2.0 DEVELOPMENT PLAN

2.1 CORRIDOR ASSESSMENT

The Corridor Assessment characterizes the project need, describes existing features of the Heartland Expressway Corridor, explains the future travel demand forecast methodology, presents the forecast results, provides a safety analysis and concludes with recommendations and improvement priorities.

The following opportunities and challenges for economic development present themselves:

- **Overall travel demand in the four-state region in and around the Nebraska Panhandle is expected to increase by approximately 90 percent between now and the year 2035.** Currently the Heartland Expressway Corridor's share of the north/south travel demand is approximately 22 percent. However, forecasts indicate that without Corridor improvements, this share will fall to about 18 percent. Specifically, Heartland Expressway Corridor improvements are needed to maintain Nebraska's existing percentage share of travel demand. When these improvements are linked with the other Ports to Plains (PTP) Alliance Corridor improvements located north and south of the Heartland Expressway Corridor, the proportion of trucks on the Heartland Expressway is expected to rise significantly and the overall travel demand share will increase to 24 percent of the total. In addition, along with this growth in travel demand will be a corresponding increase in economic output in the Panhandle and growth in population, reversing historic trends.[1]
- **According to the Federal Highway Administration (FHWA) and historic trends, a substantial increase in truck freight activity is expected to occur nationally.** Nearby competing facilities such as Interstate 25 (I-25) through northern Colorado are expected to be congested. In addition, there is a nearly 500 mile wide gap between the I-25 and Interstate 29 (I-29) corridors. The PTP Alliance Corridor can help fill this large gap and provide a trade conduit from Canada to Mexico through the Panhandle of Nebraska, but only if it is included as part of a continuous transportation corridor that has an identity and provides a reliable and efficient route for freight, similar to the Interstate Highway network.
- **Travel demand in the Nebraska Panhandle has fallen the last ten years for a variety of reasons, but fundamental factors remain in place to support future travel and economic development.** One key factor limiting travel demand and economic development is the limited capacity of the transportation infrastructure in the Panhandle, which mainly consists of two-lane highways that lack passing opportunities. While some four-lane improvements have been constructed within the Heartland Expressway Corridor (i.e. Nebraska Highway 71 from Kimball to Scottsbluff and U.S. Highway 26 from East of Morrill to Minatare), these segments need to be connected with other improvements to increase posted speed limits and improve travel time reliability to substantially shift travel patterns.
- **With a comprehensive trade corridor in place, the groundwork will be cultivated for economic activity to extend outward from it.** Additionally, emerging economic sectors and opportunities such as those possible from energy development and the emerging wind and solar energy sectors will have an infrastructure framework upon which to grow. This infrastructure investment will reduce the barriers and cost to development, place the Panhandle in a much better competitive position for limited exploration and development investments, and help offset the negative impacts associated with a potentially and suddenly booming new need for the resources available in the Panhandle.

[1]Travel demand statistics are based on the travel demand model, which can be found in Appendix B.

2.1.1 VISION OF THE CORRIDOR

Figure 2.1 – Corridor Area Detail

One goal of this Corridor Development and Management Plan (CDMP) is to address these challenges and to leverage them into opportunities. The Heartland Expressway Corridor is comprised of the following highways located within the State of Nebraska:

- U.S. Highway 26 (US 26) from the Wyoming/Nebraska border to Scottsbluff and continues to Nebraska Highway Link 62A (L62A) intersection located east of Minatare, Nebraska.
- Nebraska Highway 71 (NE 71) from the Colorado/Nebraska border to the intersection with US 26 located on the eastern edge of Scottsbluff, NE.
- L62A from the US 26 junction to the intersection with U.S. Highway 385 (US 385).
- US 385 from the intersection with L62A to the South Dakota/Nebraska border. US 385 borders the city of Alliance, Nebraska and goes through the west edge of Chadron, Nebraska.

The Heartland Expressway Corridor route identified above was adopted, in part, from the Heartland Expressway Economic and Engineering Feasibility Study (NDOR and South Dakota Department of Transportation 1993). This study primarily focused on potential economic development that could be brought to the region by the Heartland Expressway. It also included reviews of alignment options, road standards, traffic demands, conceptual design, costs, economic benefits, and environmental impacts and implications. The study concluded that a major investment in the Heartland Expressway is economically feasible, and identified the route that is expected to provide the greatest economic benefit. Multiple highway routes were examined, and ultimately the study concluded that the Heartland Expressway's most feasible route (from engineering, environmental, and economic perspectives) would connect Rapid City to Scottsbluff/Gering via Hot Springs, SD, Chadron, NE, and Alliance, NE (i.e. using US 385, L62A, and US 26). *The Heartland Expressway Economic and Engineering Feasibility Study Executive Summary* is included as Appendix A.

Figure 2.2- Selected Route from the Heartland Expressway Economic and Engineering Feasibility Study Executive Summary

As part of the CDMP, the study team evaluated improvements for the Heartland Expressway Corridor to meet the needs of the high priority corridor. The following evaluation criteria were used to determine alternatives to be considered:

- Travel demand within the border of Nebraska and from the adjacent states located along the PTP Alliance Corridor
- Safety
- Connectivity to improved corridors

The selected improvements to the proposed route of the Heartland Expressway were chosen to present a positive environment for economic growth and prosperity, as well as to serve the existing population of the Panhandle of Nebraska.

The vision of the proposed Heartland Expressway improvements consists of the following:

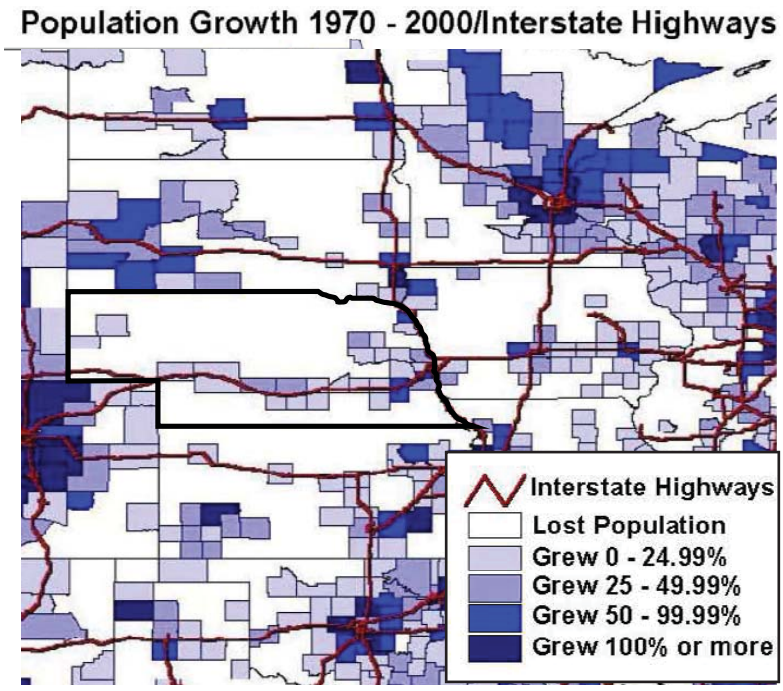
- Widen US 26 to a four-lane divided highway from Torrington, Wyoming to County Road (CR) 10 east of Morrill, Nebraska.
- Widen US 26 to a four-lane divided highway from CR 30 in Minatare, Nebraska to the US 26/L62A junction.
- Widen L62A to four lanes with median from US 26/L62A split to US 385.
- Widen US 385 to four lanes with median from L62A Link to Nebraska Highway 2 (NE 2) in Alliance, Nebraska.[2]
- Improve US 385 into a "Super-2" facility to include 12-foot lanes, 10-foot shoulders, auxiliary turn lanes and passing lanes from NE 2 to US 20 in Chadron, Nebraska. This should be constructed in accordance to the Super-2 criteria. The ultimate roadway section would include a four-lane highway when traffic volumes warrant the four-lane section.
- Improve the intersection of US 385 and US 20.
- Improve US 385 into a Super-2 facility to include 12-foot lanes, 10-foot shoulders, auxiliary turn lanes and passing lanes from US 20 west of Chadron, Nebraska to Oelrichs, South Dakota.
- Additional major safety and bottleneck improvements.

The intent of the Heartland Expressway CDMP is to identify long range transportation improvements that meet the vision of the overall Heartland Expressway and Ports to Plains Alliance Corridors. The goals of this corridor are to promote economic development, encourage population growth, improve system reliability, and reduce travel time. Project-specific purpose and need and alternative analysis will occur as project specific details arise and during future NEPA documentation.

[2]This improvement along the Heartland Expressway Corridor ("Junction L 62A US 385 to Alliance," Project number 385-3(118), Control number 51432) has received funding from the Build Nebraska Act and is currently in the Pre-liminary Engineering and NEPA phase. More information about this project can be found on NDOR's website http://www.transportation.nebraska.gov/projects/heartland-exp/. See Chapter 6 for more information on the Build Nebraska Act.

2.1.2 PROJECT NEED

Corridor Development and Economic Activity Linkages



Data Source: US Census Bureau Environmental Systems Research Institute
Map produced by: Jarrod Haberman, Panhandle Area Development District

Figure 2.3- Population Growth Rates 2000 to 2010

Figure 2.3 provides an illustration of interesting growth trends between 1970 and 2000. Together, these trends reflect the importance and interdependence of the Interstate Highway system and growth and the significance of travel infrastructure addressed by the PTP Alliance Corridor. The areas adjacent to major regional highway facilities have grown, whereas areas without an interstate have been stagnant or have decreased in population.

While the argument could be made that interstate facilities are located in areas that are growing, many of these facilities were constructed prior to 1970. The pattern of growth around city centers clearly demonstrates that the location of major roadways influences the location of new development and population increases.

Figure 2.3 suggests that without an investment in major highway improvement necessary to promote interstate travel, economic development and growth is difficult to achieve. As illustrated in Figure 2.3, the counties that experienced population growth are located along major interstates or trade corridors.

For example, the I-25 and I-29 corridors have grown compared to areas within Nebraska and North Dakota where a 4-lane highway exists. On the positive side, the evidence is clear that highway infrastructure improvements have been proven to be linked to both economic and population growth. Although this link is clear, the magnitude and timing of related growth may vary considerably.

Connectivity

Connectivity is an important consideration in developing a unified transportation network. The importance of connectivity is illustrated in the following historic examples:

Erie Canal

The Erie Canal is a waterway in New York that runs from Albany, New York, on the Hudson River to Buffalo, New York, at Lake Erie, completing a navigable water route from the Atlantic Ocean to the Great Lakes. This canal was the first transportation system between the eastern seaboard (New York City) and the western interior (Great Lakes) of the United States that did not require portage. The canal was faster than carts pulled by draft animals, and cut transport costs by about 95 percent. The canal fostered a population surge in western New York State, opened regions farther west to settlement, and helped New York City become the chief U.S. port.

Transcontinental Railroad
The world's First Transcontinental Railroad was built between 1863 and 1869 to join the eastern and western halves of the United States. When it opened, this served as a vital link for trade, commerce, and travel and opened up vast regions of the North American heartland for settlement. Shipping and commerce could thrive away from navigable watercourses for the first time since the beginning of the nation.

Interstate Highway System
Development of the Interstate Highway System has had significant positive impacts on the nation's economic performance since 1956. The Interstate Highway System represented an investment in a new, higher speed, safer, lower cost per mile technology which fundamentally altered relationships between time, cost, and space in a manner which allowed new economic opportunities to emerge that would never have emerged under previous technologies. The Interstate Highway System replaced a lower capacity, lower speed, less safe, and more expensive (per mile of travel) highway system. The Interstate Highway System provided a new envelope of space, time, and cost, in which the U.S. economy could reorganize.

There is a nearly 500 mile wide gap between the I-25 corridor in Wyoming and the I-29 corridor in Iowa. Specifically, there are no four-lane or greater north/south highways fully traversing the State of Nebraska. If one excludes the very short segment of Interstate 76 (I-76) in western Nebraska and the urban interstates (Interstate 180 (I-180) which is confined to Lincoln, Nebraska, and Interstates 480 and 680 (I-480 and I-680) which are confined to Omaha, Nebraska), Nebraska is one of only two lower 48 states with only one through/continuous Interstate Highway. The other state is Maine.

In developing the Interstate Highway System, many links were included for their connectivity rather than travel demand on any particular segment. Examples include Interstate 70 (I-70) through Eastern Utah and the interstate connections to the Canadian and Mexican borders. An objective view of the national highway network clearly indicates that the PTP Alliance Corridor would fill a missing gap in the highway network since there are currently no north/south routes through Nebraska. The closest north/south routes are I-25 through Colorado and Wyoming and I-29 in Iowa.

Existing Truck Mobility and Freight Demand

The American Association of State Highway and Transportation Officials (AASHTO) report "Unlocking Freight" states that railroads, highways, ports, waterways and airports require investments well beyond current levels to maintain and improve freight mobility (July 2010). The report identifies key projects in 30 states that would improve freight delivery and dependability, and outlines a three-point plan for relieving freight congestion, generating jobs and improving productivity. Although the Heartland Expressway Corridor is not listed in this report, the PTP Alliance Corridor to which it connects, is listed.

The AASHTO report clarifies that "despite more long-distance freight being moved by intermodal rail, trucks continue to haul 74 percent of all cargo." By 2035, the report concludes that the "number of trucks traveling on the nation's highways is expected to increase from 10,500 to 22,700 daily."

More specifically, the report concludes:

- The need to move significantly more freight across the country and the world will increase substantially in the 21st century.
- The U.S. population reached 308 million in 2010, and is expected to reach 420 million by 2050. A larger population will consume more food, clothing, and other commodities.
- By 2020, the U.S. trucking industry will move three billion more tons of freight than we haul today. To meet this demand, the industry will put another 1.8 million trucks on the road.
- In 20 years, for every two trucks now on the road, there will be an additional one right behind it, carrying the expected growth in food deliveries, goods, and manufacturing equipment.
- In 40 years, overall freight demand will double, from 15 billion tons today to 30 billion tons by 2050. Freight carried by trucks will increase 41 percent; by rail 38 percent from today's quantities. The number of trucks on the road compared to today will also double.

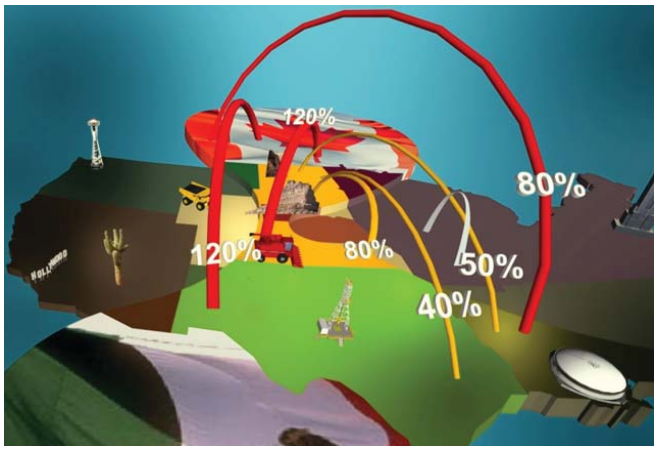


Figure 2.4 - Forecast Growth Rates from FHWA's Freight Analysis Framework for Canada and Ports to Plains Alliance Corridor

The Heartland Expressway responds to these demands by providing an alternate route and expanded roadway capacity to meet future freight needs.

The FHWA's Freight Analysis Framework (FAF) integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation. With data from the 2007 Commodity Flow Survey and additional sources, FAF version 3 (FAF3) provides estimates for tonnage and value, by commodity type, mode, origin, and destination for 2007, the most recent year, and forecasts through 2040. Also included are truck flows assigned to the highway network for 2007 and 2040.

