or WB-21 will need to make wide right turns, taking up most of 10a St	I-BUS	I-BUS	Exhibit TWLTL 12.4, 12.5, 12.6 - Intersection can accommodate I-BUS Design Vehicle. Exhibit TWLTL 12.1, 12.2, 12.3 - need to increase corner radii (all 4 corners) if want to accommodate WB-21, or WB-21 will need to make wide right turns, taking up most of 10a St

Design Vehicle Swept Path Check - Accesses / Intersections along Highway 14 through Wainwright

Site	Access / Intersection	Design Veh - Existing		Remarks	Design Veh - TWLTL		Remarks
		IN	OUT		IN	OUT	
13	Access (S) to Royal Pizza / Domino Pizza	I-BUS	I-BUS	Did not prepare exhibit or swept path check	I-BUS	I-BUS	Did not prepare exhibit or swept path check
14	West Access (N) to Esthetics	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check (Consider closing either West or East Access)	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check (Consider closing either West or East Access)
15	East Access (N) to Esthetics	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check (Consider closing either West or East Access)	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check (Consider closing either West or East Access)
16	Access (S) to Jebb's Joint	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check	1-direction for I-BUS	1-direction for I-BUS	Did not prepare exhibit or swept path check
17	Access (S) to Husky Vacant Site (Right-In/Right-Out Proposed)	WB-21 (via Hwy 14 or 14 St)	WB-21 (via 14 St)	Exhibit EX 17.1 - WB-21 can access Site from Hwy 14 West either through the North Access (zig-zag) or the East Access (U-Turn from Hwy 14, via 14 St). Can exit from Site to Hwy 14 by making a right turn from the North Access, or via the East Access on 14 St and then left or right at 14 St	n/a	n/a	n/a
18	Access (N) to Fas Gas Plus (Right-In/Right-Out Proposed)	WB-21	WB-21	Exhibit EX 18.1, 18.2 - Exhibit 18.1 - WB-21 can exit FAS GAS to Hwy 14 West through the South Access. Exhibit EX 18.2 - WB-21 can enter FAS GAS from Hwy 14 E either through the South Access (U-Turn) or the East Access (Zig-Zag from Hwy 14, via 14 St).	n/a	n/a	n/a

Design Vehicle Swept Path Check - Accesses / Intersections along Highway 14 through Wainwright

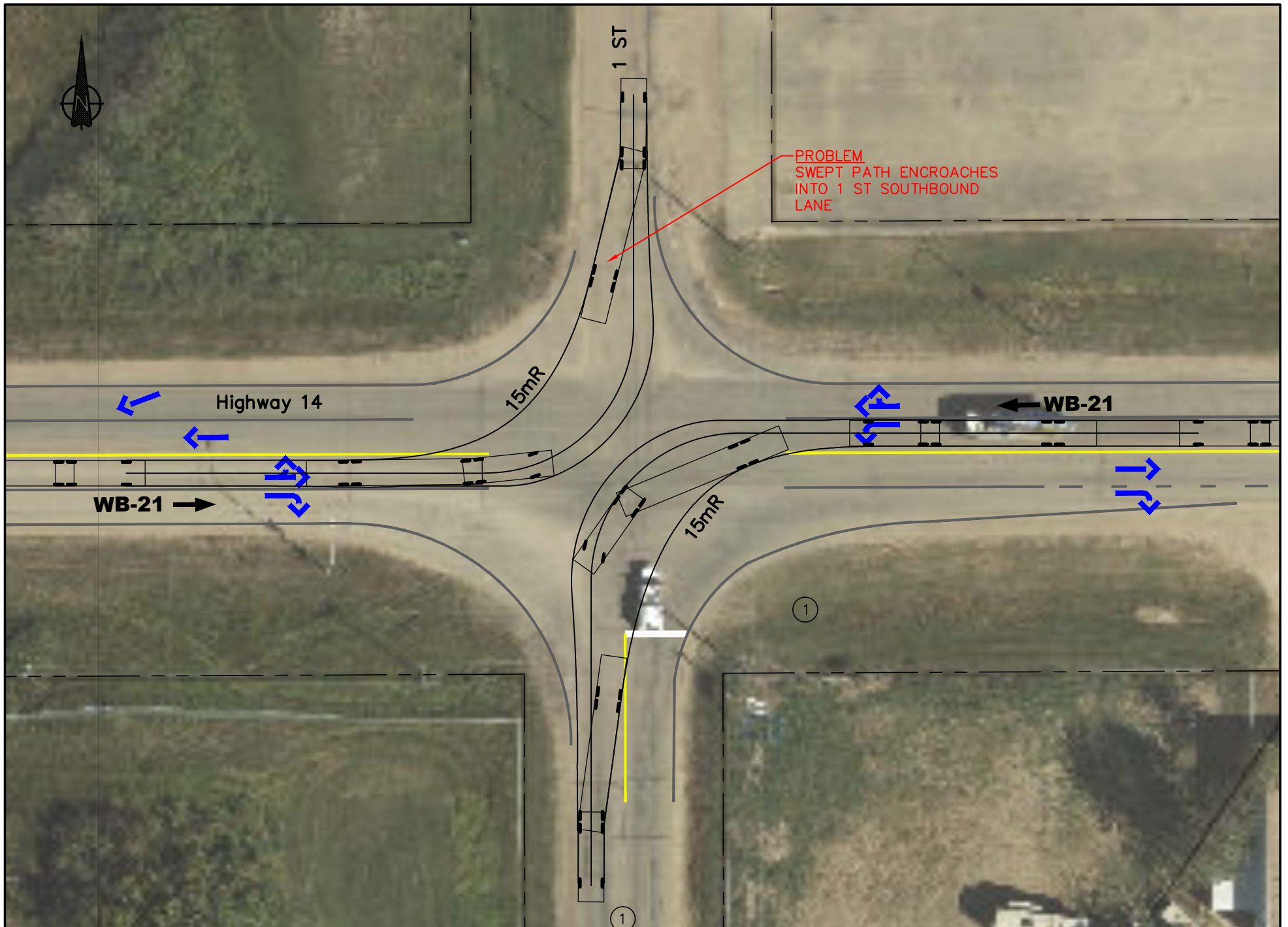
Site	Access / Intersection	Design Veh - Existing		Remarks	Design Veh - TWLTL		Remarks
		IN	OUT		IN	OUT	
19	14 St (N/S)	WB-21	WB-21	Exhibit B1X, B2X, B3X, B4X, B5X. Exhibit B1X - Need to widen N Leg to provide 2 SB lanes; Assign LT lane at N & S Legs; Move Stopline back at all 4 Legs. Exhibit B4X & B5X - Create WBRT Lane. Widen East Outer Separation (NEC) to accommodate Zig-Zag from Hwy 14 EB to NE Service Rd EB, and may need to widen north edge of NE Service Rd to accommodate U-Turn from Hy 14 WB-to-SE Service Rd EB.	WB-21	WB-21	n/a
20	15 St (S)	I-BUS	I-BUS	Exhibit EX 20.1, 20.2 - Intersection can accommodate I-BUS Design Vehicle. It is too narrow for WB-21. WB-21 will need to make a wide turn for making either a right or left turn into 15 St, taking up most of the width of 15 St.	I-BUS	I-BUS	Exhibit TWLTL 20.1, 20.2 - Intersection can accommodate I-BUS Design Vehicle. It is too narrow for WB-21. WB-21 will need to make a wide turn for making either a right or left turn into 15 St, taking up most of the width of 15 St.
21	Access (S) to EMCON Hwy Maintenance	1-direction for WB-21	1-direction for WB-21	Exhibit EX 21.1, 21.2 - Access can accommodate one-directional travel of a WB-21 Design Vehicle. Acceptable as it is unlikely to have two WB-21 trucks entering and exiting at the same time	1-direction for WB-21	1-direction for WB-21	Exhibit TWLTL 21.1, 21.2 - Access can accommodate one-directional travel of a WB-21 Design Vehicle. Acceptable as it is unlikely to have two WB-21 trucks entering and exiting at the same time
22	Access (S) to Wainwright Seed Cleaning Plant	1-direction for WB-21	1-direction for WB-21	Exhibit EX 22.1, 22.2 - Access can accommodate one-directional travel of a WB-21 Design Vehicle. Acceptable as it is unlikely to have two WB-21 trucks entering and exiting at the same time	1-direction for WB-21	1-direction for WB-21	Exhibit TWLTL 22.1, 22.2 - Access can accommodate one-directional travel of a WB-21 Design Vehicle. Acceptable as it is unlikely to have two WB-21 trucks entering and exiting at the same time
23	18 St (N) (Closure proposed)	n/a	n/a	n/a	n/a	n/a	n/a

Site	Access / Intersection	To/From 23 St		Remarks	To/From North Service Rd		Remarks
24	18 St (S)	WB-21	WB-21	Exhibit EX 24.1, 24.2 - Intersection can accommodate WB-21 Design Vehicle	n/a	n/a	Exhibit TWLTL 24.1, 24.2 - Intersection can accommodate WB-21 Design Vehicle
25	23 St (N)	WB-21	WB-21	Turn Path ALC-A1, A2, C1-X. Exh ALC-A2 ALC-C1-X - Need to widen NWC and East Outer Separation (NEC).	n/a	n/a	Turn Path ALC-B1, B4-X, C5-X, D3-X, D4-X. Exh ALC-B1 & ALC-D3X - Need to widen East Outer Separation (NEC). Exh ALC-B4-X - Need to widen East Outer Separation and NWC. Exh ALC-C5X - Need to widen West Outer Separation. Exh ALC-D4X - Need to widen East & West Outer Separation.
26	23 St (S) - (Closure Proposed)	n/a	n/a	n/a	n/a	n/a	n/a

Site	Access / Intersection	To/From 27 St		Remarks	To/From North Service Road and 13 Avenue		Remarks
27	27 St (N&S)	WB-21	WB-21	Exhibit 1, 2. Exhibit 1 - Shows Hwy 14 WBRT swept path will clear the proposed centre median at the South Leg. Also shows adequate separation between the EBLT and WBLT swept paths. Exhibit 2 - shows 27 St NBLT swept path can clear the Centre Median north median nose. Also shows adequate separation between the NBLT and SBLT swept paths.	n/a	n/a	Exhibit 1, 2, 3, 4, 5. Exhibit 1 - shows swept path of LT trucks from 27 St to NW Service Road. Also shows truck making a U-Turn from the E Leg of 13 Ave to Hwy 14 EB, and truck making a Right Turn from 27 St to the W Leg of 13 Ave. Exhibit 2 - shows concurrent NBLT and EBRT of trucks turning at the 27 St/NW Service Road junction. Also shows Zig-Zag turns of truck from Hwy 14 EB to 13 Ave EB. Also shows trucks turning right from 13 Ave (W) to 27 St (S). Exhibit 3 - shows the following U-Turns: EB from NW Service Road U-Turn to WN on Hwy 14; EB from Hwy 14 U-Turn to WB on 13 Ave (WB); EB on 13 Ave (W) U-Turn to Hwy 14 WB. Exhibit 4 - shows U-Turn: Hwy 14 EB U-Turn to EB on 13 Ave (E). Also shows opposing left turns at the 13 Ave/27 St junction. Exhibit 5 - shows Zig-Zag movement from NW Service Road Zig-Zag to Hwy 14 EB. Also shows Zig-Zag movement from W leg of 13 Ave Zig-Zag to Hwy 14 EB. Aksi shows opposing EBLT and WBLT for trucks turning at 13 Ave/27 St junction, as well as concurrent WBLT from 13 Ave (E) to 27 St (S), and NBRT from 27 St (S) to 13 Ave (E)

