DEERFOOT TRAIL STUDY

Option Package Definition

Technical Memorandum – DRAFT

February 2020

Calgary

Alberta Transportation

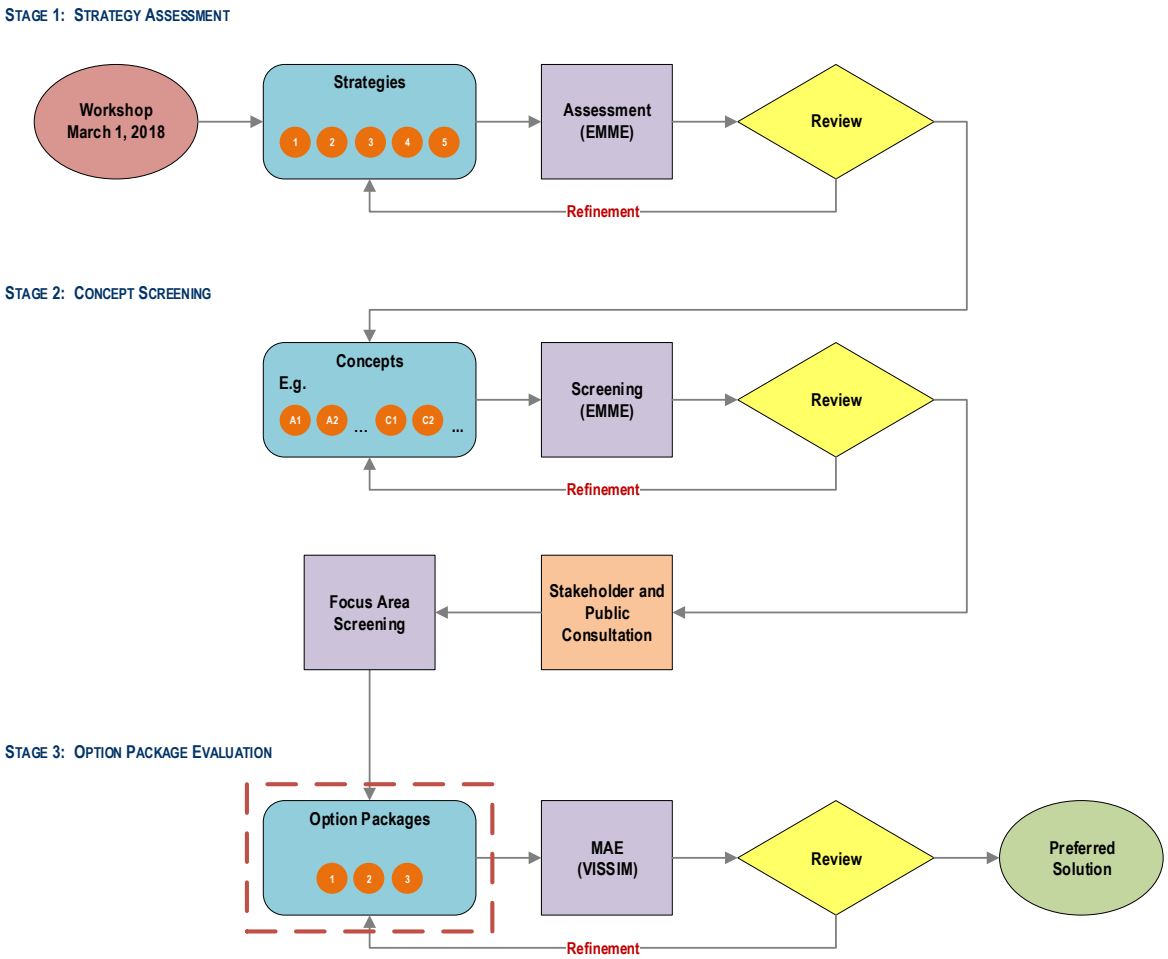
1. Introduction

This document presents the initial definition of the set of option packages that have been developed through a comprehensive option generation and screening process. These options packages, once finalized, will be the subject of the subsequent multiple account evaluation process to determine the long term solution for the Deerfoot Trail corridor.

The development of option packages for the Deerfoot Trail Study involved a three stage process to efficiently generate, assess, and screen various corridor improvements to address the numerous deficiencies identified along the entire length of the study corridor. This three stage process, shown in ***Figure 1*** and discussed in length in the Strategy Assessment and Concept Screening Criteria document submitted in March 2018, involves progressively more detailed analysis as the strategies were narrowed down to more definitive concepts and eventually to a series of option packages. The three stages are as follows:

- Stage 1: Strategy Assessment;
- Stage 2: Concept Screening; and
- Stage 3: Option Package Evaluation.

Figure 1: Option Evaluation Process



The first stage of the option evaluation process, Strategy Development, was completed in August 2018 with the assessment of 13 different corridor strategies involving varying approaches to provide additional capacity within and across the corridor.

Following the assessment of the various corridor strategies, several more detailed corridor wide concepts were developed based on the outcomes of the Strategy Assessment (Stage 1), input received from the "tool box" screening workshops held on February 28, 2018 and March 1, 2018, and other potential mitigation measures / corridor improvements under consideration. At this stage, the corridor wide concepts were developed to begin formulating the overall solutions to directly address the various deficiencies identified in the Problem Definition Report. Through this initial step of Stage 2, a total of eight concepts were developed under three general themes related to the proposed approach for adding overall capacity to the corridor, High Occupancy Lanes (A1, A2, A3), General Purpose Lanes (B1, B2, B3), and Collector Distributor Lanes (C1, C2).

The eight concepts were subsequently screened based on specified performance metrics to determine which concepts are feasible while providing the most efficient and effective improvements to the corridor. The outcome of the concept screening recommended that capacity improvements involving contiguous general purpose lanes or high occupancy lanes be considered further. The concept screening also indicated that collector distributor lanes extending north of Glenmore Trail may not provide sufficient benefits that outweigh the identified impacts, therefore collector distributor lanes should only be considered in the southern segment of the study corridor. Finally, the various concepts involving reversible lane systems were shown to provide minimal benefits and were therefore removed from further consideration.

In the subsequent third and final stage, Option Package Evaluation, the most feasible and promising components as identified in the screened-in concepts were combined to create several option packages. Other more detailed and focused improvements were also added to the options packages to address more specific traffic operations or safety related deficiencies. Several of the more site specific corridor improvements were generated at an Option Generation Workshop, held on January 30 and January 31, 2019. The workshop involved the generation of potential solutions to address complex traffic operations in two geographical areas generally focused on the Anderson Road / Bow Bottom Trail interchange and the 17 Avenue Interchange. In addition to these areas of focus, potential improvements for active transportation across the corridor were also generated as well as several potential technology considerations to augment any infrastructure changes to further improve traffic safety, operations, and reliability.

Following the generation and refinement of several improvement alternatives at the key areas of focus in addition to the other interchange improvements being considered, stakeholder and public consultation was undertaken in the fall of 2019 to solicit input that could be used to further refine the configuration of various infrastructure improvement elements under consideration. In addition, more detailed assessment of the options being considered at the key areas of focus was also conducted to potentially reduce the number of alternatives to be advanced to the option evaluation process.

Through this final stage, three option packages were defined with the basis of each package being one of the three complex infrastructure alternatives being considered at the Anderson Road / Bow Bottom Trail interchange area. In all option packages, a general approach of adding capacity in the corridor through the provision of a high occupancy vehicle lane in each direction was assumed. As such, the option of providing capacity in the form of a general purpose lane in each direction will be examined through sensitivity analysis at the conclusion of the option evaluation process.

The general feature of each option package is summarized below:

Option Package 1: Collector Distributor System begins at Anderson Road / Bow Bottom Trail and extends to Glenmore Trail (Based on Focus Area Option 3A)

Option Package 2: Collector Distributor System begins at Barlow Trail and extends to Glenmore Trail (Based on Focus Area Option 3B)

Option Package 3: Collector Distributor System begins at Barlow Trail and extends to Glenmore Trail with direct access between the core lanes and Blackfoot Trail (Based on Focus Area Option 3C)

Given the number and geographic range of the identified corridor issues, each option package involves multiple elements across three types or "layers" of improvements. These three layers include various traffic infrastructure elements located throughout the study corridor, several improvements to enhance active transportation across the corridor, and technology applications to further improve traffic safety operations and reliability.

Each option package is described in the following sections in terms of the various elements contained within the package as related to the three layers of potential corridor improvements, Traffic Infrastructure, Active Transportation Enhancements, and Technology Applications.

2. Traffic Infrastructure

Numerous potential corridor improvements have been identified and / or developed at several interchange locations along Deerfoot Trail in order to mitigate the identified deficiencies summarized in the Problem Definition Report. Many of these potential improvements have evolved through the full option evaluation process that began with Stage 1 Strategy Assessment, followed by increasing detail and focus in Stage 2 Concept Screening, and finally through further analysis and refinement in the initial activities of Stage 3 Option Evaluation. Other interchange and network improvements have been adopted from previous planning studies, where the recommendations are either recent and / or remain relevant with respect to the corridor deficiencies identified in this study.