Figure 2.4 summarizes forecast growth rates from FHWA's Freight Analysis Framework (FAF) for Canada and the overall PTP Alliance Corridor. The truck freight between Canada and the PTP Alliance Corridor is estimated to increase about 120 percent; and the Heartland Expressway Corridor is a core component of the overall PTP Alliance Corridor. This data was the basis for baseline 2035 border crossings between Canada and the U.S. along the Montana and North Dakota borders. This increase in international trade is only part of the overall increase in freight movement. Growth in surrounding states, as well as freight activity within the U.S., is also increasing.

On the domestic scale, Figures 2.5, 2.6, and 2.7 represent a nationwide perspective of freight transportation in 2007 and 2040, respectively. Truck and rail freight movements through Nebraska are clearly depicted along with a major north/south gap that relates directly to the planned alignment of the PTP Alliance Corridor (Figures 2.5 and 2.6). Freight congestion is anticipated through Nebraska east of the Heartland Expressway Corridor (Figure 2.7). Highly congested conditions along I-25 (north/south) and I-70 (east/west) in Colorado reflect capacity challenges that may ultimately shift some freight operations into Nebraska.

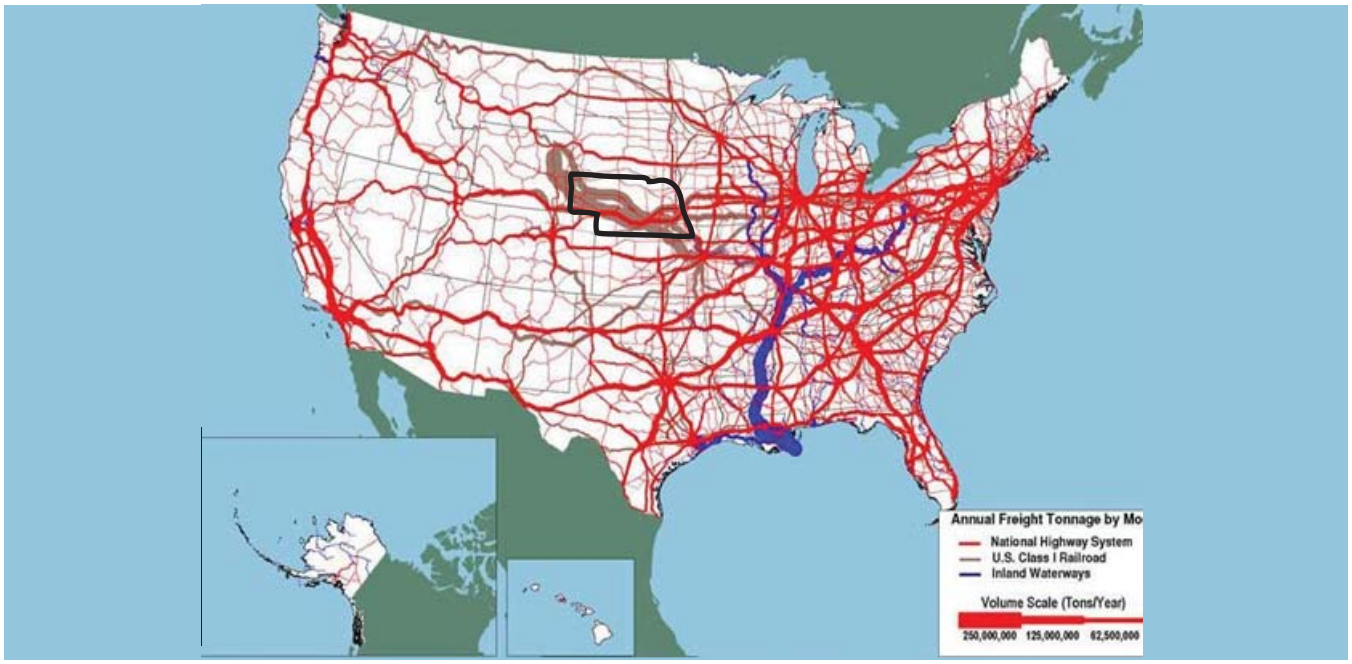


Figure 2.5 - Tonnage on Highways, Railroads and Inland Waterways in 2007
Source: FHWA

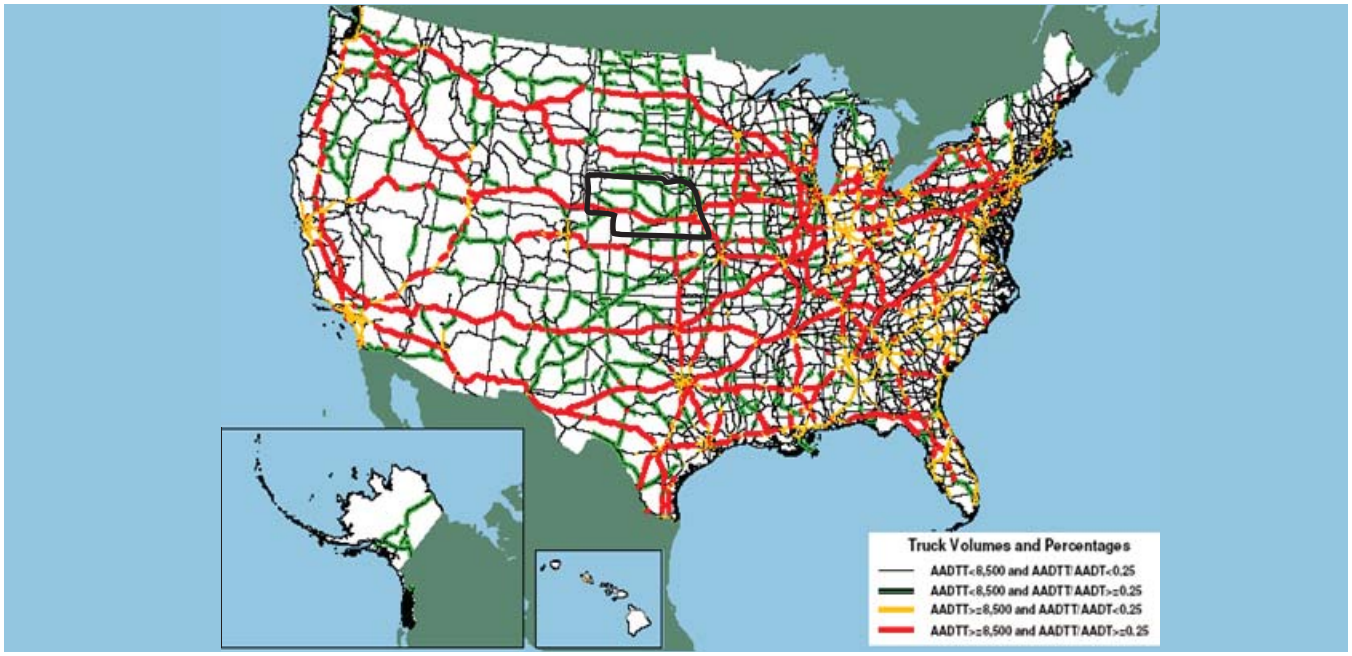


Figure 2.6 - Major Truck Routes on the National Highway System in 2040
Source: FHWA

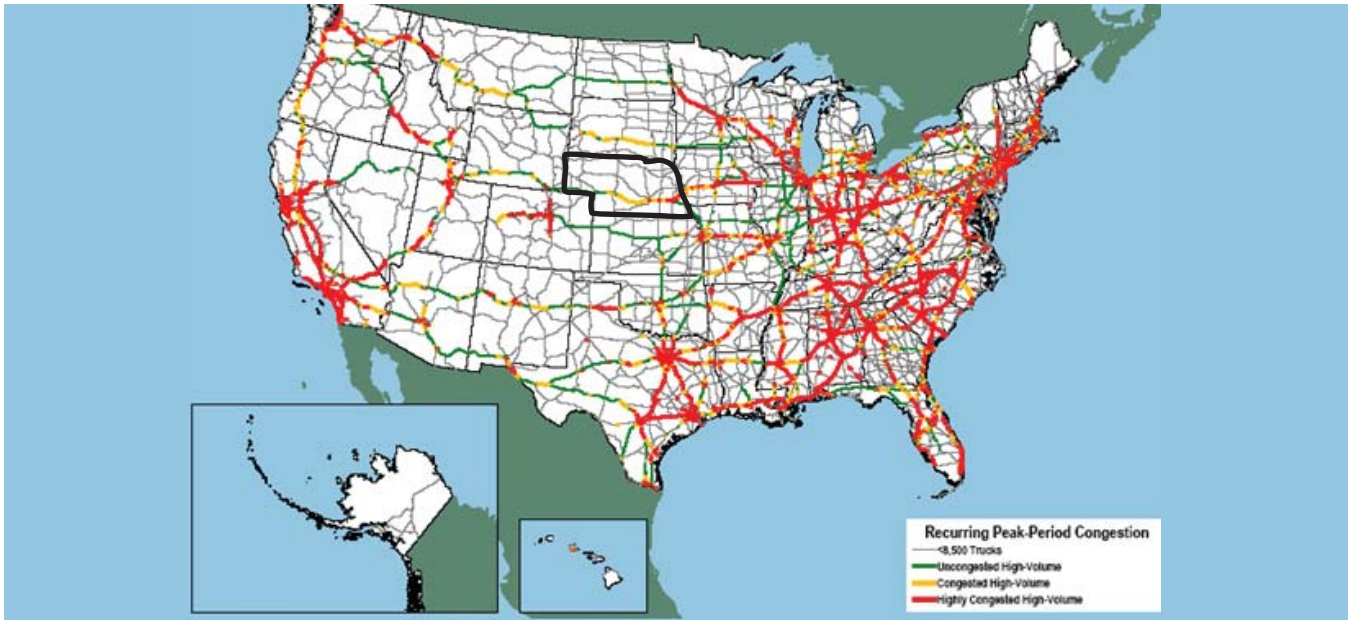


Figure 2.7 - Peak-Period Congestion on High-Volume Truck Portions of the National Highway System in 2040
Source: FHWA

The Nebraska Department of Economic Development and Nebraska Department of Labor report defines the twelve primary industry clusters in Nebraska as follows:

1. Agricultural Machinery
2. Agriculture and Food Processing
3. Biosciences
4. Business Management and Administrative Services
5. Financial Services
6. Health Services
7. Hospitality and Tourism
8. Precision Metals Manufacturing
9. Renewable Energy
10. Research, Development, and Engineering Services
11. Software and Computer Services
12. Transportation, Warehousing, and Distribution Logistics

Trends in Population, Land Use and Economic Development in Nebraska

Past economic trends in Nebraska are generally reflected in population data presented in Appendix D. However, future trends may be driven by Nebraska's competitive advantages and new industrial development such as oil and gas development.

Competitive Advantages

Some areas in the Heartland Expressway Corridor are growing while others show no growth or declining growth. Local, regional, and statewide economic development efforts are at work throughout the state in an effort to identify economic strengths and weaknesses and to develop strategic economic development plans.

Economic output related to agriculture is heavily dependent on commodity prices. Recently, commodity prices have been favorable and in some ways the Panhandle has fared somewhat better than the nation as a whole. However, with farm consolidation and further advances in farming automation, fewer jobs are required to produce a comparable output of agricultural product and this has been a contributing factor in the trend of declining population.

The Nebraska Department of Economic Development and Nebraska Department of Labor prepared a report entitled: "Growing Jobs, Industries, and Talent: A Competitive Advantage Assessment and Strategy for Nebraska" in September of 2010. The report states the following:

"Nebraska's primary industry clusters have performed strongly in industry employment measures. These 12 industry clusters provide a balanced portfolio of growth opportunities. Five of them—financial services; transportation, warehousing, and distribution logistics; precision metals manufacturing; biosciences; and renewable energy—are current strengths, i.e., they have a larger concentration of employment than found nationally and they are adding jobs more rapidly than at the national level. Three other industry clusters—R&D and engineering services; health services; and hospitality and tourism—are emerging strengths and opportunities with strong employment growth in Nebraska, but they are not yet specialized in their overall employment concentration in the state. The remaining four industry clusters—agriculture and food processing; business management and administrative services; software and computer services; and agricultural machinery—fall into a retention category, being highly specialized in their employment concentration but not faring as well in employment growth."

The report also states that "Nebraska has weathered the recession much stronger than other states." Given global and nationwide economic conditions, growth forecasts for Nebraska or other states and regions are difficult to make with much certainty. In general, Nebraska is reasonably well positioned to grow in the future.

According to the Nebraska Department of Economic Development, Business Development Division, some factors that support this assertion include:

2nd Best Employment Leader
Business Facilities Magazine Rankings Report 2010

3rd Best States for Jobs
MSN and Career Builder.com 2011

3rd Best Pro-Business Legal Climate
U.S. Chamber's Institute for Legal Reform 2010

4th Best Quality of Life
Business Facilities Magazine Rankings Report 2010

5th Best Education Climate
Business Facilities Magazine Rankings Report 2010

5th Best Pro-Business State
Pollina Corporate Real Estate 2012

9th Best State for Business and Careers
Forbes.com 2010

Top 10 America's Top States for Business
CNBC Special Report 2011

Oil and Gas Development

The Niobrara formation, as shown in Figure 2.8, is one among many natural resources areas in the Denver Basin and western U.S. that presents substantial oil and gas development opportunities that are active now and are likely to be more active in the future. Based on a U.S. Geological Survey Report for Province 39 entitled: "Petroleum Systems and Assessment of Undiscovered Oil and Gas in the Denver Basin Province, Colorado, Kansas, Nebraska, South Dakota, and Wyoming" compiled by Debra K. Higley:

> *"More than 1.05 billion barrels of oil and 3.67 trillion cubic feet of natural gas have been produced from wells across the Denver Basin. Of this, 245 million barrels of oil and 2.15 trillion cubic feet of natural gas are from wells within the Front Range Urban Corridor; this totals about 23 percent of the oil and 58 percent of the gas produced in the basin. The urban corridor located adjacent to and east of the Rocky Mountains in the Colorado and Wyoming portions of the basin is as much as 40 miles (64 kilometers) wide and encompasses Denver, Colorado, Cheyenne, Wyoming, and other population centers."*

The Niobrara resource potential, or "play" in industry terms, has the potential to create substantial amounts of traffic within and near the Heartland Expressway Corridor due to the location of the Niobrara formation, which includes parts of Wyoming, Colorado, and Nebraska (see Figure 2.8). More specifically, the Niobrara formation generally spans the southern portion of the Heartland Expressway Corridor in Nebraska and Colorado, a northern portion of the PTP Alliance Corridor in Colorado, and a portion of the Camino Real Corridor in Colorado and Wyoming. Other plays, such as the Bakken in North Dakota, are part of a large production effort that is driven largely by commodity prices and the proven results from ongoing and future drilling operations. The Niobrara play is large. Resource extraction is expected to occur over a long period of time and exploration and production activity will occur in what may or may not be a predictable manner.

The overall play is anticipated to involve a wide range of operators over a large geographic area. The rate at which drilling will occur and the drilling locations are uncertain. Consequently, like all plays of this type, there will be a ramp up period, peak period and waning period over the course of many years. In general and overall terms, the Niobrara Play is expected to involve exploration and production activity for 20 to 30 years. Details of the methodology used to estimate the travel demand associated with the Niobrara and other energy development activities are detailed in Appendix B.