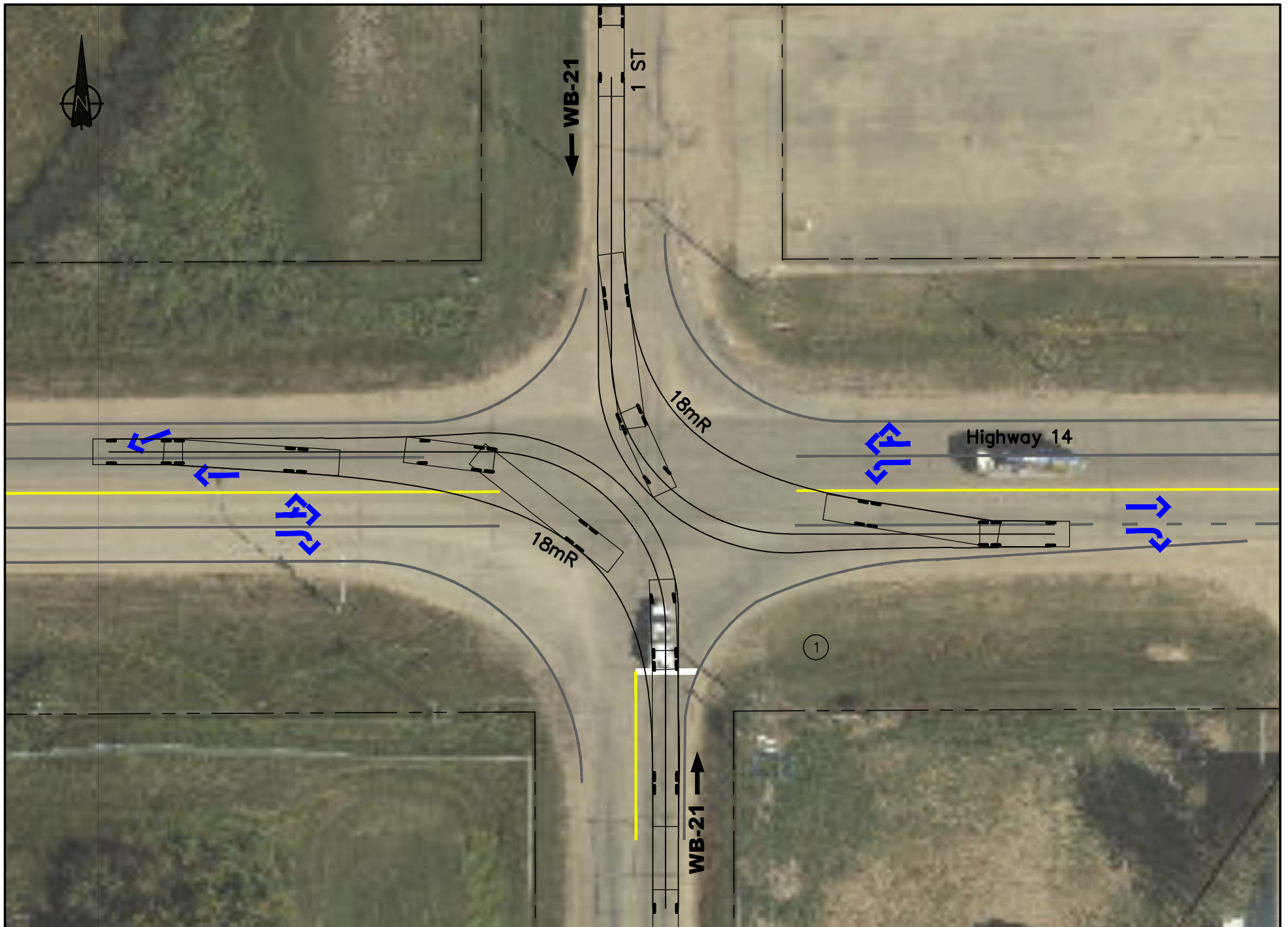
Swept Path Check

01 - 1 Street



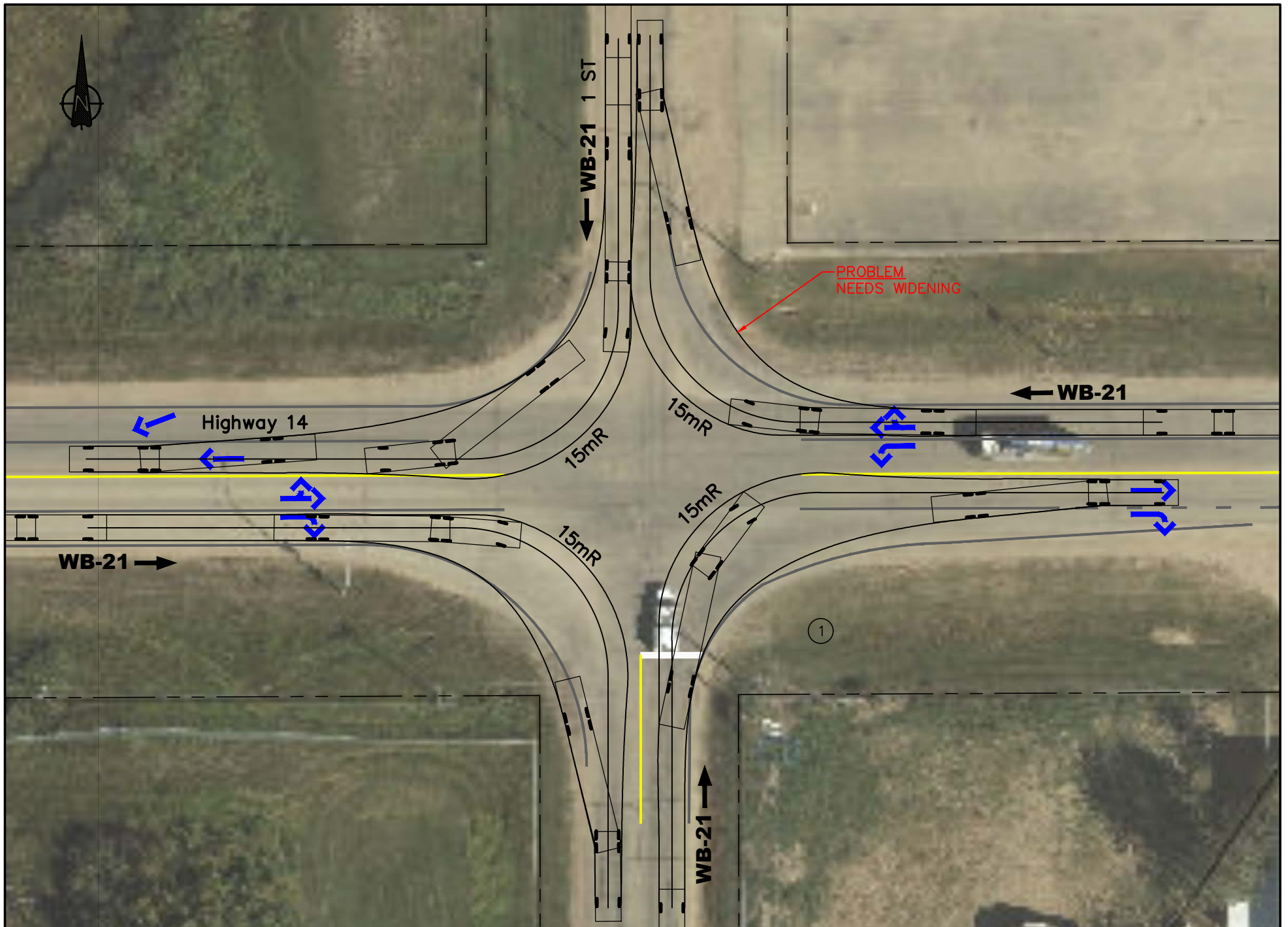
Existing Scenario

Hwy 14 & Access 1 (1 St) – (EX 1.1)
Swept Path Plot 1



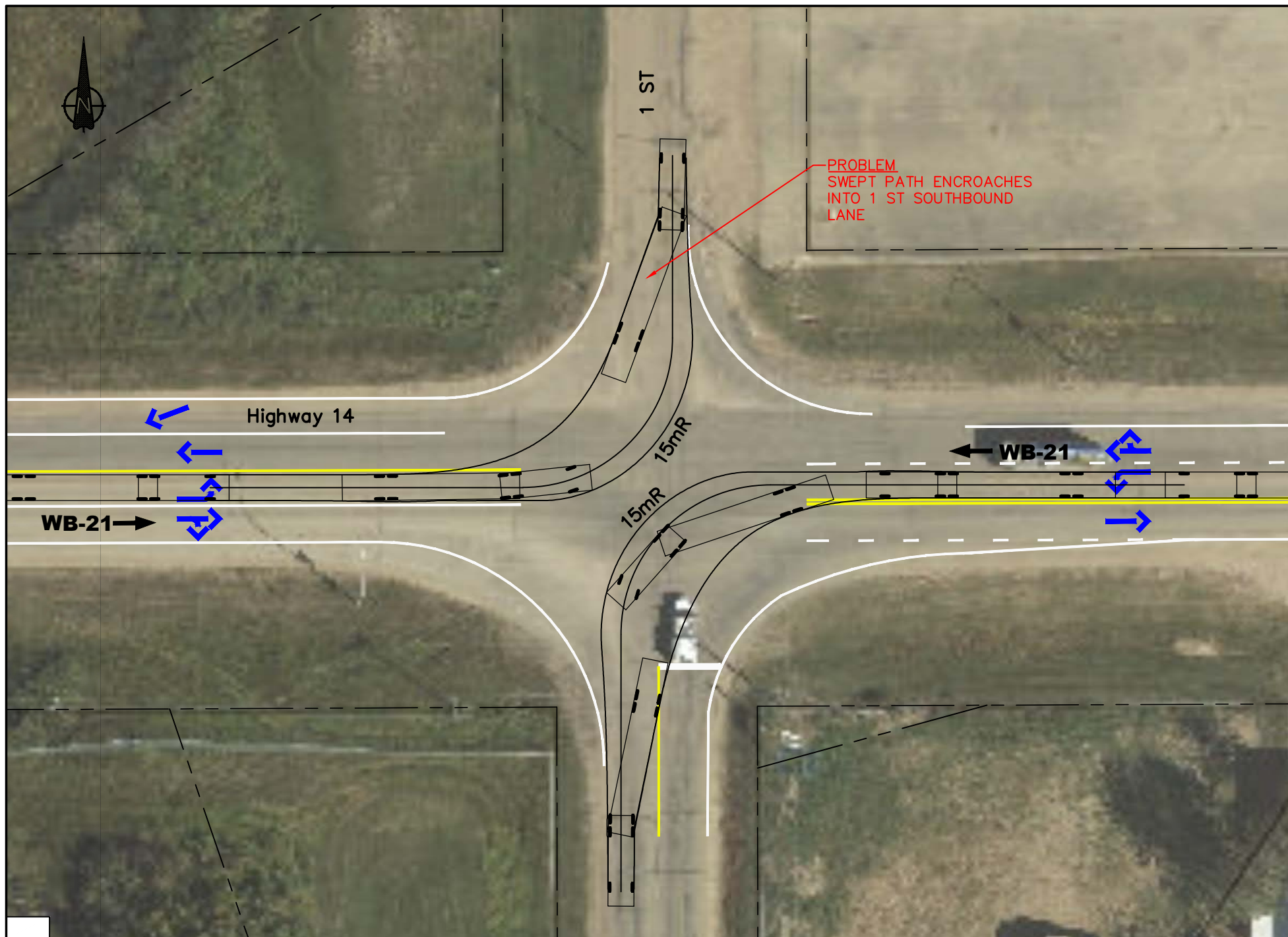
Existing Scenario

Hwy 14 & Access 1 (1 St) – (EX 1.2)
Swept Path Plot 2



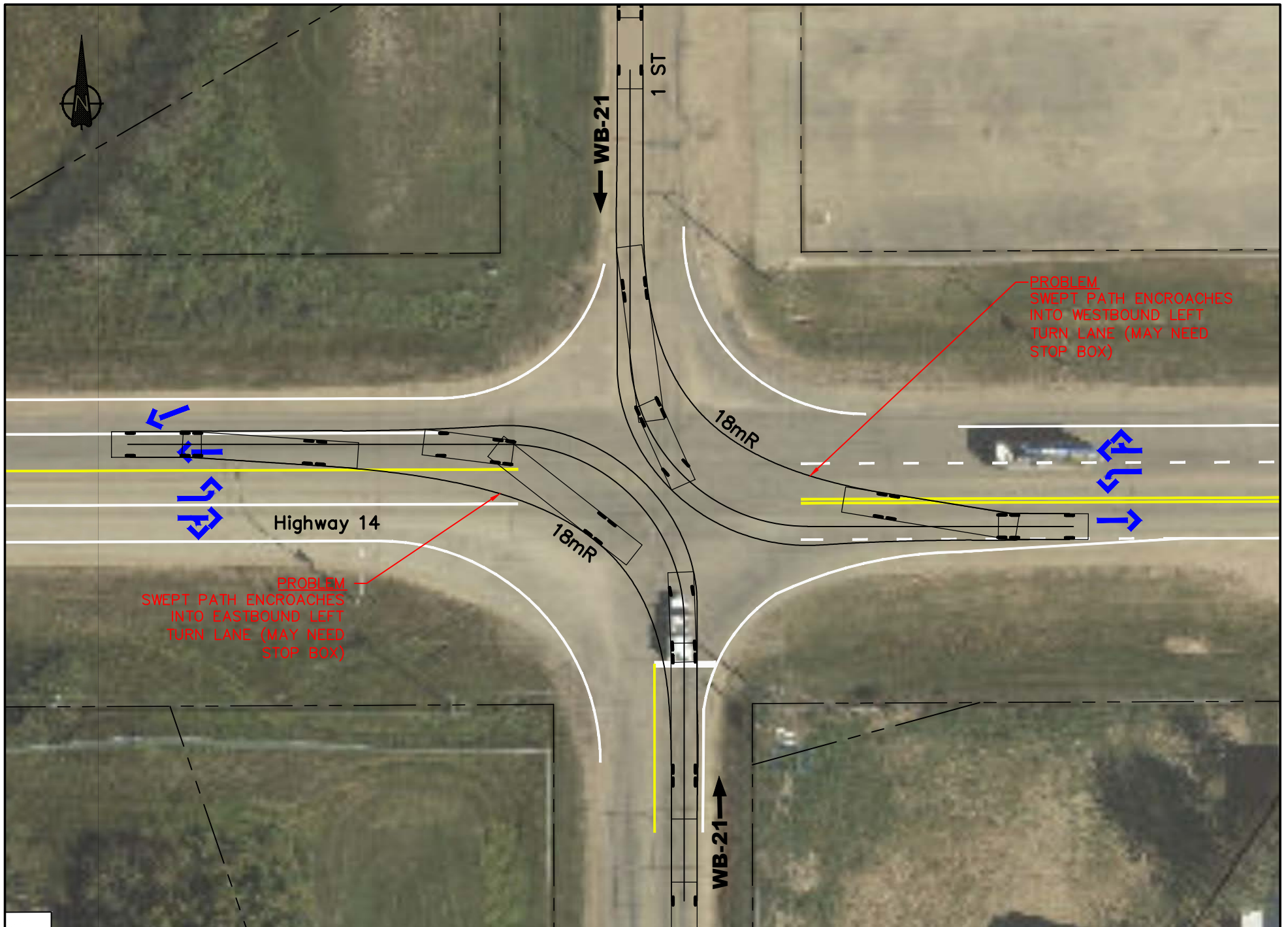
Existing Scenario

Hwy 14 & Access 1 (1 St) – (EX 1.3)
Swept Path Plot 3



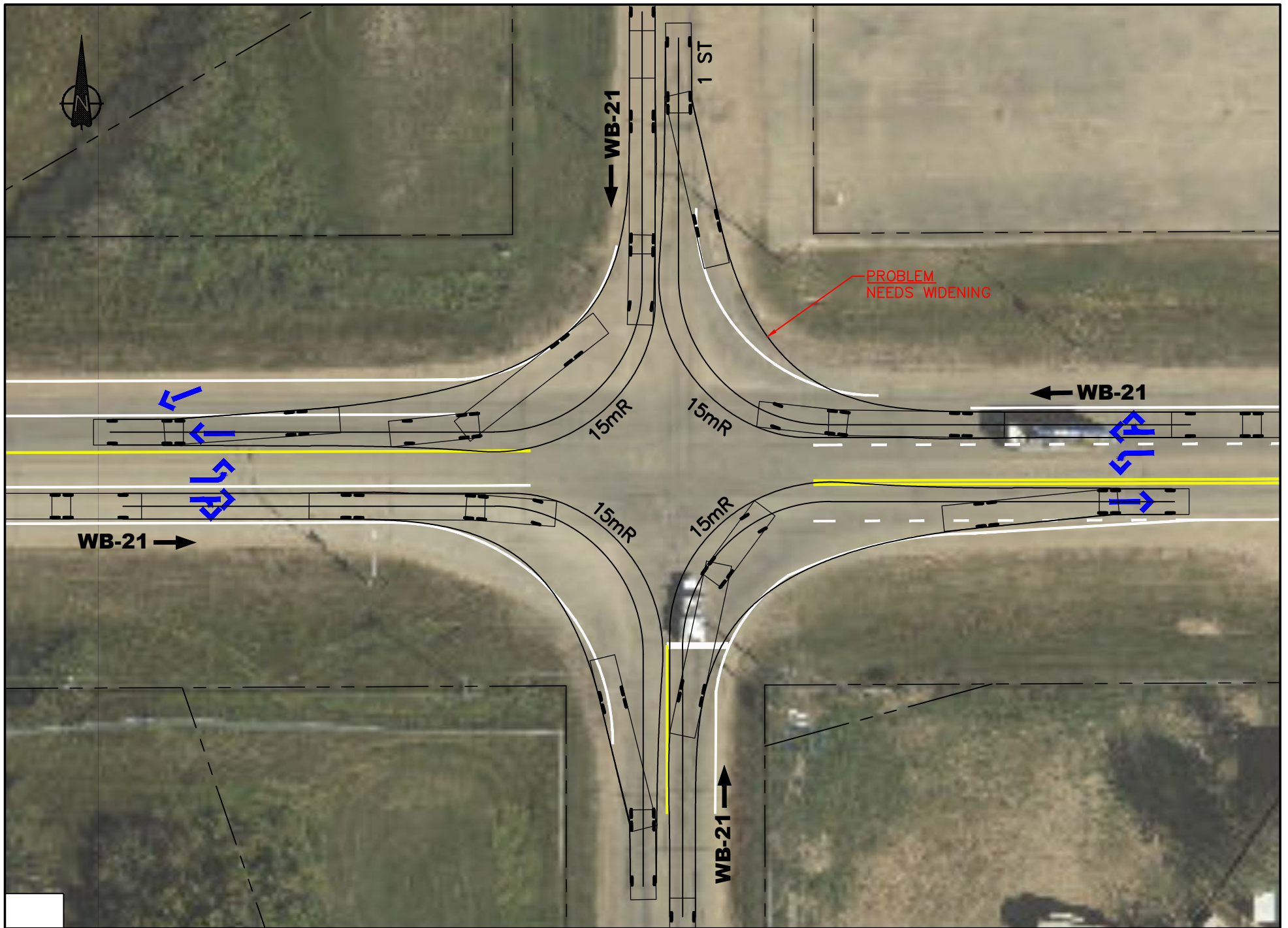
TWLTL Scenario

Hwy 14 & Access 1 (1 St) – (TWLTL 1.1)
Swept Path Plot 1



TWLTL Scenario

Hwy 14 & Access 1 (1 St) – (TWLTL 1.2)
Swept Path Plot 2

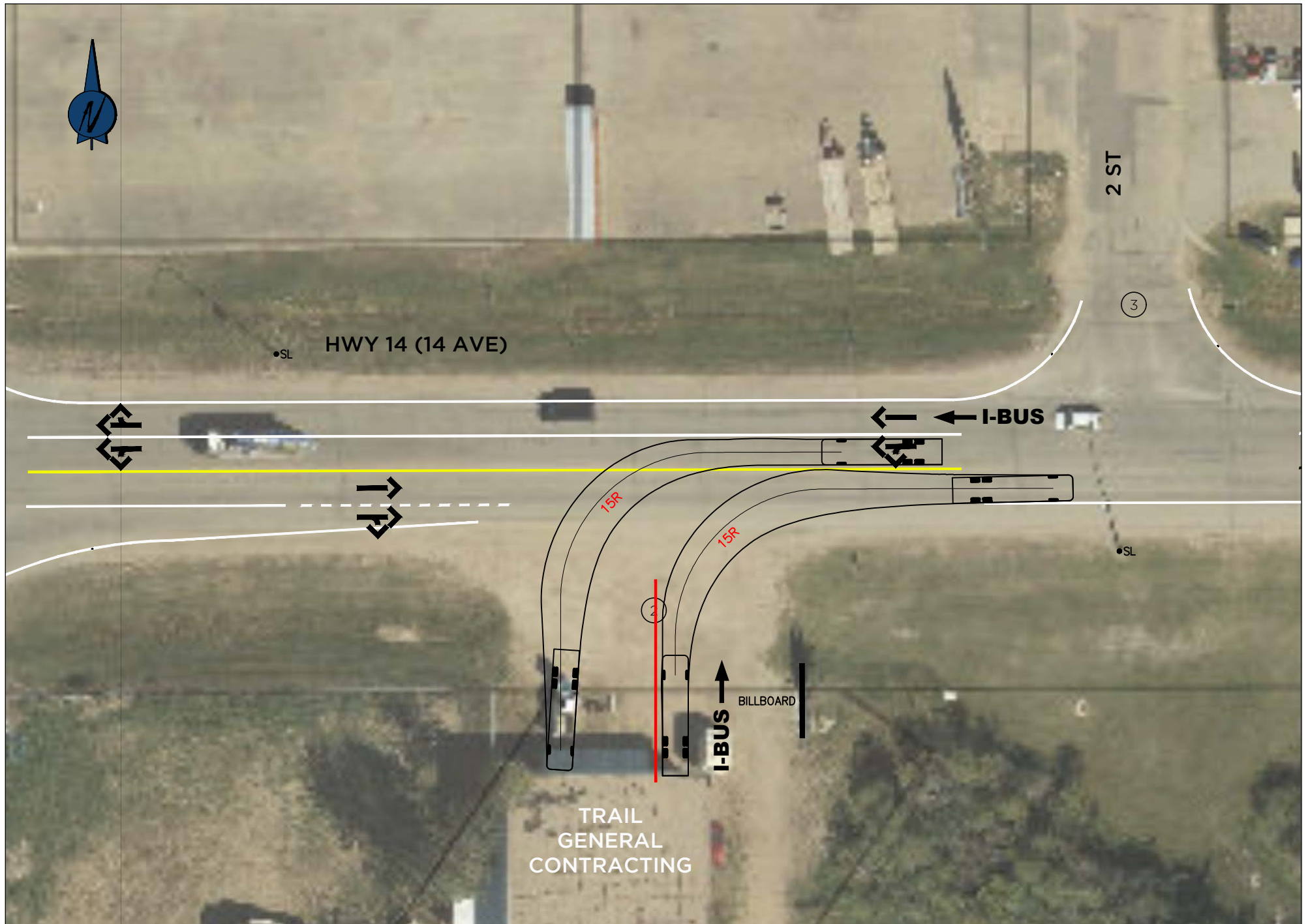


TWLTL Scenario

Hwy 14 & Access 1 (1 St) – (TWLTL 1.3)
Swept Path Plot 3

Swept Path Check

02 - Access to Trail General Contracting

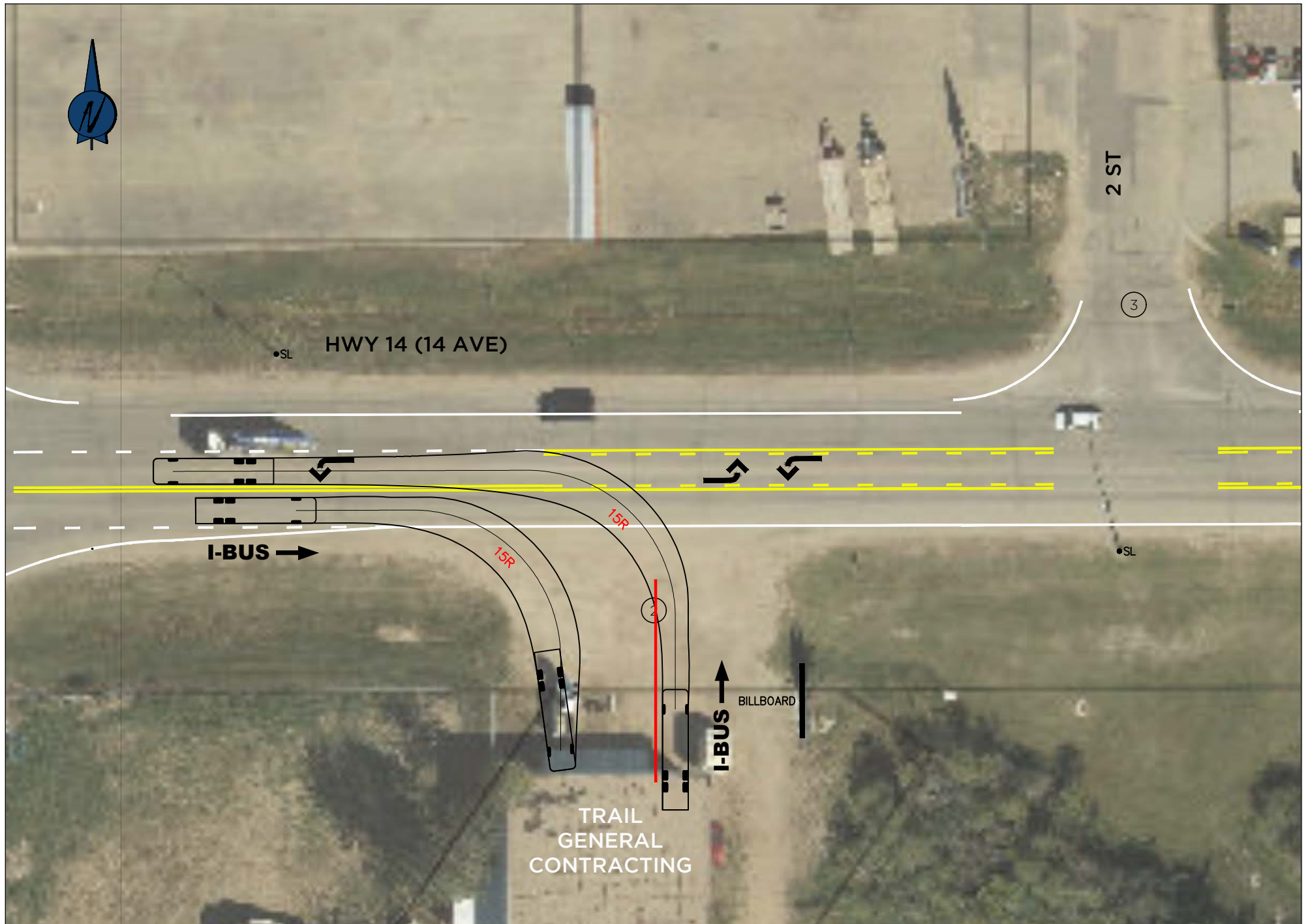


Existing Scenario

Hwy 14 & Access 2 (Ex 2.1)
Swept Path Plot 1



Hwy 14 & Access 2 (Ex 2.2)
Swept Path Plot 2

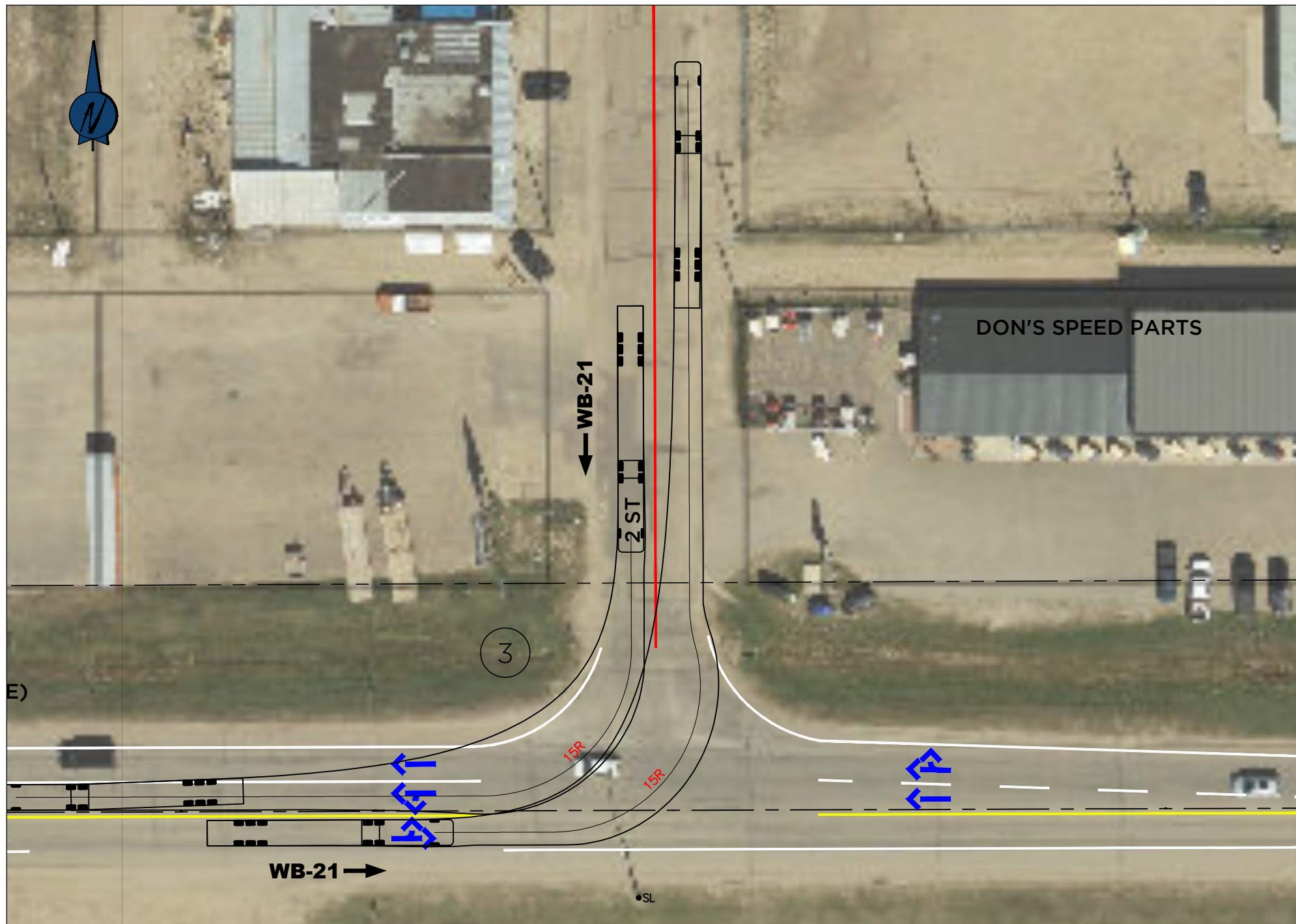


TWLTL Scenario

Hwy 14 & Access 2 (TWLTL 2.2)
Swept Path Plot 2

Swept Path Check

03 - 2 Street



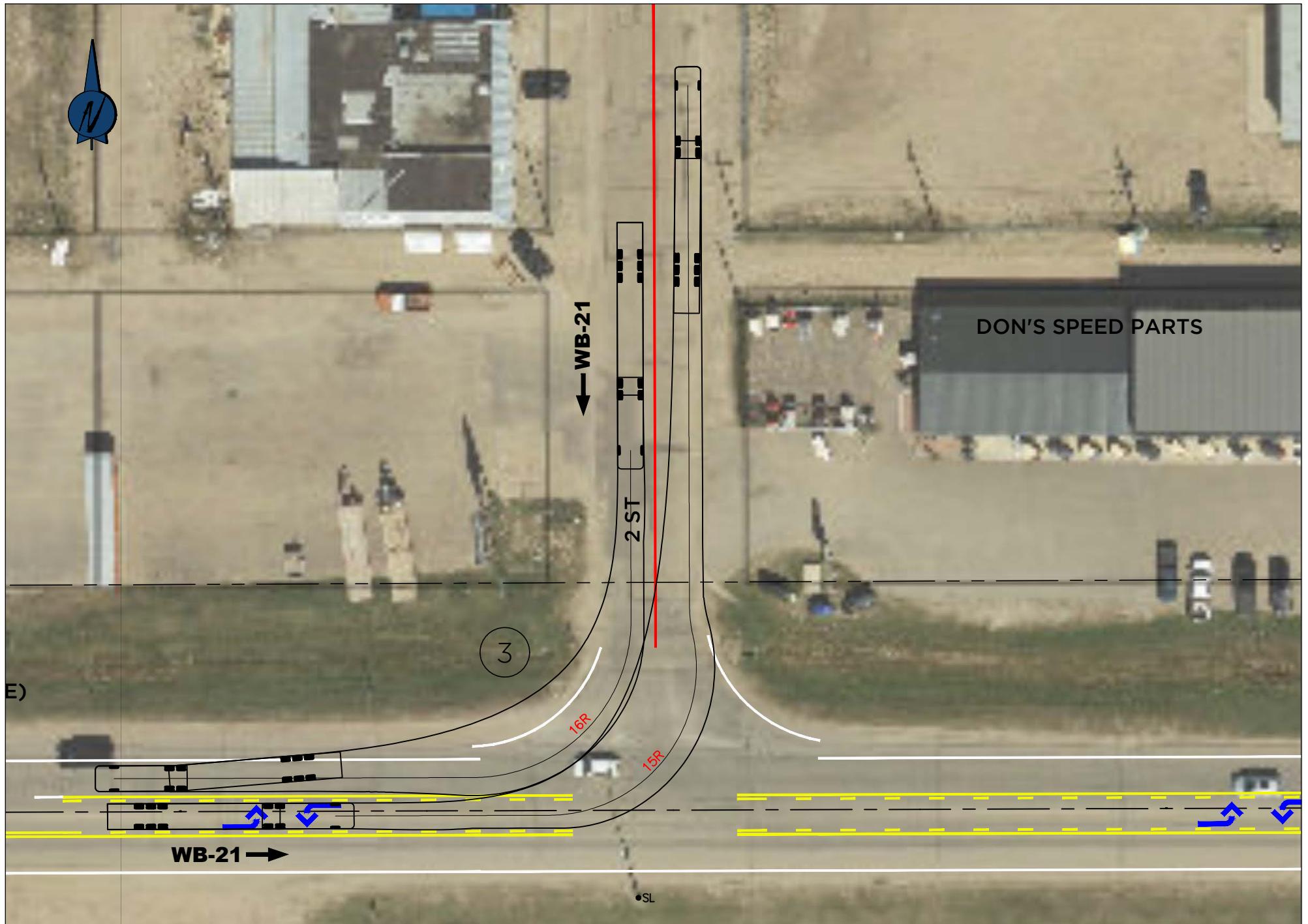
Existing Scenario

Hwy 14 & Access 2 (2 St) (Ex 3.1)
Swept Path Plot 1



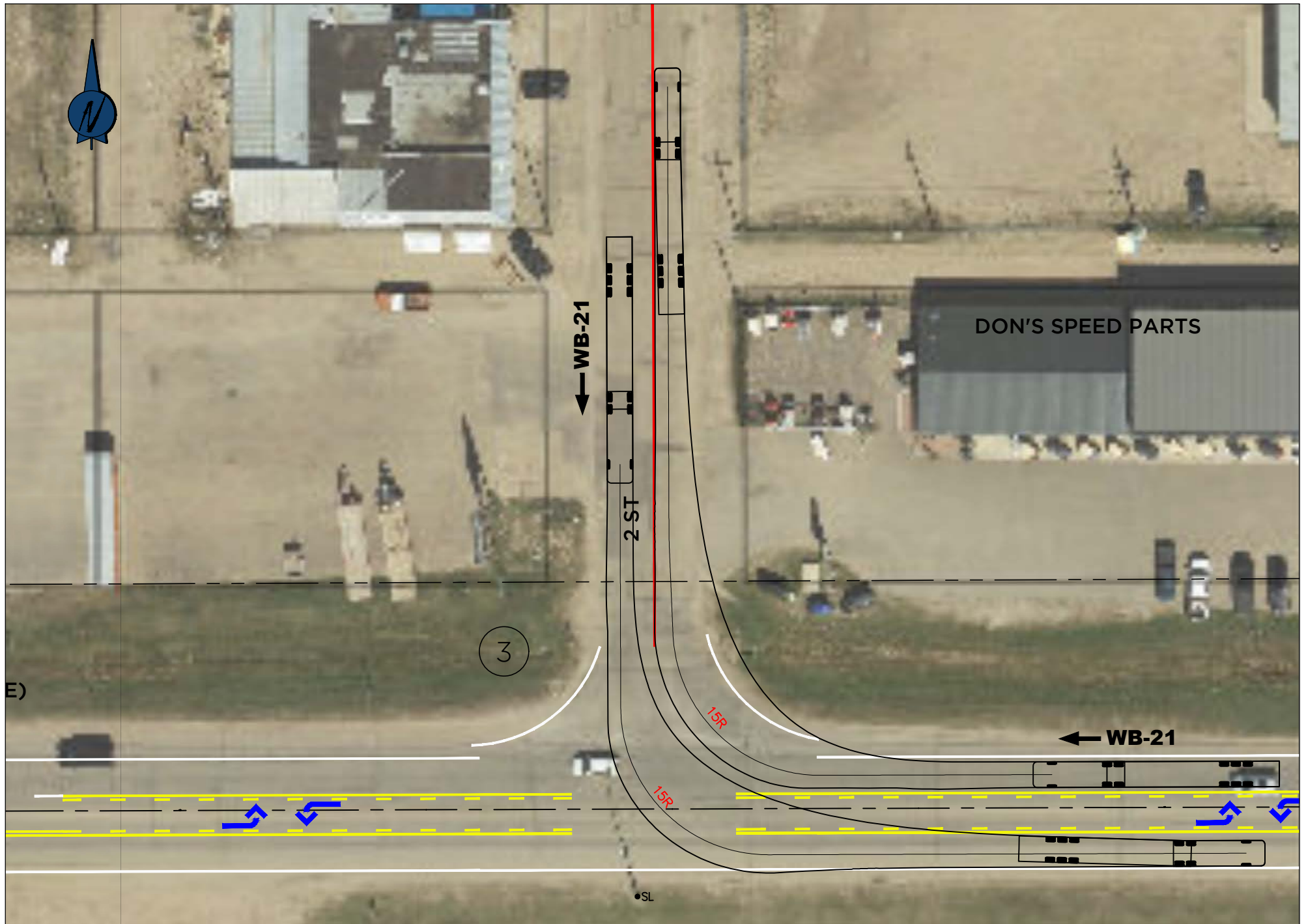
Existing Scenario

Hwy 14 & Access 2 (2 St) (Ex 3.2)
Swept Path Plot 2



TWLTL Scenario

Hwy 14 & Access 2 (2 St) (TWLTL 3.1)
Swept Path Plot 1

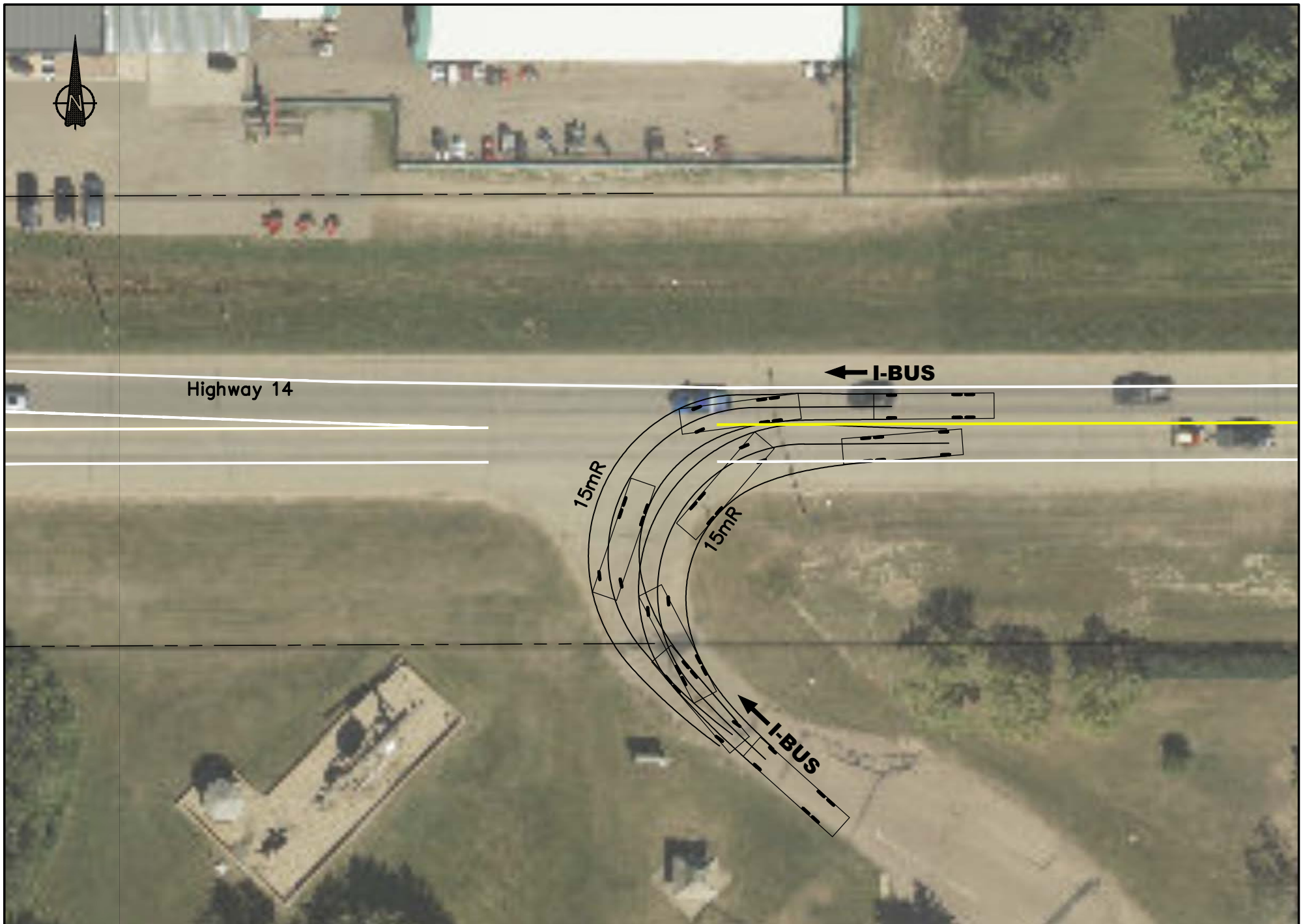


TWLTL Scenario

Hwy 14 & Access 2 (2 St) (TWLTL 3.2)
Swept Path Plot 2

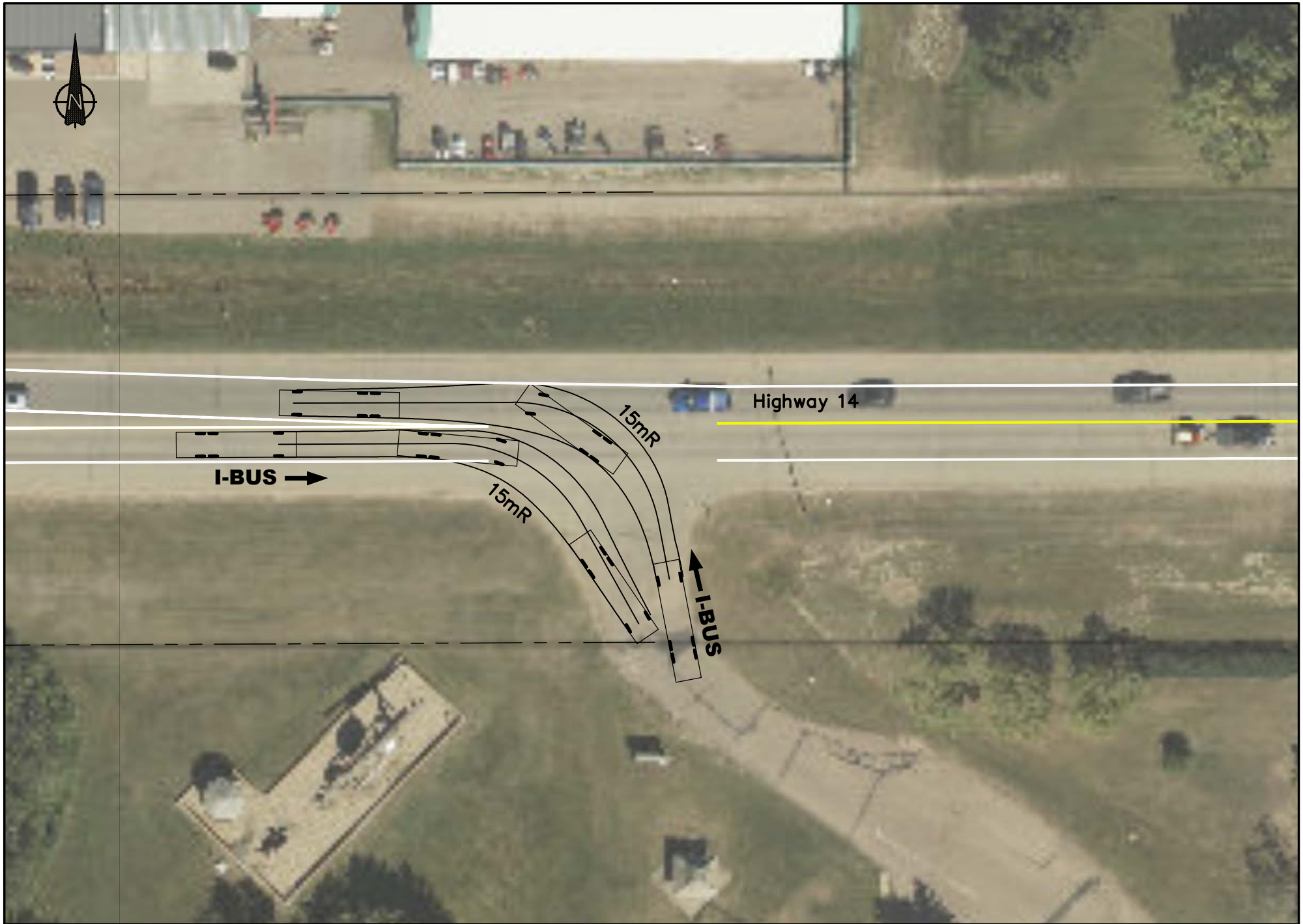
Swept Path Check

04 - Access to Petroleum Park



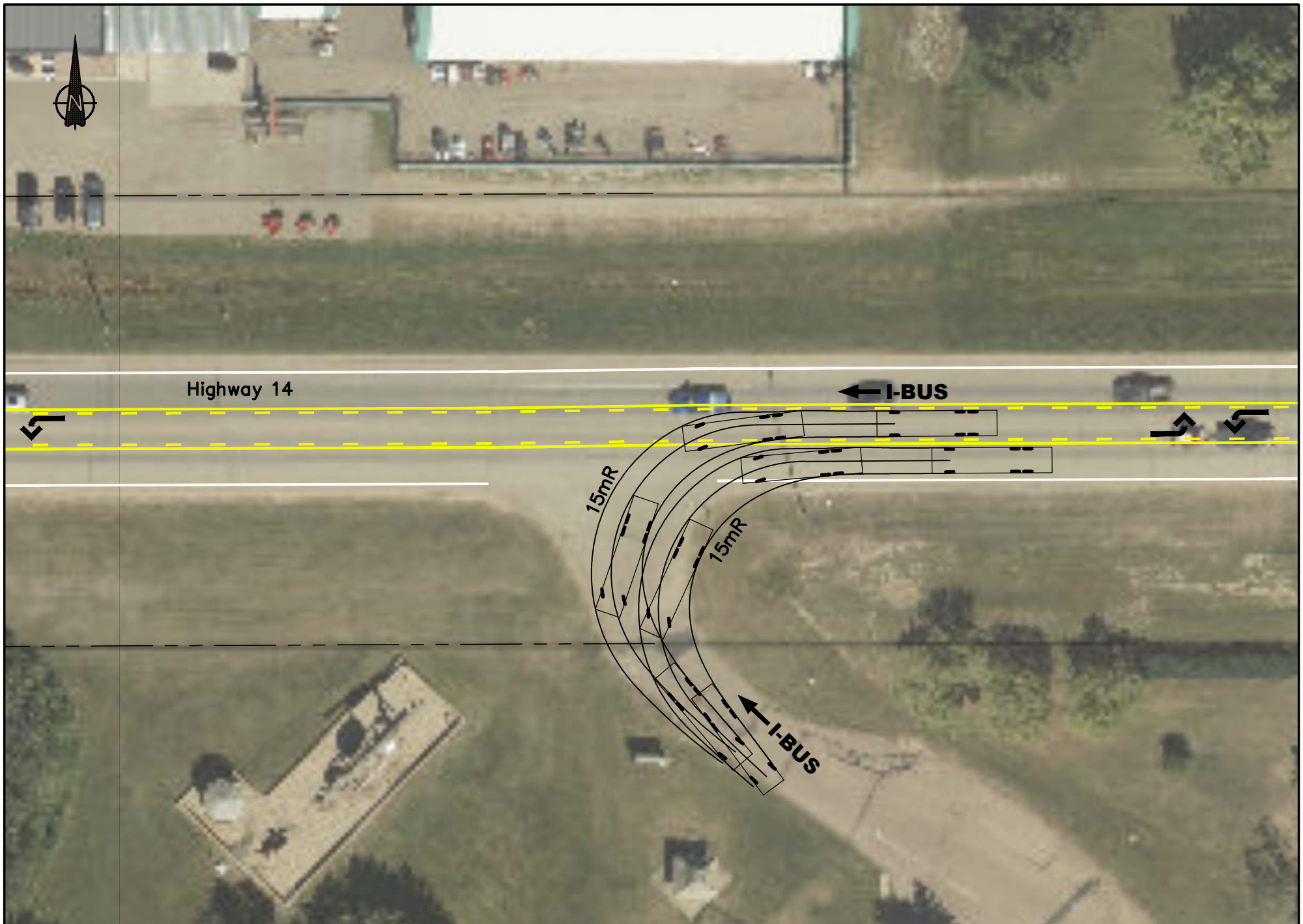
Existing Scenario

Hwy 14 & Access 4 (Petroleum Park) – (EX 4.1)
Swept Path Plot 1



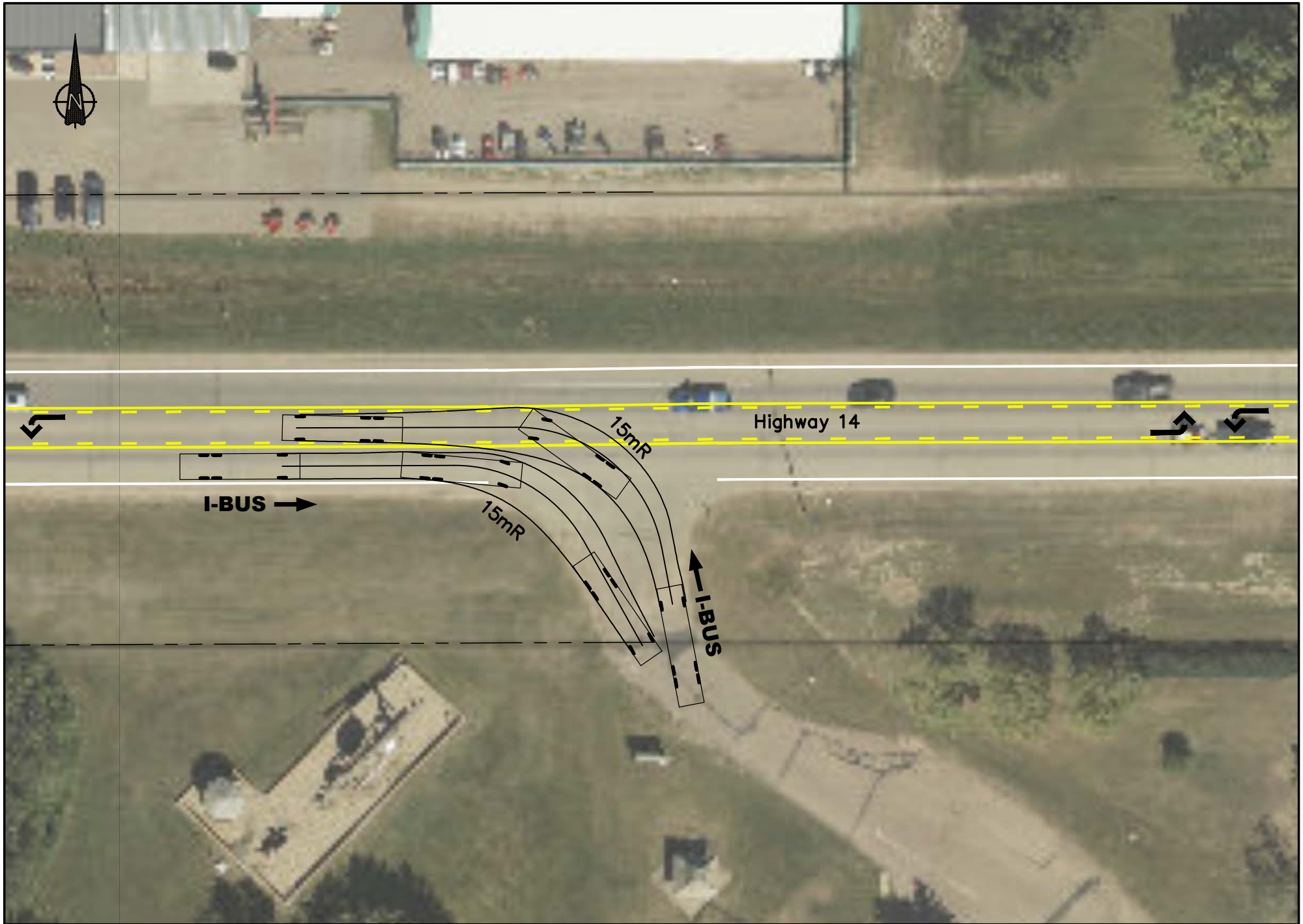
Existing Scenario

Hwy 14 & Access 4 (Petroleum Park) – (EX 4.2)
Swept Path Plot 2



TWLTL Scenario

Hwy 14 & Access 4 (Petroleum Park) – (TWLTL 4.1)
Swept Path Plot 1

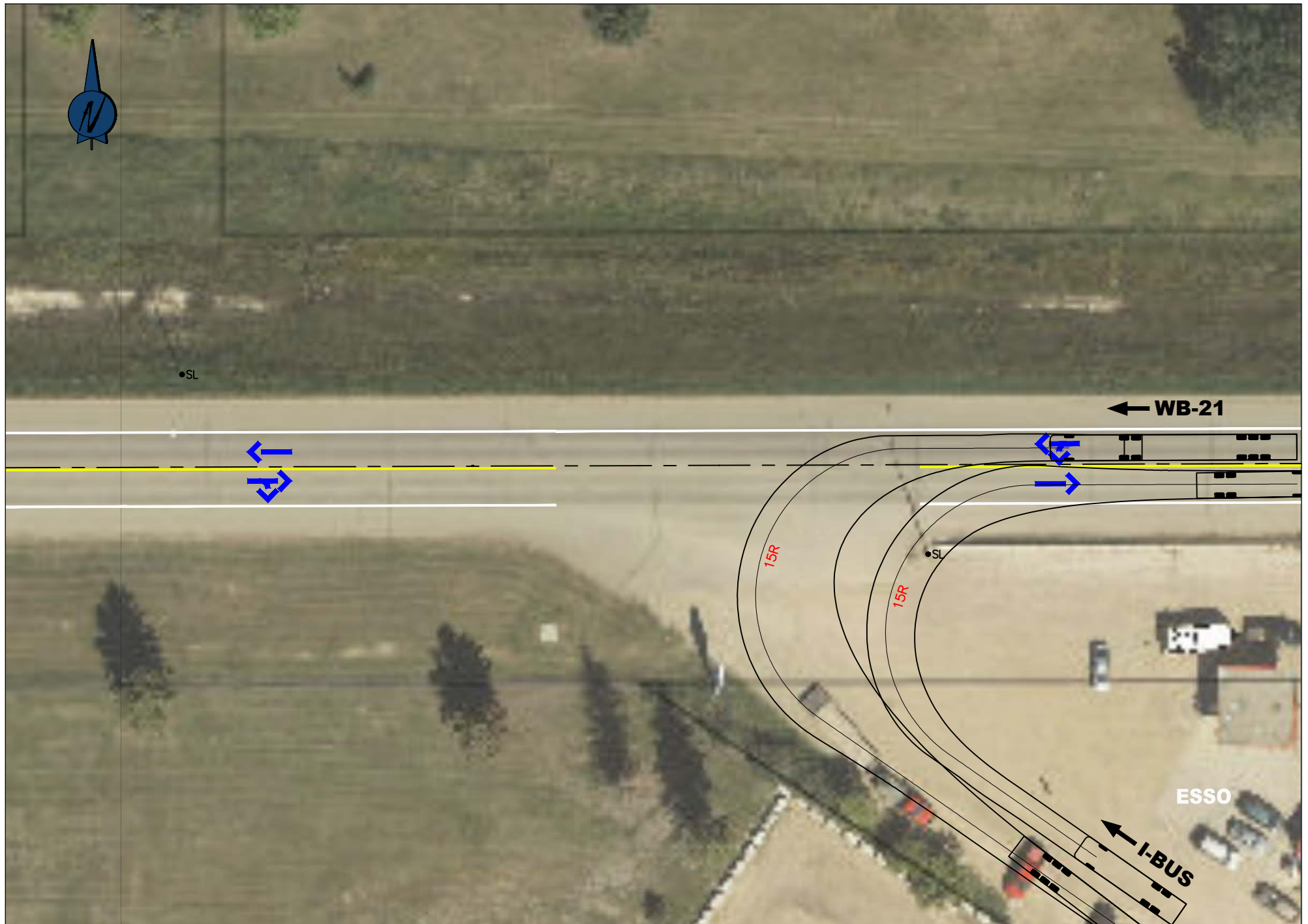


TWLTL Scenario

Hwy 14 & Access 4 (Petroleum Park) – (TWLTL 4.2)
Swept Path Plot 2

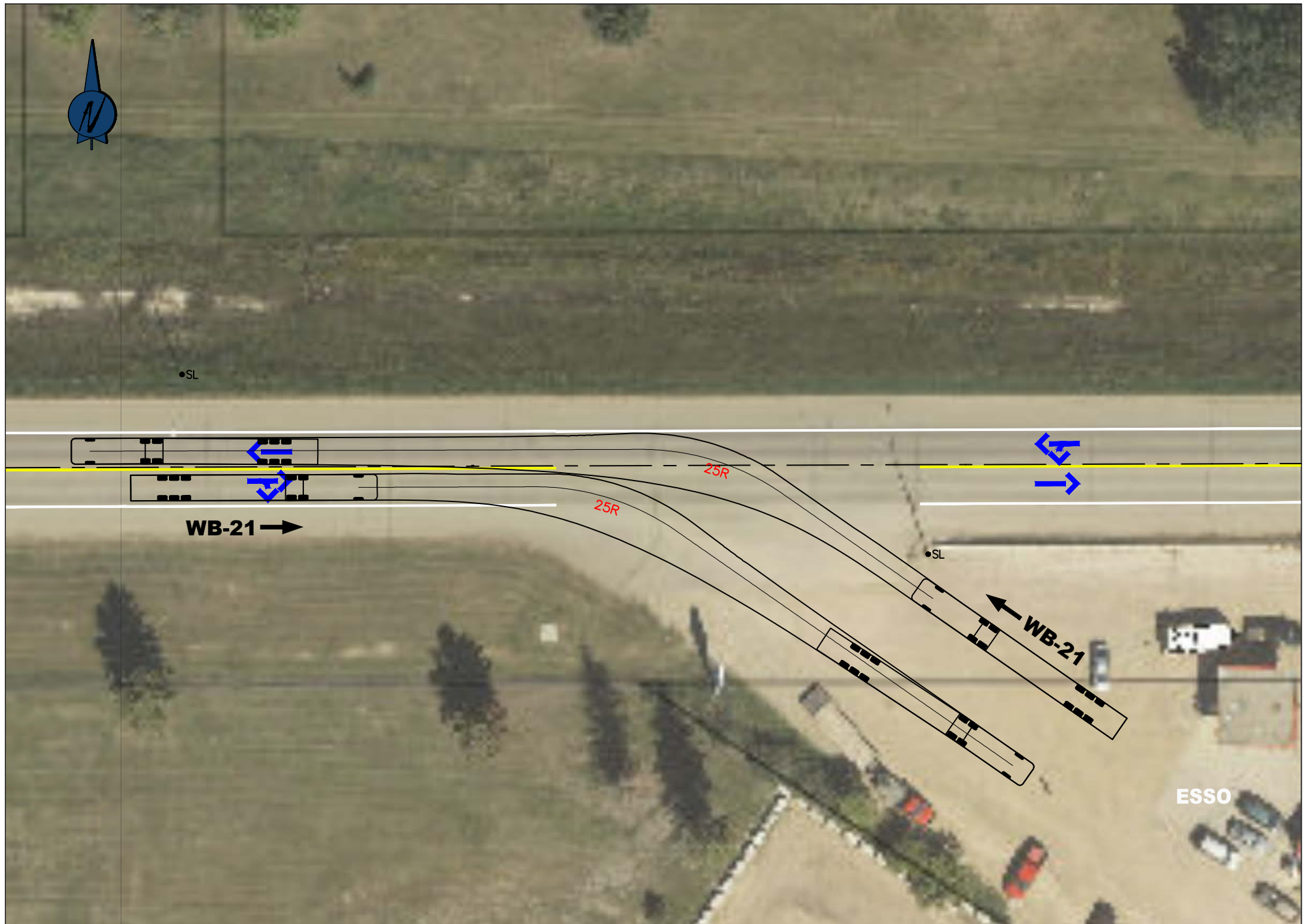
