

Memo

Date: April 12, 2017

Project: I-29 Exit 77 (41st Street) Environmental Assessment (EA)
Project # IM0293(A6)77 3014 N, PCN 03RA

To: Study Advisory Team

From: HDR

Subject: **I-29 Exit 77 (41st Street) Purpose and Need**

1.1 Introduction

The South Dakota Department of Transportation (SDDOT) and the City of Sioux Falls (the City) are studying alternatives to improve safety and enhance traffic operations at the I-29 Exit 77 (41st Street) interchange and along 41st Street in Sioux Falls, South Dakota. This memorandum contains the draft Purpose and Need statement for the project, and is intended for review and approval by the Study Advisory Team (SAT). Upon review and approval by the SAT, this statement will be presented to the public at the next Public Information Meeting/Open House. Public input will then be incorporated into the Purpose and Need statement for inclusion in Chapter 1 of the Environmental Assessment (EA) which is being prepared according to the provisions of the National Environmental Policy Act (NEPA) and corresponding regulations and guidelines of the Federal Highway Administration (FHWA), the lead federal agency, and the requirements of SDDOT, the joint lead agency. All alternatives evaluated for this project must satisfy the issues identified in the Purpose and Need statement in order to advance for further evaluation against a No Build alternative.

1.2 Project Background

The I-29/41st Street interchange in Sioux Falls is located in a fully developed urbanized area in the Sioux Falls metropolitan area. Land use at and near the interchange is comprised primarily of commercial development east of I-29 and a combination of commercial and residential properties west of I-29. Both the I-29 and 41st Street corridors serve as primary routes for commuters and local traffic. 41st Street is the most heavily traveled street in Sioux Falls and it provides access to virtually all levels of retail and employment centers; this has resulted in closely spaced accesses. A major feature of the I-29/41st Street area is the Empire Mall which consistently ranks among the state attractions that draws the most visitors. **Figure 1-A** shows the location of the I-29 and 41st Street corridors within the Sioux Falls area.

The *SDDOT 2010 Decennial Interstate Corridor Study* (2010 Interstate Study) identified a combination of operational and safety issues at the existing I-29 Exit 77 (41st Street) Interchange that contributed to its high crash rate (ranked second highest for the 3-year period from 2006 to 2009 in comparison to other interchanges in South Dakota).

The 2010 Interstate Study also noted the existing and predicted future poor Level of Service (LOS)¹ for traffic at the interchange ramp terminals with LOS E and F during existing peak hour traffic periods and LOS F for predicted year 2030 peak hour traffic periods.

As follow-up to the 2010 Interstate Study, SDDOT and the City of Sioux Falls initiated the *I-29 Exit 77 (41st Street) Crossroad Corridor Study* (2012 Corridor Study). The purpose of the 2012 Corridor Study was to:

- Identify specific traffic, safety, and access problems
- Develop potential improvement options
- Estimate approximate construction costs
- Prioritize potential construction projects and timeframes

The 2012 Corridor Study considered not only the I-29 Exit 77 (41st Street) interchange but also these City arterial street corridors:

- 41st Street from Valley View Road to Kiwanis Avenue
- Louise Avenue from 34th Street to 49th Street

The outgrowth of the 2012 Corridor Study was inclusion of an I-29 Exit 77 (41st Street) construction project in the 2017-2020 Statewide Transportation Improvement Program (STIP) as part of the 2021-2023 Developmental STIP.

1.3 **Project Limits**

The 2021-2023 Developmental STIP project limits were listed as:

- I-29 Exit 77 (41st Street) interchange
- 41st Street from just west of Marion Road to just west of Louise Avenue
- Arterial, collector, and local street intersections along 41st Street from just west of Marion Road to just west of Louise Avenue

Figure 1-B illustrates the limits of:

- 2012 Corridor Study roadways
- 2021-2023 Developmental STIP project
- NEPA evaluation logical termini

The logical termini were established in conjunction with the SAT during a project scoping meeting on January 27, 2016. The majority of direct impacts resulting from the Project would occur within the logical termini. However, some direct impacts and various indirect impacts may extend beyond the logical termini. **Figure 1-A** illustrates an approximate one-half mile EA Study Area buffer within which indirect impacts of the Project may occur such as traffic impacts during construction. Other potential cumulative impacts could occur within the buffer area or extend beyond this area.

