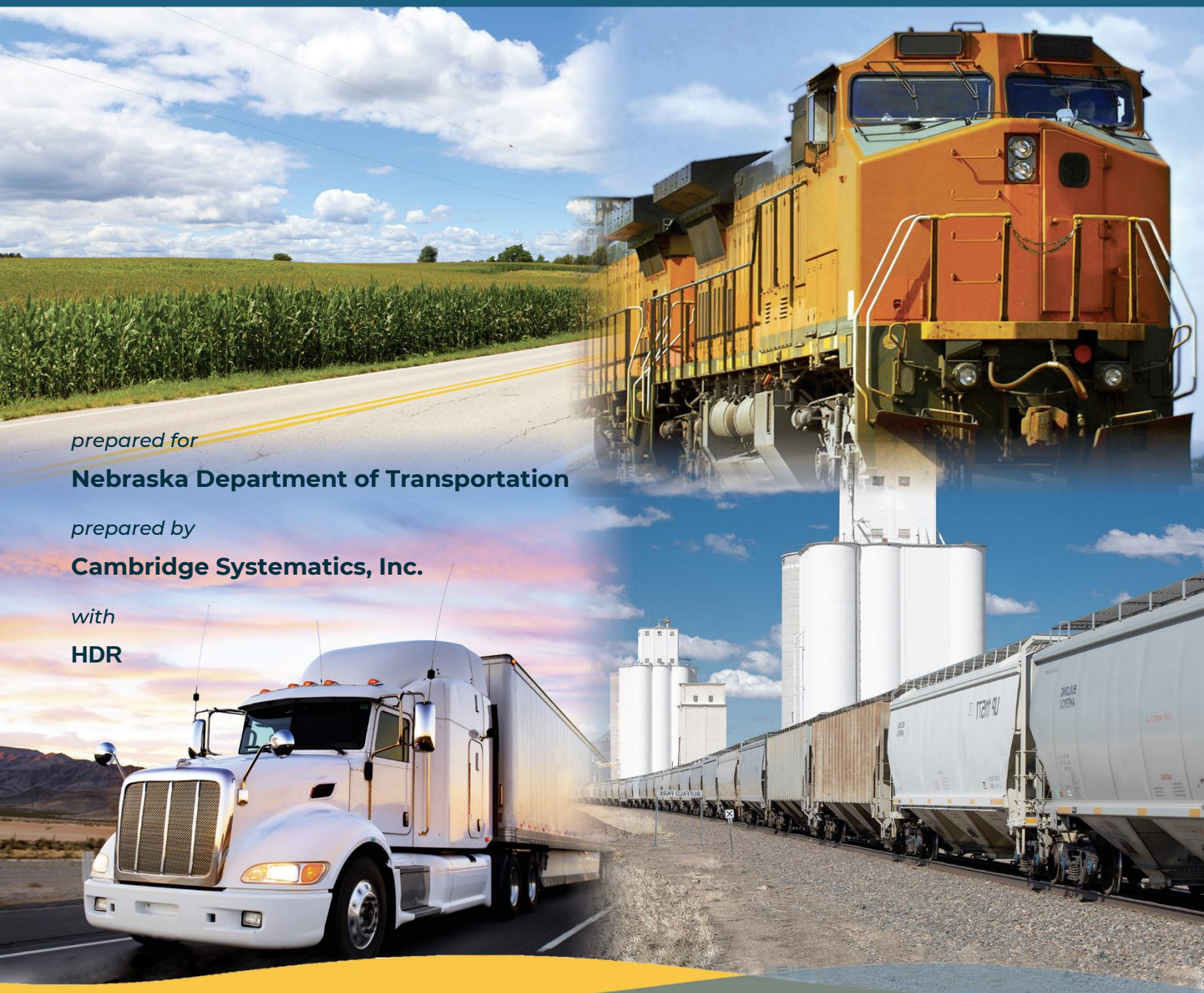
2023 NEBRASKA STATE FREIGHT PLAN



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prepared by

Cambridge Systematics, Inc.

with

HDR

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NEBRASKA
Good Life. Great Journey.

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1.0 Introduction

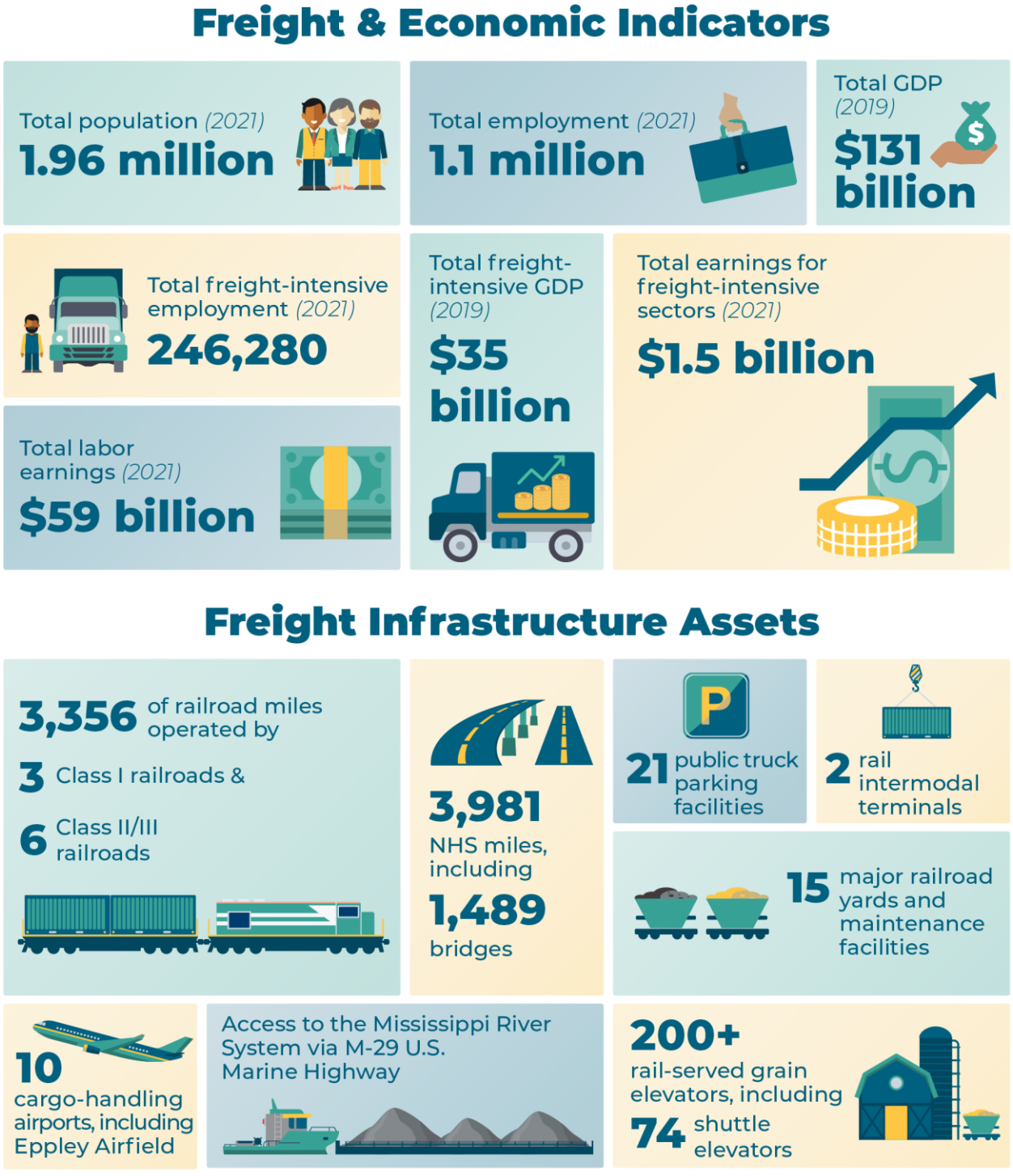
Nebraska's economic vitality and quality of life depend in great part on how well the State's freight transportation network moves goods regionally, nationally, and internationally. Nebraska's intricate network of highway corridors, railroads, ports, and air cargo facilities handle large volumes of legacy energy, agriculture, and manufactured goods, as well as goods that are essential in today's modern economy, including electronics, pharmaceuticals, and other consumer products from all over the world. The State's importance to these industries and markets offers continued prospects for growth, but it is imperative that Nebraska not only preserve critical system assets and support freight-related development, but also proactively prepare for a future that will almost certainly increase freight volumes and activity, particularly on the highway system. Further compounding the challenge is the persistent and increasing challenge of extreme weather and natural hazards that threatens the integrity of the multimodal freight system and the stability of homes, businesses, farms, and communities.

Understanding these complex systems, the role the Nebraska Department of Transportation (NDOT) plays in their continued use, and how publicly funded projects, policies and strategies can influence private-sector decisions that impact Nebraska's citizens and companies is key to planning for a future funding environment where needs far outweigh available resources.

The 2017 Nebraska State Freight Plan—the first of its kind for NDOT—laid the groundwork for the development of a continuous, comprehensive statewide freight planning program. The 2023 Nebraska State Freight Plan (SFP) builds on this document by identifying and describing the underlying industry drivers of goods movement in Nebraska and evaluating how supply chains have impacted the condition and performance of the system, particularly in light of the transformative shocks and changes that have occurred since the onset of the COVID-19 global pandemic in early 2020. The 2023 SFP incorporates the latest data and research on freight and supply chain trends, with insight from a broad set of public- and private-sector freight transportation stakeholders, including the Plan's Freight Advisory Committee (FAC). Stakeholder input is a key element in helping NDOT and its partners develop policies, programs, and projects that can reduce the cost of business in Nebraska and help the state attract and retain the industries it covets.

NDOT's mission is to enhance quality of life through a convenient, safe, and innovative transportation system. The vision, goals, strategies, and actions established in the 2023 SFP move forward NDOT's comprehensive program to invest in the State's highway system, as well as efforts by other Nebraska-based entities to invest and grow multimodal freight infrastructure, including railroads, air cargo facilities, and intermodal and transload facilities. Together with the 2040 Statewide Transportation Plan, the 2023 SFP ensures that Nebraska is ready to rise to the challenges and opportunities through 2040 and beyond, to fulfill its mission and keep the state's businesses and communities thriving.

FIGURE 1.1 NEBRASKA FREIGHT SYSTEM & ECONOMY OVERVIEW



Source: U.S. Bureau of Economic Analysis; U.S. Bureau of Transportation Statistics; U.S. Bureau of Labor Statistics; U.S. Census; Nebraska Department of Transportation.

1.1 Report Organization

The 2023 SFP includes both a high-level, graphics-rich Executive Summary as well as the following chapters of the Final Report, which were derived from technical memoranda that detailed technical data and analysis. The remaining chapters of the 2023 SFP include:

- Chapter 2.0—State Freight Plan Vision & Goals.
- Chapter 3.0—Freight & Industry Stakeholder Outreach.
- Chapter 4.0—Freight Transportation Drives the Nebraska Economy.
- Chapter 5.0—Freight Assets, Condition, and Performance.
- Chapter 6.0—Freight Demand and Forecasts.
- Chapter 7.0—Multimodal Freight Trends, Needs, and Opportunities.
- Chapter 8.0—Strategies and Actions for the Future of Freight in Nebraska.
- Chapter 9.0—Fiscally-Constrained Freight Investment Plan.
- Appendix A—Nebraska State Freight Plan Compliance with Federal Requirements.
- Appendix B—Stakeholder Outreach Summary.

2.0 State Freight Plan Vision & Goals

The first Nebraska State Freight Plan (SFP) was developed in 2017, and the 2040 Statewide Transportation Plan (STP) was developed in 2020, both with a common goal of guiding funding and decision-making related to the state's multimodal transportation system. The STP gives the state and its partners end-to-end information about Nebraska's transportation system, how it is funded, and the influences that are most likely to propel changes through 2040, using that information to set 20-year goals and objectives for the transportation system, performance metrics, and a course for evaluating and implementing new policies and processes. It is critical for the goals of the SFP and the STP to remain aligned, and build off of one another to ensure consistent transportation planning efforts across the state.

2.1 Alignment with National Goals and Priorities

The 2023 SFP goals also support national freight priorities defined in U.S. DOT's National Freight Strategic Plan and supported by the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21), 2015 Fixing American's Surface Transportation Act (FAST), and the Infrastructure Investment and Jobs Act (IIJA) signed in law in November 2021.

MAP-21 established seven national freight goal areas to be reflected in state freight plans:

- Improve the safety, security and resilience of freight transportation.
- Improve the state of good repair of the national freight network
- Invest in infrastructure improvements and implement operational improvements that strengthen the contribution of the national freight network to the economic competitiveness of the U.S. and that reduce congestion and increase productivity, particularly for domestic industries and businesses that create high-value jobs.
- Improve the economic efficiency of the national freight network.
- Use advanced technology to improve the safety and efficiency of the national freight network.
- Reduce the environmental impacts of freight movement on the national freight network.
- Incorporate concepts of performance, innovation, competition and accountability into the operation and maintenance of the national freight network.

Building upon the goals of MAP-21, the FAST Act identified the need for a National Multimodal Freight Policy and Strategic Plan. The National Multimodal Freight Policy and Strategic Plan are used to inform state freight plans and guide decision-making at both the Federal and state level. The National Multimodal Freight Policy goals include:

- Invest in infrastructure improvements and implement operational improvements on the highways of the United States that strengthen the contribution of the National Highway Freight Network to the economic competitiveness of the United States; reduce congestion and bottlenecks on the National Highway Freight Network; reduce the cost of freight transportation; improve the year-round reliability of freight transportation; and increase productivity, particularly for domestic industries and businesses that create high-value jobs.
- Improve the state of good repair of the National Highway Freight Network.

- Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Highway Freight Network;
- Improve the efficiency and productivity of the National Highway Freight Network;
- Improve the flexibility of States to support multi-State corridor planning and the creation of multi-State organizations to increase the ability of States to address highway freight connectivity; and
- Reduce the environmental impacts of freight movement on the National Highway Freight Network.

The Infrastructure Investment and Jobs Act (IIJA) builds upon both MAP21 and the FAST Act by adding provisions and recommendations for state freight plan content with particular emphasis on prioritizing resilience. As defined in 49 U.S.C. 70202, resilience includes the reliability or redundancy of freight transportation or the ability to rapidly restore access and reliability. To support this priority, state freight plans are required to establish strategies and goals to decrease the severity of impacts of extreme weather and natural disasters; impacts of freight on local air pollution; impacts on flooding and stormwater runoff; and impacts on wildlife habitat loss. The 2023 Nebraska SFP fulfills these requirements by adding an additional goal area that focuses on environmental and community vitality.

2.2 Nebraska's Freight Vision

Based on input from the Plan's Freight Advisory Committee (FAC), as well as Federal planning requirements and best practices, the 2023 Nebraska Freight Plan vision statement is:

TO SUPPORT AND GROW NEBRASKA'S FREIGHT SYSTEM IN EFFICIENT AND INNOVATIVE WAYS THAT MAKE THE MULTIMODAL SYSTEM SAFER, MORE RESILIENT, AND PROMOTE THE STATE'S ECONOMIC GROWTH AND COMPETITIVENESS WHILE BALANCING ENVIRONMENTAL CONSIDERATIONS.

2.3 Nebraska's Freight Goals

State and national goals provide a clear and strong foundation from which the 2023 SFP goals were established. Based on this analysis and the strategic input of NDOT staff and the FAC, five goal areas were identified to align with national and state priorities. The 2023 goals are:

Asset Preservation: Optimize road and bridge preservation investments decisions to best utilize limited funds to maintain and preserve the existing multimodal freight system.

Economic Competitiveness: Improve intermodal transportation system connectivity, efficiency, and mobility and strengthen inter-governmental partnerships to support existing industries and increase national and regional economic competitiveness.

Reliable, Secure & Resilient Freight Transportation: Support network resilience, reduce vulnerabilities in the statewide freight transportation system, implement redundancy, and make innovative investments that improve mobility, connectivity, accessibility, and reliability of goods movement.

Safety: Improve statewide safety by funding projects, including through the use of new technologies, that reduce injuries and fatalities on the freight transportation network.

Environmental and Community Vitality: Improve the use of data, policies, or guidance to support the avoidance, minimization, and/or mitigation of impacts, including air quality and impacts on vulnerable communities and the environment, to natural and cultural resources on freight related projects.

Chapter 8.0 describes the specific, implementable actions that NDOT will take to realize each of these goals and address the challenges and needs across the state's multimodal freight system.

3.0 Freight & Industry Stakeholder Outreach

While developing the Nebraska State Freight Plan, NDOT engaged with a variety of public and private freight transportation stakeholders across the State. Stakeholder outreach efforts included conducting a series of stakeholder interviews and Freight Advisory Committee (FAC) meetings.

3.1 Freight Advisory Committee

NDOT formed the FAC in late 2016 to examine economic and transportation trends, share insights and experiences with Nebraska freight issues, and discuss potential recommendations. The FAC, which included representation from Nebraska's diverse agriculture, trucking, manufacturing, and rail industries, provided input throughout the development of the plan. The complete list of FAC members is shown in Table 3.1. The FAC met three times in 2022.

TABLE 3.1 FREIGHT ADVISORY COMMITTEE MEMBERSHIP

Public Sector/Utility	Private Sector	Academic Institutions, Associations, and Advocacy
Federal Highway Administration (FHWA), Nebraska Division	Union Pacific Railroad	Nebraska Corn Board
Lincoln Electric System	BNSF Railway	Nebraska Farm Bureau
Nebraska Chamber of Commerce	Cash-Wa	Nebraska Trucking Association
Nebraska Dept. of Agriculture	Crete Carrier	Owner Operator Independent Driver's Association (OOIDA)
Nebraska Dept. of Economic Development (NDED)	Werner Trucking	University of Nebraska—Lincoln (UNL) Transportation Center
Nebraska Public Power District (NPPD)	Nebraska Central Railroad	UNL—Economics
Nebraska State Police—Carrier Enforcement	Pioneer Hi-Bred International, Inc	UNL—Supply Chain Management & Analytics
Port of Omaha, U.S. Customs and Border Protection		

FAC Meeting 1

April 18, 2022 (virtual via Microsoft Teams)

In this virtual meeting, FAC members discussed the motivation and background of the State Freight Plan, reviewed and brainstormed the vision and goals for the Plan update, and participated in a roundtable discussion on industry trends, challenges, and opportunities. Polling results can be found in Appendix B.1.

FAC Meeting 2

July 8, 2022 (in-person in Lincoln, NE)

The FAC met in-person to discuss the Nebraska freight profile, including commodity flows and existing and future conditions by mode, and broke into small groups for in-depth discussion of needs on Nebraska's multimodal freight network, such as site-specific, systemic, policy, and programming needs. These topics included safety, truck parking, technology, mobility and reliability, asset preservation, and rural needs. Key themes from the small group discussions can be found in Appendix B.2.

FAC Meeting 3

December 15, 2022 (in-person in Lincoln, NE)

The FAC met in-person to discuss the status of the draft plan and the schedule moving forward towards the deadline for plan submission. Dr. Nathan Huynh, Director of the UNL Transportation Center, spoke to the group about his role at the center, and how he hopes to leverage his knowledge and research to benefit transportation in Nebraska. The group discussed multimodal needs, opportunities, and challenges, transportation strategies and actions, as well as the updated framework of the committee's vision and goals. Polling results from the discussion of recommendations can be found in Appendix B.3.

3.2 Stakeholder Interviews

NDOT conducted a series of in-person and telephone stakeholder interviews to validate the extensive data analysis and better understand freight and industry perspectives, needs, and opportunities. Targeted participants included:

- **Public Sector Participants.** Direct (those that provide freight/rail service) public sector stakeholders are somewhat limited when considering freight services. The primary direct public sector stakeholders include public airports, public ports, and the U.S. Postal Service. Other, non-direct, public sector stakeholders include communities and cities that generate/receive large volumes of freight/rail goods, statewide and economic development agencies, Chambers of Commerce, and Metropolitan Planning Organizations (MPOs).

- **Private Sector Participants.** Stakeholder engagement included interaction with the region's private sector. Private sector stakeholder groups include, but are not limited to:

  - *Trucking stakeholders,* including intermodal drayage providers; carriers focused on overweight and over-dimension cargo; bulk commodity haulers; general freight and retail full truckload carriers, both regional and interstate, public and private; less-than-truckload (LTL) companies; package and parcel delivery; private fleets (shipper-owned fleets); third-party logistics providers; and trucking industry groups.

  - *Rail stakeholders*, including freight railroads, including both Class I and short line (Class II/III), and rail-served industries and facilities.

  - *Port stakeholders,* including air cargo-handling airports, cargo facility owners, carriers, and brokers; river ports and terminals, port directors, port users, terminal operators, and barge operators.

- *Shippers and receivers*, including manufacturers; companies providing business to business products; retail and commercial establishments; warehousing/distribution; public and private warehouse operators, including company specific retail; and warehouse developers and leasing companies.

Nine (9) interviews were held with various public agencies, key businesses and industries, and freight system operators. Table 3.2 lists the stakeholders that were contacted, including those that either declined to be interviewed or did not respond to requests for interview.

TABLE 3.2 STAKEHOLDER INTERVIEWEES CONTACTED

Entity/Organization		
Blackburn Manufacturing[1]	Lukjan Metal Products	Orthman Manufacturing
Buckle	Michael Foods	Port of Omaha, U.S. Customs and Border Protection[1]
BNSF Railway[1]	Nebraska Association of Meat Processors	Puritan Manufacturing
Case IH Plant	Nebraska Cattlemen[2]	Reinke Manufacturing
Daniels Manufacturing	Nebraska Central Railroad Company[1]	Rivers Metal Products
Dutton—Lainson	Nebraska, Kansas, Colorado Railway	Spreetail
Eppley Airfield[1]	Nebraska Northwestern Railroad	Sustainable Beef
Fairview Mills and Nebraska Manufacturing	Nebraska Poultry Industries[2]	Union Pacific Railroad[1]
Central Nebraska Regional Airport[1]	North Platte Chamber of Commerce[1]	Westin Foods
Hornady Manufacturing	Omaha Public Power District[1]	
Lindsay Corporation	Omaha Steaks	

[1] Entity agreed to be interviewed.
[2] Entity declined to be interviewed.

Interviews covered a variety of topics, including:

- Freight movements and why certain modes/methods were chosen over others
- Whether current freight movement methods meet specific requirements
- Value in developing new or expanded transload facilities to handle the transfer of various goods
- Value in developing intermodal facilities to facilitate the movement of materials
- Issues with current rail access and service
- Reasons behind changing commodity transportation methods
- Supply chain challenges that can be solved through service improvements
- Regulations impacting freight movements or rail service

- Means in which the State of Nebraska could help to improve freight service
- Capacity constraints or operational bottlenecks affecting freight movement in Nebraska
- Potential opportunities to improve highway-rail grade crossing safety in Nebraska
- Potential opportunities for economic development in Nebraska through new or expanded rail-served industrial properties
- Potential opportunities for economic development in Nebraska through reactivation of disused railroad facilities

4.0 Freight Transportation Drives the Nebraska Economy

In 2018, Nebraska was ranked 5th of the list of Forbes' top states for business.[1] Nebraska also ranks 7th in terms of total farmland in the U.S.[2] The state's critical industries are supported by Nebraska's extensive highway, railroad, air cargo, pipeline, and waterways network, especially I-80 and several Class I railroad lines. These transportation capabilities support economic development and business opportunities, which in turn create a significant number of jobs and earnings for workers. Freight transportation supports all goods-producing and consuming sectors of the economy and is also a leading economic sector.

ECONOMIC IMPACT

In 2019, freight-intensive output accounted for over a quarter of the state's gross domestic product (GDP), and in 2021 freight-intensive sectors accounted for more than 1 in every 5 jobs in the state.

Freight activity plays a significant role in Nebraska's economy. Freight transportation is a derived demand, meaning that the demand for freight transportation arises when goods or services are purchased. As such, this assessment highlights those industries that are heavily supported by freight activity.

This Chapter provides insights on the dynamics of freight-intensive industries and how these dynamics influence economic outcomes for Nebraska. It discusses recent changes in key Nebraska industries and provides insight into possibly expected economic trends that may impact future freight demand in Nebraska. The findings of this analysis revealed that manufacturing—specifically food manufacturing, which is strongly associated with animal protein production—is one of the most prominent sectors in the state, in addition to the truck and rail transportation sectors, which enable many manufacturing and other freight-intensive sectors to grow and prosper in Nebraska. These insights help NDOT better understand where to invest in the network to ensure that the state's freight transportation assets can continue to serve these critical sectors.

4.1 Freight & the Economy

This section provides a top-down assessment of freight-intensive sectors at the state and regional levels. At the geographic level, this analysis considers population and gross domestic product (GDP) levels and growth rates, shares of GDP, employment and labor earnings by sector, and a shift-share analysis. These economic trends provide context into Nebraska's economic development and industry opportunities, which may impact future freight demand, modal choice, and commodity flows. For the purpose of the analysis, industries in Nebraska were divided into three major categories:

The innermost sector, **cargo-handling and transportation**, includes economic activities related to freight transportation and operations.[3] In addition to activities generated by trucks, rail, pipeline, water, and air transportation, other activities included in the cargo-handling and transportation group consist of in-house truck transportation carried out by businesses in which transportation is not the main economic activity (such as grocery stores), self-employed individuals in the

1 https://www.omahachamber.org/international-business/.

2 https://stacker.com/stories/1578/states-most-farmland.

3 Defined by National Industry-Specific Occupational Code 53-7062; North American Industry Classification System (NAICS) codes 48-49.

trucking and courier activities, United States Postal Service (USPS), and for-hire warehousing and storage.

Freight-generating industries rely heavily on freight transportation services to receive inbound raw materials, manufacture goods, and/or store/distribute product before it moves to market.[4] This group can be further divided into four sectors: Agriculture, Mining and Derivatives, Construction, and Manufacturing. Collectively, the cargo-handling and transportation and freight-generating groupings comprise **freight-intensive** sectors.

The remaining industries are considered **service sectors**, which may generate or receive some freight volumes but are otherwise not considered to be freight-intensive.[5]

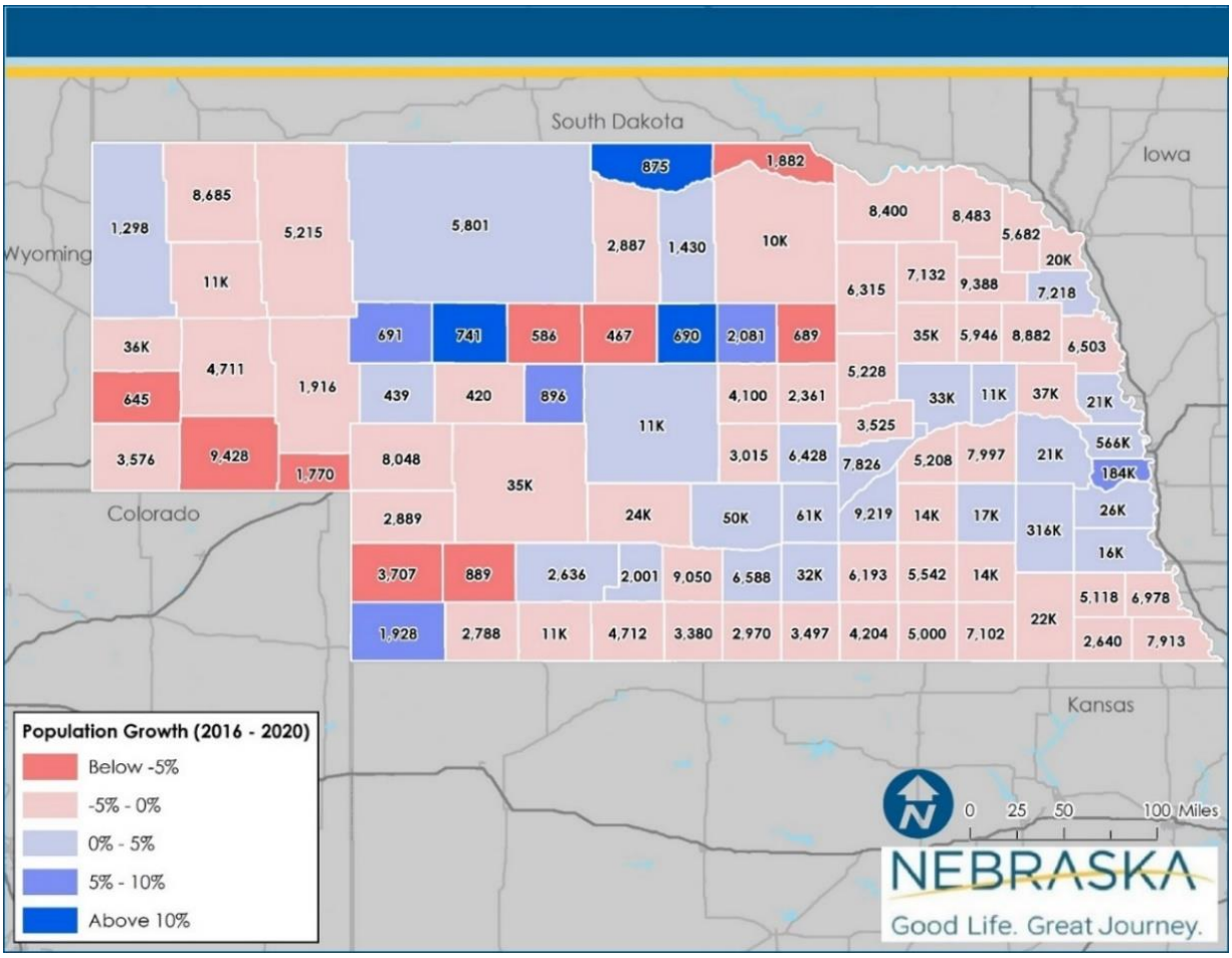
Population Growth

Nebraska's population is concentrated in the southeastern or eastern portions of the state, while other regions are more sparsely populated. Between 2016 and 2020, total population grew by more than 2.2 percent. Population growth has been moderate and steady near the state's largest urban areas, slightly declining in most rural areas, and notably high or low only in counties with few inhabitants, with the exception of Cheyenne County. Located in the region where Nebraska borders Colorado to the South, Cheyenne County's population of once over 10,000 inhabitants declined by more than five percent during this period. The estimated number of inhabitants by 2020 and the growth rate between 2016 and 2020 by county are shown in Figure 4.1.

[4] Defined by North American Industry Classification System (NAICS) codes 11, 21, 23, 31-33.

[5] Defined by all remaining NAICS industries not otherwise captured in the cargo-handling and transportation industry category or freight-generating industry category.

FIGURE 4.1 TOTAL POPULATION BY COUNTY AND PERCENTAGE CHANGE 2016-2020



Source: Cambridge Systematics, Inc., based on U.S. Census Bureau, American Community Survey, 2016 and 2020 5-Year Estimates.