Swept Path Check

05 - Access to ESSO



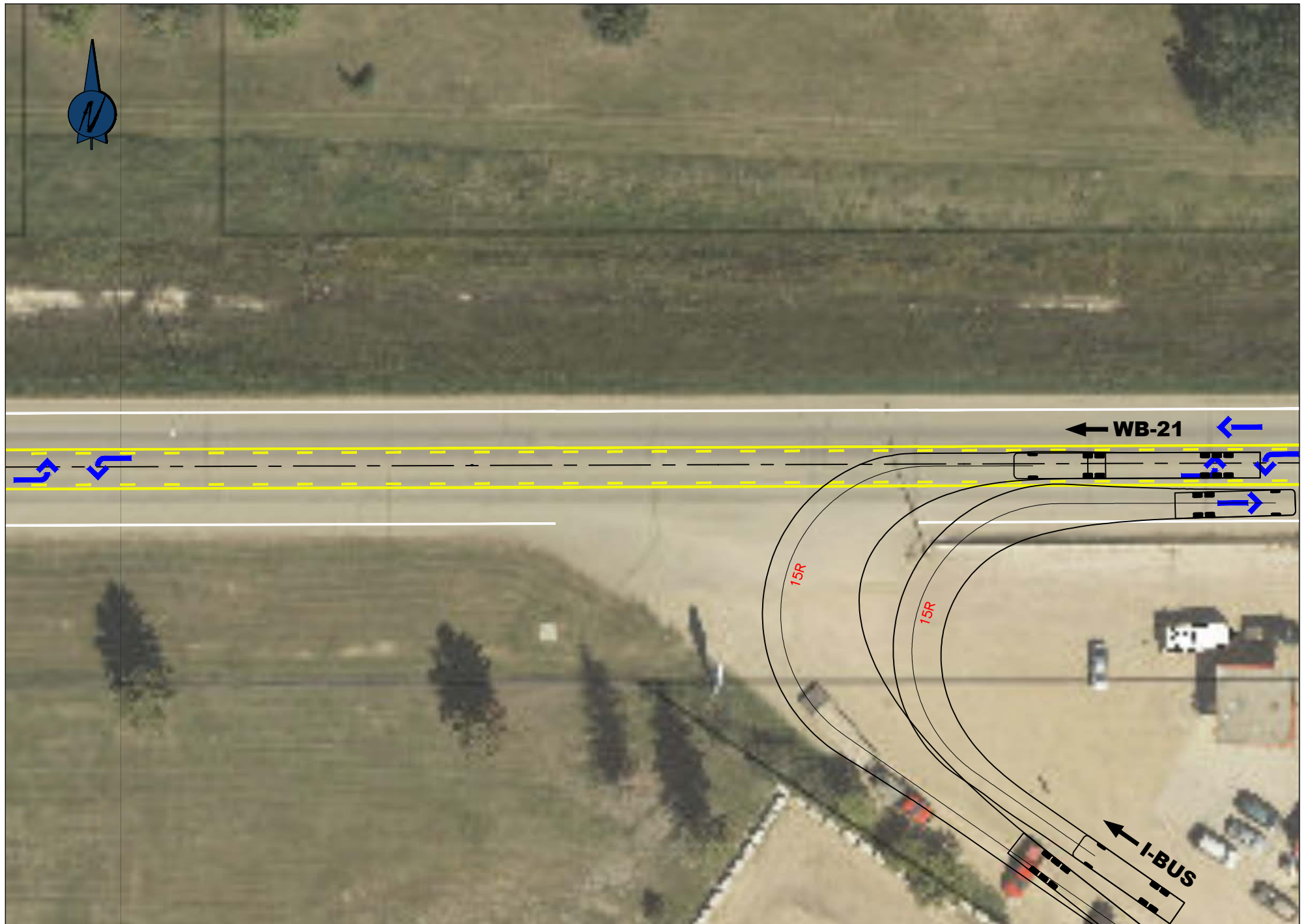
Existing Scenario

Hwy 14 & Access 5 (Esso) (Ex 5.1)
Swept Path Plot 1



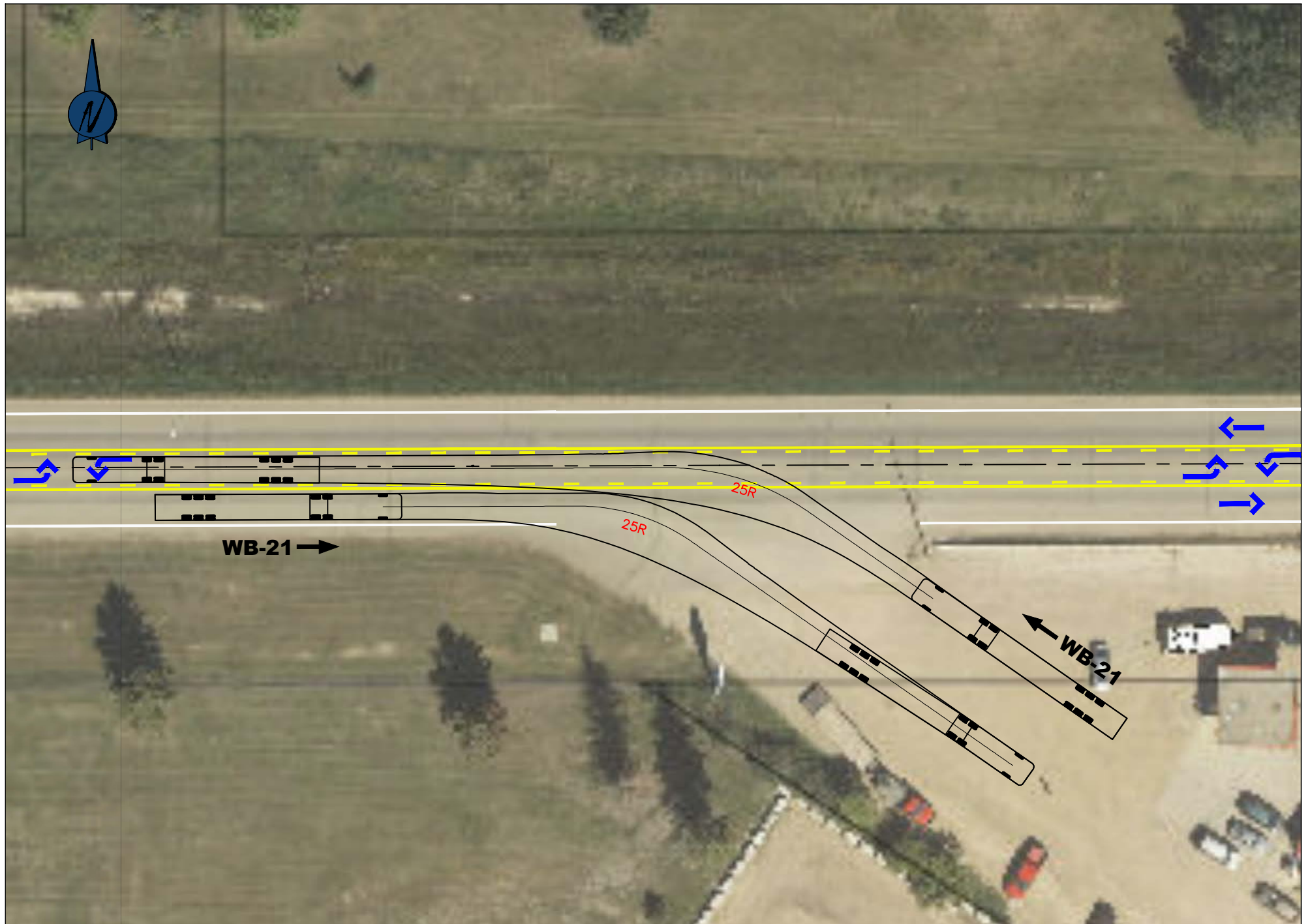
Existing Scenario

Hwy 14 & Access 5 (Esso) (Ex 8.2)
Swept Path Plot 2



TWLTL Scenario

Hwy 14 & Access 5 (Esso) (TWLTL 8.1)
Swept Path Plot 1



TWLTL Scenario

Hwy 14 & Access 5 (Esso) (TWLTL 8.2)
Swept Path Plot 2

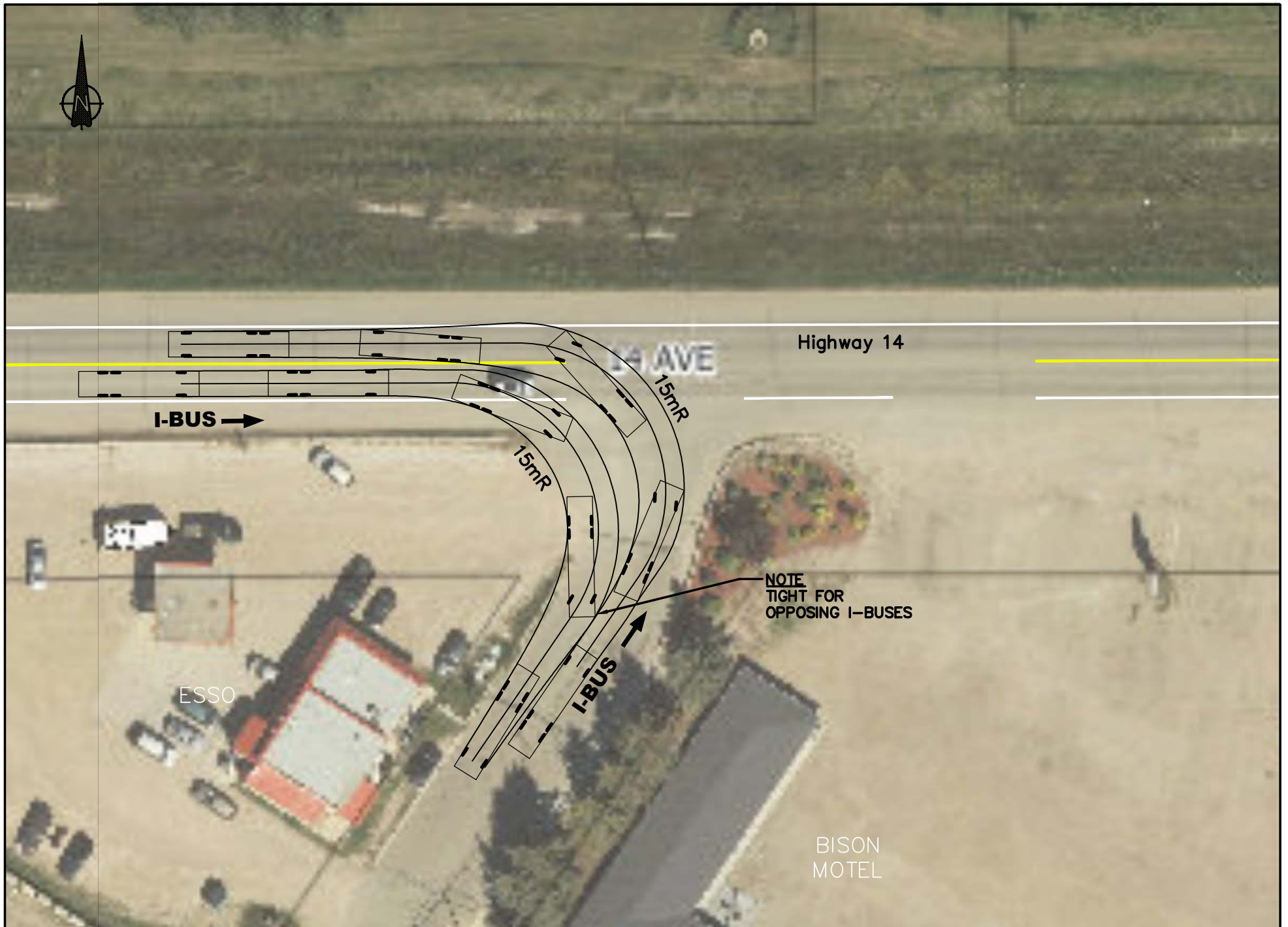
Swept Path Check

06 - 6 Street



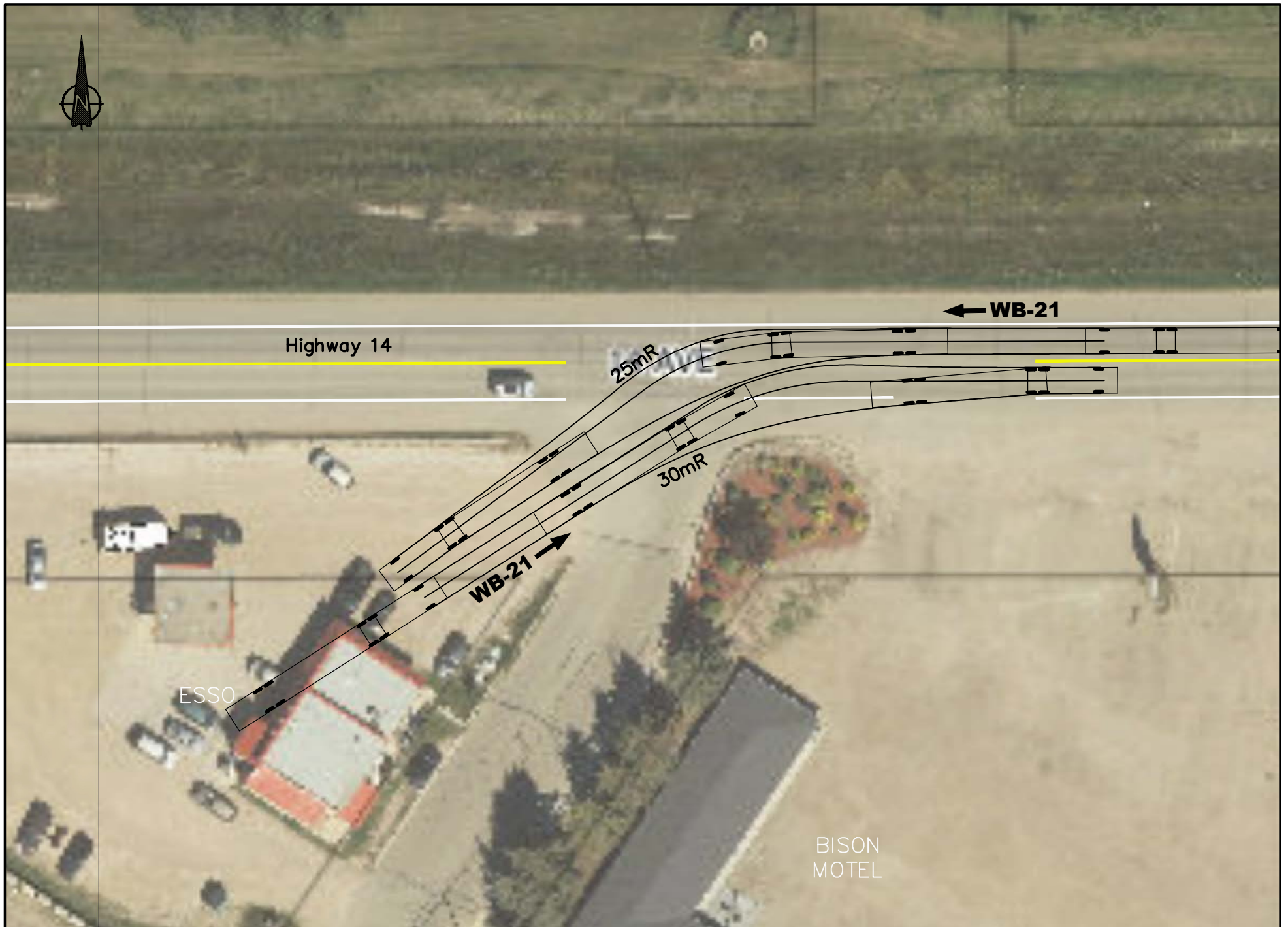
Existing Scenario

Hwy 14 & Access 6 – (EX 6.1)
Swept Path Plot 1



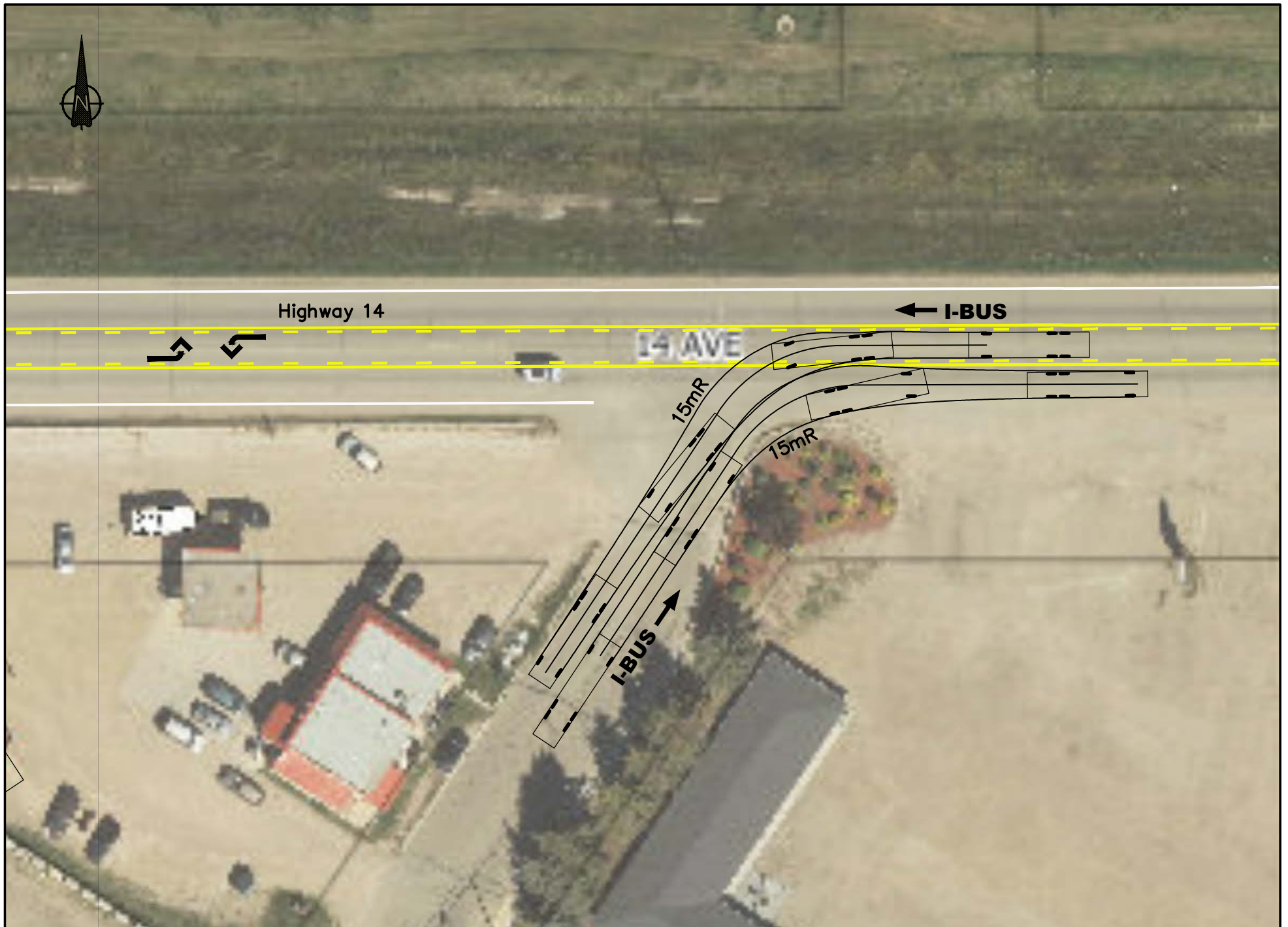
Existing Scenario

Hwy 14 & Access 6 – (EX 6.2)
Swept Path Plot 2



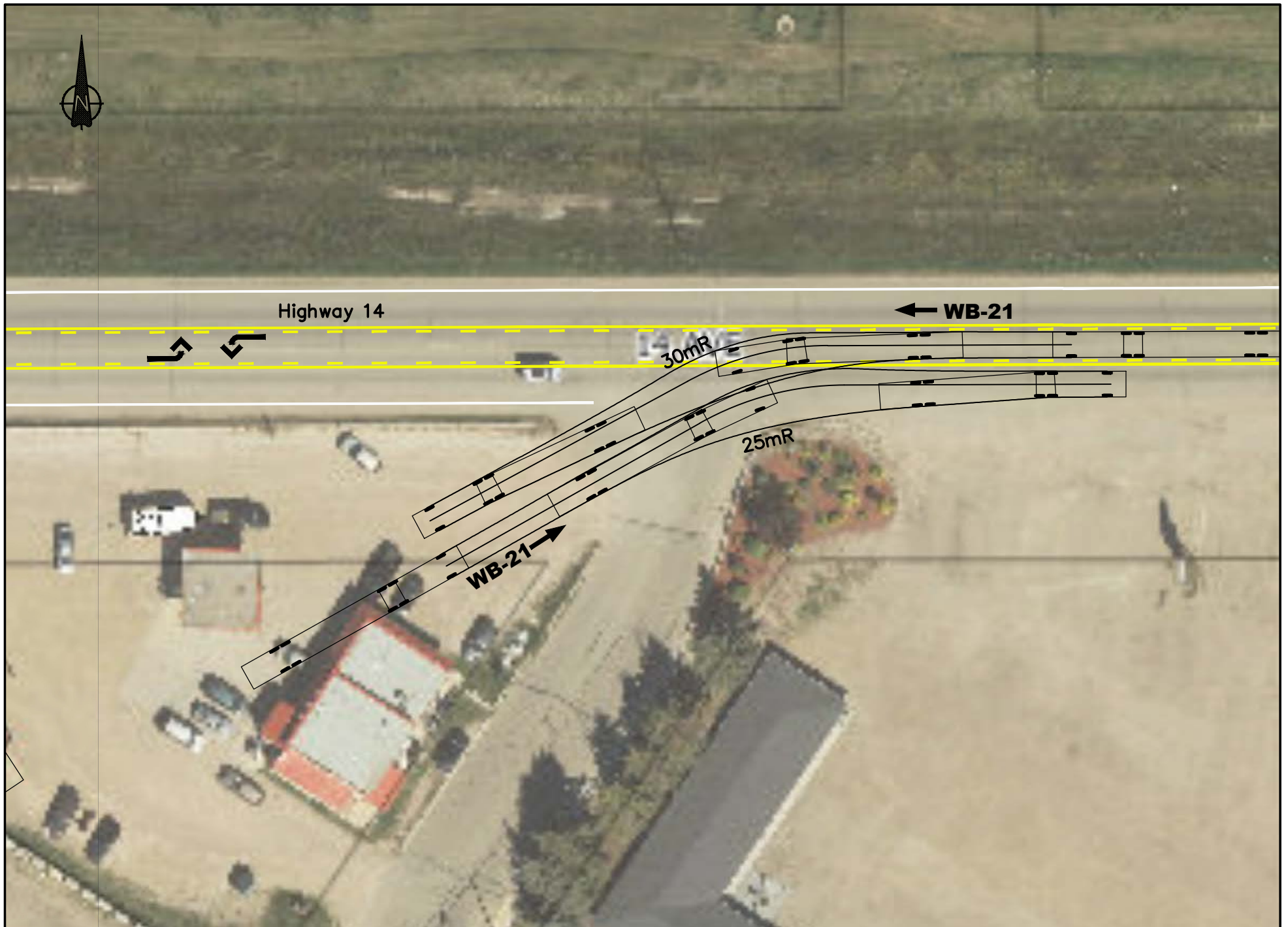
Existing Scenario

Hwy 14 & Access 6 – (EX 6.3)
Swept Path Plot 3



TWLTL Scenario

Hwy 14 & Access 5 – (TWLTL 6.1)
Swept Path Plot 1



TWLTL Scenario

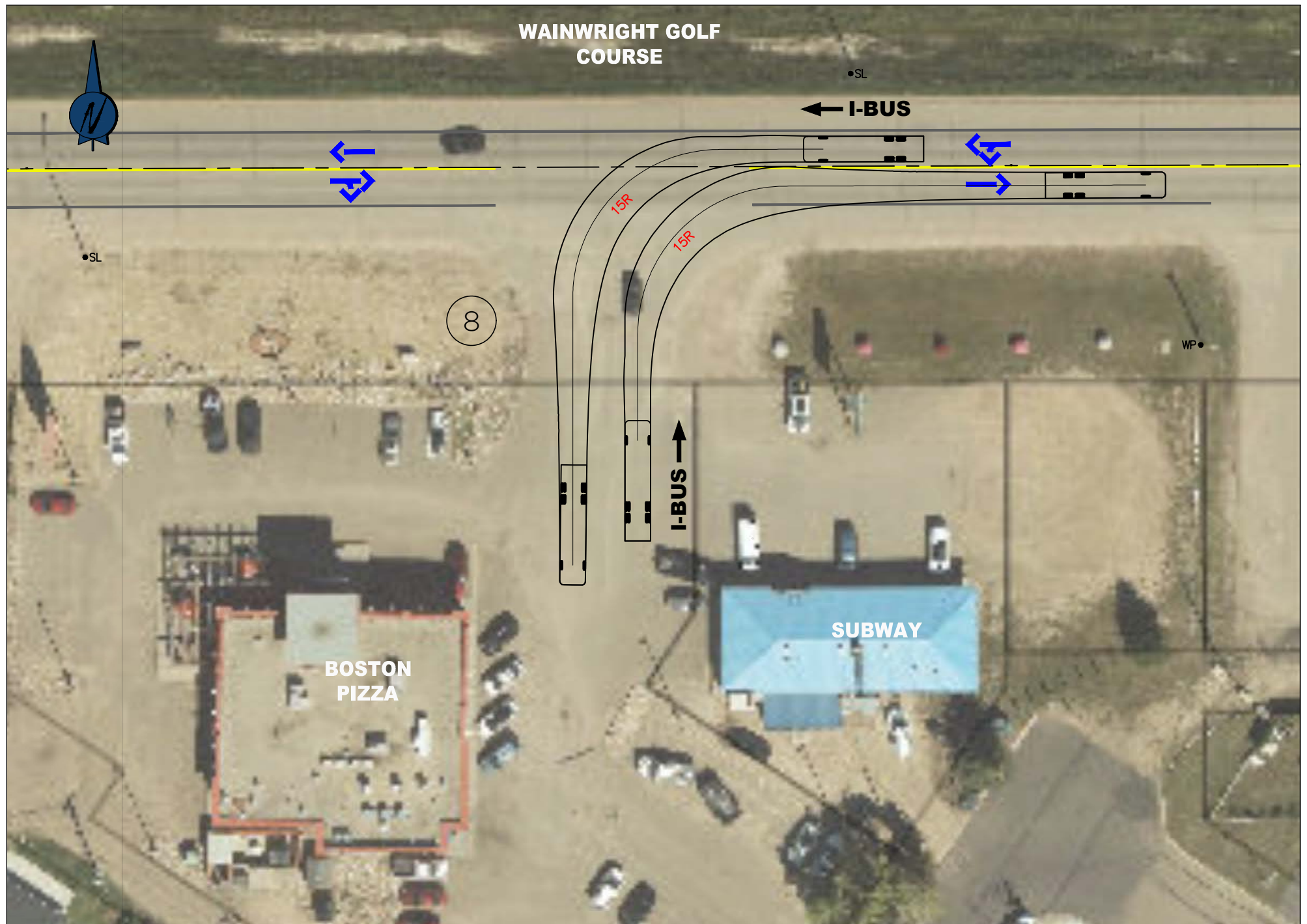
Hwy 14 & Access 5 – (TWLTL 6.3)
Swept Path Plot 3

Swept Path Check

07 - Access to Bison Motel

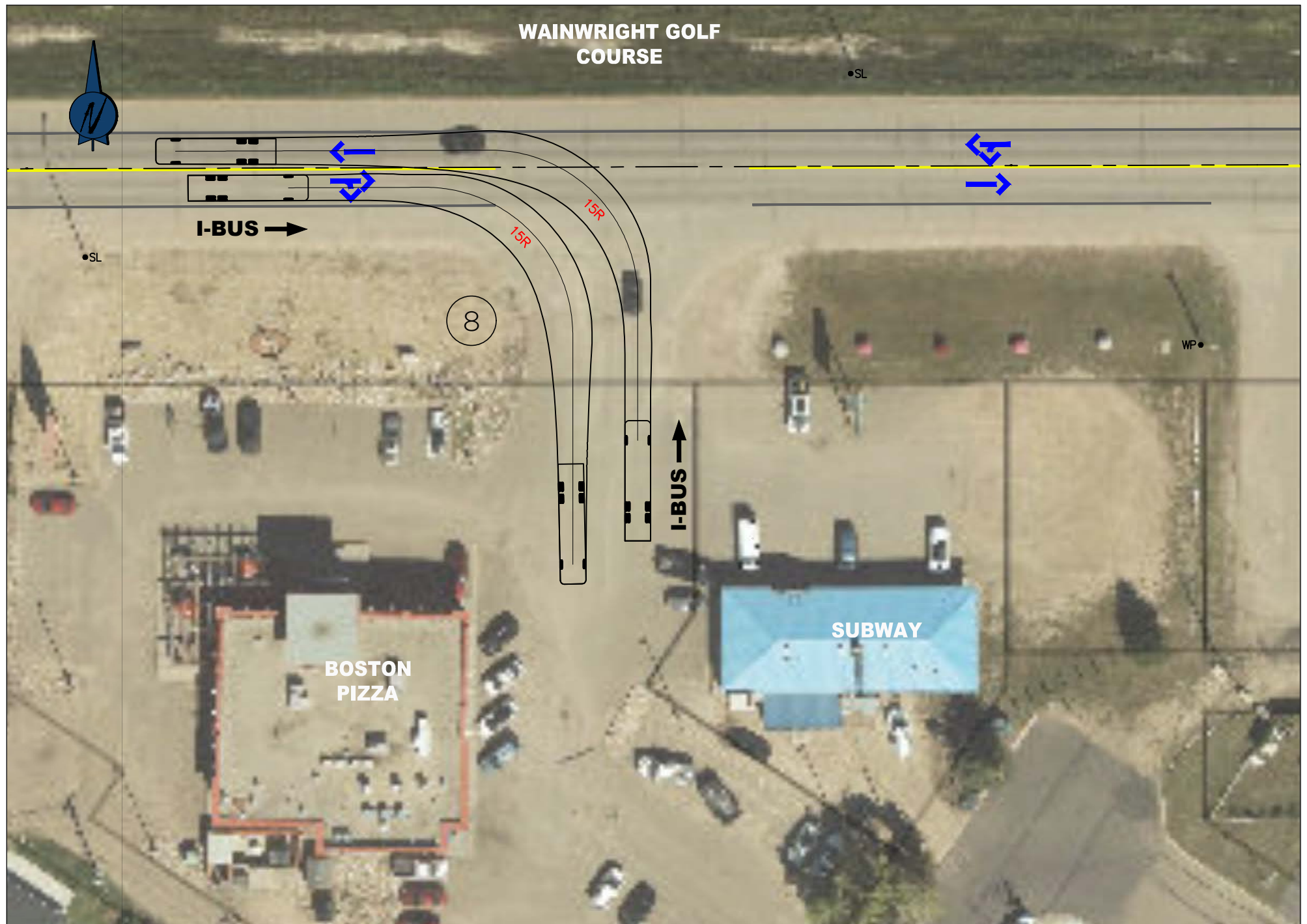
Swept Path Check

08 - Access to Boston Pizza



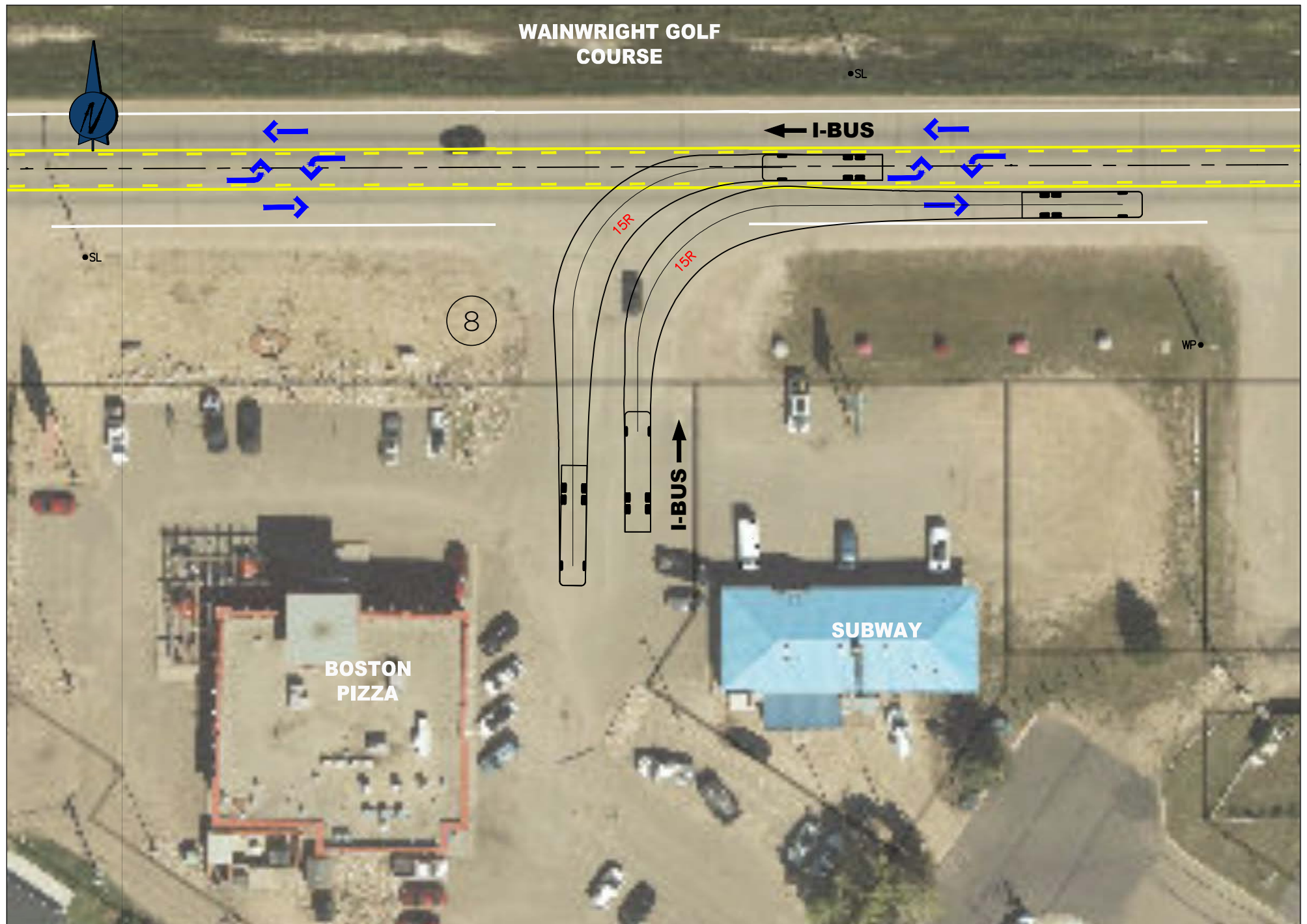
Existing Scenario

Hwy 14 & Access 8 (Boston Pizza/Subway) (Ex 8.1)
Swept Path Plot 1



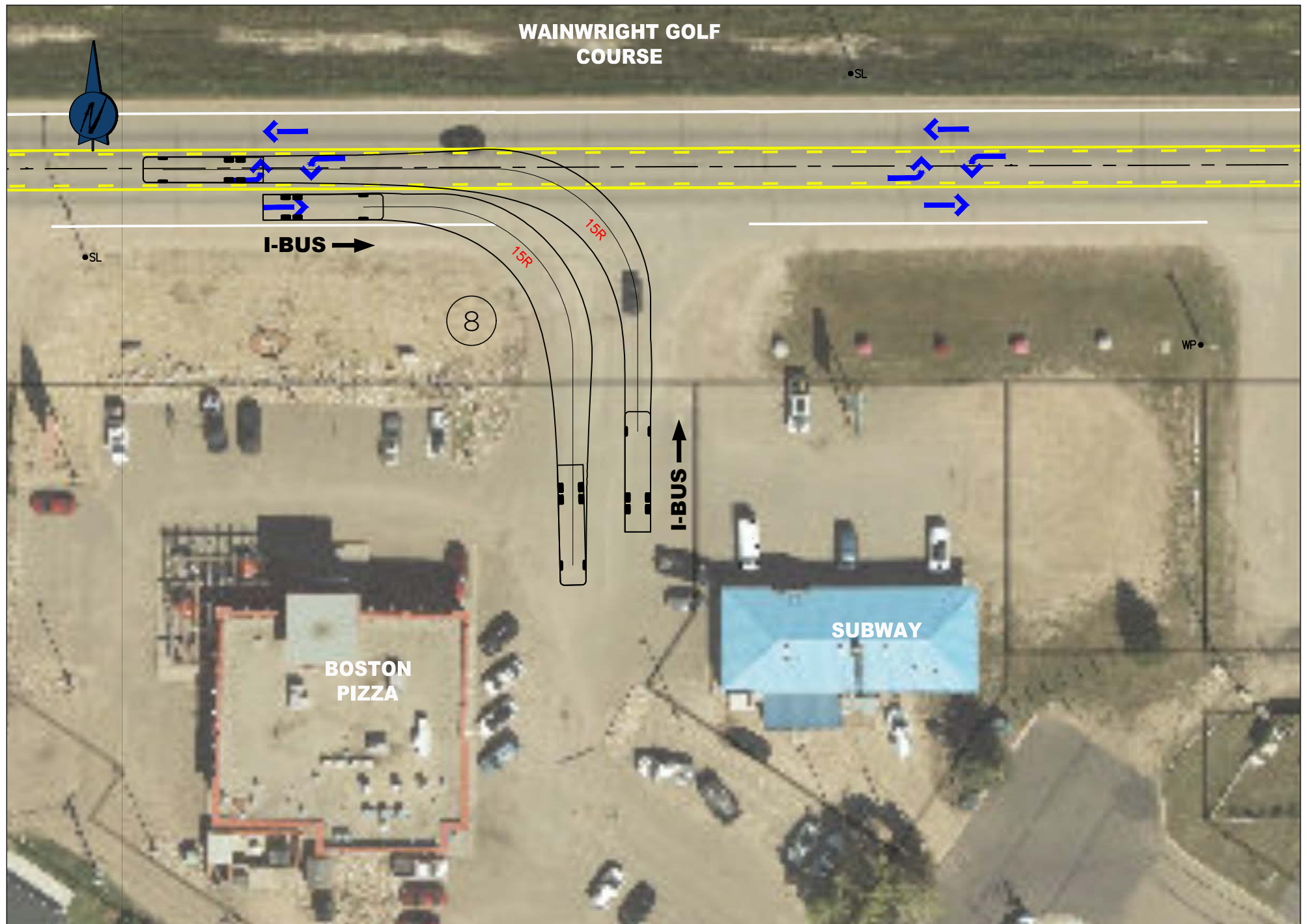
Existing Scenario

Hwy 14 & Access 8 (Boston Pizza/Subway) (Ex 8.2)
Swept Path Plot 2



TWLTL Scenario

Hwy 14 & Access 8 (Boston Pizza/Subway) (TWLTL 8.1)
Swept Path Plot 1

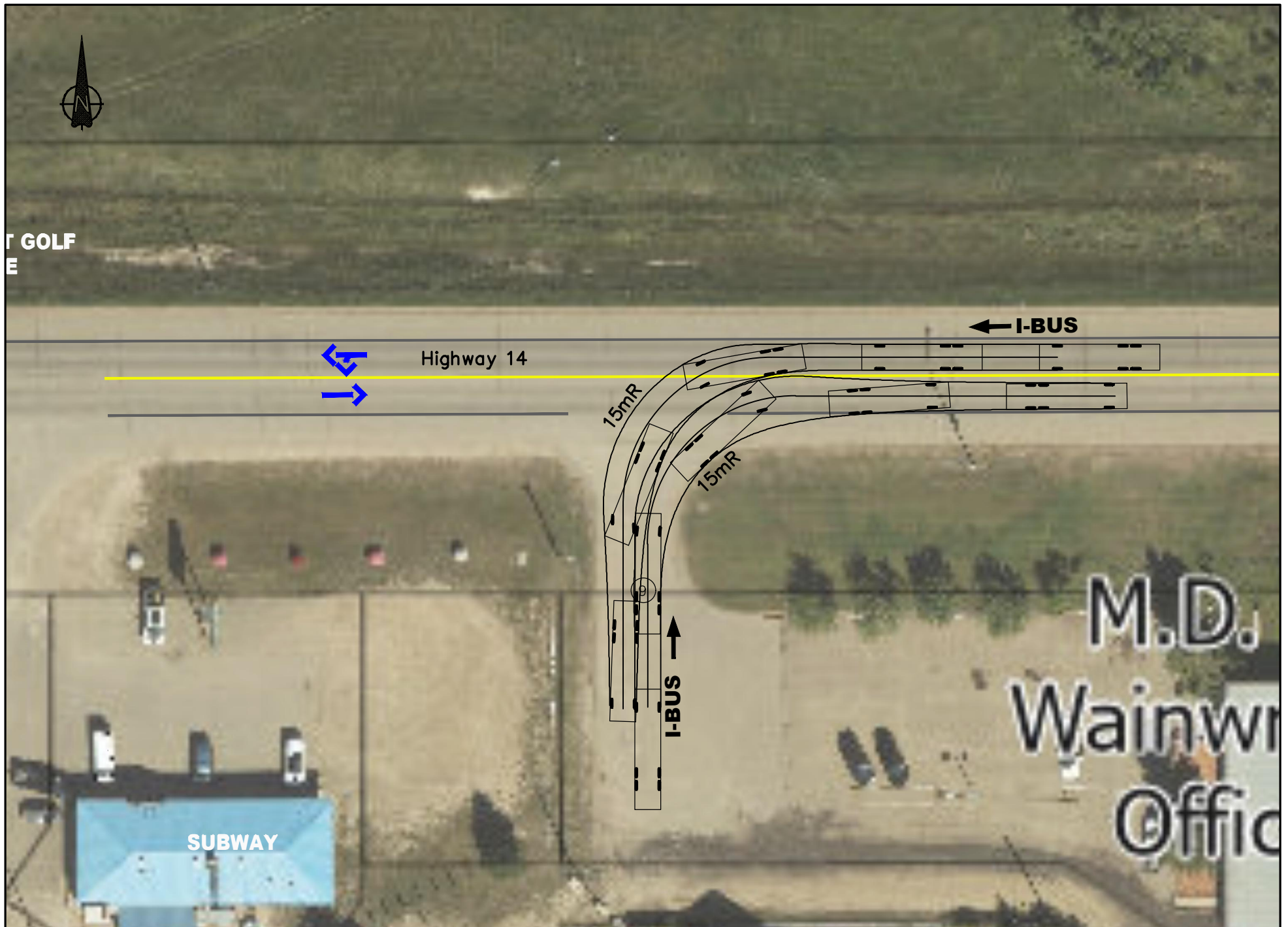


TWLTL Scenario

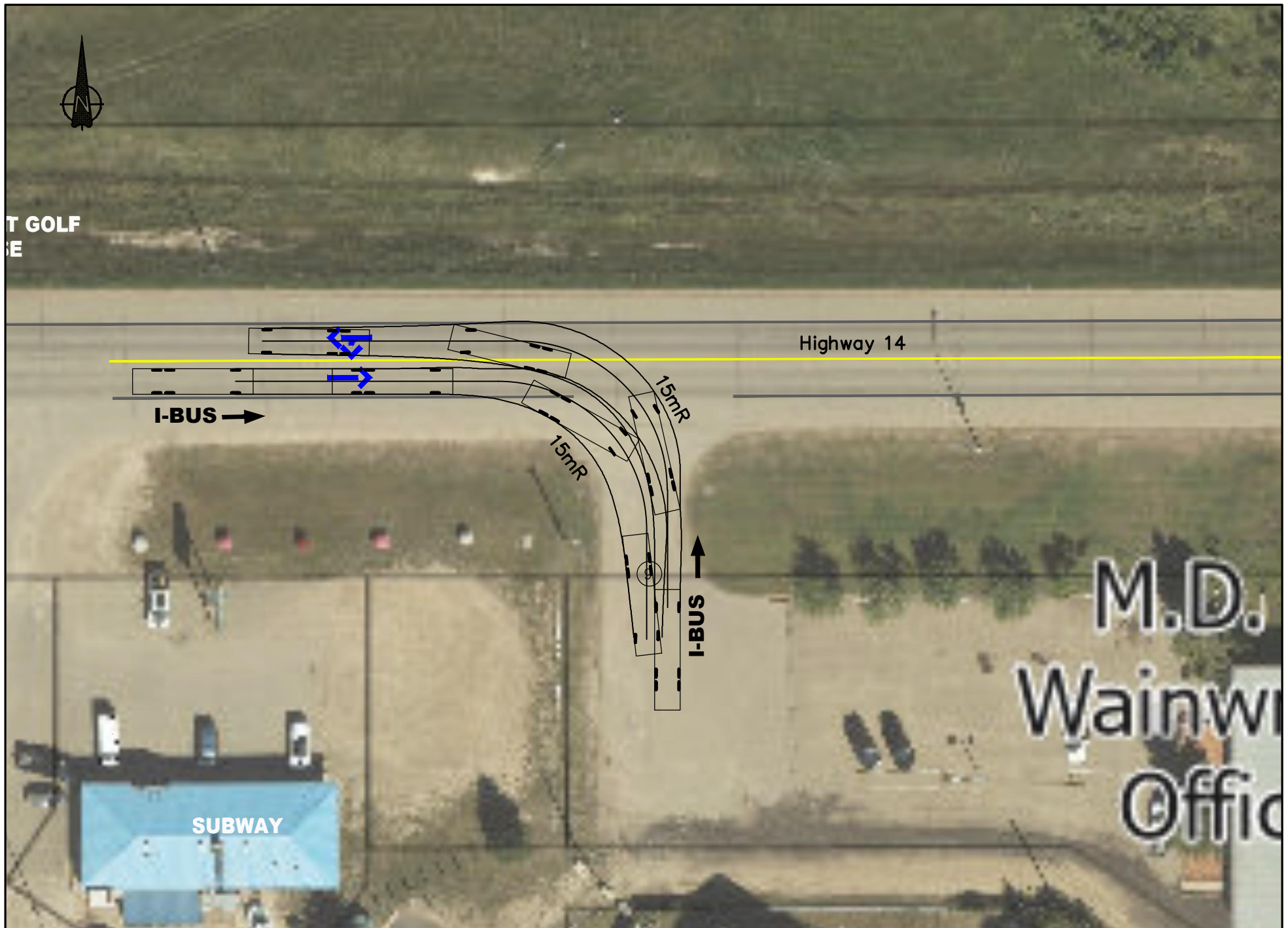
Hwy 14 & Access 8 (Boston Pizza/Subway) (TWLTL 8.1)
Swept Path Plot 2

Swept Path Check

09 - Access to M.D. of Wainwright

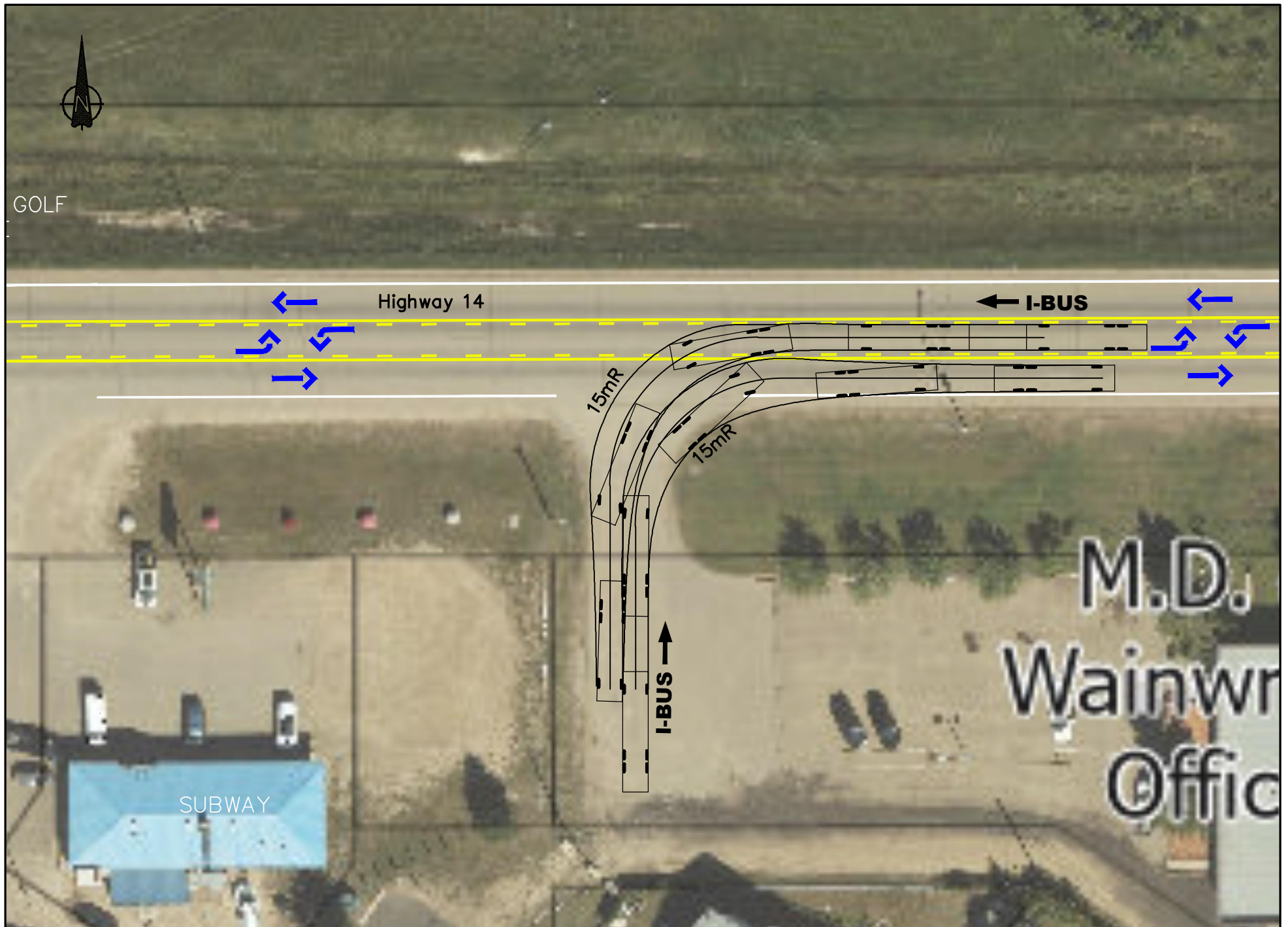


Existing Scenario Hwy 14 & Access 9 (M.D. of Wainwright Office) – (EX 9.1)
 Swept Path Plot 1

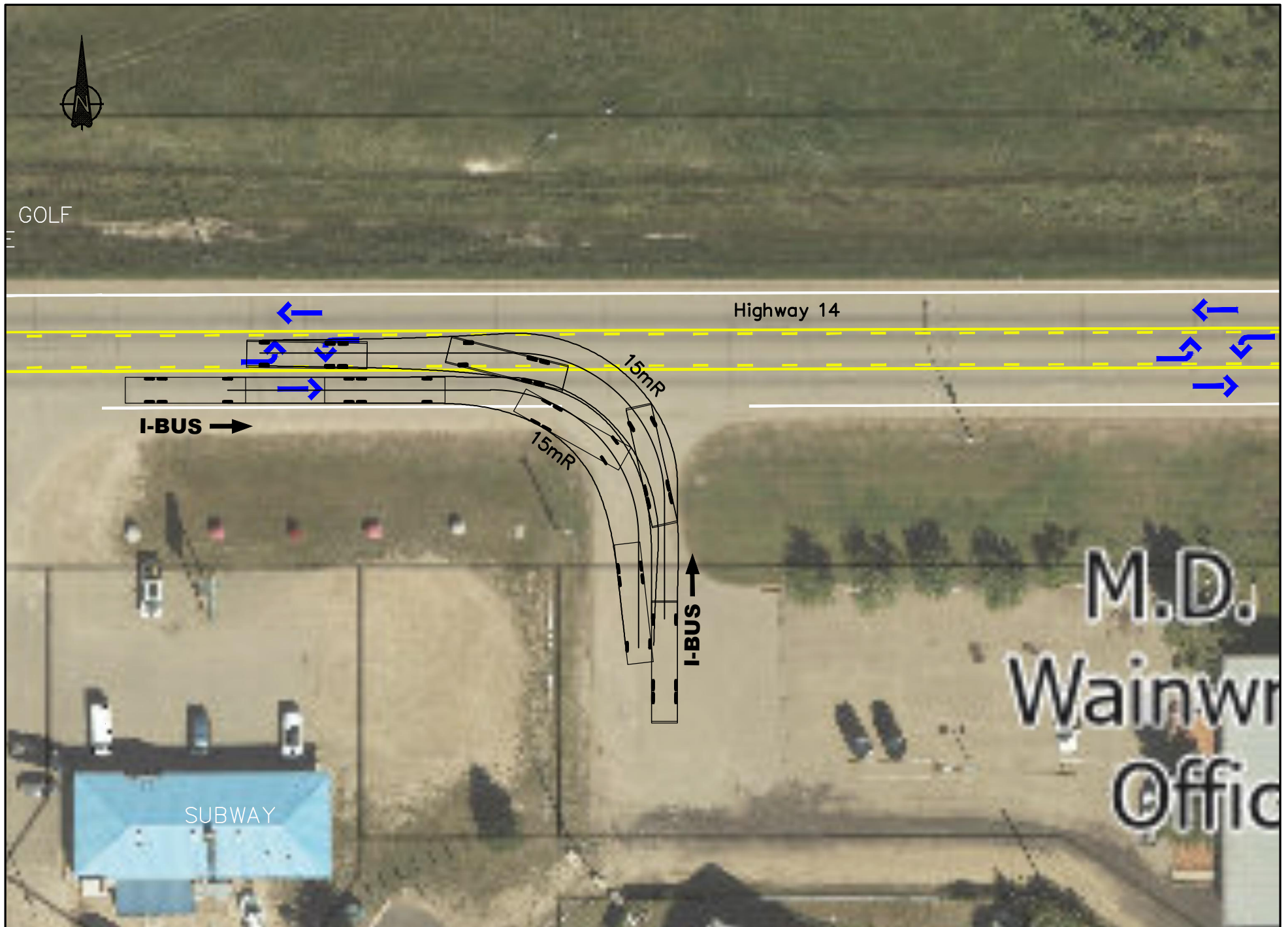


Existing Scenario

Hwy 14 & Access 9 (M.D. of Wainwright Office) – (EX 9.2)
Swept Path Plot 2



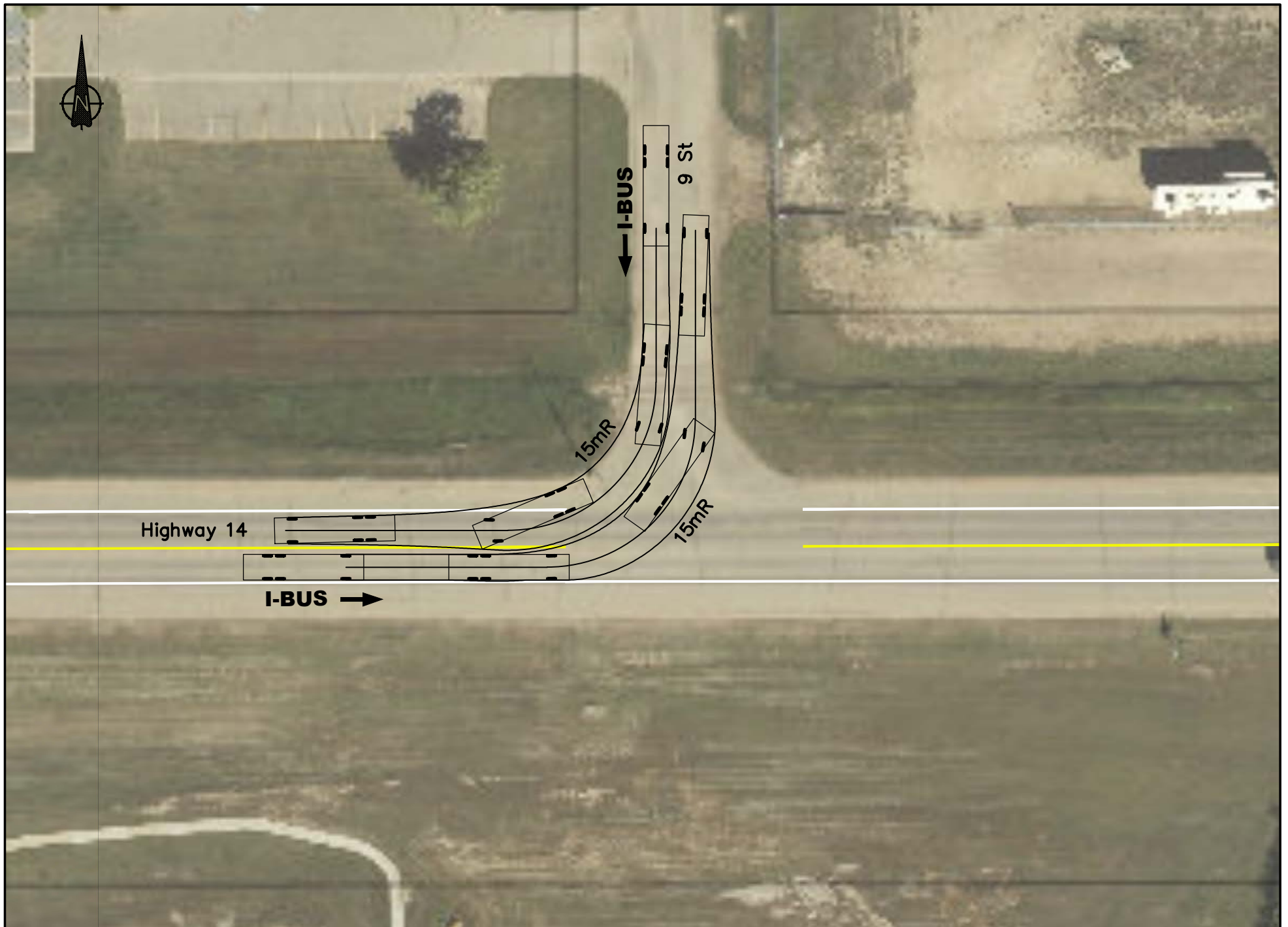
TWLTL Scenario Hwy 14 & Access 9 (M.D. of Wainwright Office) – (TWLTL 9.1)
Swept Path Plot 1



