

SECTION 1

PURPOSE AND NEED FOR ACTION

PURPOSE AND NEED FOR PROPOSED ACTION

This Environmental Impact Statement (EIS) addresses the Iowa Department of Transportation (Iowa DOT) and Federal Highway Administration (FHWA) proposed action to improve approximately 3.5 miles of Interstate 29 (I-29) in Sioux City, Iowa. This EIS has been prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA).¹ The purpose of this EIS is to provide a full and fair discussion of the environmental impacts of the proposed action and to inform decision makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment.

This section describes the proposed action, the area analyzed in this EIS (the Project Study Area), and the purpose of the proposed action. It also presents information useful in understanding the need for the proposed action based on the transportation issues that exist or are expected in the future. Sufficient detail on this need is provided so that the basis for the development of alternatives to solve the identified transportation issues is understood. Section 2 presents the range of alternatives evaluated. Subsequent sections address the environmental analysis and agency coordination and public involvement efforts.

1.1 Description of the Proposed Action

The Iowa DOT and the FHWA are proposing to improve approximately 3.5 miles of I-29 in Sioux City, Iowa. The proposed improvement considers reconfiguring four interchanges to increase safety, enhance connections to the local roadway system, add one lane in each direction, and improve or eliminate some of the traffic merging issues that occur in this 3.5-mile long corridor. Specifically, the project study area includes the area along I-29 from approximately 0.25 mile south of the Burlington Northern Santa Fe Railroad (BNSF) Bridge over the Missouri River to approximately 0.7 miles west of the existing Hamilton Boulevard Interchange with I-29, along the existing I-29 alignment (Figure 1-1, *Location Map*). The project study area includes the following interchanges:

- Floyd Boulevard
- Nebraska Street/Pierce Street
- US 77/Wesley Parkway (Wesley Parkway)
- Hamilton Boulevard

The project study area is larger than the area that would be used to construct the proposed improvements. Some of the resources discussed in this EIS document extend beyond the project study area but may be impacted by the proposed improvements. Examples of this are traffic patterns, water resources, and floodplain impacts.

¹ NEPA (42 United States Code [USC] 4321-4347) is the foundation of environmental policy making in the U.S. The NEPA process is intended to help public officials make decisions based on an understanding of environmental consequences and take actions that protect, restore, and enhance the environment. NEPA also seeks input by citizens to assist in the decision making process. It includes an environmental review process early in the planning for proposed actions.

The Missouri River parallels much of the project corridor on the south and west. Railroad right-of-way owned by BNSF and Union Pacific (UP) Railroads parallels much of the project corridor's eastern and northern boundaries. The land adjacent to the railroad right-of-way has been developed or is likely to be developed in many areas along the project corridor.

The project corridor locally serves the Sioux City Downtown Central Business District and adjoining industrial areas. The project study limits were selected after reviewing relevant traffic patterns in the corridor as part of a previous I-29 corridor study completed in 1997 (Iowa DOT, 1997). The 1997 study is discussed in more detail in Section 1.2. Additionally, the project study limits were determined based on the interrelationship of the interchanges and were identified to help review the interaction of these interrelated interchanges and traffic to and from the urban core of Sioux City.

1.2 Project Background

Interstate 29 (I-29) is an interstate highway in the Midwestern United States that was authorized by the Federal-Aid Highway Act of 1956. As such, I-29 became part of the Dwight D. Eisenhower National System of Interstate and Defense Highways. It runs from Kansas City, Missouri to the Canadian border near Pembina, North Dakota. This interstate system consists of controlled-access freeways allowing for generally consistent safe high-speed driving. The interstate highway system remains an important component to daily life in the United States providing an efficient means of delivering goods and services. In urban areas such as Sioux City, many residents use the interstate on a daily basis. The project corridor in Sioux City is part of a larger component that connects Sioux City to Sioux Falls, South Dakota and Council Bluffs, Iowa. The portion of the interstate within Sioux City was open to traffic in 1961. Since 1961, no major roadway improvements have occurred to the mainline of this section of the Interstate except for two partial resurfacing projects that occurred in 1970 and 2002. The majority of the interstate roadway pavement in the project study area is original pavement constructed about 46 years ago.