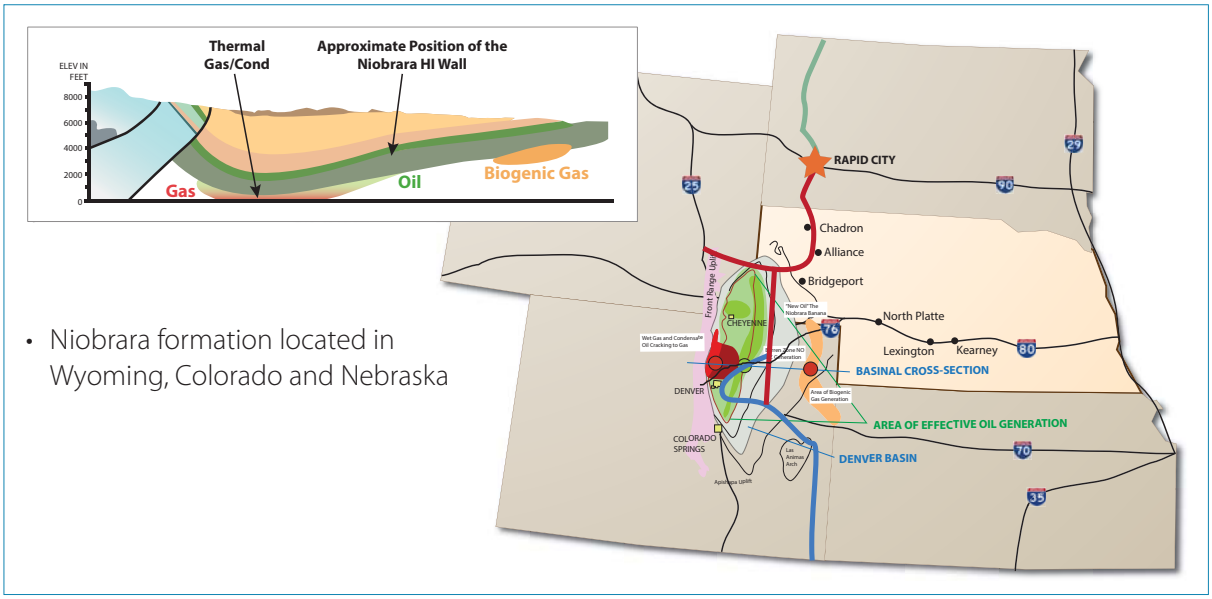


Figure 2.8 - Boundaries and Characteristics of the Niobrara Play

2.1.3 EXISTING FEATURES OF THE HEARTLAND EXPRESSWAY CORRIDOR

Corridor Limits

- NE 71 from the Colorado/Nebraska border to Scottsbluff;
- US 26 from Scottsbluff to the Nebraska/ Wyoming border;
- US 26 from Scottsbluff to the intersection with L62A;
- L62A from the intersection with US 26 to US 385, north of Bridgeport;
- US 385 from L62A intersection north to the Nebraska/South Dakota border.

The following discussion characterizes the existing features of the Heartland Expressway Corridor. The discussion begins with highway characteristics and features, and then describes intermodal freight facilities, railroads, airports and truck freight amenities such as parking and rest stops.

Highway Characteristics and Features

Nebraska Highway 71 (NE 71) – Colorado/Nebraska State Line to Interstate 80 (I-80): NE 71 is a two-lane undivided roadway classified as a Major Arterial with a posted speed limit of 60 miles per hour (mph). Driveways are sparsely located throughout the section of highway for access to residential land. There are no left-turn lane bays for any of the driveways of intersections. There are no traveler amenities (traveler services such as gas stations, rest stops, truck plazas, restaurants, hotels, etc.) along this stretch of highway. The Kimball Municipal Airport is located about 1.5 miles south of I-80. There are no paved shoulders south of the Kimball Airport. NE 71 intersects I-80 as a diamond interchange.

Nebraska Highway 71 (NE 71) - Interstate 80 (I-80) to U.S. Highway 26 (US 26): A new bypass has opened approximately two miles east of the existing NE 71 interchange. NE 71 continues east along I-80 to the newly opened NE 71. The NE 71 northbound exit on I-80 is at Exit 22, and the southbound exit is at Exit 20. The City of Kimball is located just north of I-80 at Exit 20, and traveler amenities are located within the city. NE 71 is a four-lane divided roadway classified as an Expressway with a speed limit of 65 mph. The median varies from sixteen- to forty-feet-wide. Outside shoulders are about eight-feet-wide with inside shoulders being about five feet. Paved intersections are located roughly every half mile to allow access to adjacent farm land. There are pullout areas that are used for temporary weigh stations for the Nebraska State Patrol Carrier Enforcement Division. These pullouts have no facilities and are not intended for the general public.

NE 71 bypasses along the eastern edge of Gering and Scottsbluff. Travelers on NE 71 have access to the City of Gering through the interchanges of County Road 21 (CR 21), Nebraska Highway 92 (NE 92), and a partial diamond interchange at South Beltline Highway before intersecting US 26 as a T-intersection. There are five at-grade intersections between CR 21 to US 26.

United States Highway 26 (US 26) – Wyoming/Nebraska State Line to Nebraska Highway Link 62A (L62A): US 26 is a three-lane undivided road coming out of Torrington, Wyoming with a posted speed limit of 45 mph. Approximately one mile east of Torrington, the road narrows to a two-lane facility and the speed limit increases to 65 mph. The BNSF Powder River Basin rail line roughly parallels US 26 to the south and west between Torrington and Scottsbluff, Nebraska.

The Town of Henry, Nebraska is located just east of the Wyoming-Nebraska State Line to the south of US 26. US 26 is a two lane undivided roadway classified as a Major Arterial Roadway with a posted speed limit of 45 mph and transitions to a posted speed limit of 65 mph just east of the Henry town limits. Shoulder widths are approximately six feet wide on both sides. Passing is not allowed near Henry. There are many unpaved driveways accessing US 26 near Henry but they diminish to one or two every mile east of Henry.

The number of driveway access points increases again as US 26 approaches the Village of Morrill. US 26 transitions to a three-lane roadway through Morrill with a posted speed limit of 25 mph. For approximately 1,500 feet, there is a posted speed limit of 45 mph on US 26 prior to the two-way left-turn lane on the eastern and western edges of town. The intersections within the Village of Morrill are all unsignalized. As US 26 leaves the Morrill city limits, the two-way left-turn lane is dropped and the roadway transitions to a four-lane divided roadway, with a 40-foot-wide median, and a 65 mph speed limit one mile east of town at CR 10.

US 26 transitions from a four-lane divided roadway to a four-lane undivided roadway at the city limit of Mitchell. A 50 mph speed zone is located about 1,000 feet outside of town and transitions to a 30 mph speed limit in town. There is one intersection that is signalized in the City of Mitchell (Center Avenue/15th Avenue.)

Within the Scottsbluff city limits, US 26 has seven signalized intersections with left and right turn lanes and four unsignalized intersections. The roadway remains a divided four-lane facility with a posted speed limit of 45 mph and transitions to 65 mph east and west of Scottsbluff.

US 26 remains as a four-lane divided highway and then transitions to a two-lane undivided roadway within the Minatare city limits with approximately eight foot shoulders and continues with these characteristics until the intersection with L62A. The posted speed limit within Minatare is 50 mph.

Nebraska Highway Link 62A (L62A) – US Highway 26 to US Highway 385: L62A is a two-lane undivided highway classified as a Major Arterial with a posted speed limit of 65 mph. Shoulder widths are approximately eight feet wide. L62A has many driveway accesses from the local farm land and residences. There are no left or right-turn bays at the driveways. No traveler amenities are available along this stretch of roadway. L62A has several crossings of irrigation ditches along this portion of the corridor. L62A terminates at an unsignalized T-intersection with US 385.

Figure 2.9 – Photograph of the US 385/US 20 Intersection

Figure 2.10 – Rest Area Pullout with Historical Marker on the West Side of US 385

US Highway 385 (US 385) – Nebraska Highway Link 62A (L62A) to Alliance: US 385 is a two-lane undivided roadway classified as a Major Arterial. The speed limit is 65 mph and shoulder widths vary from six to eight feet. The L62A intersection with US 385 is a T-intersection with L62A traffic required to stop and yield to US 385 traffic. About ¾ of a mile north of the intersection there is a truck parking area on the west side of US 385. This pullout area is used as a temporary weigh station for the Nebraska State Patrol Carrier Enforcement Division. There are no shelters, rest rooms or other amenities at this parking area.

Further north, approximately three miles north of the L62A intersection and near the unincorporated community of Angora, the BNSF mainline parallels US 385 to the east. There are several intersecting roadways that have at-grade crossings with the rail line that are located about 100 to 200 feet east of US 385.

There is one rest area, with no facilities, on the east side of US 385 approximately six miles north of L62A intersection. This area is served with southbound left-turn lanes for both entrances.

The City of Alliance is located east of US 385 and there are four local streets connecting the city with US 385 (W. Kansas Street, W. 3rd Street, W. 10th Street and Nance Road).W. 3rd Street is also designated as NE 2. Each intersection is unsignalized with the city street traffic required to stop for US 385 traffic. There are turn lanes provided at three of the intersections, with no turns at the intersection of Nance Road. The BNSF mainline is located east of US 385 approximately 4,300 feet at W. 3rd Street and converges back to US 385 north and south of Alliance. Just south of Alliance and east of US 385 is a major BNSF rail yard. The BNSF mechanical division operates a major locomotive maintenance facility at this location that performs preventive maintenance and repairing and servicing of equipment. Further south is a large switching yard used primarily for coal unit trains.

US Highway 385 (US 385) – Alliance to US 20 (Charon): North of Alliance, US 385 continues to the northwest. The BNSF rail line runs parallel and adjacent to US 385. There are several roadway intersections that have at-grade crossings with the rail line. Each crossing is located about 100 to 200 feet from US 385. US 385 and NE 2 share the same alignment, beginning at the intersection with W. 3rd Street and continuing north approximately eight miles

where US 385 and NE 2 split at a grade separated interchange. US 385 continues north and is grade separated over NE 2 and the adjacent BNSF rail line via a two-lane bridge. NE 2 intersects US 385 south of the interchange at a T-intersection with NE 2 required to stop for US 385 traffic. North of the interchange NE 2 continues to the northwest, adjacent to the rail line.

About 13 miles south of Chadron, the road passes through the wooded area of the Nebraska National Forest where the road descends approximately 1,000 feet in elevation to Chadron. This occurs near the Chadron Reservoir. Within this section of roadway, US 385 has a climbing lane for the southbound (uphill) direction. There are also a number of large radius curves within this section.

US 385 transitions to a three-lane roadway within the Chadron city limits and has a posted speed limit of 45 mph. The center lane is a two-way left-turn lane. US 385 intersects with US 20 as a four-legged intersection. The south leg of US 385 and the driveway to the Shell gas station are stop sign controlled.

US Highway 385 (US 385) – Chadron to South Dakota State Line: US 385 and US 20 share the same alignment for 2.5 miles west of Chadron. US 20 is a three-lane roadway with a posted speed limit of 45 mph.

US 385 has a sweeping horizontal right-turn lane to the north at the western intersection with US 20. Southbound US 385 traffic is required to stop and yield to US 20 traffic on the large horizontal curve. Along the large horizontal curve, US 385 intersects with Nebraska Highway Link 23D (L23D). US 385 is a two-lane roadway with a posted speed limit of 65 mph through the horizontal curve and continues to the South Dakota border.

Located just north of the horizontal curve is a historical marker parking area with a picnic table on the west side of US 385. No restroom services are provided at this location. The Chadron airport is also west of US 385 at this location. There is an at-grade railroad crossing with the Nebraska Northwestern rail line, approximately two miles north of US 20.

General highway characteristics include:

- Speed limits along the majority of the Heartland Expressway Corridor are 65 MPH. NE 71 is posted as 60 MPH from the Colorado/Nebraska state line to Kimball. Speed limits drop to less than 50 MPH through the following cities:
  - US 26 - Henry, Morrill, Mitchell, Scottsbluff, Minatare
  - US 385 - Alliance, Chadron
- Two-lane undivided roadways that allows passing when the driver feels it is safe to complete the passing maneuver:
  - NE 71 from the Colorado/Nebraska state line to the beginning of the four-lane divided roadway south of Kimball, passing is allowed 85 percent of the time (estimated).
  - US 26 from the Wyoming/Nebraska state line to the beginning of the four-lane divided roadway east of Morrill, passing is allowed 75 percent of the time (estimated), except when driving through Henry and Morrill.
  - L62A from US 26 to US 385, passing is allowed 75 percent of the time (estimated).
  - US 385 from L62A to the South Dakota/Nebraska state line, passing is allowed 75 percent of the time (estimated), except when adjacent to Alliance, south of Chadron, and through Chadron city limits. There are also two climbing lane locations for southbound US 385, south of Chadron, as the roadway travels through Nebraska National Forest.

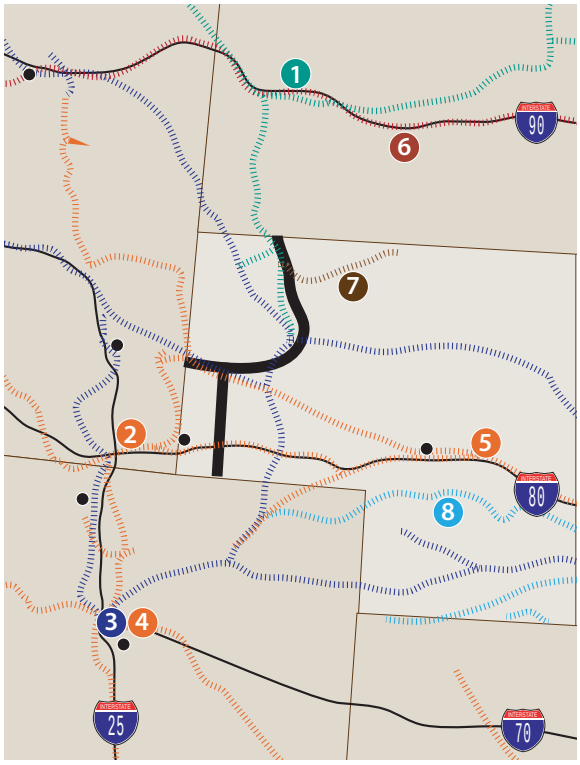
Intermodal Freight Facilities and Railroads

Intermodal freight facilities primarily involve railroad freight operations, but also include airport freight operations. Rail operations are described first. Three major intermodal freight hubs influence truck traffic in the Heartland Expressway Corridor. These hubs include:

1. Denver, Colorado
2. Omaha, Nebraska/Council Bluffs, Iowa
3. Billings, Montana

In these locations, freight trailers (containers) are off-loaded from railcars to be hauled by trucks, or are loaded onto railcars to be hauled by train. While no major facilities of a similar size exist within the Heartland Expressway Corridor, there are other intermodal rail activities and facilities near and within the corridor, specifically the grain silo facilities adjacent to rail lines. The following discussion briefly describes Union Pacific Railroad (UPRR), Burlington Northern Santa Fe Railway (BNSF) and other relevant rail activities and facilities. Figure 2.11 presents existing railroad facilities and their relationship to freight movement.

The following summaries provide additional information.