TWLTL Scenario Hwy 14 & Access 9 (M.D. of Wainwright Office) – (TWLTL 9.2)
Swept Path Plot 2

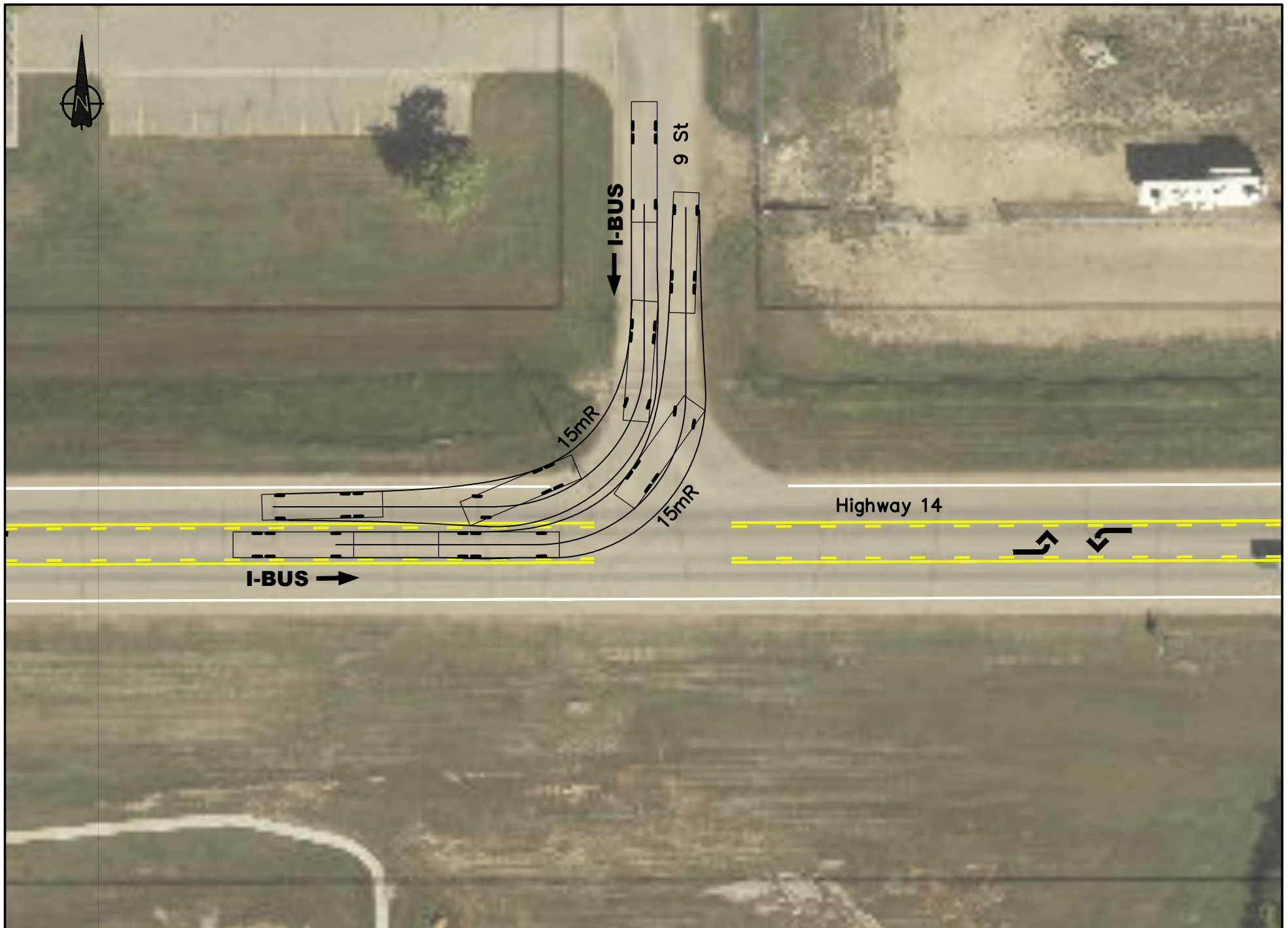
Swept Path Check

10 - 9 Street



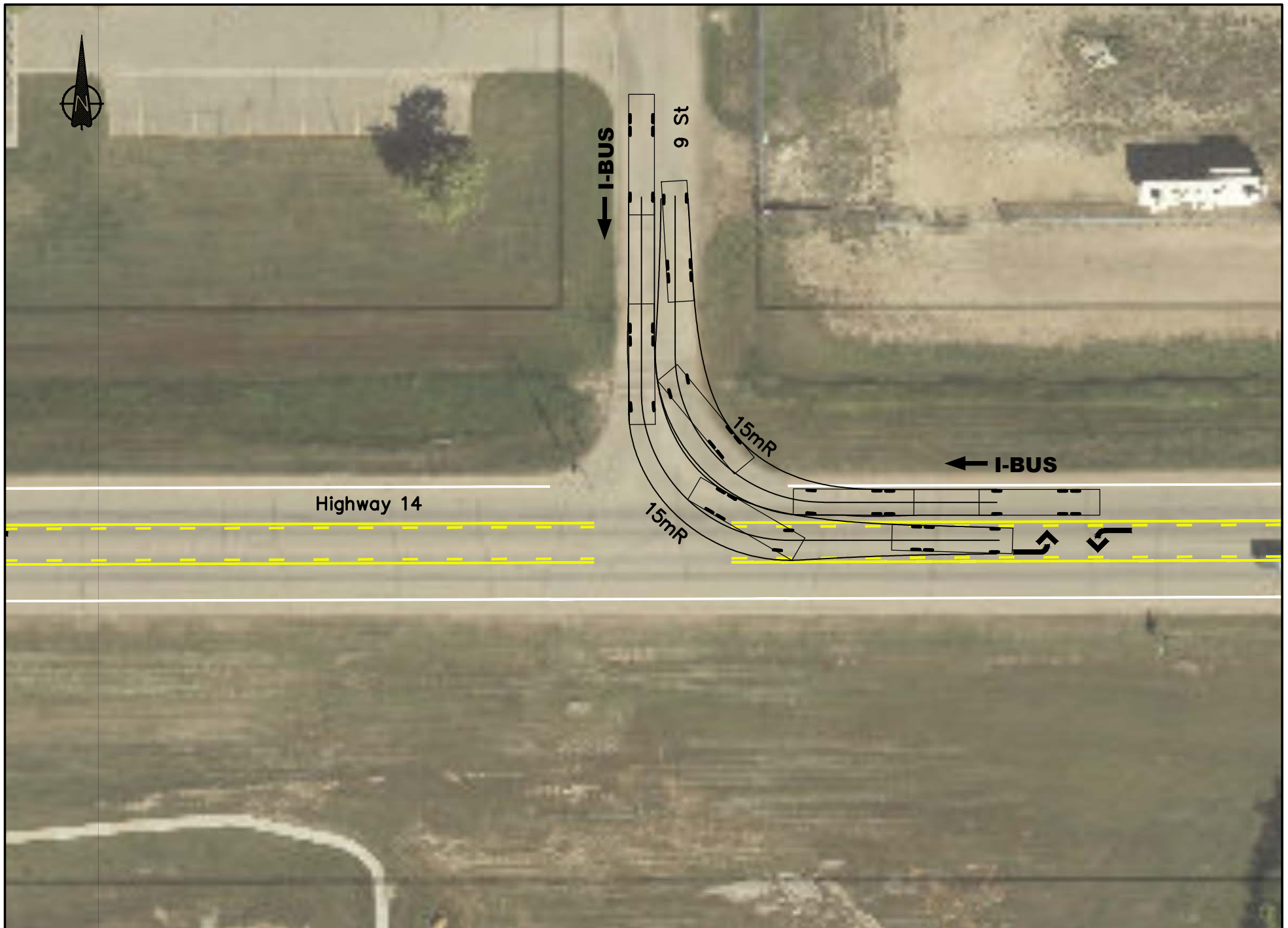
Existing Scenario

Hwy 14 & Access **10** (9 St) – (EX 9.1)
Swept Path Plot 1



TWLTL Scenario

Hwy 14 & Access **10** (9 St) – (TWLTL 9.1)
Swept Path Plot 1

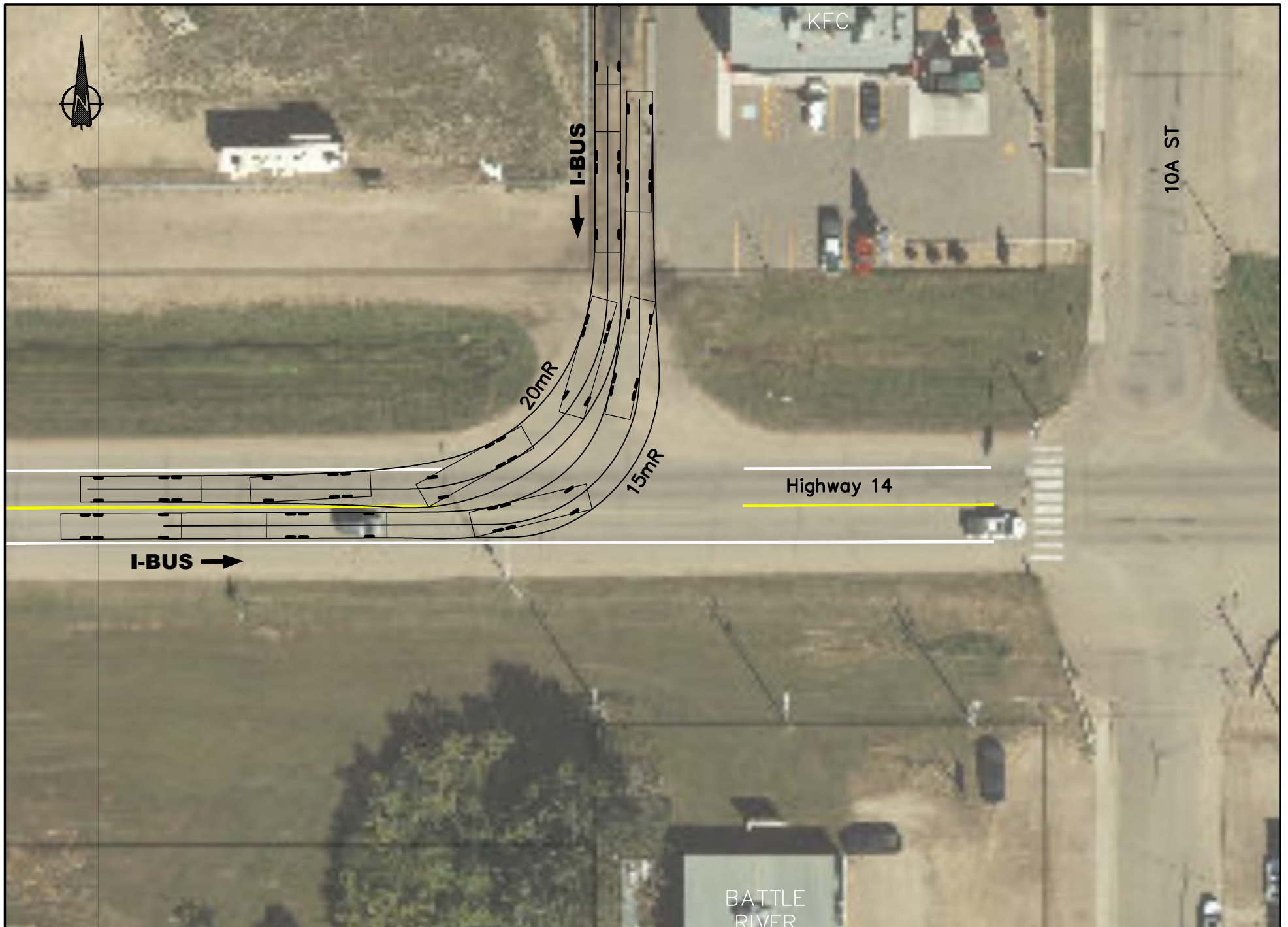


TWLTL Scenario

Hwy 14 & Access **10** (9 St) – (TWLTL 9.2)
Swept Path Plot 2

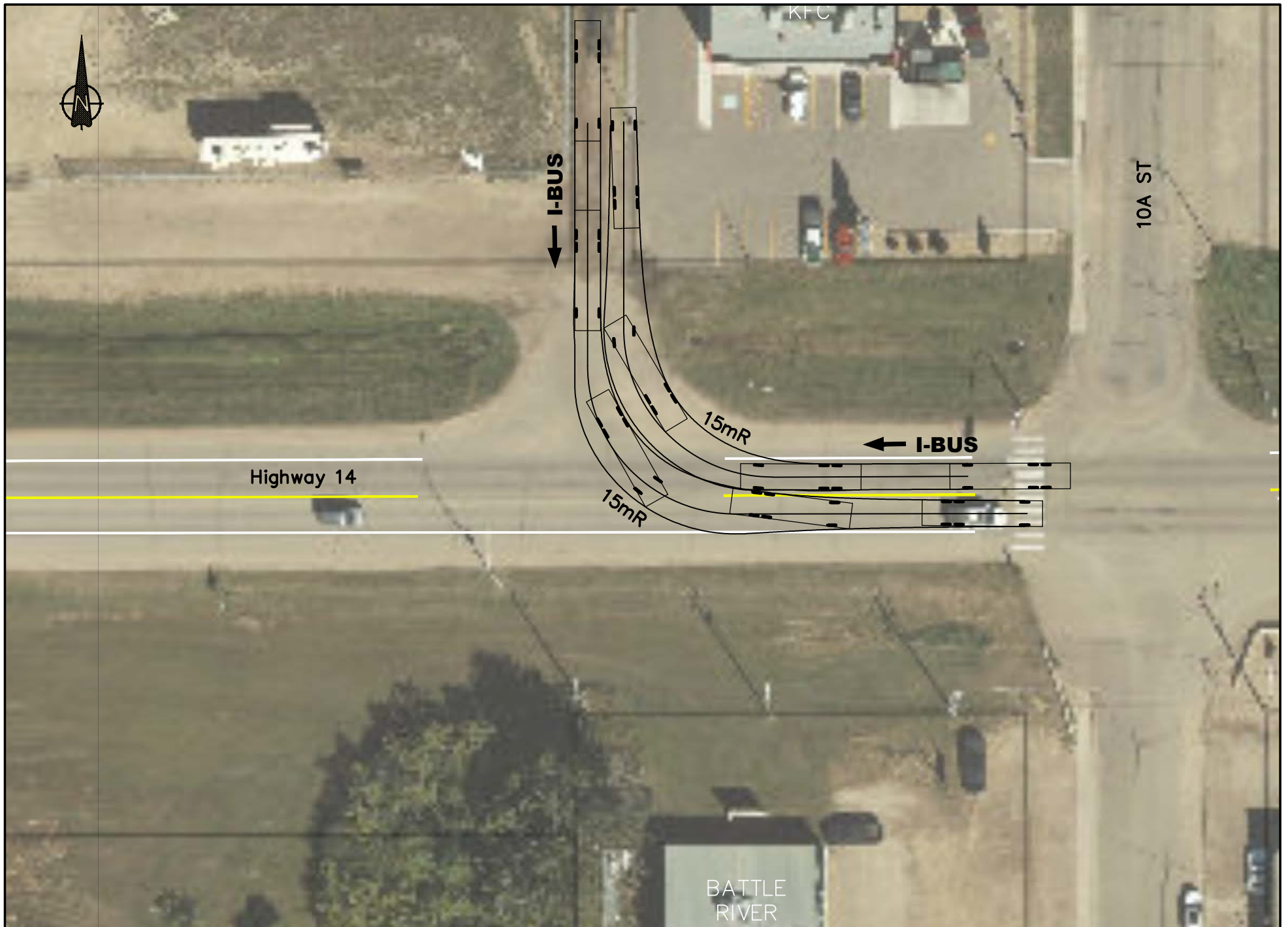
Swept Path Check

11 - Access to KFC



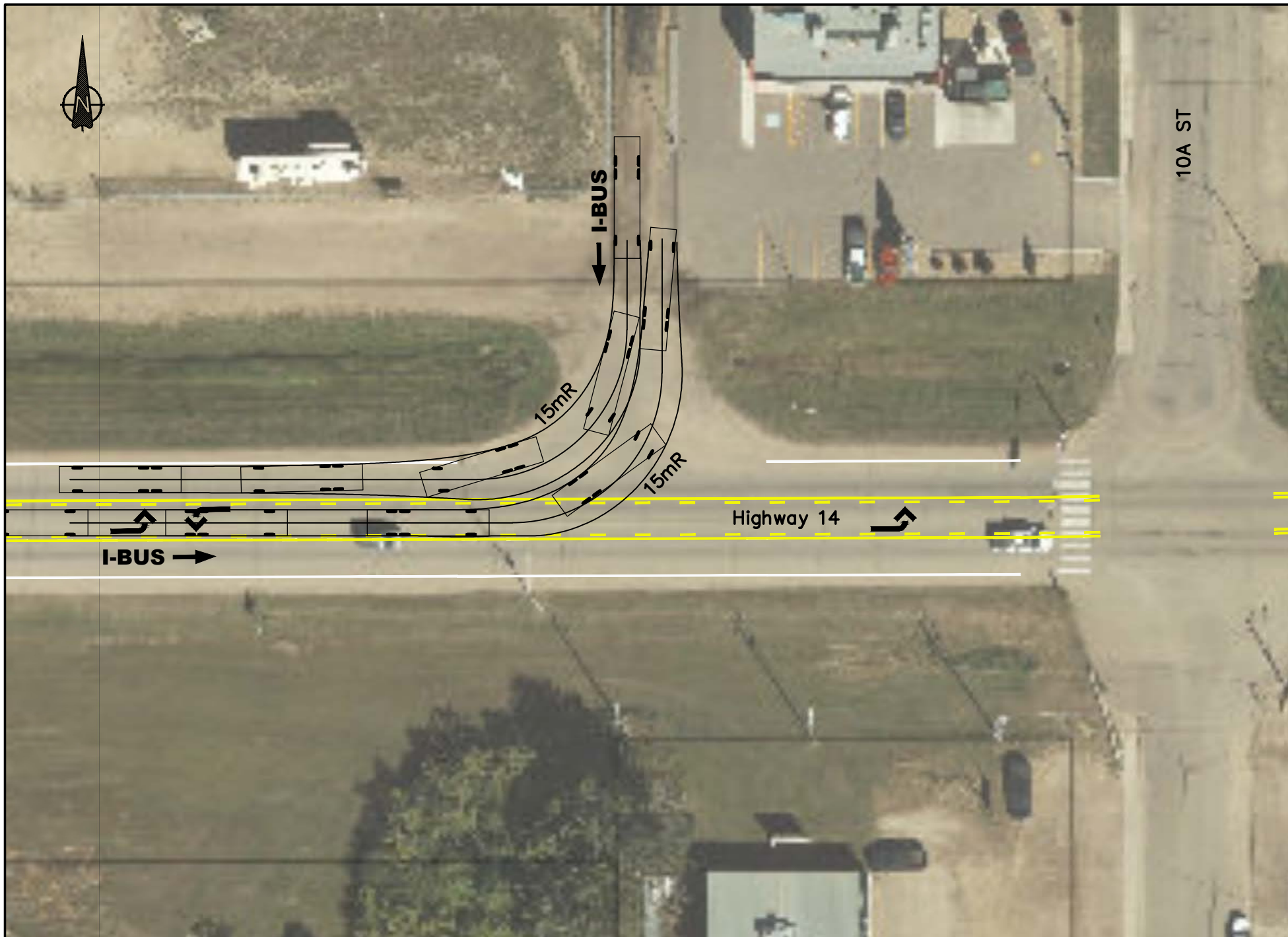
Existing Scenario

Hwy 14 & Access 11 – (Ex 11.1)
Swept Path Plot 1



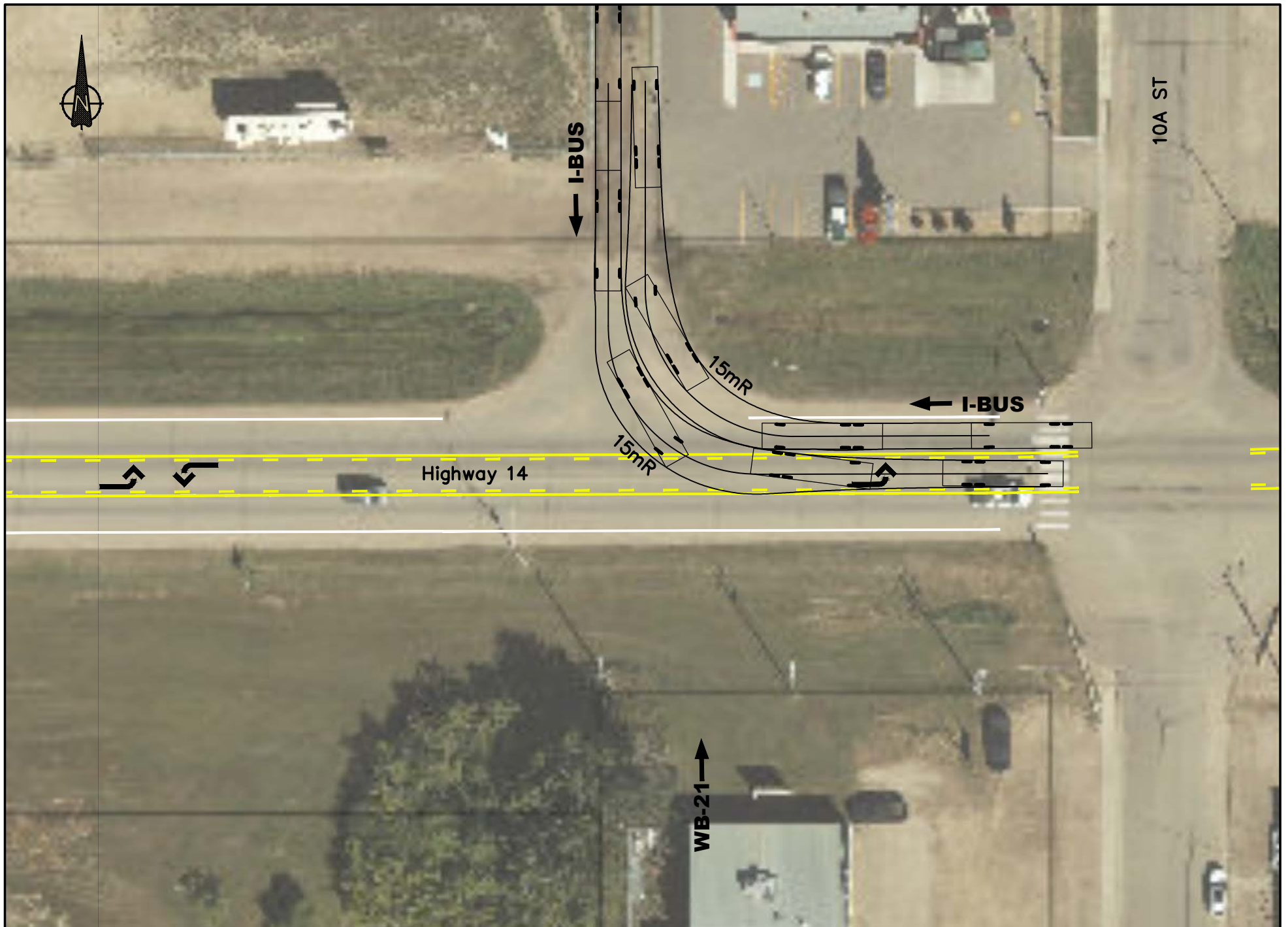
Existing Scenario

Hwy 14 & Access 11 – (Ex 11.2)
Swept Path Plot 2



TWLTL Scenario

Hwy 14 & Access **11** – (TWLTL **11.1**)
Swept Path Plot 1

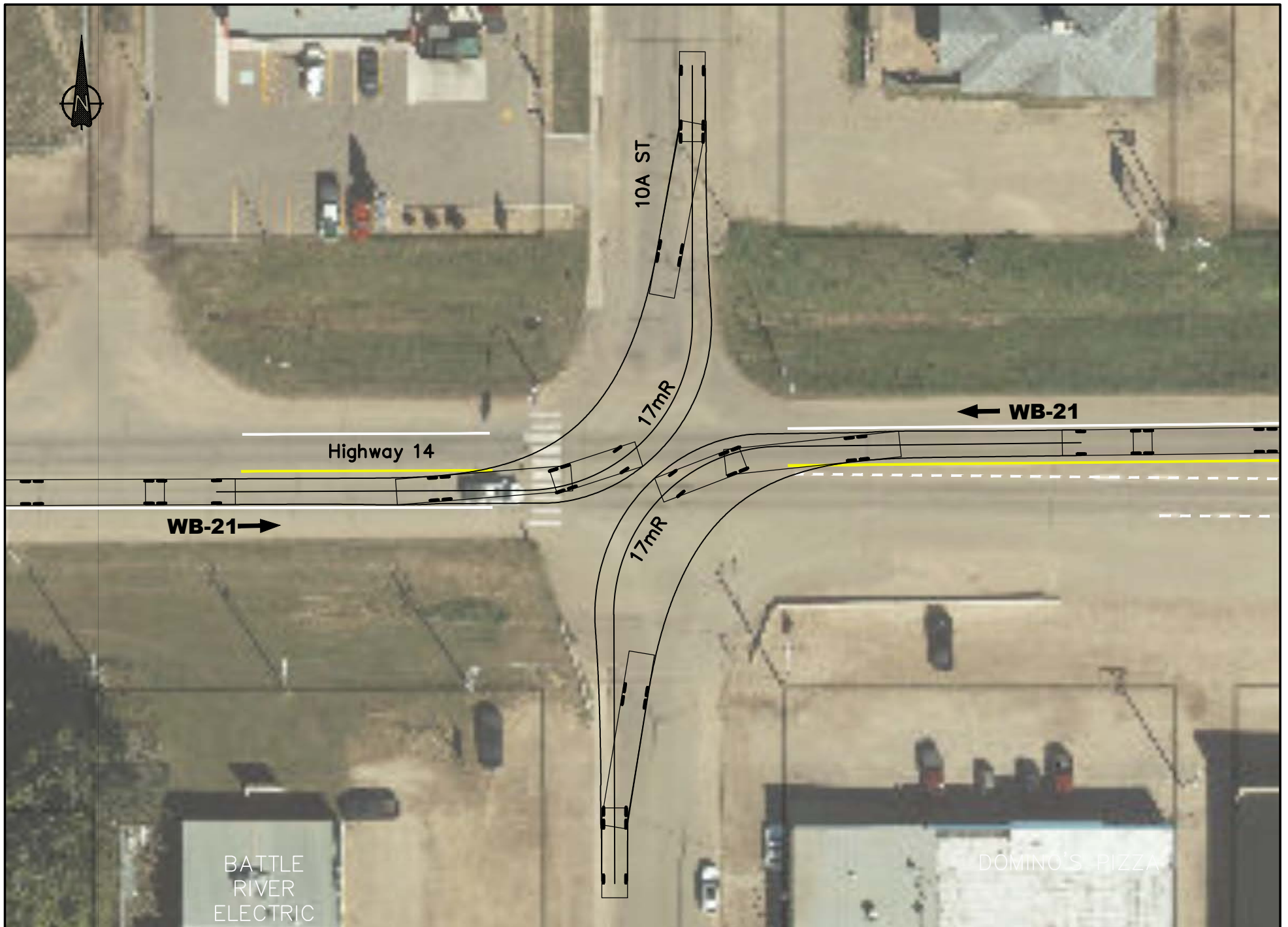


TWLTL Scenario

Hwy 14 & Access 11 – (TWLTL 11.2)
Swept Path Plot 2

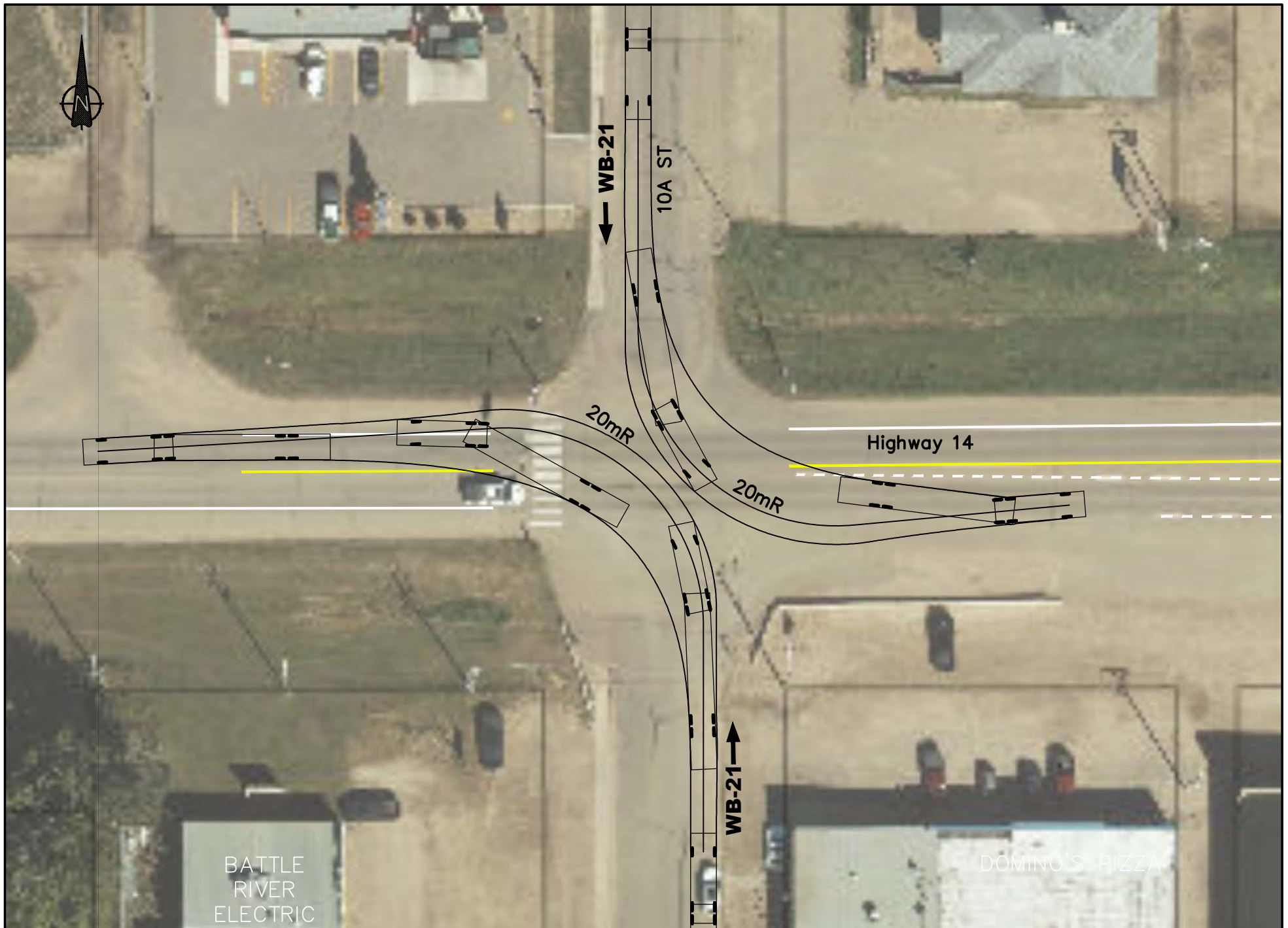
Swept Path Check

12 - 10a Street



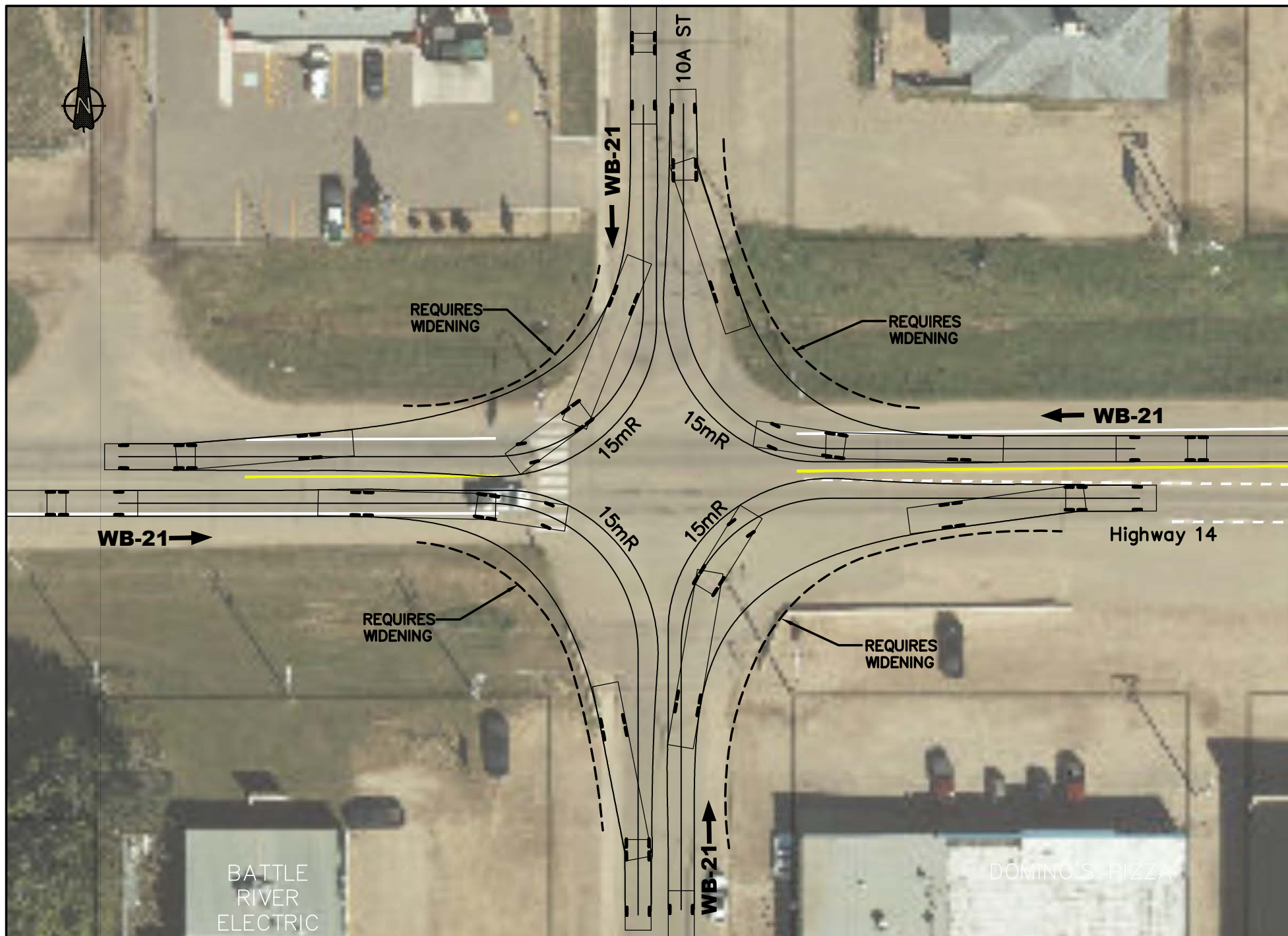
Existing Scenario

Hwy 14 & Access 12 (10A St) – (Ex 12.1)
Swept Path Plot 1



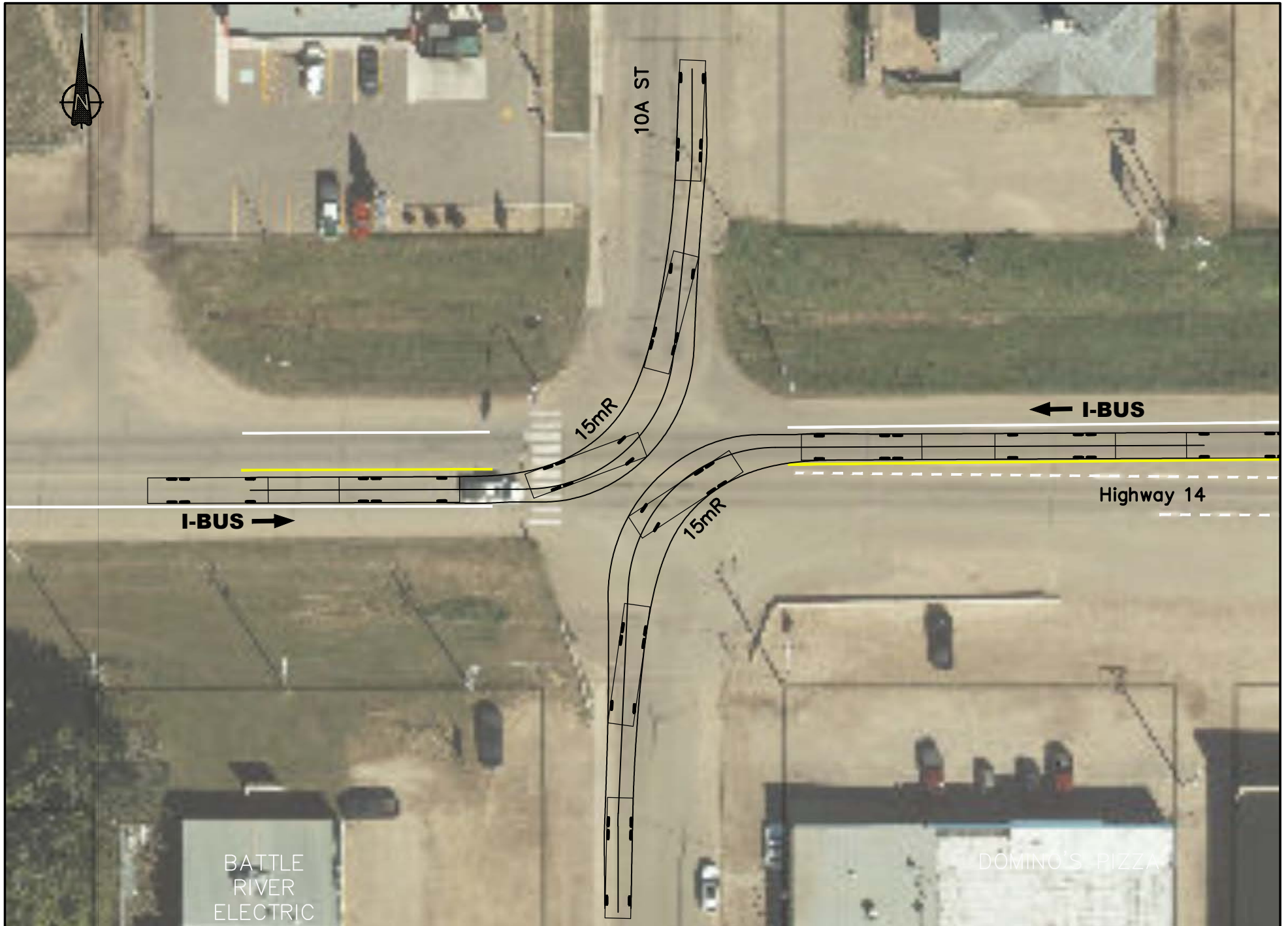
Existing Scenario

Hwy 14 & Access 12 (10A St) – (Ex 12.2)
Swept Path Plot 2



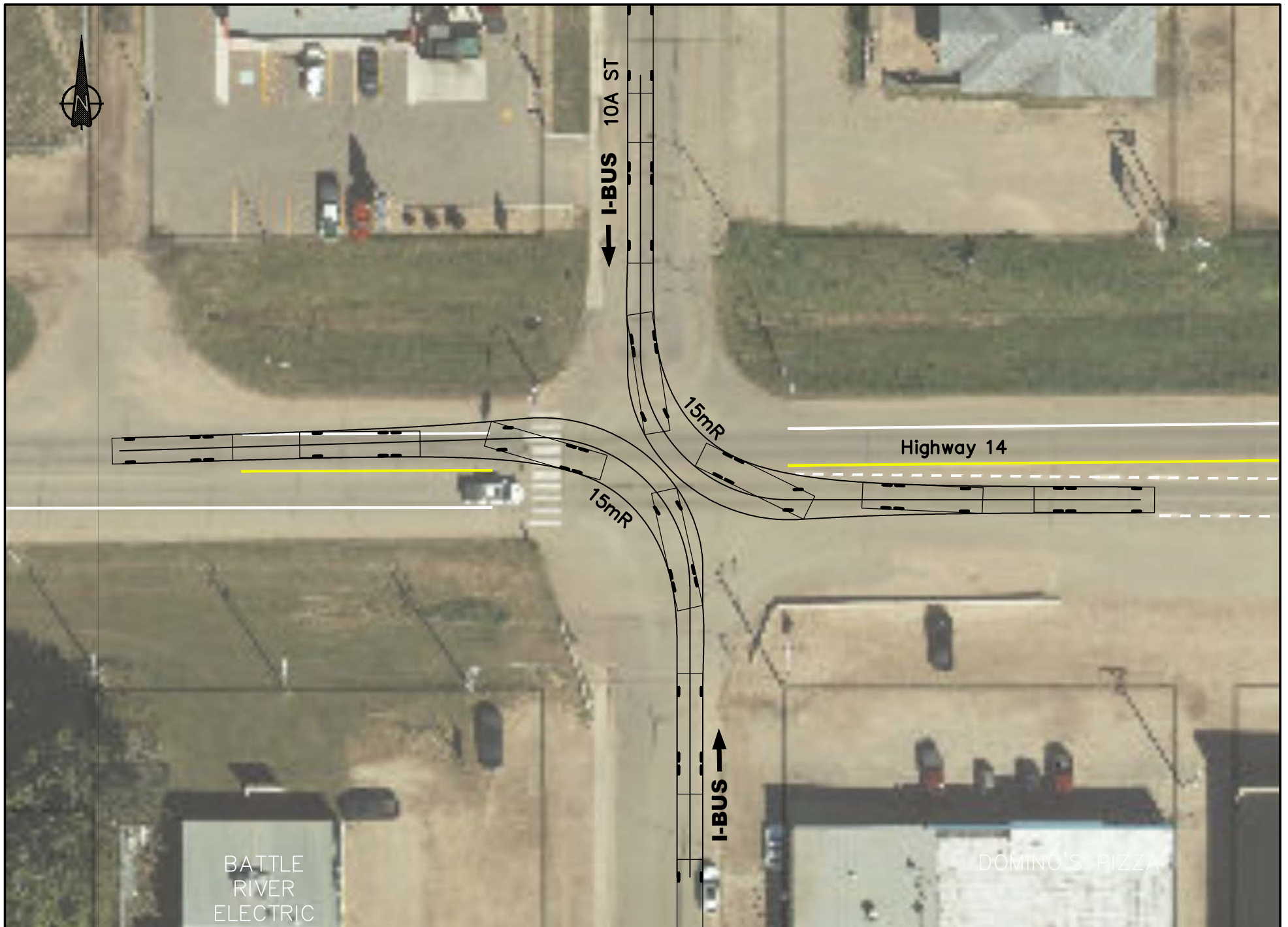
Existing Scenario

Hwy 14 & Access 12 (10A St) – (Ex 12.3)
Swept Path Plot 3



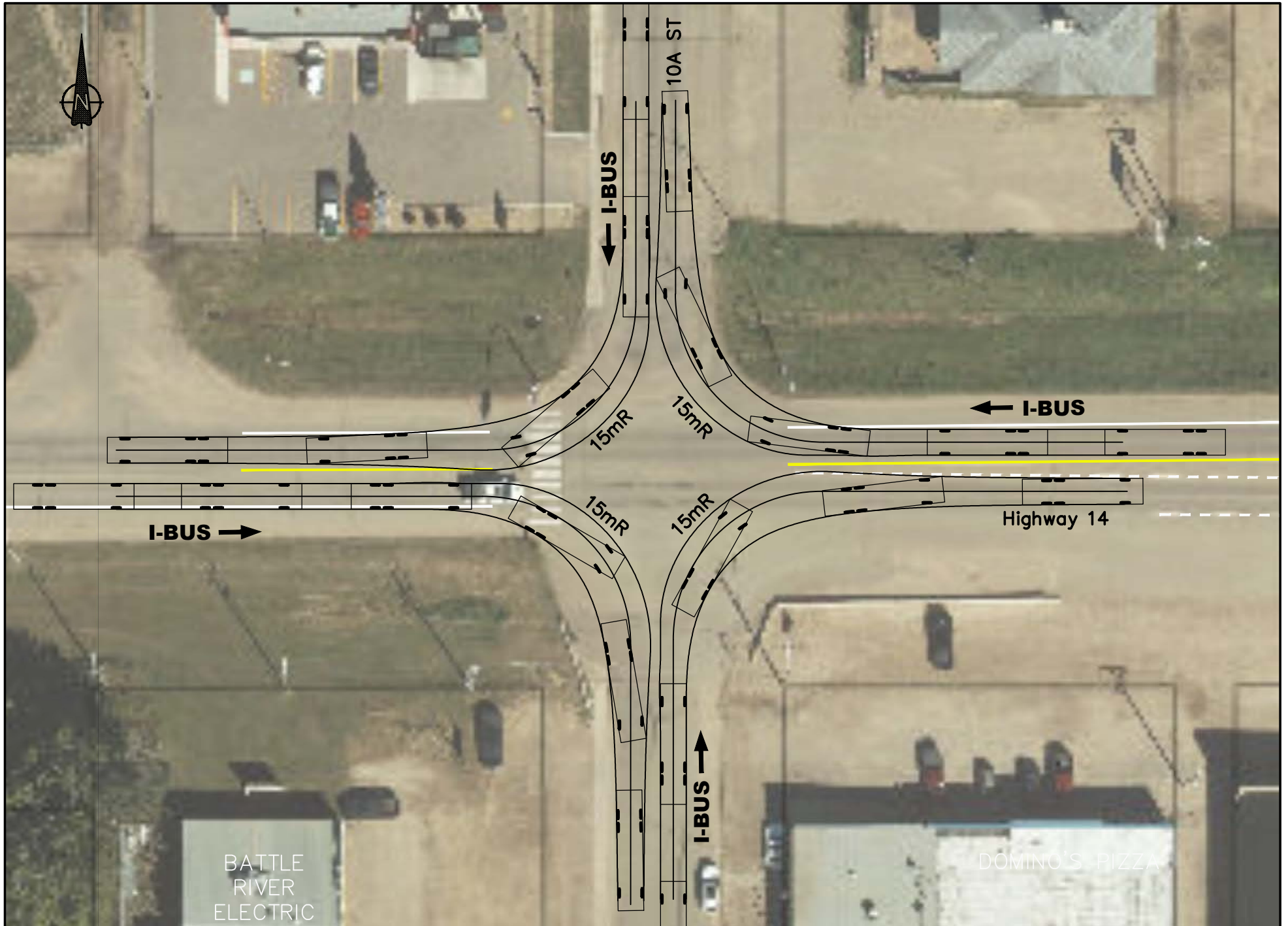
Existing Scenario

Hwy 14 & Access 12 (10A St) – (Ex 12.4)
Swept Path Plot 4



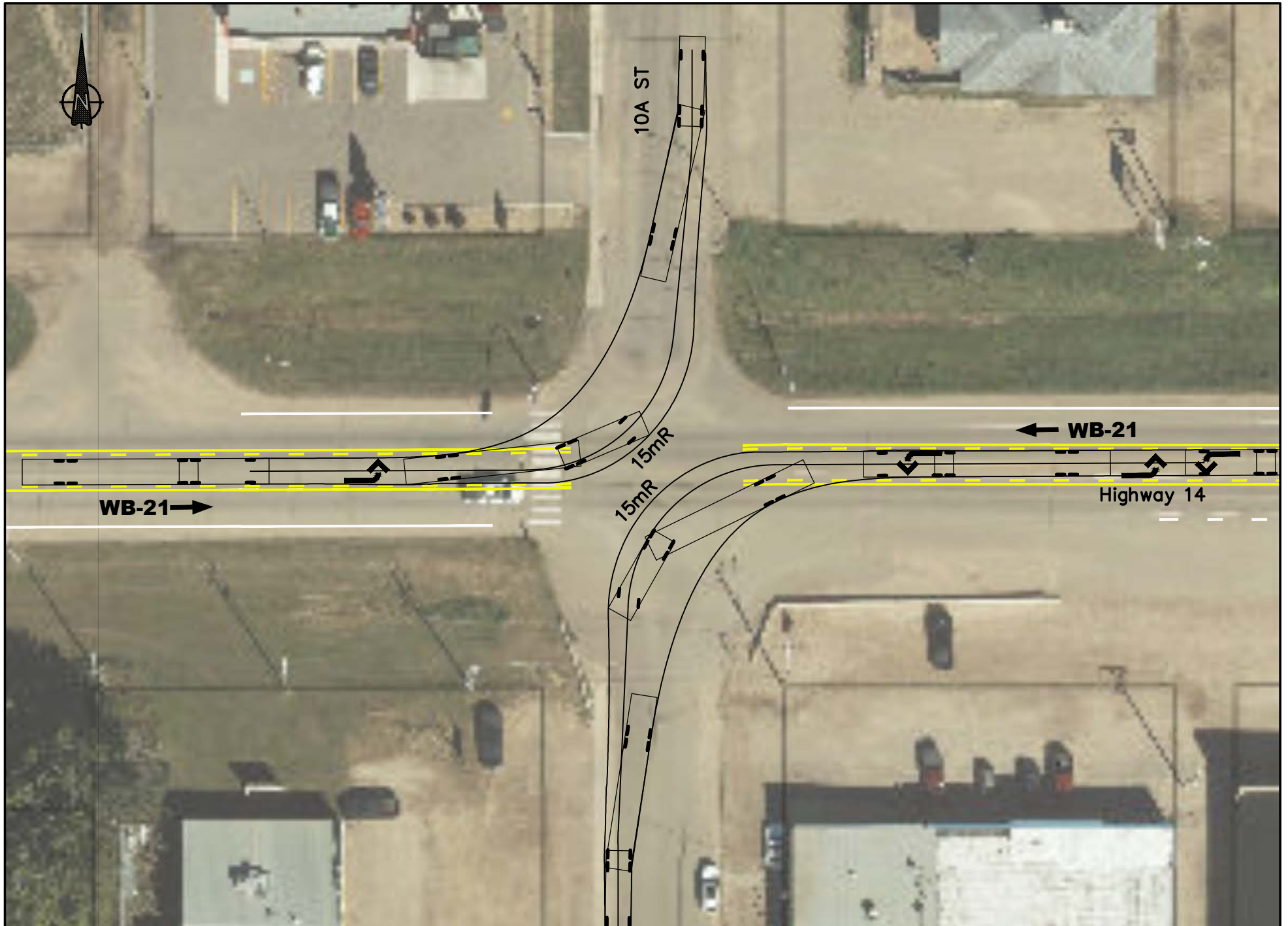