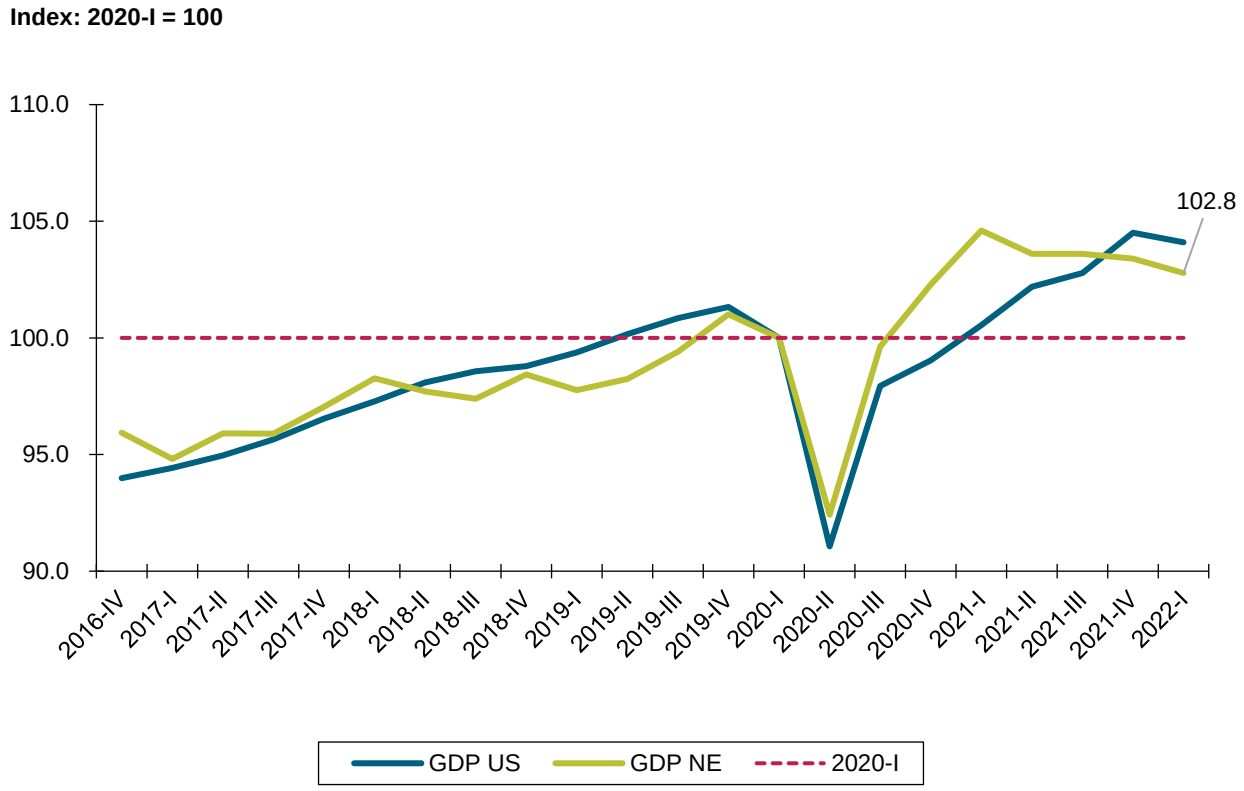
Statewide Industry Assessment

Between 2016 and 2022, trends become especially important given the occurrence of the COVID-19 pandemic and its differentiated impact across the economy's sectors. In a broad sense (at the NAICS 2-digit level), the following figures show how the economy as a whole (Figure 4.2), freight-generating sectors, and the cargo-handling and transportation sector performed during this period. The analysis uses an index where the value for the first quarter of 2020 (*Q1 2020*, or *2020-I*) is set as equal to 100, as a watermark to show whether each sector was able to overcome the impacts of the pandemic or demonstrate another trend. Each figure also shows the performance at the state level alongside the U.S. as a whole.

Nebraska's overall GDP performed similarly to that of the United States, having already surpassed its pre-pandemic levels, after having shown a steep, V-shaped recovery (Figure 4.2). Part of its resilience, visible in the smaller economic downturn and earlier recovery, is due to its rural setting—significantly less affected than metropolitan areas, the strength of goods-producing (as opposed to service-producing) industries, and the slightly smaller size of Nebraska's leisure and hospitality industries (the most affected

by the pandemic) as compared to the rest of the United States. Some of these elements have also made the state more resilient in previous economic downturns such as those of 2001 or 2007-2009.[6]

FIGURE 4.2 NEBRASKA AND U.S. GDP TRENDS, 2016–2022—ALL INDUSTRIES



Source: CS Estimates, based on BEA GDP data by State, using 2-digit NAICS codes and real GDP quantity indices.

Highlights from the performance of other industry categories include:

» The **Agriculture, Forestry, Fishing and Hunting** sector not only recovered rapidly, but also expanded in Nebraska, way above seasonal oscillations. Amid food security concerns after supply chains were affected worldwide, crop commodities increased their prices significantly, favoring the sector's income and ability to create jobs.[7] This strategic convenience has persisted into 2020 as a result of the conflict in Ukraine, a major producer of field crops, as well as weather-related impacts that have suppressed production in many regions. The type of agriculture performed in Nebraska helps to explain an exceptional performance that diverts from what has been observed in the rest of the U.S., with levels still below Q1 2020 (Figure 4.3).

6 https://www.kansascityfed.org/omaha/nebraska-economist/nebraskas-economy-outperforms-through-crisis-and-recession/.

7 https://news.unl.edu/newsrooms/today/article/nebraska-will-continue-to-recover-from-pandemic-forecast-shows/.

- **Construction** in Nebraska did not face a dramatic drop, which is aligned with the strong performance of this sector nationwide during the pandemic.[8] Construction was one of the few industries that managed to add jobs in 2020,[9] although this had not been true at previous recessions.[10] However, it has not yet recovered the growth rates from previous years. Moreover, before Q1 2020, this sector had been steadily growing as compared to a more hesitant expansion happening nationwide. Since then, although differences persisted in terms of magnitude, trends at both levels have been resembling each other.

- **Manufacturing** had also been growing faster at the state level than at the national level. Trends since the pandemic aligned with the rest of the Nation and may have been influenced by U.S. policy and efforts of manufacturers to near-shore operations (discussed further in Section 7.1). The sector has performed above pre-pandemic values since Q3 2020 and has been slightly outnumbering national standards despite their similar paths (Figure 4.3). At the national level, the manufacturing of motor vehicle parts has declined in employment, likely due to shortages and supply chain issues with critical parts such as semiconductor chips, while most other manufacturing industries have expanded.[11] These insights are further reinforced by business initiatives and incentives the State targets to some of these sectors: *imagiNE* allows for the application of investment credits, and is related to manufacturing sectors, plus the smart inclusion of logistics industries from the cargo-handling and transportation sector.[12]

- The **cargo-handling and transportation** sector has been struggling in Nebraska in recent years. Although this sector's absolute GDP levels reached a peak by early 2019, it stagnated and ultimately plummeted, only to repeat a similar downturn in 2020. Since then, it has caught up with the national trend, and experienced a slight uptick by early 2022. Effects are consistent with the difficulties retail trade had initially experienced, and have been impacted by numerous supply chain disruptions, including reduced capacity for container shipping, workforce layoffs and shortages, higher shipping and material goods costs, shifting shipping modes and routes, delays at ports and other multimodal hubs, among numerous other impacts.[13,14]

[8] https://www.forconstructionpros.com/business/news/21259330/housing-lifts-us-construction-spending-to-nearly-5-2020-growth-over-and-3-nonresidential-pandemic-slide

[9] https://news.unl.edu/newsrooms/today/article/nebraska-will-continue-to-recover-from-pandemic-forecast-shows/.

[10] https://www.kansascityfed.org/omaha/nebraska-economist/nebraskas-economy-outperforms-through-crisis-and-recession/.

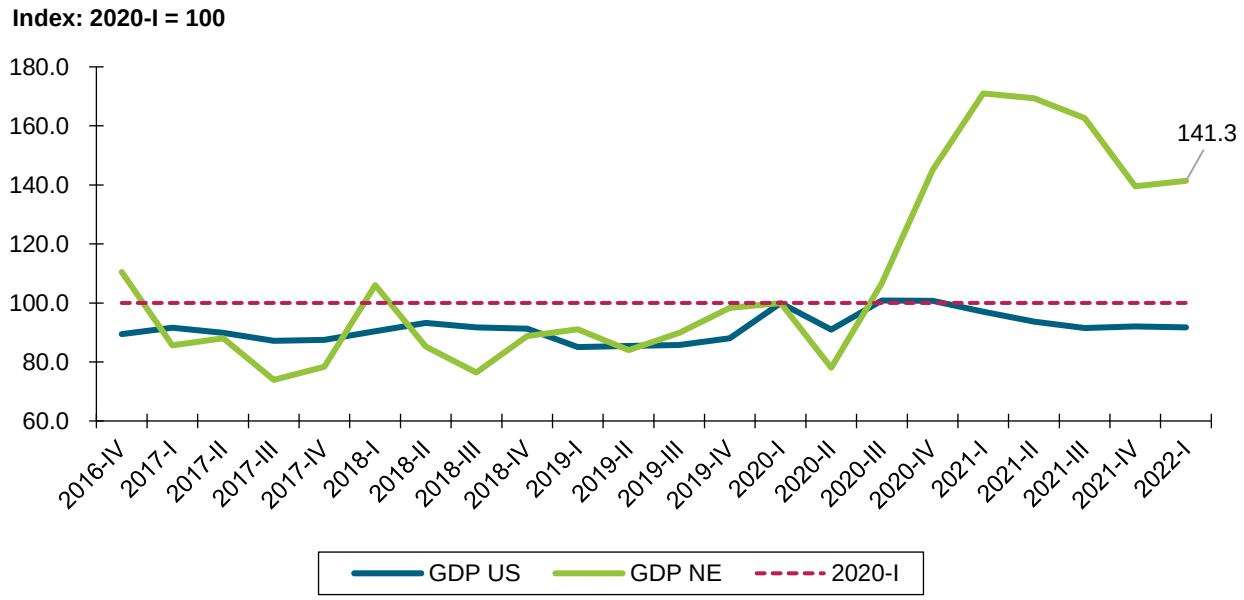
[11] https://www.kansascityfed.org/omaha/nebraska-economist/nebraskas-economy-outperforms-through-crisis-and-recession/.

[12] https://imagine.nebraska.gov/.

[13] https://news.unl.edu/newsrooms/today/article/nebraska-will-continue-to-recover-from-pandemic-forecast-shows/.

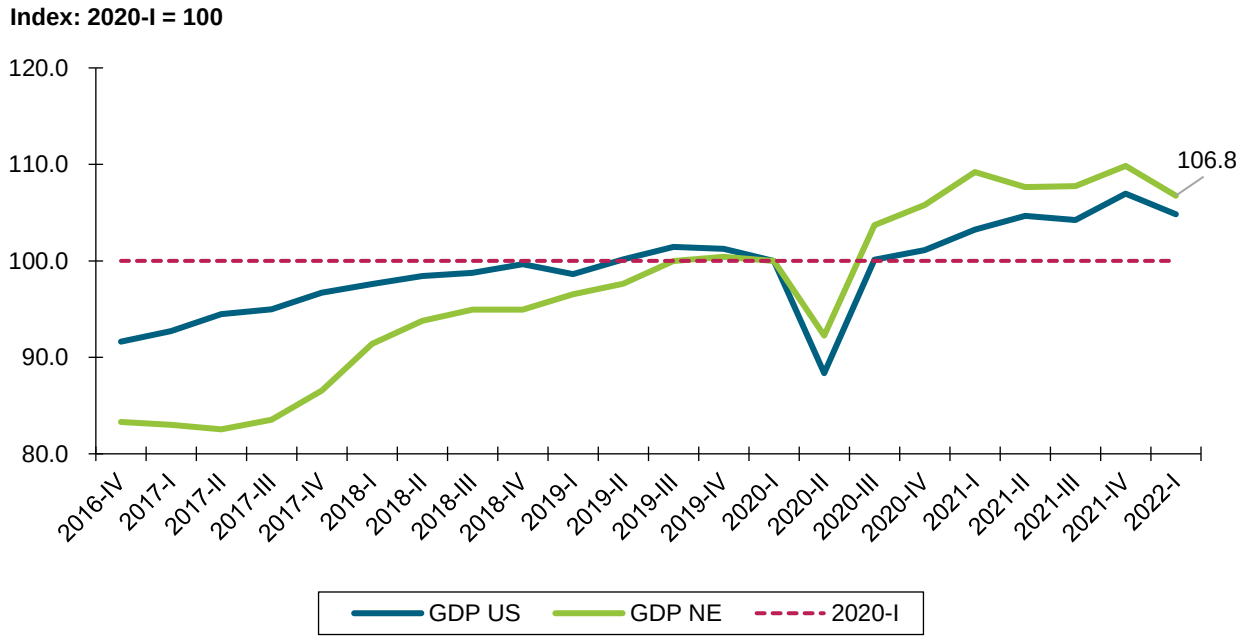
[14] https://www.usitc.gov/research_and_analysis/tradeshifts/2020/special_topic.html.

FIGURE 4.3 NEBRASKA AND U.S. GDP TRENDS, 2016-2022— AGRICULTURE, FORESTRY, FISHING & HUNTING



Source: CS Estimates, based on BEA GDP data by State, using 2-digit NAICS codes and real GDP quantity indices.

FIGURE 4.4 NEBRASKA AND U.S. GDP TRENDS, 2016-2022— MANUFACTURING

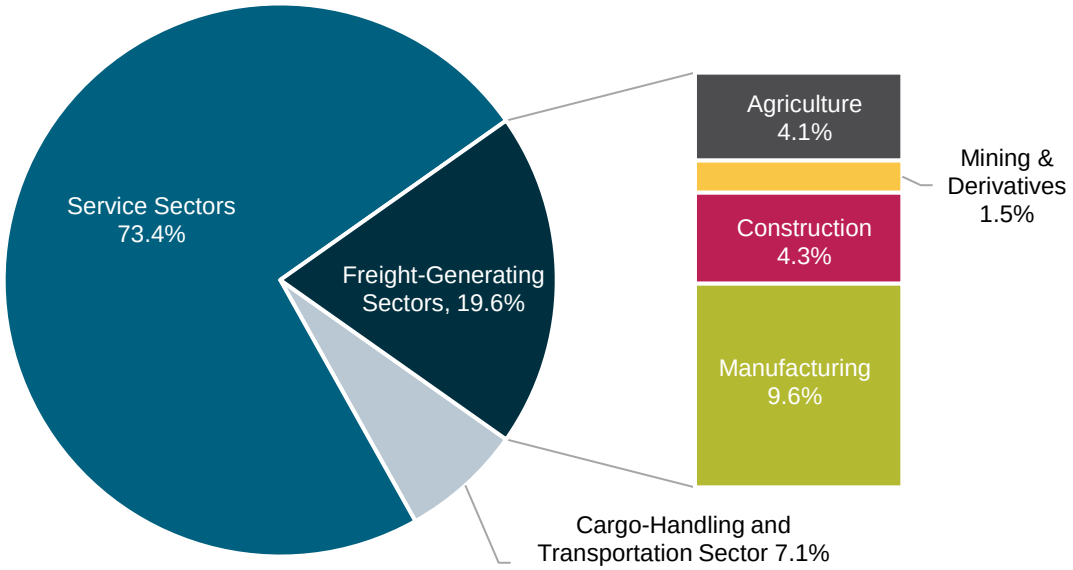


Source: CS Estimates, based on BEA GDP data by State, using 2-digit NAICS codes and real GDP quantity indices.

GDP Share by Industry

One indicator that provides insight into the role and magnitude of the different freight-intensive sectors and their respective industries in Nebraska is share of state GDP, or total output. This analysis uses 2019 numbers, which at the time of writing are the latest-available figures, reflecting the last "normal" year of activity prior to the onset of the COVID-19 pandemic. These and other high-precision variables (e.g., labor earnings data for 3, 4, or 6-digit NAICS level industries) are needed to weight and apportion GDP shares of specific industries of interest that are not estimated by BEA at the state level.

FIGURE 4.5 FREIGHT-INTENSIVE SECTORS AS A SHARE OF GDP IN NEBRASKA, 2019



Source: CS Estimates, based on BEA GDP by State data, BLS-QCEW data, BLS-OEWS data, U.S. Census Bureau NES data, and AAR data.

In 2019, about seven percent of Nebraska's economy was comprised of the cargo-handling and transportation sector, while 20 percent comprised freight-generating sectors (Figure 4.5). Manufacturing represented half of the freight-generating sectors' contribution to economic output. Construction and Agriculture contributed around four percent, while Mining and Derivatives comprised less than two percent. Overall, freight-intensive industries collectively contributed to 28 percent of Nebraska's 2019 GDP, which is a relatively small share compared to Nebraska's neighbors (such as Missouri, where 36 percent of employment is in freight-intensive industries[15]), underscoring the importance of planning for current and future needs of the state's freight transportation network.

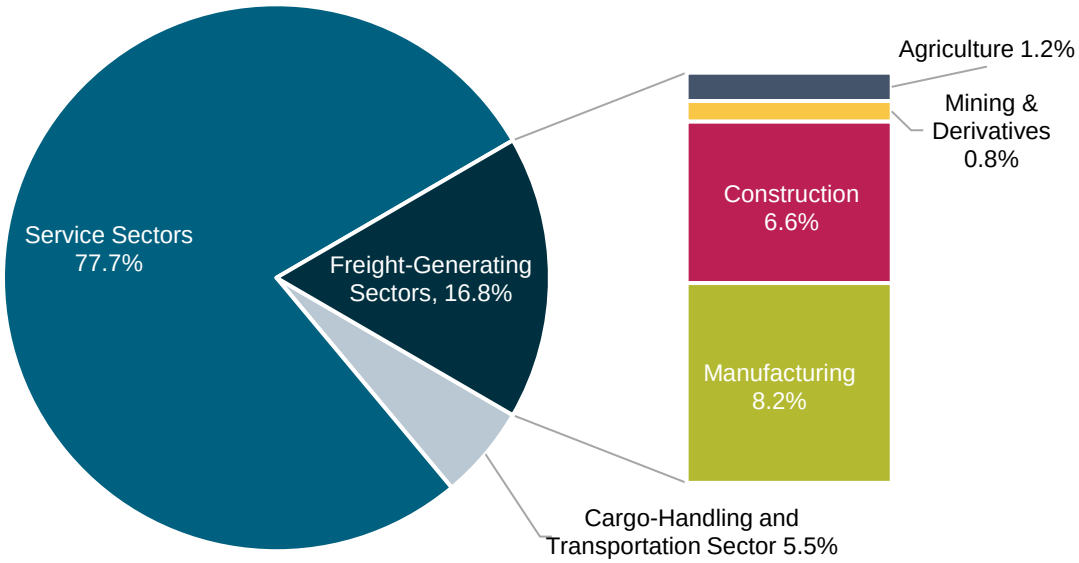
Employment & Labor Earnings

Beyond its importance as a macroeconomic indicator by itself, employment and wage data allow for analyzing a more recent picture of traditionally salaried employees (as opposed to self-employed records), which are available shortly after the incurred period. The interpretation of the distribution of

[15] 2022 Missouri State Freight & Rail Plan, Economic Futures and Needs Assessment. https://www.modot.org/sites/default/files/documents/Economic%20Futures%20and%20Needs%20Assessment%20FINAL.pdf

employment and labor earnings is twofold: first, it could be understood as a proxy for 2021 GDP, allowing for comparisons with Figure 4.6. However, since this would not be a totally accurate comparison, differences between shares of the economy could still be understood as indicators of how labor-intensive sectors are. High participation in GDP alongside low participation in employment, for example, would suggest a high labor productivity for that industry. However, if labor earnings were also low, that sector's labor force should not be considered to be highly compensated. Different combinations of these three elements can illustrate how industries operate and perform using only a few variables.

FIGURE 4.6 FREIGHT-INTENSIVE SECTORS AS A SHARE OF EMPLOYMENT IN NEBRASKA, 2021

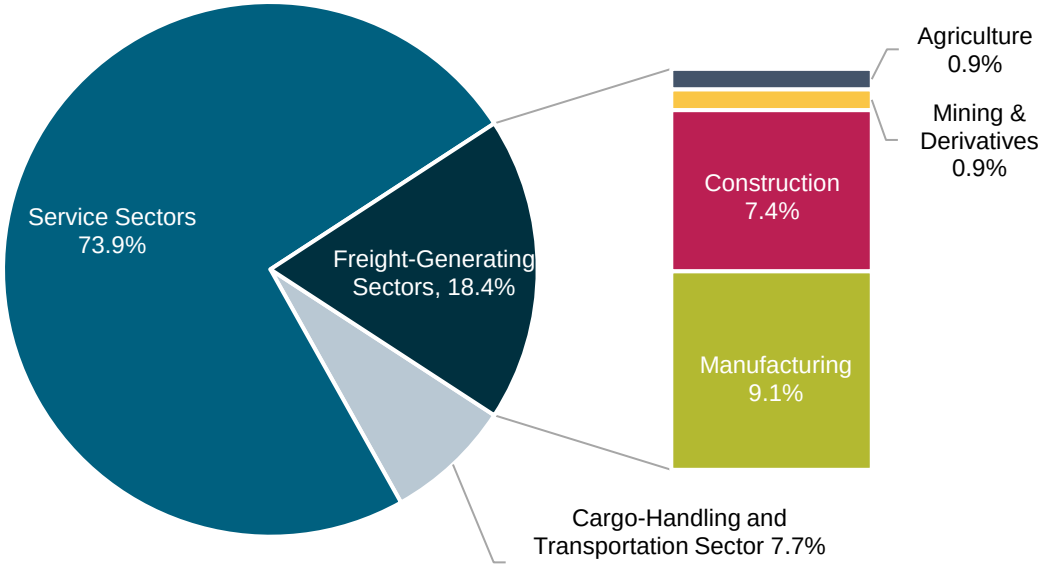


Source: CS Estimates, based on BLS-QCEW Employment data, BLS-OEWS data, AAR data, and U.S. Census Bureau NES data.

In 2021, both cargo-handling and transportation and freight-generating sectors had a smaller share of employment than for 2019 GDP values. It is notable that Construction is a labor-intensive industry (Figure 4.6) since its participation in employment is larger than that for GDP, whereas Mining and Derivatives or Agriculture have significantly smaller shares as compared to their output. Nebraska's economy had over 1.1 million salaried workers in 2021, and one out of four or five of them was employed by the freight-intensive sectors.

Freight-intensive sectors experienced an overall rise in labor earnings (Figure 4.7) as compared to employment. The cargo-handling and transportation sector, Construction, Manufacturing, and Mining and Derivatives sectors expanded, whereas Agriculture had a smaller share. This might relate to the lower cost of living in rural areas, where the majority of Agriculture production activities occur. The high compensation for Mining and Derivatives workers, while still smaller than the sector's GDP share suggests that workers are not only paid above average, but also that other types of income are frequently generated from the activity (e.g., profit, dividends). Conversely, Construction appears to be a mid-level wage, labor-intensive industry that does not directly translate to higher economic output. Labor earnings derived from freight-intensive sectors account for a quarter of all labor earnings.

FIGURE 4.7 FREIGHT-INTENSIVE SECTORS AS A SHARE OF LABOR EARNINGS IN NEBRASKA, 2021



Source: CS Estimates, based on BLS-QCEW Wage data, BLS-OEWS data, AAR data, and U.S. Census Bureau NES data.

Sector Competitiveness

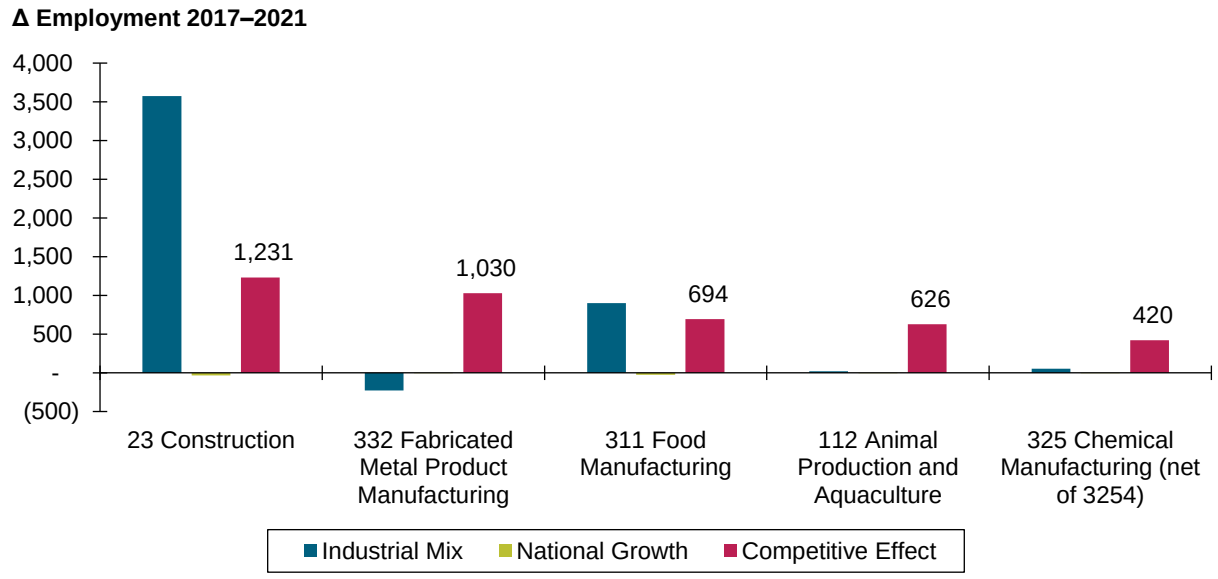
A shift-share analysis was performed to better understand the dynamics underpinning the growth/decline in these sectors. Shift-share analysis provides a framework to evaluate the regional competitiveness of an industry vis-à-vis the larger economy. Simply identifying high-growth industries fails to consider the factors driving growth. However, shift share analysis overcomes this limitation by decomposing growth into national, industry and regional components. By conducting an analysis of these specific industries, insights on shipping constraints and opportunities can be addressed to support the future needs of regionally competitive industries.

Shift-share analysis is made up of three components: (1) national share, (2) industry mix effect, and (3) regional competitive effect. The national share calculates the expected change in employment arising from job growth at the national level. Industry mix reveals the expected level of job growth, based on the industry's growth or decline at the national level. The regional competitive effect is the actual growth in jobs less expected job growth arising from the national share and industry mix effect. A positive competitive effect indicates that industry growth is attributable to the local region and not due to national or industry-specific trends.

Figure 4.8 shows the results of a shift-share analysis conducted using employment data for specific freight-intensive industries, highlighting the five with the greatest competitive effects in absolute (change in the number of jobs) and relative (percentage change) terms. The analysis was conducted at the state level and compares 2017 values to 2021 values. Results show favorable trends for freight-generating sectors, including construction, fabricated metal product manufacturing, food manufacturing, and chemical manufacturing (excluding pharmaceutical and medicine manufacturing) and animal production and aquaculture. Based on the shift-share methodology, these top 5 industries altogether can attribute the existence of four thousand jobs to Nebraska's competitive effect. Other industries that were less relevant in terms of absolute numbers, but had high growth in terms of percentage change (Figure 4.9)

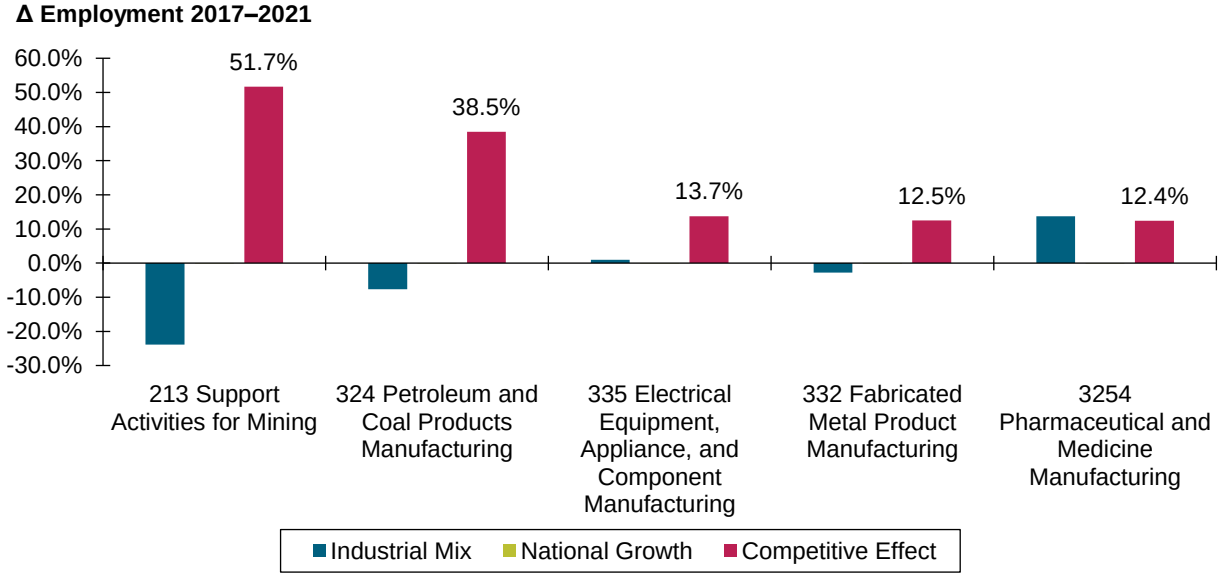
include support activities for mining and petroleum and coal products manufacturing, from the Mining and Derivatives sector, and two other industries from the manufacturing sector: electrical equipment, appliance, and component manufacturing; and pharmaceutical and medicine manufacturing.

FIGURE 4.8 TOP 5 INDUSTRIES FROM SHIFT-SHARE ANALYSIS FOR FREIGHT-INTENSIVE SECTORS IN NEBRASKA, 2017–2021, IN TERMS OF ABSOLUTE VALUE



Source: Cambridge Systematics Estimates, based on BLS-QCEW Employment Data, 2017-2021.

FIGURE 4.9 TOP 5 INDUSTRIES FROM SHIFT-SHARE ANALYSIS FOR FREIGHT-INTENSIVE SECTORS IN NEBRASKA, 2017–2021, IN TERMS OF PERCENTAGE CHANGE



Source: Cambridge Systematics Estimates, based on BLS-QCEW Employment Data, 2017–2021.

Between 2017 and 2021, construction has been consistently present all across the state. While nonresidential building construction experienced a slight downturn, impacted by the reduced profitability for office, commercial, and hospitality spaces, the rest of the sector has experienced growth. Residential buildings, engineering works and contractor activity in general operated almost under normalcy.[16] An additional contributor to construction has been the Community Block Development Grant (CBDG) program. This program funds construction while prioritizing Economic Development and Housing, including rehabilitation in both cases. The HOME program also assists individuals to achieve homeownership and dwelling as long as it involves non-luxury housing.[17] Several fabricated metal product manufacturing firms have expanded in Nebraska in recent years, including Hornady Manufacturing in Grand Island, Lukjan Metal Products in Sidney, and CS Precision in Gering, which will be discussed more in the Metal Products Manufacturing profile.