¹ Level of Service (LOS) is a measurement for categorizing traffic flow on roadways and at intersections, generally during peak (worst congestion) traffic periods. The LOS scale is similar to classroom grading with LOS "A" being the best traffic conditions, i.e. free flow, and LOS "F" being the worst, i.e. gridlock.

Figure 1-A also illustrates the extent of roadways that must be examined as part of the Interchange Modification Justification Report for I-29 Exit 77 (41st Street).

1.4 Project Purpose

The primary purpose of this project is to correct roadway deficiencies and enhance traffic operations and safety for the I-29 Exit 77 interchange and 41st Street corridor immediately east and west of I-29. Specific considerations include:

- Improve the traffic capacity of the I-29 Exit 77 (41st Street) interchange and at signalized intersections along 41st Street to meet acceptable level of service (LOS) criteria² for predicted year 2023 (proposed year of improvements) and year 2045 traffic volumes.
- Improve the vehicular safety of the I-29 Exit 77 (41st Street) interchange and along 41st Street.
- Provide pedestrian facilities along the 41st Street corridor that promote safe access and use, and that comply with Americans with Disabilities Act (ADA) requirements.

1.5 Project Need

1.5.1 **Traffic Capacity**

I-29 Exit 77 (41st Street) Ramp Terminals – While a 2011 lane expansion project on I-29 ensured adequate I-29 capacity through 2035, the 2010 Interstate Study and the 2012 Corridor study showed that the ramp terminals operate at levels of service (LOS) below acceptable criteria.

41st Street East of I-29 – Existing 41st Street has 3 through lanes in each direction and a center two-way left-turn lane. Traffic congestion is generally a result of:

- high volume of right-turning traffic into and out of the closely spaced commercial business accesses which reduces the effective capacity of the outside through lane
- traffic backups from the I-29 ramp terminals and the Louise Avenue intersection



The photo above shows a typical commercial driveway along 41st Street with right-turning traffic from the outside traffic lane.

41st Street west of I-29 – Existing 41st Street has 2 through lanes in each direction and a center two-way left turn lane. With the exception of the I-29 ramp terminals, capacity is

² SDDOT has defined acceptable LOS at intersections such as the southbound and northbound I-29 ramps at 41st Street as LOS C or better. The City of Sioux Falls has defined acceptable LOS for signalized urban intersections such as the intersection of 41st Street and Marion Road as LOS D or better.

adequate along this segment of 41st Street for current conditions. However, as determined in the 2012 Corridor Study, without additional through lanes anticipated traffic growth west of I-29 will result in LOS below the acceptable LOS at the Marion Road and Terry Avenue signalized intersections.

41st Street/Louise Avenue intersection – Although existing and future LOS is below acceptable criteria for peak traffic periods, existing developments adjacent to the intersection limit the feasible opportunities for improvement of the intersection. Therefore, this intersection is not included in this Project, but will be included in a separate, subsequent Louise Avenue corridor project between 34th Street and 49th Street. However, any traffic impacts at this intersection resulting from capacity improvements at the I-29 Exit 77 (41st Street) interchange and along 41st Street will be evaluated in this assessment.

Figure 1-C provides an illustrative summary of traffic capacity deficiencies based on the 2012 Corridor Study.

1.5.2 Traffic Safety

I-29 Exit 77 (41st Street) Ramp Terminals – While no major safety concerns were identified on I-29 mainline after 2011 improvements, the 2010 Interstate Study identified a combination of operational and safety issues at the existing I-29 Exit 77 (41st Street) Interchange that contributed to its high crash rate (ranked second highest for the 3-year period from 2006 to 2009 in comparison to other interchanges in South Dakota). The high crash rate at the interchange ramps was confirmed in the 2012 Corridor Study.