Iowa DOT in conjunction with Siouxland Interstate Metropolitan Planning Council (SIMPCO) and the City of Sioux City commissioned several studies to learn more about the functional needs of I-29 from the Iowa/South Dakota border to Sergeant Bluff, Iowa. These studies resulted in a final report in 1997 that drew attention to the need for numerous improvements along I-29 through Sioux City as well as specific needs for the corridor adjoining the Downtown Central Business District. Studies, including the 1997 final report, that contributed to the understanding of the project corridor safety and operational needs included:

- *Report 1, I-29 Corridor Study, Sioux Gateway Airport to South Dakota Border.* Stanley Consultants, February 1993.
- *Report 2, Development of Alternative Improvement Schemes, I-29 Corridor Study, Sioux Gateway Airport to South Dakota Border.* Stanley Consultants, June 1996.
- *Report 3, Refinement of Selected Improvement Concepts, I-29 Corridor Study, Sioux Gateway Airport to South Dakota Border.* Stanley Consultants, January 1997.

- *Final Report, Refinement of Selected Improvement Concepts, I-29 Corridor Study, Sioux Gateway Airport to South Dakota Border.* Stanley Consultants, July 1997.

Between 2001 and 2003 the Sergeant Bluff/Sioux Gateway Airport Interchange was redesigned and reconstructed. The bridge clearance over I-29 needed to be increased by approximately two feet and the on- and off-ramps were reconfigured to meet current Iowa DOT standards and improve capacity.

In 2004 the Iowa DOT began the early planning process of improving ten miles of I-29 through Sioux City. Initially, the planning process assumed the interstate had the same safety, capacity, and traffic flow issues throughout the ten mile corridor. As the planning process continued, it became evident that areas of the ten mile corridor had different characteristics and functioned differently than other parts of the I-29 within Sioux City. As a result, the FHWA divided the project into three individual projects. The northern-most of the three projects is the I-29/Riverside Boulevard Interchange project with project limits beginning at the South Dakota border and ending at Judd Street. The southern-most of the three projects is the I-29/System Interchange project with project limits beginning 0.25 miles south of the BNSF Railway Bridge to approximately 0.75 miles south of the Sergeant Bluff/Sioux Gateway Airport Interchange. Both the northern-most and the southern-most projects were classified by FHWA as Categorical Exclusions (CE) type projects. The project that is located in the middle of the two CE projects is the project that is described in detail in Section 1.1, *Description of Proposed Action*, and is the project study area used for this EIS document.

1.3 Purpose of the Proposed Action

The purpose of the proposed improvements is to improve traffic operations, and provide a safe facility that serves the local, regional, and national traffic demands of the I-29 Sioux City corridor from 0.25 mile south of the BNSF Railroad Bridge to approximately 0.7 miles west of the existing Hamilton Boulevard Interchange with I-29 in Sioux City, Iowa. See Figure 1-1 for the location of the Project Study Area. The remainder of this section discusses the corresponding needs in detail.

1.4 Need for the Proposed Action

The proposed action is intended to meet the following needs:

- Improve Safety
- Improve Traffic Operations
- Provide for Driver Expectancy
- Improve Roadway Infrastructure Condition

1.4.1 Improve Safety

The proposed action would address the need to provide a reduction in the number and severity of traffic accidents in the project corridor. All four interchanges in the project corridor were above the statewide average for crash rates and nearly 4 or 5 times higher than state averages.

Predicted traffic volume is an important consideration to understanding future potential crash incidents. And, while the rate of incidents might not change, the actual number of incidents could increase as the volume of traffic on a roadway increases. If the accident rate in 2030 were to remain similar to today and traffic increases as projected, a greater number of vehicle accidents would be expected in the future. Thus, the need to address highway design standards along with the design features discussed in Section 1.4.2 becomes more critical.