Existing Scenario

Hwy 14 & Access 12 (10A St) – (Ex 12.5)
Swept Path Plot 5



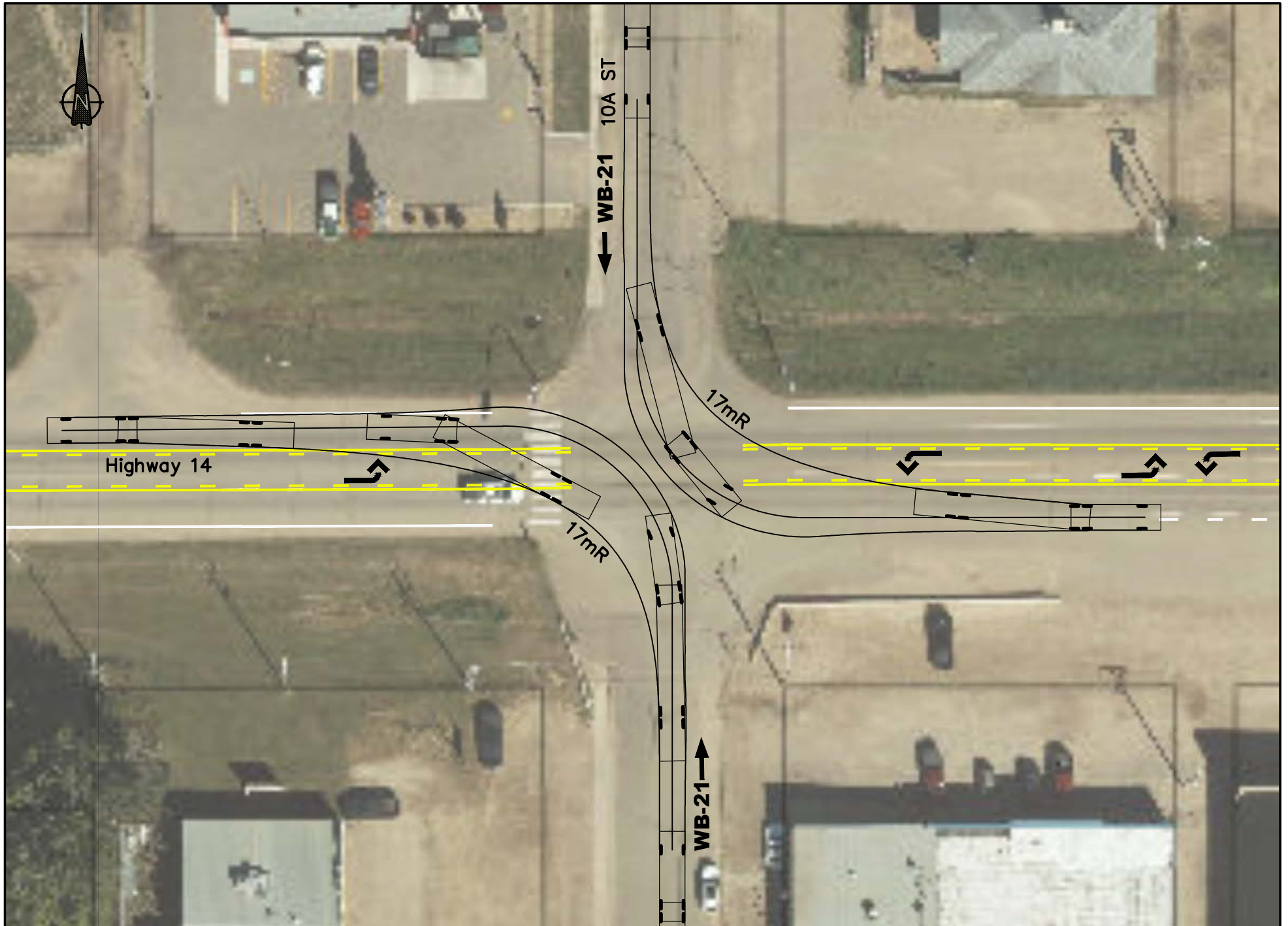
Existing Scenario

Hwy 14 & Access 12 (10A St) – (Ex 12.6)
Swept Path Plot 6



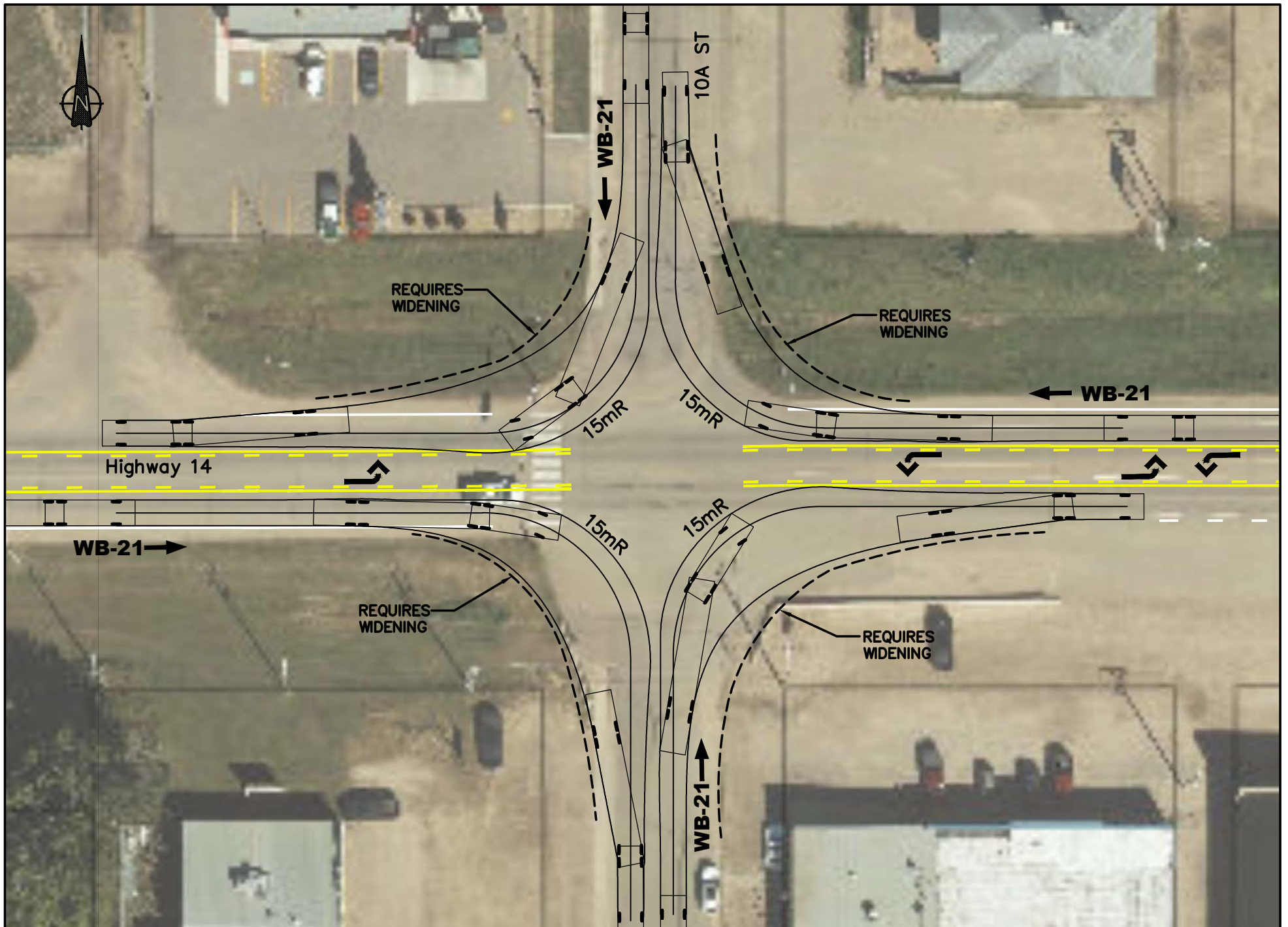
TWLTL Scenario

Hwy 14 & Access 12 (10A St) – (TWLTL 12.1)
Swept Path Plot 1



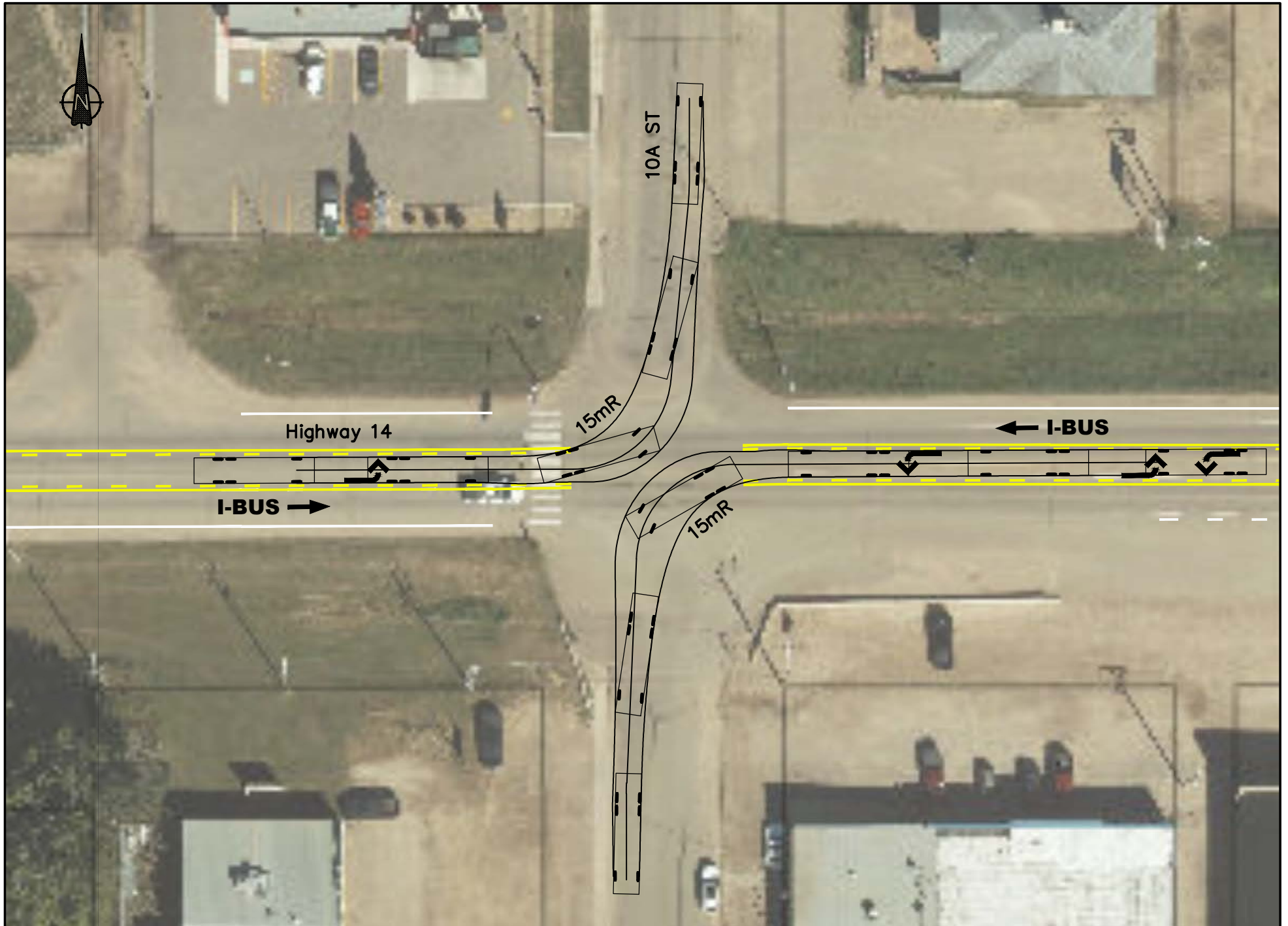
TWLTL Scenario

Hwy 14 & Access 12 (10A St) – (TWLTL 12.2)
Swept Path Plot 2



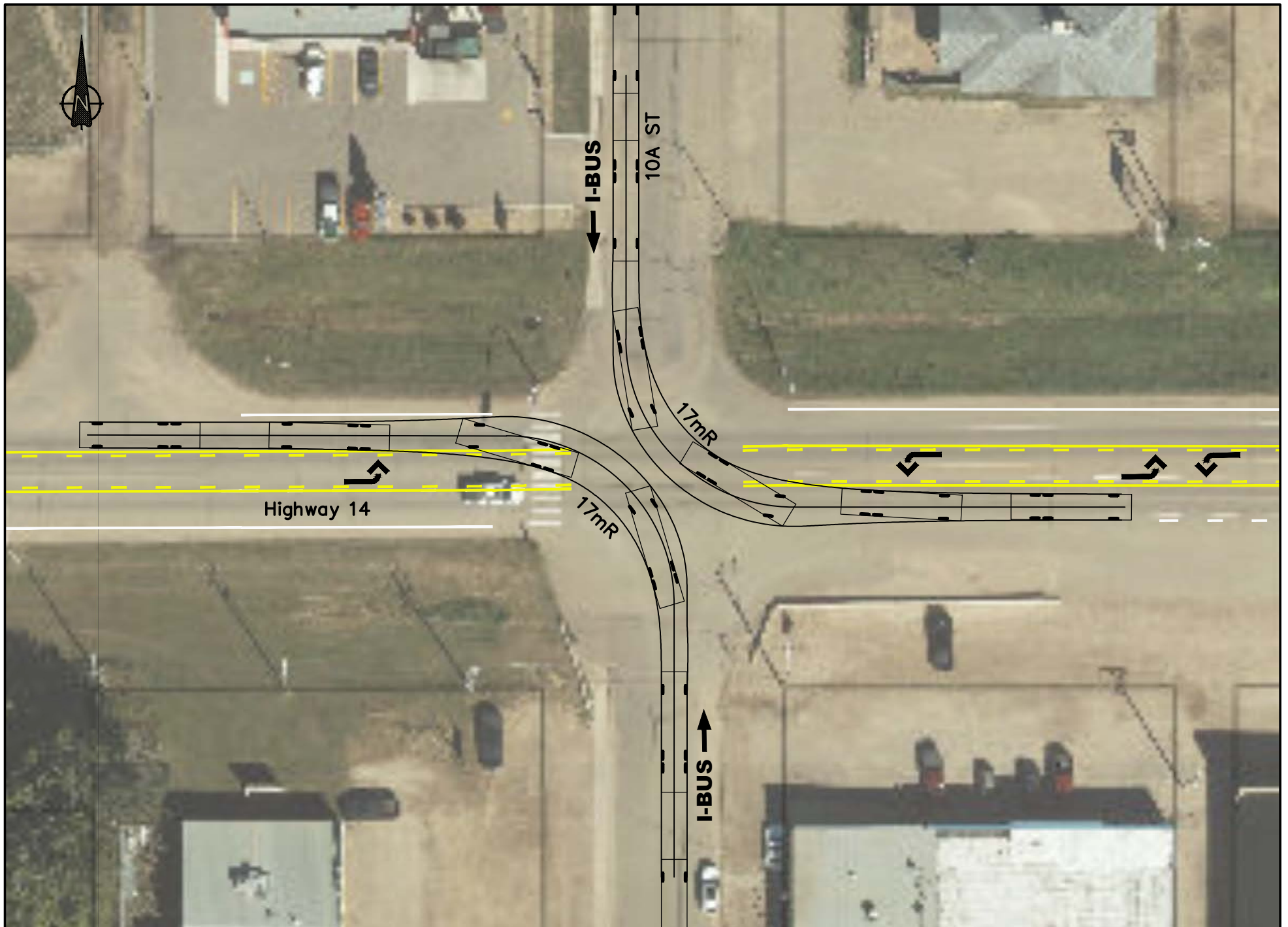
TWLTL Scenario

Hwy 14 & Access 12 (10A St) – (TWLTL 12.3)
Swept Path Plot 3



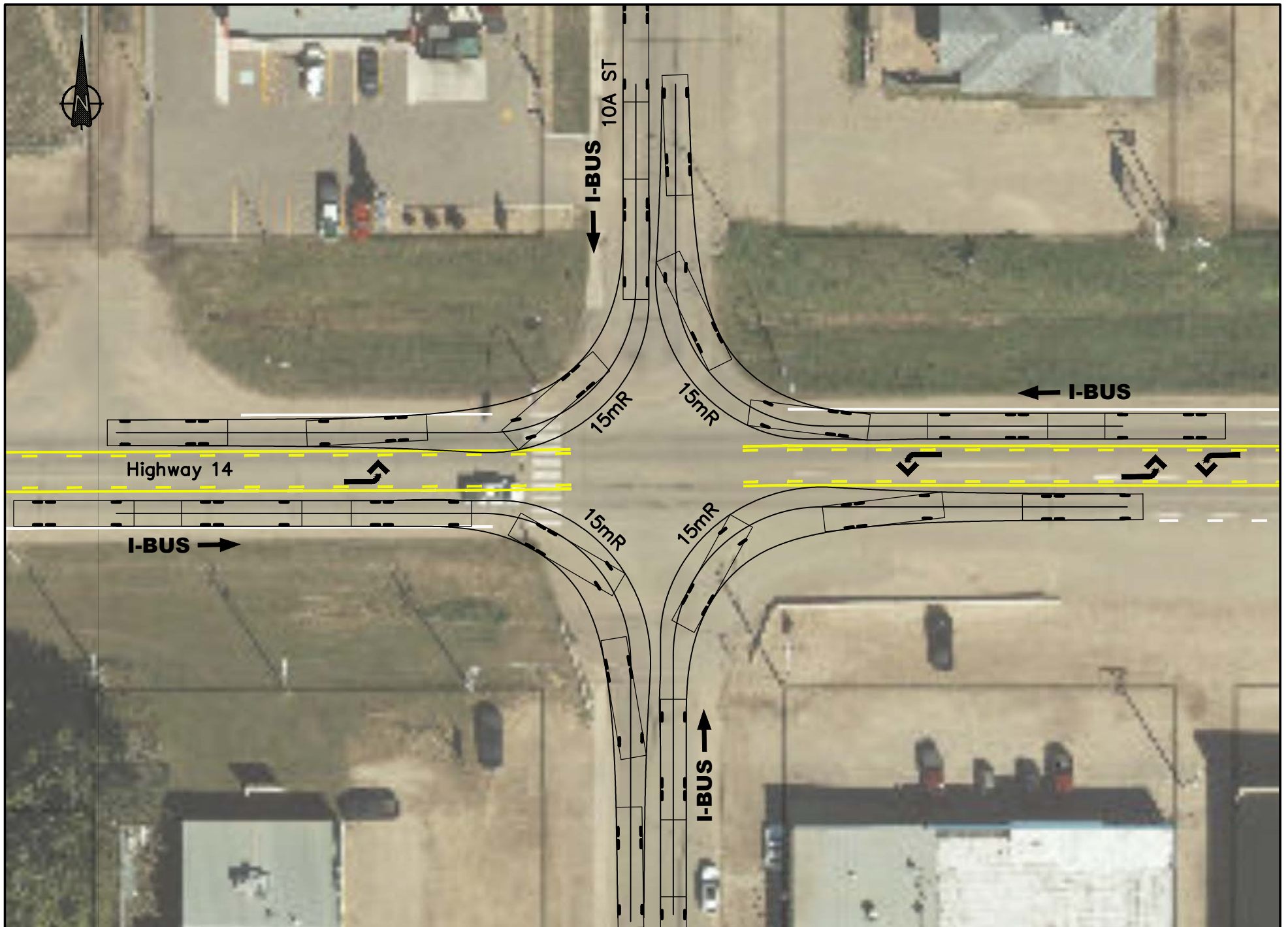
TWLTL Scenario

Hwy 14 & Access 12 (10A St) – (TWLTL 12.4)
Swept Path Plot 4



TWLTL Scenario

Hwy 14 & Access 12 (10A St) – (TWLTL 12.5)
Swept Path Plot 5

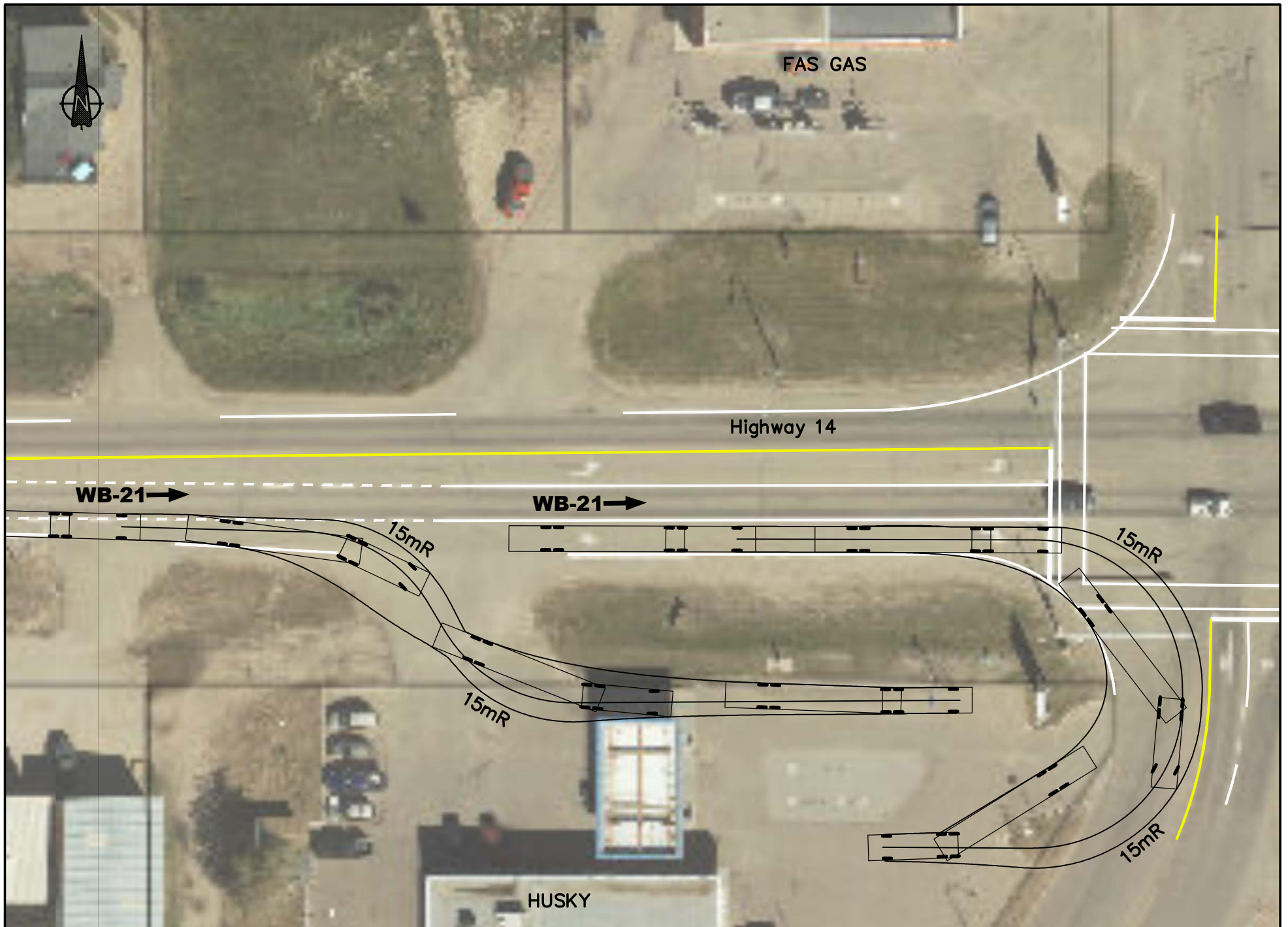


TWLTL Scenario

Hwy 14 & Access 12 (10A St) – (TWLTL 12.6)
Swept Path Plot 6

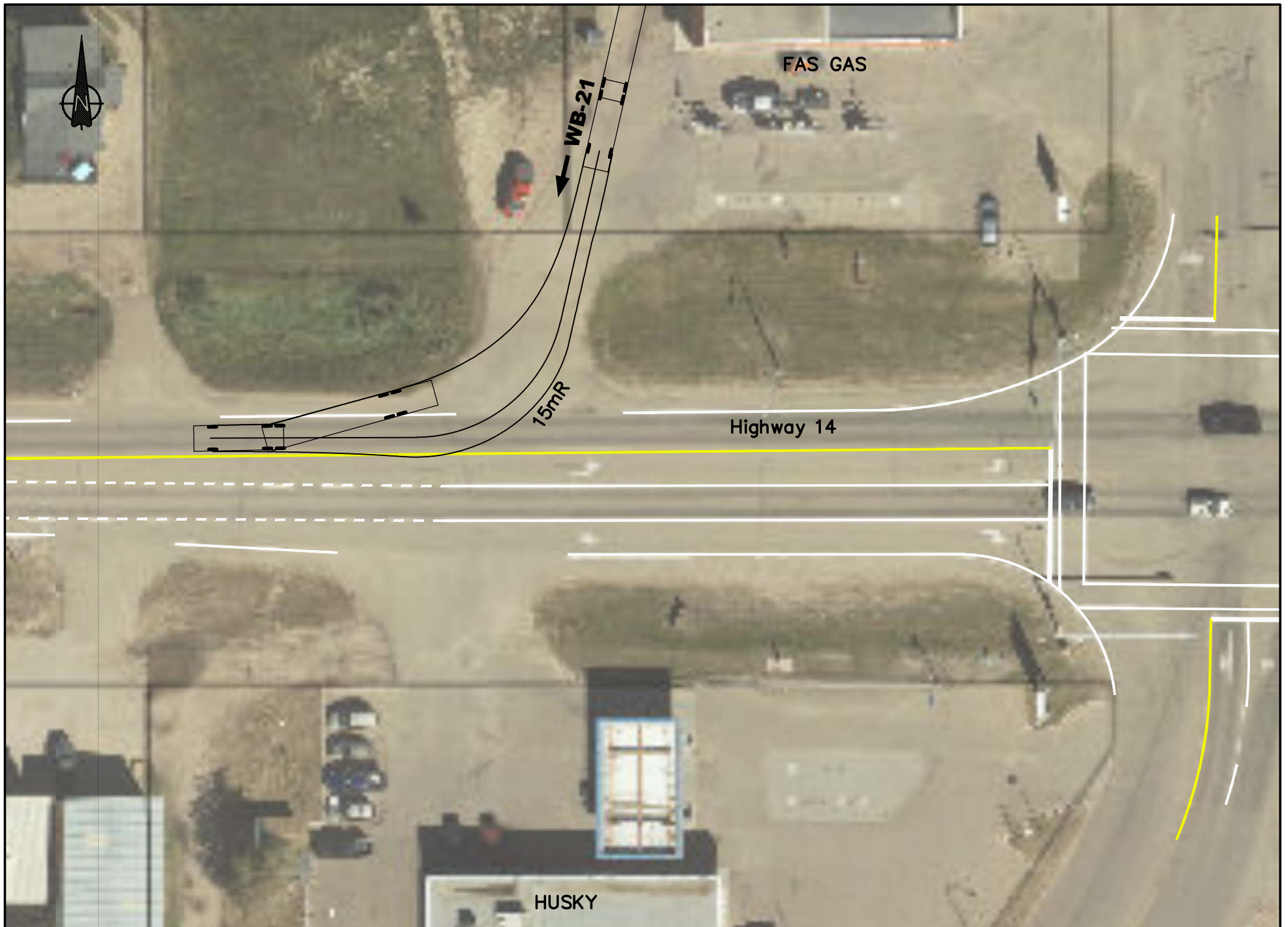
Swept Path Check

17 & 18 - Accesses to Fas Gas & Vacant Lot



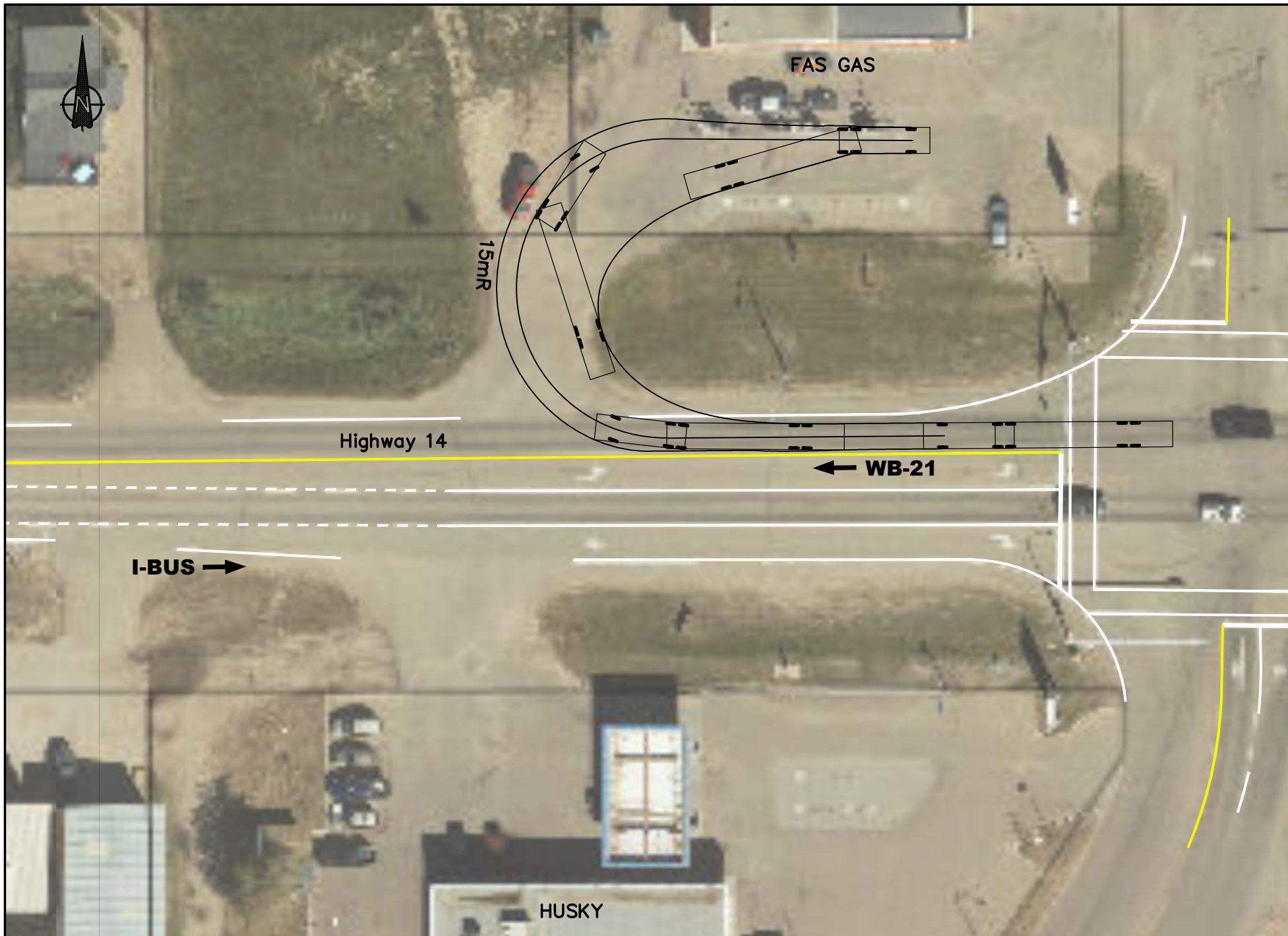
Existing Scenario

Hwy 14 & Access 17 – (Ex 17.1)
Swept Path Plot 1



Existing Scenario

Hwy 14 & Access 18 – (Ex 18.1)
Swept Path Plot 1

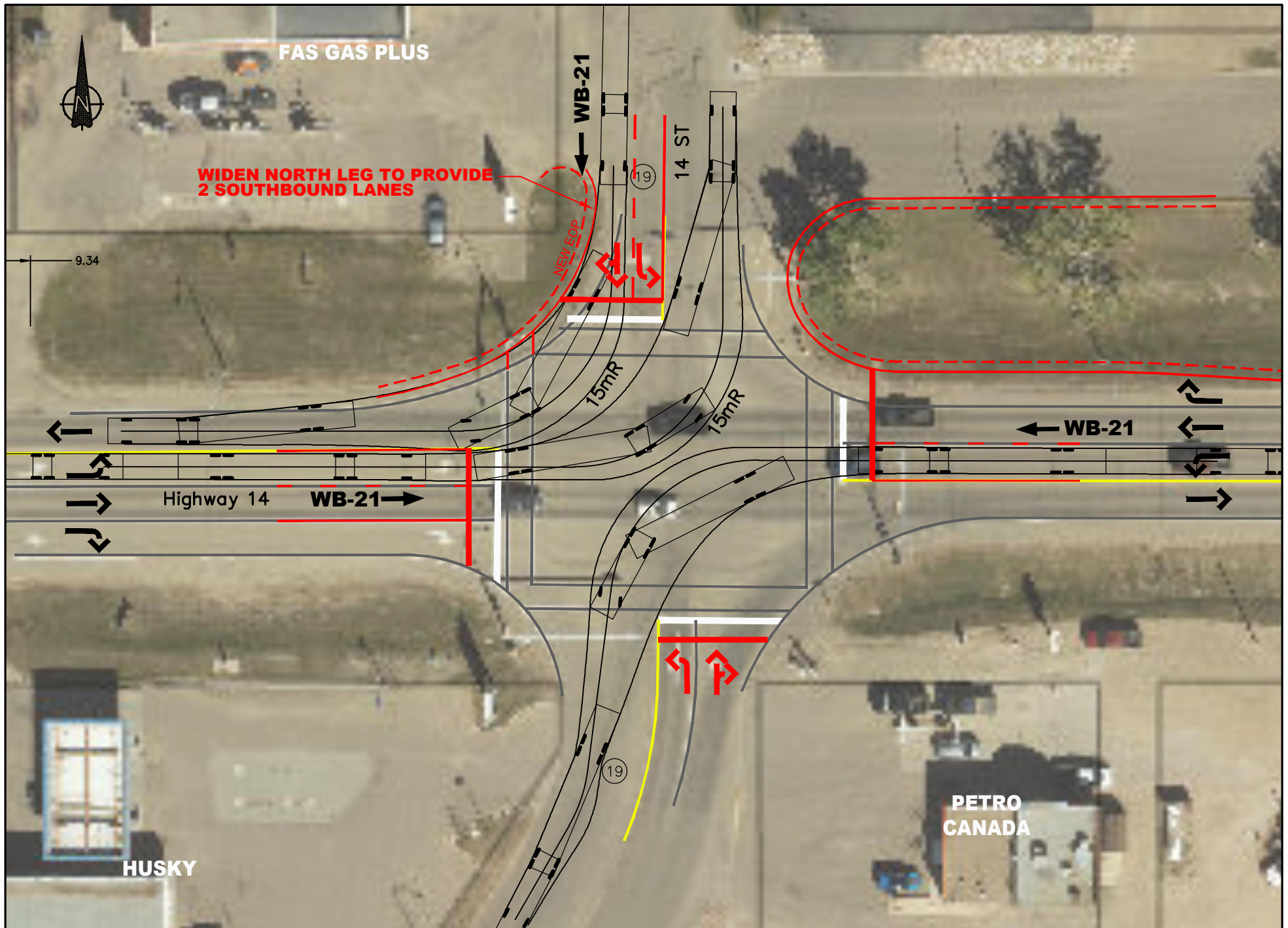


Existing Scenario

Hwy 14 & Access 18 – (Ex 18.2)
Swept Path Plot 2

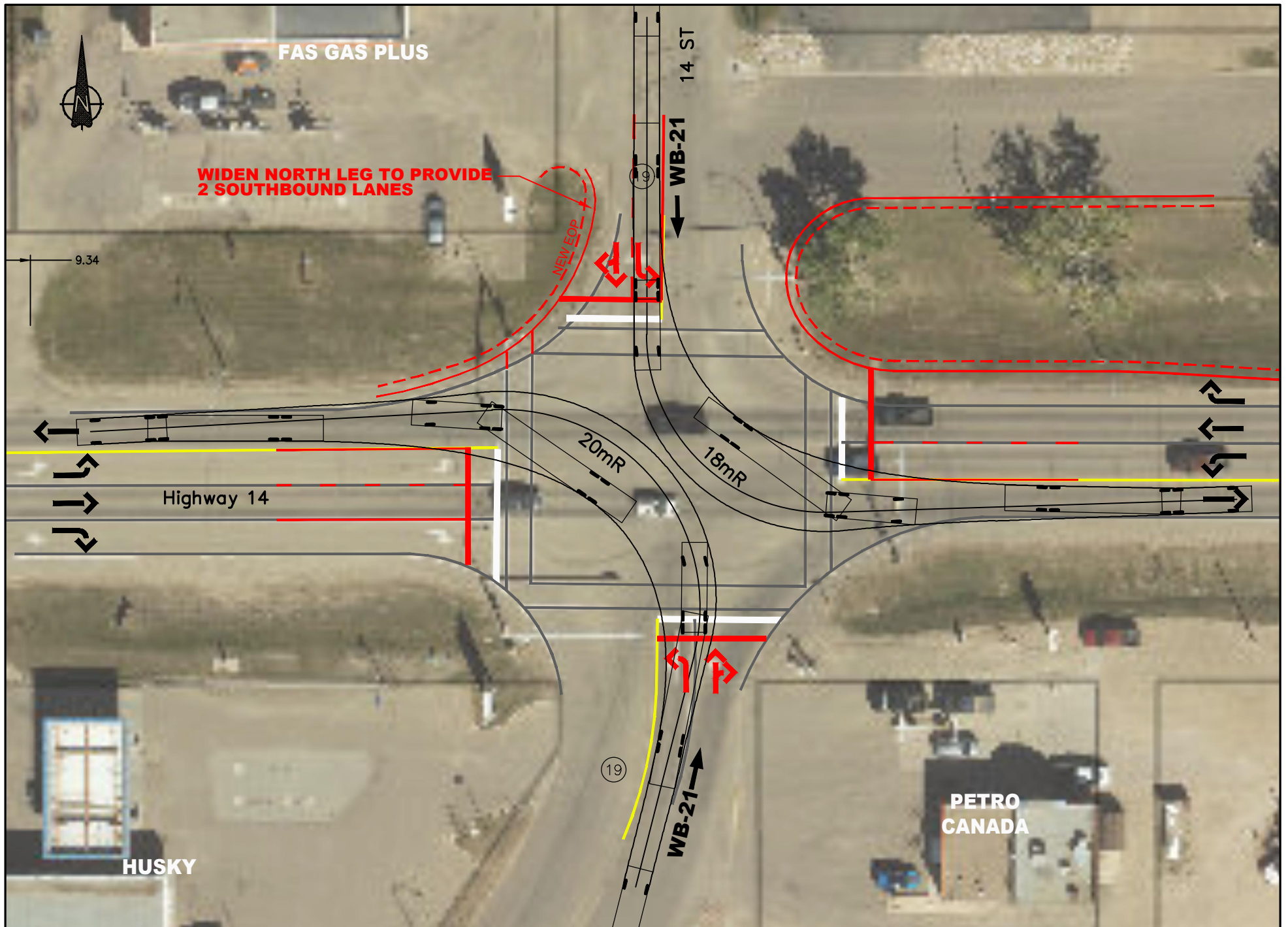
Swept Path Check

19 - 14 Street



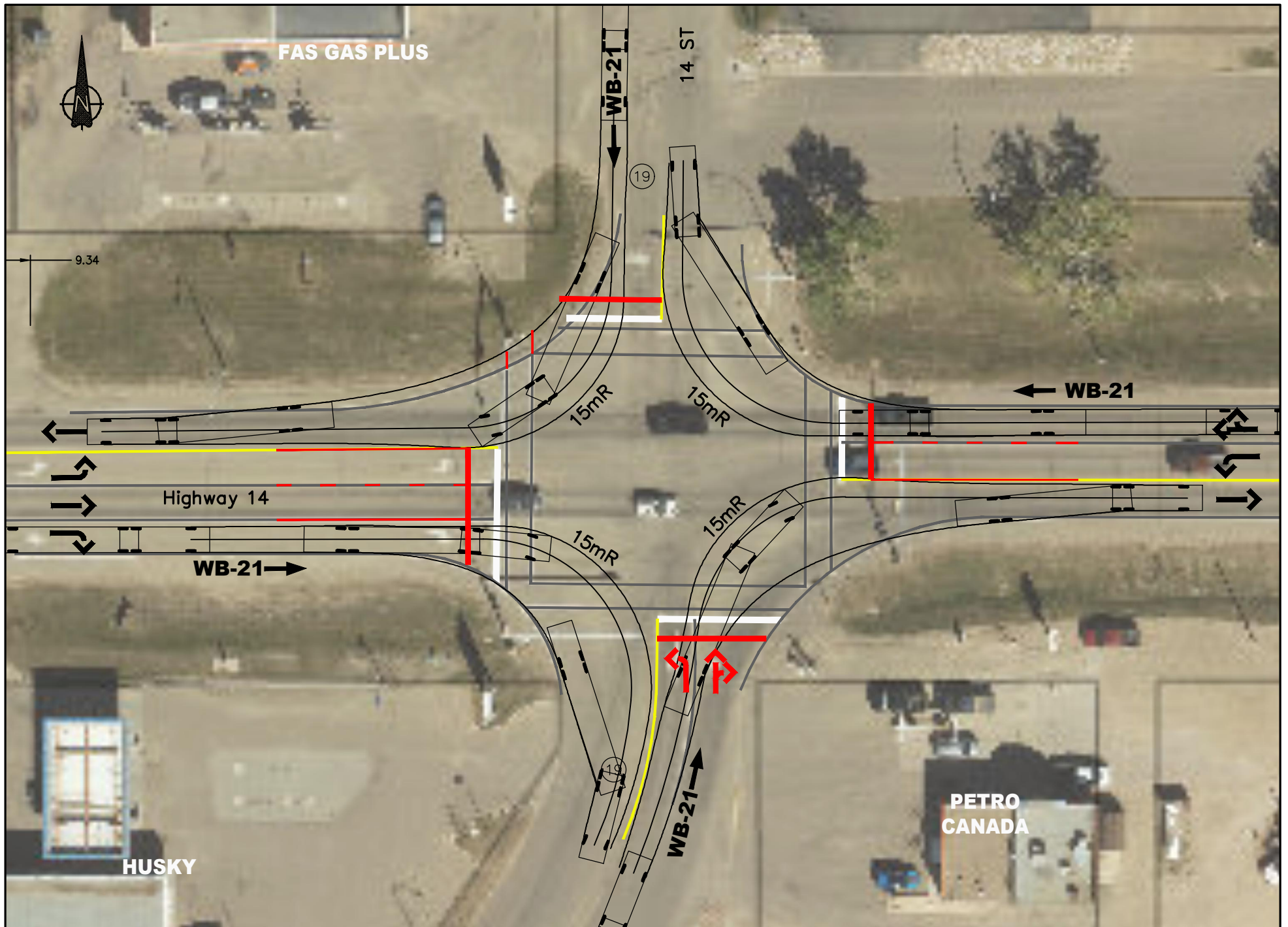
Existing Scenario

Hwy 14 & Access 19 (14 St)
Swept Path Plot B1X



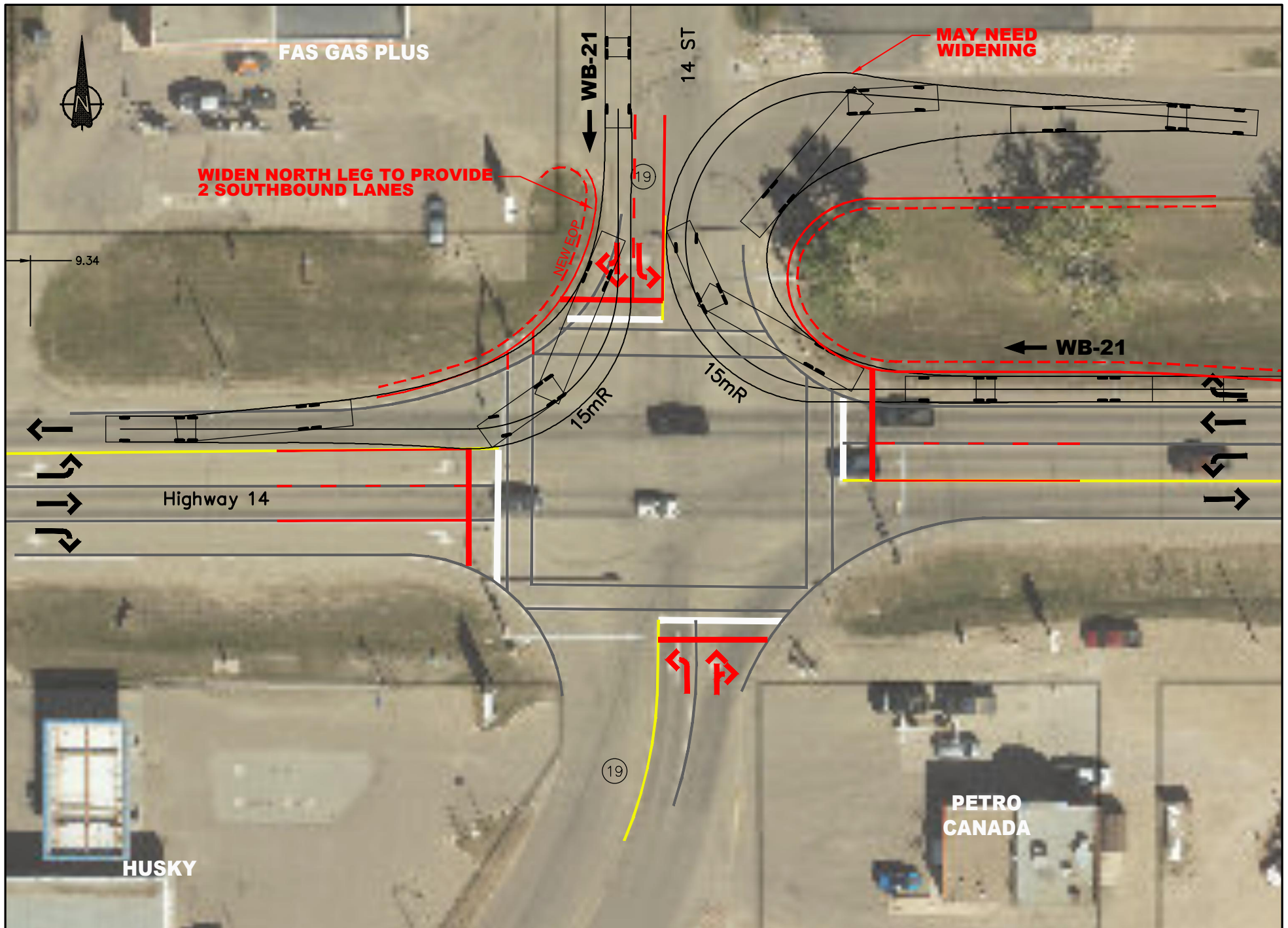
Short Term Scenario

Hwy 14 & Access 19 (14 St)