41st Street east of I-29 – High crash rates identified in the 2010 Interstate Study and 2012 Corridor Study for this area are the result of multiple conditions, most importantly:

- The Carolyn Avenue intersection is approximately 200 feet east of the I-29 northbound ramp terminal. The optimal distance from the ramp terminal is 600 feet. Unrestricted left turn movements at this intersection have resulted in high crash rates. Adjacent landowners have noted at landowner group meetings in 2011 and 2016 the high frequency of crashes at the intersection and the need to address this undesirable situation.
- Driver confusion at the Shirley Avenue intersection due to the unusual configuration of the intersection.
- Long traffic backups at the 41st Street/Louise Avenue intersection.
- High volume of unrestricted left-turning traffic into and out of the closely spaced commercial business accesses and inadequate gaps in through traffic to safely accommodate the left-turning traffic.

41st Street west of I-29 – Traffic backups from the Marion Road and I-29 ramp intersections were identified in the 2012 Corridor Study as the main cause of high crash rates in this area.³

³ HDR, September 6, 2016; Technical Memo 2 Crash Analysis I-29 Exit 77

In addition to the findings of the 2010 Interstate Study and the 2012 Corridor Study, the City's 2040 Long Range Transportation Plan documented that the I-29 Exit 77 (41st Street) interchange with its associated ramps and the 41st Street intersections near I-29 consistently yielded the highest density crash history in the Sioux Falls Metropolitan Planning Area.

Figure 1-C provides an illustrative summary of project deficiencies resulting in safety issues.

1.5.3 Design Standard Deficiencies

The 2010 Interstate Study identified several minor geometric deficiencies with the existing I-29 Exit 77 (41st Street) Interchange ramps. Nearly all of these deficiencies were corrected with the 2011 I-29 reconstruction/expansion project. The remaining major design standard deficiency is the close proximity of the full access Carolyn Avenue intersection to the I-29 northbound ramp terminal. Carolyn Avenue is approximately 90 feet from the northbound I-29 on-ramp and is within the right-turn lane for the on-ramp. Per SDDOT design standards, any type of access within a turn lane for an interchange ramp would not be allowed; minimum separation from a ramp turn lane to the closest access is 100 feet.⁴

1.5.4 Pedestrian Facilities

The 41st Street corridor lacks facilities that promote safe pedestrian use. Specific needs include:

- Several ramps at intersections that are not compliant with the Americans with Disabilities Act of 1990 (ADA).
- The long 41st Street crossing distances at signalized intersections tend to discourage pedestrian use.
- Driveway crossings do not meet ADA requirements for cross slope.
- The condition of the existing sidewalks is poor and in many locations impassable for wheel chairs.
- High density commercial uses such as the Empire Mall do not have sidewalks at entrance roads.
- The I-29 Exit 77 (41st Street) ramp crossings do not have well defined crosswalks approaching the I-29 bridge crossing. The high volume of left turning traffic tends to discourage pedestrian traffic.



The photo above illustrates the poor sidewalk condition at locations along 41st Street.

⁴ SDDOT Road Design Manual Chapter 13

Several of these issues were raised at landowner group meetings during the 2012 Corridor Study, especially for the area along both sides of 41st Street between Marion Road and Terry Avenue where there are multiple disadvantaged, handicapped, and assisted living facilities. **Figure 1-C** shows this area.

Multiple issues have been advanced by citizens to the City and the MPO regarding lack of ADA complaint pedestrian facilities along 41st Street.

1.6 Conclusion

The 2010 Interstate Study and the 2012 Corridor Study identified operational and safety issues at Exit 77 and along the 41st Street roadway and intersections. These issues include inadequate traffic capacity, geometric design deficiencies, high crash rates, and pedestrian facilities not ADA compliant. The purpose of this Project is to eliminate or improve these issues and deficiencies identified as the primary needs of Exit 77 and 41st Street from west of Marion Avenue to west of Louise Avenue.

The 2017-2020 STIP includes this Project in the Developmental STIP portion in the 2021-2013 funding and construction years.