1. DAKOTA, MINNESOTA & EASTERN RAILROAD (DM&E)
- Black Hills Transload Facility
- Owned by Canada Pacific (CP)

2. UNION PACIFIC YARD: CHEYENNE

Ships
- Coal
- Soda Ash

Receives
- Coal
- Non-Metallic Minerals
- Stone, Sand and Gravel
- Fertilizer
- Revenue Empty Covered Hoppers

Rail Cars Originated in Wyoming in 2010: 1,845,145
Rail Cars Terminated in Wyoming in 2010: 15,473

3. BNSF INTERMODAL HUB: DENVER

BNSF Nationwide Ships
- Coal
- Grain
- Chemicals
- Petroleum
- Grain Mill
- Sand/Gravel

Total Intermodal and Carloads Services Nationwide: 9,143,043

Heartland Expressway Corridor
Coal Fired Power Plant
N

4. UNION PACIFIC YARD: DENVER

Ships
- Coal
- Intermodal - Wholesale
- Wheat and Food Grains

Receives
- Coal
- Intermodal - Wholesale
- Non-Metallic Minerals
- Assembled Autos
- Roofing Products

Rail Cars Originated in Colorado in 2010: 240,576
Rail Cars Terminated in Colorado in 2010: 121,511

5. UNION PACIFIC YARD: NORTH PLATTE

Ships
- Corn and Feed Grains
- Corn Refining
- Feed and Animal Protein
- Meats and Oils
- Wheat and Food Grains

Receives
- Coal
- Fertilizer
- Ferrous Scrap
- Roofing Products

Rail Cars Originated in Nebraska in 2010: 174,952
Rail Cars Terminated in Nebraska in 2010: 162,264

6. DAKOTA SOUTHERN RAILROAD (DSRR)
- Owned by state of South Dakota
- Non-operational: Rapid City to Kadoka (98.5 Miles)
- Local operating line: Kadoka to Mitchell (190 Miles)

7. NEBKOTA RAILWAY

Ships
- Grain

8. NEBRASKA, KANSAS & COLORADO RAILWAY (NKCR)

Ships
- Wheat
- Corn
- Coal
- Fertilizer

NEBRASKA CENTRAL RAILROAD COMPANY (NCRC)

Ships
- Steel
- Agricultural Product
- Grain

Figure 2.11 - Existing Railroad Facilities and their Relationship to Freight Movement

Union Pacific Railroad (UPRR)

North Platte, Nebraska Yard: Corn and feed grains, corn refining, feed and animal protein, oils, and wheat and food grains are the top commodities shipped from the North Platte Yard. Coal, fertilizer, ferrous scrap, steel, and roofing products are the top commodities received at the North Platte Yard.

Cheyenne, Wyoming Yard: Coal and soda ash are the top commodities shipped from the Union Pacific Cheyenne Yard. Coal, non-metallic minerals, stone, sand and gravel, fertilizer, and revenue empty covered hoppers are the top commodities received at the Cheyenne Yard.

Denver, Colorado Yard: Coal; intermodal wholesale and wheat and food grains are the top commodities shipped from the Denver Yard. Coal, intermodal wholesale, non-metallic minerals, assembled automobiles, and roofing products are the top commodities received at the Denver Yard.

Burlington Northern Santa Fe Railway Company (BNSF)

- BNSF Railway Company has one major intermodal hub near the Heartland Expressway Corridor in Denver, Colorado.
- The Denver (Irondale) site is on the BNSF automotive network and contains an automotive facility with an automotive ramp.
- BNSF rail transports coal and has rail lines accessing the Powder River Region which contains numerous coal fired power plants and coal mines.
- Nationwide, BNSF top commodities shipped are coal, grain, chemicals, petroleum, grain mill and sand/gravel.
- BNSF has a rail yard located in Alliance, Nebraska. The southern portion of this rail yard parallels US 385 for approximately half a mile.

Dakota, Minnesota & Eastern Railroad (DM&E)

DM&E is owned by Canada Pacific (CP) and has a "transload" facility located at Box Elder, South Dakota

Dakota Southern Railroad (DSRR)

DSRR is owned by the State of South Dakota. The rail line is non-operational from Rapid City to Kadoka, South Dakota (total of 98.5 miles). The rail line is locally operated from Kadoka to Mitchell, South Dakota (total of 190 miles).

Nebraska, Kansas & Colorado Railway (NKCR)

NKCR owns and operates approximately 559 miles of track. The top commodities shipped include wheat, corn, coal and fertilizer.

Nebkota Railway

Nebkota Railway is owned by West Plains Company. The Nebkota Railway is a short-line carrier serving stations in northwest Nebraska near Chadron. The main commodity transported is grain.

Nebraska Central Railroad Company (NCRC)

NCRC is owned and operated by Rio Grande Pacific Corporation. NCRC is a network of 340 miles of track operating solely in Nebraska. It serves industries such as steel production, agricultural products, grain marketing and ethanol production.

Nebraska Northwestern Railroad (NNW)

NNW is a short-line railroad that owns track from Chadron to Dakota Junction, which is approximately 1.3 miles west of US 385, and leases track from DM&E and Canadian Pacific from Dakota Junction to Crawford, Nebraska. NNW operates the Chadron Yard, where it also operates a roundhouse/machine shop for repair activities for railroads, utilities, and other car owners.

In addition to these rail operations, there are other important truck/rail connection points associated with grain silos. Grain silos along active rail lines are located in the following communities:

Sidney	Potter	Lodgepole	Chappel	Big Springs	Brule
Ogallala	Scottsbluff	Gering	Melbeta	Hemingford	Lyman
Morrill	Kimball	Alliance	Chadron	Bridgeport	Bayard

Airports

Airports with direct access to major road and railroad transportation tend to provide efficient air to ground intermodal service. A wide range of airports with freight operations exist in Nebraska and the surrounding states. The primary operations are associated with major urban areas such as Denver and larger cities such as Omaha. The primary airports in Nebraska are the Lincoln Airport at Lincoln, Eppley Airfield at Omaha, North Platte Regional Airport at North Platte and the Kearney Municipal Airport at Kearney. Other important airports in Nebraska are located in Chadron, Gordon, Valentine, Ainsworth, O'Neill, Norfolk, Alliance, Scottsbluff, Ogallala, Imperial, North Platte, McCook, Hastings, Grand Island, and Fremont. All of these airports and others play a role in freight operations passing through the Heartland Expressway Corridor.

According to a February 19, 2007, article in the Denver Post entitled: "Hub Awaits Word on Rail"–

"An intermodal transportation hub planned for years near Colorado's Front Range Airport may not get the key piece its developers have been hoping for - a Union Pacific rail and truck freight yard. Union Pacific and the Schuck Corp., the developer of the hub, called TransPort, signed a letter of intent in 2004 that called for Union Pacific to move its freight operation to the TransPort location near Front Range, a general aviation airport southeast of Denver International Airport. But now, Union Pacific is conducting a study to look at moving its rail yards to about 640 acres in the Fort Lupton area, a $40 million initial project (Yamanouchi)."

New facilities of this type can create a substantial shift in freight movement. At this time, no major road, rail, or air hub is proposed to be developed within the Heartland Expressway Corridor. However, UPRR provides line-haul service to and from facilities in Egbert, Wyoming with the remainder of the deliveries completed by local motor carriers. This facility, located approximately 10 miles west of the Nebraska border along I-80, could be a future intermodal hub for oil and gas transportation. This facility and other rail operations associated with the Niobrara formation and other energy resource developments could substantially influence freight operations in Nebraska.

Truck Amenities: Rest Areas, Truck Stops and Parking Facilities

The Heartland Expressway Corridor has four existing rest areas: one on NE 71 and three along US 385. Three rest areas provide parking only, while the fourth has amenities including shaded picnic tables.

There are pullouts for both northbound and southbound NE 71 three miles south of State Spur 4a at approximately mile post 36.5 which travels to the town of Harrisburg. These pullouts are ¼ of a mile long and are located adjacent to the roadway. These are truck scale pullouts used by the State Patrol. These pullouts have no amenities.

There is a rest area pullout on the west side of US 385 at approximately mile post 85.5. The pullout is approximately 500 feet long and is located about 125 feet away from southbound traffic. US 385 has turn lanes to access the rest area. There are no amenities at this pullout.

There is a rest area pullout on the south side of US 385 at approximately mile post 90.5. The rest area is at least 250 feet away from traffic on US 385 and amenities include shaded picnic tables. Additionally, commuters use this area as a park-and-ride lot. US 385 has turn lanes to access the rest area.

There is a rest area pullout on the west side of US 385 just north of Chadron and the intersection with US 20 at mile post 164. The pullout is approximately 300 feet long and is located about 70 feet away from southbound traffic on US 385. US 385 does not have turn lanes to access this pullout. There are no amenities at this pullout; however, a historical marker is present.

Truck Stops are located along the Heartland Expressway corridor at the following locations:

1. Gering, 2648 NE 71 Business. This stop is not open 24 hours a day.
2. Scottsbluff, 401 NE 71 Bypass SW. This stop is not open 24 hours a day.
3. Scottsbluff, NE 71 and S Beltline W. This stop is open 24 hours a day.
4. Alliance, NE 2 W and US 385. This stop is not open 24 hours a day.
5. Chadron, 1250 US 20 and US 385. This stop is open 24 hours a day.

Additional truck parking exists beyond the limits of the Heartland Expressway Corridor.

The primary truck parking facilities are located along I-80. These facilities are private trucking plazas located throughout the I-80 corridor. Some of the larger facilities are located at Sidney, Big Springs, Ogallala, North Platte and Grand Island. America's Independent Truckers' Association, Inc. (AITA) provides a comprehensive list of truck stops.

As the Heartland Expressway Corridor is developed, the demand for rest areas and truck parking will increase. New rest area construction, modifications and renovations should be considered. Construction costs of rest areas can vary significantly from $1.5 million for a minimal installation to $15 million for a comprehensive installation.

There is a growing need for a systematic network of safe rest areas for all traffic, and a special need for long-term truck parking facilities. The increase in allowable speed limits and traffic on the Heartland Expressway Corridor may increase the need for locations offering rest and rejuvenation for the commercial vehicle operator who must maintain a high level of awareness on the road.

Currently, Nebraska has rest stops on I-80 spaced between 30 and 60 miles apart. These rest facilities are large with picnic areas, flush toilets, truck parking, and visitor information services. It is recognized that I-80 differs from the Heartland Expressway Corridor.

The following minimum levels of service should be provided for along the corridor:

Truck parking facilities should be spaced at a minimum of 60 miles with a desired spacing of 30 miles. They should be wherever possible near locations where trucks may have to wait to pick up or drop off a load. These facilities could be State facilities or private facilities such as a truck stop.

There should be, at a minimum, flush restroom facilities provided every 60 miles along the corridor accessible to all vehicle types. These facilities should also incorporate either a picnic facility or be located near an easily accessible restaurant or fueling facility. Again these facilities can be State operated facilities or private facilities, or a public-private partnership.

2.1.4 FUTURE TRAVEL DEMAND FORECAST METHODOLOGY

Forecast Horizon Year and Analysis Scenarios

The forecast horizon year for long-range planning is typically 25 years. In 2011, the appropriate forecast year is 2035. In addition to forecast years, various scenarios are frequently developed and applied to characterize future assumptions and corresponding influences on future outcomes. The following scenarios were developed for this study:

Existing and Future Baseline Conditions

2010 Existing Traffic: This scenario serves as the baseline condition and applies existing traffic counts. The baseline condition is compared to the Year 2035 forecast scenarios to establish anticipated differences attributable to various factors. Existing traffic volumes and historical growth are depicted in detail in Appendix B.

2035 without Improvements: This scenario evaluates the Year 2035 conditions based on traffic counts and growth trends, but does not reflect traffic that may result from making transportation improvements that would draw additional vehicles into the Heartland Expressway Corridor. This scenario is often referred to as the "No Build Alternative."

Future "Build" Conditions

2035 with Heartland Improvements: This scenario highlights how improvements within the boundaries of the Heartland Expressway Corridor would influence the Year 2035 traffic volumes.

2035 with Heartland Improvements and Intensified Energy Resource Development: This scenario reflects the future importance of transportation increases associated with anticipated natural resource extraction activities involving intensified oil and gas and alternative energy development in the region, such as the Niobrara energy basin and wind energy potential.

2035 with All PTP Alliance Corridor Improvements: This scenario highlights how improvements along the entire PTP Alliance Corridor would influence the Year 2035 traffic volumes without considering impacts of the energy development. This scenario includes the Heartland Expressway Corridor improvements.

2035 with All PTP Alliance Corridor Improvements and Intensified Energy Resource Development: This is the long-term ultimate scenario reflecting all of the primary conditions that are expected to influence future traffic by the Year 2035.

Methods and Assumptions

The following discussions provide details regarding the forecast methodology, including details about the assumptions behind these scenarios.

Transportation Demand Model

A transportation demand model was built to evaluate impacts of Heartland Expressway Corridor improvements (Appendix B). This model was built to reflect the special rural roadway travel demand patterns of this part of Nebraska as well as to integrate traffic forecasts and methodologies from several different sources and states. The modeled area was bounded by:

- Interstate 90 (I-90) on the north
- I-25 on the west
- I-76 to the southeast extending down to Denver
- Nebraska Highway 61 and South Dakota Highway 73 on the east

Roadway facilities within the modeled boundary included all Interstate, US, and State Highways along with selected county roads.

Traffic Analysis Zones

Model traffic was generated using 133 Traffic Analysis Zones (TAZ). A TAZ is an area where traffic generation assumptions can be made based on development characteristics within the zone. Appendix B includes a listing of the TAZs. The model only considered the number of trips generated from TAZs to the regional highway network. Local trips on local roads within a TAZ were not used in the model.

The size of the individual TAZs varied substantially within the study area. Many major population centers such as Cheyenne and Denver were modeled as a single TAZ. Trips generated by these large TAZs only accounted for the trips either entering or leaving via the regional highway network. Internal trips, such as shopping trips or many work related trips were not specifically modeled as they were assumed to be within the zone and hence never reaching the modeled regional highway network. At the other end of the spectrum were smaller rural communities which could have a significant enough influence to change the traffic volume on the highway network passing through or near them. The result was a TAZ structure specifically designed to model rural traffic between cities and towns.

Modeling Steps

The methodology used to develop traffic forecasts followed the following steps:

- Identify existing Average Annual Daily Traffic (AADT) 2010 travel demands for both the total number of vehicles and for trucks. This was done by consulting the published traffic count maps from the four states (NDOR, Colorado Department of Transportation (CDOT), Wyoming Department of Transportation (WYDOT) and South Dakota Department of Transportation (SDDOT)).
- Trip generation totals for TAZs within Nebraska were taken from the NDOR statewide travel demand model. Trip generation totals for TAZs outside of Nebraska were initially estimated using an external trip rate derived from the NDOR model based on population. These initial estimates were refined in the next step.
- The model network was built with link speeds and distances. The shortest path between each TAZ pair was determined. An initial trip origin destination (OD) matrix was then estimated and assigned to the roadway network. Rates for trips generated outside of Nebraska were then varied to correspond or agree with the observed existing travel demands thereby calibrating the model results. Forecast travel demands were then compared to existing counts and a very good fit was found to have taken place (i.e. model results correlated appropriately with existing conditions).
- The model forecasts were then analyzed and adjusted to account for local variations in travel demand such as increases in traffic near cities and towns since the calibrated link volumes were for those between the "influence areas" of cities. These adjustments were noted and used in the development of future forecasts.
- Future travel demands were developed in consultation with the following sources:
  - Expected growth in travel demand from the NDOR Statewide travel demand model
  - SDDOT Decennial Interstate Corridor Study, March, 2011
  - Mead County (South Dakota) Transportation Plan, November 2008
  - City of Gillette, Wyoming, 2009 Transportation Plan Update
  - Laramie County (Wyoming) Wyoming Planning Department Growth factors for population and travel demand
  - CDOT 20-year growth factors
  - North Front Range Metropolitan Planning Organization (Fort Collins, Colorado) 2035 travel demand forecasts
  - Denver Regional Council of Governments (Denver, Colorado) 2035 travel demand forecasts
  - WYDOT Interstate 80 Tolling Feasibility Study, Phase 2 Final Report, November 2009

Scenario Assumptions

Travel demand growth assumptions were developed for each "Build" scenario. These assumptions addressed population growth, economic conditions, anticipated freight activity and major new industrial operations with a potential to influence basic forecasts. Table 2.1 summarizes the primary assumptions applied to the 2035 build scenarios.