Swept Path Plot B2X



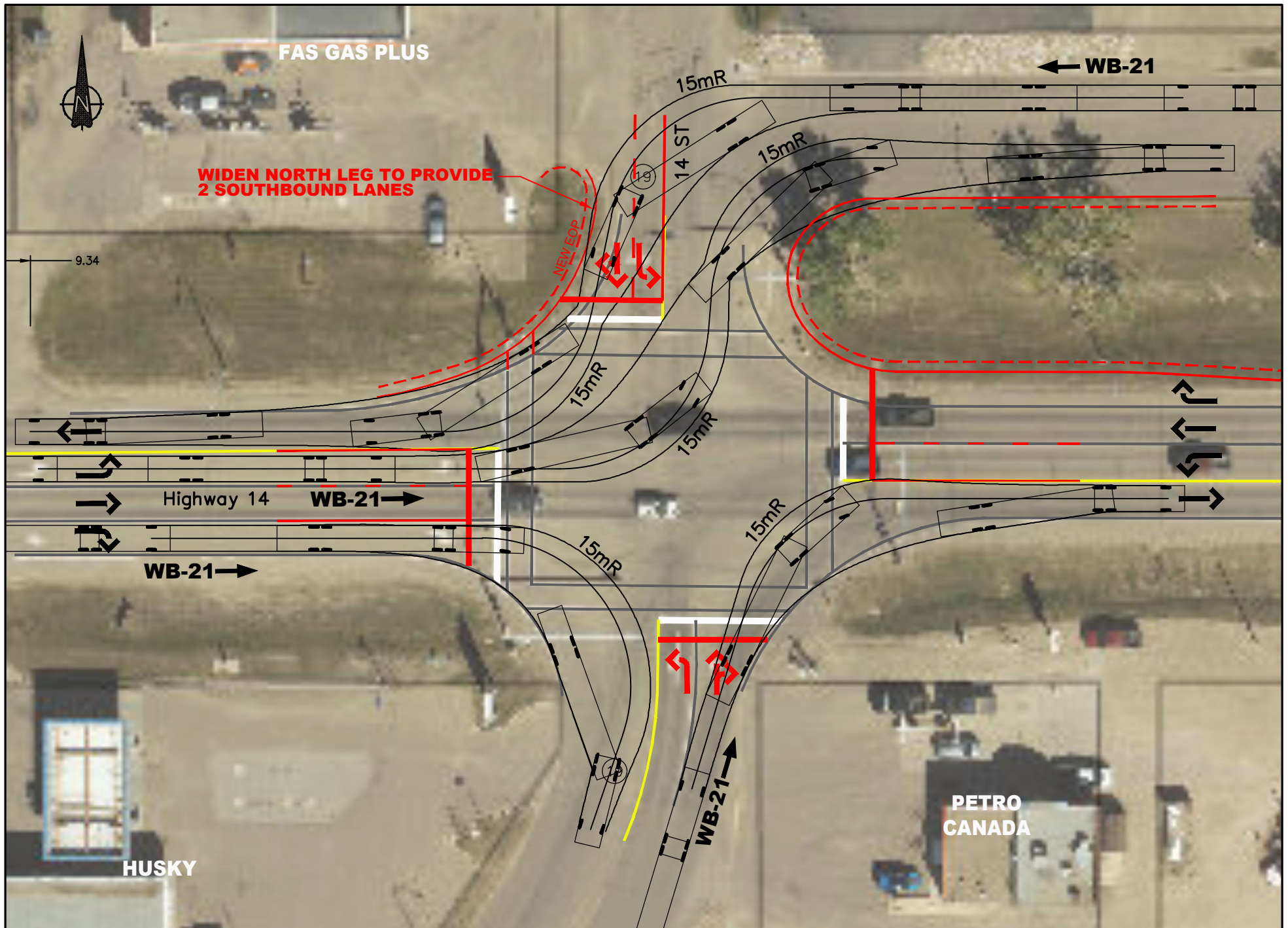
Existing Scenario

Hwy 14 & Access 19 (14 St)
Swept Path Plot B3X



Short Term Scenario

Hwy 14 & Access 19 (14 St)
Swept Path Plot B4X

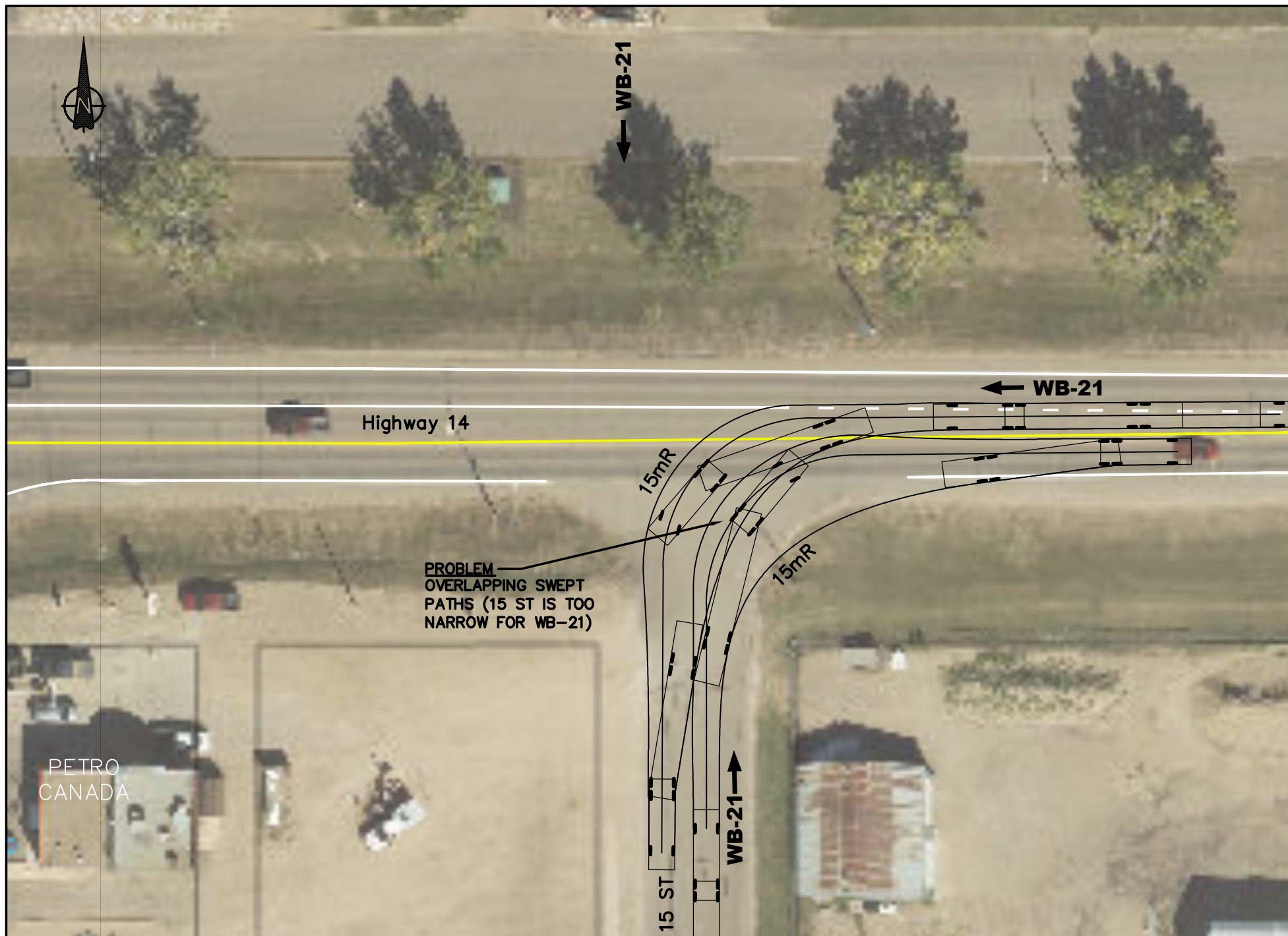


Short Term Scenario

Hwy 14 & Access 19 (14 St)
Swept Path Plot B5X

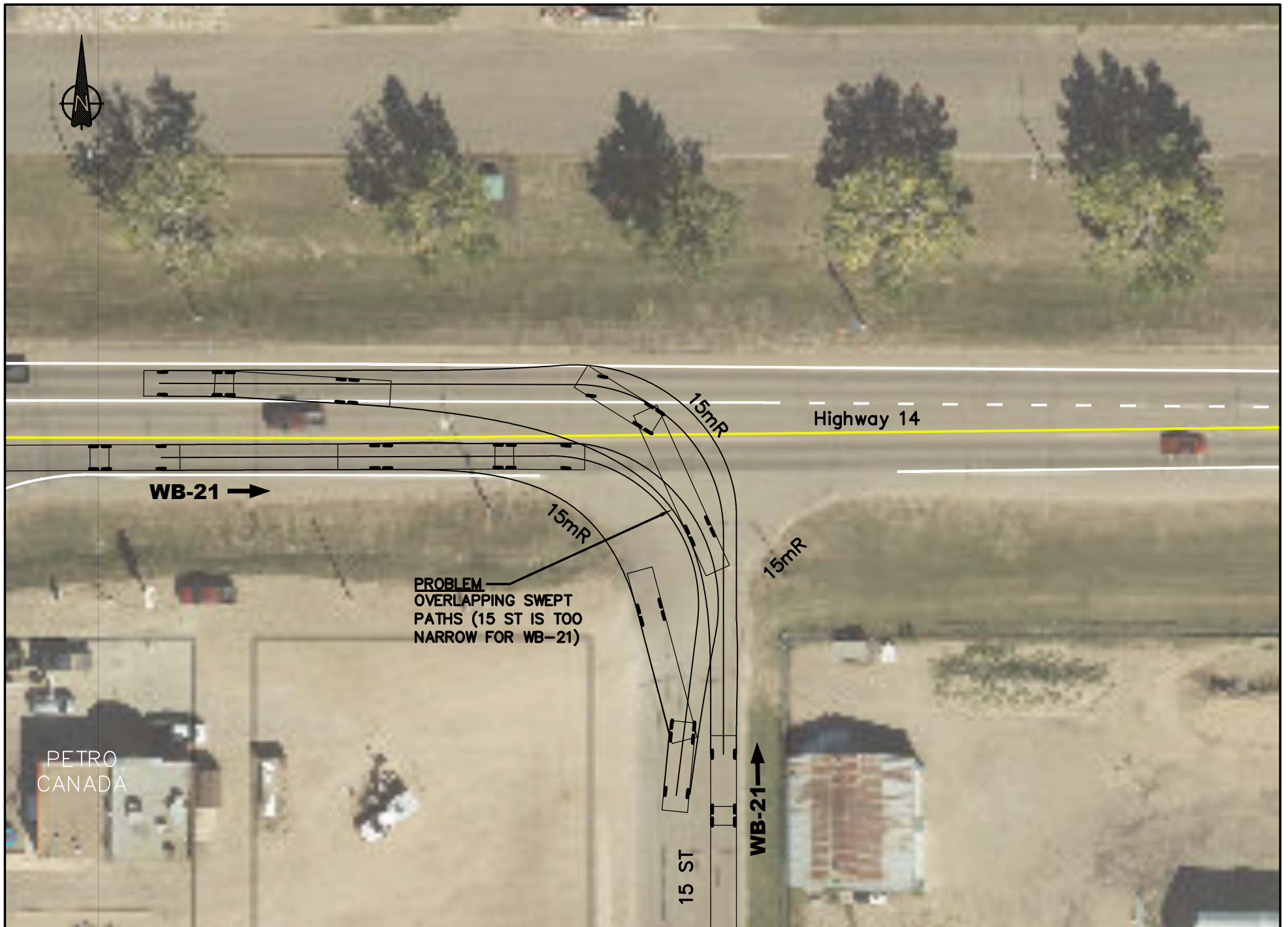
Swept Path Check

20 - 15 Street



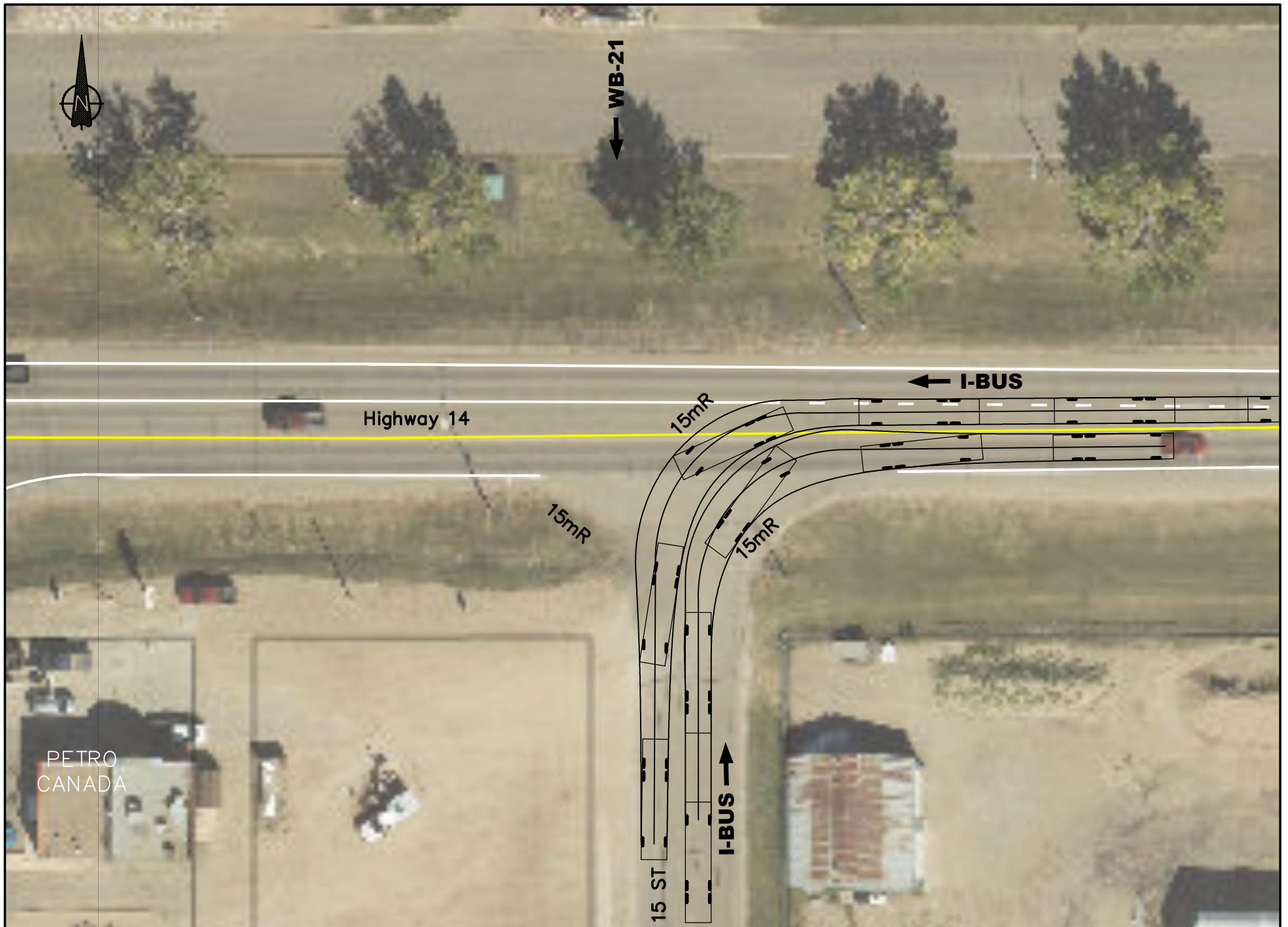
Existing Scenario

Hwy 14 & Access 20 (15 St) – (Ex 20.1)
Swept Path Plot 1



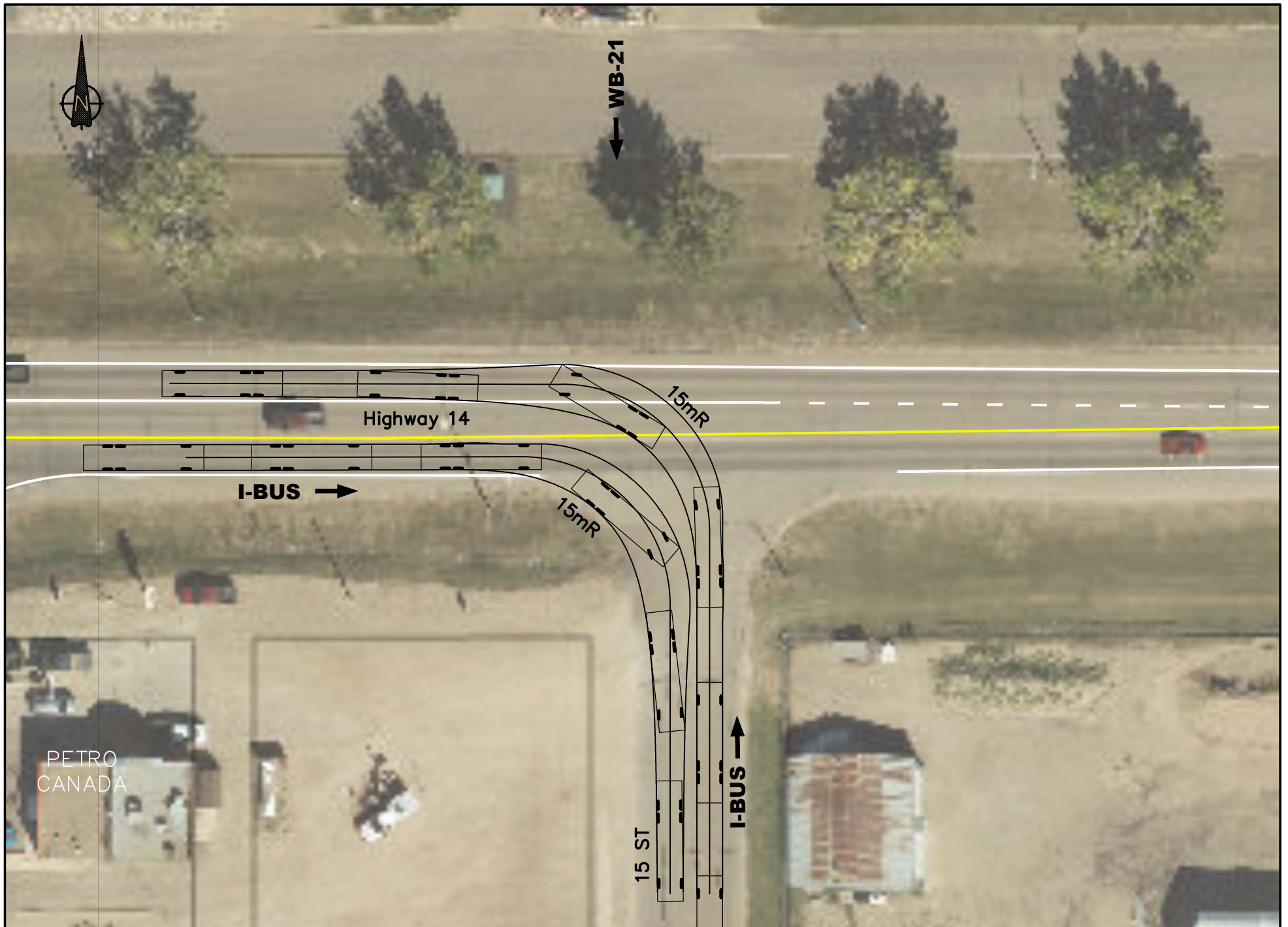
Existing Scenario

Hwy 14 & Access 20 (15 St) – (Ex 20.2)
Swept Path Plot 2



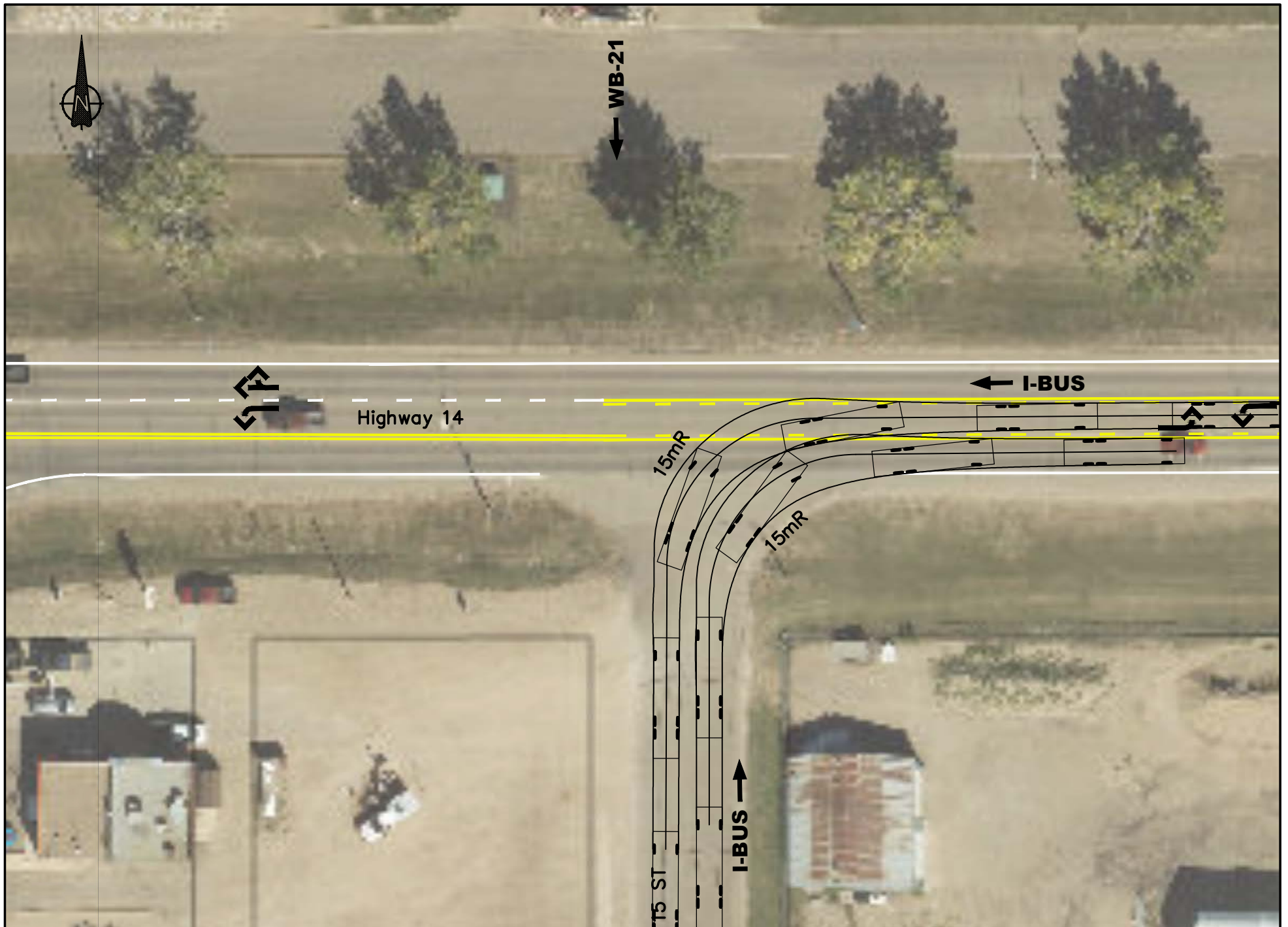
Existing Scenario

Hwy 14 & Access 20 (15 St) – (Ex 20.3)
Swept Path Plot 3



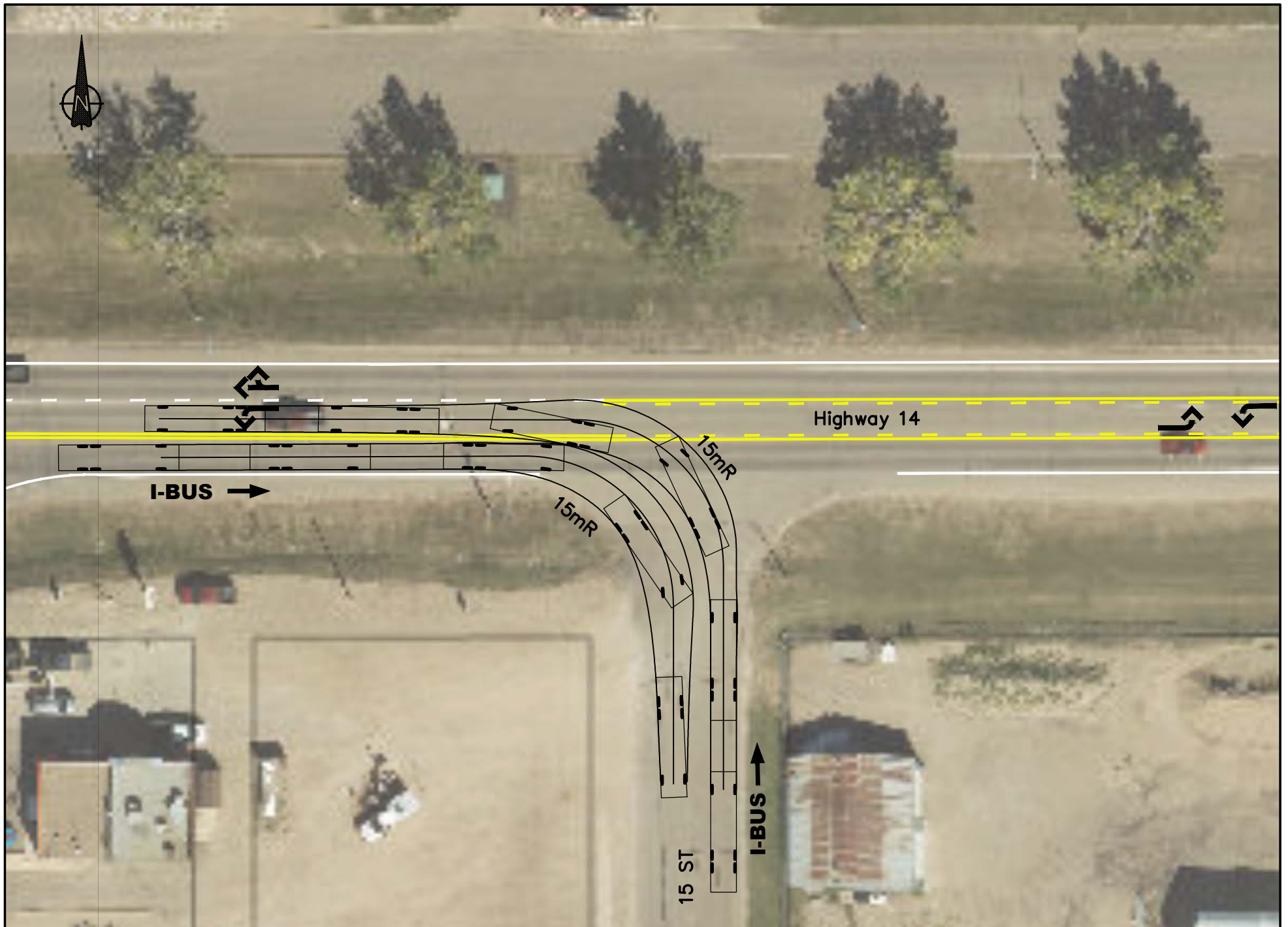
Existing Scenario

Hwy 14 & Access 20 (15 St) – (Ex 20.4)
Swept Path Plot 4



TWLTL Scenario

Hwy 14 & Access 20 (15 St) – (TWLTL 20.1)
Swept Path Plot 1

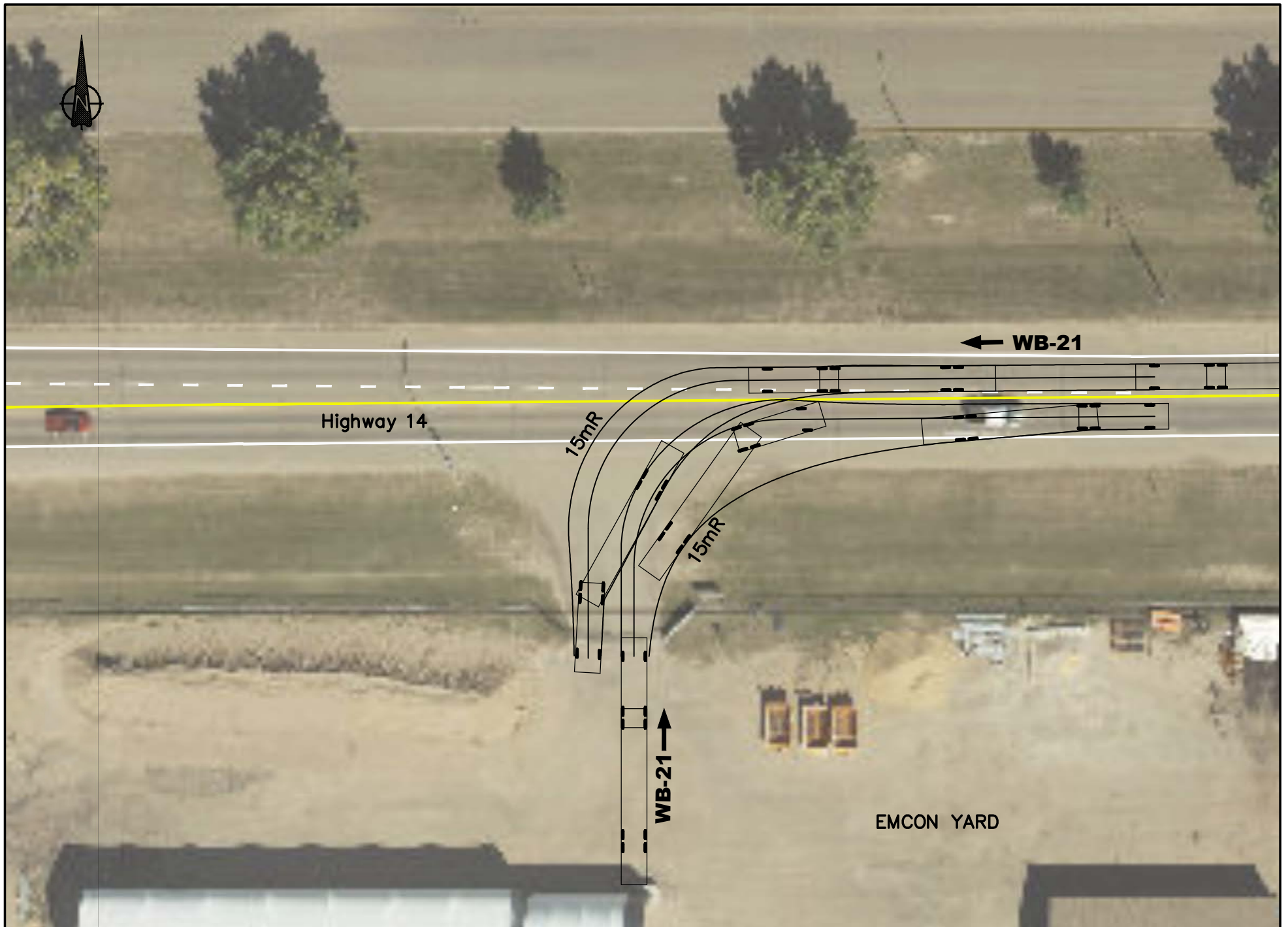


TWLTL Scenario

Hwy 14 & Access 20 (15 St) – (TWLTL 20.2)
Swept Path Plot 2

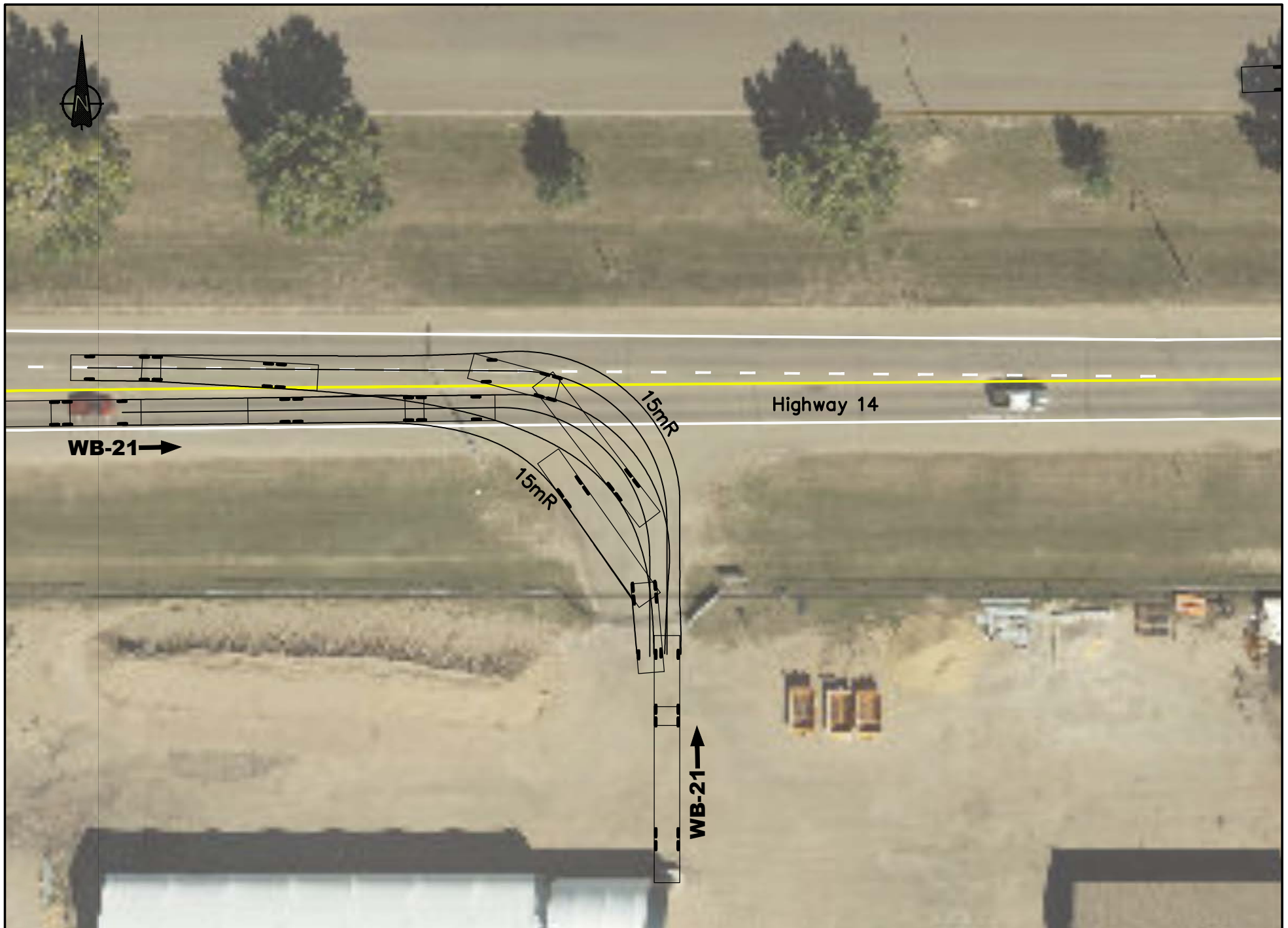
Swept Path Check

21 - Access to EMCON Services



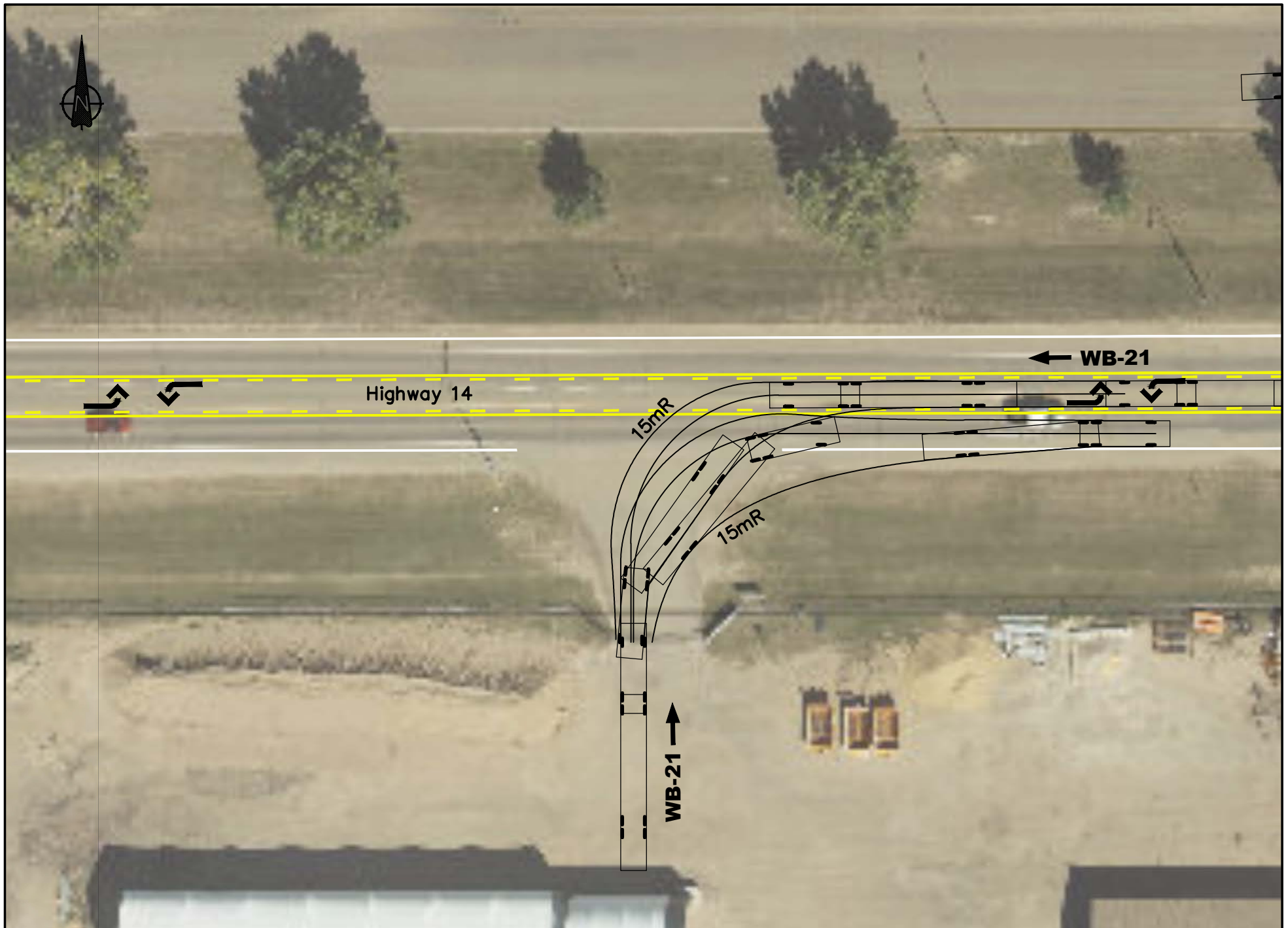
Existing Scenario

Hwy 14 & Access 21 (EMCO) – (Ex 21.1)
Swept Path Plot 1



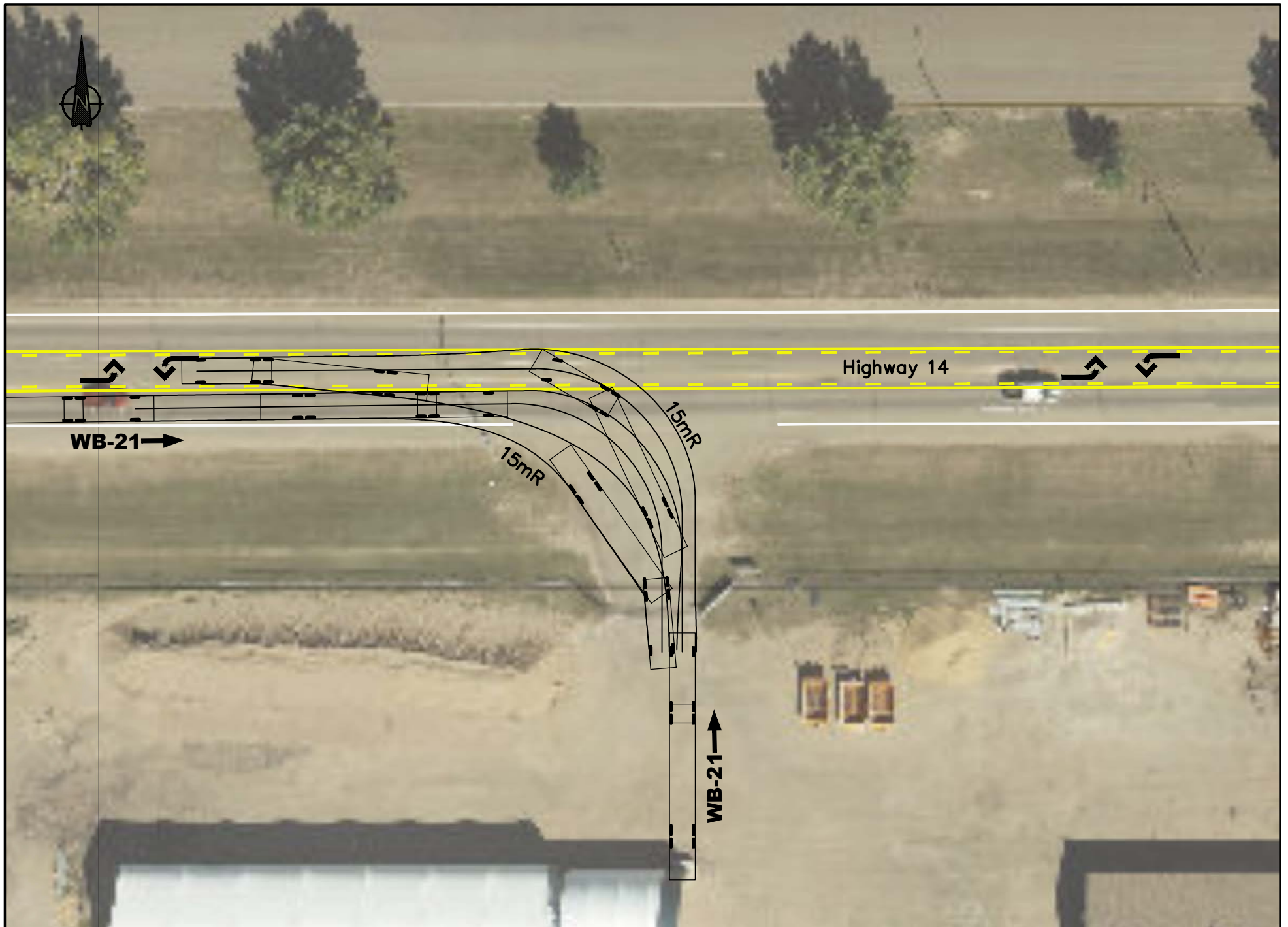
Existing Scenario

Hwy 14 & Access 21 (EMCO) – (Ex 21.2)
Swept Path Plot 2



TWLTL Scenario

Hwy 14 & Access 21 (EMCO) – (TWLTL 21.1)
Swept Path Plot 1



TWLTL Scenario

Hwy 14 & Access 21 (EMCO) – (TWLTL 21.2)
Swept Path Plot 2

Swept Path Check