NDOT'S ECONOMIC OPPORTUNTIY PROGRAM

One contributing factor to the success of many recent corporate expansions in Nebraska can be attributed to NDOT's Economic Opportunity Program (EOP), which assists with first and last mile connections and job growth in key sectors. Its primary goal is to attract or retain jobs and private capital investment in the state through local grants for strategic transportation improvements. The EOP provided grant funds for the Scoular, Vireo Resources, and Allmand projects. In all, the EOP has helped create nearly 600 jobs (and another 1,200 projected in ongoing projects) and bring $272 million (with nearly $2 billion more projected) in private capital investment to Nebraska since 2017 with the first mile/ last mile program.

In the food manufacturing industry, highlighted openings and expansions include Costco's poultry processing facility in Lincoln, which created 800 jobs, or Scoular's creation of 100 jobs in Seward and its commitment to add another 80. The animal production industry was favorably impacted by the opening of Chinese markets for American beef exports after 14 years, which benefited Nebraska-based businesses. The chemical manufacturing industry, in turn, has benefited from diverse stakeholders, namely biofuel-related companies (Nebraska is the second biggest ethanol producer in the U.S.) like Novozymes in Blair.[18,19] The components of the food manufacturing sector in Nebraska and recent industry developments will be further detailed in the Food Manufacturing profile.

Among the industries and firms with remarkable performance in percentage terms for the 2017-2021 period, Adjuvance Technologies, based in Lincoln, has shown progress and cutting-edge performance at the pharmaceutical and medicine manufacturing industry. This adjuvant-producing (vaccine ingredient) company had received seed investment in 2016 and was able to raise $20 million in its Series A venture capital round, the largest ever seen in Nebraska.[20] Vireo Resources, another pharmaceutical and medicine manufacturing firm, also presented a promising plan to invest $15 million in an expansion that will create 200 jobs in Plattsmouth, after leveraging on land and development incentives.[21]

16 BLS-QCEW Employment data.

17 https://planninghcd.cityofomaha.org/cdbg-home-app.

18 https://www.omahachamber.org/economic-development/target-industries/agribusiness/ (report).

19 https://opportunity.nebraska.gov/gov-ricketts-novozymes-unveil-36-million-investment-in-blair/.

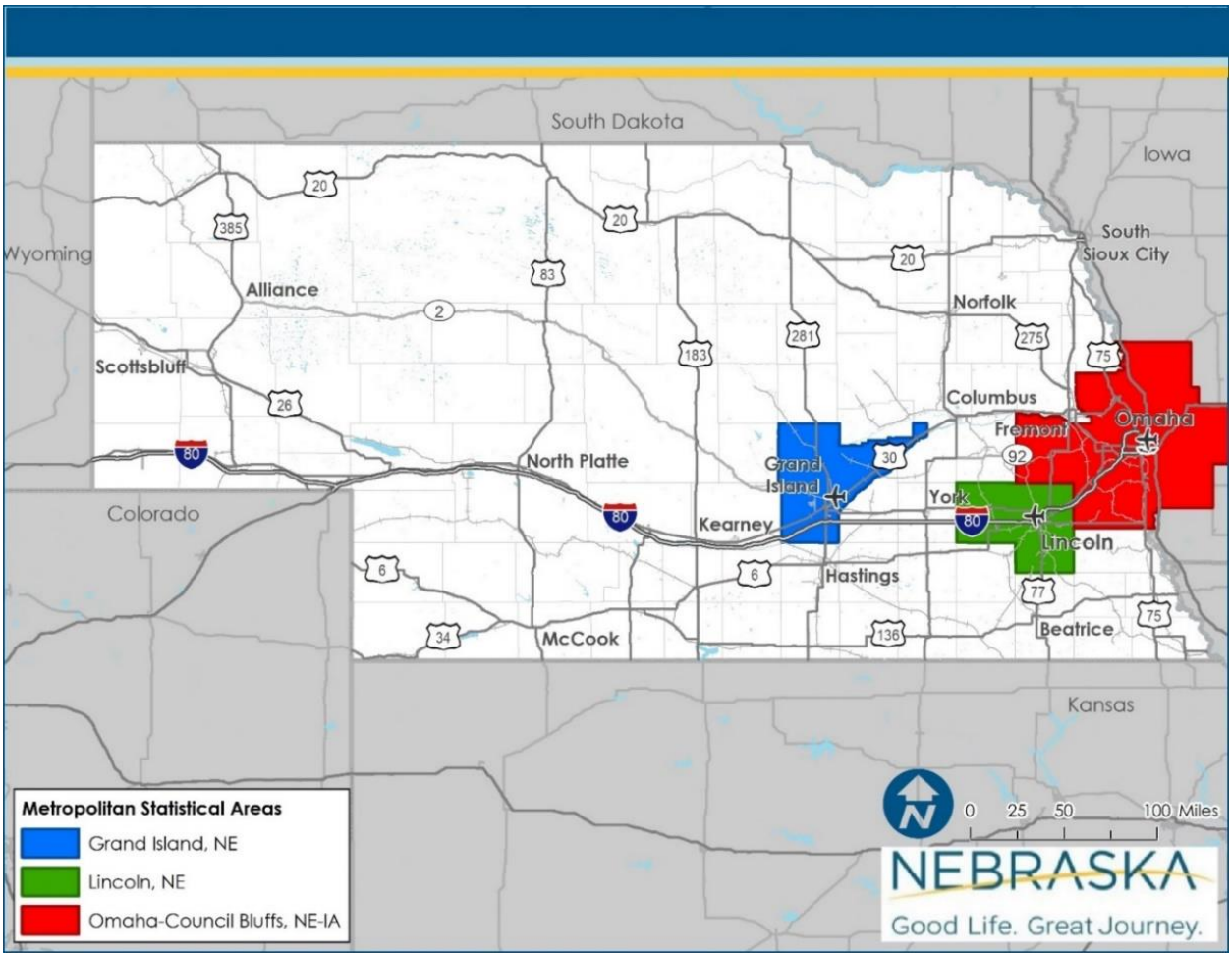
20 https://opportunity.nebraska.gov/report-shows-growth-of-states-entrepreneurial-ecosystem-under-nebraska-business-innovation-act/.

21 https://opportunity.nebraska.gov/lt-gov-foley-commends-city-of-plattsmouth-for-than-15-million-in-business-recruitment-expansion-investments/.

Regional Assessment

This economic analysis also included a regional assessment of Nebraska, including "Urban Nebraska," which encompasses Omaha, Lincoln, and Grand Island Metropolitan Statistical Areas (Figure 4.10), and "Rural Nebraska," which includes the remainder of the state. Urban Nebraska represents approximately 70 percent of the state's total population.[22,23] Omaha, Lincoln, and Grand Island are located roughly in the southeastern portion of the state, and in close connection to the corridors consisting of the Platte River and the I-80 highway. Their surroundings are where the most intensive farming takes place, across rolling hills crisscrossed by rivers and streams. Further west, where sand dunes dominate the landscape, growing cattle is a frequent activity, relying rather on well water. Industrial facilities are typically located not only in the major urban areas, but also in smaller towns located along the Platte River valley.

FIGURE 4.10 NEBRASKA'S METROPOLITAN STATISTICAL AREAS



Source: Cambridge Systematics, Inc., based on U.S. Census Bureau.

[22] South Sioux City (SIMPCO) is also an MPO in Nebraska, but most of the population that comprises the SIMPCO region is in Iowa. For this reason it is not being considered as an "Urban" area within Nebraska.

[23] 1,348,948 out of 1,923,826 inhabitants, according to U.S. Census Bureau, American Community Survey, 2020 5-Year Estimates.

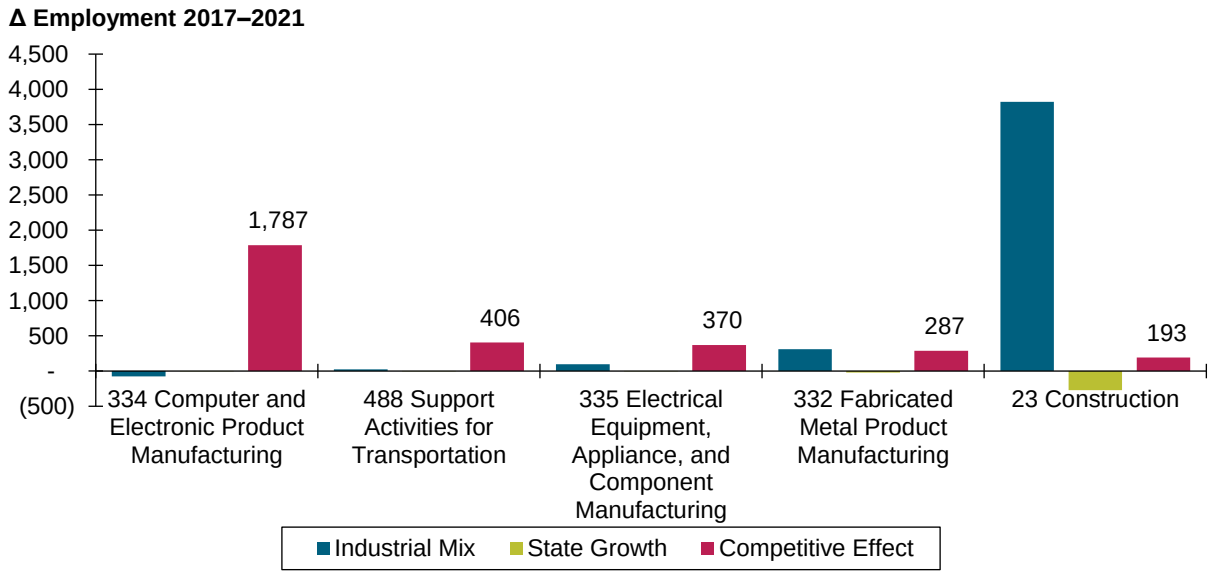
Urban Nebraska

Omaha, Nebraska's most populous city, is at the crossroads of interstate and rail traffic and well-positioned to move goods from coast to coast. Available land and workforce are valuable assets to be harnessed by capital investment. According to the Omaha Chamber of Commerce, the city has a number of competitive advantages—truck transportation is 2.23 times more concentrated than the national average, and the concentrations of food manufacturing, plastics manufacturing, and agrochemical manufacturing are 2.52x, 1.25x, and 2.56x higher, respectively, relative to the rest of the Nation.[24]

Lincoln, the second-largest city in Nebraska, has a highly-educated workforce and a strong advanced manufacturing base.[25] One existing asset is its foreign trade zone (FTZ) designated area, in the context of the FTZ Alternative Site Framework Program.[26] Kawasaki, one of its main users, has been particularly successful in being hired for the production of aerospace parts for the Boeing Corporation, and rolling stock for the New York MTA, although the latter is presenting some delays in the supply chain.[27,28]

Shift-share analysis for Urban Nebraska in the 2017-2021 period shows that some industries featured at the state level performed better in urban areas, including: support activities for transportation from the cargo-handling and transportation sector; computer and electronic product manufacturing (by far the largest in this top five); electrical, equipment, appliance, and component manufacturing; fabricated metal product manufacturing; and construction (Figure 4.11). The competitive effect of Urban Nebraska helps to explain, through the lens of shift-share analysis, more than three thousand jobs among these top five industries.

FIGURE 4.11 TOP 5 INDUSTRIES FROM SHIFT-SHARE ANALYSIS OF FREIGHT-INTENSIVE SECTORS IN URBAN NEBRASKA, 2017–2021, IN TERMS OF ABSOLUTE VALUE

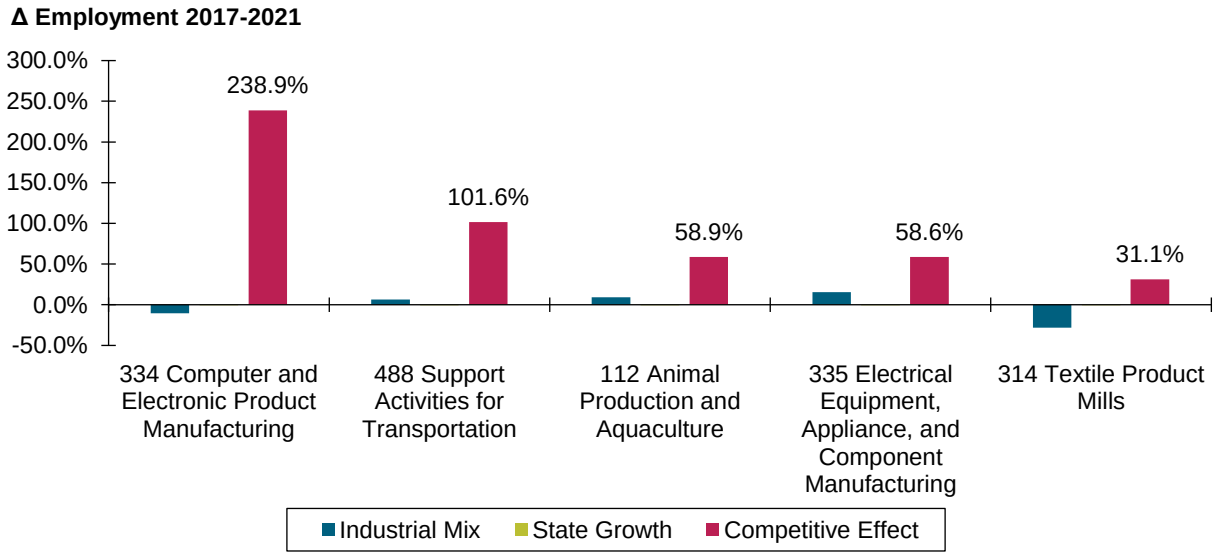


Source: CS Estimates, based on BLS-QCEW Employment Data, 2017-2021.

[24] https://www.omahachamber.org/economic-development/target-industries/logistics/.
[25] https://www.selectlincoln.org/business/research-reports.
[26] https://www.selectlincoln.org/site-selectors/foreign-trade.
[27] https://opportunity.nebraska.gov/gov-ricketts-kawasaki-unveil-companys-first-aerostructures-productionline-in-u-s/.
[28] https://opportunity.nebraska.gov/gov-ricketts-congratulates-kawasaki-on-new-york-subway-car-contract/.

Other two industries showed outstanding growth rates without necessarily being significant in absolute terms (Figure 4.12): animal production; and textile product mills, from the Manufacturing sector (also contrasting recent trends in which manufacturing industries have been moving out of cities).

FIGURE 4.12 TOP 5 INDUSTRIES FROM SHIFT-SHARE ANALYSIS OF FREIGHT-INTENSIVE SECTORS IN URBAN NEBRASKA, 2017-2021, IN TERMS OF PERCENTAGE CHANGE



Source: CS Estimates, based on BLS-QCEW Employment Data, 2017-2021.

Besides industries that were already highlighted at the state level, some relevant stakeholders for computer and electronic product manufacturing in urban areas include LI-COR in Lincoln and Control Services in Omaha. The cargo-handling and transportation sector as a whole, including support activities for transportation, experienced growth. Examples include expected openings of an Amazon fulfillment center in Papillion[29] and a Dollar General distribution center in Blair[30] (both are part of the Omaha-Council Bluffs MSA) would respectively add 1,000 and 400 jobs to the state's and region's warehousing and transportation-related industries. Additionally, an example of animal production and aquaculture expansion in urban areas was Hendrix Genetics, responsible for creating 40 jobs in 2018, also in Grand Island.

Rural Nebraska

One notable difference between Nebraska's Urban and Rural regions is that the least competitive sectors in urban areas appear to be the most competitive ones in rural areas, and vice versa. In Rural Nebraska, the freight-intensive sectors altogether comprised more than a third of employment. Manufacturing is a significant sector (more than half of the employment at freight-generating sectors) and has been growing in that direction, confirming its trend of moving away from cities

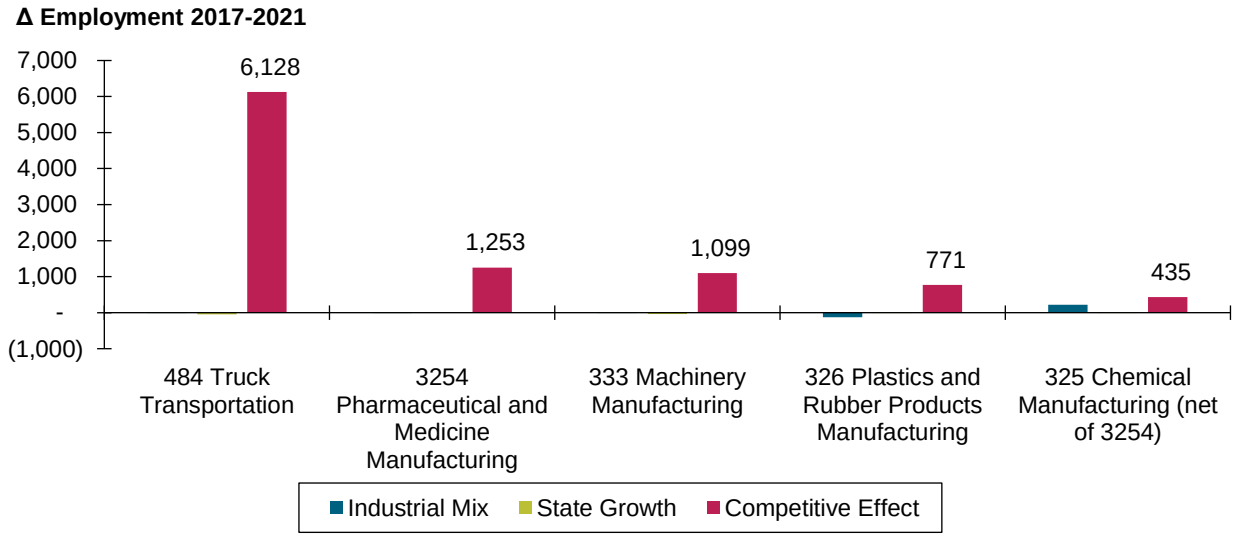
The shift-share analysis for Rural Nebraska found that top five industries in terms of absolute value in employment comprised 9,686 jobs created or retained thanks to competitive effects (Figure 4.13). Truck transportation is a key component of the cargo-handling and transportation sector and a leading industry.

[29] https://opportunity.nebraska.gov/gov-ricketts-joins-state-and-local-officials-for-amazon-project-announcement/.

[30] https://opportunity.nebraska.gov/gov-ricketts-announces-major-blair-investment-from-dollar-general-corporation/.

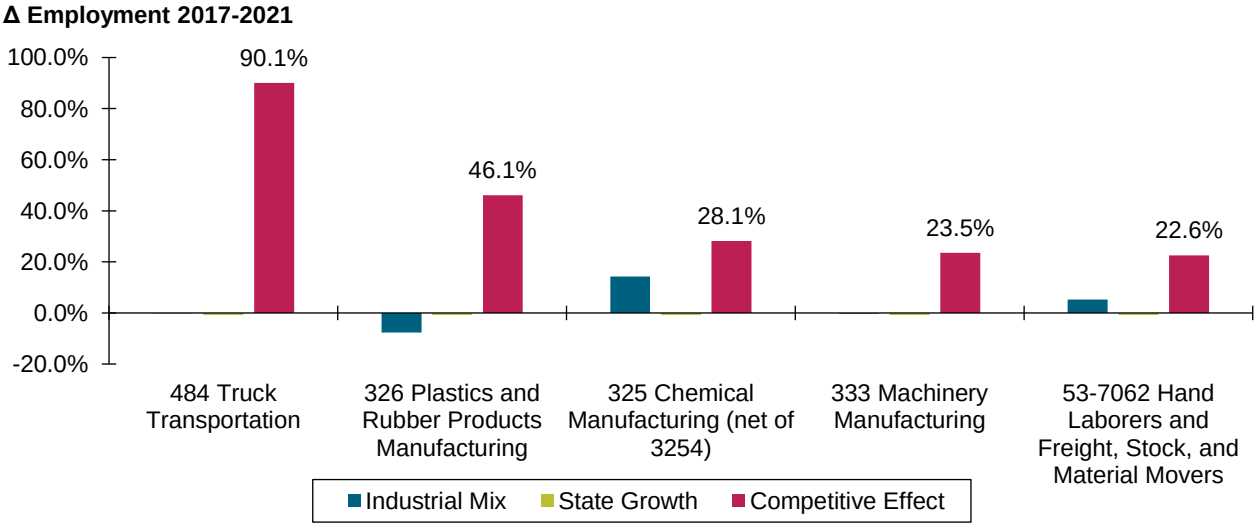
Pharmaceutical and medicine manufacturing and machinery manufacturing from the Manufacturing sector came next. The list is completed by a possibly promising growth in plastic and rubber products manufacturing and chemical manufacturing (excluding pharmaceutical and medicine manufacturing, which was considered separately). Although smaller in volume, there was another featured industry from the cargo-handling and transportation sector among the percentage change leaders (Figure 4.14), the hand laborers, freight, stock, and material movers' portion of Wholesale Trade industries. The latter suggests an important competitive advantage for the most pure-freight activities in Rural Nebraska.

FIGURE 4.13 TOP 5 INDUSTRIES FROM SHIFT-SHARE ANALYSIS OF FREIGHT-INTENSIVE SECTORS IN RURAL NEBRASKA, 2017-2021, IN TERMS OF ABSOLUTE VALUE



Source: CS Estimates, based on BLS-QCEW Employment Data, 2017-2021.

FIGURE 4.14 TOP 5 INDUSTRIES FROM SHIFT-SHARE ANALYSIS OF FREIGHT-INTENSIVE SECTORS IN RURAL NEBRASKA, 2017-2021, IN TERMS OF PERCENTAGE CHANGE



Source: CS Estimates, based on BLS-QCEW Employment Data, 2017-2021.

Examples of growth in the truck transportation and hand laborers and freight, stock, and material movers sectors in Rural Nebraska include the industrial rail park proposed for North Platte with the cooperation of Union Pacific Railroad.[31] In the machinery manufacturing sector, examples of growth in rural areas includes Agri-Plastics investment in Sidney[32] and Blueprint Engines in Kearney.[33] In the plastics and rubber products manufacturing sector, Royal Engineered Composite created 70 jobs in 2019.[34]

4.2 Key Nebraska Industries and Supply Chains

This section profiles three key freight-intensive industries in Nebraska, including food manufacturing in relation to meat production, e-commerce, and metal product manufacturing. Each profile includes an overview of key supply chain elements, as well as a discussion of opportunities and challenges associated with shipping infrastructure and transportation modes within Nebraska. These industry supply chain profiles were developed through an examination of statewide, national, and global economic trends, as well as existing knowledge of the Nebraska freight network.

Food Manufacturing

Food production, a particularly freight-intensive process, is a major driver of Nebraska's economy. Owning to suitable climate and soil conditions, as well as a large supply of water from the High Plains Aquifer, Nebraska is a major agricultural producer of both crops and animals. In 2019, Nebraska farmers harvested more than 1.79 billion bushels of corn and 283 million bushels of soybean, ranking the state as the third-largest corn producer and fourth-largest soybean producer in the U.S. Home to approximately 6.8 million cattle, Nebraska also ranks second in the U.S. for beef production, only behind Texas, the third-largest U.S. state by area. Additional key agricultural products related to food manufacturing include wheat, hay, beans, pork, poultry, and dairy.[35] In relation to food manufacturing, this profile places a particular emphasis on meat production, the largest and most prominent agricultural industry in Nebraska.

31 https://opportunity.nebraska.gov/from-historic-restorations-to-modern-era-housing-north-platte-leaders-build-opportunities-across-generations/

32 https://opportunity.nebraska.gov/gov-ricketts-applauds-investment-from-ontario-based-agri-plastics-in-sidney/

33 https://opportunity.nebraska.gov/lt-gov-foley-honors-kearneys-economic-growth-in-tech-manufacturing-sectors/

34 https://www.royalcomposites.com/ownership/company-history/

35 https://nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf

Overview of Supply Chain Elements

Nebraska's food manufacturing and production supply chain is highly complex and interconnected. More than 99 percent of Nebraska-grown corn, the state's most widely grown crop, is known as field corn.[36] A hard and dry corn, field corn is primarily used as livestock (especially cattle), but also for ethanol production. When used as cattle feed, field corn is trucked from individual farms, located in nearly every Nebraska county, to silos. Key inputs to these corn farms, characteristic of much of Nebraska's landscape, include fertilizer, seeds, and farming equipment, which are also transported by truck. Similar processes are undertaken for soybeans which are often used as poultry feed. From silos, raw agricultural product can be transported by truck or rail. This includes transport by truck to other silos for localized distribution, or to livestock farms or distilleries. Rail is an option for long-haul transport to out-of-state destinations, or to ports for waterborne exports.

The livestock portion of the state's food manufacturing and production supply chain includes multiple steps. In terms of cattle production, the supply chain begins on farms specializing in cow-calf operations. With 90 percent of such farms consisting of less than 100 cattle[37], these farms are typically small and scattered throughout the state. Once cattle are weaned, they are sold at auction houses to backgrounder/ stocker farms which focus on further weight gain. The last stage of cattle production takes place at feedlots where finishing occurs, in which cattle are fattened to between 1,600 and 2,400 pounds. Unlike the former portions of the livestock, feedlots are highly centralized. In Nebraska, there are approximately 150 feedlots, with the top 10 accounting for nearly 30 percent of the statewide capacity of almost 1.4 million heads (cattle).[38] Each of these stages of cattle production almost exclusively involves the use of trucks for transport. Key inputs, also transported by truck, include animal feed and medicine.

Processing and distribution is the final stage of the food manufacturing and production supply chain. With a focus on beef, fattened cattle are transported by truck to slaughterhouses. At these locations, slaughtered carcasses are cut up into smaller sections for further processing. Additional processing may also take place with the addition of packaging and additional value-added ingredients. This process is further centralized, with just four companies—Cargill, Tyson Foods Inc., JBS SA, and National Beef Packing Co.—controlling 85 percent of domestic cattle slaughter and beef processing, with all but National Beef Packing maintaining significant meat processing operations in Nebraska. Final processing and transportation to end consumers and markets are the final steps in the supply chain. This can range from raw meat bound for both domestic and international supermarkets and restaurants, to fully cooked meat combined and processed with other ingredients for packaged foods, schools, or public institutions (Figure 4.15). In 2021, Nebraska exported more than $68 million in meat products, the highest since 2010, which were primarily shipped to markets in China, Mexico, Hong Kong, South Korea, and Japan.[39]

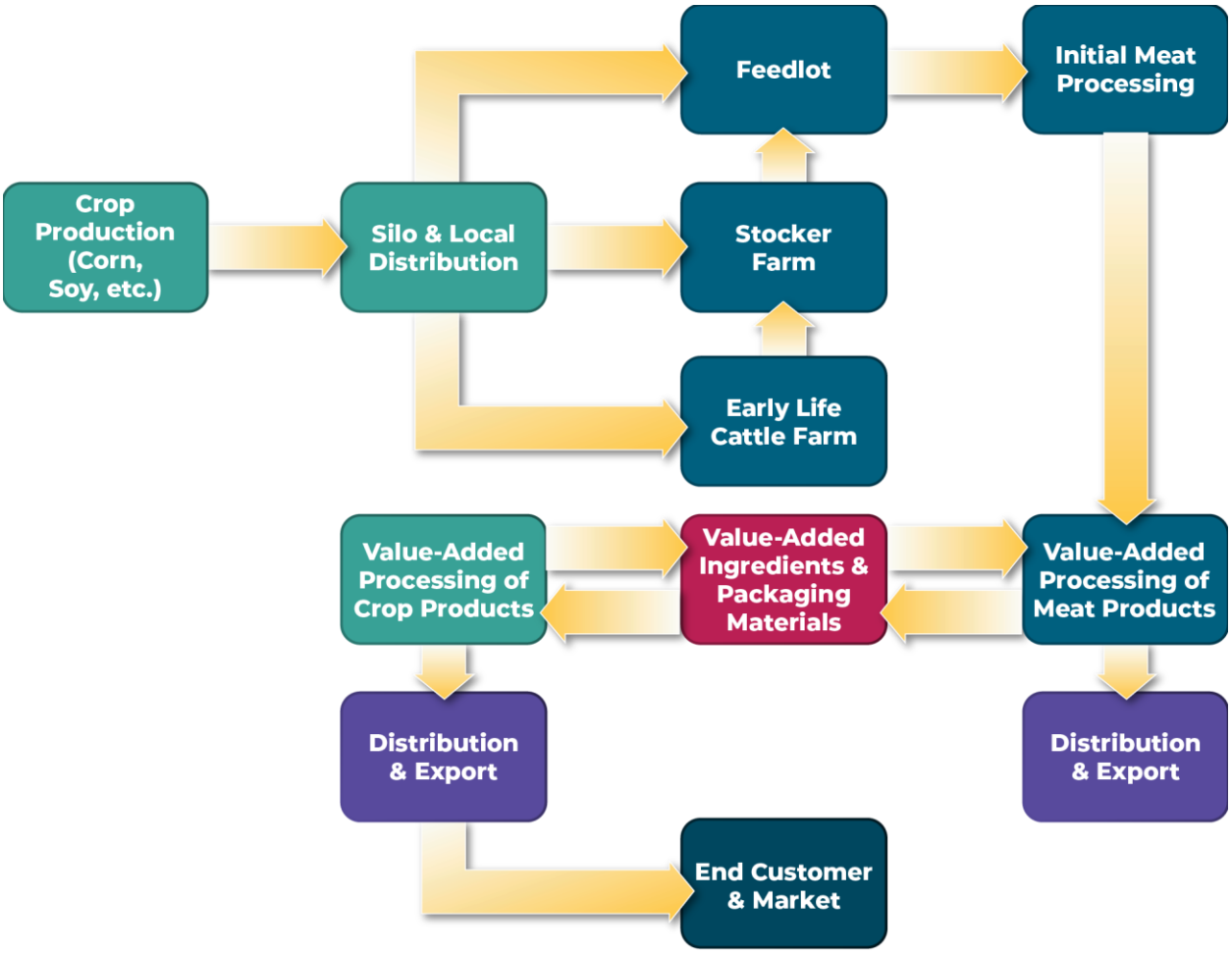
36 https://nebraskacorn.gov/corn-101/

37 https://www.nrdc.org/sites/default/files/better-beef-timeline.pdf

38 https://nda.nebraska.gov/publications/promotion/cattle_feeders/index.html

39 https://opportunity.nebraska.gov/programs/research/nebraska-exports/

FIGURE 4.15 MEAT-FOCUSED FOOD MANUFACTURING SUPPLY CHAIN ELEMENTS



Source: Cambridge Systematics.

Opportunities & Challenges

During the initial stages of the COVID-19 pandemic, concerns over challenging conditions at meat processing facilities, exacerbated by the spread of COVID-19, highlighted some of the issues associated with the current meat processing supply chain. This was in addition to other longstanding concerns about the potential health and environmental effects associated with a high and growing consumer demand for meat. The supply chain commences in a highly decentralized manner across small farms that specialize in cattle breeding, while the latter portion of the supply chain is largely dominated by just four firms specializing in the slaughter and processing of meat into various degrees of finished products.

Despite any issues associated with the Nation's meat and food manufacturing supply chain, from a statewide freight transportation planning perspective, demand will likely continue to remain strong. Through 2030, the global demand for animal proteins is expected to increase by 14 percent, with especially strong demand stemming from Asia and South America.[40] Locations such as Nebraska are in

[40] https://www.fao.org/3/cb5332en/Meat.pdf

especially strong position to capture this increased demand, given that U.S. produced meat is considered to be of top quality. This will lead to increased freight traffic, especially in the form of truck moves, across all stages of the supply chain.