Table 2.1 –Summary of Technical Assumptions Used in Travel Forecasts for the Build Alternatives

Scenario/ Assumptions	2035 With Heartland Improvements	2035 With Heartland Improvements and Intensified Energy Resource Development	2035 With All Ports to Plains Alliance Corridor Improvements	2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resource Development
Population Growth	No Change from No Build, 15% increase from 2010	A 7% increase in the Panhandle area over No Build	A 7% increase in the Panhandle area over No Build	A 13% increase in the Panhandle area over No Build
Economic Conditions	Baseline economic conditions same as No Build	Significant additional development due to the increased energy activity.	Baseline economic conditions same as No Build	Significant additional development due to the increased energy activity.
Travel Behavior	Some shifting of travel demand to the Heartland Corridor, overall 9% increase over No Build	30% increase over No Build	63% increase over No Build	70% increase over No Build
Anticipated Freight Activity	Some shifting of Freight demand to the Heartland Corridor, overall 8% increase over No Build	52% increase over No Build	103% increase over No Build	124% increase over No Build
Major New Industrial Development (Niobrara and Other)	No Change from No Build	Energy Development	No Change from No Build	Energy Development

NDOR modeling results were not used in these assumptions because economic conditions outside of Nebraska were not accounted for in the NDOR model.

As described previously, the "No Build" scenario or "2035 without Improvements" scenario evaluates the projected Year 2035 conditions based on traffic counts and growth trends, but does not reflect traffic that may result from making transportation improvements that would draw additional vehicles into the Heartland Expressway Corridor.

Future travel demands from the above mentioned sources were placed on the model roadway network. Future OD patterns were then estimated using the existing OD travel demand as a seed matrix (Appendix B contains existing OD travel demand). It became evident that the four to five percent total growth in travel demand assumed in the NDOR travel demand model between existing conditions and the Year 2035 was out of step with the much higher rate of growth expected in the surrounding states.

Based on this differential, the rate of growth in Nebraska was increased to accommodate the expected growth rates in the surrounding states (Appendix B). The resulting increase in overall traffic for all vehicles was 19 percent versus the five percent assumed in the NDOR model. The increase in truck demand needed to balance the surrounding demand rates was eight percent.

There is some historic evidence to support a greater level of travel demand through the panhandle of Nebraska generated by surrounding states. The one corridor within the panhandle that has seen growth in travel demand over the last ten years is the US 26 corridor between the Powder River, Wyoming energy production area and I-80.

US 26 also serves as a shortcut around Cheyenne, Wyoming between I-80 and I-25. Given this pattern, it is likely that much of this growth in travel demand is due to trips with origins and destinations outside the panhandle area.

The final set of growth rates that were applied are presented in Table 2.2.

Table 2.2 – Assumed Baseline Growth in Travel Demand Under No-Build Conditions

State	2010 to 2035 Baseline Growth in Travel Demand	
	All Vehicles	Trucks
Nebraska	19%	8%
Wyoming	60%	48%
South Dakota	82%	67%
Colorado	118%	97%
Average	88%	56%

The following discussions elaborate on travel behavior, freight and energy development assumptions.

Travel Behavior Changes Related to Improvements

Travel behavior is the outcome of travel conditions faced by a driver, and in this case, route choices available to a motorist. Key factors associated with travel behavior include clear or perceived travel time savings, safety benefits, travel simplicity (fewer turns and route changes reduce complexities) and roadside attractions, features and services. New road alignments and access benefits that enhance a road system's reach have the most significant influences on driver behavior.

The PTP Alliance Corridor is not a new route, but the overall set of anticipated improvements has the effect of creating a new major route option for many motorists. However, perhaps more importantly, a comprehensive package of improvements that upgrades everything from travel speeds and safety to drive amenities and directional signage is expected to draw existing and future travel demand into this corridor to varying degrees from Canada to Mexico. The modeling effort for the "Build" scenarios reflects this effect.

In September 2008, the Texas Department of Transportation (TxDOT) produced the Great Plains International Trade Corridor Assessment document and the travel forecast section referred to the FAF3 data. This study concluded that the data was not disaggregated enough to conduct travel demand forecasts. However, the data can be used to estimate the added demand by fully improving the corridor as well as for expected increases in international trade due to the North American Free Trade Act (NAFTA) and other trade conditions and agreements.

In summary, just north of Limon, Colorado, Highway 71 carries approximately 870 vehicles per day, with 190 of those being trucks. The PTP Corridor Development and Management Plan prepared by CDOT in December 2004 for the States of Colorado, New Mexico, Texas, and Oklahoma estimated that traffic on Colorado Highway 71 north of Limon would grow as a result of the PTP improvements as well as ambient growth by approximately 210 percent. Truck travel is expected to increase from 190 vehicles per day (VPD) to 430 VPD by 2035 with corridor improvements.

According to the Montana Department of Transportation and the North Dakota Department of Transportation records, at the Canadian border there are approximately 2,640 vehicles crossing the border each day between US 191 in Montana and US 256 North of Minot, North Dakota. Of these crossings, approximately 720 are trucks. These boundaries for the crossings were selected as being those that could reasonably be expected to feed the improved PTP Alliance Corridor. The total volume of border crossings between I-15 and I-29 is approximately 11,520 with 3,200 being trucks.

To estimate the total number of crossings for the PTP Alliance Corridor, it was assumed that 70 percent of the crossings occurring between US 191 in Montana and US 256 would occur on the PTP Alliance Corridor. Additionally, an estimated one third of the remaining crossings between I-15 and I-29 would be diverted to the PTP Alliance Corridor. This results in a base border crossing at the PTP Alliance Corridor of 3,000 daily trips, with 820 being trucks, or approximately ¼ of the total crossings between I-15 and I-29. These results are summarized in Table 2.3.

Table 2.3– Additional PTP Alliance Corridor Travel Demand (2035)

	Vehicles (Vehs.) Per Day			
	To/From Canada		To/From Ports to Plains	
	All Vehs.	Trucks	All Vehs.	Trucks
With Attraction Due to PTP Improvements (2010)	4,730	1,300	1,290	300
With Expected Trade Corridor Growth	7,570	2,860	2,660	430

As the corridor proceeds northward, the Ports to Plains component decreases and the Canadian component increases as the corridor gets closer to the Canadian border, and the reverse occurs in the southbound direction. The changes in travel demand are attributable to cars entering or leaving the corridor at intersecting facilities. As expected, interstate highway crossings have a large influence on vehicles accessing the corridor. The two right-most columns depict total segmental trade component due to the combined impact of Ports to Plains and Canadian Border crossings. These results are summarized in Table 2.4.

Table 2.4– Additional Ports to Plains Alliance Corridor Travel Demand by Heartland Expressway Corridor Location (2035)

	Vehicles (Vehs.) Per Day					
	To/From Canada		To/From Ports to Plains		Totals	
	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks
Between Canada and US 2	7,570	3,390	40	5	7,610	3,395
Between US 2 and ND 23	7,080	3,160	40	10	7,120	3,170
Between ND 23 and I-94	6,930	3,090	40	10	6,970	3,100
Between I-94 and US 12	2,630	1,080	70	20	2,700	1,100
Between US 12 and SD 20	2,480	950	140	30	2,620	980
Between SD 20 and I-90	2,450	920	150	30	2,600	950
Between I-90 and US 18	1,650	210	510	60	2,160	270
Between US 18 and US 20	1,420	190	680	90	2,100	280
Between US 20 and NE 2	1,260	170	790	110	2,050	280
Between NE 2 and US 26	1,210	170	820	120	2,030	290
Between US 26 and I-80	740	120	1,160	190	1,900	310
Between I-80 and CO 14	80	50	1,640	280	1,720	330
Between CO 14 and I-76	70	50	1,770	300	1,840	350
South of I-76	30	30	2,660	430	2,690	460

Future Travel Demand Model Results

As shown in Table 2.5, AADT increases based on general traffic growth and anticipated community population changes ranging from low to high. With the addition of Heartland Expressway Corridor improvements, additional increases are evident. These increases are based on the value of the improvements for travelers in terms of travel time savings and increased safety on the new facilities. Larger increases are noticeable in the southern portion of the corridor when anticipated energy development activity is added to the forecasts. The largest increases are attributed to completion of the overall PTP Alliance Corridor improvements. Clearly, the formation of this new corridor from Canada to Mexico has substantial influences on travel route choices and reflects the importance of travel to and through Nebraska from distant origins and destinations.

Table 2.5 –2010 Existing Traffic and 2035 Traffic Forecasts for Various Scenarios (AADT)

Location	2010 Existing Traffic		Future No Build 2035 without Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Intensified Energy Resource Development		2035 With All Ports to Plains Alliance Corridor Improvements		Ultimate 2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resource Development	
	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks
NE 71												
At Colorado Border	820	135	860	140	1,020	220	1,480	350	2,180	820	2,640	950
South of Kimball	1,610	355	1,690	370	1,850	450	2,310	580	2,850	970	3,310	1,100
North of Kimball	2,055	315	2,160	330	2,460	410	3,080	500	3,770	1,110	4,390	1,200
South of Gering	3,805	215	4,000	230	4,360	310	4,430	330	6,980	1,200	7,050	1,220
North of Scottsbluff	1,860	185	2,900	330	3,010	330	3,160	330	3,160	350	3,310	350
North of NE 2	750	105	1,950	190	1,780	100	1,830	100	1,870	110	1,920	110
L7E												
West of US 385	2,470	435	2,590	540	2,650	550	3,170	590	4,010	730	4,530	770
NE2												
West of Hemingford	1,035	110	2,590	460	2,870	550	2,970	550	3,010	580	3,110	580
South of Hemingford	1,220	135	2,000	160	2,000	160	2,020	160	2,000	160	2,020	160
South of US 385	3,010	305	3,160	320	3,220	320	3,380	330	4,640	510	4,800	520
East of Alliance	1,260	245	1,320	300	1,320	300	1,350	300	1,320	300	1,350	300
I-80												
At Wyoming Border	7,475	4,350	7,800	4,570	7,750	4,570	8,150	4,750	7,920	4,660	8,320	4,840
East of Kimball	7,285	4,455	8,700	4,620	8,650	4,620	9,200	4,780	8,820	4,710	9,370	4,870
West of Sidney	7,215	4,420	9,600	4,700	9,650	4,700	10,010	4,740	9,750	4,750	10,110	4,790
West of I-76	7,395	4,515	9,600	4,740	9,660	4,740	9,870	4,770	9,710	4,760	9,920	4,790
East of Ogallala	14,865	6,830	20,400	9,060	20,400	9,060	21,080	9,190	20,400	9,060	21,080	9,190

Table 2.5 (continued) –2010 Existing Traffic and 2035 Traffic Forecasts for Various Scenarios (AADT)

Location	2010 Existing Traffic		Future No Build 2035 without Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Intensified Energy Resource Development		2035 With All Ports to Plains Alliance Corridor Improvements		Ultimate 2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resource Development	
	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks
I-76												
At Colorado Border	6,500	2,100	18,400	4,170	18,390	4,170	18,950	4,240	18,390	4,170	18,950	4,240
US 26												
East of Henry	4,320	390	9,340	480	9,500	520	10,970	550	9,690	530	11,160	560
West of NE 71	7,615	445	13,040	540	13,200	580	14,670	610	13,390	590	14,860	620
East of Scottsbluff	4,890	350	9,140	630	9,160	630	9,830	700	9,160	630	9,830	700
East of Melbeta	2,510	285	6,030	490	6,050	490	6,720	560	6,050	490	6,720	560
West of Bridgport	3,175	440	6,570	510	6,550	510	7,260	590	6,550	510	7,260	590
West of Lisco	1,315	285	5,450	780	5,410	780	5,850	830	5,460	780	5,900	830
East of Oshkosh	1,920	330	6,170	700	6,120	700	6,490	740	6,170	700	6,540	740
NE 92												
At Wyoming Border	540	70	1,170	90	1,190	100	1,370	100	1,210	100	1,400	110
West of Scottsbluff	1,415	130	2,420	160	2,450	170	2,720	180	2,480	170	2,760	180
US 385												
North of Sidney	2,795	405	4,070	470	4,070	470	4,100	470	4,070	470	4,100	470
South of NE 92	2,095	380	2,510	470	2,510	470	2,630	480	2,510	470	2,630	480
South of Angora	3,230	580	4,690	610	4,690	610	4,740	610	4,740	610	4,790	610
South of Alliance	3,485	385	3,660	400	3,720	400	4,150	440	5,140	590	5,570	630
North of NE 2	1,960	305	2,060	320	2,270	410	2,400	420	3,700	620	3,830	630
South of Chadron	3,370	230	3,540	240	3,750	330	3,880	340	5,180	540	5,310	550
At South Dakota Border	1,790	235	2,610	340	2,660	340	2,710	340	4,130	520	4,180	520
US 20												
At Wyoming Border	550	125	580	180	460	180	460	180	470	190	470	190
East of Crawford	1,595	205	2,590	370	2,300	280	2,310	280	2,300	280	2,310	280
West of Chadron	3,515	290	3,690	300	3,930	390	3,990	390	4,130	570	4,190	570
East of Hay Springs	2,560	215	4,120	300	4,120	300	4,150	300	4,320	480	4,350	480

Table 2.6 provides a summary percent change in traffic growth along several Nebraska Highway segments in Nebraska. The percent increase in travel demand is from Year 2010 to Year 2035 Ultimate PTP Corridor condition. Some traffic volumes are anticipated to double or triple between Year 2010 and 2035. Tables 2.5 and 2.6 summarize how the traffic growth along the Heartland Expressway and the adjacent highways will see an increase in overall vehicle traffic and truck traffic with the completion of the overall Ports to Plains Corridor.

A couple of the largest traffic increases occur on US 26 and NE 71 corridors. US 26 provides a shorter route between I-80 and I-25 resulting in the increase in traffic, and NE 71 is expected to have an increase in traffic south of Scottsbluff to the Nebraska/Colorado border. Tables 2.6 and 2.7 also provide a summary of the expected increase in truck traffic.