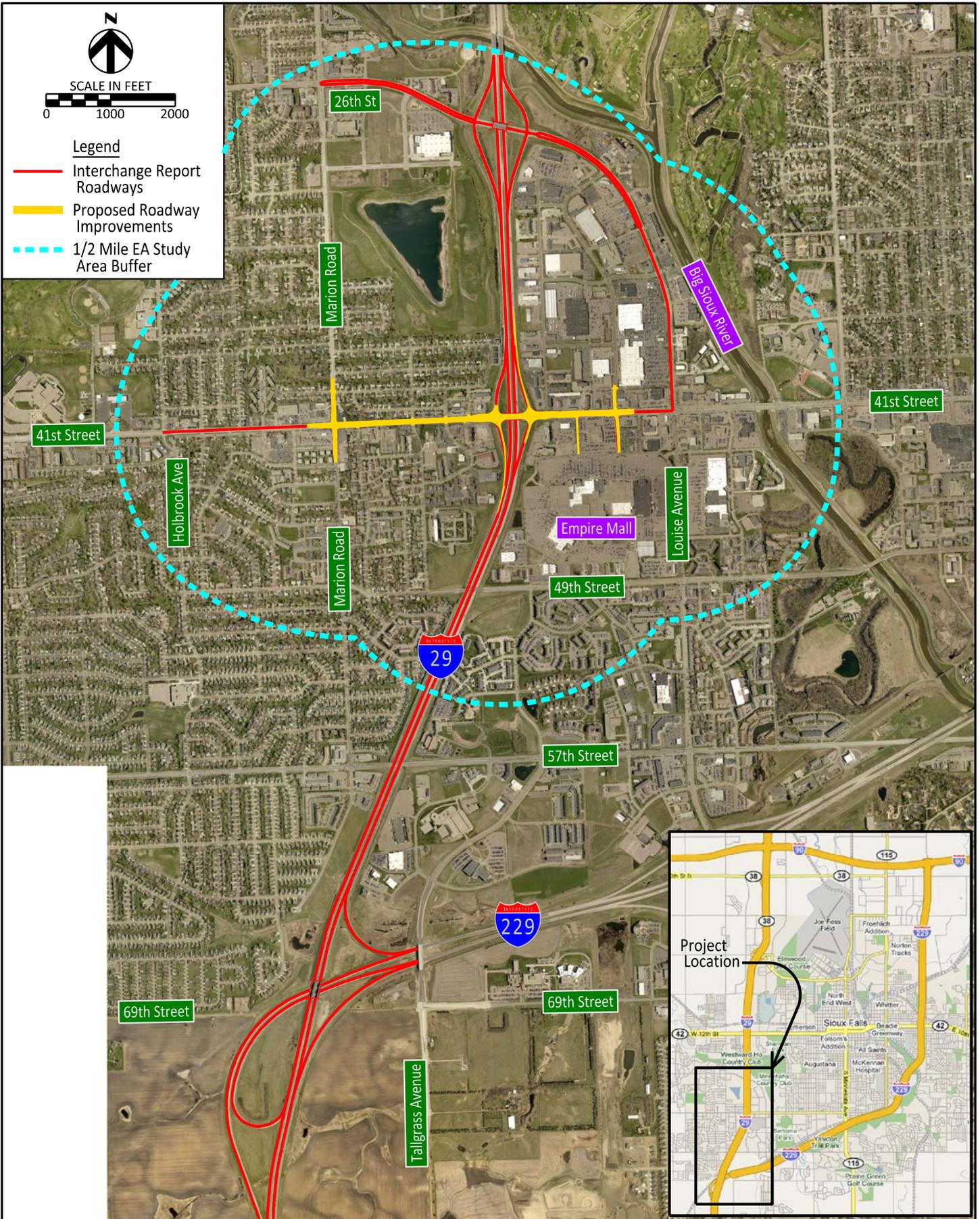


SCALE IN FEET



Legend

- Interchange Report Roadways
- Proposed Roadway Improvements
- - - 1/2 Mile EA Study Area Buffer



Drawn By: B.Miller
 Date: 11/30/2016
 Chkd By: J.Unruh
 Date: 11/30/2016
 Revision: 4/12/2017