In spite of this strong demand, additional opportunities for growth may exist in relation to sustainability. In recent years, demand for items such as sustainable, humane, organic, natural, and additive-free foods has grown significantly. In response, food manufacturers, marketers, sellers, and distributors have taken notice. In August 2022, Walmart, the Nation's largest retailer, announced a minority stake in North Platte-based Sustainable Beef LLC, with plans to construct a new 1,500-head processing facility. Expected to create approximately 800 new jobs, the partnership and facility will allow Walmart a greater degree of control and transparency over its beef supply chain. In addition, the partnership with a beef processor focused on responsible sourcing and land management directly caters to consumer preferences across the U.S.[41] This could lead to additional demand and growth in the ladder portions of the food manufacturing supply chain, based on a potential shift to increasingly localized production.

E-commerce

E-commerce is a purposefully broad term referring to all goods which are bought and sold online. Nebraska's role in the e-commerce industry is two-fold. The eastern portion of Nebraska is home to key population centers including Lincoln and Omaha. These areas are home to a denser and generally wealthy consumer base, and also serve as key locations for facility siting. Additionally, as a gateway between additional population centers in the eastern and western portions of the U.S., Nebraska likely sees a large amount of e-commerce-generated through traffic.

41 https://www.nwaonline.com/news/2022/sep/04/walmart-sets-nebraska-beef-facility-plans/

Overview of Supply Chain Elements

Broadly comprising economic activity in relation to multiple industries, ranging from food to consumer discretionary products, e-commerce involves the direct use of nearly every mode of freight transportation. Goods that are produced abroad in markets such as Asia and South America are often shipped by vessel to the Nation's largest ports such as Long Beach, Houston, and New York. To reach end users from ports or domestic production/finishing sites, goods are shipped either by rail or truck, including through containerized multimodal formats.

E-commerce has largely risen alongside the increased availability of high-speed Internet and mobile smartphone usage. The ability for everyday consumers to order virtually any product within seconds for delivery to their front door within a few days has also given rise to demand for expedited shipping. As of 2019, Amazon, the Nation's largest e-commerce retailer, was able to provide same-day shipping to 72 percent of the U.S.[42] For packages bound for Grand Island through FedEx, three-day ground shipping is available to the majority of the United States, with the exception of the West Coasts, and portions of rural Montana.

Based on these characteristics, e-commerce operations are heavily centered on last-mile needs, and the ability to efficiently reach customers across a wide range of geographies. This includes the use, citing and operation of warehouses and distribution center networks, and reliance on trucks to access customers. Locally within Nebraska, e-commerce operations are primarily located in the eastern portion of the state, primarily in and around Omaha. A number of key large e-commerce facilities in Nebraska are shown in Table 4.1.

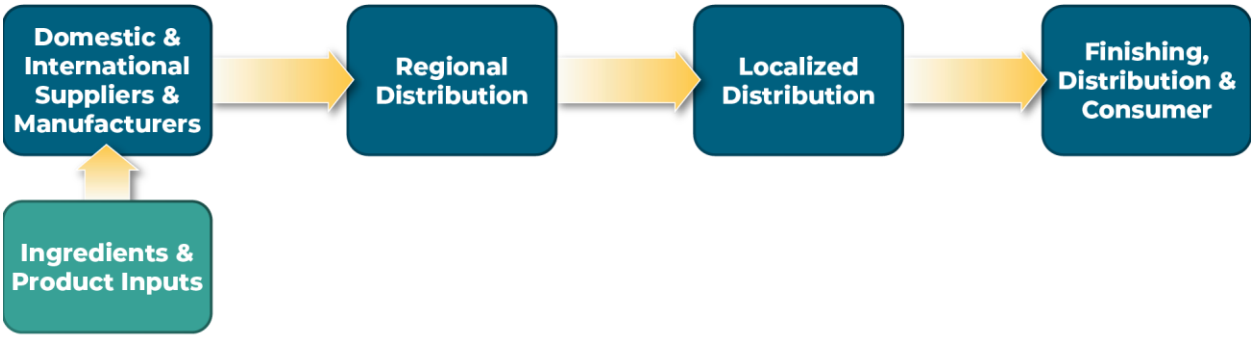
TABLE 4.1 MAJOR E-COMMERCE FACILITIES & HUBS IN NEBRASKA

Facility	Location	Square Footage
Commerce Park	Omaha	1,100,000
Buckle Distribution Center	Kearney	240,000
Dollar General Distribution Center	Blair, Washington County	865,000
Amazon Fulfillment Center (Opening Delayed)	Papillion, Sarpy County	700,000
Omaha Steaks Warehouse	Omaha	100,000
Commerce Park (Expansion)	Omaha	1,300,000
Lincoln Logistics Hub (Planned)	Lincoln	965,000
Gretna Logistics Park (Planned)	Gretna, Sarpy County	700,000

Source: Cambridge Systematics.

[42] https://www.cnbc.com/2019/05/05/amazon-can-already-ship-to-72percent-of-us-population-in-a-day-map-shows.html

FIGURE 4.16 E-COMMERCE SUPPLY CHAIN ELEMENTS



Source: Cambridge Systematics.

Opportunities & Challenges

A key opportunity in relation to last-mile e-commerce is bolstering service to rural areas, characteristic of most areas of Nebraska outside of the Omaha and Lincoln regions. In an effort to maximize profit, e-commerce platforms have traditionally focused on service to urban and economic centers. However, since at least 2021, Amazon has been developing a strategy, known as the Amazon Hub Delivery Program, to improve rural delivery service.[43] This strategy involves utilizing "mom and pop" shops in rural areas and small towns to deliver orders to Amazon customers within a set radius. In exchange, these businesses are paid a fee by Amazon. The strategy is currently being tested in ten states, including Nebraska. Citing shortcomings of partner package delivery services, including the United States Postal Service (USPS), the strategy is part of a larger goal to have greater control over the entire shipping process. At the local level, the strategy can potentially provide an effective and necessary financial boost for local small businesses, which may be particularly impacted by ongoing supply chain issues in the post-COVID-19 era.

Despite these opportunities, there are several challenges emerging in e-commerce industries. After years of rapid expansion, firms like Amazon are beginning to slow down and halt construction of distribution space. This can be attributed to concerns of rising costs due to inflation, as well as slowing customer demand. After Amazon CEO Brian Oslavsky indicated in April 2022 that the Nation's largest e-commerce retailer was stuck with "too much space," plans for its 700,000 square foot distribution center Papillon facility were put on hold until at least 2024.[44] An additional warehouse that Amazon leased across the Missouri River from Omaha in Council Bluffs, Iowa is now scheduled to launch in 2024.[45] In larger urban markets where Amazon aggressively built out space, the firm is planning to sublet its large facilities. Although inflation appears to be leveling off, macroeconomic concerns over consumer demand appear to be persisting. This could indicate that e-commerce growth, including in rural and comparatively smaller urban markets characteristic of Nebraska, may be subdued in upcoming years.

Given that a significant amount of through freight traffic, including in relation to e-commerce, passes through Nebraska, the issue of truck parking availability warrants attention. There is a need to better understand the truck parking needs of Nebraska, which have not yet been extensively studied beyond

[43] https://www.vox.com/recode/2022/5/9/23063528/amazon-rural-small-business-delivery-program-hub-partners-usps
[44] https://www.businessinsider.com/amazon-warehouse-sitting-empty-delayed-opening-nebraska-2022-7
[45] https://businessrecord.com/Content/Retail-Business/Retail-Business/Article/Amazon-warehouse-projects-delayed-in-Iowa-cities/179/854/98548

identification of available public spaces and private facilities. For example, the Missouri Department of Transportation (MoDOT) has found that during the peak hours of usage (during nighttime hours), more than half of all statewide public truck parking sites are at or above 100 percent utilization.[46] Due to required hours of rest for long-haul truck drivers, this can result in drivers needing to park in unsafe locations such as along highway shoulders. Although the severity of the truck parking issue may be less in Nebraska given its lower density and relatively smaller urban centers, the issue still requires attention in future freight transportation planning efforts.

Metal Products Manufacturing

In the U.S. and globally, approximately 95 percent of metal manufacturing consists of iron and steel production. Iron and steel metals are widely used across multiple sectors of the global economy, ranging from consumer products such as kitchen products and tools, to industrial equipment, construction materials, and major infrastructure systems. In 2021, the U.S. produced approximately 85 million tons of steel, making it the fourth-largest producer globally. Steel production in the U.S. is widely distributed across the country, with high concentrations of manufacturing in the Midwest and South. Owning to an extensive infrastructure network, massive consumer base, and urbanized population, the U.S. is the largest importer of steel in the world. In 2019, the U.S. imported 26.3 million tons of steel, compared to an export figure of 7.1 million. Canada, Brazil, and Mexico accounted for half of all imports, while Canada and Mexico accounted for nearly 90 percent of all exports.[47]

Overview of Supply Chain Elements

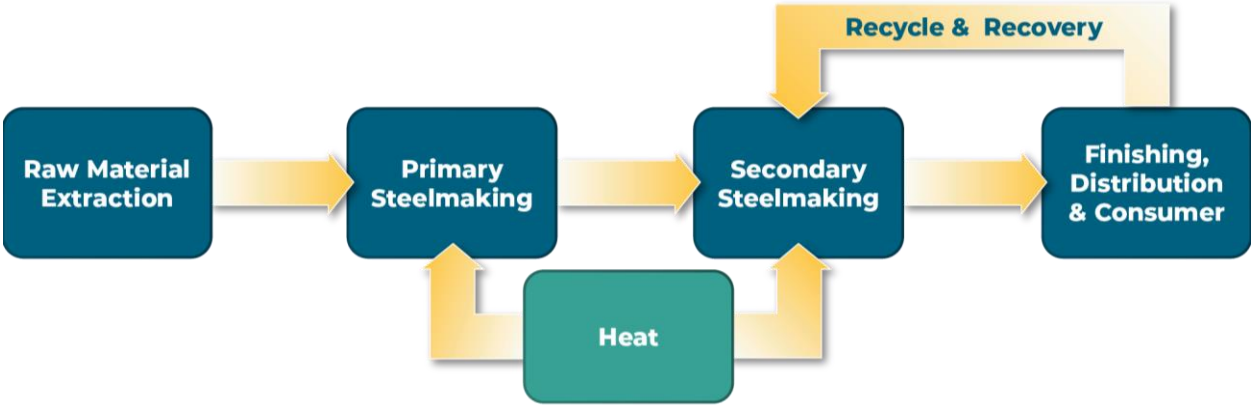
Steelmaking is an energy intensive, efficient process. At the most basic level, steel consists primarily of iron, along with varying amounts of carbon, as well as the addition of nickel, molybdenum, manganese, titanium, cobalt, and other metals, depending on the specific product. Raw material is brought into steel mills, typically by rail or truck and heated to extremely high temperatures (upwards of 2,600°F). This heating process is done through the use of natural gas (transported by pipeline) or coke. This process is

46 https://landline.media/truck-parking-part-of-solving-supply-chain-issues-says-missouri-task-force/

47 https://worldpopulationreview.com/country-rankings/steel-production-by-country

known as primary steelmaking, which creates the base steel product. Through secondary steelmaking, the base steel product is molded and ladled into useful products, ranging from household products to large pipes. Following any sanding, finishing, painting, and other value-added processes, products are shipped to distribution and consumer endpoints, typically using varying combinations of rail and truck. Approximately 98 percent of steel can be recycled, meaning scraps can be remolded and refigured into new products.[48] A breakdown of the supply chain elements is depicted in Figure 4.17.

FIGURE 4.17 STEEL MANUFACTURING SUPPLY CHAIN ELEMENTS



Source: Cambridge Systematics.

Nebraska exported $66.4 million worth of iron and steel, the highest since 2010, primary destined to Canada, Mexico, and Oman.[49] Several fabricated metal product manufacturing firms have expanded in Nebraska in recent years as a result of Nebraska's Economic Development Certified Community (EDCC) program, which has led to significant economic development opportunities and industry growth throughout Nebraska. This includes Hornady Manufacturing in Grand Island, which opened a $16 million bullet and ammunition manufacturing facility in 2018, which included 150,000 square feet for production and shipping operations.[50] In 2017, Lukjan Metal Products announced plans to invest $8 million in developing a manufacturing facility for sheet metal pipe, duct and fittings for the HVAC wholesale market in Sidney, NE.[51] The company indicated that it would take advantage of logistics already in place in Sidney, including access to local highway and rail systems to transport the company's raw materials to and from the Sidney-based warehouse and logistics company, Adams Industries, Inc., and that the addition of the Sidney plant will increase Lukjan's product delivery base to 38 states, as well as a portion of Canada. In addition, CS Precision completed a $4.7 million building and equipment expansion for its fabricated metals manufacturing operations in Gering, NE in 2020.[52]

48 https://www.reliance-foundry.com/blog/how-is-steel-made#:~:text=At%20the%20most%20basic%2C%20steel,than%20is%20correct%20for%20steel.

49 Nebraska Department of Economic Development.

50 https://opportunity.nebraska.gov/lt-gov-foley-honors-grand-island-for-economic-growth-spurred-by-industry-housing-expansions/

51 https://opportunity.nebraska.gov/oh-metal-manufacturer-chooses-sidney-for-company-expansion-project/

52 https://opportunity.nebraska.gov/diverse-industry-growth-solidifies-city-of-gering-as-a-leader-in-economic-development/

Opportunities and Challenges

Nebraska may stand to benefit from increased demand for metals beyond just iron and steel, especially in the mining and extraction phase. In the summer of 2022, the Governor of California announced plans to begin phasing out internal combustion engine vehicles. This would be achieved through the banning of internal combustion engine (ICE) vehicle sales beginning in 2035, while all new commercial trucks and vans would need to be zero-emission vehicles by 2045.[53] As the largest U.S. state, and a major and reverberating domestic policy influencer, other states are likely to follow California's actions to phase out emissions-producing vehicles. For example, Governor Kathy Hochul announced in September 2022 that New York, the fourth largest state in the U.S., would follow the lead of California in banning sales of new ICE vehicles by 2035.

Regardless of how many additional states follow California and New York in completely banning sales of ICE vehicles, demand for rare earth metals used in electric vehicle (EV) batteries is expected to soar. By the end of 2022, EVs are expected to comprise six percent of all domestic automobile sales.[54] Through 2030, there are additional projections that EVs could comprise anywhere from 10 to 36 percent of all automobile sales.[55] As a result, the market for rare earth metals could double by 2030[56], which has notable implications for Nebraska, leading to opportunities for metals extraction and the production of EVs and parts.

A recent study conducted by NioCorp[57] found that southeast Nebraska could be home to the Nation's second-largest deposit of rare earth metals. This is in addition to expectations of significant concentrations of niobium, titanium, and scandium, which were the original driving factors for the project. Currently, the U.S. imports nearly all rare earth metals, which can be used for EV battery production, primarily from China.[58] Although currently in the economic feasibility and pre-extraction stage, in recent weeks NioCorp has taken additional steps to commence such operations at Elk Creek. Most recently in September 2022, NioCorp announced a deal to merge with GXII, a special purpose acquisition company, for the purposes of raising additional cash to fund Elk Creek mining extraction. This merger will allow NioCorp to raise up to $285 million, in addition to an already committed $80 million, of the required $1.1 billion required to commence operations at Elk Creek. Although no official timeline has been set, the identification of a significant deposit of rare earth metals could be used by NioCorp as a mechanism for additional funding, as this has not yet been factored into formalized economic feasibility documents. As such, there is a strong possibility that the mine could be in operation before the forecast years of this freight planning process. If so, it is likely that southeast Nebraska would see increased freight rail and truck traffic hauling necessary commodities such as water, excavation equipment, earth, and extracted materials.

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53 https://www.gov.ca.gov/2022/08/25/california-enacts-world-leading-plan-to-achieve-100-percent-zero-emission-vehicles-by-2035-cut-pollution/

54 https://insight.factset.com/strong-ev-sales-could-soon-weigh-on-gasoline-demand

55 https://www.brattle.com/wp-content/uploads/2021/05/19421_brattle_-_opportunities_for_the_electricity_industry_in_ev_transition_-_final.pdf

56 https://electrek.co/2022/08/11/soaring-ev-demand-pushes-lithium-market-double-2030/

57 https://secureservercdn.net/198.71.233.156/gx0.d43.myftpupload.com/wp-content/uploads/NioCorp_June-2022_NI_43-101_Technical_Report.pdf

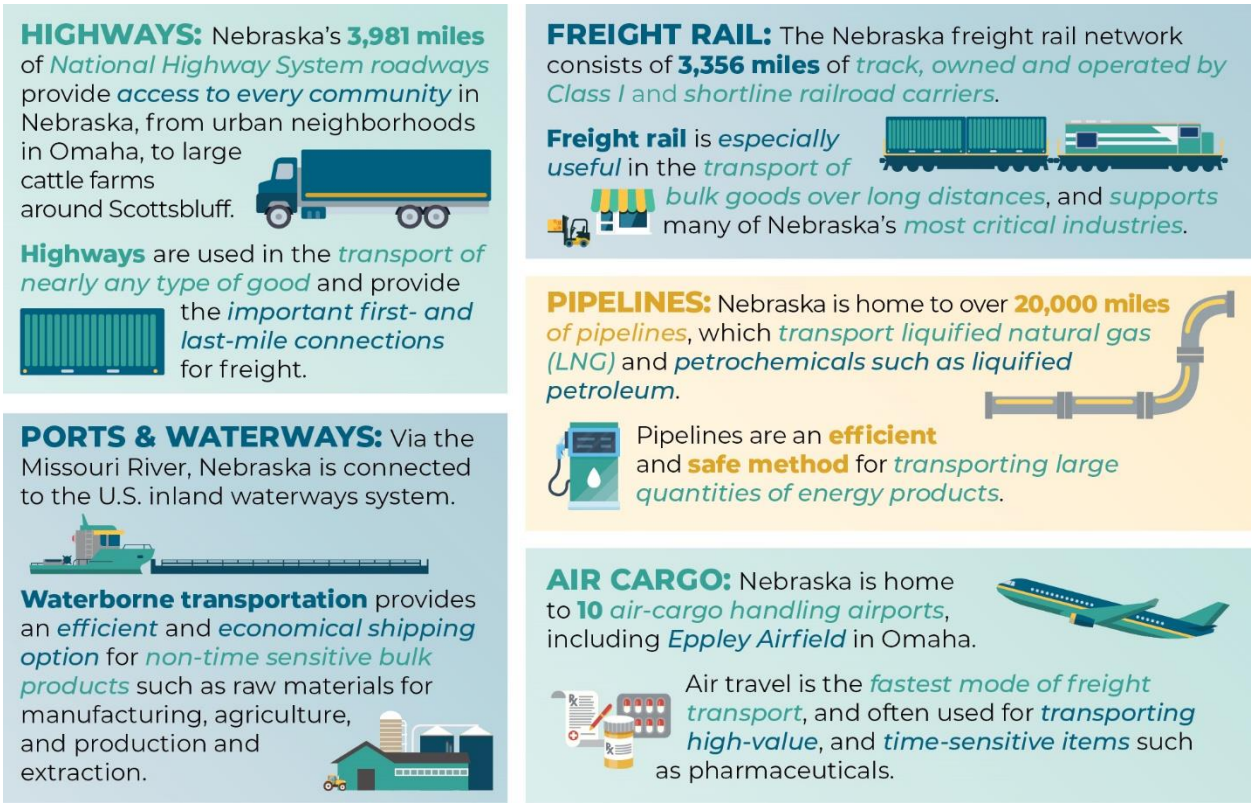
58 https://www.usnews.com/news/best-states/nebraska/articles/2022-05-19/proposed-nebraska-mine-has-sizeable-deposit-of-rare-elements#:~:text=Home-,Proposed%20Nebraska%20Mine%20Has%20Sizeable%20Deposit%20of%20Rare%20Elements,amount%20of%20other%20rare%20elements.&text=May%2019%2C%202022%2C%20at%207%3A33%20p.m.&text=OMAHA%2C%20Neb.

5.0 Freight Assets, Condition, and Performance

In order to use and transport the wide variety of goods, products, and materials used in everyday life, freight, and the methods used to move it, takes many forms. Delivery of new clothing to a regional department store, shipments of Nebraska-produced high-quality steaks bound for Asia, inbound shipments of lumber and stone for a construction project, and time-sensitive delivery of medical supplies at a local hospital, are just a few examples of the freight moves that take place in Nebraska practically on a daily basis.

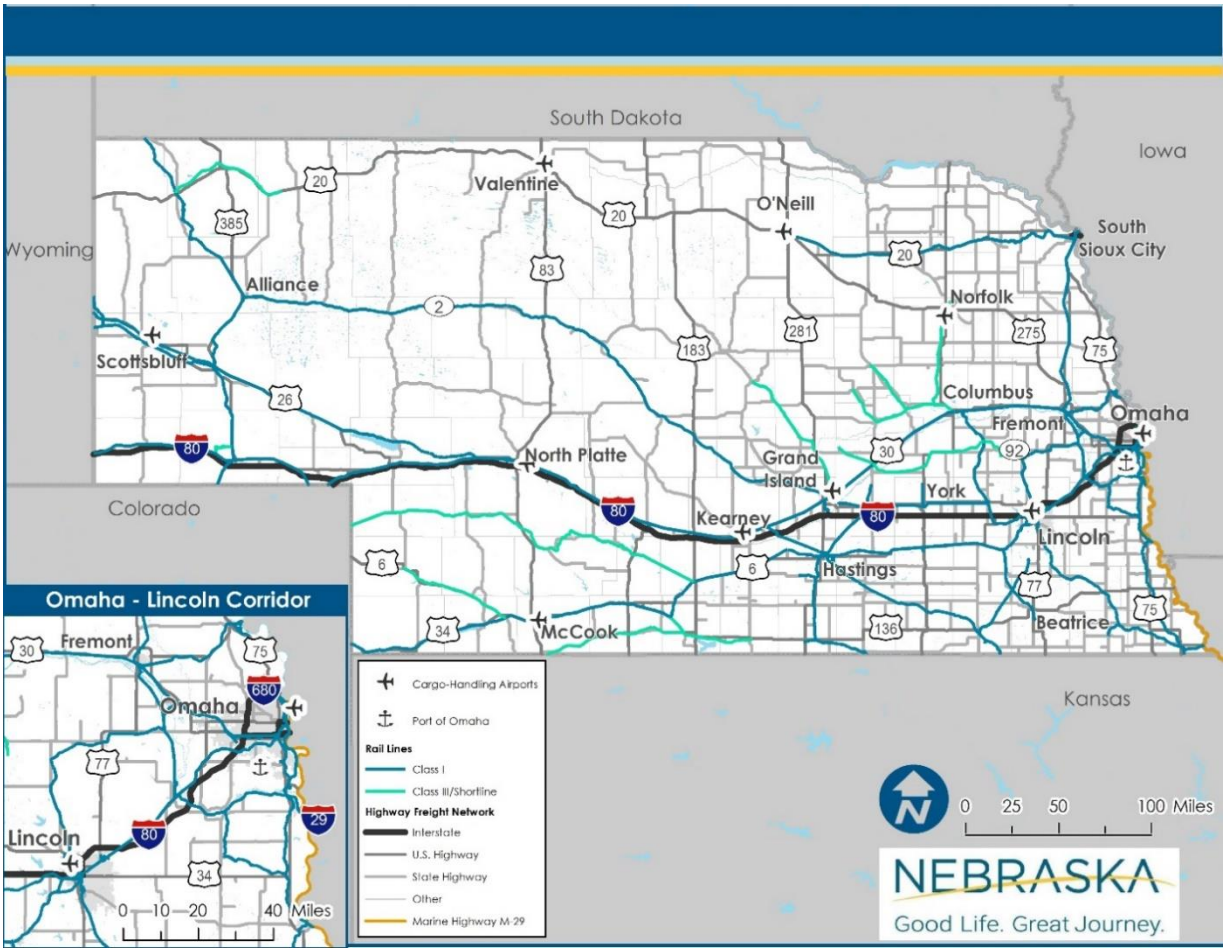
The movement of freight requires the use of multiple modes of transportation. Mode choices for moving freight are based on measured factors of cost-effectiveness, capacity, and time, depending on the type of freight being shipped. Nebraska's multimodal freight system consists of the statewide highway, freight rail, port & waterway, air cargo, and pipeline networks. Excluding pipelines, these assets are summarized in Figure 5.1 and shown in Figure 5.2.

FIGURE 5.1 SUMMARY OF FREIGHT ASSETS IN NEBRASKA



Beginning with highways, this chapter profiles each of these components, while relaying relevant information about key modal assets, conditions and performance. The intent of this chapter is to provide a strong understanding of the state's multimodal freight transportation system as it operates today. This will help set the stage for the identification of infrastructure needs and recommended policies moving forward.

FIGURE 5.2 NEBRASKA FREIGHT NETWORK & INTERMODAL FACILITIES



Source: U.S. Department of Transportation; Nebraska DOT.

5.1 Freight Highways

As the primary infrastructure supporting truck traffic, Nebraska's highway network is the broad foundation of the statewide freight transportation system. Trucks are involved in the transport of nearly every good and commodity, ranging from raw commodities and livestock to intermediate and finished consumer products. Some examples of truck moves include:

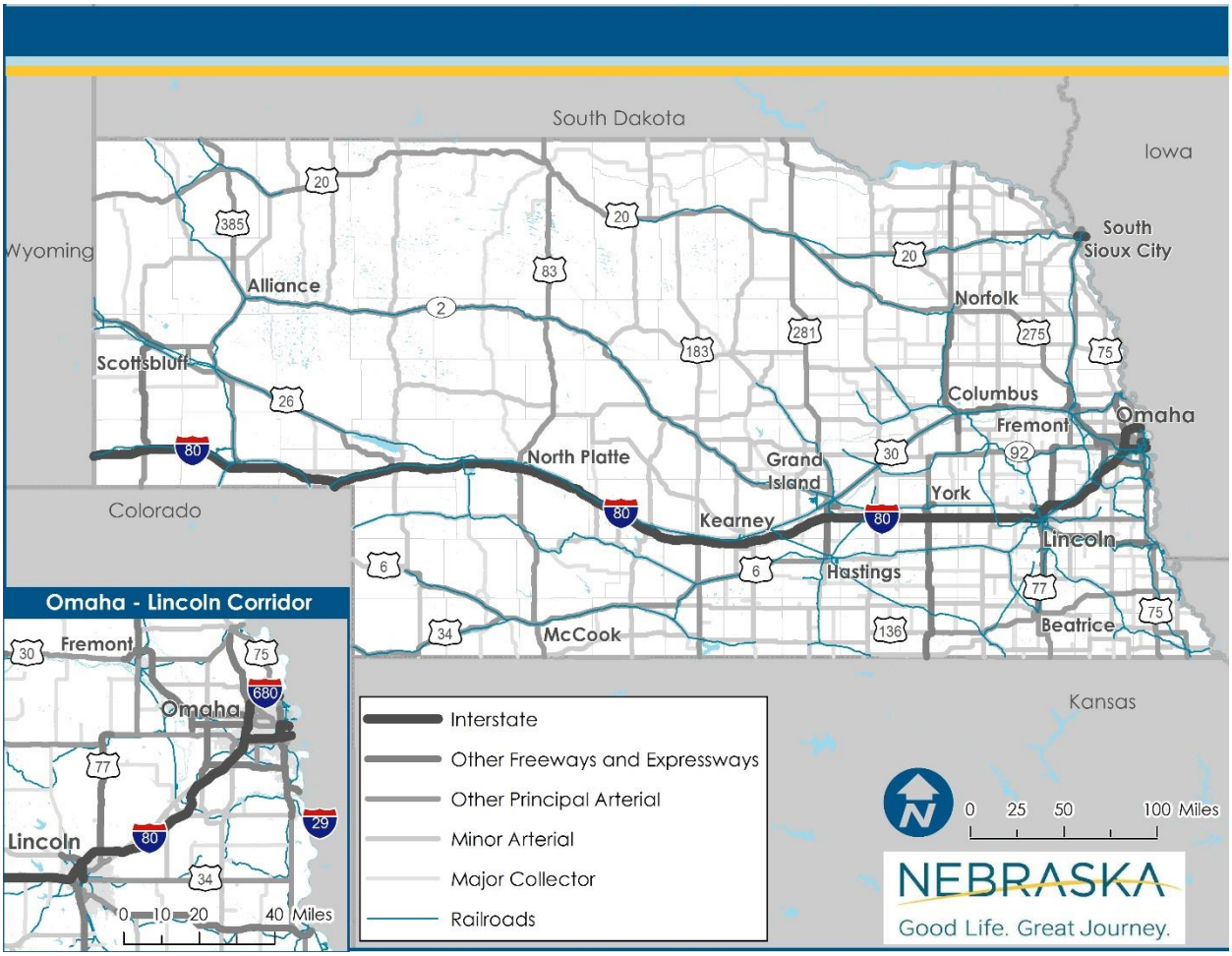
- Transport of animal feed from a grain elevator by small truck to a local cattle breeding farm in Rock County in northern Nebraska.
- Delivery of wood pallets from a transloading facility to a home improvement big-box retailer in Keith County in western Nebraska.
- Delivery of frozen food products by refrigerated truck to a supermarket from a regional distribution center in Lincoln.
- Last-mile delivery in Omaha from a regional fulfillment center of a consumer product purchased through an e-commerce retailer.

The expansive use of trucks for freight purposes can be attributed to the expansive coverage of the road network, and the versatility of trucks themselves. Unlike other modes of freight, the Nebraska highway network covers every statewide community, including rural hamlets and urban neighborhoods. As a result, it is also one of the fastest modes of freight transport, including for regional and long-haul shipments.

Infrastructure and Assets

Nebraska's freight highway network is comprised of several classifications of Federal and state highway systems as well as a number of facilities that support highway travel, including over 15,000 bridges, 21 public truck parking rest stops, and 11 weigh stations. This network is comprised of different elements of federally- and state-designated road networks and supporting facilities. Figure 5.3 depicts the Nebraska highway network based on functional classification. The state's highway network is densest in the eastern portion of the state, especially in and around Omaha and Lincoln.

FIGURE 5.3 NEBRASKA FUNCTIONALLY CLASSIFIED HIGHWAY NETWORK



Source: Federal Highway Administration, NDOT.

Note: Minor collectors not shown due to scale.

The Nebraska highway network consists of several subsection classifications of corresponding infrastructure. In relation to facilitating freight, the National Highway Freight Network (NHFN) is a network of roadways designated by Fixing America's Surface Transportation Act (FAST Act). The NHFN was established with the intent of improving the performance of the Nation's highway system by directing Federal resources towards the routes considered to be most critical to the Nation's freight system. The Nebraska NHFN is comprised of subsystem links which are defined in Table 5.1.