A brief overview of the potential improvements under consideration, many of which have been refined and enhanced based on input from the stakeholder and public engagement activities, is provided below for each interchange location:

- **128 Avenue Interchange** – A new interchange is proposed with a half diamond configuration as per the current planning study being conducted by the City of Calgary.
- **Country Hills Boulevard Interchange** – Upgrades to this interchange are proposed to provide additional capacity across Deerfoot Trail as per the recent planning study conducted by the City of Calgary.
- **Airport Trail Interchange** – Upgrades are proposed to provide loop ramps for the NB to WB movement and the SB to EB movement as well as a directional ramp for the WB to SB movement. The western at-grade intersection would be removed. This new configuration is consistent with previous plans.
- **Beddington Trail Interchange** – Upgrades to this interchange are proposed to provide full movements. This configuration remains consistent with the concept presented at the public engagement events in the fall of 2019.
- **64 Avenue Interchange** – No changes are proposed.
- **McKnight Boulevard Interchange** – Proposed modifications to the interchange configuration include the provision of a directional ramp for the EB to NB movement and the removal of the WB to SB loop ramp.
- **32 Avenue Interchange** – Minor ramp widening is proposed on the NB off-ramp to provide two right turn lanes and two left turn lanes onto 32 Avenue east and west respectively. Minor intersection changes are proposed at the 12 Street NE intersection including the addition of a "jug handle" connection to the intersection to eliminate weaving manoeuvres across 32 Avenue between the NB off-ramp and the left turn lane to 12 Street NE.
- **16 Avenue Interchange** – Proposed upgrades to this interchange include a third level for 16 Avenue traffic such that this through traffic is removed from the existing ramp terminal intersections. This configuration remains consistent with the previous plans developed for the 19 Street / 16 Avenue interchange study.
- **Memorial Drive Interchange** – Two alternatives are under consideration for this interchange, both of which are consistent with the concepts presented at the public engagement events in the fall of 2019:
    - As per *Focus Area Option 2B*, the Memorial Drive interchange configuration would be modified to remove the south facing ramps. The SB to EB movement would be provided through a directional ramp. All at-grade intersections along Memorial Drive would be removed.

- As per *Focus Area Option 2C*, the Memorial Drive interchange configuration would remain as per the current configuration. Basket weave structures are proposed between the 17 Avenue interchange and the Memorial Drive interchange to eliminate the weaving operations between the on-ramps and off-ramps in both directions of travel.

- **17 Avenue Interchange** – Two alternatives are under consideration for this interchange, both of which are consistent with the concepts presented at the public engagement events in the fall of 2019:
  - As per *Focus Area Option 2B*, the interchange would be reconfigured to allow Blackfoot Trail to connect to Barlow Trail. A full movement interchange, in a Parclo B configuration, would remain between Deerfoot Trail and the new connector. An upgraded interchange, in the form of a diverging diamond, is proposed at the junction of Memorial Drive and Barlow Trail.
  - As per *Focus Area Option 2C*, the interchange is proposed to be reconfigured as a diverging diamond interchange. Basket weave structures are proposed between the 17 Avenue interchange and the Memorial Drive interchange to eliminate the weaving operations between the on-ramps and off-ramps in both directions of travel.

- **Peigan Trail Interchange** – Minor modifications are proposed at this interchange to remove the loop ramp for the WB to SB movement and to replace this existing ramp with a directional ramp.

- **50 Avenue Connector** – Two alternative configurations are under consideration for this proposed network improvement:
  - In the first alternative, Deerfoot Trail would remain in the existing highway alignment and the new four lane connector between 50 Avenue and 11 Street would follow a new alignment across the Bow River.
  - In the second alternative, Deerfoot Trail would be realigned to cross the Bow River further south of the existing bridge, which would allow the new four lane connector between 50 Avenue and 11 Street to use the existing Calf Robe bridge to cross the Bow River. This configuration is consistent with the concept presented at the public engagement events in the fall of 2019.

- **Glenmore Trail Interchange to Anderson Road / Bow Bottom Trail** – Three alternatives for this segment of the corridor, and the basis for the three options packages, are under consideration.
  - *Focus Area Option 3A:*
    - Glenmore Trail Interchange – Interchange upgraded to permit all movements between Deerfoot Trail and Glenmore Trail through the provision of several new directional ramps. The interchange has been configured as the terminus of the collector distributor system. Includes modifications to the Blackfoot Trail / Glenmore Trail interchange.
    - Heritage Meadows Way Interchange – Interchange reconfigured to connect to the collector distributor lane system.
    - Southland Drive Interchange – Interchange reconfigured to connect to the collector distributor lane system.
    - Anderson Road / Bow Bottom Trail Interchange – Interchange reconfigured as the terminus of the collector distributor system. The configuration is consistent with the concept presented at the public engagement events in the fall of 2019.

- *Focus Area Option 3B:*
  - Glenmore Trail Interchange – Interchange upgraded to permit all movements between Deerfoot Trail and Glenmore Trail through the provision of several new directional ramps. Includes modifications to the Blackfoot Trail / Glenmore Trail interchange.
  - Heritage Meadows Way Interchange – Minor modifications to the interchange to connect to the widened segment of Deerfoot Trail.
  - Southland Drive Interchange – Interchange reconfigured to connect to the collector distributor lane system.
  - Anderson Road / Bow Bottom Trail Interchange – Interchange reconfigured to connect to the collector distributor system. The configuration is consistent with the concept presented at the public engagement events in the fall of 2019.
- *Focus Area Option 3C*:
  - Glenmore Trail Interchange – Interchange upgraded to permit all movements between Deerfoot Trail and Glenmore Trail through the provision of several new directional ramps. Includes modifications to the Blackfoot Trail / Glenmore Trail interchange.
  - Heritage Meadows Way Interchange – Minor modifications to the interchange to connect to the widened segment of Deerfoot Trail.
  - Southland Drive Interchange – Interchange reconfigured to connect to the collector distributor lane system.
  - Anderson Road / Bow Bottom Trail Interchange – Interchange reconfigured to connect to the collector distributor system. Direct ramps to / from the core lanes in Deerfoot Trail to Blackfoot Trail / Southland Drive intersection. The configuration is consistent with the concept presented at the public engagement events in the fall of 2019.

- 24 Street Interchange – Two alternative modifications are under consideration for this interchange:
  - In the first alternative, the interchange ramps would be modified to accommodate the extension of the collector distributor lanes to Barlow Trail.
  - In the second alternative, the interchange ramps would be modified to accommodate widening of Deerfoot Trail with an additional lane in each direction of travel.
- Barlow Trail Interchange – Two alternative modifications are under consideration for this interchange:
  - In the first alternative, the interchange ramps would be modified to accommodate the extension of the collector distributor system which will terminate / start just south of this interchange.
  - In the second alternative, the interchange ramps would be modified to accommodate widening of Deerfoot Trail with an additional lane in each direction of travel.
- 130 Avenue Interchange – no changes are proposed for traffic operations.
- McKenzie Towne Boulevard Interchange – no changes are proposed for traffic operations.

The following table, ***Table 2.1,*** summarizes the distribution of the traffic infrastructure related improvements between the three option packages. Widening of Deerfoot Trail to accommodate an addition high occupancy vehicle lane in each direction of travel between Airport Trail and Barlow Trail, with the exception of the highway segments where the collector distributor system is being contemplated, is included in each option package. Exhibits showing the configuration of the various corridor improvements for each option package are attached in ***Appendix A.***

Table 2.1: Traffic Infrastructure "Layer"

COMPONENT	PACKAGE 1	PACKAGE 2	PACKAGE 3
128 Avenue (planned connection)	X	X	X
Country Hills Boulevard	X	X	X
Airport Trail (incorporate planned improvements WB-SB)	X	X	X
Beddington Trail – full movement interchange / current concept	X	X	X
64 Avenue – no improvements proposed	-	-	-
McKnight Boulevard (with new modifications developed)	X	X	X
32 Avenue (intersection improvements at 12 Street / 32 Avenue)	X	X	X
16 Avenue (incorporate planned improvements)	X	X	X
Memorial Drive (free flow modifications – compatible with Focus Area Option 2B)	X	X	
Memorial Drive (no modifications – compatible with Focus Area Option 2C)			X
17 Avenue (Focus Area Option 2B)	X	X	
17 Avenue (Focus Area Option 2C)			X
Peigan Trail (new modifications developed – SB on-ramp)	X	X	
50 Avenue Connector (with existing Deerfoot Trail Alignment)		X	X
50 Avenue Connector (with alternate Deerfoot Trail Alignment)	X		
Glenmore Trail (CD System Terminus)			X
Heritage Meadows Way (Modifications to Accommodate CD System)			X
Southland Drive (Modifications to Accommodate CD System)			X
Anderson Road / Bow Bottom Trail (Focus Area Option 3A)			X
Glenmore Trail (No CD System)	X		
Heritage Meadows Way (No CD System)	X		
Southland Drive (CD System Terminus)	X		
Anderson Road / Bow Bottom Trail (Focus Area Option 3B)	X		
Glenmore Trail (No CD System)		X	
Heritage Meadows Way (No CD system)		X	
Southland Drive (CD System Terminus)		X	
Anderson Road / Bow Bottom Trail (Focus Area Option 3C)		X	
24 Street (Modifications to Accommodate CD System)	X	X	
24 Street (Minor modifications to widen Deerfoot Trail to four lanes per direction)			X
Barlow Trail (Modifications to accommodate CD system terminus)	X	X	
Barlow Trail (Minor modifications to widen Deerfoot Trail to four lanes per direction)			X
130 Avenue (no improvements for traffic operation proposed)	-	-	-
McKenzie Towne Boulevard (no improvement for traffic operations proposed)	-	-	-

3. Active Transportation

Potential improvements for the Active Transportation "layer" are based on two general issues within the Deerfoot Trail corridor:

Barrier Effect. The Deerfoot Trail, which extends north south through the entire city, acts as a barrier for active transportation modes travelling in the east west direction. This barrier effect is either the result of the lack infrastructure to cross the corridor or the very long distance between available crossings. The quality of the existing facilities that do cross the highway also represents a significant issue as does the level of connectivity to the existing network on either side of the corridor. From the perspective of an active transportation user, the spacing between crossings, the condition of existing crossings, and the level of connectivity may be seen as a deterrent.