07 - Access to Bison Motel

Swept Path Check

08 - Access to Boston Pizza

Swept Path Check

09 - Access to M.D. of Wainwright

Swept Path Check

10 - 9 Street

Swept Path Check

11 - Access to KFC

Swept Path Check

12 - 10a Street

Swept Path Check

17 & 18 - Accesses to Fas Gas & Vacant Lot

Swept Path Check

19 - 14 Street

Swept Path Check

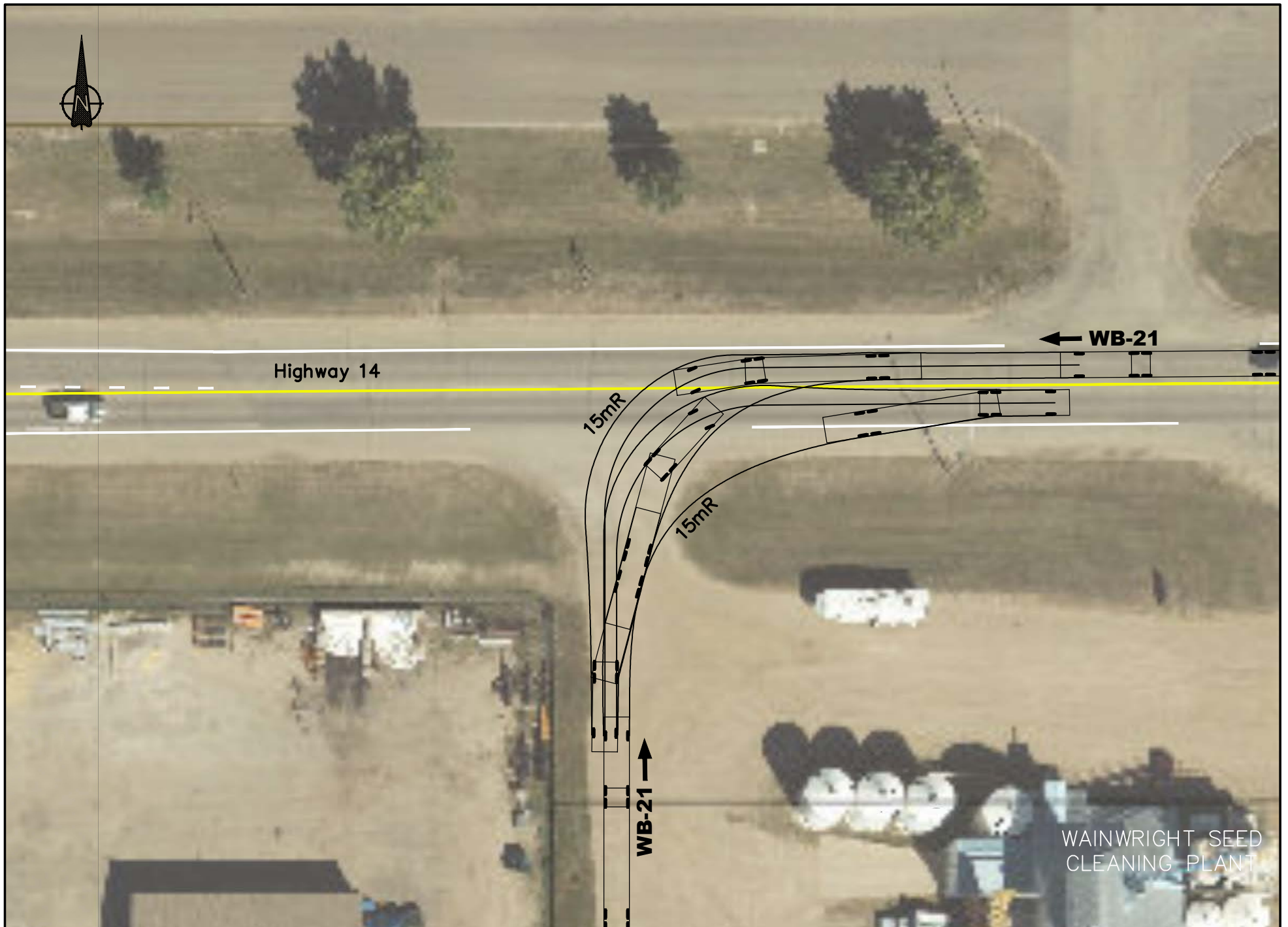
20 - 15 Street

Swept Path Check

21 - Access to EMCON Services

Swept Path Check

22 - Access to Seed Cleaning Plant



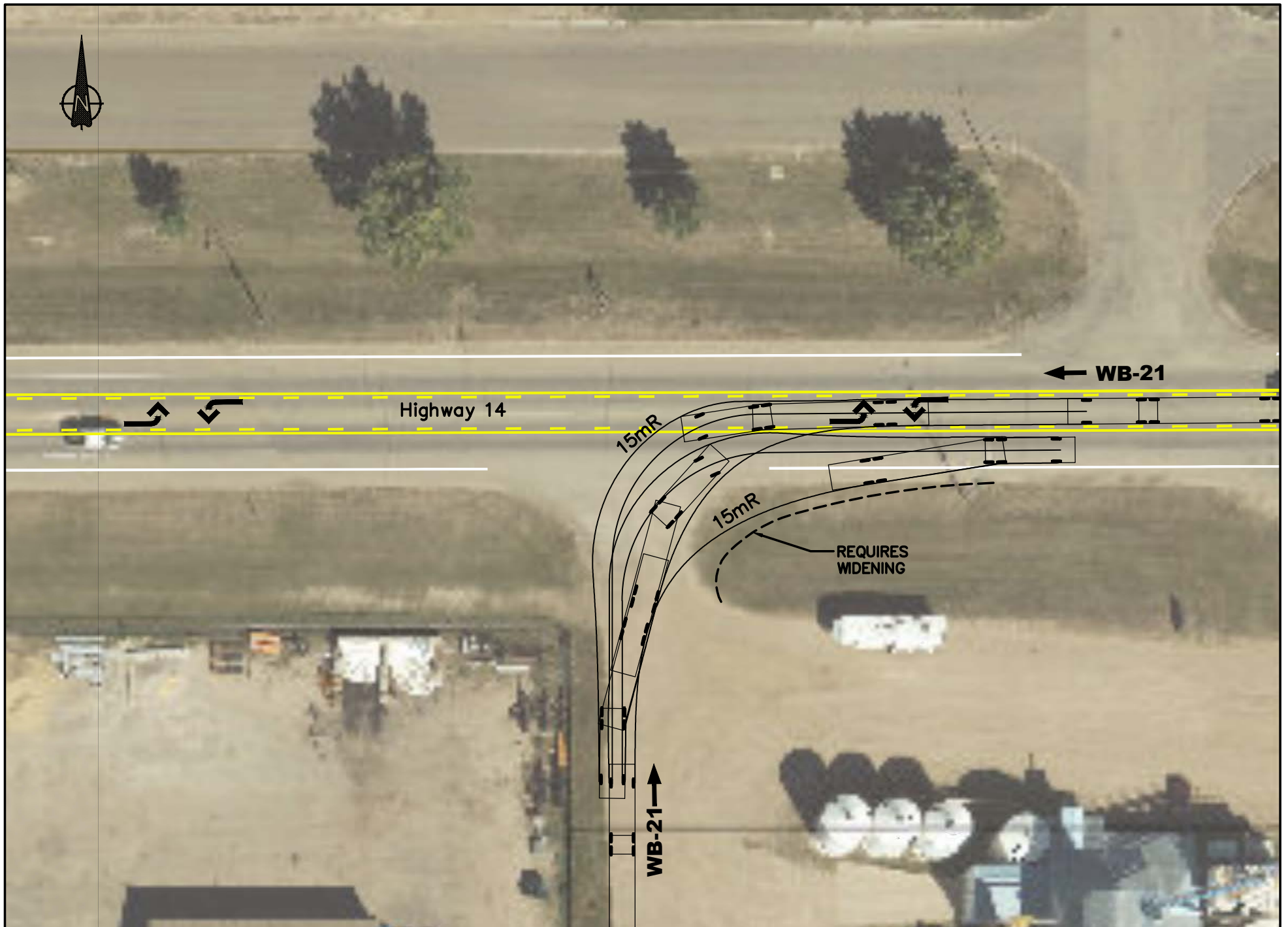
Existing Scenario

Hwy 14 & Access 22 (Seed Cleaning Plant) – (Ex 22.1)
Swept Path Plot 1



Existing Scenario

Hwy 14 & Access 22 (Seed Cleaning Plant) – (Ex 22.2)
Swept Path Plot 2



TWLTL Scenario

Hwy 14 & Access 22 (Seed Cleaning Plant) – (TWLTL 22.1)

Swept Path Plot 1

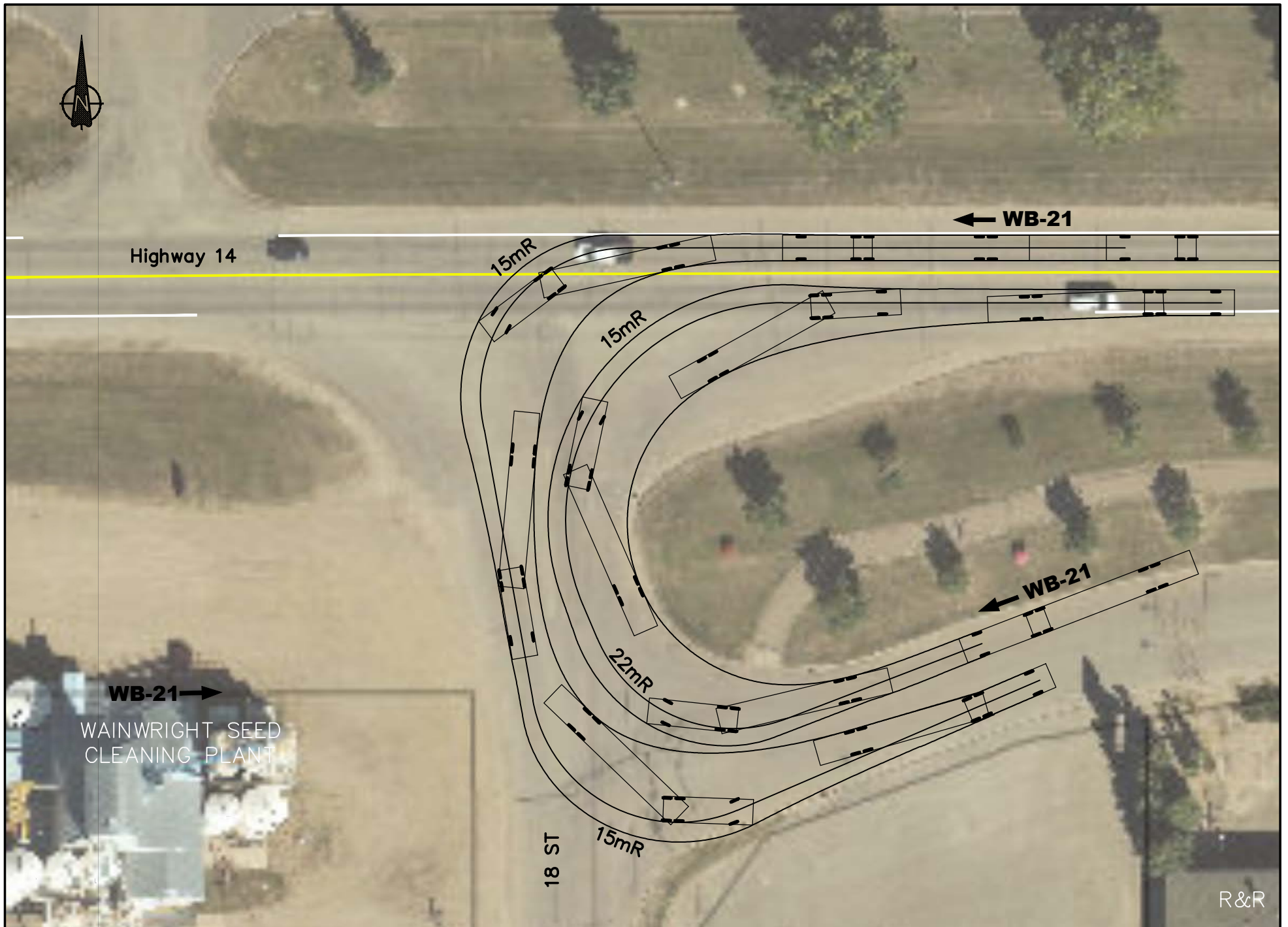


TWLTL Scenario

Hwy 14 & Access 22 (Seed Cleaning Plant) – (TWLTL 22.2)
Swept Path Plot 2

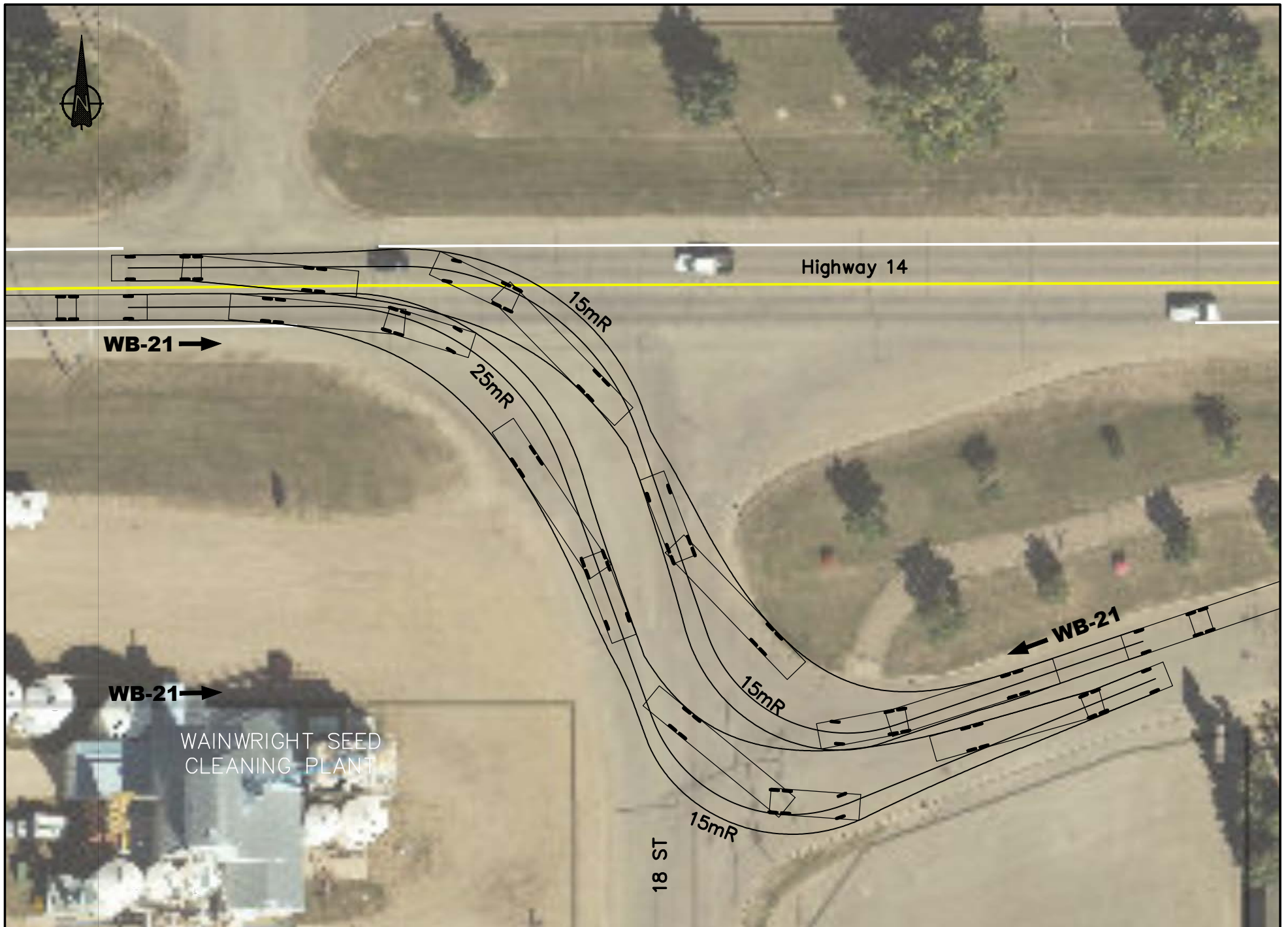
Swept Path Check

24 - 18 Street (S)



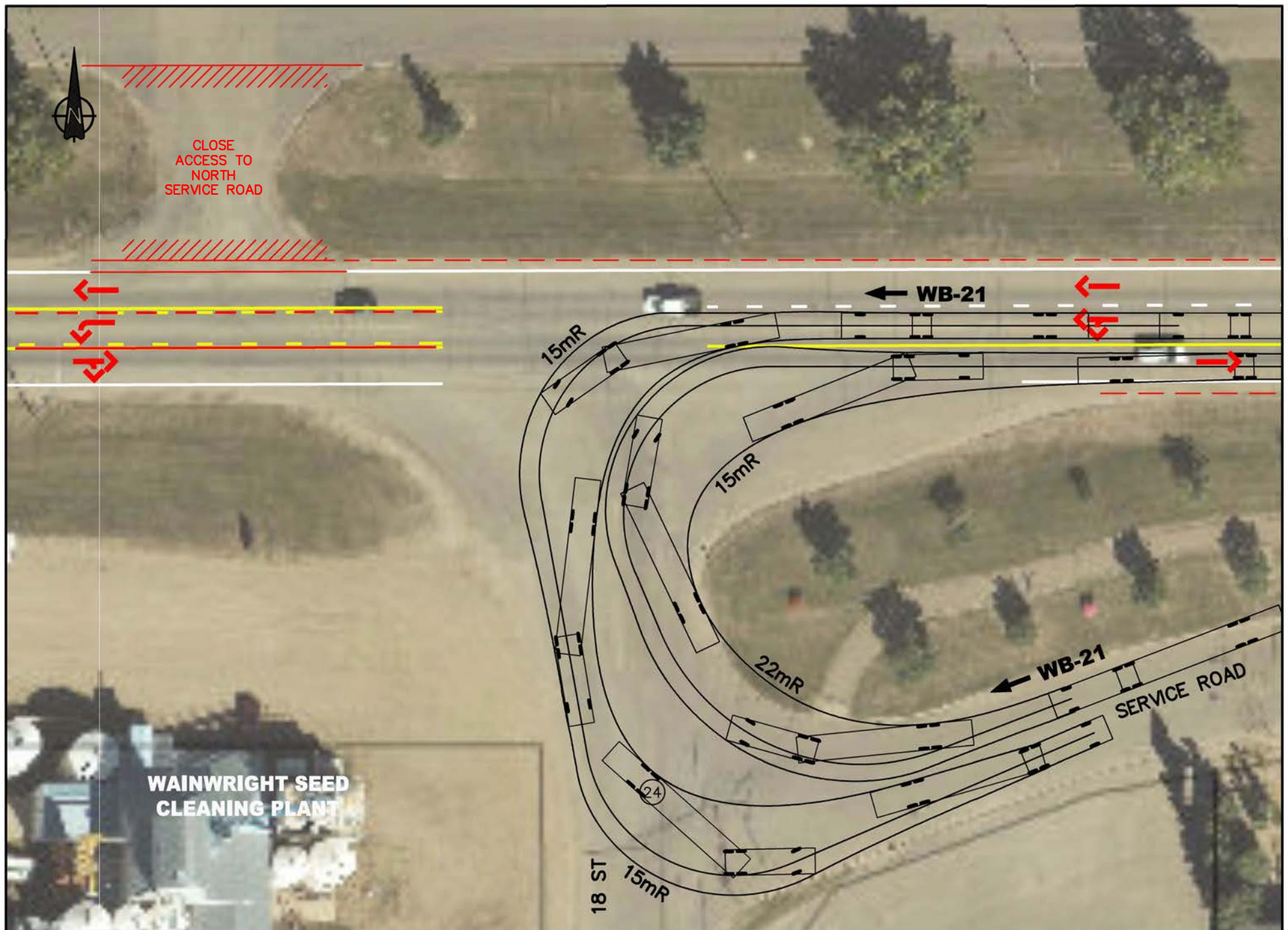
Existing Scenario

Hwy 14 & Access 24 (18 St) – (Ex 24.1)
Swept Path Plot 1



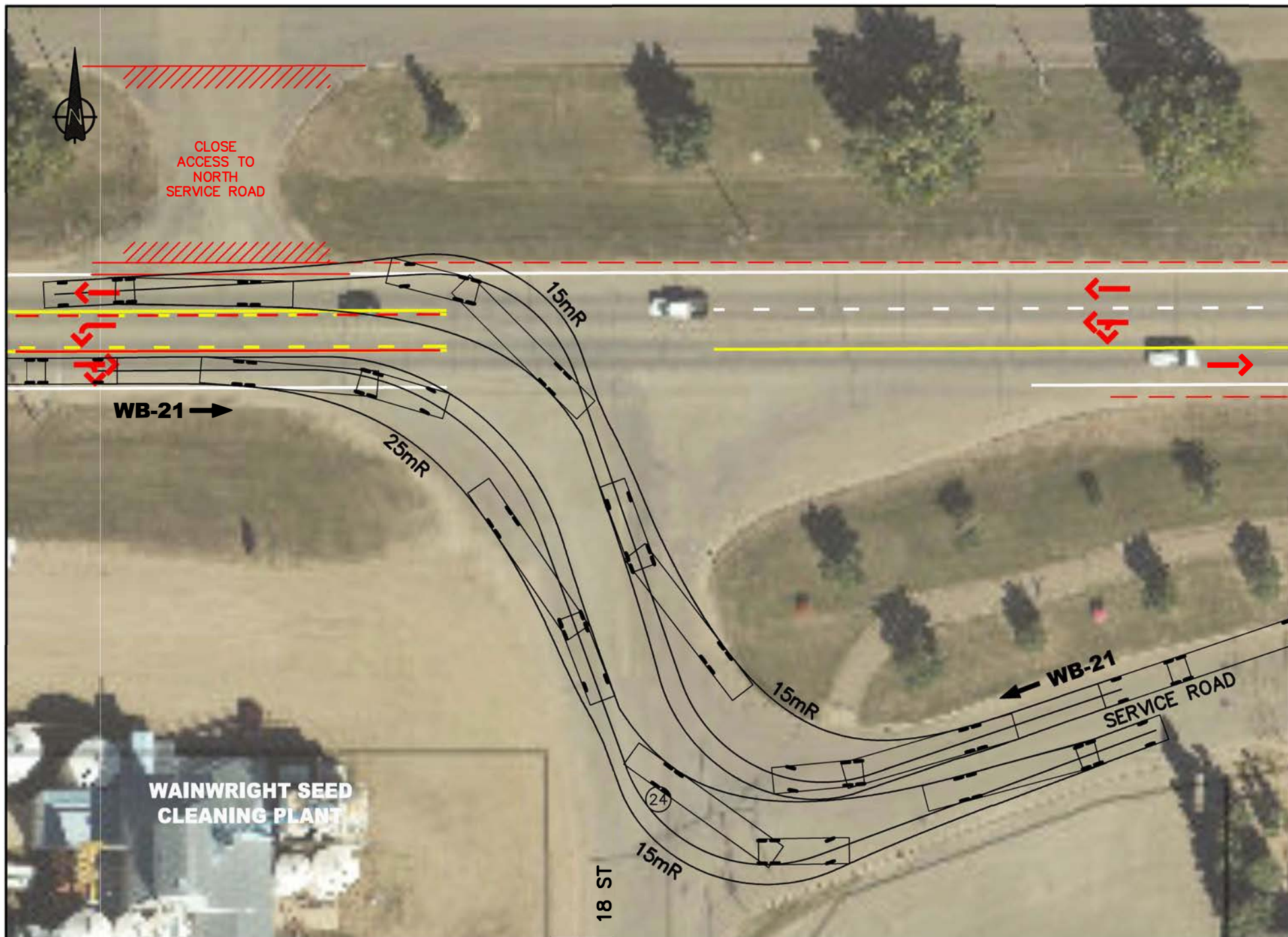
Existing Scenario

Hwy 14 & Access 24 (18 St) – (Ex 24.2)
Swept Path Plot 2



TWLT Scenario - TWLT 24.1

Hwy 14 & 18 St
Swept Path Plot C1X

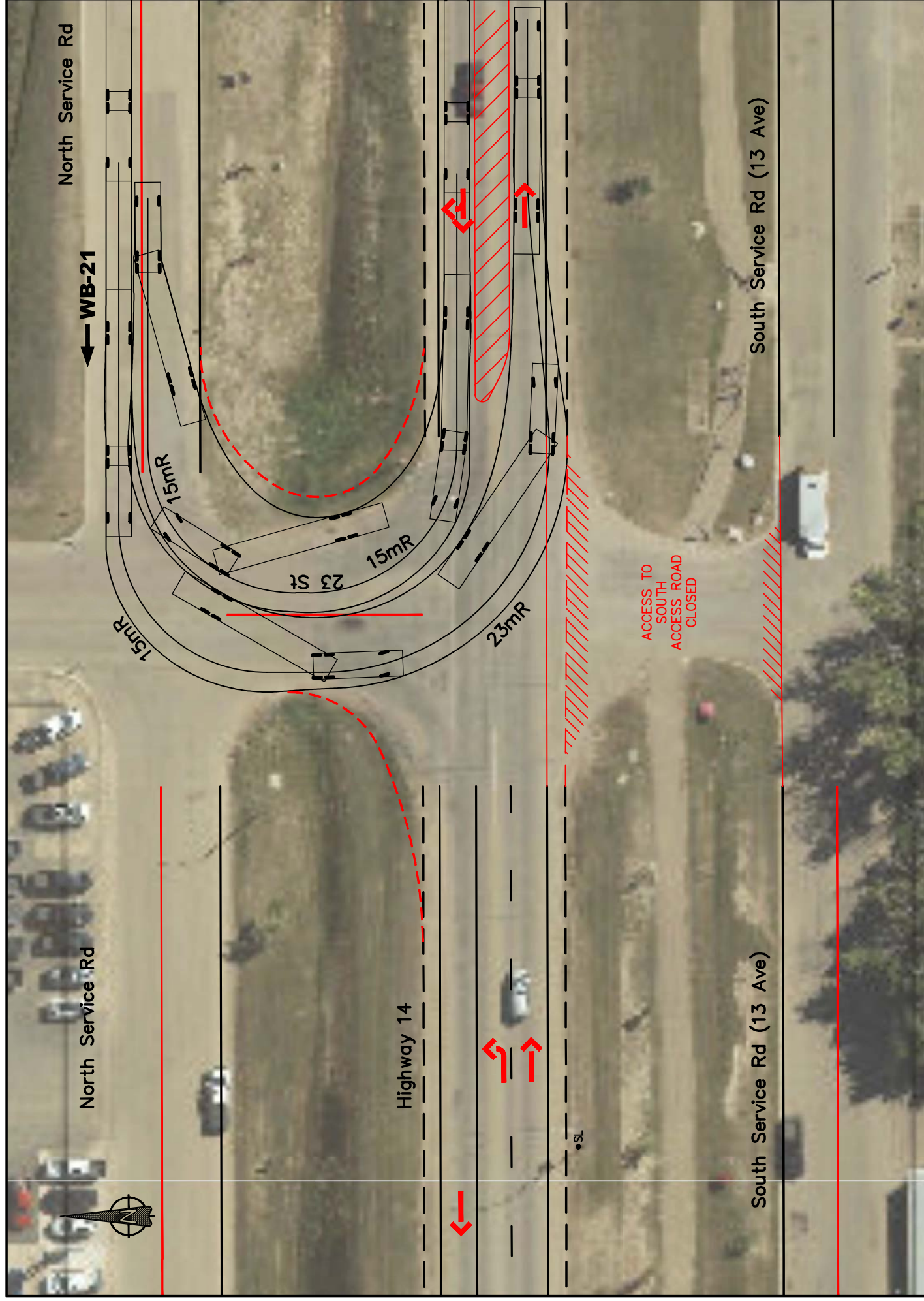


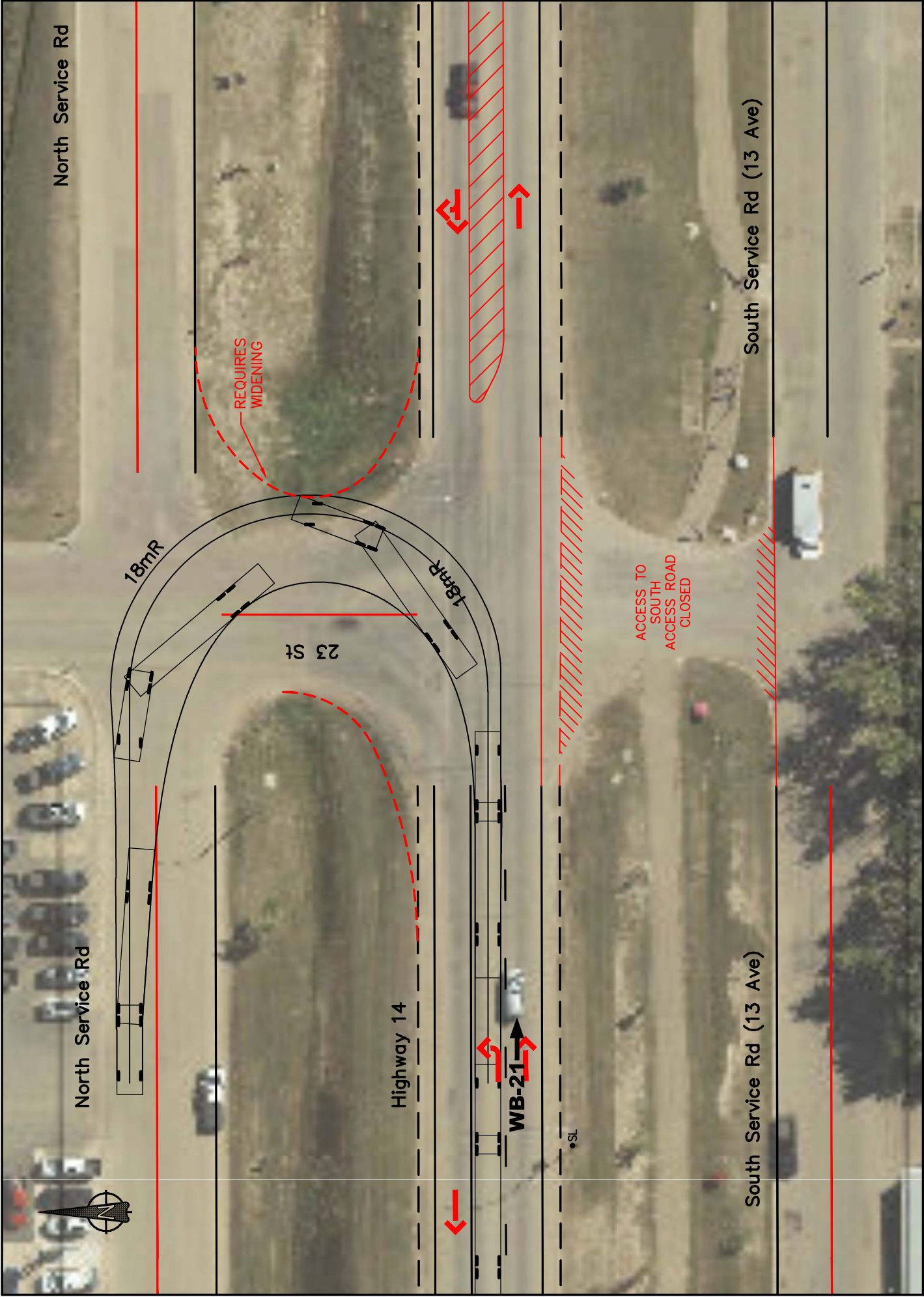
TWLTL Scenario - TWLTL 24.2

Hwy 14 & 18 St
Swept Path Plot C2X

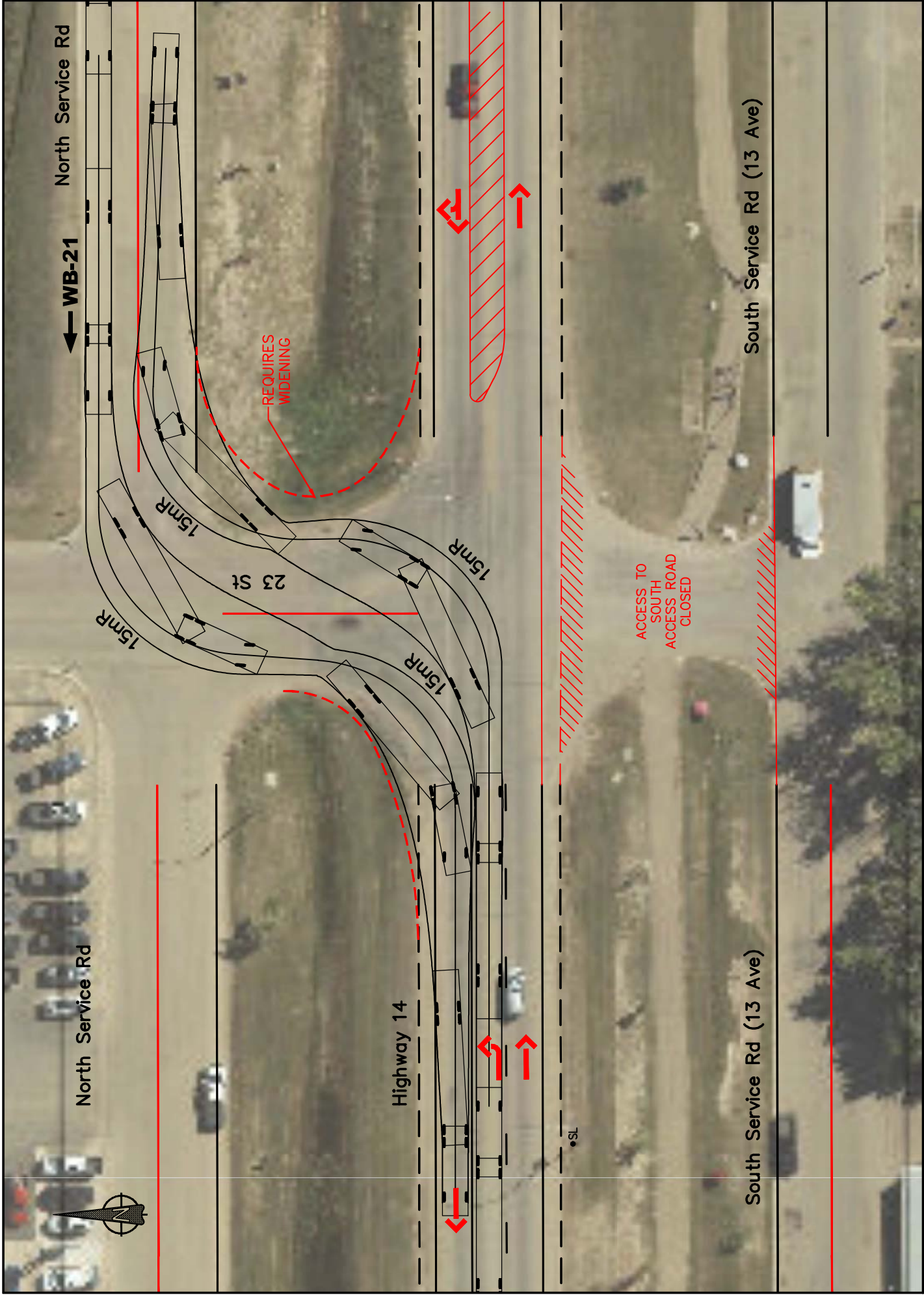
Swept Path Check

25 - 23 Street (N)