TABLE 5.1 NEBRASKA NATIONAL HIGHWAY FREIGHT NETWORK COMPONENTS

NHFN Subsystem	Description	Nebraska Mileage	U.S. Mileage
Primary Highway Freight System (PFHS)	Highways deemed most critical to the U.S. freight system.	462	41,513
Other Interstate portions not on the PHFS	All Interstate routes not included in the PHFS but provide continuity and access to national freight facilities.	23	9,709
Critical Rural Freight Corridors (CRFCs)	Rural public roads that provide continuity and access to national freight facilities.	146	5,044
Critical Urban Freight Corridors (CUFCs)	Urban public roads that provide continuity and access to national freight facilities.	75	2,386

Source: Federal Highway Administration.

MILITARY FREIGHT CONSIDERATIONS: HIGHWAYS

The U.S. Transportation Command developed the Strategic Highway Network (STRAHNET), which is a system of approximately 62,500 miles of roadways, including the Interstate System, that serves as the foundation of the U.S. Department of Defense's domestic on-the-ground operations. The STRAHNET defines the public highway network that is essential for supporting critical military and defense needs, including emergency mobilization and movement of goods including heavy armor, fuel, ammunition, repair parts, food, and other freight commodities that supports military operations. In Nebraska, the STRAHNET includes all of I-80 and State Highway 2 between Lincoln and Nebraska City.

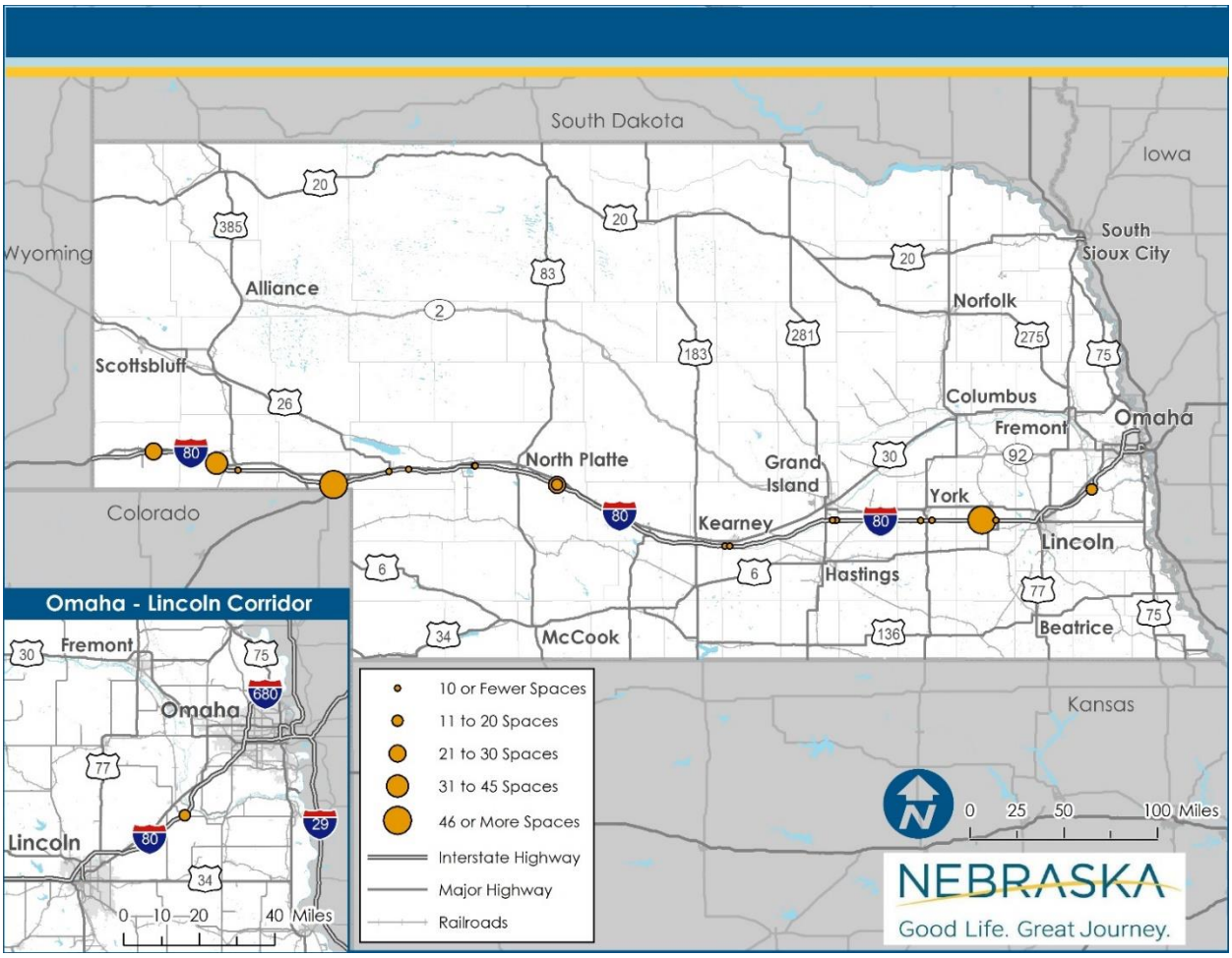
Truck Parking in Nebraska

A lack of safe and accessible truck parking is a major issue across the Nation. Federal legislation mandates the total allowable hours of service that truck operators are able to drive before resting for eight consecutive hours.[59] Truck parking facilities provide the needed space for operators to rest and take breaks to fulfill these requirements. However, the shortage of truck parking facilities can lead operators to rest in potentially unsafe locations such as highway off-ramps and parking lots.

Nebraska's 21 public truck parking facilities are concentrated along Interstate 80, as shown in Figure 5.4. Most of these I-80 truck parking locations have a facility available for both directions of travel, which provides ease of access for truck operators. Despite the presence of truck parking facilities along I-80, there is an absence of public facilities along the rest of the highway network which highlights the potential need for investment in parking facilities across the state.

[59] Federal Motor Carrier Safety Administration, *Summary of Hours of Service Regulations*

FIGURE 5.4 AVAILABLE TRUCK PARKING SPACES AT NEBRASKA'S PUBLIC TRUCK PARKING FACILITIES

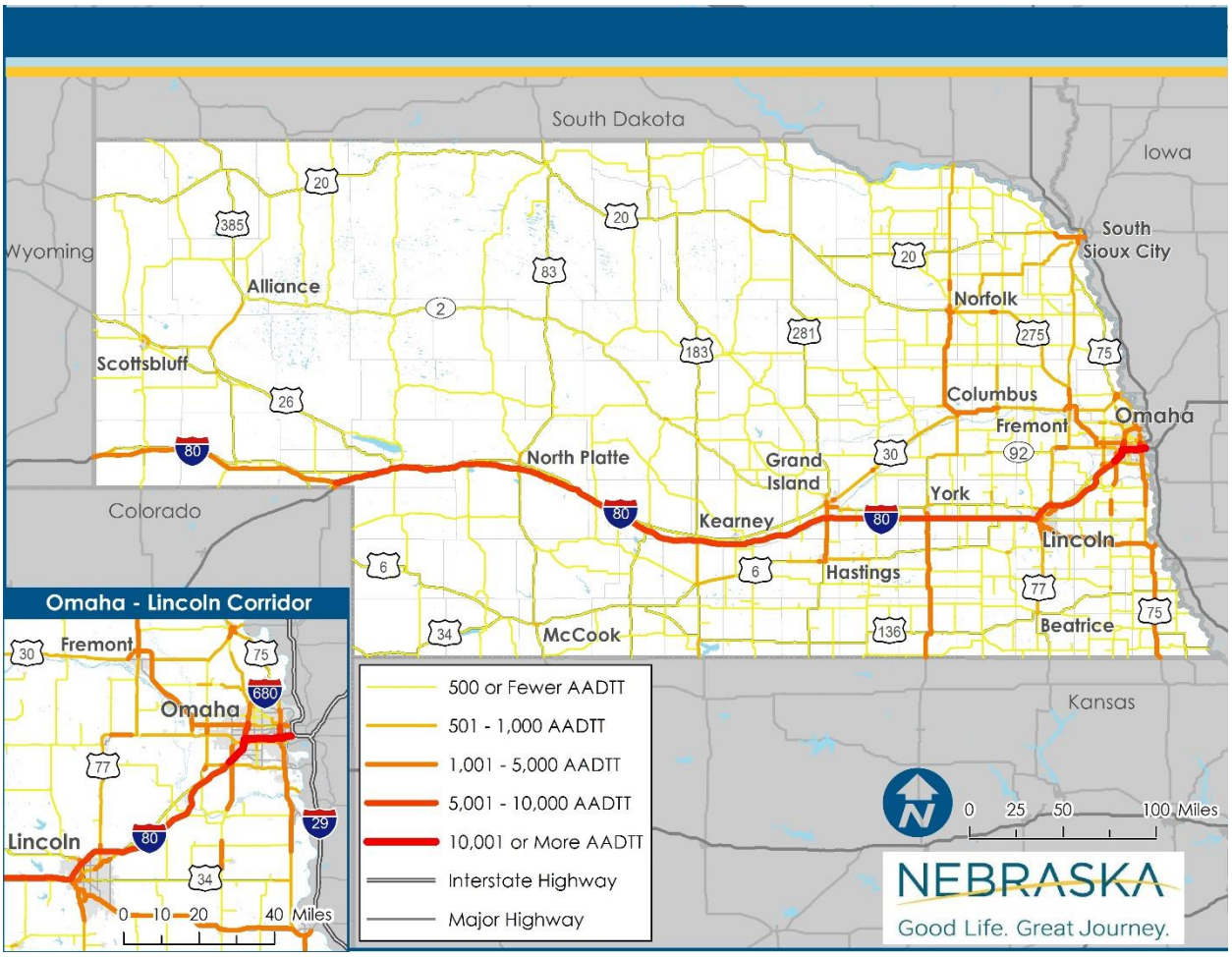


Source: Nebraska Department of Transportation.

Demand and Activity

Truck volumes are the primary measure of highway modal freight activity. Average annual daily truck volumes (AADTT) on Nebraska's state highway system in 2019 are shown in Figure 5.5. Truck volumes are highest along Nebraska's Interstate routes, with volumes exceeding 10,000 daily trucks on much of the Interstate system between Omaha and Lincoln. I-80 in Omaha carries the highest daily truck volumes, with almost 13,000 trucks using this route each day, while segments of I-680 and I-480 carry over 5,500 daily trucks. Daily truck volumes on I-80 in the Lincoln area reach up to 9,000 daily trucks while segments of U.S. 77 carry nearly 4,000 daily trucks. Outside of Interstate, a number of corridors in eastern Nebraska handle more than 1,000 daily trucks. These include U.S. 20 in South Sioux City, U.S. 34 / U.S. 281 between Grand Island and Hastings, U.S. 75 south of Omaha, U.S. 81 south of I-80 and between Norfolk and Columbus, and U.S. 275 between Omaha and Fremont.

FIGURE 5.5 AVERAGE ANNUAL DAILY TRUCK TRAFFIC ON NEBRASKA'S HIGHWAYS (2019)



Source: HPMS; Nebraska Department of Transportation.

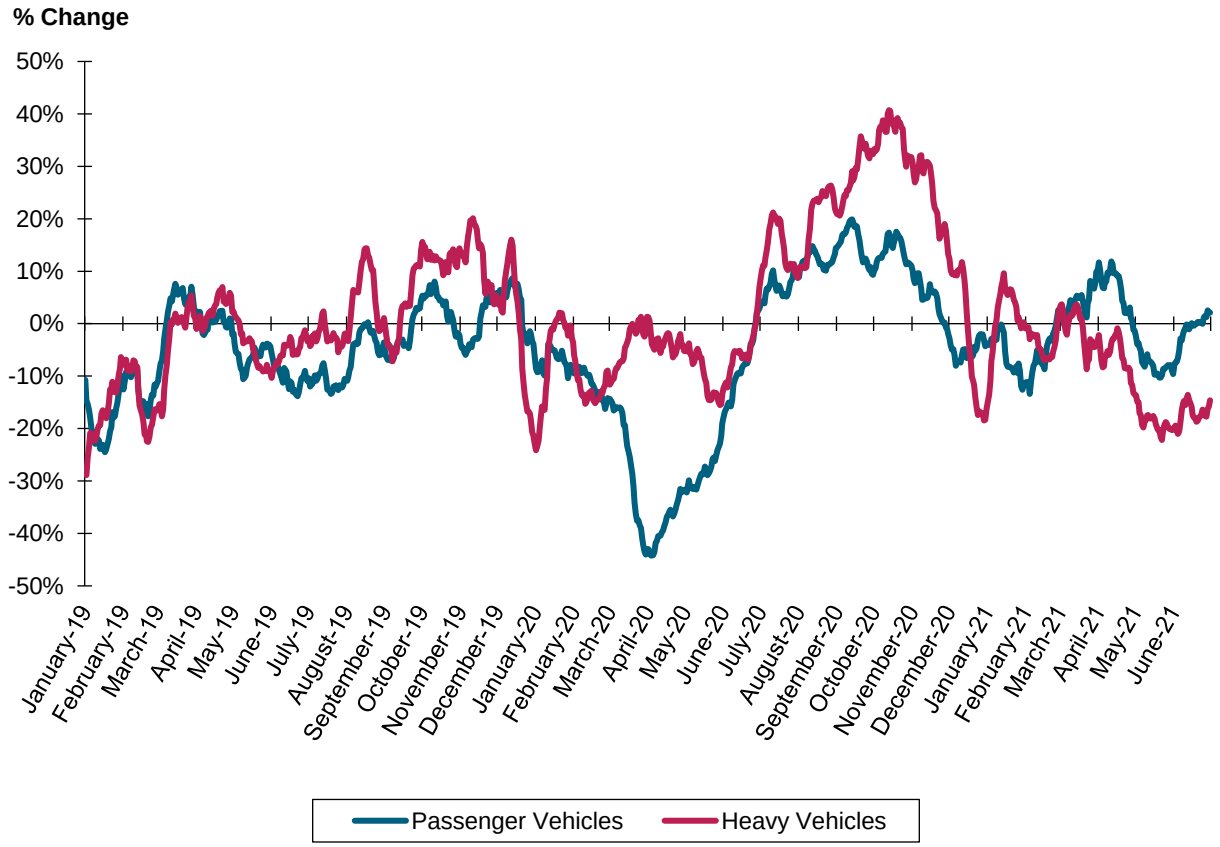
As was the case across the entire Nation, the COVID-19 global pandemic had a notable impact on overall truck traffic beginning in 2020. As a result of local shelter-in-place orders, an increase in individuals working from home full-time, and limitations on occupancies in stores and restaurants, freight traffic, represented by heavy vehicle traffic[60] in Figure 5.6, initially dropped by approximately 15 percent due to suddenly subdued demand. Into the second half of 2020 however, heavy vehicle traffic rose to over 40 percent of 2019 volumes, likely attributed to excess demand following the loosening of COVID-19 restrictions. In comparison, with the exception of March and April when traffic dropped by nearly 50 percent, passenger vehicle figures remained relatively comparable to pre-pandemic figures.

Into 2021, heavy vehicle traffic dropped somewhat in comparison to pre-pandemic figures. This drop can be attributed to multiple factors, including seasonality, as well as the onset of supply chain constraints. These trends persisted through the end of 2021, despite the nearly complete loosening of statewide and national COVID-19 restrictions. Although finalized figures have not yet been published, preliminary 2022 trends appear to show economic growth and corresponding truck volumes returning to pre-pandemic

[60] Heavy vehicle traffic consists of both truck and bus traffic. It is assumed that the majority of such traffic is in the forms of trucks.

levels. On the other hand, supply chain constraints have persisted. Although this has not impacted consumer demand, supply chain constraints could hamper the ability for manufacturers to fill orders.

FIGURE 5.6 DEVIATION IN NEBRASKA'S STATEWIDE PASSENGER AND HEAVY VEHICLE TRAFFIC VOLUMES, 2019—2021[1]



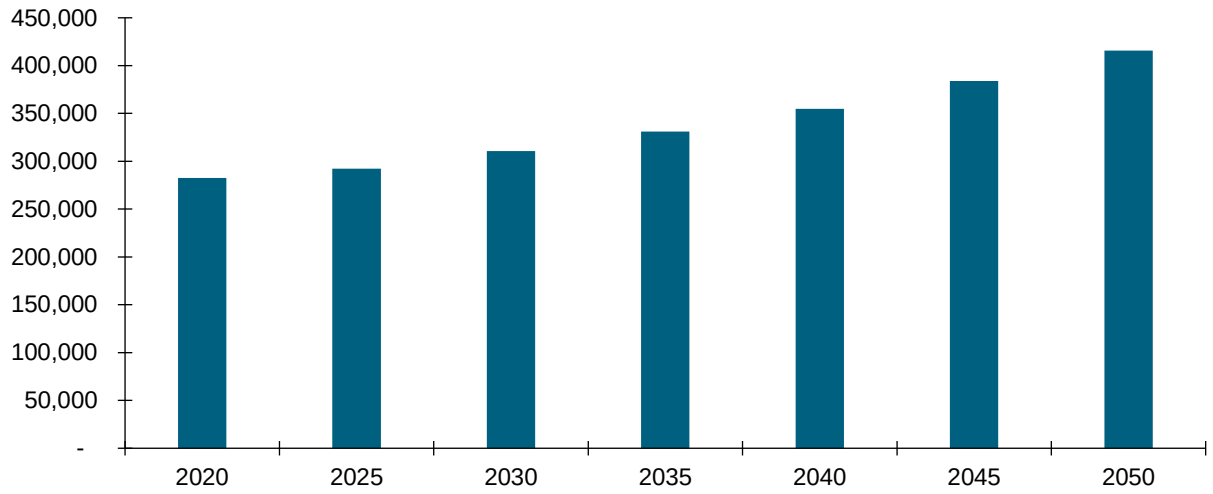
[1] Traffic volumes for 2018 were used to develop the baseline for assessing the deviation.

Source: Nebraska Department of Transportation.

Commodity Flows

Into 2023 and beyond, it is likely that statewide truck volumes will continue to increase. Even with existing supply chain constraints and labor shortages, brought about during the COVID-19 era, decreases in overall freight traffic appear to have been temporary. As a result, pre-COVID forecasts for truck-transported goods into, out of, and within Nebraska appear to still carry strong merit. As shown in Figure 5.7, by 2050, Nebraska's highways are expected to handle over 400 million tons of goods, an increase of nearly 50 percent.

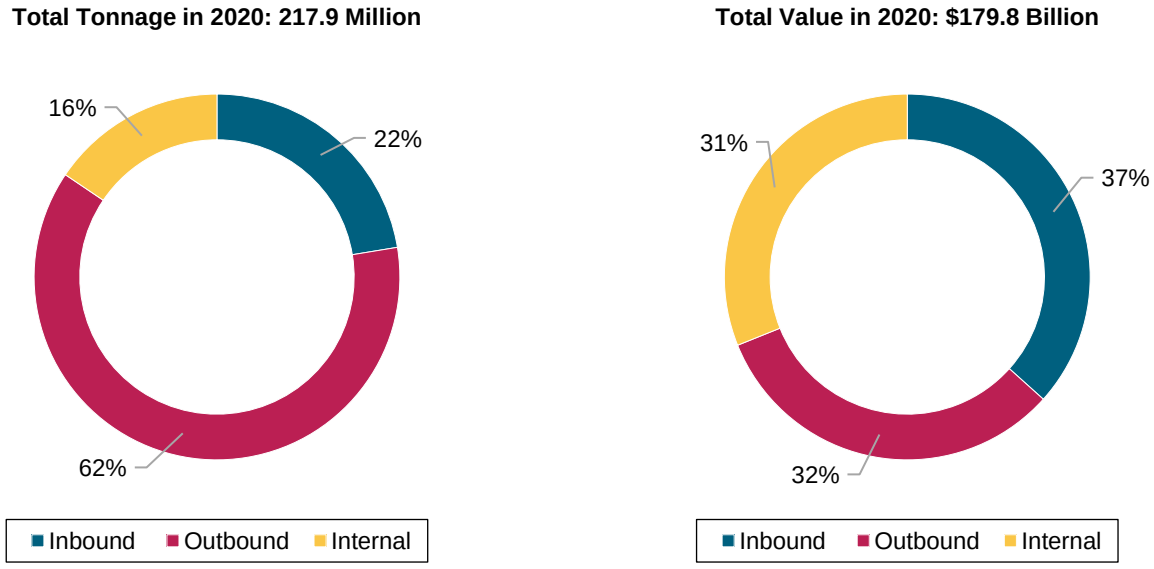
FIGURE 5.7 ESTIMATED INCREASE IN VOLUME OF FREIGHT GOODS MOVED BY TRUCKS, 2020—2050



Source: FHWA Freight Analysis Framework 5.

The following figures further examine the characteristics of truck traffic in Nebraska. Figure 5.8 shows the directional split of freight goods moved by trucks in Nebraska. When measured by tonnage, nearly two-thirds of freight traffic was comprised of outbound moves in 2020. When measured by value, there was a relatively even split between inbound, outbound, and internal moves.

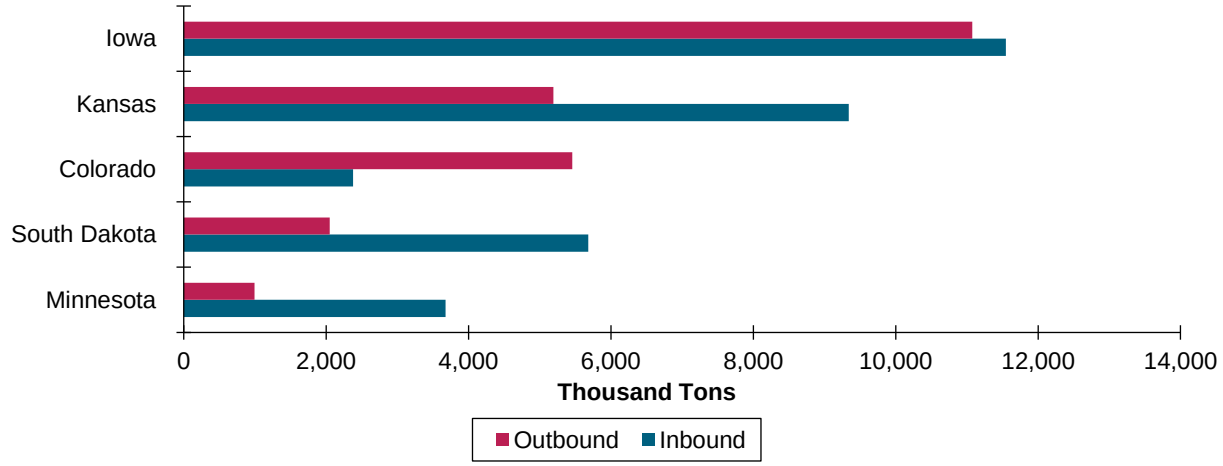
FIGURE 5.8 DIRECTIONAL SPLIT FOR NEBRASKA FREIGHT GOODS MOVED BY TRUCKS



Source: FHWA Freight Analysis Framework 5.

The majority of inbound and outbound truck tonnage trade occurs with adjacent states. As shown in Figure 5.9, Iowa and Kansas were the top trading partners for Nebraska, with at least 50 million tons of both inbound and outbound tonnage transported between the two states. Minnesota was the top trading partner that does not directly border Nebraska. The majority of this tonnage consisted of inbound moves into Nebraska. It is noted that similar trends for top trading partners are evident when measured by value.

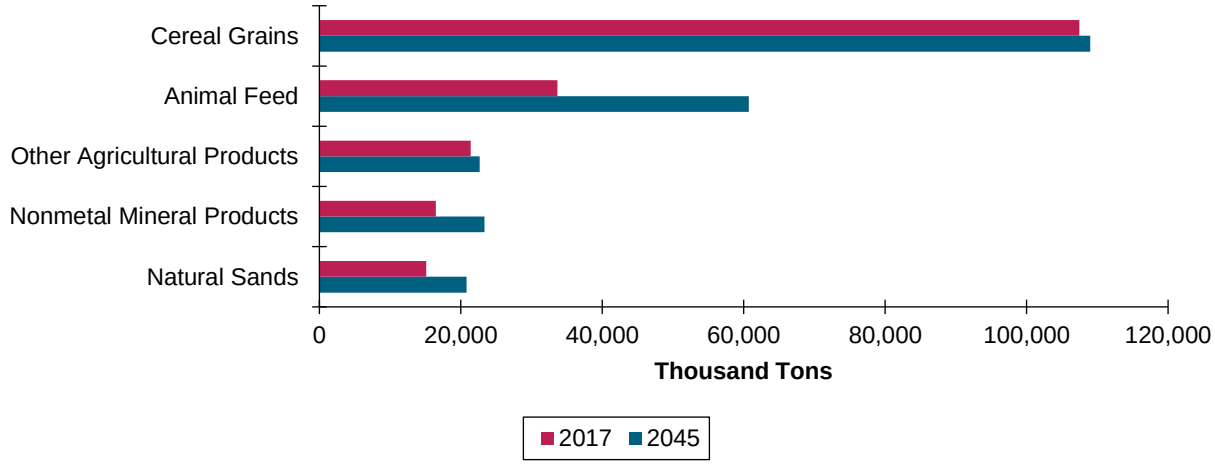
FIGURE 5.9 TOP 5 TRADING PARTNERS FOR GOODS MOVED BY TRUCK BY TONNAGE, 2017



Source: FHWA Freight Analysis Framework 5.

The commodities comprising these truck moves by tonnage are shown in Figure 5.10. Agricultural products, and especially cereal grains and animal feed comprise the top trucked commodities, with sizable increases expected through 2045. These commodities are likely trucked in to support Nebraska's cattle and poultry industries, in addition to the production of crops, both for animal and human consumption.

FIGURE 5.10 TOP COMMODITIES MOVED BY TRUCK BY TONNAGE, 2017–2045



Source: FHWA Freight Analysis Framework 5.

Condition and Performance

The economic challenges that surfaced with COVID-19 have continued to impact many industries and markets. Because the nearly every good consumed in the U.S. is moved by truck at some point in its supply chain, the trucking industry is impacted by current events, macroeconomic forces, and other industry-specific challenges, even those of other freight modes. Global supply chain disruptions have continued to impact nearly every business sector, and other macroeconomic factors have resulted in dramatic industry impacts including record-high diesel prices, severe equipment and parts shortages, skyrocketing inflation, and persistent workforce shortages, ranging from drivers to technicians to warehouse and distribution center workers. The American Trucking Research Institute (ATRI)[61] reported in its annual survey of trucking industry issues that its members cited fuel prices as the top industry concern in 2022, followed by driver shortage (which relates to issues with truck driver attraction and retention, discussed more in the Multimodal Freight Trends, Needs, and Opportunities section), lack of available truck parking, driver compensation, and the state of the nation's economy.

In addition to these macroeconomic factors, a number of infrastructure performance measures influence conditions for freight movement along Nebraska highways. This includes pavement and bridge conditions, assessment of traffic conditions, and crash metrics. NDOT monitors asset condition and develops projects to address system needs on a regular basis. Maintaining quality pavement is vital to the highway freight system as pavement that is in poor condition can impact travel times and result in congestion, while posing risks to vehicles and goods in transit. Pavement conditions, according to the international roughness index (IRI) for the Nebraska highway system are shown in Table 5.2 and visualized in Figure 5.11. Over 70 percent of pavement on the Nebraska highway system is in good condition, with an additional 21 percent of statewide pavement rated as 'fair'. Most of the state's pavement rated in poor condition can be found in the more urbanized portions of the state where traffic levels tend to be higher; leading to increased rates of pavement deterioration.

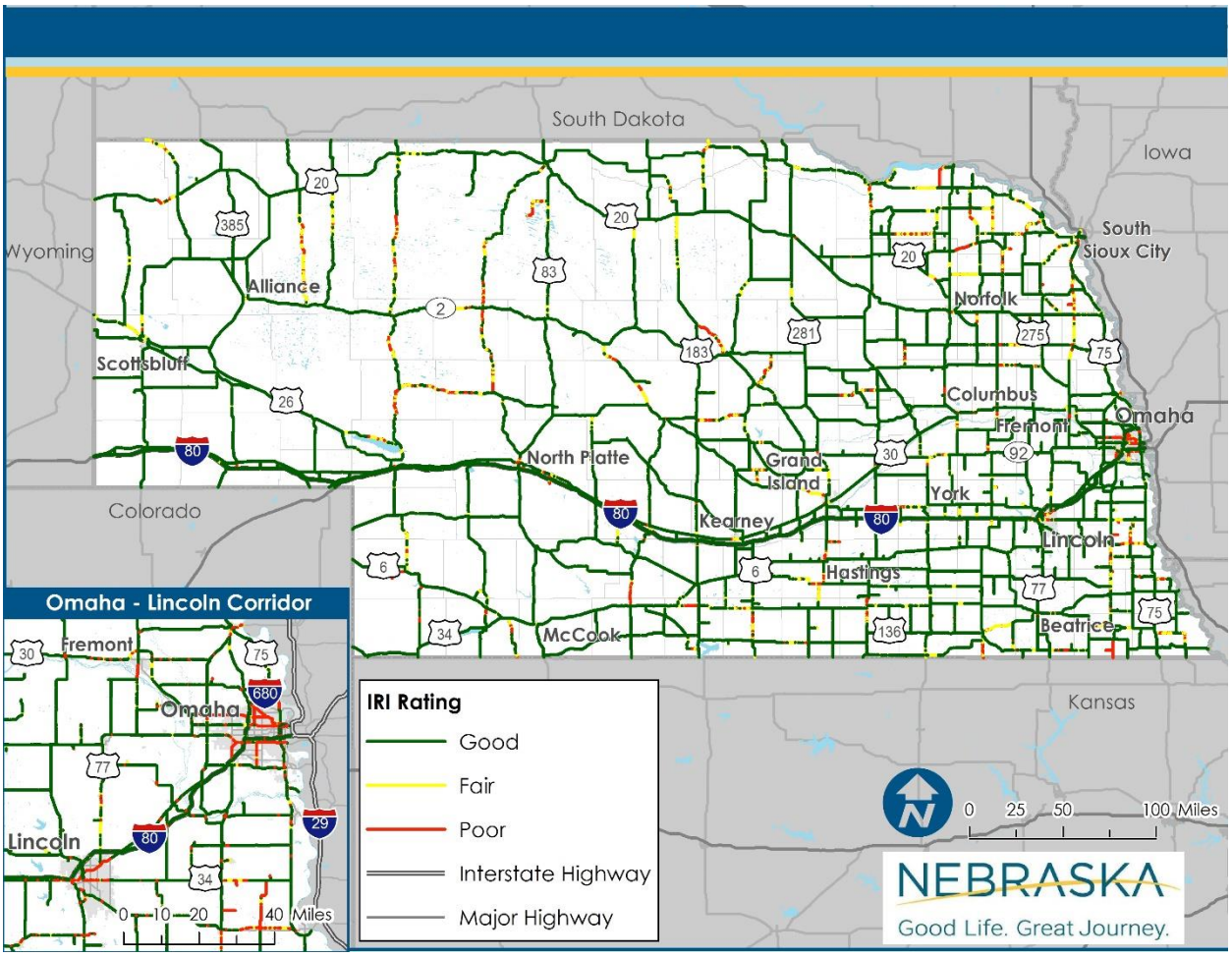
TABLE 5.2 PAVEMENT CONDITION FOR NEBRASKA HIGHWAY SYSTEM

Pavement Condition	IRI Rating	Miles	Percent
Good	95 or Below	11,405	72%
Fair	96-170	3,283	21%
Poor	171 or Above	1,045	7%
Total		**15,733**	

Source: Nebraska Department of Transportation.