Table 2.6 –Travel Forecasts Reflecting Percent Change from 2010 to 2035

	2010		Ultimate 2035 With All PTP Alliance Corridor Improvements and Intensified Energy Resource Development		Ultimate 2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resource Development	
Segment	Veh.	Trucks	Veh.	Trucks	Veh.	Trucks
NE 71						
At Colorado Border	820	135	2,640	950	222%	604%
South of Kimball	1,610	355	3,310	1,100	106%	210%
North of Kimball	2,055	315	4,390	1,200	114%	281%
South of Gering	3,805	215	7,050	1,220	85%	467%
North of Scottsbluff	1,860	185	3,310	350	78%	89%
North of NE 2	750	105	1,920	110	156%	5%
L7E						
West of US 385	2,470	435	4,530	770	83%	77%
NE 2						
West of Hemingford	1,035	110	3,110	580	200%	427%
South of Hemingford	1,220	135	2,020	160	66%	19%
South of US 385	3,010	305	4,800	520	59%	70%
East of Alliance	1,260	245	1,350	300	7%	22%
I-80						
At Wyoming Border	7,475	4,350	8,320	4,840	11%	11%
East of Kimball	7,285	4,455	9,370	4,870	29%	9%
West of Sidney	7,215	4,420	10,110	4,790	40%	8%
West of I-76	7,395	4,515	9,920	4,790	34%	6%
East of Ogallala	14,865	6,830	21,080	9,190	42%	35%
I-76						
At Colorado Border	6,500	2,100	18,950	4240	192%	102%

Segment	2010		Ultimate 2035 With All PTP Alliance Corridor Improvements and Intensified Energy Resource Development		Ultimate 2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resource Development	
	Veh.	Trucks	Veh.	Trucks	Veh.	Trucks
US 26						
East of Henry	4,320	390	11,160	560	158%	44%
West of NE 71	7,615	445	14,860	620	95%	39%
East of Scottsbluff	4,890	350	9,830	700	101%	100%
East of Melbeta	2,510	285	6,720	560	168%	96%
West of Bridgeport	3,175	440	7,260	590	129%	34%
West of Lisco	1,315	285	5,900	830	349%	191%
East of Oshkosh	1,920	330	6,540	740	241%	124%
NE 92						
At Wyoming Border	540	70	1,400	110	159%	57%
West of Scottsbluff	1,415	130	2,760	180	95%	38%
US 385						
North of Sidney	2,795	405	4,100	470	47%	16%
South of NE 92	2,095	380	2,630	480	26%	26%
South of Angora	3,230	580	4,790	610	48%	5%
South of Alliance	3,485	385	5,570	630	60%	64%
North of NE 2	1,960	305	3,830	630	95%	107%
South of Chadron	3,370	230	5,310	550	58%	139%
At South Dakota Border	1,790	235	4,180	520	134%	121%
US 20						
Wyoming Border	550	125	470	190	-15%	52%
East of Crawford	1,595	205	2,310	280	45%	37%
West of Chadron	3,515	290	4,190	570	19%	97%
East of Hay Springs	2,560	215	4,350	480	70%	123%

Table 2.7 – Daily Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) for the Modeled Area (in thousands)

Location	2010 Existing Traffic		2035 without Improvements		2035 With Heartland Improvements		2035 With Heartland Improvements and Intensified Energy Resource Development		2035 With All Ports to Plains Alliance Corridor Improvements		2035 With All Ports to Plains Alliance Corridor Improvements and Intensified Energy Resource Development	
	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks
VMT												
Nebraska	3,299	1,025	3,937	1,103	3,959	1,107	4,248	1,137	4,219	1,188	4,507	1,218
Wyoming	2,689	594	4,292	880	4,274	878	4,430	905	4,066	855	4,222	882
South Dakota	1,427	166	2,601	277	2,603	277	2,610	278	2,703	283	2,710	283
Colorado	10,216	1,245	22,283	2,454	22,280	2,452	23,586	2,589	22,458	2,451	23,764	2,588
Total	17,631	3,030	33,113	4,714	33,116	4,714	34,874	4,909	33,446	4,777	35,203	4,971
VHT												
Nebraska	52.1	17	66	21.7	62.1	18.1	67.7	18.9	66.8	19.5	72.4	20.5
Wyoming	41.9	9.8	70.1	17.1	66.1	14.3	69.7	15.0	63.6	14.0	67.0	14.7
South Dakota	25.9	3.3	47.5	5.6	47.5	5.5	48.0	5.6	49.6	5.7	50.3	5.8
Colorado	164.7	21.4	365.6	42.7	365.8	42.7	389.7	45.7	368.8	42.6	393.1	46.0
Total	284.6	51.5	549.3	87.1	541.5	80.6	575.1	85.2	548.8	81.8	582.8	87.0

The data in Table 2.8 indicates that without improvements to the Heartland Expressway Corridor, the corridor's overall share of the total travel demand will be significantly reduced. Improvements to the Heartland Expressway Corridor will help reverse some of the declines, but not all. It is only with the full corridor improvements that the total share of vehicles is roughly equal to the existing share. However, a much greater share of the truck traffic will be on the corridor with implementation of the full improvements to the PTP Alliance Corridor. This finding validates that as the corridor is improved the attraction for the trucking activity will increase.

Table 2.8 reflects changes in travel behavior found during the modeling process. On the table are "cordons." Cordons are imaginary lines drawn east-west across all north/south modeled facilities. The total AADT crossing the cordon is depicted on the table along with the percentage of the total that is on the Heartland Expressway Corridor.

Table 2.8 – Changes in Travel Behavior Found during the Modeling Process

Cordon		2010 Existing Traffic		2035 without Improvements		2035 With Heartland Improvements		2035 With Complete PTP Improvements	
		All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks	All Vehs.	Trucks
South of I-90	AADT	27,330	2,990	44,780	5,070	44,790	5,080	45,530	5,170
	Heartland %	23.1%	31.5%	20.5%	26.8%	20.5%	26.8%	23.5%	29.8%
South of US 20	AADT	12,300	2,225	16,540	2,540	16,380	2,530	16,470	2,570
	Heartland %	15.9%	13.7%	12.5%	12.6%	13.9%	16.2%	22.5%	24.1%
South of US 26	AADT	15,695	2,822	25,090	3,620	25,100	3,670	26,420	4,370
	Heartland %	25.2%	8.0%	15.9%	6.4%	17.4%	8.4%	26.4%	27.5%
South of I-80	AADT	33,390	6,425	74,000	14,110	74,000	14,160	74,000	14,560
	Heartland %	2.5%	2.1%	1.2%	1.0%	1.4%	1.6%	2.9%	5.6%

2.1.5 SAFETY ANALYSIS

NDOR provided crash data for a four-year time period from July 1, 2007, to June 30, 2010. The crashes were separated into four categories by severity: Property Damage Only (PDO - reportable crashes with at least $1,000 damage); Non-reportable PDO (less than $1,000 damage); Injury; and Fatality. NDOR calculated the crash rates for roadway sections and intersections. The crash rates for the project area were compared to the statewide averages to identify any locations with a crash rate at least 150 percent of the average (these have been highlighted in red for emphasis). This analysis did not consider the specific location or the causes of individual crashes.

Table 2.9 displays the statewide average crash rates for roadway sections by facility type. The roadway section crash rates are expressed as "crashes per hundred million vehicle-miles" (HMVM).

Table 2.9 – Nebraska Average Crash Rates for Roadway Sections (Crashes/HMVM)

Roadway Type	Urban Crash Rate	Rural Crash Rate
6-lane Interstate	30.10	28.90
4-lane Interstate	24.70	32.90
Freeway	25.80	23.30
Expressway	150.20	62.40
Other 4-lane	301.10	90.80
2-lane with shoulder	102.00	74.60
2-lane without shoulder	185.90	98.20
2-lane combined	153.70	83.90

Table 2.10 and Table 2.11 display the intersection crash rates for complex intersections and simple intersections, respectively. The intersection crash rates are expressed as "crashes per million entering vehicles" (MEV).

The NDOR definitions for the terms in the statewide average tables are as follows:

- "with shoulder" are highway sections that have at least a six-foot paved shoulder
- "without shoulder" are highway sections that have less than a six-foot paved shoulder
- "combined" is all two-lane highways included into one rate

Table 2.10 – Nebraska Average Crash Rates for Complex Intersections (Crashes/MEV)

Roadway Type	Urban Crash Rate	Rural Crash Rate
6-lane Interstate	1.244	0.890
4-lane Interstate	1.050	0.458
Freeway	0.708	1.633
Expressway	0.810	0.624
Other 4-lane	0.903	0.943
2-lane with shoulder	0.337	0.721
2-lane without shoulder	0.394	0.492
2-lane combined	0.372	0.687

Table 2.11 – Nebraska Average Crash Rates for Simple Intersections (Crashes/MEV)

Roadway Type	Urban Crash Rate	Rural Crash Rate
Expressway	0.934	0.367
Other 4-lane	0.666	0.404
2-lane with shoulder	0.414	0.321
2-lane without shoulder	0.388	0.311
2-lane combined	0.395	0.318

The crash rates along the segments were broken out by two-lane and four-lane segments.

Table 2.12 and Table 2.13 display the crash rates for the two-lane and four-lane sections, respectively. Two of the two-lane sections, US 26 within Henry, NE, and US 385 within Alliance, NE, have crash rates more than 150% of the statewide average, and are highlighted in Table 2.12. Both of these sections are urban, two-lane sections with shoulder. One four-lane section has a crash rate greater than 150 percent of the statewide average, depicted in Table 2.13, US 26 between the junctions with NE 71, on the northeastern side of Scottsbluff, NE. This section is an urban, four-lane expressway.

In addition to the roadway section crash rates, NDOR provided crash rates at intersections along the study corridor, excluding intersections with local roads. The intersection crash rates, expressed as "crashes per million entering vehicles" (MEV), are displayed in Table 2.14.

Five intersections have crash rates greater than 150 percent of the statewide average:

1. West Junction of US 26 and NE 92 south of Bayard, NE
2. Junction of US 26 and L79E west of Minatare, NE
3. West Junction of US 20, US 385, and L23D west of Chadron, NE
4. Junction of US 30 and NE 71 in Kimball, NE
5. East Junction of US 20 and US 385 in Chadron, NE

Table 2.12 – Existing Two-Lane Roadway Section Crash Rates (Crashes/HMVM)

Roadway	From	To	Length (mi)	Existing AADT	Type	Crash Rate	Avg Rate	%Avg
NE 71	CO State Line	I-80 EB Ramps	15	1,300	Rural	63.6	98.20	65%
NE 71	I-80 WB Ramps	Kimball S Corp Lim	1	2,780	Rural	114.4	98.20	116%
NE 71	Kimball S Corp Lim	Kimball N Corp Lim	1	2,400	Urban	216.6	185.90	117%
NE 71	Kimball N Corp Lim	Begin Divided Hwy	2	1,910	Rural	120.0	98.20	122%
US 26	WY State Line	Henry	7	3,770	Rural	85.0	74.60	114%
US 26	**Henry NW Corp Lim**	**Henry SE Corp Lim**	**1**	**5,220**	**Urban**	**197.4**	**102.00**	**194%**
US 26	Morrill W Corp Lim	Morrill E Corp Lim	1	8,870	Urban	58.8	153.70	38%
US 26	Morrill E Corp Lim	Begin Divided Hwy	1	7,100	Rural	46.5	74.60	62%
US 26	End Divided Hwy	Junction (Jct) L62A	9	3,060	Rural	67.2	83.90	80%
L62A	Jct US 26	Jct US 385	9	2,060	Rural	73.2	74.60	98%
US 385	Jct L62A	Alliance S Corp Lim	24	3,170	Rural	48.3	74.60	65%
US 385	**Alliance S Corp Lim**	**Alliance N Corp Lim**	**1**	**3,610**	**Urban**	**180.0**	**102.00**	**176%**
US 20	W Jct US 385	Chadron W Corp Lim	2	3,690	Rural	58.6	74.60	79%
US 20	Chadron W Corp Lim	E Jct US 385	0.3	3,690	Urban	64.6	102.00	63%
US 385	W Jct US 20	SD State Line	16	1,800	Rural	62.1	74.60	83%

Table 2.13 – Existing Four-Lane Roadway Section Crash Rates (Crashes/HMVM)

Roadway	From	To	Length (mi)	Existing AADT	Type	Crash Rate	Avg Rate	%Avg
NE 71	Begin Divided Hwy	Ramp from NE 92	39	1,770	Rural	81.9	62.40	131%
NE 71	NE 92	US 26	2	2,430	Rural	49.7	62.40	80%
US 26	Begin Divided Hwy	Mitchell W Corp Lim	4	7,100	Rural	33.7	62.40	54%
US 26	Mitchell W Corp Lim	Mitchell E Corp Lim	1	9,580	Urban	159.7	150.20	106%
US 26	Mitchell E Corp Lim	W Jct NE 92	7	9,580	Urban	50.9	150.20	34%
US 26	W Jct NE 92	W Jct NE 71	0.6	7,150	Urban	20.3	150.20	14%
US 26	W Jct NE 71	E Jct NE 71	3	9,780	Urban	251.2	150.20	167%
US 26	E Jct NE 71	End Divided Hwy	7	5,080	Rural	88.9	62.40	142%

Table 2.14 – Existing Intersection Crash Rates (Crashes/MEV)

Intersection	Type	Crash Rate	Avg Rate	%Avg
Interchange I-80 & NE 71	Rural	0.577	0.458	126%
Jct US 30 & NE 71	Urban	0.806	0.414	195%
Jct NE 71 & S-4a	Rural	0	-	-
S Jct NE 71 & NE 88	Rural	0	-	-
N Jct NE 71 & NE 88	Rural	0	-	-
S Jct NE 71 & NE 92	Rural	0.621	0.624	100%
Jct US 26 & NE 29	Urban	0.625	0.934	67%
W Jct US 26 & NE 92	Rural	1.043	0.367	284%
W Jct US 26 & NE 71	Urban	0.676	0.934	72%
E Jct US 26 & NE 71	Rural	0.344	0.367	94%
Jct US 26 & L79E	Rural	0.962	0.367	262%
Jct US 26 & L62a	Rural	0.271	0.721	38%
Jct L62A & US 385	Rural	0.836	0.721	116%
E Jct US 20 & US 385	Urban	0.795	0.414	192%
W Jct US 20, US 385, L23D	Rural	1.421	0.687	207%

As previously stated, this crash analysis did not consider the specific location and causes of individual crashes; rather, the purpose of this analysis was the identification of roadway sections and intersections that have crash rates greater than 150 percent of the statewide average, highlighted in Table 2.14. The crashes on the identified sections and intersections should be examined in detail on a project level.

Figure 2.12 – NE 71, Two-Lane Highway South of Kimball

Figure 2.13 – NE 71, Four-Lane Highway Kimball to Scottsbluff

Figure 2.14 – US 26, Two-Lane Highway Through Henry, NE

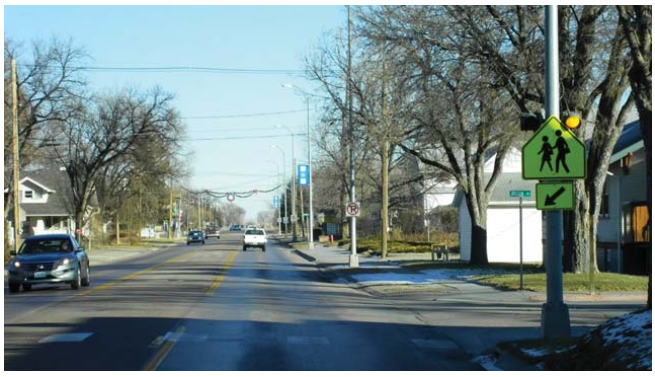


Figure 2.15 – US 26, Two-Lane Highway with Center Two-Way Left Lane Through Morrill, NE

2.1.6 CORRIDOR RECOMMENDATIONS AND IMPROVEMENT PRIORITIES

The many sub-corridors that constitute the Heartland Expressway Corridor are considered a single system for analysis purposes.

Recommended Corridor Vision

The Heartland Expressway Steering Committee further refined the concept of the corridor agreeing on the following definitions. The ultimate vision is a four lane expressway with interim improvements defined below.