1.4.2 Improve Traffic Operations

The flow (or operation) of vehicles along any freeway is influenced by many design features including continuity, lane balance, ramp spacing, and use of guide signs. These features affect whether motorists have sufficient time to make decisions and smooth transitions into adjacent lanes and ramps without adversely affecting other motorists using the facility. Less than adequate roadway characteristics in the corridor include ramp sequence and spacing, lane balance, ramp design, guide signage, and design standards (HDR, April 2005). Specific design deficiencies include:

- Ramp Sequence and Spacing² – I-29 ramp sequence and spacing is not adequate near the Floyd Boulevard Interchange, between the Nebraska Street/ Pierce Street Interchange and the Wesley Parkway Interchange, and between the Wesley Parkway Interchange and the Hamilton Boulevard Interchange.
- Lane Balance - Lane balance refers to the consistency in the number of travel lanes in both directions of the roadway. Lane balance issues exist between Wesley Parkway and Floyd Boulevard.
- Ramp Design - Ramp design refers to the configuration and geometry of interstate on and off ramps. I-29 exit and entrance ramp designs are either too short or do not meet current design standards at Floyd Boulevard, Nebraska Street/ Pierce Street, and Hamilton Boulevard.
- Guide Signs - Signs that direct the driver are called guide signs. Guide signage is poorly located throughout the corridor and does not exist in some locations near the Wesley Parkway Interchange.
- Design Standards - Given this segment of I-29 was designed in the late 1950's, many of the engineering standards that guided the manner in which the roadway was designed are now outdated. The outdated roadway design adversely affects traffic operations and the need exists to update the roadway to current standards to accommodate new driving speeds and improved vehicle performance characteristics.

² Ramp sequence and spacing refers to the distance between interchange on and off ramps.

1.4.3 Provide for Driver Expectancy

Driver expectancy relates to a driver's readiness to respond to highway events and information in predictable and successful ways. In the project corridor, short acceleration and deceleration lanes, tight curves, and poor sight distance are existing factors that contribute to crashes by not consistently meeting driver expectations.

The shape or configuration of a roadway (roadway geometry) contributes to driver expectancy and the overall safety of a roadway system. Roadway geometry refers to the horizontal and vertical layout of a roadway as well as the spatial relationship between various parts of the roadway. Contributing geometric features that can affect driver expectancy include:

- Shape of interchanges;
- Length of acceleration (on) and deceleration (off) lanes and ramps;
- Tightness of curves;
- Steepness of hills;
- Width of lanes, shoulders, and medians;
- Spacing of interchanges;
- Stopping sight distance;
- Decision sight distance; and
- Balance and transition of lanes.

Identifying deficiencies in the existing roadway geometry includes comparing the roadway that was constructed in the 1960s to current design standards set forth by Iowa DOT and by the American Association of State Highway & Transportation Officials (AASHTO). Since I-29 in Sioux City was opened to traffic in 1961, new revisions and improvements in roadway design and technology to increase safety have been adopted by Iowa DOT and AASHTO. These standards accommodate the higher speeds of today's traffic as well as driver habits and vehicle types.

Horizontal stopping sight distance was found to be mostly inadequate in the areas that involved a horizontal curve and a median barrier. Horizontal stopping sight distance is the distance required for a driver to react to a hazard in the roadway along the horizontal plane and bring the vehicle to a complete stop. Horizontal stopping sight distance on I-29 south of the BNSF Railroad Bridge, Floyd Boulevard Interchange, near Pearl Street, and at Wesley Parkway does not meet minimum criteria based on AASHTO policy. Horizontal stopping site distance meets the minimum criteria near the Floyd Boulevard Interchange, at the Nebraska/Pierce Street Interchange, and at the Hamilton Boulevard Interchange.