[61] https://truckingresearch.org/wp-content/uploads/2022/10/ATRI-Top-Industry-Issues-2022.pdf

FIGURE 5.11 INTERNATIONAL ROUGHNESS INDEX OF NEBRASKA HIGHWAYS (2019)



Source: HPMS; Nebraska Department of Transportation.

Bridge conditions are analyzed in the following figures. As established in NDOT's 2040 Long Range Transportation Plan, Table 5.3 identifies established bridge performance targets for Nebraska's NHS bridges. NDOT surpassed its targets for bridge deck condition in 2019 and again in 2021 for both the proportions of bridge deck areas in "Good" and "Poor" conditions. The state's NHS bridges with deck areas classified in "Poor" condition[62] (Figure 5.12) are exclusively found in the eastern half of the state. The 42 percent of remaining NHS bridges in Nebraska are classified as in "Fair" condition.

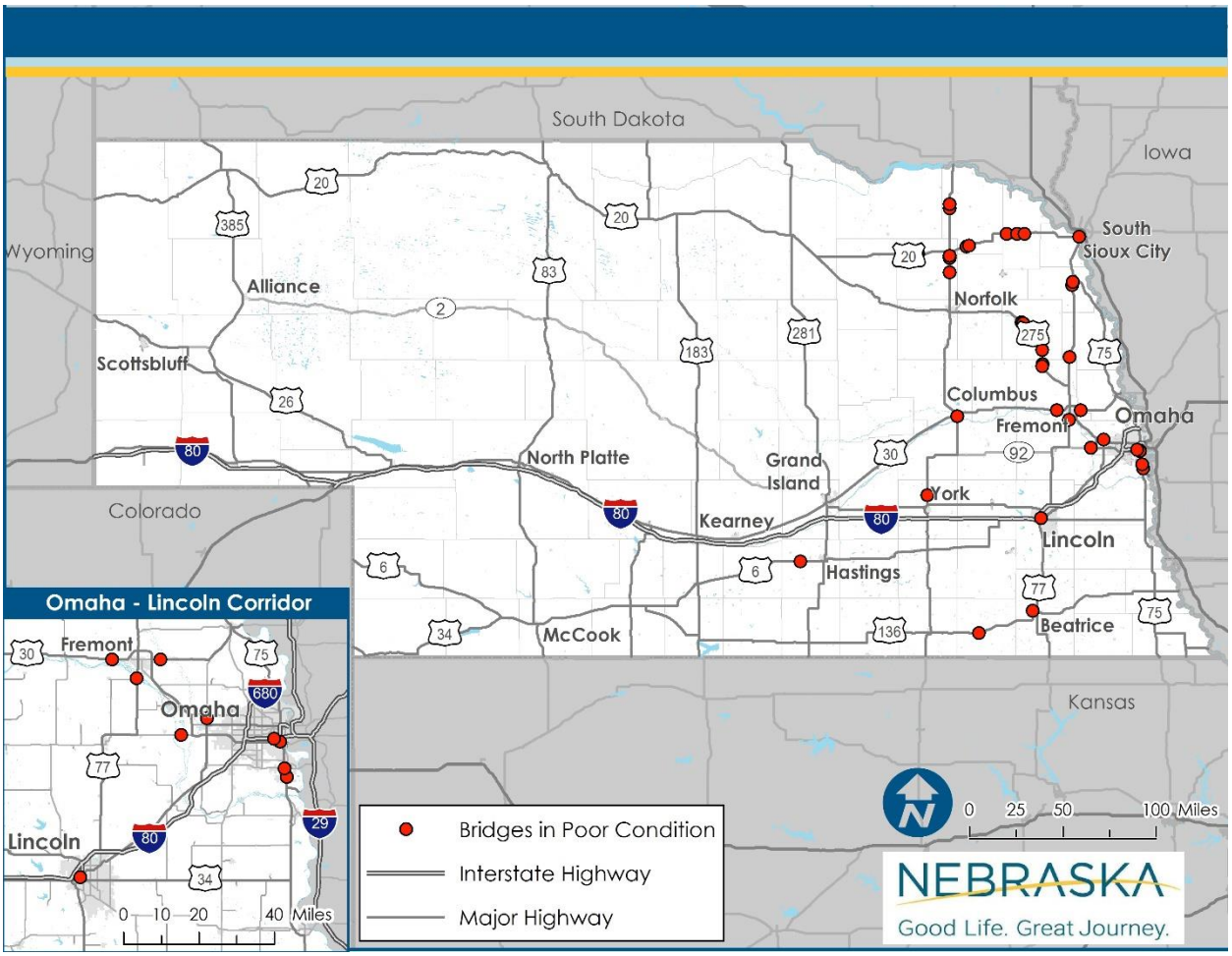
[62] As described in NDOT's Transportation Asset Management Plan, NDOT reports bridges in Good, Fair and Poor condition based on National Bridge Inspection program data. Bridges are considered to be in Good condition if all major National Bridge Inspection components (bridge deck, bridge superstructure and bridge substructure or culvert) are in good condition or better (9, 8, 7). Bridges are considered to be in poor condition if one or more of the major components is in poor condition or worse (4 or less). Bridges that do not meet the criteria for good or poor condition are considered to be in fair condition (5 or 6). https://dot.nebraska.gov/media/13303/ndot-tamp.pdf

TABLE 5.3 NEBRASKA BRIDGE CONDITION PERFORMANCE TARGETS

Goal	Actual	2019 Target	2021 Target
Percentage of NHS bridges by deck area in Good Condition	56.5%	55%	55%
Percentage of NHS bridges by deck area classified as in Poor Condition	1.9%	10%	10%

Source: Nebraska Department of Transportation.

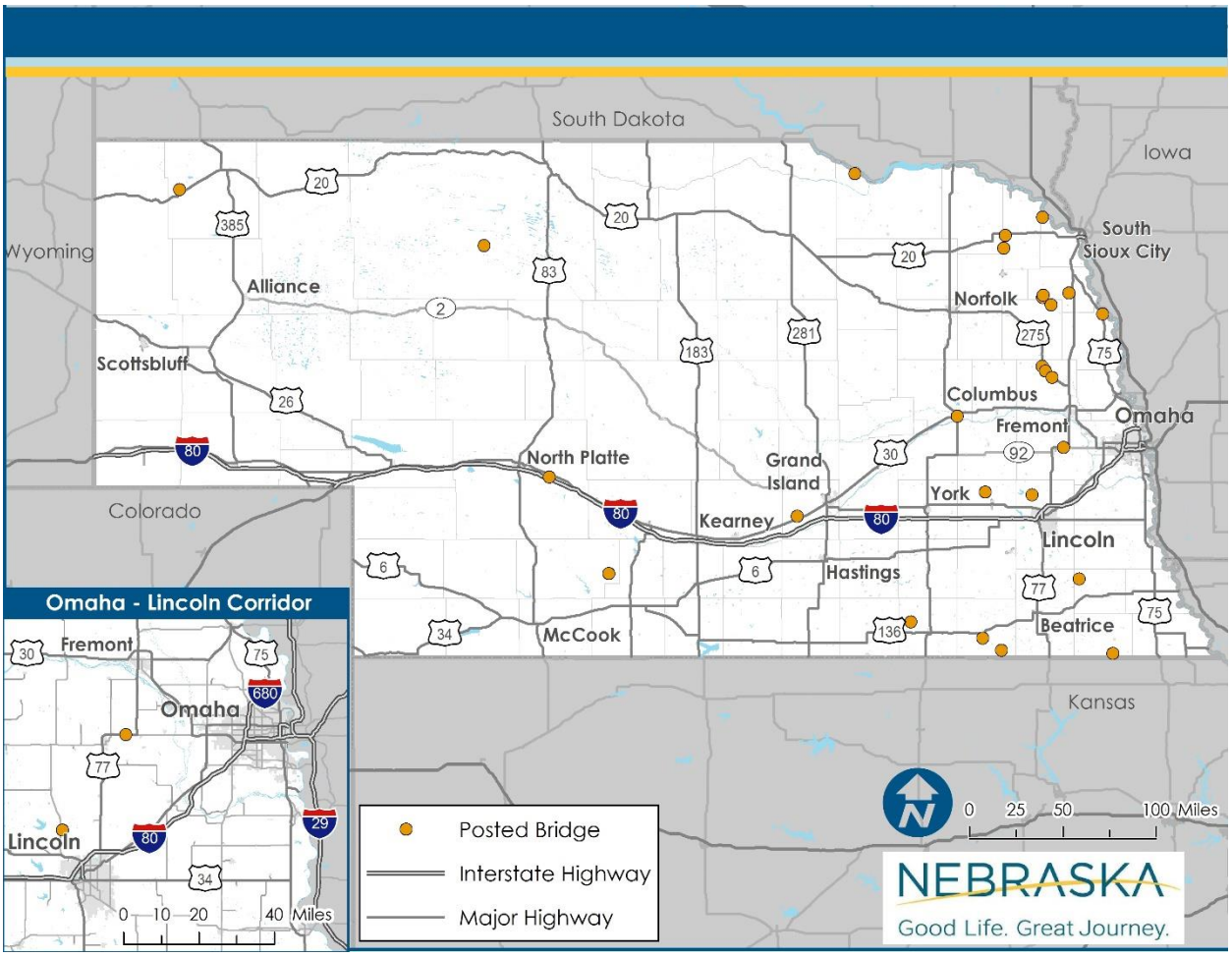
FIGURE 5.12 NHS BRIDGES IN POOR CONDITIONS (2021)



Source: National Bridge Inventory.

Posted bridges are those structures identified by NDOT as having weight restrictions that limit the size of vehicles that are able to use these structures due to structural or other safety issues that could pose a damage risk to the bridge in the event of an excessive load. As a result, posted bridges can become a barrier to certain types of truck movements. This can add excess travel and expense for shippers that operate near these bridges. As of 2022, NDOT has designated 31 bridges on the state system as weight restricted; these bridges are shown in Figure 5.13. The majority of the posted bridges are also found in the eastern part of the state.

FIGURE 5.13 POSTED BRIDGES IN NEBRASKA (2022)



Source: Nebraska Department of Transportation ArcGIS Rest Server.

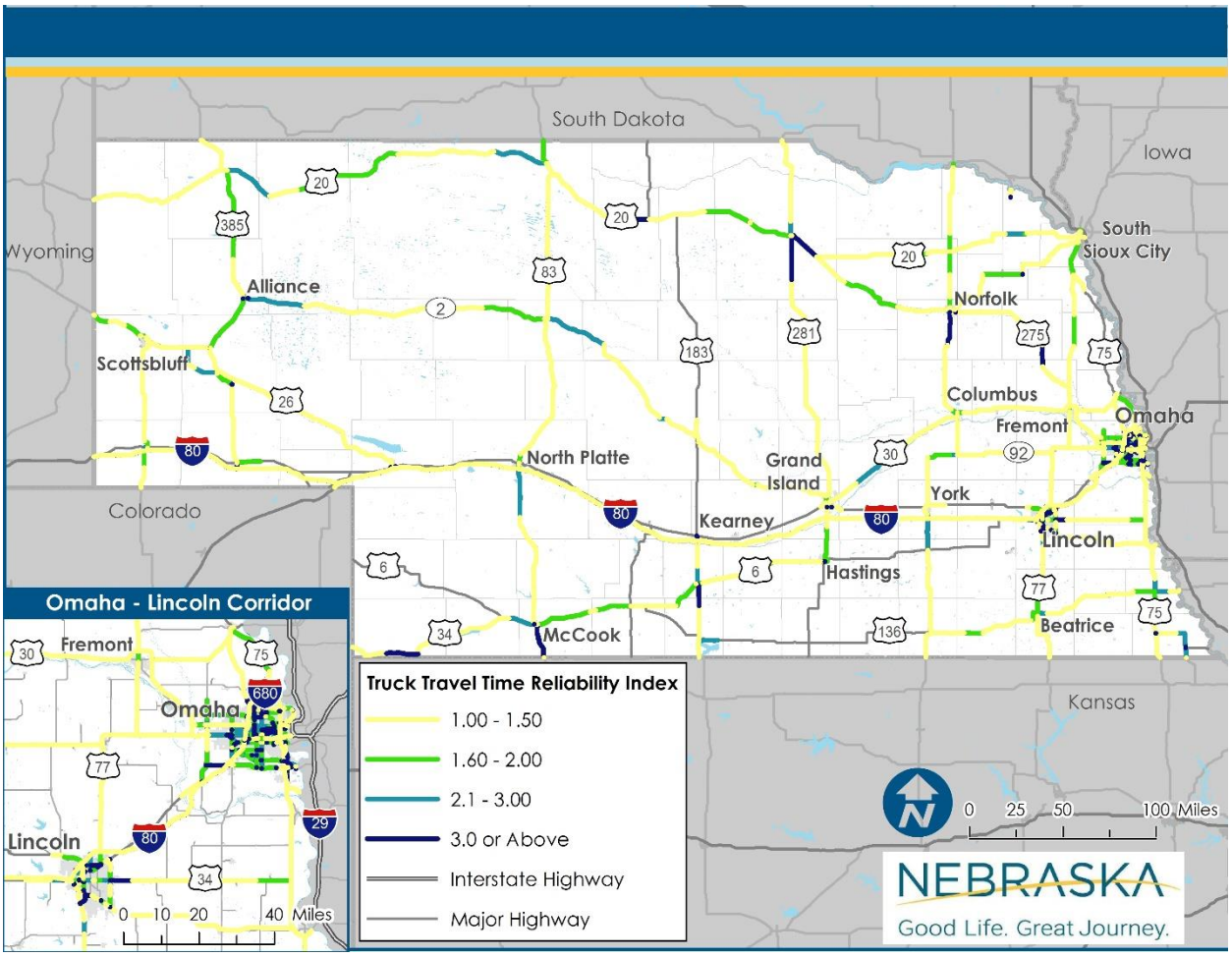
Travel reliability is a useful metric for assessing conditions that could disrupt the predictability of a trip's duration. For freight traffic, reliability is evaluated using the truck travel time reliability (TTTR) index, which compares the 95th percentile ("congested") travel time to the 50th percentile ("free flow condition") travel time. A ration closer to 1.0 is considered optimal in that travel times are considered more constant. While NDOT's 2021 TTTR goal for the Interstate system is 1.25, any segment with a TTTR below 1.5 is considered reliable. TTR data for the Nebraska NHS is shown in Table 5.4. Overall, the NHS system is determined to be reliable. This is especially the case for Nebraska's Interstate highways which carry the highest truck volumes. These results are visualized in Figure 5.14 and indicate the least reliability in and around Omaha and Lincoln.

TABLE 5.4 TRUCK TRAVEL TIME RELIABILITY FOR NEBRASKA'S NATIONAL HIGHWAY SYSTEM (2021)

System	AM Peak	Mid-Day	PM Peak	Overnight	Weekend
NHS	**1.46**	**1.44**	**1.44**	**1.45**	**1.46**
Interstate	1.09	1.07	1.09	1.10	1.09
Non-Interstate NHS	1.51	1.49	1.50	1.50	1.51

Source: NPMRDS, 2021.

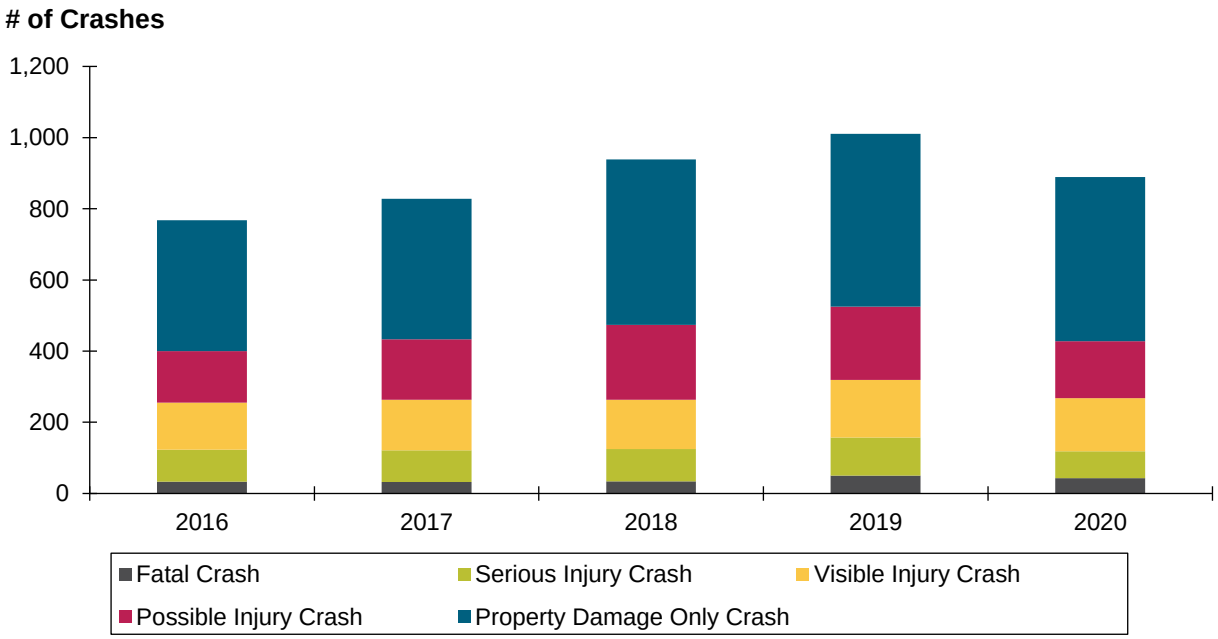
FIGURE 5.14 MAXIMUM TRUCK TRAVEL TIME RELIABILITY FOR NEBRASKA'S HIGHWAY SYSTEM (2021)



Source: NPMRDS, 2021.

Highway infrastructure condition and performance needs are directly influenced by safety metrics. Figure 5.15 depicts crashes by severity for all crashes involving heavy vehicles (both trucks and buses) for 2016 through 2020. It is assumed that the majority of heavy vehicle traffic is in the form of trucks. Between 2016 and 2019, heavy vehicle crashes of all severity levels rose before dropping in 2020.

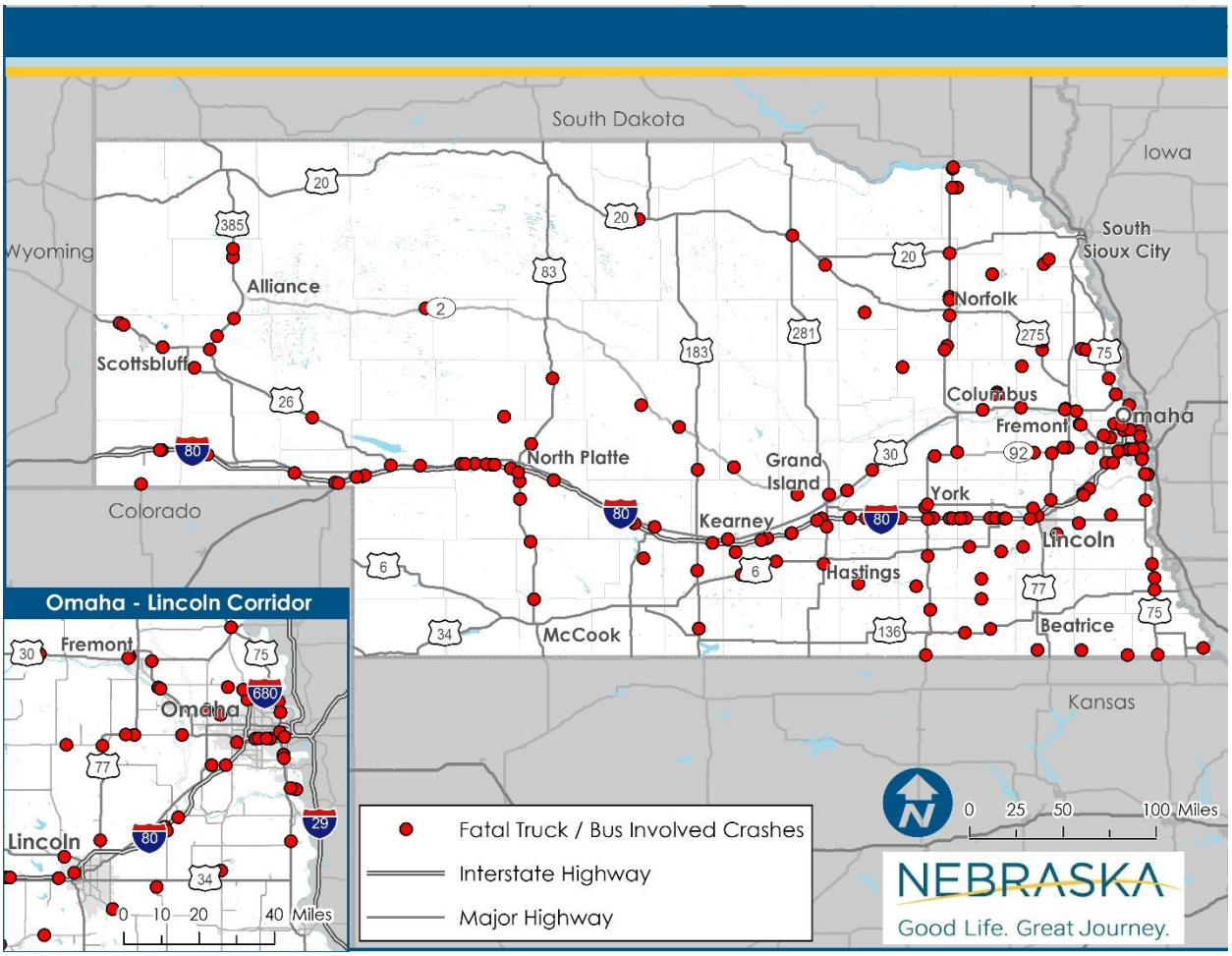
FIGURE 5.15 CRASH SEVERITIES FOR CRASHES INVOLVING A HEAVY VEHICLE, 2016—2020



Source: Nebraska Department of Transportation.

Between 2016 and 2020, heavy vehicle crashes involving a fatality comprised approximately four percent of all crashes. The 192 fatal crashes during the five-year period are shown in Figure 5.16. The majority of fatal crashes occurred either along I-80, or thoroughfares into, out of, or within Omaha and Lincoln. Additional highways with elevated numbers of fatal crashes include U.S. 75 and U.S. 81. In western Nebraska, U.S. 83 and U.S. 395 recorded the highest numbers of fatal crashes.

FIGURE 5.16 FATAL CRASHES INVOLVING A TRUCK OR BUS, 2016—2020



Source: Nebraska Department of Transportation.

5.2 Freight Rail

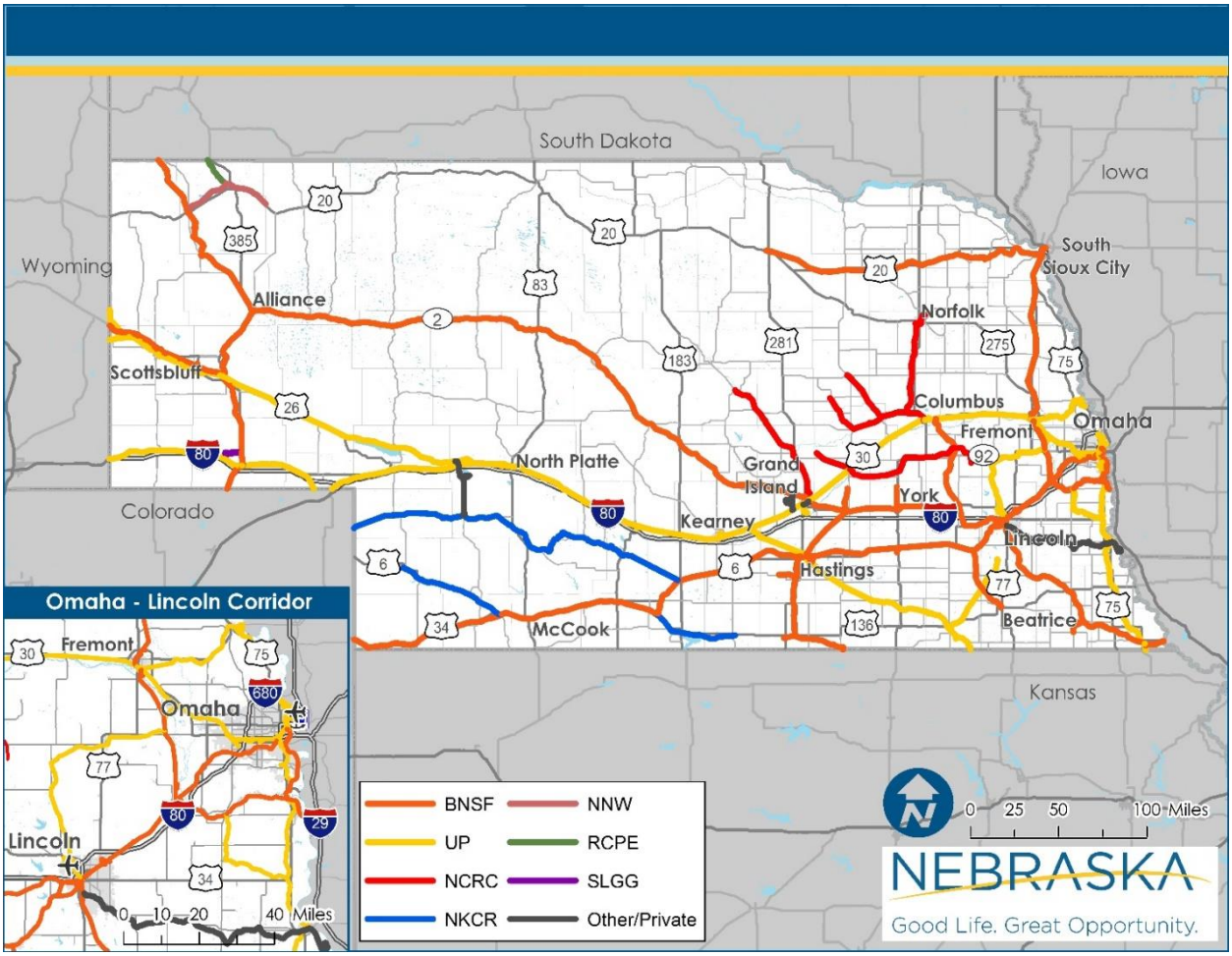
Freight rail functions as the “backbone” of the national freight network. As a centralized component of the U.S. freight rail network, Nebraska’s freight rail network is essential in the transport of a wide range of goods and commodities, especially bulk, heavy, and containerized long-distance traffic. By coverage, and in comparison to all modes, the statewide and national rail network is one of the most expansive modal systems, second only to the highway network. Some examples of freight rail moves include:

- Delivery of quarried stone from Vermont to a construction site via transloading in Chalco, outside of Omaha.
- Transport of consumer goods and electronics to an intermodal facility in Omaha from the Port of Long Beach in California.
- Inbound transport of coal from Wyoming’s Powder River Basin to the Gerald Gentleman Station in Sutherland.

Infrastructure and Facilities

The Nebraska freight rail network consists of nearly 3,400 miles of operated trackage. Comprised of 11 railroads, the Nebraska freight rail network is visualized in Figure 5.17 and tabulated in Table 5.5. The Nebraska freight rail network consists of three Class I railroads, one Class II railroad, and five Class III railroads. The majority of the state's rail network is comprised of BNSF Railway (BNSF) and Union Pacific Railroad (UP) trackage, which comprise approximately 2,600 miles, or 77 percent of operated trackage. Class II and Class III railroads combined make up about 20 percent of the state's total rail mileage. Nebraska's primary rail corridors include UP's transcontinental Overland Corridor, and BNSF's route linking the Midwest with Wyoming and the Pacific Northwest.

FIGURE 5.17 NEBRASKA FREIGHT RAIL NETWORK



Source: Nebraska Department of Transportation.

MILITARY FREIGHT CONSIDERATIONS: RAILROADS

The U.S. Transportation Command developed the Strategic Rail Corridor Network (STRACNET), which is a system of commercial railroads that serves U.S. Department of Defense's domestic operations, connecting bases, military installations, and maritime ports when rail service is needed. In Nebraska, the STRACNET includes UP's east-west trackage parallel to I-80, as well as BNSF trackage north of Alliance, and UP trackage south of Omaha to Kansas.

TABLE 5.5 NEBRASKA RAILROAD OWNERSHIP

Railroad	Reporting Mark	Classification	Miles Operated	Miles Owned	Trackage Rights Miles	Miles Leased
BNSF Railway	BNSF	Class I	1,522	1,477	45	–
Canadian National Railway	CN	Class I	12	3	9	–
Union Pacific Railroad	UP	Class I	1,065	972	93	–
Rapid City, Pierre & Eastern Railroad	RCPE	Class II	13	33	5	–
Nebraska Central Railroad Company	NCRC	Class III	340	270	70	–
Nebraska, Kansas & Colorado Railway	NKCR	Class III	359	327	32	–
Nebraska Northwestern Railroad	NNW	Class III	32	12	–	20
OL&B Railway	OLB	Class III	2	2	–	–
Sidney & Lowe Railroad	SLGG	Class III	11	11	–	–
Nebraska Public Power District	NPPX	Non-Operating	–	28	–	–
Omaha Public Power District	OMAX	Non-Operating	–	55	–	–
Total			**3,356**	**3,190**	**254**	**20**

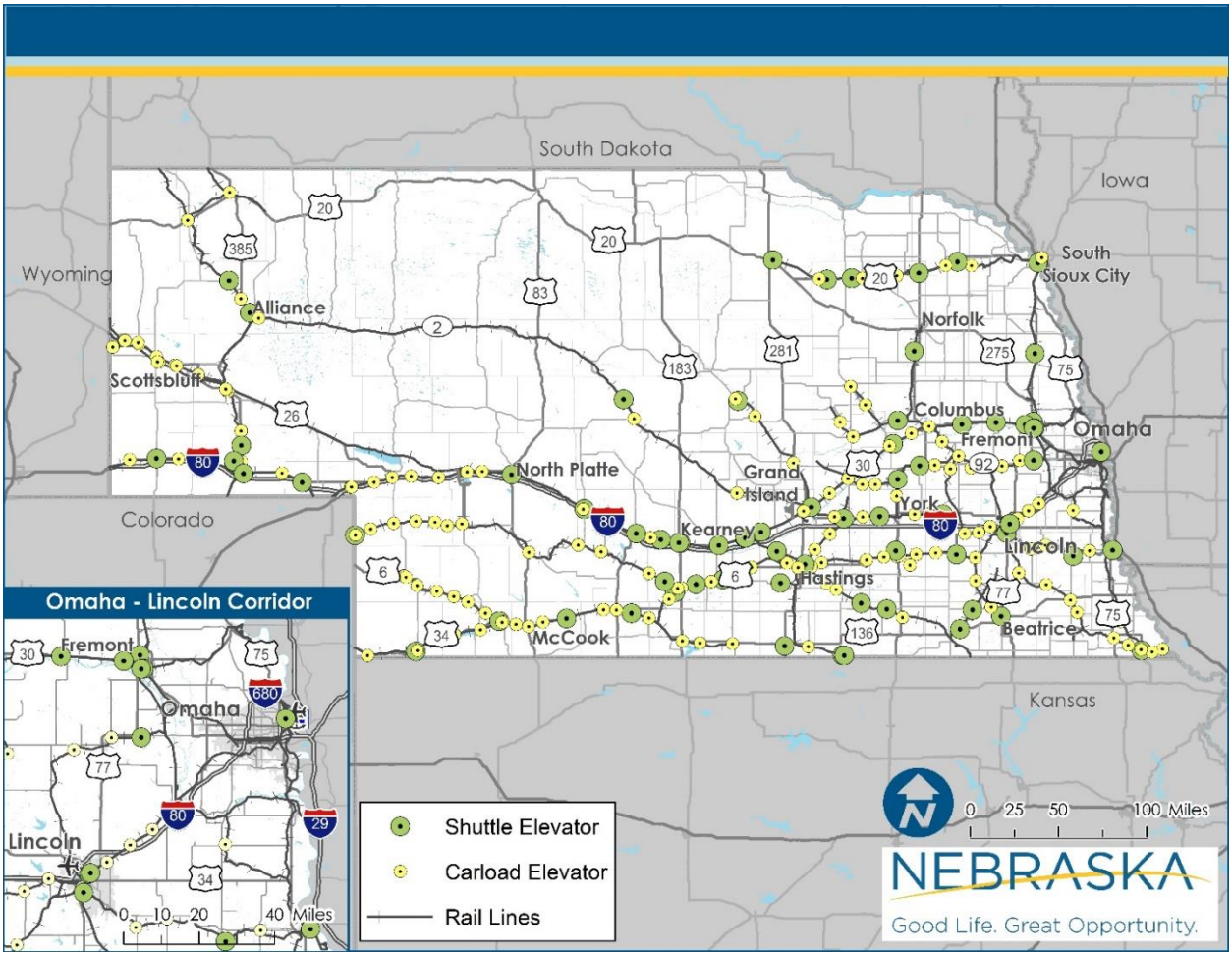
Source: Nebraska Department of Transportation, Surface Transportation Board.