- Four-lane divided highway, except in sections where more than four-lanes exist or are planned, with a stepped development process to achieve the ultimate four-lane corridor
- Super-2 facility including two 12-foot lanes and ten-foot shoulders with passing lanes
- Individual state rules and guidelines will be followed for specific design details, such as highway width and access management
- Inclusion of planned relief routes
- Consideration of other major safety bottleneck improvements

2.2 GAP ANALYSIS

The Gap Analysis portion of the study is to identify and discuss enhancements to the corridor that help fill the gaps of the Heartland Expressway Corridor transportation network, and ultimately the overall PTP Alliance Corridor. Providing enhancements along the Heartland Expressway Corridor may help to attract more private and commercial vehicles. These enhancements could include relief routes, roadway geometric improvements, intermodal facilities, connecting routes and truck amenities.

Figure 2.16 – US 26, Four-Lane Divided Highway Entering Mitchell, NE

Figure 2.17 – US 26, Four-Lane Highway Through Mitchell, NE

Figure 2.18 – US 385, Two-Lane Highway with Multiple Turning Lanes

Figure 2.19 – US 385, Two-Lane Highway at the US 385/NE 2 Junction

Figure 2.20 – US 385, Three-Lane Highway Through the Nebraska National Forest, Approximately Ten Miles South of Chadron at Mile Marker 157.

Figure 2.21 – US 385 Through the Nebraska National Forest, Three-Lane Highway with Climbing Lane for the Southbound (Uphill) Direction.

Figure 2.22 – US 26, Intersection of Jct US 26 and NE L79E

Figure 2.23 – US 385, Intersection at E Jct US 20 and US 385 at Chadron (facing north)

Figure 2.24 – L23D, Intersection of W Jct US 20, US 385, L23D (Facing South/Southeast) Approximately Two Miles West of Chadron.

2.2.1 RELIEF ROUTES

NDOR has no planned relief routes for the proposed Heartland Expressway Corridor within the borders of Nebraska. Relief routes perform a needed function for communities as well as for through traffic. Relief routes are considered to help improve the efficiency and safety of the corridor. Review of potential relief routes locations include:

- US 385 at Chadron - The existing US 385 route intersects with US 20 in Chadron, NE. From Alliance, US 385 would intersect US 20 on the western edge of town then would continue west approximately 2.5 miles to the western intersection of US 385 and US 20. As part of an improved corridor, the evaluation of a revised route to align the southern portion of US 385 to the north leg of US 385 may be considered in the future. As part of this study, no detailed route locations will be evaluated
- US 26 west of Scottsbluff - NDOR has no current plan to evaluate relief routes near Mitchell or Morrill, NE.

2.2.2 GEOMETRIC SAFETY IMPROVEMENTS

The overall corridor of the Heartland Expressway within the State of Nebraska was evaluated to identify geometric improvements that should be studied further in order to improve the safety and efficiency of the corridor. The geometric factors along the corridor that were evaluated include shoulder widths, intersection geometrics and horizontal curves.

Shoulder Width

The entire corridor of the Heartland Expressway has a paved shoulder. Majority of paved shoulders are eight feet wide. Consideration should be given to widen the shoulders to eight to ten feet to facilitate the future growth of the traffic along the corridor. Figures 2.12 through 2.24 shown on the previous page represent the different roadway types throughout the Heartland Expressway Corridor.

Intersection Geometrics

The majority of the intersections along the Heartland Expressway corridor are unsignalized intersections. The following intersections were identified as experiencing crash rates that are over 150 percent over the state wide average. Further analysis of these intersections will need to be considered to determine the crash patterns at the study intersections.

- Intersection of US 30 and NE 71
- Intersection of W Junction (Jct) US 26 and NE 92
- Intersection of Jct US 26 and NE L79E
- Intersection of E Jct US 20 and US 385
- Intersection of W Jct US 20, US 385, L23D

Horizontal Curve

The horizontal curves along the corridor will be evaluated in more detail upon the evaluation and design of the existing two-lane highway to the four-lane highway. Based on our windshield survey, the horizontal curves appear to meet the current design speed criteria. No speed advisory curves were observed during our field survey, but the horizontal curves should be evaluated during future design studies.

2.2.3 CONNECTING ROUTES

The Heartland Expressway Corridor is the middle section of the overall PTP Alliance Corridor. The Heartland Expressway Corridor will connect to the PTP Alliance Corridor to the south, and the PTP Alliance Corridor will then connect to Texas and the ports in Mexico and the Gulf of Mexico. The Theodore Roosevelt Corridor to the north of the Heartland Expressway Corridor connects the ports in Canada to the Great Plains area. The Theodore Roosevelt Corridor runs north/south through North Dakota and South Dakota.

The Heartland Expressway Corridor is a north/south corridor that will run parallel to I-25 and I-29. I-25 and I-29 are separated by about 500 miles and there are no other north/south four-lane corridors between them. The Heartland Expressway Corridor will intersect I-70 and I-76 in Colorado, I-80 in Nebraska, and I-90 in South Dakota.

In addition to connecting the interstate highways, the Heartland Expressway Corridor will intersect with U.S. Highway 30 in Kimball, NE; US 26 connects Scottsbluff to Ogallala, NE, Torrington, WY, and I-25; US 20 in Chadron, NE; and NE 2 at Alliance, NE. Each of these highways provide important connections to rural communities in Nebraska.

2.3 COST, PRIORITIZATION, AND IMPLEMENTATION SCHEDULE

As part of the Corridor Development and Management Plan, the study evaluated the entire Heartland Expressway Corridor located within the State of Nebraska. An unconstrained twenty year improvement program was developed to be used as part of the economic analysis. The overall vision of the corridor is to develop a high-speed highway that will promote and enhance domestic and international trade as it connects metropolitan areas of Denver, Colorado Springs, Cheyenne, and Rapid City to the PTP Alliance Corridor. The Heartland Expressway also provides an essential economic development tool for rural areas in Colorado, Nebraska, South Dakota, and Wyoming.

2.3.1 COST ESTIMATES

The study team, working with NDOR, developed a list of potential improvement projects to improve the safety, increase capacity of the corridor and to ultimately meet the overall goal of a four lane divided roadway. The improvements considered included intersection improvements, roadway widening for a Super-2 facility, widening for a four-lane roadway, safety improvements, and ITS improvements. The following projects were considered:

NE 71:

1. Widen NE 71 to a Super-2 facility from Colorado/ Nebraska border to I-80
2. Intersection Improvement at Clean Harbors (South of Kimball)
3. Extend NE 71 Bypass to NE 71 south of Kimball
4. I-80 Interchange Improvements
5. Truck Parking/Visitor Center I-80 & NE 71 interchange.
6. Widen NE 71 to four lanes from Colorado/Nebraska border to I-80

US 26:

1. Pedestrian Overpass Scottsbluff at 5th Avenue[3]
2. L79E and US 26 Intersection Improvement
3. Widen US 26 to four lanes from Wyoming/Nebraska border to Morrill
4. Safety and Traffic Operation Improvements/Relief Route in Morrill
5. Safety and Traffic Operation Improvements in Mitchell
6. Widen US 26 to four lanes from Minatare to L62A/US 26 intersection
7. Safety and Traffic Operation Improvements in Minatare
8. US 26 and NE 71 Interchange
9. US 26 Relief Route Mitchell

L62A:

1. Widen L62A to four lanes from L62A/US 26 intersection to US 385

US 385:

1. Widen US 385 to four lanes from L62A intersection to Alliance
2. Construct Passing Lanes (Super-2) on US 385 from Alliance to Chadron
3. US 385 and US 20 Intersection Improvement
4. Widen US 385 to four lanes from Chadron to South Dakota/Nebraska state border
5. Widen US 385 to four lanes from Alliance to L7E (Hemmingford)
6. US 385 bridge widening over NE 2
7. US 385 to four lanes from L7E to Chadron
8. Relief Route for Chadron
9. Truck Parking/Visitor Center for Chadron

[3]A public open house meeting was held on June 25, 2013 for the "Scottsbluff Valley Pathway North Project," which was in the preliminary design phase at this time.

Planning level costs, in 2012 dollars[4], were developed based on recent information from NDOR improvement projects in the area. The following costs were general costs used in the estimation process. Independent costs were completed for some individual projects that do not meet the following criteria. A summary of the cost estimates are included in Appendix D.

The Super-2 section includes two 12-foot lanes and ten-foot shoulders and construction of a 12-foot passing lane. The passing lanes were estimated to be one mile in length with appropriate taper lengths.

"Four-lane" improvements include construction of two new lanes with ten-foot shoulders and the existing two lanes would remain in place.

- Construction of two new lanes of a four-lane roadway. Assumption that the existing two lanes would remain in place - $3,000,000/mile
- Construction of four lanes of relief route. Assumption that four new lanes are constructed. - $5,000,000/mile
- Construction of "Super-2" improvements - $1,000,000/mile

(2012 Dollars)

Costs for the project development, engineering, construction engineering, utilities, and right-of-ways were developed based upon a percentage of the construction costs. The estimated percentages are listed below. These percentages were based on historical NDOR data.

- Project Development, Engineering, and Construction Engineering were estimated to be 16 percent of the construction costs.
- Utility Costs were estimated to be three percent of the construction costs.
- Right-of-Way Costs were estimated to be three percent of the construction costs.

[4]2012 dollars were used for cost development due to the uncertainty of the years of expenditure, which will likely vary.

2.3.2 PRIORITIZATION

With such a large investment required to upgrade the Heartland Expressway Corridor, located within the State of Nebraska, to the envisioned capacity and functionality, it is important to understand the priority of the improvement projects from the standpoint of the overall system need. The prioritization process used criteria for ranking the improvement projects relative to one another. The weighting criteria, used in this study, is similar to the prioritization process used in the Ports to Plains Corridor Development and Management Plan. The following criteria were used for ranking both expansion sections and relief routes.

Truck Average Annual Daily Traffic (AADT): The PTP Alliance Corridor is designated as a high priority corridor with the importance of improving the trade corridor to promote the flow of goods both regionally and internationally. Using truck AADT allows priority to be given to improvement projects that are expected to have a higher number of trucks.

Accident Rate: Existing crash rates were used to compare improvement projects with each other to identify safety enhancements.

Existing Pavement Condition: The existing pavement conditions were provided by NDOR. Improvement projects with known deteriorating pavement received a higher priority over projects with good pavement.

Intermodal Connection: As discussed in Section 2.1.3 of this report, intermodal facilities are at the forefront of increasing efficiency in the transfer and transport of goods. Roadway expansion projects that support existing intermodal facilities should be considered in prioritizing improvements to the system. Improving the efficiency of transporting freight and goods to the intermodal facilities provides an additional benefit.

System Connectivity: As discussed in Section 2.1.2, the system connectivity provides the ability to connect the Heartland Expressway improvements to the planned improvements along the PTP Alliance Corridor. The measure provides priority to projects that connect planned improvements to improved corridors outside of Nebraska.

Total Vehicle AADT: While a primary focus of the Heartland Expressway is to promote trade growth along the PTP Alliance Corridor, the general motorist will also benefit from improvements. This measure accounts for all motorists, not just commercial vehicles. The data includes existing and forecasted AADT.

Travel Time Savings Rate: This criterion allows existing and (forecasted) future delay along the Corridor to be accounted for in prioritization. Improvements that cause greater travel time savings per mile of improvement have a higher priority for implementation.

Cost per Vehicle Mile Traveled: This measure allows cost to play a role in prioritizing improvements. The lower the cost per vehicle mile traveled, the greater the cost-effectiveness of the improvement.

Volume to Capacity Ratio: The volume to capacity ratio is a measure that allows areas with higher congestion to gain priority over areas where congestion is less of a problem. Congested roadways cause costly delays in the movement of goods and people.

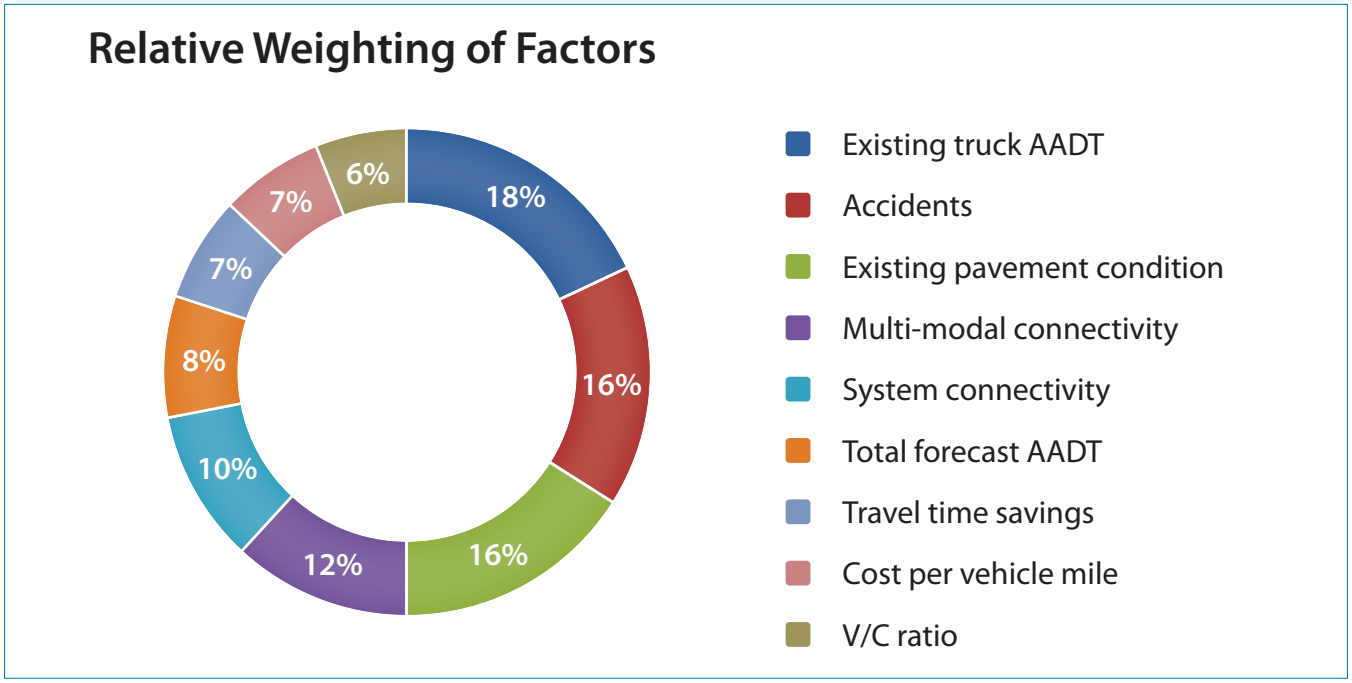


Figure 2.25 – Project Prioritization Weighting Criteria

Figure 2.25 shows the weighting used to assign importance of these criteria for prioritization purposes. These weighted factors were discussed and verified by the Project Steering Committee. The weights were established based upon the significance of the criteria in meeting the function of the Corridor. See Appendix B for more detail on criteria and weighting.

2.3.3 IMPLEMENTATION PLAN

A 20-Year implementation plan was developed to address the operational and safety needs along the corridor to ultimately develop the high priority corridor. The 20-Year implementation plan was created into five year periods. The periods are 2015 to 2020; 2020 to 2025; 2025 to 2030; and 2030 to 2035. See Appendix C for the Heartland Expressway Corridor 20-year implementation plan.

This 20-year plan was established to assist in the economic analysis described in Chapter 5. This program currently is an unconstrained plan with no identified funding sources, with the exception of the current US 385 project from Junction L62A to Alliance which is being funded by the Build Nebraska Act. To develop the implementation plan, the proposed improvement projects were developed to spread the improvement costs over the twenty year period while addressing the project priorities. The weighting criteria described in Section 2.3.2 was used to measure the project implementation groups. Figures 2.26, 2.27, 2.28 and 2.29 illustrate the project implementation plan and the estimated time frame.