Two locations in the project study area do not meet the minimum criteria for vertical stopping sight distance. Vertical stopping sight distance is the distance required for a driver to react to a hazard in the roadway over the top (crest) or bottom (sag) of a hill and bring the vehicle to a

complete stop. When a hill or vertical curve is too steep and drivers cannot see over the crest of the hill or the sag of the hill, the ability of the driver to stop safely in an unexpected roadway hazard event lessens. The first sight distance problem occurs at the sag curve just east of the Nebraska/Pierce Interchange. The second problem occurs at the crest curve over the Nebraska/Pierce Interchange.

Decision sight distance, the distance required for a driver to detect and avoid an unexpected object or situation in the roadway, also does not meet current standards from the Nebraska/Pierce Interchange to the Hamilton Boulevard Interchange.

1.4.4 Improve Roadway Infrastructure Condition

The original interstate pavement was constructed in 1961 with resurfacing projects completed in 1970 and 2002. The infrastructure (i.e., the pavement, bridges or structures, ramps, shoulders, and underlying support structure) is in a deteriorated state in terms of pavement condition and the condition of some bridge structures.

1.4.4.1 Pavement Conditions

The condition of the pavement in the project corridor was evaluated on criteria that included:

- Uniformity of the riding surface (bumps, potholes, etc.)
- Support of the roadbed (unevenness, soft spots, etc.)
- Maintenance cost (below, average, or above average)

The majority of pavement in the project corridor is approaching 50 years of age. The condition of the pavement exhibits signs of distress with some full depth patching, some unevenness and warping of the roadbed, and average maintenance costs. The majority of pavement from the Floyd Boulevard Interchange to Judd Street, is in deteriorated or poor condition.

1.4.4.2 Bridge Structural Condition

The condition of bridges is evaluated on criteria such as:

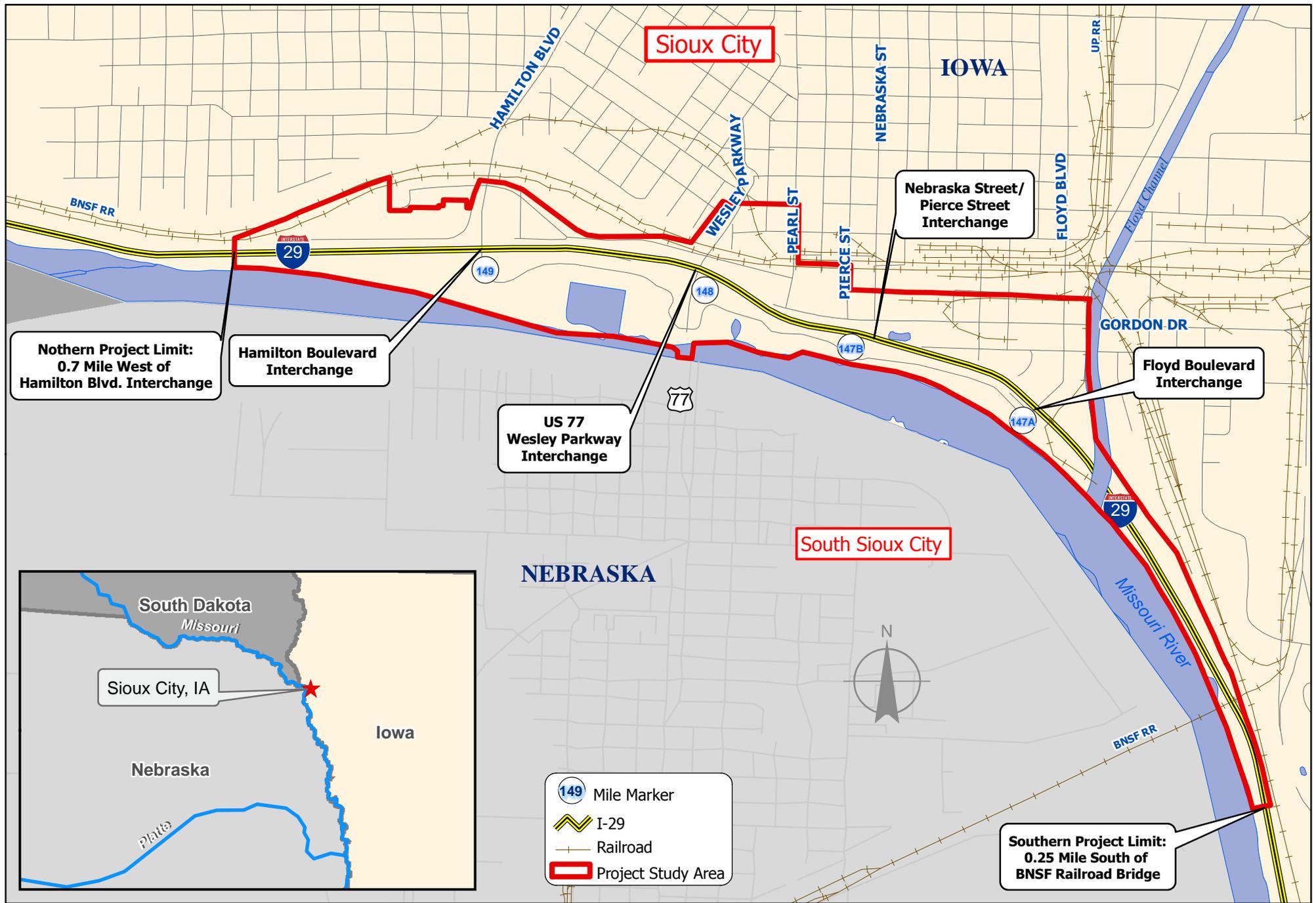
- Structural inventory and appraisal value (includes physical conditions of the bridge deck pavement and supports)
- Evidence of deterioration (cracking, pitting, bumps, potholes, etc.)