The Nebraska freight rail network also includes 15 railroad yards and maintenance facilities, as well as intermodal and transloading facilities. Intermodal terminals are a key component of the national freight rail network as they allow for the modal transfer of containerized freight between rail and one or modes (primarily truck and water modes). Nebraska is served by two rail intermodal terminals located in the Omaha-Council Bluffs metropolitan area:

- BNSF's Omaha Intermodal Facility, located along the Missouri River to the south of Downtown Omaha, handles both international and domestic intermodal containers. There is a facility on-site that enables agricultural products to be packaged into international containers for export by rail.
- UP, in partnership with the Iowa Interstate Railroad (IAIS), operates an intermodal facility in Council Bluffs, Iowa that serves the greater Omaha–Council Bluffs metropolitan area. Although it is located in Iowa, the intermodal terminal provides direct access to Omaha via UP's Missouri River Bridge.

Additional transloading facilities are scattered throughout the state's rail network. Transloading facilities allow for the transfer of non-containerized commodities between rail and other modes (primarily truck and water modes). These commodities include aggregates, grains, coal, and project cargoes. In addition to transloading facilities, there are 200 rail-served grain elevators in Nebraska, including 74 shuttle elevators capable of loading 110-car unit or "shuttle" trains. These facilities allow for the consolidation of grain loads at centralized locations for the purposes of reducing transportation costs.

FIGURE 5.18 RAIL-SERVED GRAIN ELEVATORS IN NEBRASKA

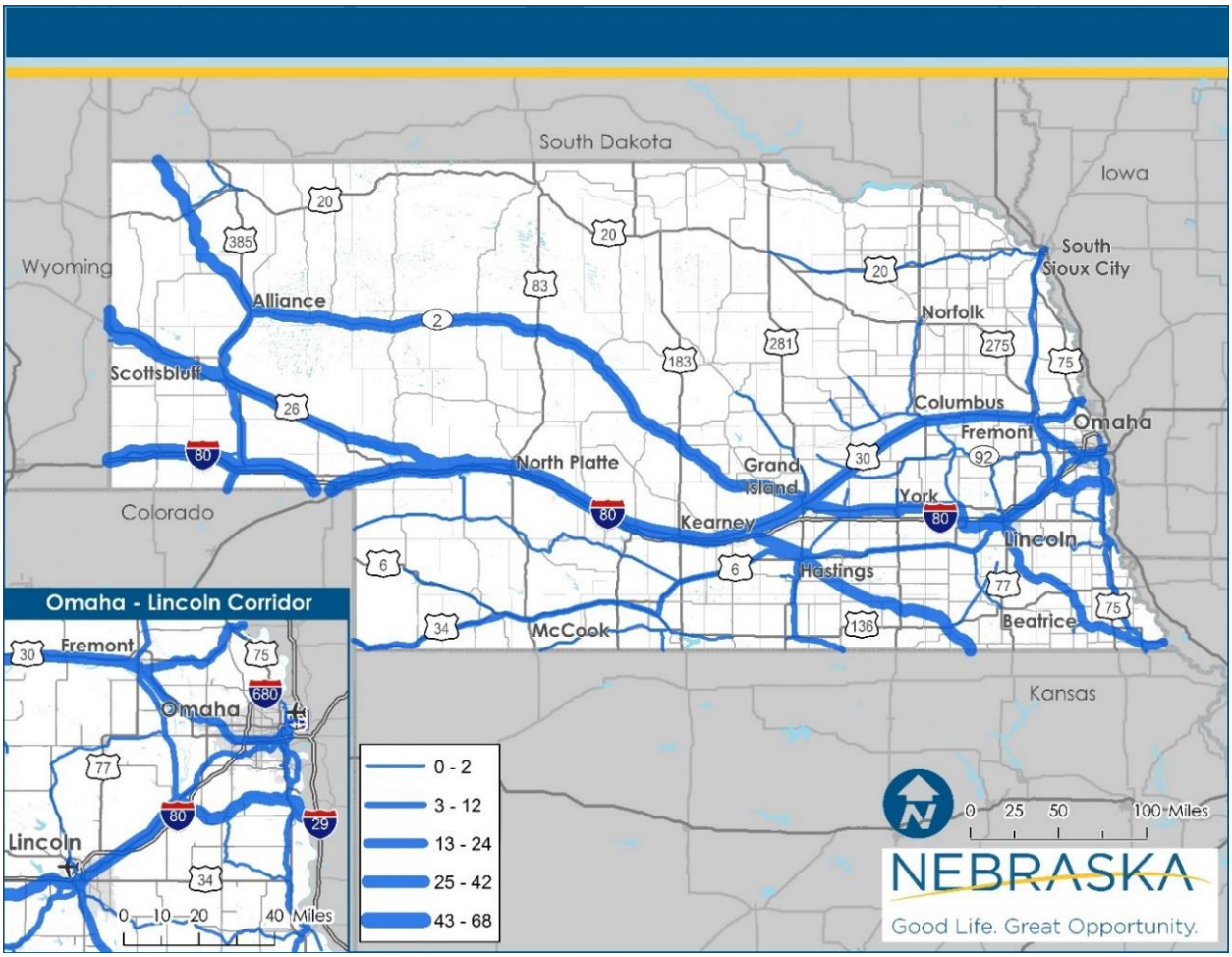


Source: BNSF Railway, Union Pacific Railroad, HDR Analysis.

Demand and Activity

Freight rail traffic can be measured through the average number of train movements per day by subdivision, as reported by freight railroads. This information is shown in Figure 5.19. The highest levels of rail traffic can be found along the east-west corridors operated by BNSF and UP, especially into and out of Wyoming. A large portion of this freight traffic into and out of Wyoming is generated by outbound coal traffic, and subsequent inbound transport of empty cars for reloading. In addition to inbound and outbound traffic which is discussed further in this section, Nebraska's freight rail traffic is also comprised of through moves between population centers to the west and east in the United States.

FIGURE 5.19 AVERAGE NUMBER OF TRAINS PER DAY BY RAIL LINE (2019)



Source: Federal Railroad Administration.

Commodity Flows

The following figures further examine the characteristics of freight rail traffic in Nebraska. Figure 5.20 shows the directional split of freight goods moved by trucks in Nebraska. When measured by tonnage, nearly two-thirds of freight traffic was comprised of outbound moves in 2020. When measured by value, there was a relatively even split between inbound, outbound, and internal moves

The following figures further examine the characteristics of freight rail traffic in Nebraska. As shown in Table 5.6, when measured by both tonnage and value, outbound moves comprised the largest proportion of all rail traffic. Internal traffic comprised the second largest proportion of tonnage and value at approximately 30 percent of all tonnage and value. Through 2045, sizable increases in tonnage are expected for internal (11 percent) and especially outbound (30 percent) moves. Inbound moves however are expected to decline by 15 percent.

TABLE 5.6 RAIL FREIGHT DIRECTIONAL SPLIT AND FORECASTED GROWTH RATES

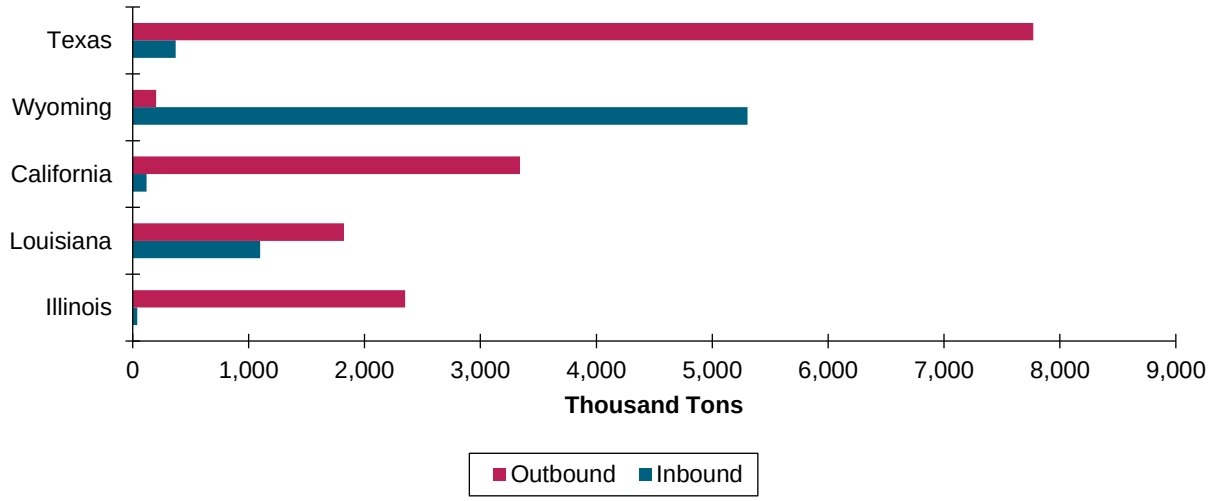
Direction	2017 Tonnage (thousands)	2017 Value ($ M)	2045 Tonnage (thousands)	2045 Value ($ M)
Inbound	9,494	$2,247	8,089	$3,328
Outbound	20,281	$5,261	26,389	$6,906
Internal	15,518	$2,991	17,312	$3,412
Total	**45,293**	**$10,500**	**51,790**	**$13,647**

Note: Totals exclude through freight movement.

Source: FHWA Freight Analysis Framework 5.

In comparison to top truck trading partners, the top rail trading partners for Nebraska (Figure 5.20), vary in terms of geographic proximity. By tonnage, Texas is the state's top trading rail partner, consisting almost exclusively of outbound tonnage. Total tonnage traded between Nebraska and Texas amounted to over 8 million tons in 2017. Wyoming is the only state directly bordering Nebraska to be included in the list of top trading partners. Unlike Texas, the majority of this tonnage consists of inbound traffic (primarily in the form of coal). The remaining top trading partners include Louisiana and the population centers of California and Illinois.

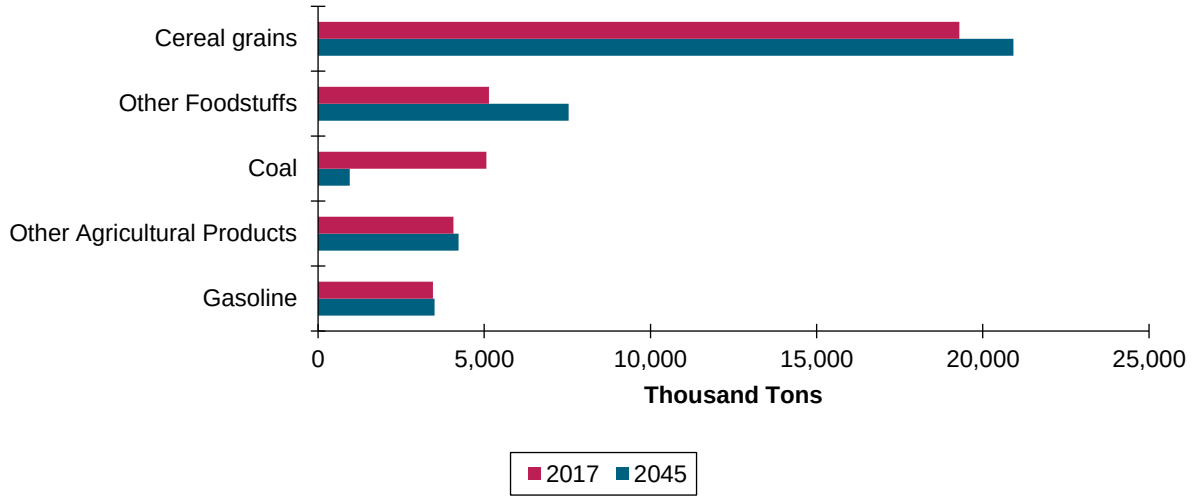
FIGURE 5.20 TOP 5 TRADING PARTNERS FOR GOODS MOVED BY RAIL BY TONNAGE, 2017



Source: FHWA Freight Analysis Framework 5.

The commodities comprising these rail moves are shown in Figure 5.21, along with predictions for total tonnage through 2045. As was the case with truck moves, cereal grains were the top commodity, with approximately 40 million tons transported in Nebraska. Additional top commodities include food products and energy products. With the exception of coal, slight to moderate increases in transported tonnage are also expected through 2045.

FIGURE 5.21 TOP COMMODITIES MOVED BY RAIL BY TONNAGE, 2017—2045



Source: FHWA Freight Analysis Framework 5.

Condition and Performance

Investment in rail infrastructure in Nebraska by the Class I railroads has been robust and continuous over the past decades. These efforts have ranged from gradual upgrades of track and signal infrastructure to complete rehabilitation and multiple-tracking of existing mainlines, construction of new lines, and expansion and creation of new terminal facilities. Funds are budgeted by the Class I railroads each year to facilitate ongoing capital investment in the state's rail network. As a result, the statewide Class I railroad network is well-maintained and able to accommodate current freight demand, including shipments of up to 286,000-pounds gross weight per railcar.

While Class I railroads have successfully achieved a state of good repair for the majority of critical infrastructure, in 2022 they faced increased scrutiny of business practices and operations as several longstanding issues came to a head. Since the onset of COVID-19, there have been persistent labor and workforce challenges impacting nearly every industry sector, putting pressure on many industries, particularly manufacturing and transportation/logistics, and forcing both shippers and carriers to pivot their operators in order to move essential freight. In the freight rail industry, this has led to operational challenges for both shippers and carriers, and for some businesses, moving less freight on the freight rail network and more on the freight highway network. However, regulators have found that the labor challenges for Class I carriers were years in the making, as most had significantly reduced the size of their operational workforce before the pandemic, making it difficult provide adequate service to customers as demand fluctuated with market shocks and responses. For shippers, inconsistent and unreliable freight rail service meant tight car supply and unfilled car orders, delays in transportation for carload and bulk traffic, increased origin dwell time for released unit trains, missed switches, and ineffective customer assistance. In April 2022, the Surface Transportation Board (STB) held a hearing on entitled "Urgent Issues in Freight Rail Service", where carriers were confronted publicly on these issues.[63] Most Class I

[63] https://www.federalregister.gov/documents/2022/04/13/2022-07831/urgent-issues-in-freight-rail-service

carriers[64] have implemented precision scheduled railroading (PSR) to streamline freight railroad operations, resulting in trains that often exceed more than two miles long in length, with minimal switching of boxcars to improve efficiency, and emphasizing point-to-point freight car movements on simplified routing networks, often with fewer employees. While PSR has increased profitability, it may have contributed to the decision to reduce overall workforce. In the coming years, it will be critical for the industry as a whole to confront and rectify these issues, not only to achieve a good quality of service for customers, but also to grow freight rail volumes and reverse the trend of declining overall market share.

Class II and Class III railroads face a different set of challenges in meeting their maintenance needs because they do not generally have the same capital and technical resources, operating capacity and flexibility, or modern infrastructure of the larger Class I railroads. Short line railroad bottlenecks are often attributed to legacy infrastructure tailored to historical railroad practice, which can limit capacity and hamper efficient modern operations. Such factors include yard capacity that is insufficient for building trains; switching; and staging cars and sidings that are of inadequate number, length, or location to accommodate the demands of present-day train operations and schedules. Some short line railroads are further constrained by delays that stem from interchanging railcars with another carrier or in the use of trackage rights to access an isolated segment of their network. As a result, short line railroads have access to a number of targeted Federal funding sources to help them address their capital needs, such as the Consolidated Rail Infrastructure and Safety Improvements (CRISI) grant program administered by the FRA. More information on discretionary grant opportunities is discussed in the Multimodal Freight Trends, Needs, and Opportunities Chapter.

Positive Train Control

Positive Train Control (PTC) refers to technologies designed to automatically stop or slow a train before certain accidents can occur. PTC is designed to prevent collisions between trains, derailments caused by excessive speed, trains operating beyond their limits of authority, incursions by trains on tracks under repair, and by trains moving over switches left in the wrong position. PTC systems are designed to determine the location and speed of trains, warn train operators of potential problems, and take action if operators do not respond to a warning. The Rail Safety Improvement Act of 2008 required railroads to place PTC systems in service by December 31, 2015, under the following circumstances:

- On all rail main lines over which regularly scheduled commuter or intercity passenger trains operate.
- On all Class I railroad main lines with over 5 million gross ton-miles per mile annually over which any amount of toxic/poison-by-inhalation hazardous materials are handled.

The mandate for PTC excludes all Class II (regional) and III (short line) railroads regardless of tonnage or number of toxic/poison cars handled as long as no passenger trains travel over the lines.

The segments where Amtrak operates within Nebraska as well as many other Class I railroad main line routes are required to be equipped with PTC. As of 2022, Class I railroads have implemented PTC systems on all required segments of their networks, including implementation of the technology on

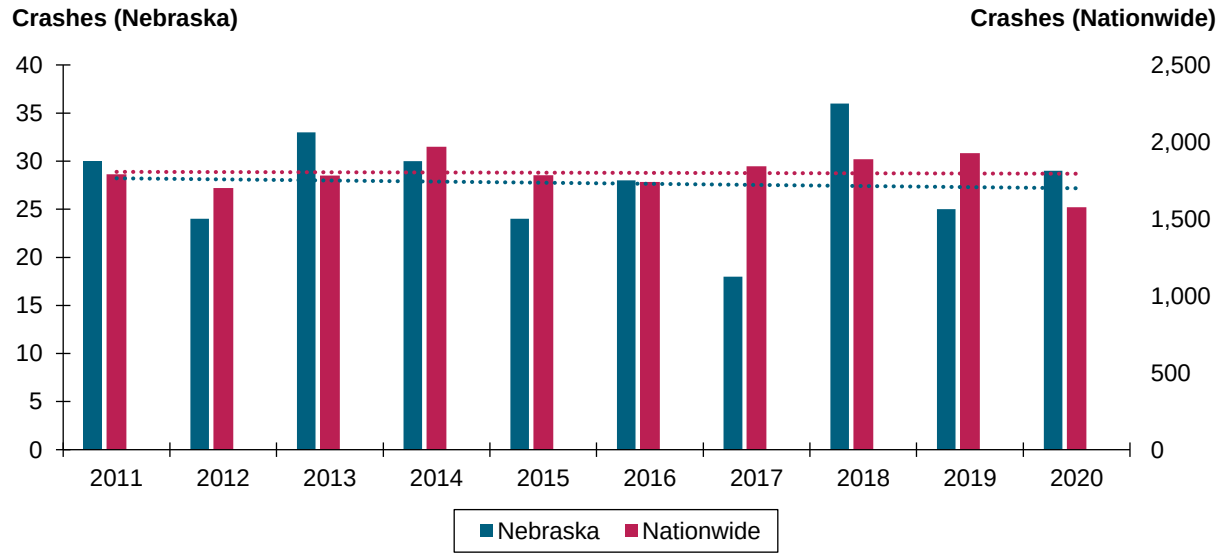
[64] Currently, PSR is in use by the following Class I railroads: Canadian National (adoption of PSR in 1998), Canadian Pacific (adoption of PSR in 2012), CSX (adoption of PSR in 2017), Kansas City Southern (adoption of PSR in 2018), Norfolk Southern (adoption of PSR in 2018) and Union Pacific (adoption of PSR in 2018).

principal lines in Nebraska. Some railroads are continuing work to voluntarily deploy PTC on lines where it is not legally required.

Highway-Rail Grade Crossing Safety

Highway-rail grade crossings are those locations where trains and vehicles have the potential to interact, and such interactions can have fatal or life-changing consequences for all users. The Nebraska Grade Crossing State Action Plan (SAP), developed in 2022, provides a framework to reduce the probability of crashes and the consequence of hazard at highway-rail grade crossings in Nebraska. As shown in Figure 5.22 with information taken from the SAP, statewide highway-rail grade crossing crash totals show a trend of slight declines. In comparison, national crash totals have largely held steady between 1,500 and 2,000 incidents.

FIGURE 5.22 STATE AND NATIONAL HIGHWAY-RAIL GRADE CROSSING CRASH TRENDS



Source: Federal Railroad Administration Office of Safety Analysis.

5.3 Ports and Waterways

Nebraska holds the unique distinction of being the only “triple landlocked” U.S. state, meaning that you would have to cross at least three states to reach an ocean. As a result, the concept of marine transportation in a state at least 1,000 miles from the Atlantic or Pacific Oceans might not immediately garner attention. However, Nebraska is connected to the United States Inland Waterways System (IWWS), which is comprised of nearly 12,000 miles of Federally-maintained inland navigable waterways on rivers, lakes, and coastal bays, touching 38 of the 48 contiguous states and handling shipments to/from those 38 states. The IWWS is part of a larger system designated as America’s Marine Highways. Inland waterways are a critical part of the Nation’s multimodal freight network, responsible for transporting nearly 830 million tons of cargo annually.

Waterborne transportation provides an efficient and economical shipping option for non-time sensitive bulk products such as raw materials for manufacturing, agriculture, and production and extraction. Inland ports often interface with roadway or rail networks, providing a competitive transportation solution that concurrently alleviates congestion on the Nation's roadways. Barges are the primary freight transportation vehicle for inland waterways. They are well-suited for the movement of large quantities of bulk commodities, such as coal; petroleum products, including crude oil, gasoline, diesel fuel, jet fuel, heavy fuel oils, and asphalt; iron and steel; grain; chemicals, including fertilizers; aggregates such as sand, gravel, and rock for the construction industry; and intermodal containers.

AN ECONOMICAL MODE OF TRANSPORTATION

One barge can move as many tons as 70 tractor trailers or 16 train cars, and are well-suited for moving large quantities of bulk commodities, oversized/ overweight equipment, and intermodal containers for many key industries.

Infrastructure and Facilities

The U.S. inland waterways system links Nebraska to the Mississippi River, which in turn provides access to coastal ports in the Gulf of Mexico, including New Orleans, LA; Mobile, AL; Gulfport, MS; Houston, TX, and other prominent destinations. The inland waterway system of Nebraska consists of one commercially accessible waterway, the Missouri River, which forms the eastern boundary of the state with Iowa and traverses from the mountains of Montana to its intersection with the Mississippi River north of St. Louis, MO. This border is approximately 200 miles long and gives 14 border counties access to the river. Other substantial rivers in Nebraska that are not commercially navigable include the Platte, Niobrara, Elkhorn, and Loup Rivers, among others. The Missouri River links Nebraska to domestic markets such as Kansas City, MO, Jefferson City, MO, and St. Louis, MO, which is at the confluence of the Missouri and Mississippi Rivers, which then provides access to domestic and international markets.

Since the first half of the 1900s, the Missouri River has been engineered by the U.S. Army Corps of Engineers (USACE) to maintain a navigation channel of 300 feet width and 9 feet depth from its terminus near at the Mississippi River to Sioux City, IA, which is approximately 100 miles upriver from Omaha, NE. Despite this, the river has resisted engineering efforts and the minimum dimensions have not always been met. On average, the river remains navigable about 8 months of the year.[65] Combined with high and low water cycles of the Missouri River that result in rapidly changing river depth, the Missouri River remains a difficult river to navigate within the central United States.[66]

Since 2007, the U.S. Department of Transportation Maritime Administration (MARAD) has administered the Marine Highway Program, working closely with public and private organizations to develop and expand service along designated waterways, especially where water-based transport can provide the most efficient, effective, and sustainable transportation option. MARAD also works to increase public awareness and highlight the benefits of these waterways. There are currently 26 marine highway routes

[65] U.S. Army Corps of Engineers, Missouri River Navigation Support, Full-Length Season, Reduced Service Levels; https://www.nwd.usace.army.mil/Media/News-Releases/Article/2679130/missouri-river-navigation-support-full-length-season-reduced-service-levels/

[66] U.S. Army Corps of Engineers, Missouri River Mitigation Project; https://web.archive.org/web/20070627040444/http://www.nwk.usace.army.mil/projects/mitigation/bankstabilization.htm.

in the Nation, as seen in Figure 5.23. Nebraska has access via the M-29, which begins in Omaha, NE and terminates at the confluence of the Missouri and Mississippi Rivers in St. Louis.

FIGURE 5.23 U.S. MARINE HIGHWAY ROUTES

Source: U.S. Department of Transportation, Maritime Administration.

PUBLIC PORTS IN NEBRASKA

Until 2021, public inland port authorities were not permitted in Nebraska. With the passing of LB156 in May 2021, up to five inland port authorities are now able to be established in the state. These port authorities will be authorized to engage in marketing activities, issue and sell revenue bonds, and acquire rights-of-way and property.

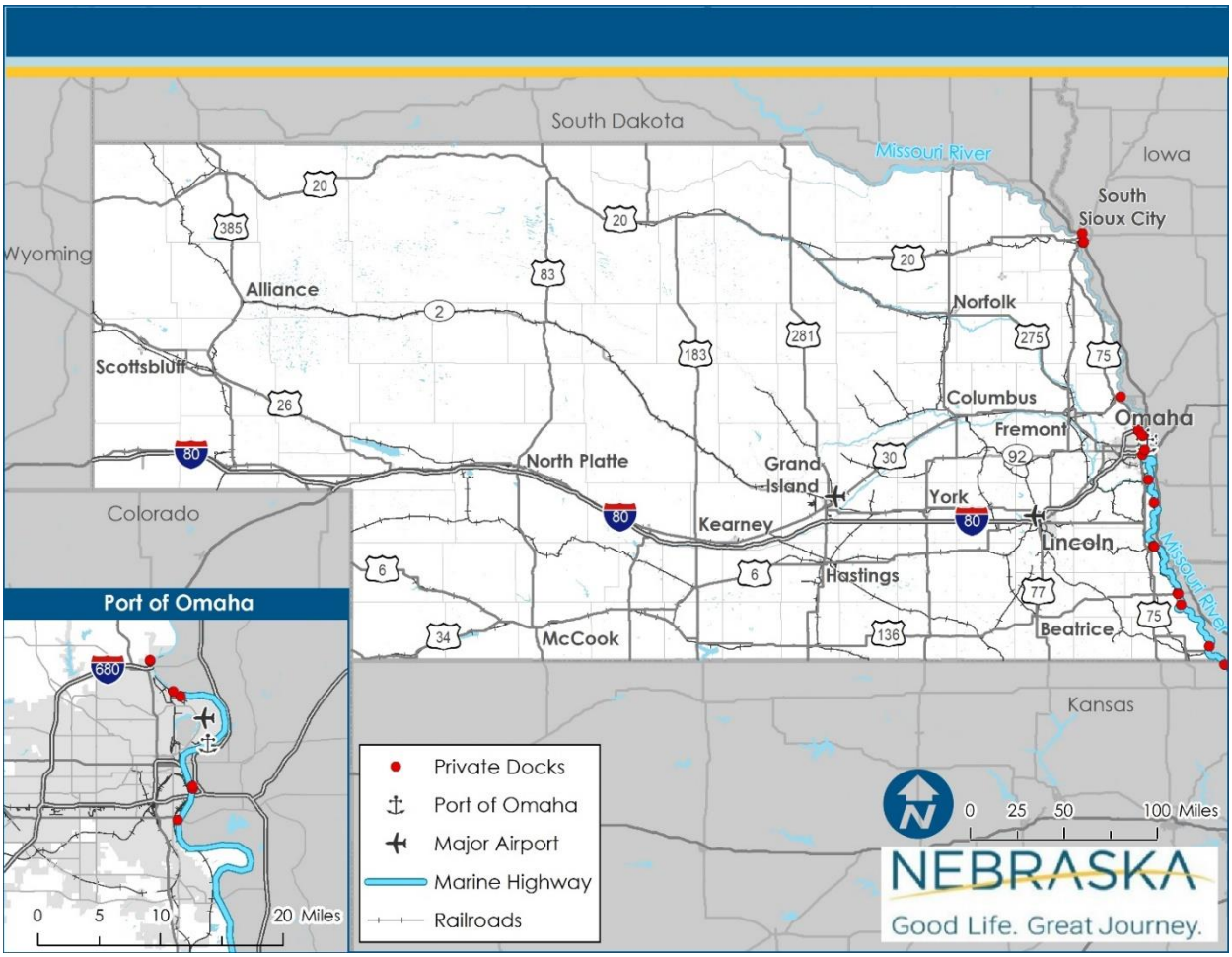
For an area to qualify, the metropolitan, primary, or first-class city or county must have a population greater than 20,000 people. The actual port site must be at least 300 acres in area and meet two of the following criteria of being within: 1 mile of a navigable waterway, 1 mile of a major rail line, 2 miles of a major airport, and/or 2 miles of any Federal Interstate or any four-lane divided highway

As of 2022, numerous cities and counties have investigated the creation of a port authority, but no port authority has been officially designated yet. Nebraska Department of Economic Development (NDED) began accepting applications in October 2022, and port districts are expected to be designated in 2023.