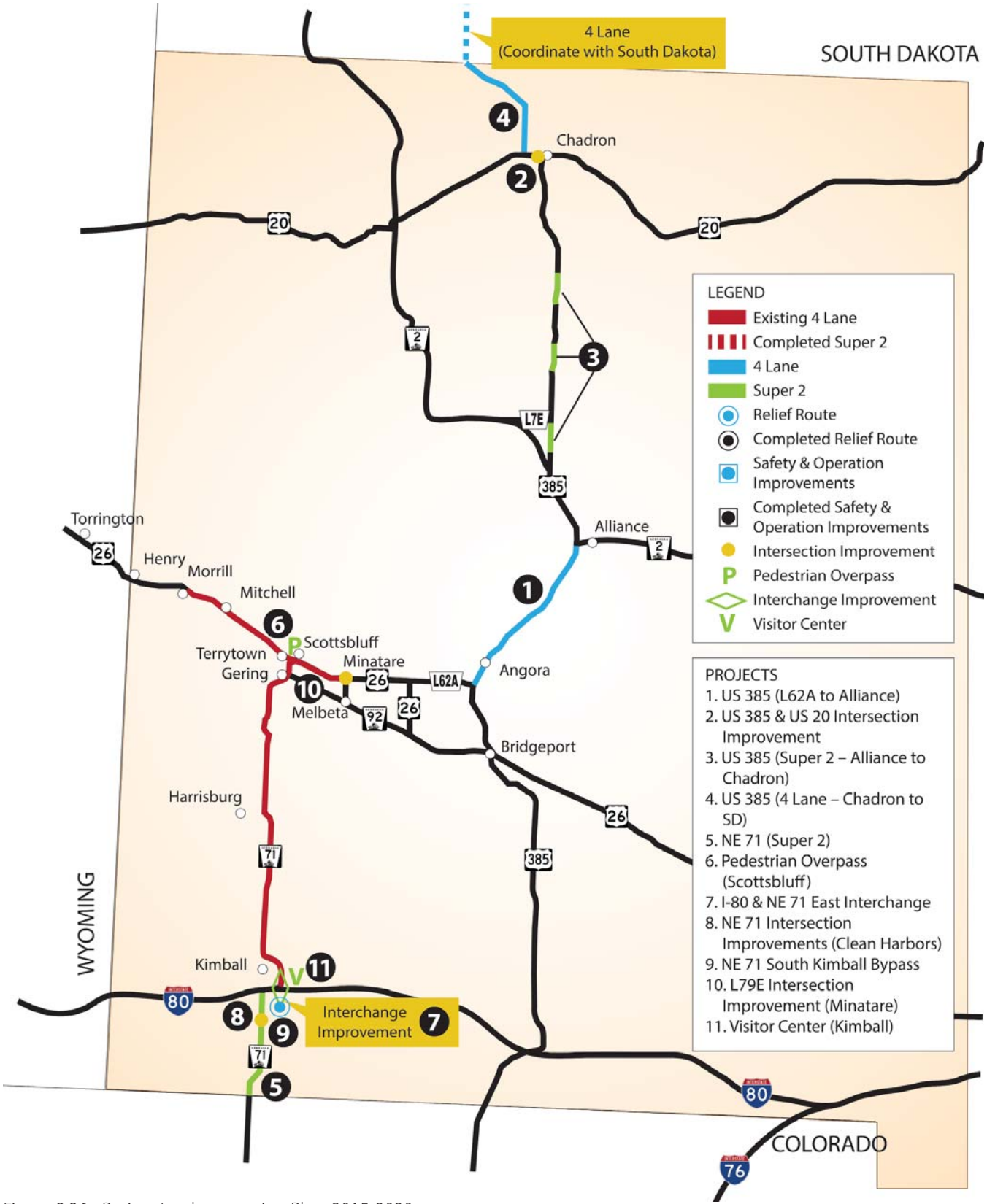


Figure 2.26 - Project Implementation Plan, 2015-2020

Figure 2.27 - Project Implementation Plan, 2020-2025

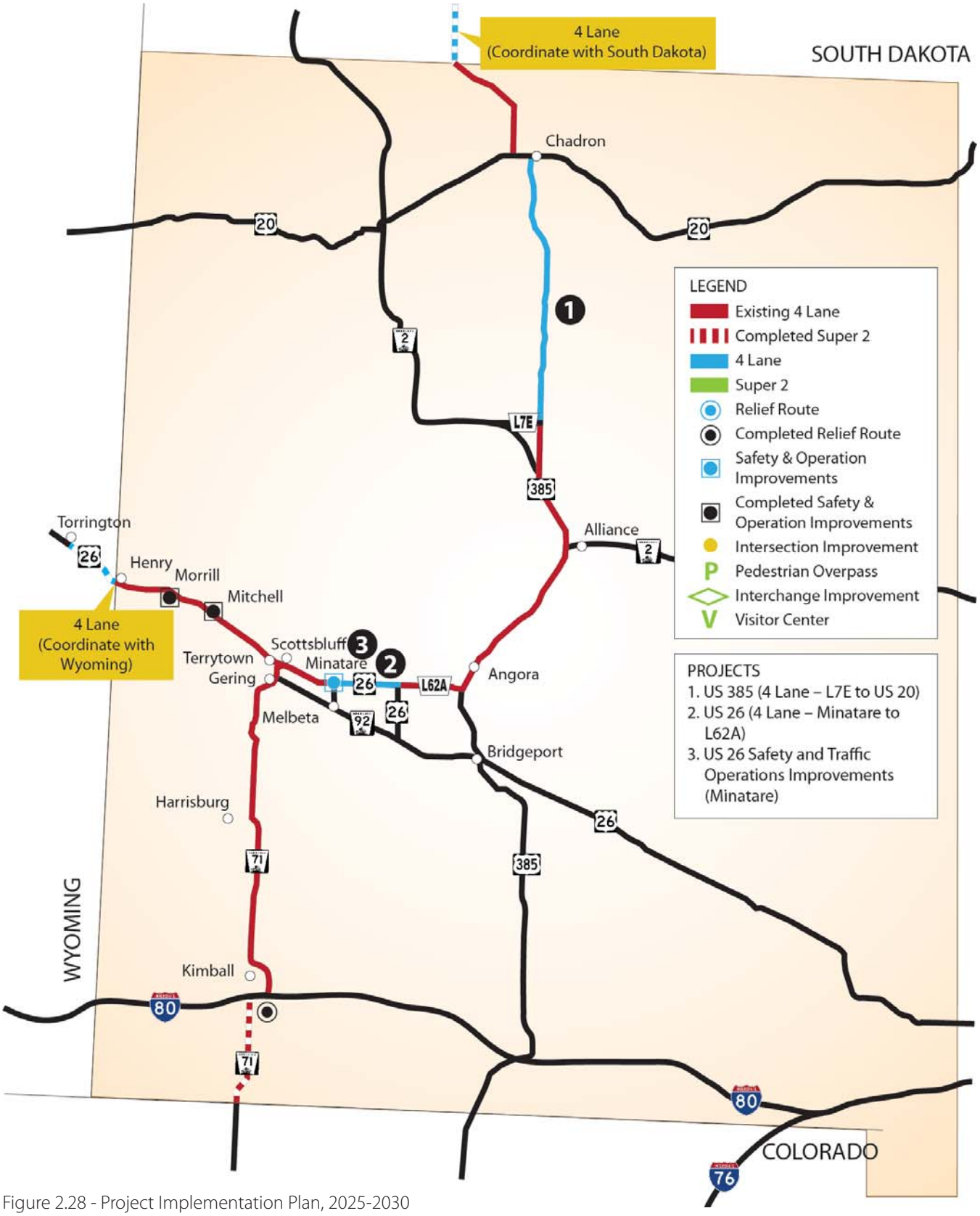


Figure 2.28 - Project Implementation Plan, 2025-2030

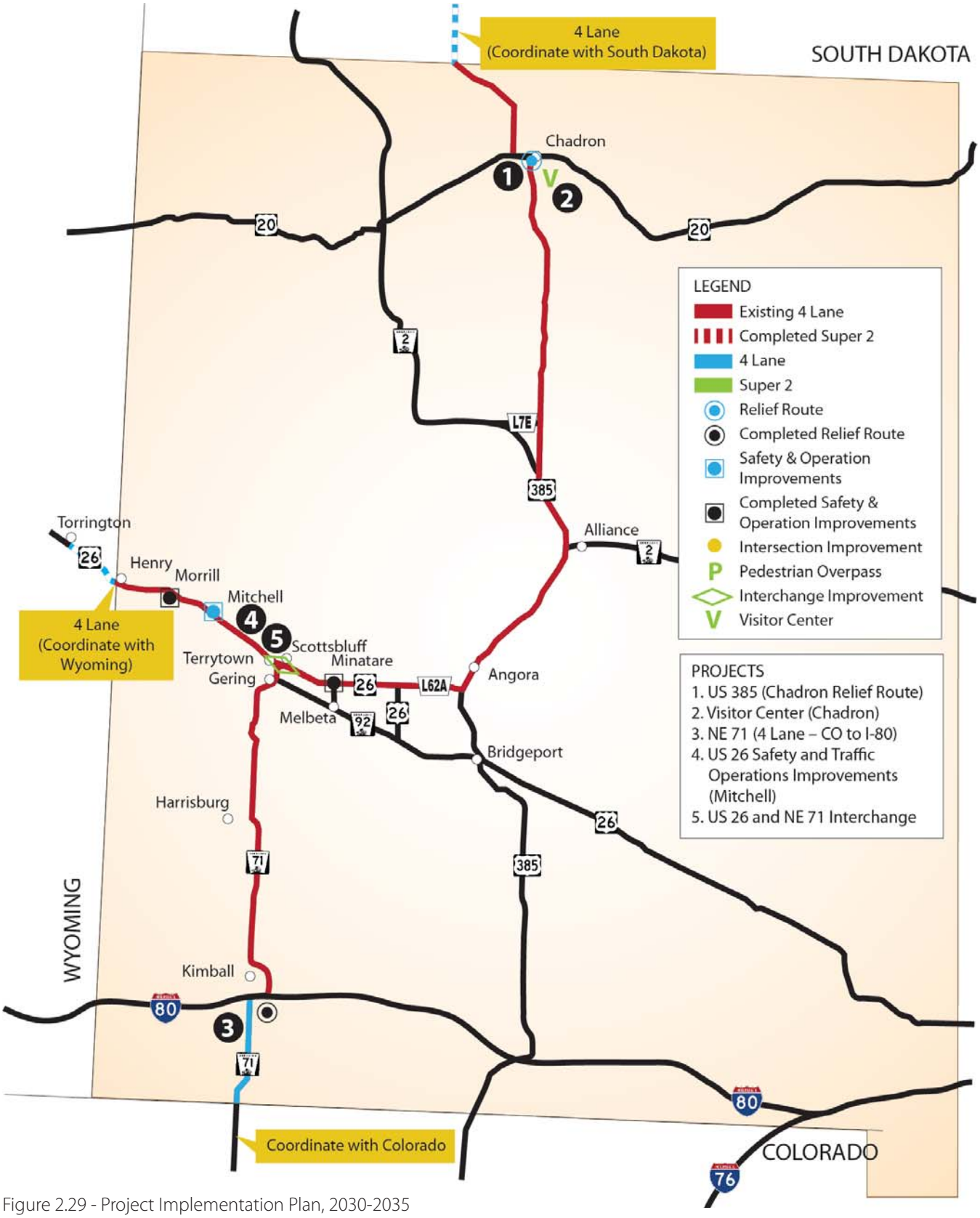


Figure 2.29 - Project Implementation Plan, 2030-2035

2.3.4 IMPLEMENTATION PLAN RANKING

The priority score summary listed in Figure 2.30 represents a summary of overall score for the project groupings using the relative weighting factors discussed in Section 2.3.2. The dollar value listed in the legend for each project grouping is the overall project group cost. Based on the project prioritization criteria described in Section 2.3.2, Group 1 rated the highest group followed by Groups 2, 3, and 4. The project prioritization was completed after the project groups were developed to meet the overall corridor needs and goals. The project groupings were established to complete the gaps within the highway system to complete the vision of the corridor and to establish a proposed improvement program to be used in the economic analysis (Chapter 5). The proposed improvement program is financially unconstrained.

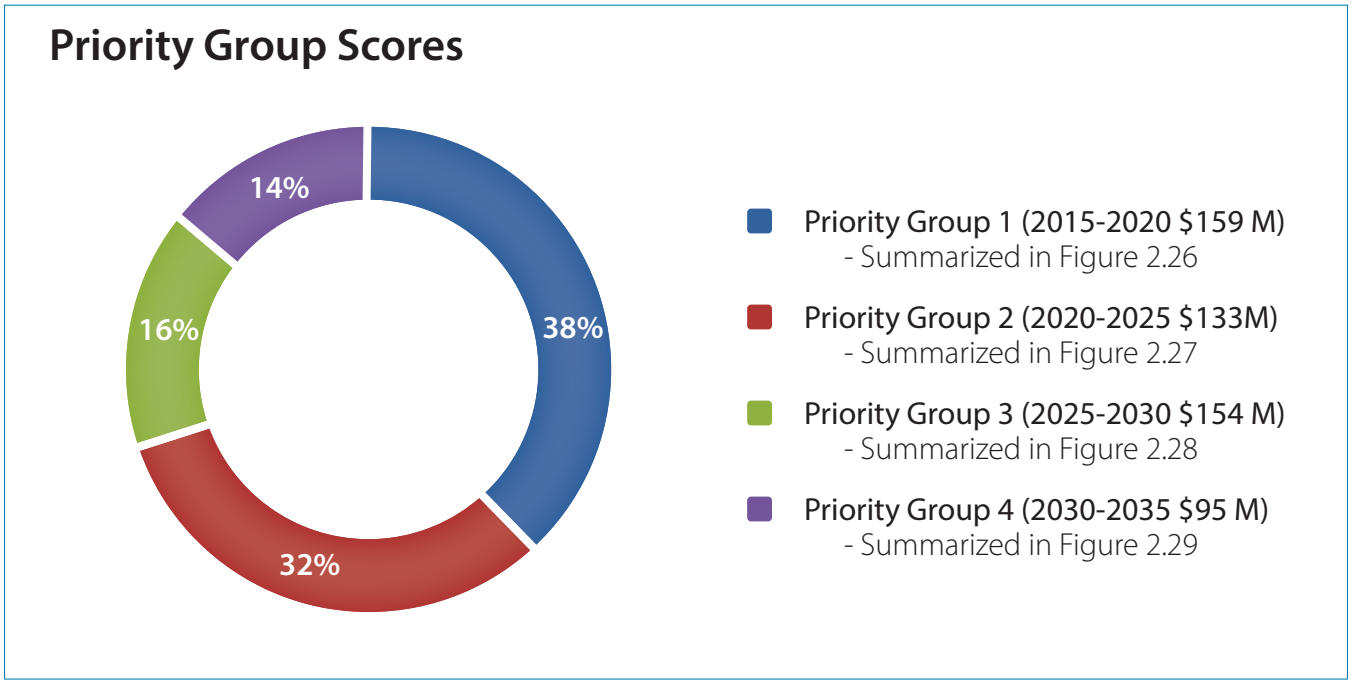


Figure 2.30 – Overall Implementation Priority Group Scores