Accessibility: The lack of accessibility has been identified as another key issue affecting active transportation modes crossing the Deerfoot Trail corridor. Accessibility refers to the required elements in place to facilitate the use of the provided infrastructure. These elements include pedestrian/bike signal phases, ramps, signs, pavement markings, wayfinding as well as elements for people with reduced mobility, among others. Within the Deerfoot Trail corridor, many of these accessibility elements are lacking.

To address these two general issues affecting active transportation modes crossing the Deerfoot Trail corridor, the following infrastructure improvements have been generated, either as part of the Option Generation Workshop held on January 30 and January 31, 2019 or through synergies with the proposed traffic infrastructure improvements described in the previous section:

- 128 Street Interchange – Include a multi-use path (MUP) on one or both sides of the cross street when the interchange is constructed.
- Country Hills Boulevard Interchange – Include a multi-use path (MUP) on one or both sides of the cross street when the interchange is upgraded.
- Airport Trail Interchange – Consider upgrades to the existing facilities to create a Multi-Use Path (MUP), ideally on the north side of Airport Trail
- Beddington Trail Interchange – Include a multi-use path (MUP) on the north side of the new bridge structure crossing the Deerfoot Trail corridor as part of the proposed interchange upgrade.
- McKnight Boulevard Interchange – Develop a multi-use path (MUP) on the north side of the existing bridge structure by repurposing the westbound auxiliary lane between the ramp terminal intersections. To be considered in conjunction with the proposed interchange upgrades and the reconfiguration of the ramp terminal intersections to remove the free flow movements to / from McKnight Boulevard.
- 32 Avenue Interchange – Consider upgrades to the existing bridge structure to include a multi-use path (MUP) on the south side of the roadway.
- 16 Avenue Interchange - Develop a multi-use path (MUP) on the north side of the existing north bridge structure by repurposing one of the westbound lanes between the ramp terminal intersections. To be considered in conjunction with the proposed interchange upgrades where the through traffic along 16 Avenue will be relocated to a new structure.

- 8 Avenue Overpass – Consider upgrades to the existing bridge structure to include a multi-use path (MUP) on one side of the roadway.
- Pedestrian Overpass – Replace existing pedestrian overpass immediately south of the Memorial Drive interchange to improve accessibility. To be considered in conjunction with the proposed Memorial Drive and 17 Avenue interchange improvements.
- 50 Avenue Connector – Include a multi-use path (MUP) as part of the proposed 50 Avenue Connector either on the existing Calf Robe Bridge (repurposed deck space) or on a new alignment.
- Heritage Drive Interchange – Consider upgrades to the existing bridge structure to include a multi-use path (MUP) on one side of the roadway. Depending upon the new cross section on Deerfoot Trail, the existing bridge structure may need to be replaced.
- Southland Drive Interchange - Consider upgrades to the existing bridge structure to include a multi-use path (MUP) on one side of the roadway. Depending upon the new cross section on Deerfoot Trail, the existing bridge structure may need to be replaced.
- 24 Street Interchange – Consider modifications to the ramp terminal intersections to improve accessibility across the highway by removing the free flow movements to / from 24 Street.
- Barlow Trail Interchange Area – Consider providing new multi-use path (MUP) across Deerfoot Trail south of Barlow Trail.
- 130 Avenue Interchange - Consider modifications to the ramp terminal intersections to improve accessibility across the highway by removing the free flow movements to / from 130 Avenue. Possible extension of a multi-use path across Bow River to be investigated.
- McKenzie Towne Boulevard Interchange - Consider modifications to the ramp terminal intersections to improve accessibility across the highway by removing the free flow movements to / from McKenzie Towne Boulevard.

The following table, ***Table 3.1,*** summarizes the distribution of the active transportation related improvements between the three option packages. Exhibits showing the locations of the proposed active transportation improvements are provided in ***Appendix B.***

Table 3.1: Active Transportation "Layer"

COMPONENT	PACKAGE 1	PACKAGE 2	PACKAGE 3
128 Avenue Interchange (provide MUP with new design)	X	X	X
Country Hills Boulevard Interchange (provide MUP with new design)	X	X	X
Airport Trail Interchange (enhance existing facilities)	X	X	X
Beddington Trail Interchange (incorporate MUP)	X	X	X
McKnight Boulevard Interchange (repurpose deck space for MUP)	X	X	X
32 Avenue Interchange (considering adding MUP to existing bridge)	X	X	X
16 Avenue Interchange (repurpose existing deck space for MUP)	X	X	X
8 Avenue (consider adding MUP to existing bridge)	X	X	X
Memorial Drive Interchange (new MUP crossing to replace ped existing)	X	X	X
50 Street Connector (incorporate MUP)	X	X	X
Heritage Drive (consider adding MUP to existing structure)	X	X	X
Southland Drive (enhance pedestrian / cycling facility)	X	X	X
24 Street (reconfigure ramp terminals on arterial)	X	X	X
Barlow Trail Interchange Area (new MUP crossing Deerfoot Trail)	X	X	X
130 Avenue (reconfigure ramp terminals on arterial)	X	X	X
McKenzie Town Boulevard (reconfigure ramp terminals on arterial)	X	X	X

4. Intelligent Transportation Systems

Intelligent Traffic Systems (ITS) can be defined as the application of advanced information and communications technology to surface transportation in order to achieve enhanced safety and mobility while reducing the environmental impact of transportation. As part of the package of corridor improvements, a technology layer is also being proposed to augment any infrastructure changes to further improve traffic safety, operations, and reliability.

As part of the Option Generation Workshop held on January 30 and January 31, 2019, a number of ITS applications were identified as possible candidates for the Deerfoot Trail corridor. However, through the development of the traffic infrastructure related improvements, several potential ITS applications were deemed to be unnecessary or at least, to be considered in the long term. The retained ITS applications to be assigned to the three option packages include:

Network Management (Advance Traveller Information Systems)

The concept of using parallel roadways requires setting up a logical road network that can be managed. The logical network for Calgary at this point is essentially Deerfoot Trail and Stoney Trail with connections between the two highways such as 16 Avenue, Peigan Trail, and Glenmore Trail. To be able to manage the road network, knowledge of the traffic conditions is required. To understand traffic conditions on the network, travel times for all roads in the network are required through approaches such as web based big data systems or through on corridor systems such as Bluetooth readers. With travel times available, dissemination of this information to drivers is required to permit decisions to be made with regards to route choice. This will require the deployment of Variable Message Signs (VMS) at key locations, approximately 900 to 1200 metres upstream of a network interchange (route choice).

Maintenance of Existing Capacity – Incident Management

There are a number of components required to efficiently manage incidents as follows:

- Quick detection of the incident.
- Quick confirmation of the incident and determination of incident details.
- Quick response to the incident scene of necessary services to respond to all the needs at the scene.
- Coordinated and efficient action at the scene.
- Information to warn motorists about the incident and lane blockage details to minimize secondary collisions.
- Traffic condition information to motorists to allow them to use alternate routes if appropriate.
- Traffic incident information to motorists to provide traffic calming.

Based on the existing deployment of CCTV along the corridor, an enhanced incident management system would include further vehicle detection along the corridor, improved CCTV coverage, and additional dynamic message signs (DMS) to provide information to other drivers. Improved functionality at the traffic management centre will be required to manage detected incidents in terms of confirmation, response actions, coordination of agencies, and information dissemination to drivers and other stakeholders.

Queue Warning System

To improve traffic safety along the corridor, especially in areas of recurring congestion or to prevent secondary incidents resulting from traffic congestion related to an earlier incident, a queue warning system is suggested as part of the over package of corridor improvements.

A queue warning system would require vehicle detection, similar to the incident management system introduced above, and a means of disseminating warnings to approaching drivers which could be provided by strategically placed dynamic message signs along the corridor. This application could form part of a comprehensive Advanced Traffic Management System (ATMS).