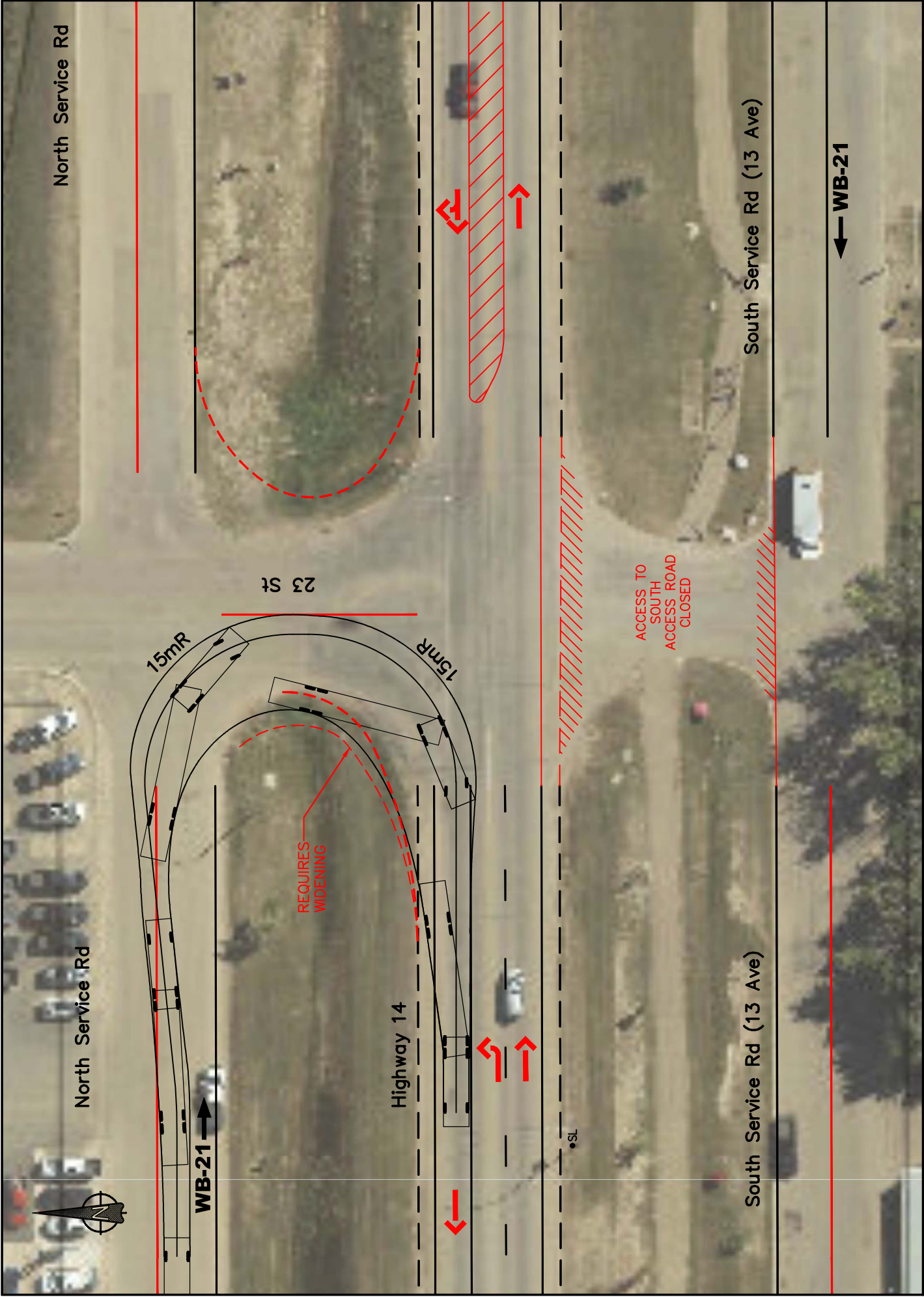
Hwy 14 & 23 St
WB-21 Swept Path ALC-B1



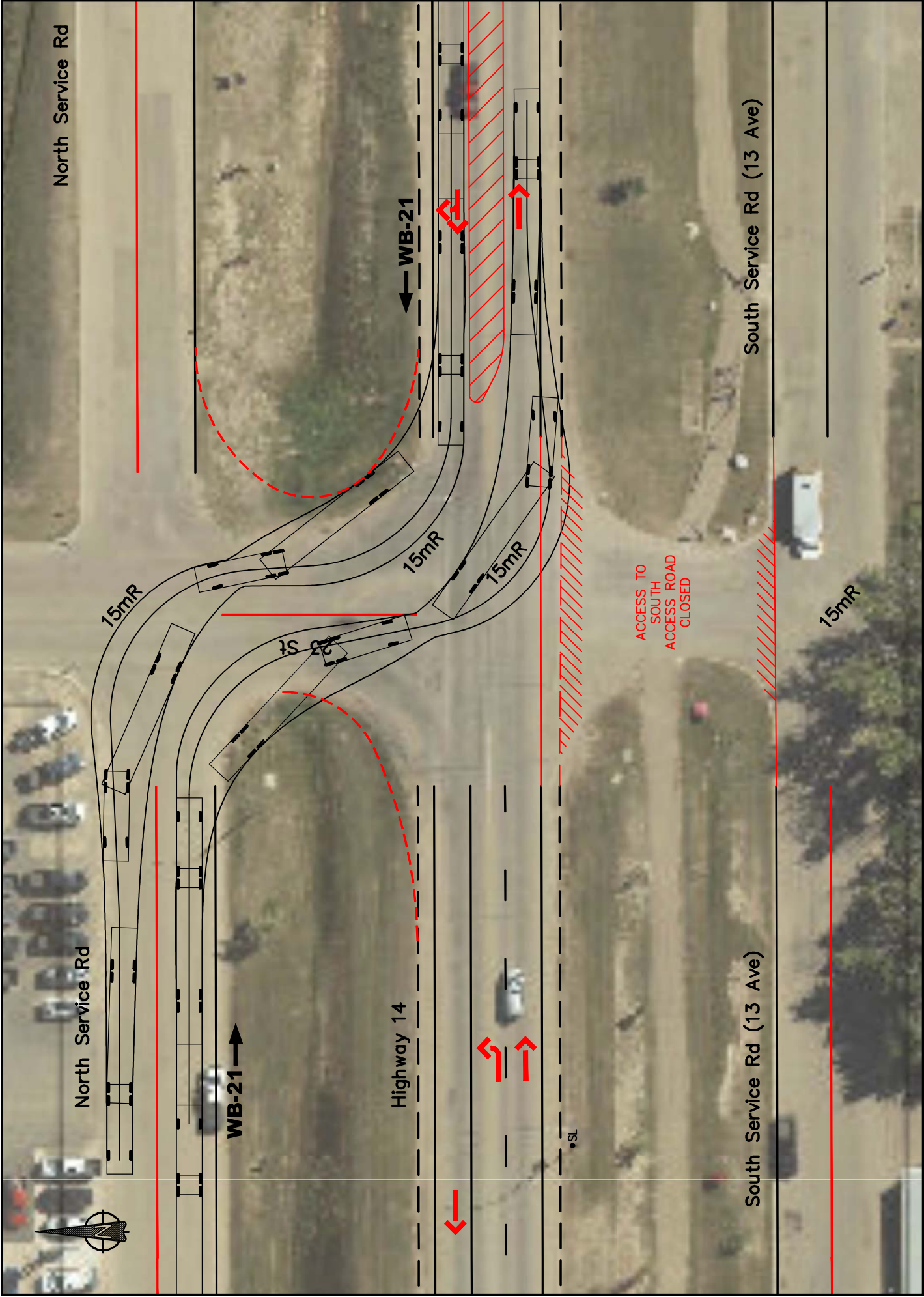
Hwy 14 & 23 St
WB-21 Swept Path ALC-D3X



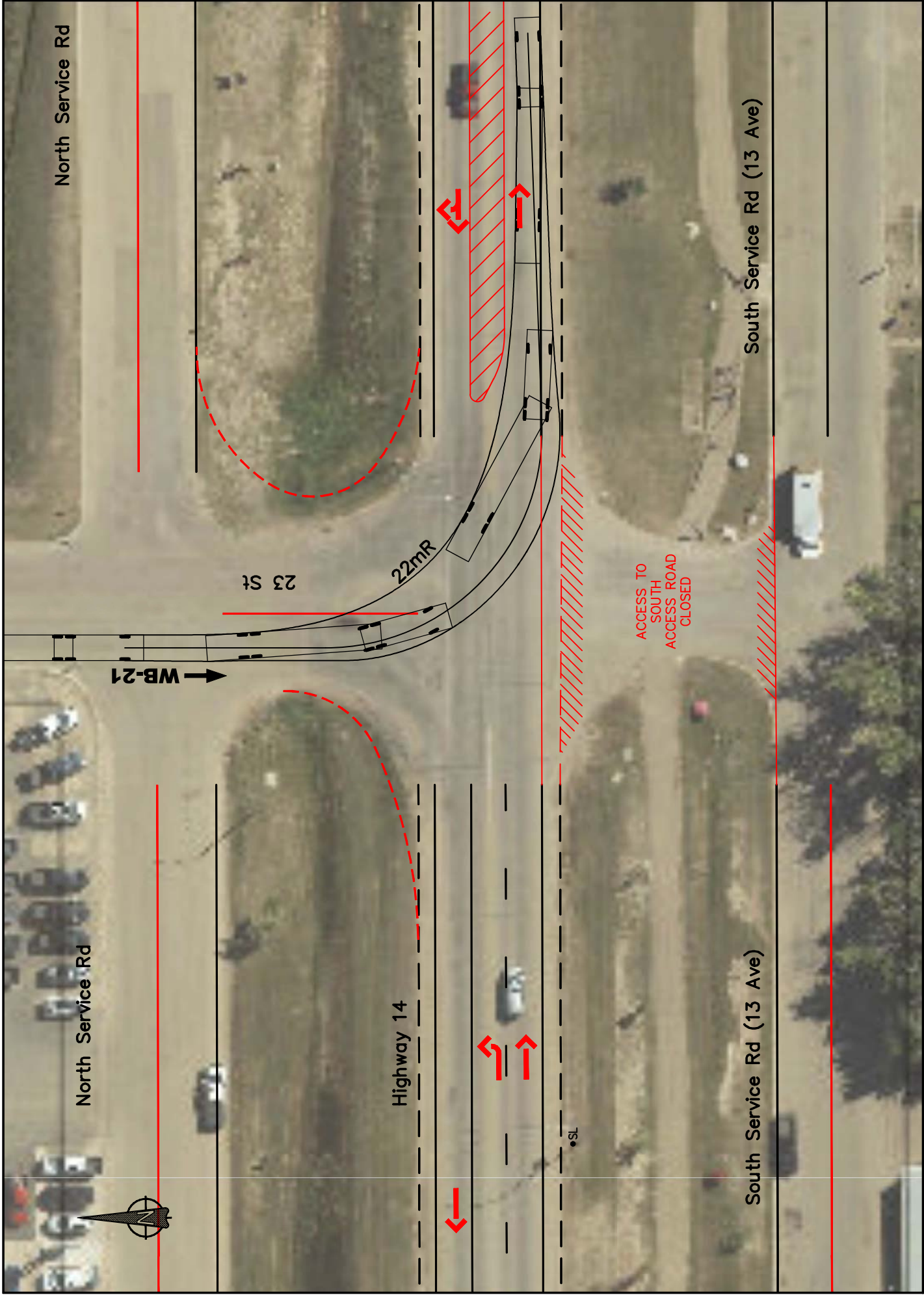
Hwy 14 & 23 St
WB-21 Swept Path ALC-B4-X



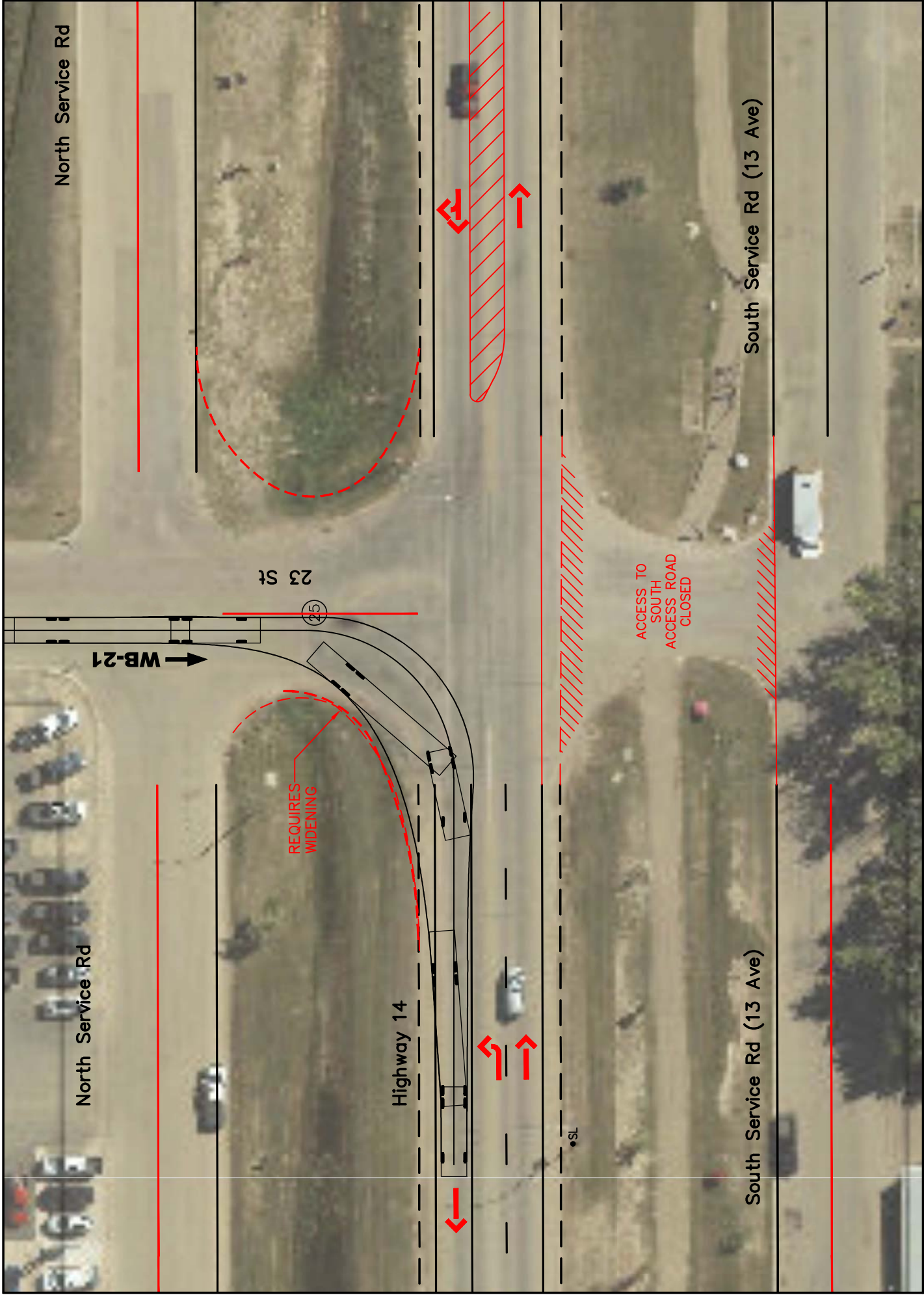
Hwy 14 & 23 St
WB-21 Swept Path ALC-C5X



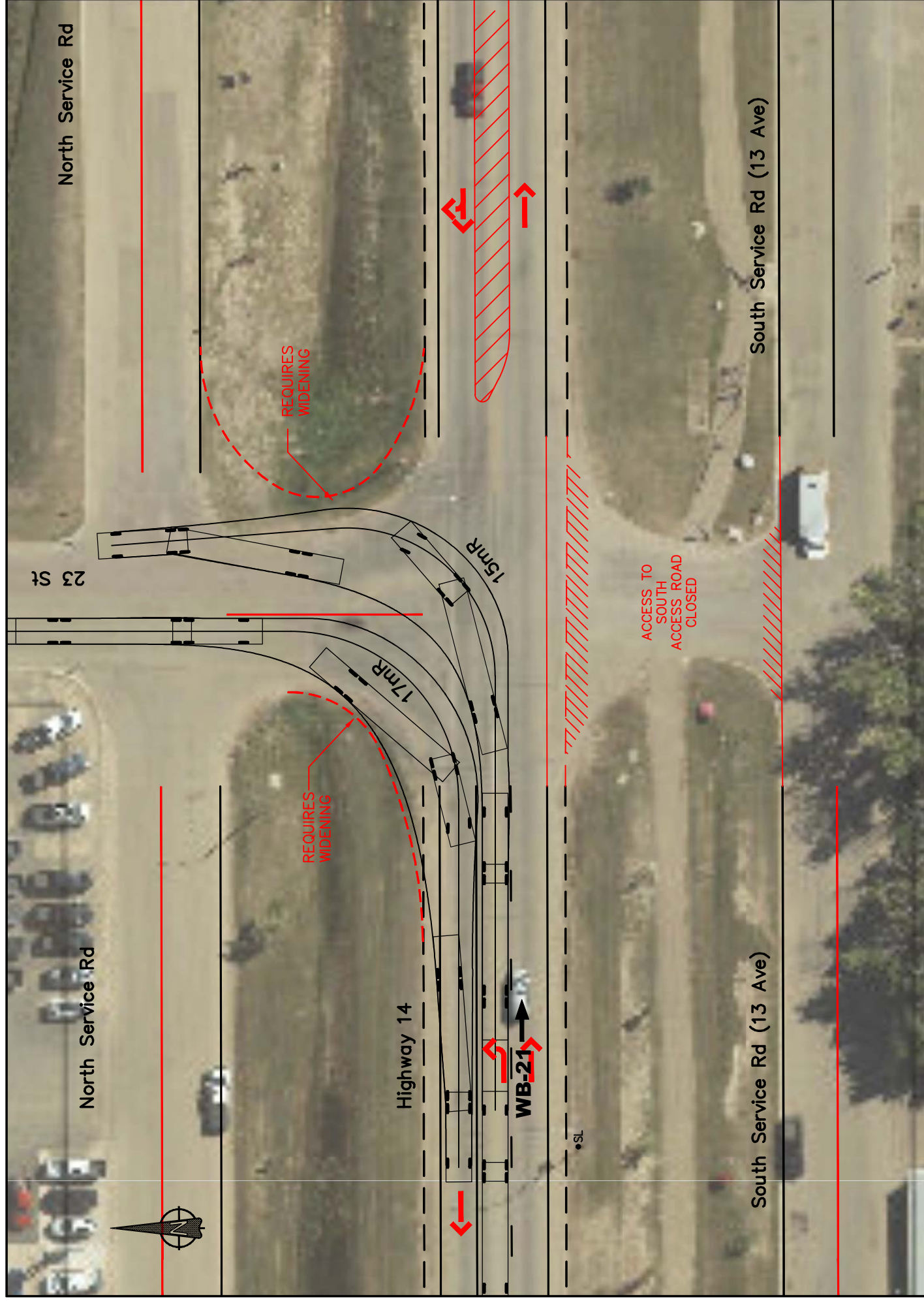
Hwy 14 & 23 St
WB-21 Swept Path ALC-D4X



Hwy 14 & 23 St
WB-21 Swept Path ALC-A1



Hwy 14 & 23 St
WB-21 Swept Path ALC-A2

Hwy 14 & 23 St
WB-21 Swept Path ALC-C1-X

Swept Path Check

27 - 27 Street

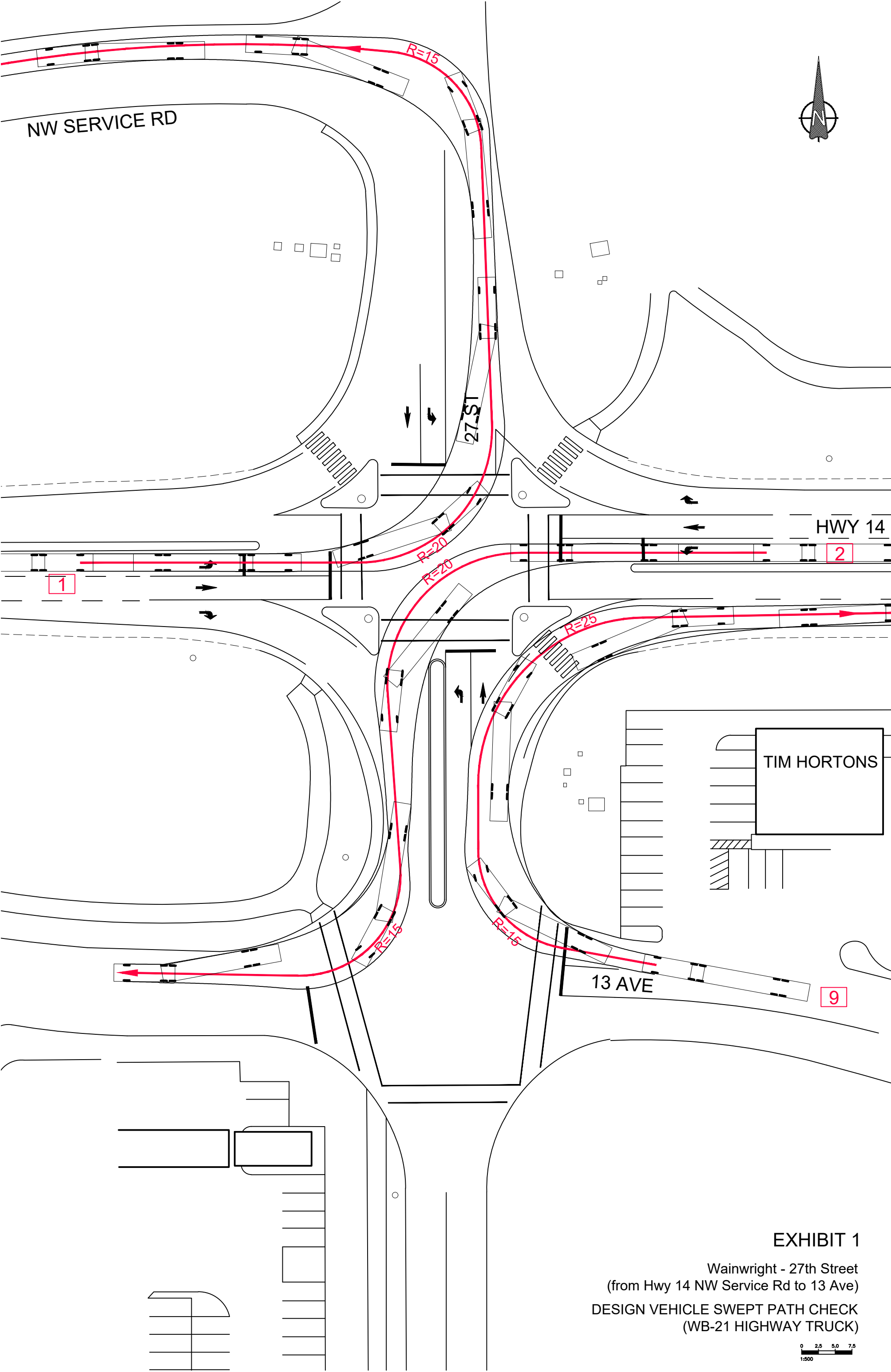


EXHIBIT 1

Wainwright - 27th Street
(from Hwy 14 NW Service Rd to 13 Ave)

DESIGN VEHICLE SWEEP PATH CHECK
(WB-21 HIGHWAY TRUCK)

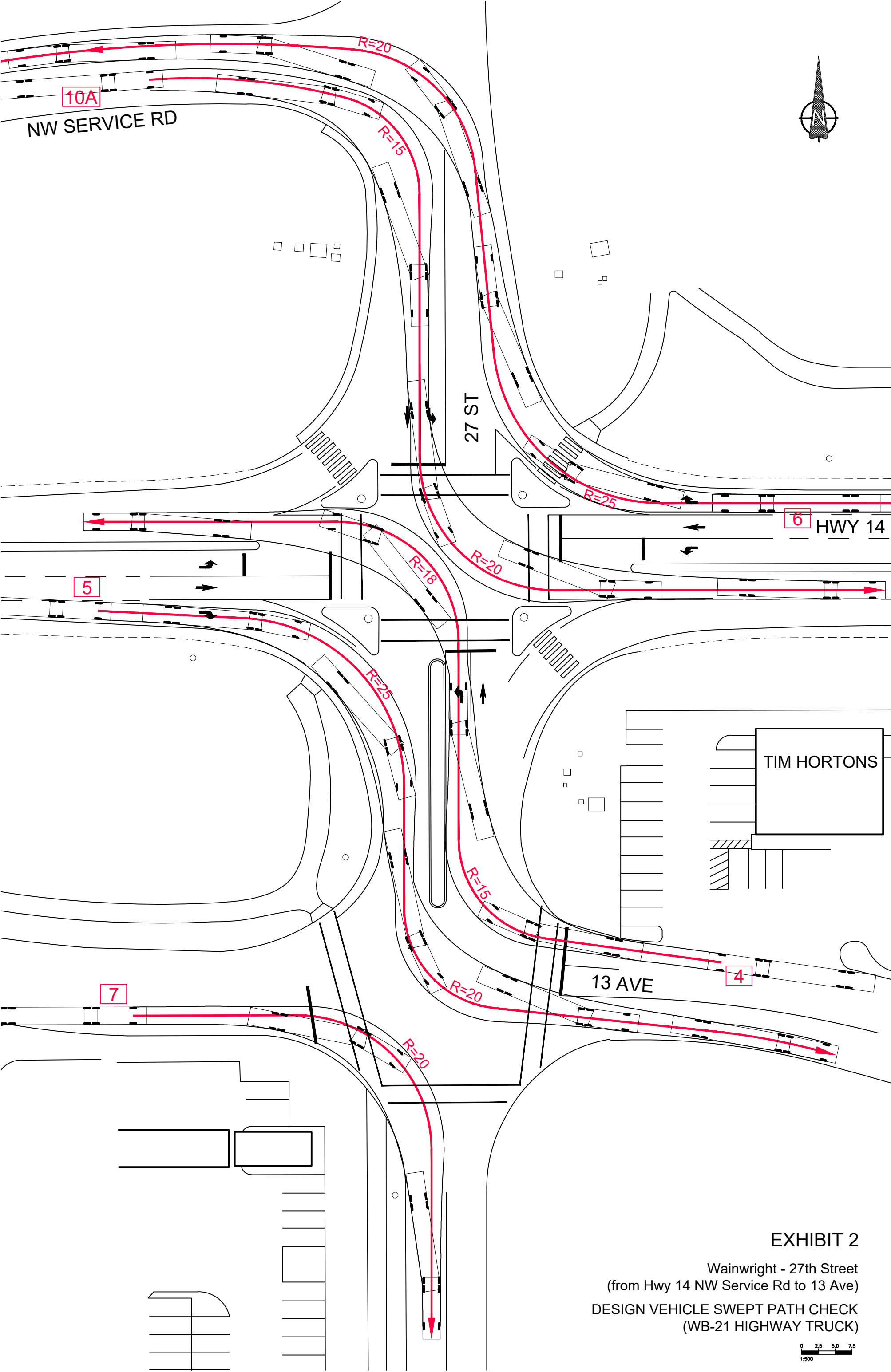


EXHIBIT 2

Wainwright - 27th Street
(from Hwy 14 NW Service Rd to 13 Ave)
DESIGN VEHICLE SWEEP PATH CHECK
(WB-21 HIGHWAY TRUCK)

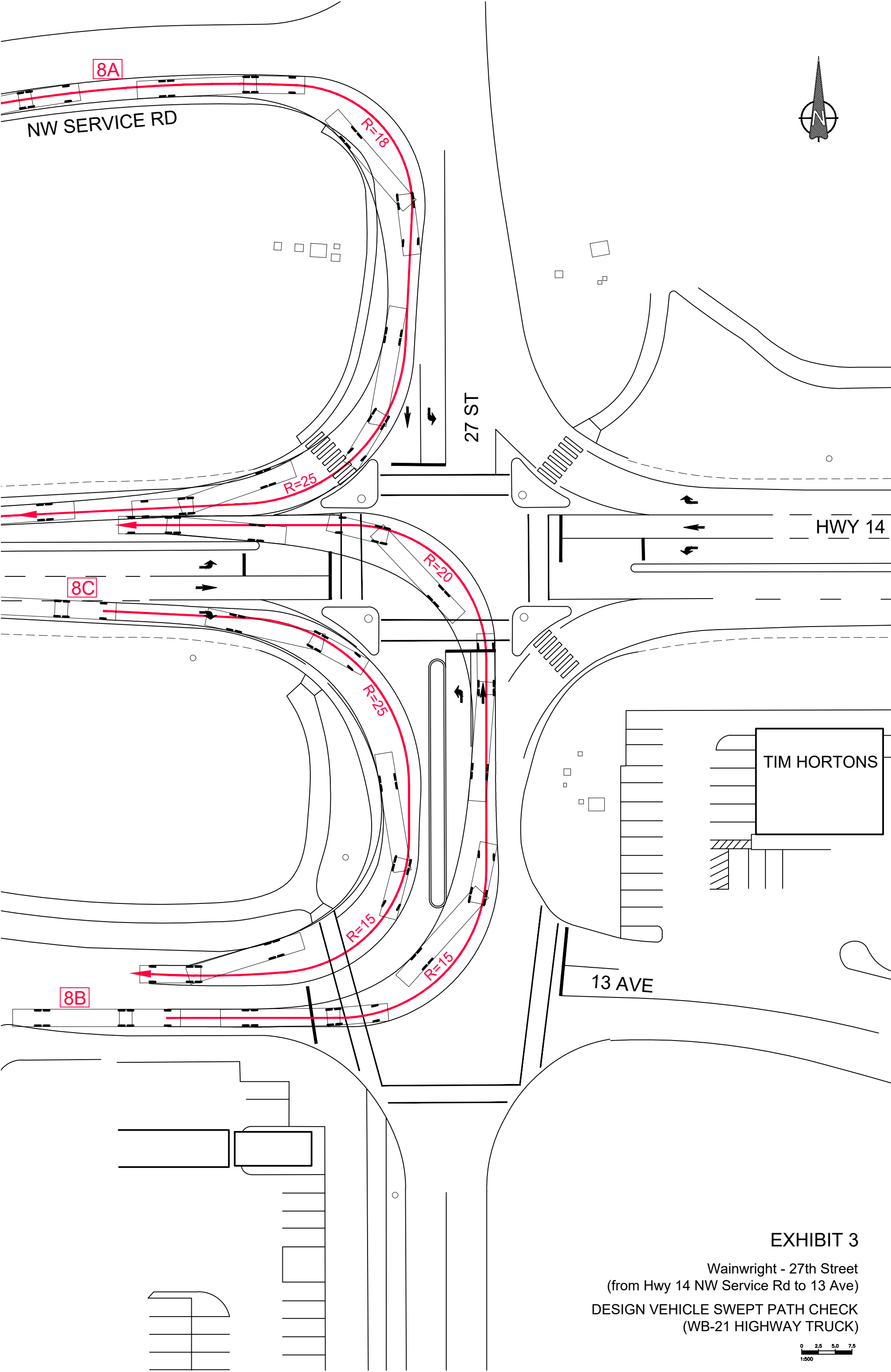


EXHIBIT 3

Wainwright - 27th Street
(from Hwy 14 NW Service Rd to 13 Ave)
DESIGN VEHICLE SWEPT PATH CHECK
(WB-21 HIGHWAY TRUCK)

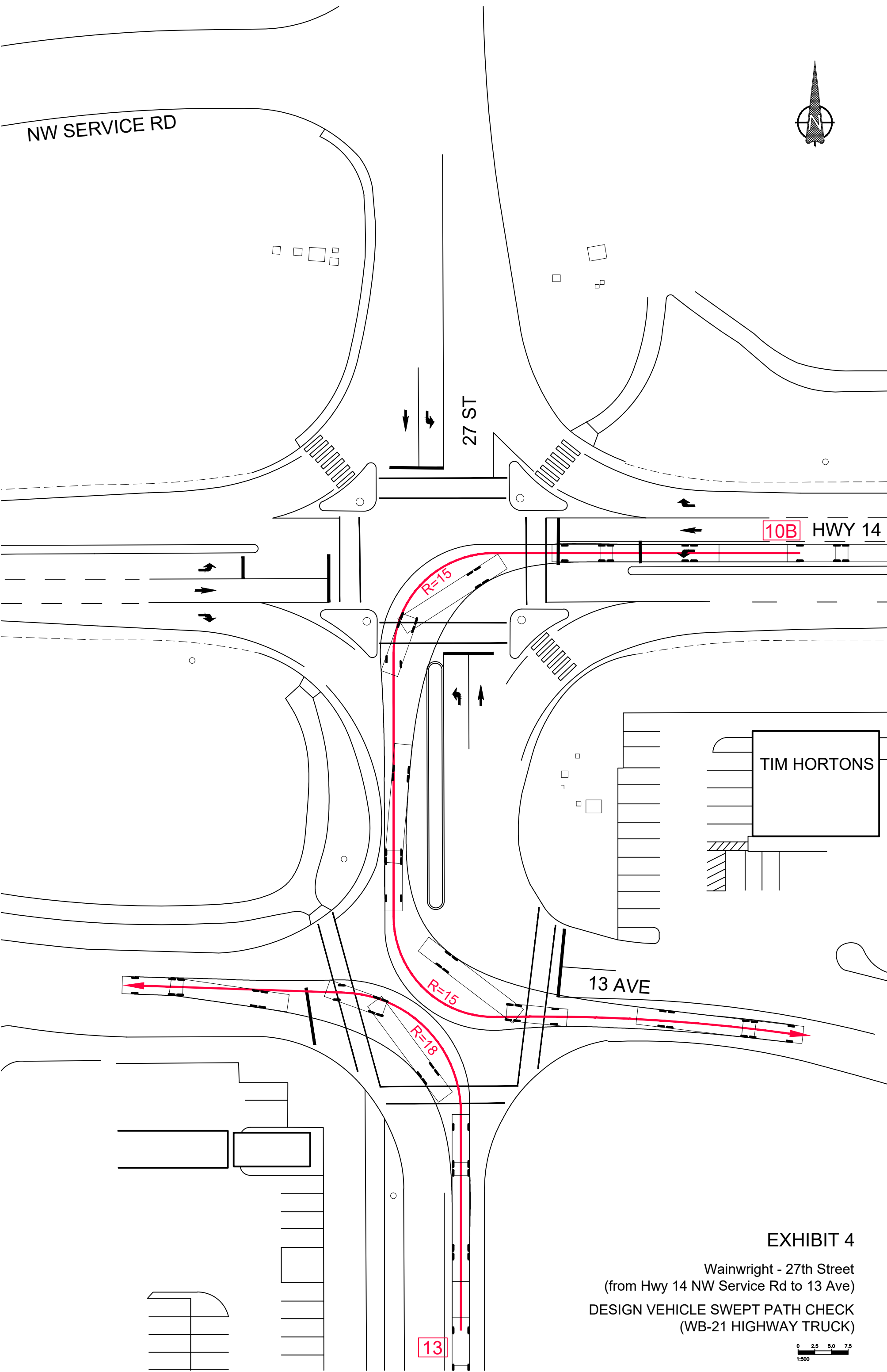
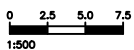


EXHIBIT 4

Wainwright - 27th Street
(from Hwy 14 NW Service Rd to 13 Ave)
DESIGN VEHICLE SWEPT PATH CHECK
(WB-21 HIGHWAY TRUCK)

13



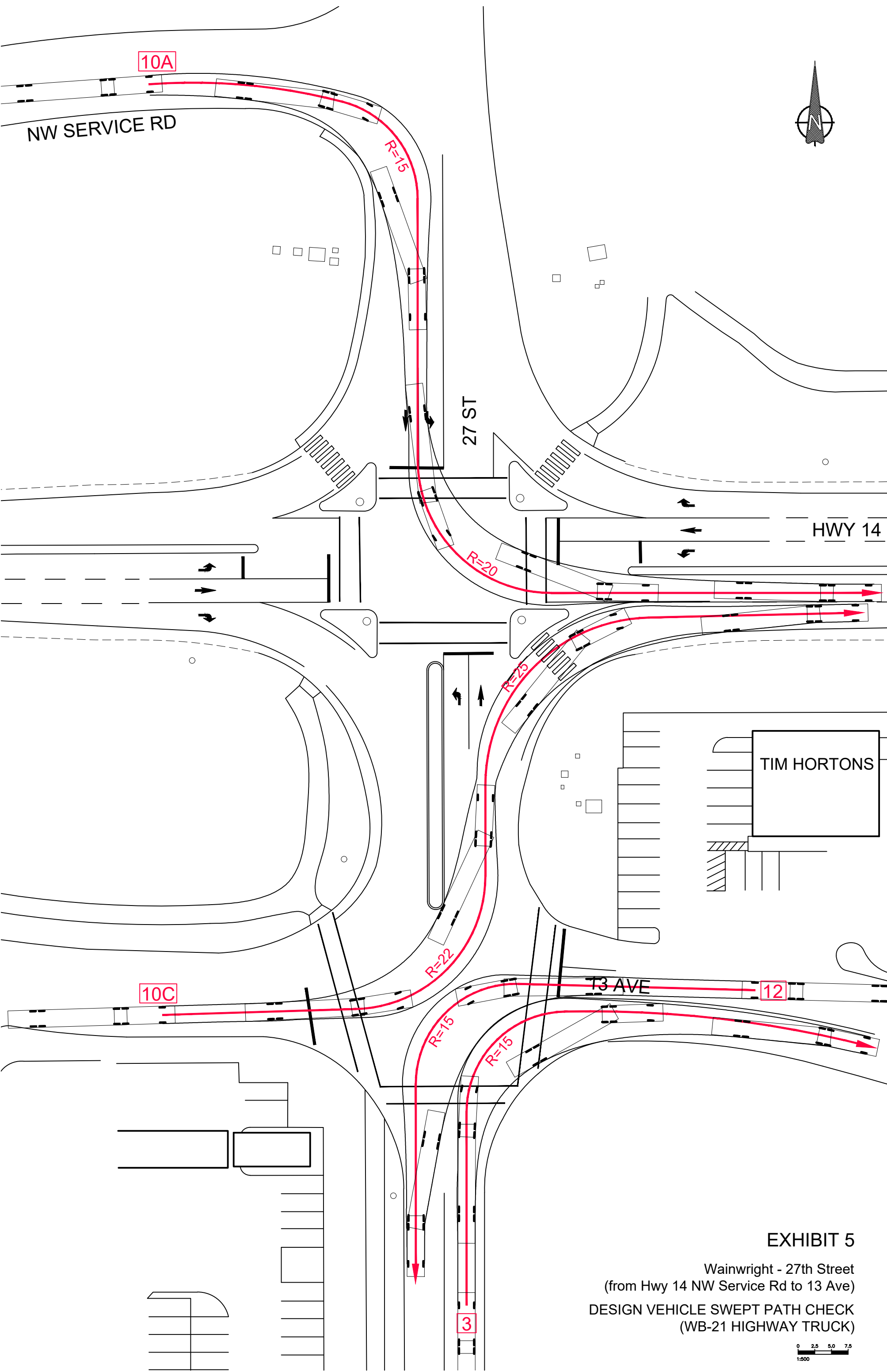


EXHIBIT 5

Wainwright - 27th Street
(from Hwy 14 NW Service Rd to 13 Ave)
DESIGN VEHICLE SWEEP PATH CHECK
(WB-21 HIGHWAY TRUCK)



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