Project Location

41st Street Corridor Environmental Assessment

Sioux Falls, SD

Figure

1-A

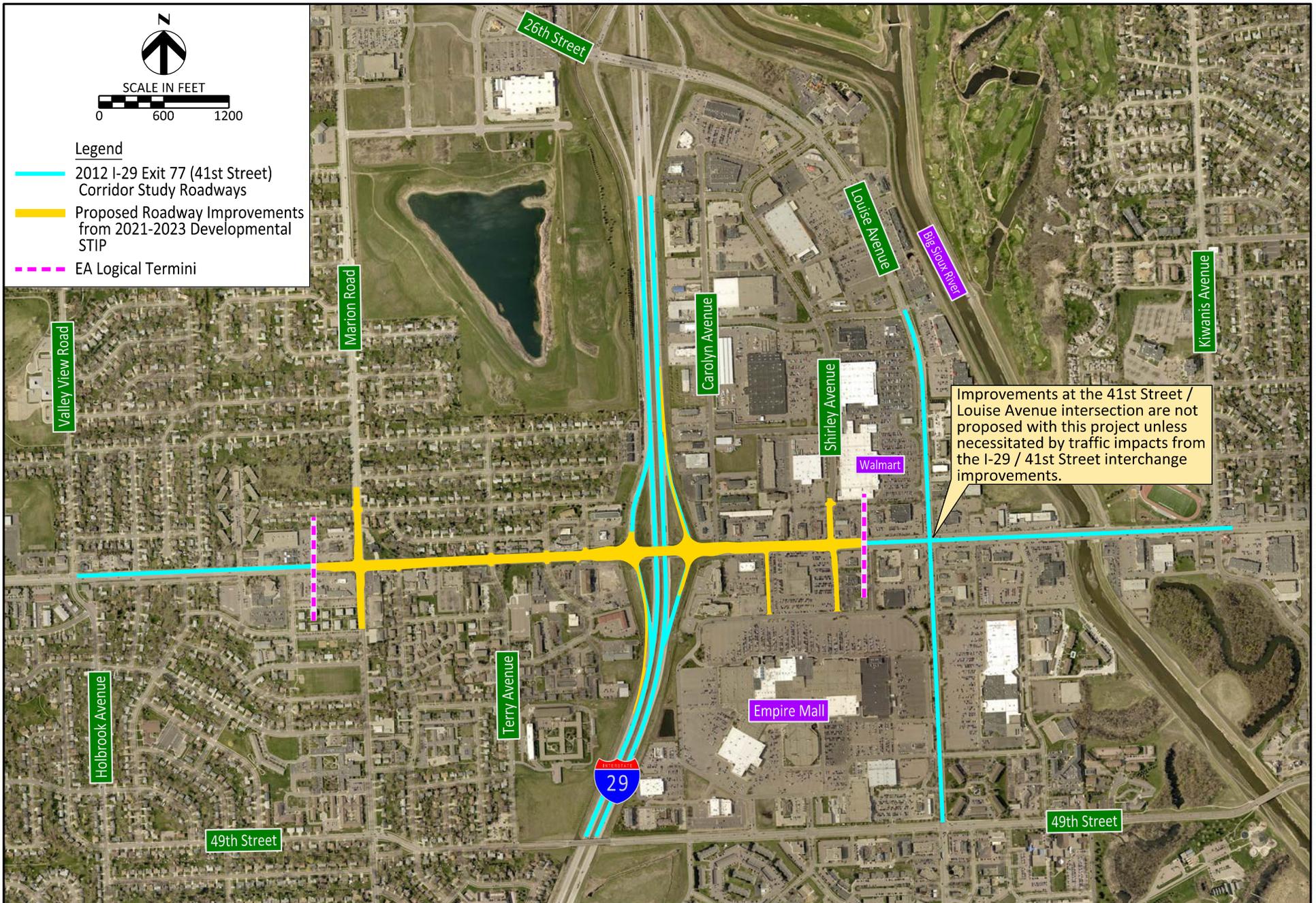


SCALE IN FEET



Legend

-  2012 I-29 Exit 77 (41st Street) Corridor Study Roadways
-  Proposed Roadway Improvements from 2021-2023 Developmental STIP
-  EA Logical Termini



Improvements at the 41st Street / Louise Avenue intersection are not proposed with this project unless necessitated by traffic impacts from the I-29 / 41st Street interchange improvements.

Date of Aerial Photography: 2014

Drawn By: B.Miller
Date: 11/30/2016
Chkd By: J.Unruh
Date: 11/30/2016
Revision:



Project Location
2012 Corridor Study and 2021-2023 Developmental STIP
41st Street Corridor Environmental Assessment
Sioux Falls, SD

Figure
1-B