Lane Management

Lane management provides information to drivers on the status of each lane ahead, and this information is provided at regular intervals along the highway corridor. The lane status, typically indicated through the use of lane control signals mounted on overhead gantries, will warn approaching drivers of a closed lane and the need to change lanes in advance.

A lane management system will provide information to drivers on the lane status as a result of a downstream incident, maintenance activity, or congestion.

Speed Harmonization

Speed harmonization involves the use of variable speed signs that recommend lower speeds to improve highway operations when traffic flow is approaching "breakdown" conditions. The variable speed signs would be mounted on gantries (similar to the lane control signals noted above) located at regular intervals along the highway corridor. In addition to improving the efficiency of the highway operations / capacity, the variable speed signs can also be used to improve safety during adverse weather conditions or in congested traffic when lower travel speeds are advisable.

Table 4.1: Intelligent Transportation Systems "Layer"

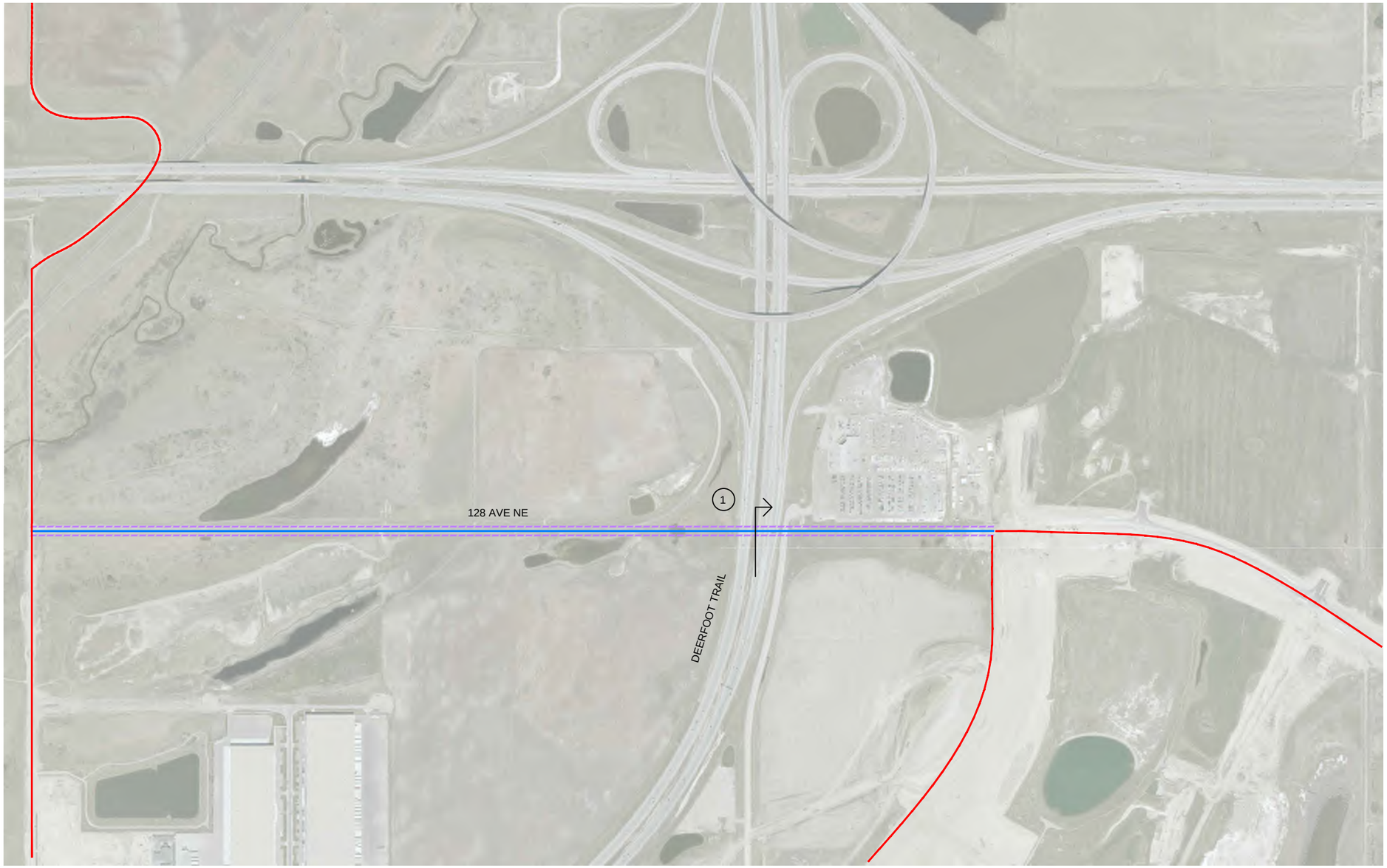
COMPONENT	PACKAGE 1	PACKAGE 2	PACKAGE 3
Network Management – enhance the existing traveller information (ATIS) along the Deerfoot Trail corridor	X	X	X
Incident management (CCTV, CMS, ATMS)	X	X	X
Queue warning system	X	X	X
Lane management – long term			
Speed harmonization – long term			

Appendix A

Traffic Infrastructure Option Packages

Appendix B

Active Transportation Improvements



LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
128 AVE NE
DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
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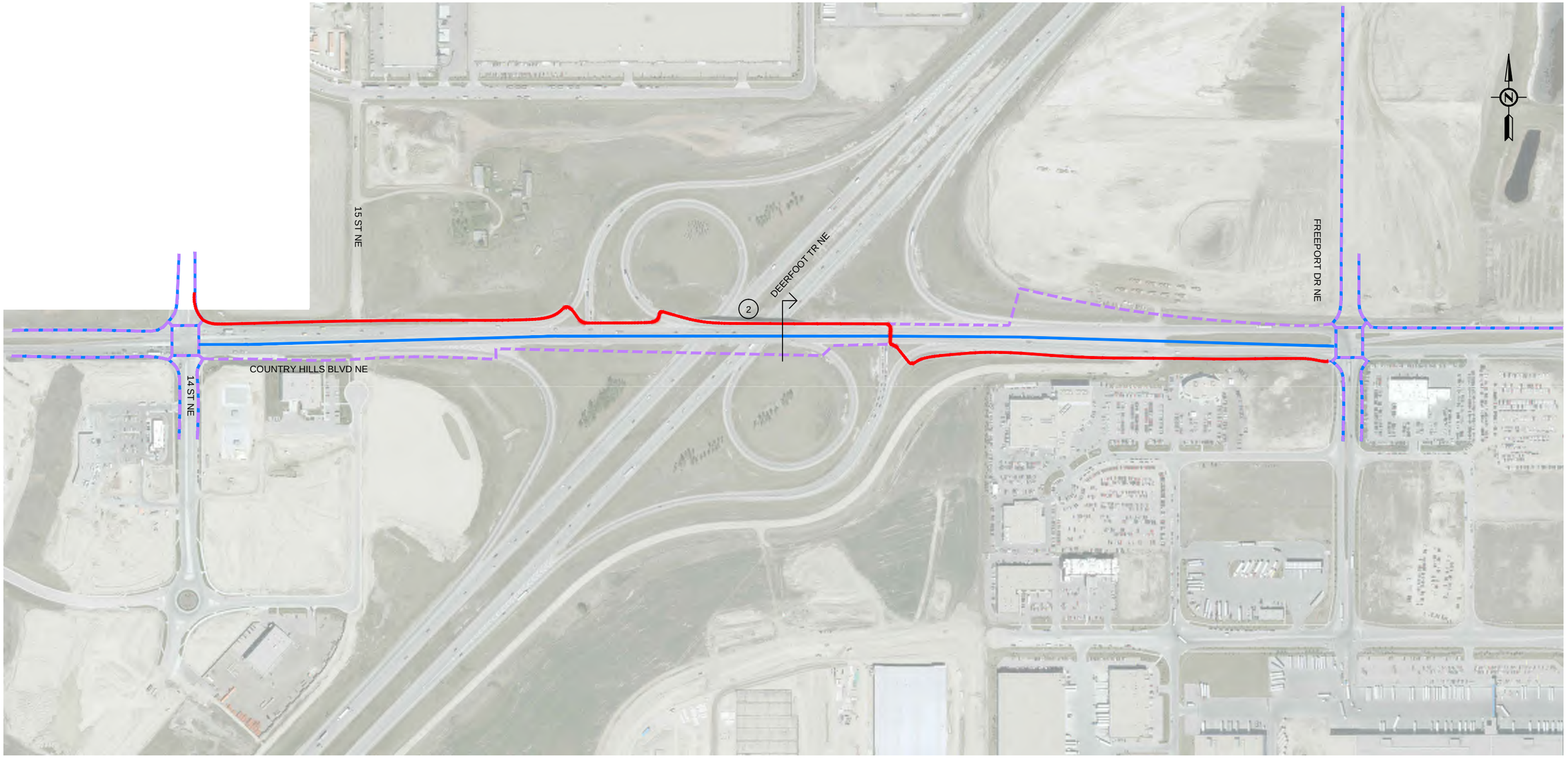

LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND
DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
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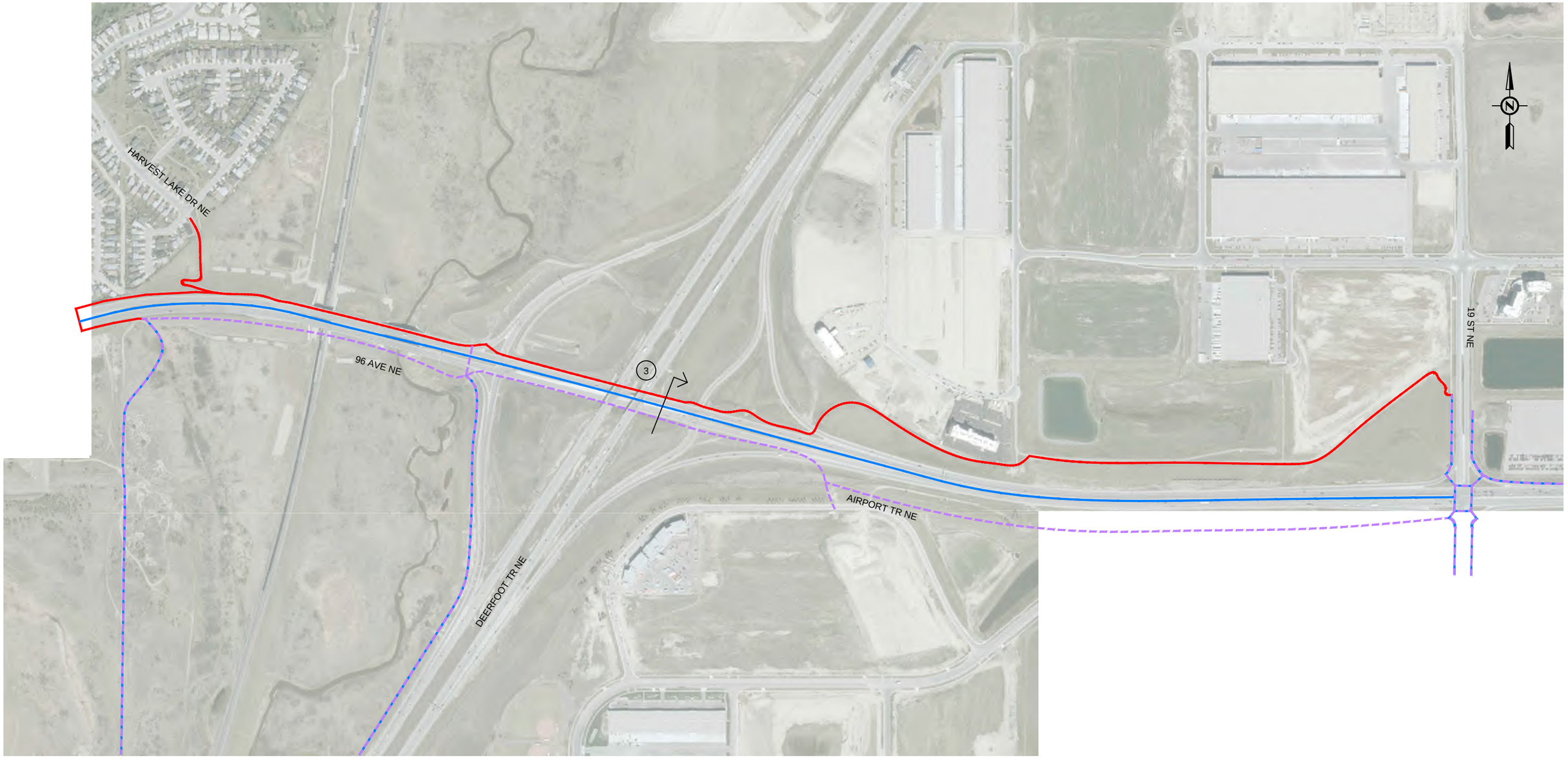

LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
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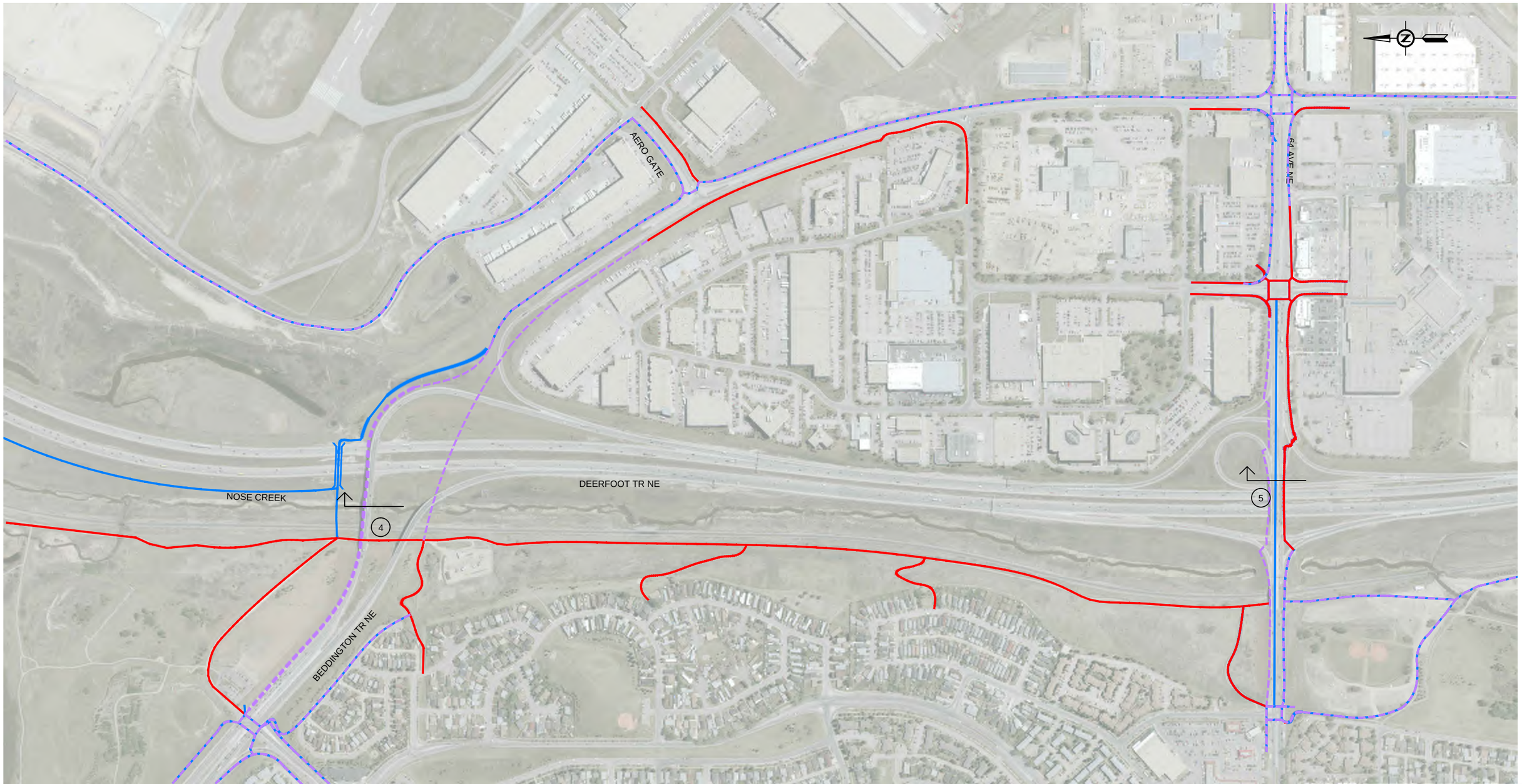

LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
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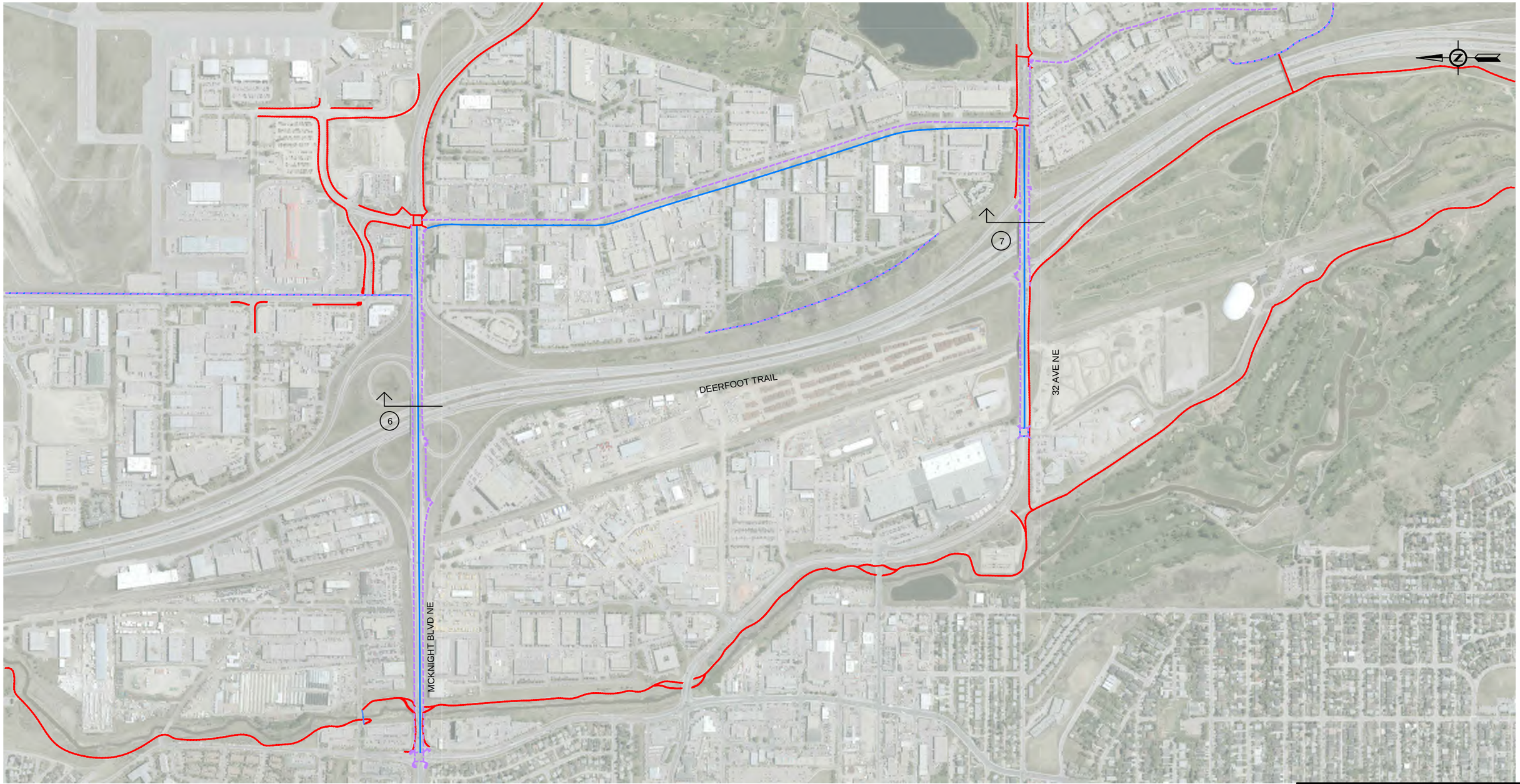

LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND
DEERFOOT TRAIL INTERCHANGE

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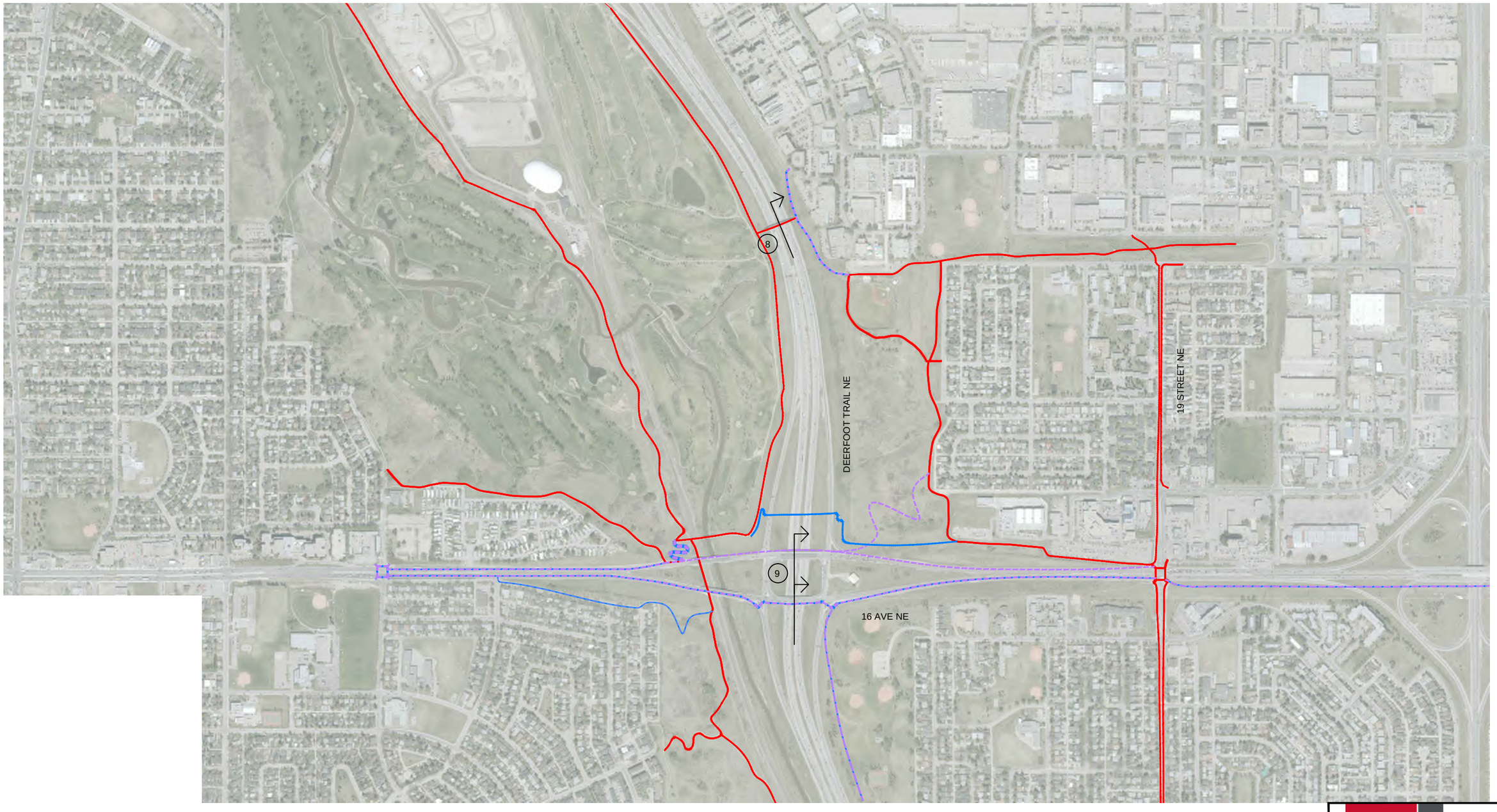

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- MUP OPTION 2
- COMBINED OPTION 1&2

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DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND DEERFOOT TRAIL INTERCHANGE

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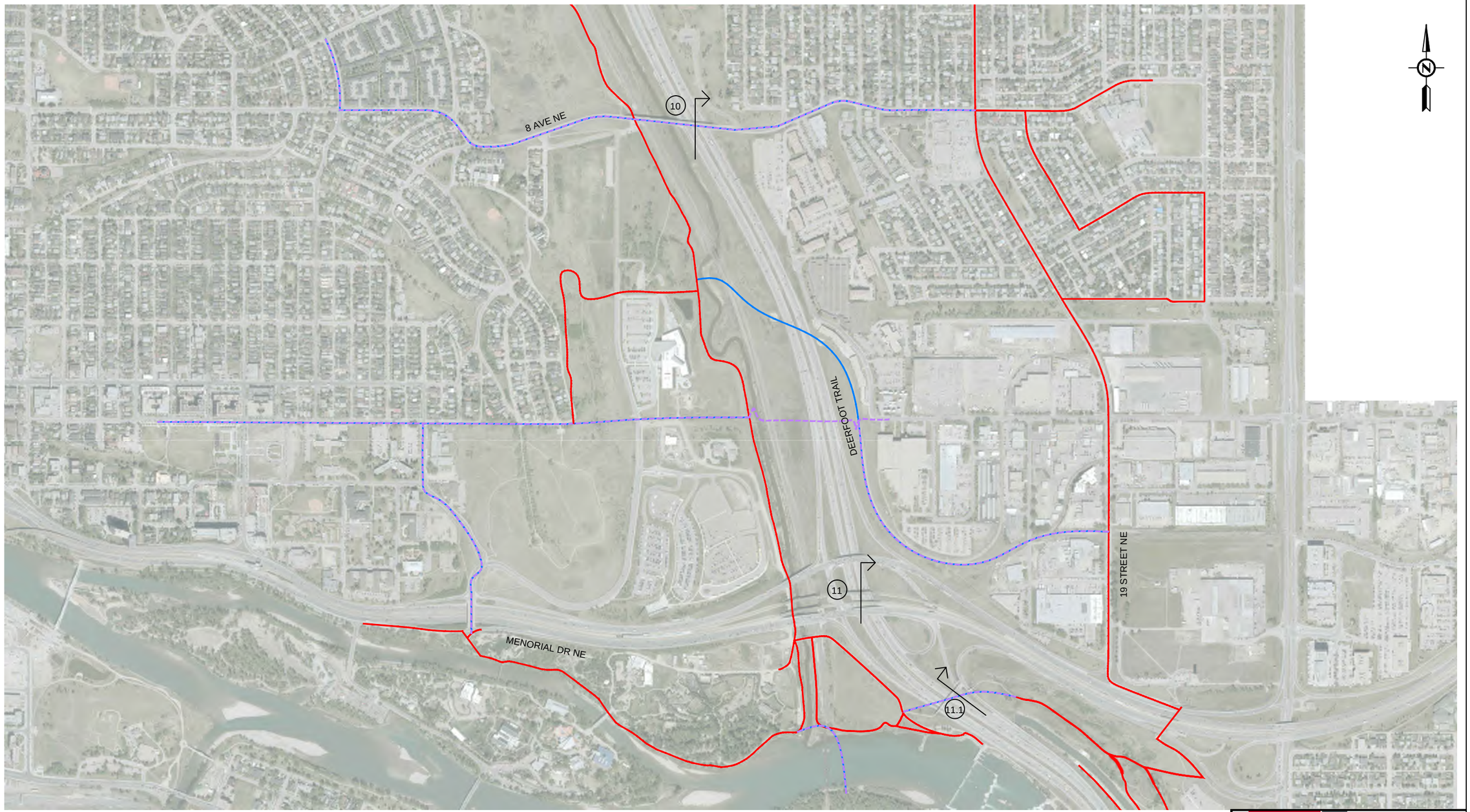