The northbound and southbound bridges spanning over Bacon Creek and over Floyd Boulevard are in poor condition and exhibit signs of advanced deterioration. These bridges received an Iowa DOT Structural Inventory and Appraisal (SI&A) rating of 59 or less, which means the bridges have advanced section loss, deterioration, spalling or scour. The northbound bridge spanning the Floyd River meets minimum FHWA criteria having received an Iowa DOT SI&A rating of 60 to 79. This rating level means all primary structural elements are sound but may

have minor section loss, cracking, spalling, or scour. However, the southbound bridge over the Floyd River received a rating of 59 or less. Despite the ratings of these bridges they remain stable due to the redundancy of the multiple beams, piers, and bearing devices used in the design and construction of the bridges. The bridges over the Floyd River would likely be ready for replacement as their rating falls from meeting the bridge criteria in 2006 to not meeting the criteria in 2030.

1.5 Purpose and Need Summary

In summary, the purpose of the proposed improvements is to provide an operationally improved and safe facility that serves the local, regional, and national traffic demands of the I-29 Sioux City Corridor. The need to improve safety is evident considering all four interchanges in the project corridor are above the statewide average for crash rates according to 2001-2003 crash data. Lane continuity, lane balance, ramp sequence and spacing, and guide sign problems indicate a need to improve the operations of the roadway. Traffic is projected to increase and would worsen safety and operational issues on the roadway. Additionally, the need exists to provide improved driver expectancy by correcting existing short acceleration and deceleration lanes, tight curves, and poor sight distances. Finally, the roadway infrastructure is reaching the end of its useful life and the need for new pavement throughout the corridor and new or upgraded bridge structures over Bacon Creek and Floyd Boulevard will exist prior to the design year 2030.



HORIZONTAL Feet
 Howard R. Green Company

**I-29 Sioux City Interstate Study
 Environmental Impact Statement**
 Sioux City, Iowa

LOCATION MAP

Date
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