LEGEND:

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- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

Calgary

PROJECT

DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND
DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
602976-RD-SK-MUP	AS SHOWN	10A/11A

LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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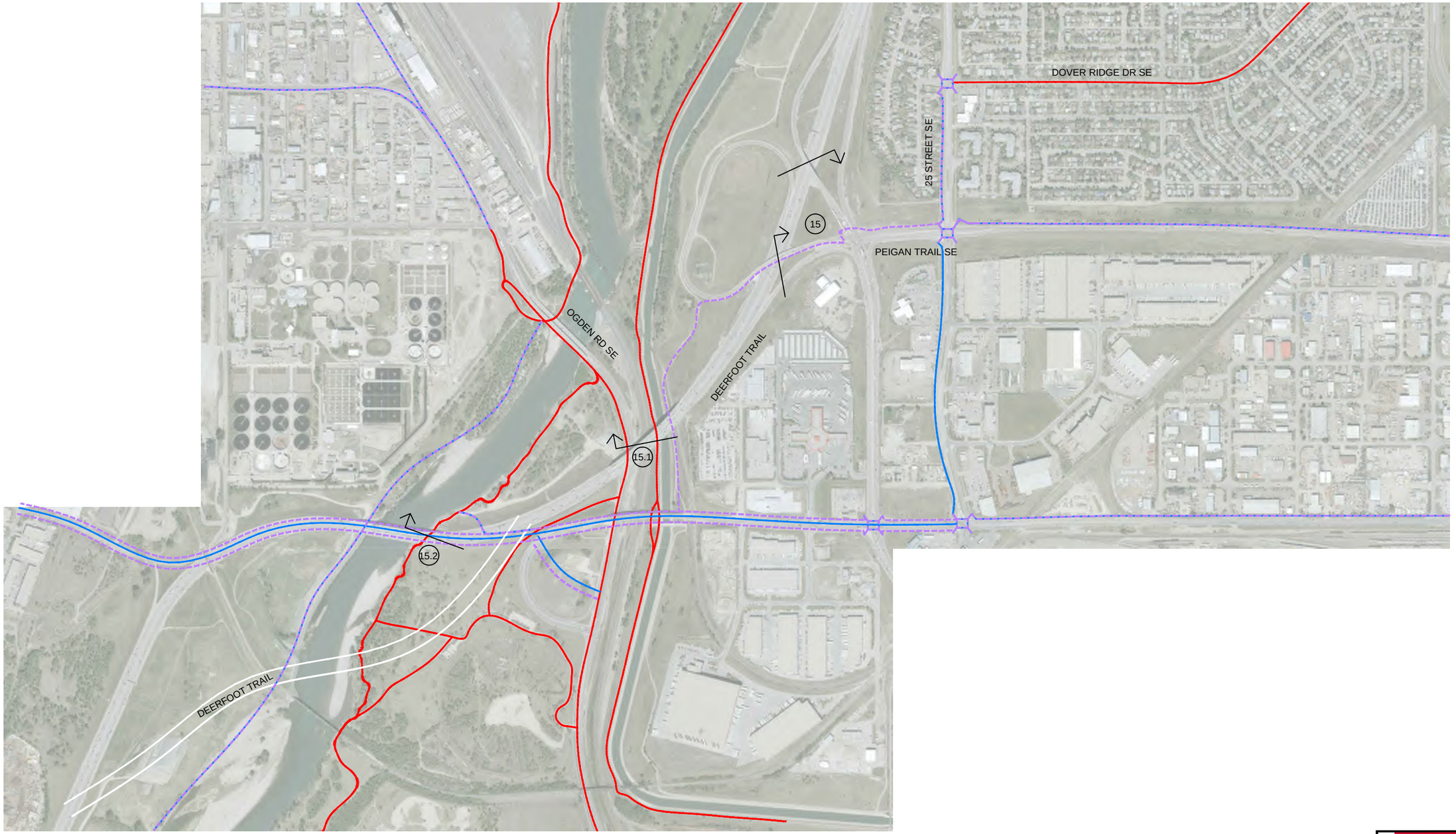
PROJECT

DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
602976-RD-SK-MUP	AS SHOWN	12A-14A



LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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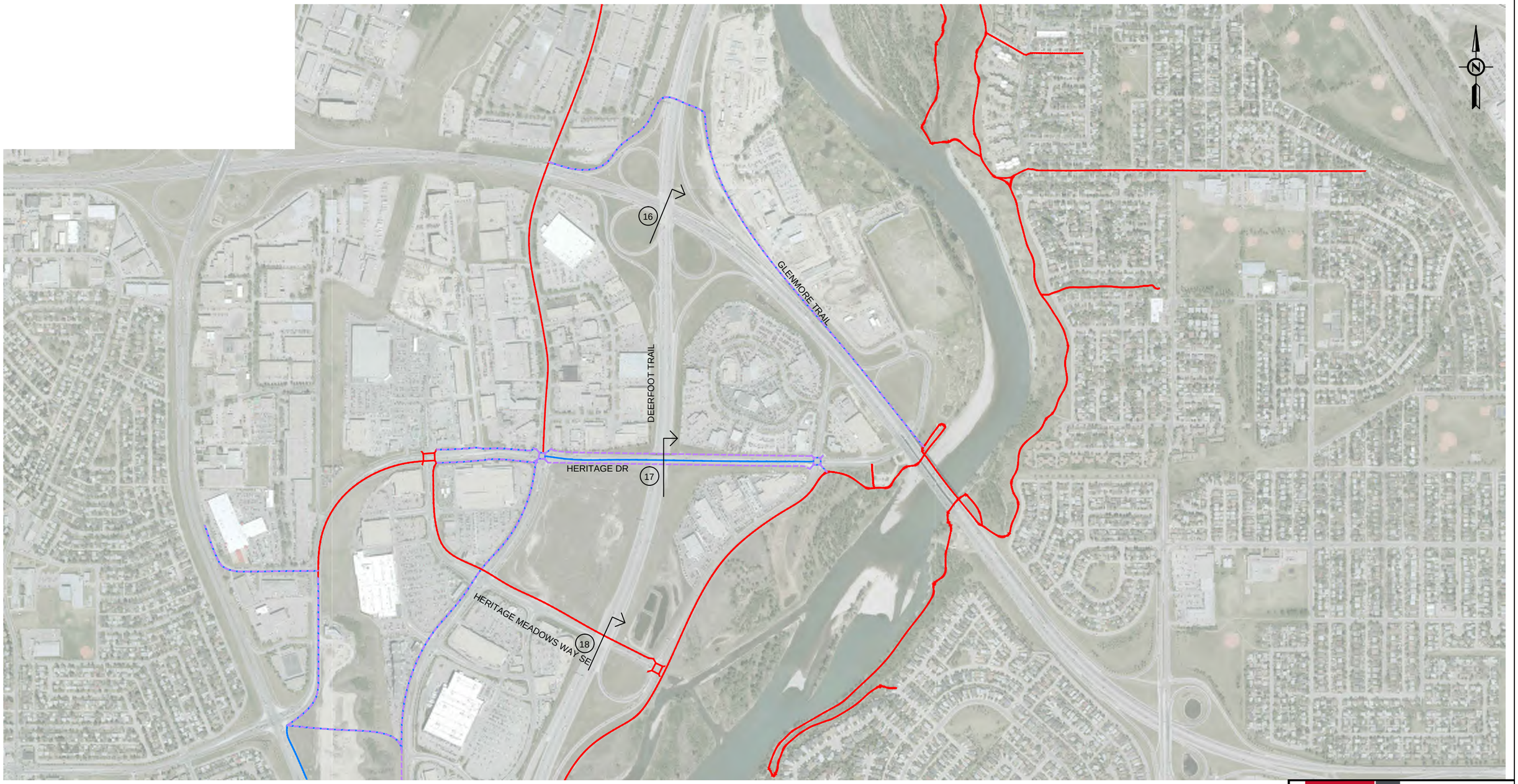
DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND
DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
602976-RD-SK-MUP	AS SHOWN	15A



LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND
DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
602976-RD-SK-MUP	AS SHOWN	16A-18A

11 STREET SE

19

DEERFOOT TRAIL

20

SOUTHLAND DRIVE SE

SOUTHLAND DR SE

LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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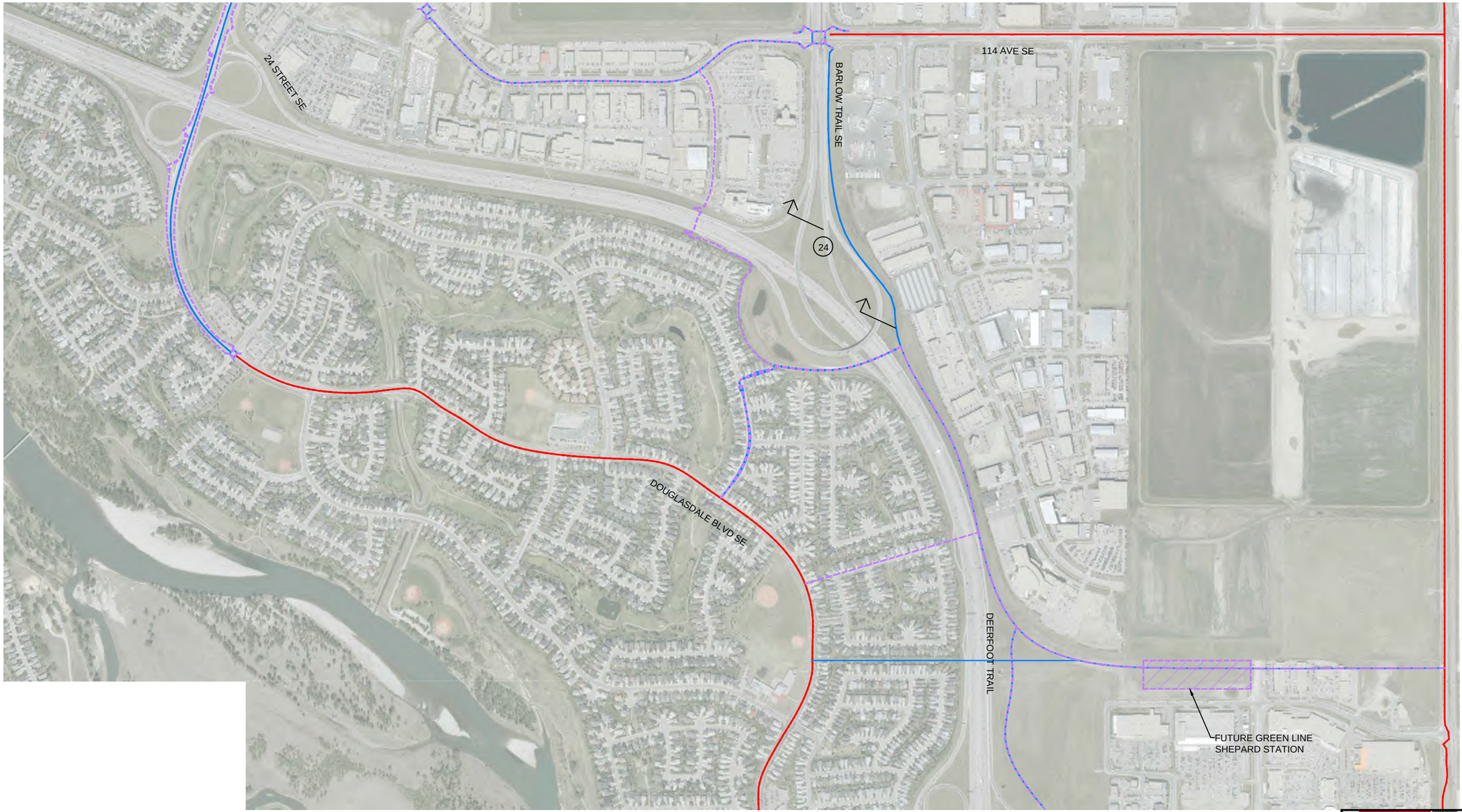
DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND
DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
602976-RD-SK-MUP	AS SHOWN	19A/20A



LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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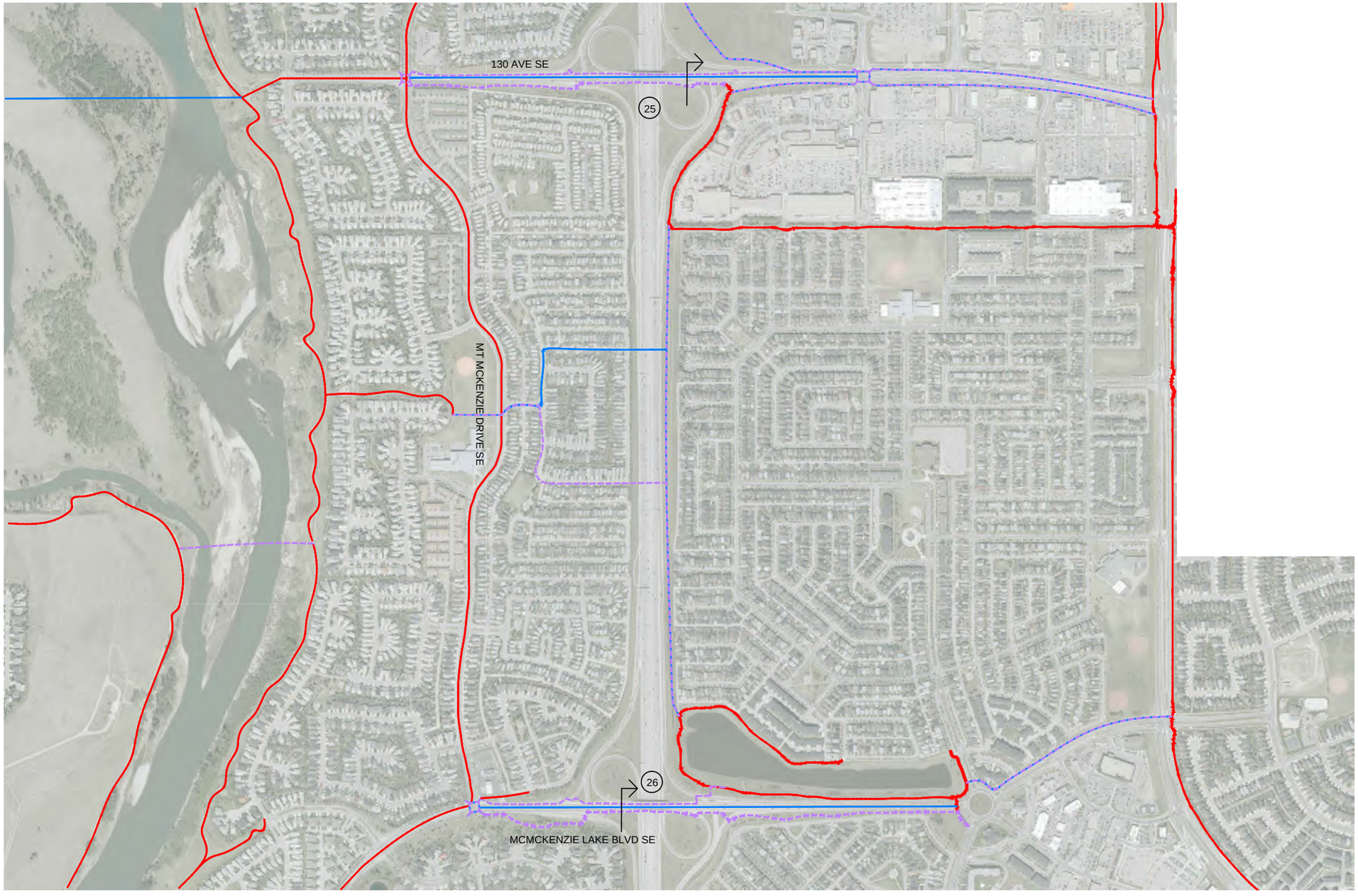
DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND
DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
602976-RD-SK-MUP	AS SHOWN	24A



LEGEND:

- EXISTING ACTIVE TRANSPORTATION INFRASTRUCTURE (SIDEWALKS, PATHWAY, AND MUP)
- MUP OPTION 1
- MUP OPTION 2
- COMBINED OPTION 1&2

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PROJECT

DEEFOOT TRAIL STUDY

FIGURE TITLE

MULTI - USE PATHS
BEDDINGTON TRAIL / 64 AVENUE AND
DEERFOOT TRAIL INTERCHANGE

FILE No.	SCALE	FIGURE No.
602976-RD-SK-MUP	AS SHOWN	25A/26A