A variety of private terminals and docks are located along the Missouri River in Nebraska and on the neighboring side of the river in Iowa. Sioux City and Council Bluffs in Iowa contain all the terminals in

Iowa, with Sioux City holding three and Council Bluffs holding two. Nebraska terminals include those in Omaha, Blair, Nebraska City, Brownville, and Rock Bluff. Many of the terminals have been closed or changed hands over the previous decades, and the amount of regular traffic moving through these terminals appears to be small. Private docks in Nebraska are shown in Figure 5.24. Most of the private docks are either around Omaha or downstream from the city (south). Many of these terminals also have access to freight rail service, and handle a variety of commodities including fertilizers, iron & steel, food and farm products, grain, animal feed, and other bulk products.

FIGURE 5.24 PRIVATE DOCKS ALONG THE MISSOURI RIVER



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center.

While lacking an official port authority, Omaha has one port on the west side of the Missouri River. Decades ago, the Port was handling barge shipments of grain and passenger boats which later expanded to include steel and asphalt. Railroads attempted to create spur lines to the Port in order to increase their economic productivity. However, the efforts by railroads to develop the Port into an economic competitor never came to fulfillment. Today, the Port is responsible for only a negligible amount of waterway freight activity and functions primarily as a port of entry. The Port is run by U.S. Customs and Border Protection agents, who monitor bonded freight and handle customs duties as part of Foreign Trade Zones (FTZ) #19

and #59.[67] The grantee for FTZ #19 is the Greater Omaha Chamber of Commerce and includes Burt, Cass, Dodge, Douglas, Sarpy, Saunders and Washington Counties. The grantee for FTZ #59 is Lincoln Foreign-Trade Zone, Inc. and includes Lancaster, Otoe and Seward Counties. Although FTZ #59 focuses on counties in and around Lincoln, NE, its designated port of entry is still considered to be Omaha.

Demand and Activity

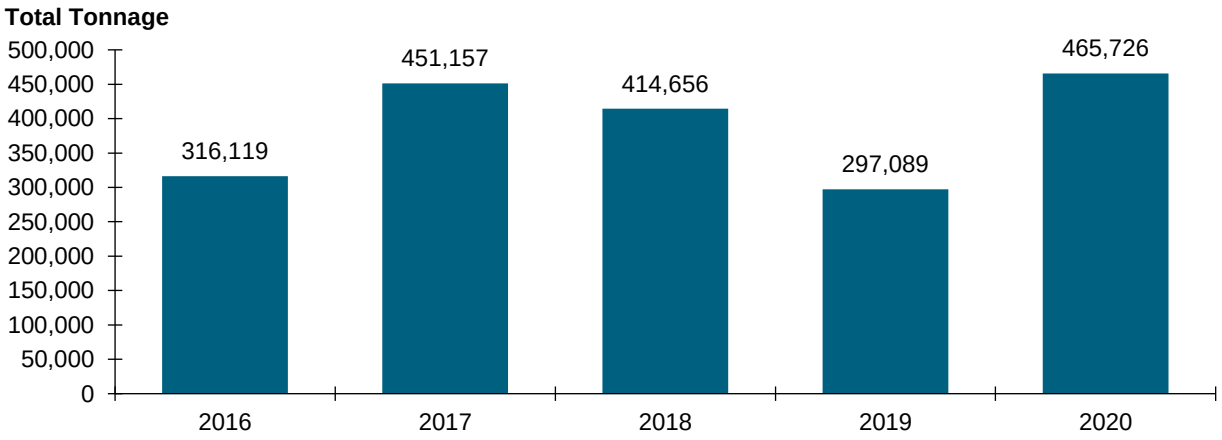
The USACE monitors and reports movement of commodities on the Nation's river system, which allows for a detailed analysis of the movement of goods by waterway in Nebraska via two segments:

» **Segment 1:** The Missouri River from Sioux City, IA to Omaha, NE (108 miles).

» **Segment 2:** The Missouri River from Omaha, NE to Kansas City, MO (252 miles).[68]

Segment 2 handled the overwhelming majority of traffic with over 1.9 million tons of freight (98 percent). Segment 1 only reported freight movement in 2018 and 2020 (either because no freight was moved along Segment 1 in the other years, or due to a lack of reporting data) and amounted to only 42,000 tons (2 percent) over the past five years. The total annual tonnage moved along the Missouri River over the past five years is shown in Figure 5.25. In 2016, there was just over 310,000 tons moved along the river. This increased by over 40 percent in 2017 and decreased over the next two years until a five-year low in 2019 with under 300,000 tons. This dip was likely due to widespread flooding throughout the state and rebounded in 2020 to more normal levels of 465,000.

FIGURE 5.25 ANNUAL WATERBORNE TONNAGE ALONG MISSOURI RIVER, 2016-2020



Source: U.S. Army Corps of Engineers, Waterborne Commerce Statistics Center.

[67] FTZs are restricted-access sites that allow companies that operate within the zone to defer, reduce, or eliminate customs duties on foreign products admitted into zones for storage, exhibition, assembly, manufacture and processing. Zone users may elect to pay the duty rate applicable to either the original foreign material or the finished product manufactured from the foreign material, whichever is lower, making U.S. manufacturing operations more cost-competitive compared to overseas operations. FTZ #19 was established in August 2006 and FTZ #59 was established in December 2020.

[68] It should be noted that Segment 2 is located partly in Missouri, but it is not possible to break this segment into separate Nebraska and Missouri sections.

From 2016 to 2020, the majority of freight transported was sand & gravel, comprising a 64 percent share of freight by weight (over 1.2 million tons). Other top commodities include soybeans (197,000 tons or 10 percent), cement & concrete (158,000 tons or 8 percent), corn (105,000 tons or 5 percent), miscellaneous mineral products (84,000 or 4 percent), and waterway improvement material (70,000 or 4 percent). The most consistent commodity category over this period is sand & gravel and soybeans, with every other reported commodity type experiencing at least one year of no movement. Still, the total volume of sand & gravel and soybeans has fluctuated; there were 153,000 total tons of sand & gravel transported in 2018, before doubling to 317,000 tons in 2020. In contrast, the total weight of soybeans transported remained consistent throughout the past five years, except for 2019 due to the flooding.

While the USACE does not estimate future commodity flows, the Freight Analysis Framework (FAF5) data from the Federal Highway Administration produces forecasts for waterborne freight. The FAF5 estimates that waterborne tonnage will decrease at an annual rate of 0.9 percent until 2045. Applying this compound annual growth rate from FAF to the 2020 data from the USACE leads to a projected 370,000 tons of commodities moved on the Missouri River in 2045, a total decrease of about 20 percent. The FAF data also contains commodity-specific projected flows in 2045 but given the lack of confidence in individual commodity flows for the ports and waterway mode in FAF5, this may not be reliable.

Condition and Performance

Condition and performance of the waterway network primarily relates to the age of infrastructure as well as recurring events, such as flooding and drought, which impedes navigation and threatens the safety of Nebraskans. Increased damage from flooding events makes investing in facility resiliency a top priority, albeit hampered by limited funding availability. In addition, the lack of reliability, circuity, and capacity have resulted in a general decline in Missouri River usage, limiting the potential for future growth in goods movement activity.

Flooding and Aging Infrastructure

In 2019, the Great Plains of the U.S. Midwest experienced some of the worst flooding on record. In the first few months of the year, Nebraska and its neighbors experienced severe blizzards, especially in early March 2019, which led to record amounts of snowfall. In mid-March, these blizzards were followed by higher-than-normal temperatures that caused most of the snow to quickly melt and overflow the Spencer Dam in northern Nebraska. This broke many of the levees along the Missouri River downstream in Nebraska and led to major flooding events throughout the eastern part of the state.[69]

Over the rest of the year, record amounts of rainfall (more than four times what is normal in the Great Plains) combined with the already-broken levees led to subsequent flooding events that eventually caused over $1.5 billion in damage throughout Nebraska, including $449 million in damage to reads, levees, and other infrastructure.[70] The after-effects of the floods of 2019 are expected to be felt for years

[69] The Associated Press, Third Round of Flooding in 2019 Likely Along Missouri River; https://www.komu.com/news/third-round-of-flooding-in-2019-likely-along-missouri-river/article_949e8188-2116-537d-bb69-6929d7184c7f.html

[70] Allison Mollenkamp, Nebraska Roads and Bridges Still in Recovery After Flooding; https://nebraskapublicmedia.org/en/news/news-articles/nebraska-roads-and-bridges-still-in-recovery-after-flooding/

due to the need to clear agriculture fields of debris and sand as well as the need to repair damaged infrastructure.[71]

Other Opportunities to Improve Performance

The use of the inland waterway network is a low-cost method to transport bulk shipments, as compared to truck or rail. The Eno Center for Transportation recently released a report[72] comparing the freight waterway network in the U.S. to other international countries. The report found that maximizing the use of waterways for freight movement would make the Nation stronger and more competitive, especially as other countries continue to develop their own waterway networks. In Nebraska, there are opportunities to better utilize the Missouri River to transport these shipments; the 2017 SFP identified the waterway network as a more efficient method to transport large equipment related to wind generation facilities, particularly by using some of the larger docks along the river. Nebraska has the 16th-largest capacity for wind energy generation in the Nation[73], and wind generation makes up almost one quarter of the state's total electricity generation.[74]

Additionally, officially designating the Omaha Port as an inland port authority and getting the official M-29 Marine Highway extended from Omaha to Sioux Falls, thereby covering the entire length of navigable Missouri River, may encourage more use of the inland waterway network. Being designated as a port authority may allow the port to increase marketing that could raise awareness of the Missouri River as a freight option, even if it does not attract more business to the port itself. However, it is unlikely that a significant amount of freight in Nebraska will be moved on the waterways given the reliability challenges of the Missouri River. The most significant opportunities will involve Nebraska-based shippers looking to ship bulk products downstream to domestic and international markets via the Mississippi River System. Still, the Missouri River remains a competitive option for some shippers, and creates some redundancy in Nebraska's freight network should another mode fail.

5.4 Air Cargo

Air transport is a particularly useful mode for transporting high-value, lightweight, and time-sensitive goods, especially over long distances. This especially includes value-added and finished products such as pharmaceuticals, electronics, semiconductors, and other specialized equipment. Some examples of air cargo moves include:

- Inbound delivery of time-sensitive medicine to Box Butte General Hospital in Alliance.
- Next-day outbound shipment of a consumer product from a facility in Freemont to an East Coast market or customer.

[71] Bill Spiegel, Nebraska Flood Damage: $1.5 Billion and Rising; https://www.agriculture.com/news/nebraska-flood-damage-15-billion-and-rising

[72] Eno Center for Transportation, Waterborne Competitiveness—U.S. and Foreign Investments in Inland Waterways, May 2022

[73] Nebraska Department of Environment and Energy, Wind Facilities' Installed Capacity by State; https://neo.ne.gov/programs/stats/inf/205.htm

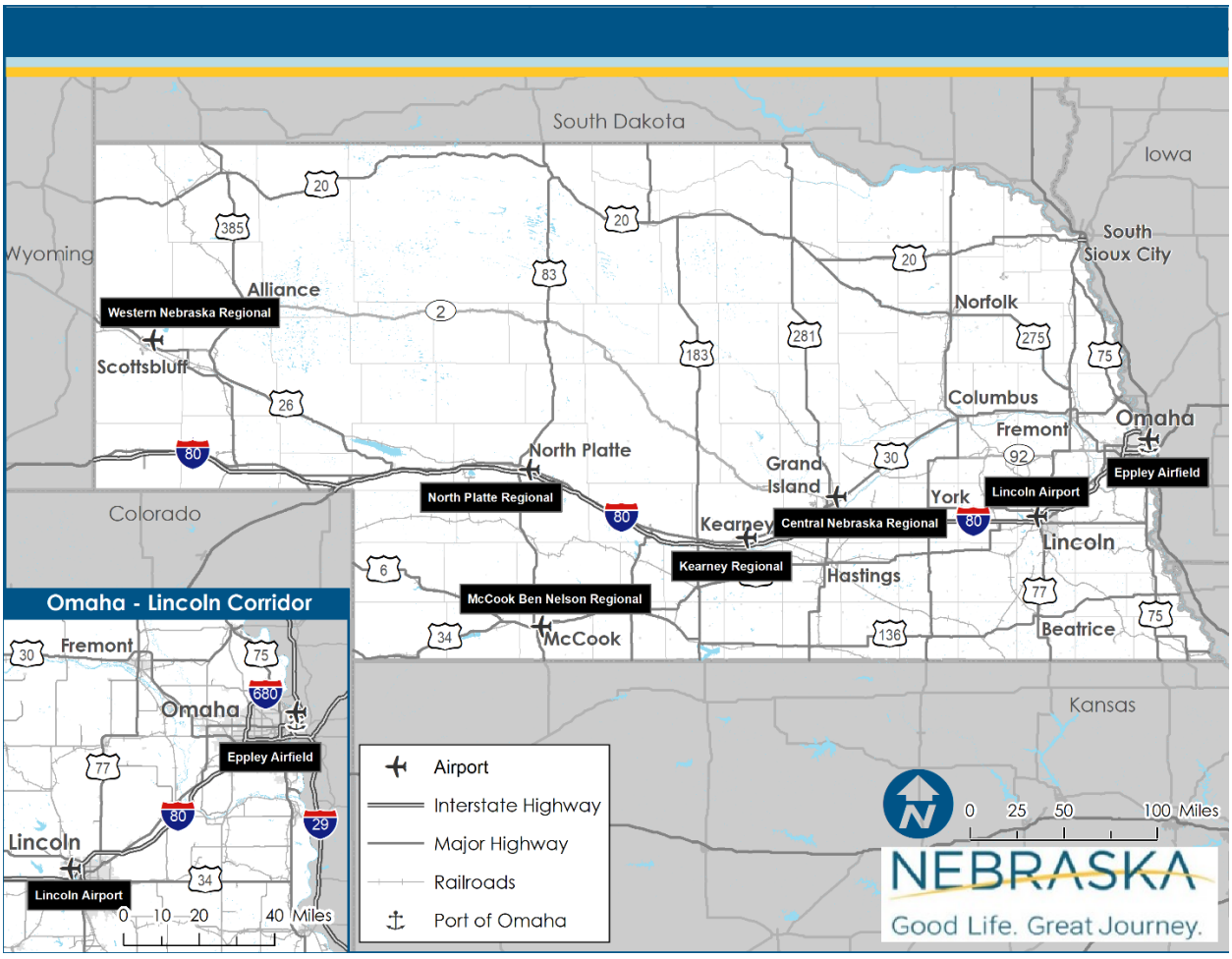
[74] Nuclear Energy Institute, State Electricity Generation Fuel Shares; https://www.nei.org/resources/statistics/state-electricity-generation-fuel-shares

The largest air cargo facility in Nebraska is Eppley Airfield (OMA) in Omaha, which transported over 95 percent of Nebraska's air cargo tonnage in the state in 2019.

Infrastructure and Facilities

The Nebraska aviation system consists of 79 public use airports and 151 private airports. A total of 72 airports are a part of the National Plan of Integrated Airport Systems. Of these, seven airports reported air cargo activity in 2019, which includes tonnage for both freight and mail shipments. Eppley Airfield (OMA) in Omaha handles the vast majority (95 percent) of total air cargo activity in the state, with other key freight-handling airports including Central Nebraska Regional Airport (GRI) in Grand Island, Western Nebraska Regional Airport (BFF) in Scottsbluff, and North Platte Regional Airport (LBF). Figure 5.26 shows a map of the airports with air cargo activity in Nebraska.

FIGURE 5.26 AIRPORTS SERVICING AIR CARGO IN NEBRASKA



Source: Federal Aviation Administration, NDOT, BTS T-100 Market, 2019.

Nebraska's top air cargo carriers are shown in Table 5.7. Federal Express Corporation (FedEx) and the United Parcel Service (UPS) account for 90 percent of all cargo carried. The remaining 10 percent of air cargo is transported by a variety of different carriers. Eppley Airfield (OMA) serves each of the state's top

10 air freight carriers. FedEx is the only carrier that operates at all of the state's freight-carrying airports, while Lincoln Airport (LNK) is the only airport outside of OMA that serves carriers other than FedEx.

EPPLEY AIRFIELD: A GROWING AIR CARGO HUB

Located 4 miles from downtown Omaha, Eppley Airfield is a medium-hub airport that served over 5 million passengers in 2019. Seven airlines provide approximately 88 departures per day to 33 nonstop destinations from Eppley Airfield. Additionally, the airport is served by 7 freight companies, including FedEx, UPS, DHL, AirNet, and Ameriflight. Amazon Air is the latest carrier to provide freight service to Eppley Airfield, beginning in February 2022. Silver Airways now operates daily flights for Amazon Air between Omaha and Forth Worth Alliance Airport in Fort Worth, Texas.

Since the completion of a master plan for Eppley Airfield in 2014, the Omaha Airport Authority has moved forward with a number of capital improvement infrastructure projects. In relation to cargo, these projects include the reconstruction and renovation of Cargo Apron A and the expansion of the Cargo B Facility. The next major project, the Terminal Modernization Program, will focus on expanding passenger capacity.

TABLE 5.7 TOP AIR CARGO CARRIERS AT NEBRASKA AIRPORTS, 2019

Carrier Name	2019 Tonnage	Percent of Total	Operating at OMA	Operating at LBF	Operating at GRI	Operating at EAR	Operating at LNK
FedEx	468,795	57%	■	■	■	■	■
UPS	269,662	33%	■				
ABX Air Inc	14,421	2%	■				
Southwest Airlines Co.	14,270	2%	■				
United Air Lines Inc.	13,350	2%	■				■
Southern Air Inc.	4,779	< 1%	■				
Delta Air Lines Inc.	4,607	< 1%	■				■
Trans World Airways LLC	4,198	< 1%	■				■
America West Airlines Inc.	3,691	< 1%	■				■
Comair Inc.	3,489	< 1%	■				

Source: Source: BTS T-100 Market, 2019.

Demand and Activity

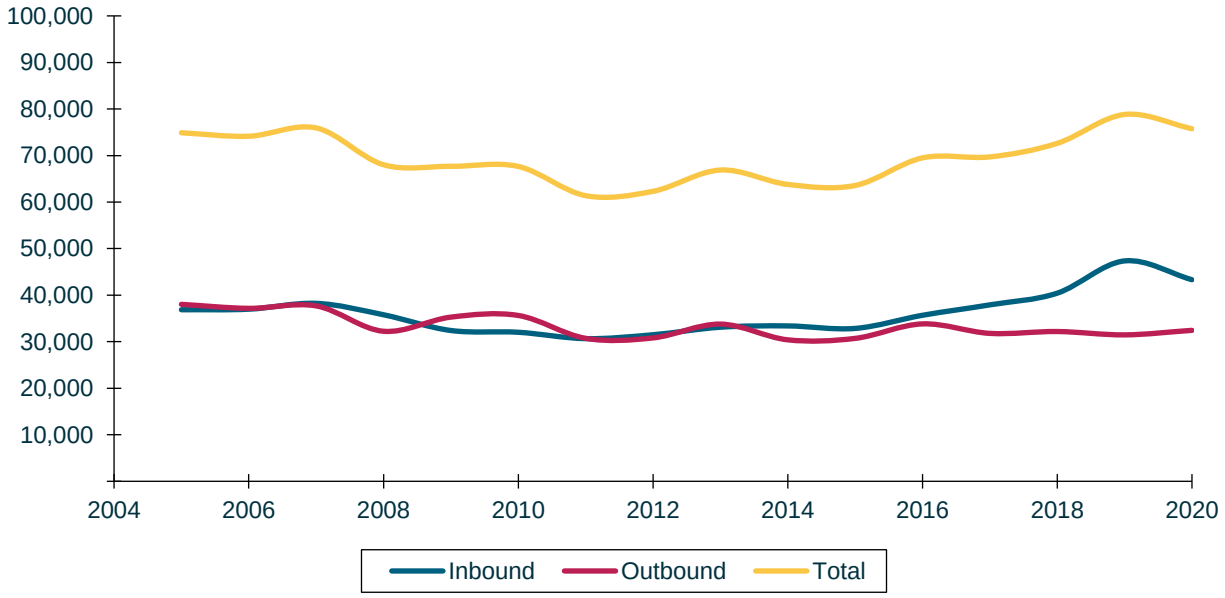
Historical air cargo tonnage trends for Nebraska is shown in Figure 5.27. Statewide air cargo activity primarily reflects activity at Eppley Airfield, which accounts for over 95 percent of the state's air cargo activity. The inbound and outbound trends for Nebraska followed a similar pattern to national trends, with

inbound traffic being slightly higher than outbound traffic. While air cargo traffic dipped somewhat following the Great Recession of 2008, total air cargo tonnage increased by 24 percent between 2015 and 2019 before slightly dipping in 2020.

CENTRAL NEBRASKA REGIONAL AIRPORT: LEVERAGING REGIONAL GROWTH OPPORTUNITIES IN MANUFACTURING

Beginning in early 2022, Central Nebraska Regional Airport (GRI) in Grand Island began seeing higher demand for cargo activity from local automobile part manufacturers. According to airport officials, as of March 1, 2022, GRI has enplaned over 300 tons of auto parts, which are transported just-in-time to Niagara Falls, Tennessee, and Saltillo, Mexico. Local auto parts manufacturers have faced increasing costs for using trucking due to increasing fuel prices in 2022, as well as driver availability issues. Manufactures are willing to pay more to ship these goods via air to avoid millions in lost revenue from having to shut down a production line if these parts were not available. GRI airport officials also reported that there have been preliminary discussions with an large online retailer about developing an e-commerce storage facility at the airport, which could cost between $40-$50 million to construct, leading to an additional 40-60 jobs at the airport.

FIGURE 5.27 NEBRASKA AIR CARGO TONNAGE, 2005—2020



Source: BTS T-100 Market, 2005-2020.

Total air cargo tonnage for 2019 and 2020 is broken out by airport in Table 5.8. Overall, Eppley Airfield (OMA) in Omaha handles the vast majority of the state's air cargo, at over 95 percent; it is the state's largest airport, with sizable domestic passenger and freight services. Central Nebraska Regional Airport (GRI), which serves as a hub for central and some western portions of Nebraska, handles the second highest amount of tonnage, although its statewide tonnage market share is well below five percent. Between 2019 and 2020 and with the onset of the COVID-19 pandemic, overall tonnage dropped at most of the state's air cargo airports, including each of the top facilities.

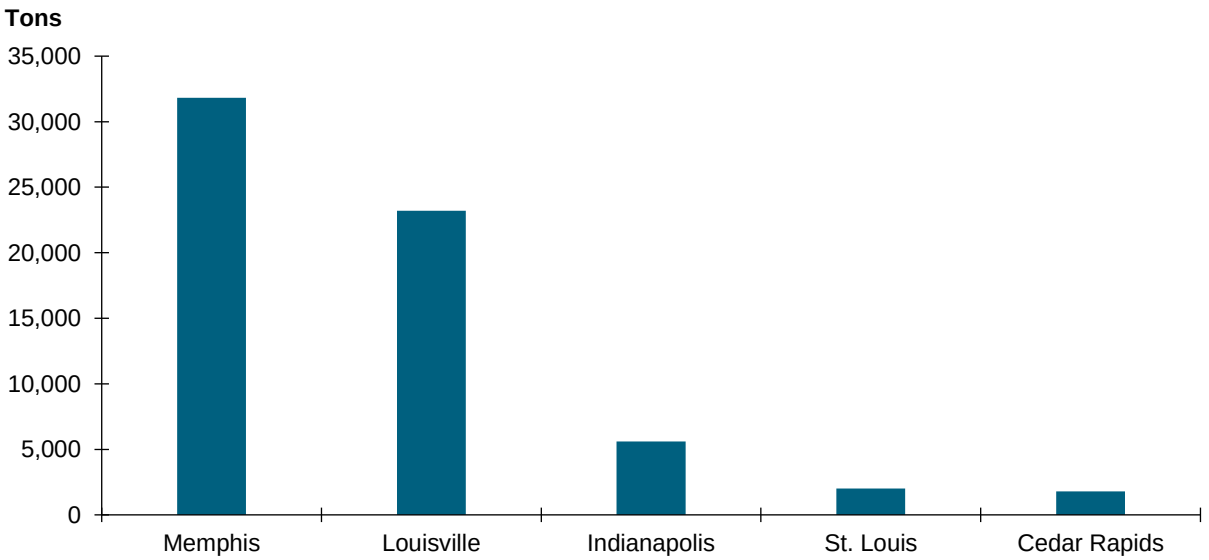
TABLE 5.8 AIR CARGO ACTIVITY AT NEBRASKA AIRPORTS

Airport	City	2019 Volume (tons)	% of Total	2020 Volume (tons)	% of Total
Eppley Airfield (OMA)	Omaha	75,459	96%	74,411	98%
Central Nebraska Regional Airport (GRI)	Grand Island	1,750	2%	607	1%
Kearny Regional Airport (EAR)	Kearny	787	1%	560	1%
Western Nebraska Regional Airport (BFF)	Scottsbluff	401	<1%	368	1%
North Platte Regional Airport (LBF)	North Platte	323	<1%	309	<1%
McCook Ben Nelson Regional (MCK)	McCook	8	<1%	137	<1%
Lincoln Airport (LNK)	Lincoln	64	<1%	12	<1%
Total		**78,823**	**100%**	**75,757**	**100%**

Source: BTS T-100 Market, 2019.

The top metropolitan markets for Nebraska air cargo, measured by traffic into and out of each city's primary airport are shown in Figure 5.28. Generating over 20,000 tons of air cargo, Memphis, home to the largest air cargo hub in the United States, and Louisville, together account for nearly 75 percent of Nebraska air cargo trade. Additional top trading partners include other central and Midwest regional and national United States markets.

FIGURE 5.28 TOP 5 AIR CARGO TONNAGE TRADING MARKETS TO & FROM NEBRASKA AIRPORTS, 2019

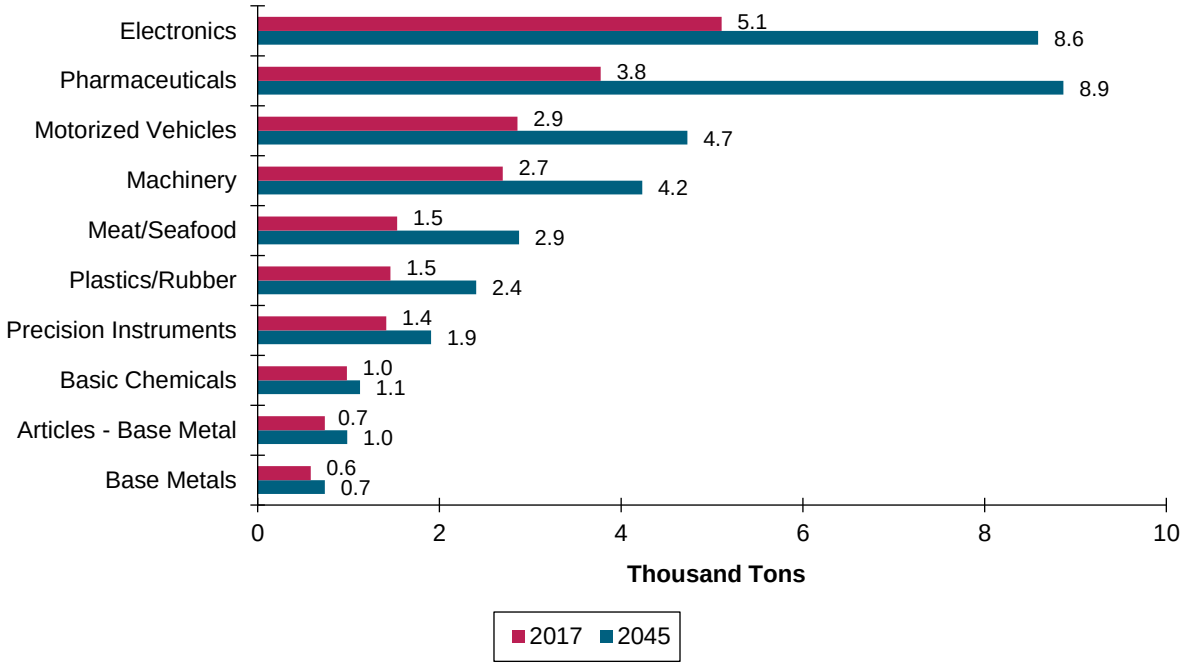


Source: BTS T-100 Market.

The breakdown of top commodities transported by air in 2018 are shown in Figure 5.29. These totals are also projected out through 2045. Electronics and pharmaceuticals are the top commodities, each accounting for more than 3,000 tons of traded goods in 2019. This is expected given the characteristics of

these products as value-added and refined items. Given the strength of Nebraska's agricultural and food production economy, meats are also considered to be a top commodity transported by air. Through 2045, sizable increases in tonnage are expected across each of the top commodities. At nearly 9,000 tons expected in 2045, pharmaceuticals are expected to be the top air cargo commodity by tonnage in the upcoming decades. These trends are also expected when measured by value.

FIGURE 5.29 NEBRASKA TOP AIR FREIGHT COMMODITIES BY TONNAGE, 2018—2045



Source: Bureau of Transportation Statistics FAF5 data; Cambridge Systematics analysis.

Condition and Performance

Condition and performance of the statewide air cargo system primarily relates to the age and infrastructure of the state's airport facilities. In addition, workforce shortages, air shipping rates, and new advances in relation to unmanned aerial systems (UAS) and unmanned aerial vehicles (UAV) have the potential to further influence air cargo performance trends.

Aging Infrastructure

There is a continuous need to maintain, rehabilitate, and modernize aviation facilities throughout the state and Nation to meet the growing demand for air cargo and passenger services. A survey by Airports Council International in 2019 estimated that airports in the U.S. will require more than $128 billion in infrastructure upgrades by 2023.[75] Inadequate airport infrastructure makes air cargo transportation less efficient, reliable, and competitive relative to other freight transportation modes, and can limit or restrict economic growth opportunities in the state. New investments can help local communities attract new air carriers, increasing competition and leading to lower shipping costs. Capital improvement funding for

[75] https://airportscouncil.org/wp-content/uploads/2019/02/2019TerminallyChallenged-Web-Final.pdf

airports in the U.S. is administered by the Federal Aviation Administration via the Airport Improvement Program (AIP) and other programs on an annual basis.

Aviation Workforce Shortage

Workforce shortages came to the forefront of transportation issues during the COVID-19 pandemic and have persisted even as economic conditions have largely returned to pre-pandemic levels. The aviation industry has historically relied on a skilled and specialized labor pipeline from former military personnel, which is itself a declining labor pool, further magnifying workforce shortages within the aviation industry in particular when compared to other modes. Air cargo operations also depend on landside warehousing and distribution. Warehousing and fulfillment establishments have especially struggled to recruit and retain staff in a physically demanding environment with low wages. Trucking and distribution companies have similarly suffered from extreme demands during the pandemic, compounding the chronic driver shortage. Nebraska falls within the Kansas City District of the Federal Reserve, where the Beige Book report on economic conditions has cited businesses reporting increasing difficulties recruiting for entry-level and low-skill positions despite efforts to increase pay and improve benefits.[76]

Other Performance Trends and Opportunities

Even after the initial shocks of the COVID-19 pandemic wore off, air shipping rates have continued to be unstable, compounded by the impact of the Russia-Ukraine conflict. Such rates are highly relevant to total air freight volumes, given that they are a key factor in shipper mode selection. Air freight rates continue to be inflated as passenger aircraft belly-cargo capacity remains restricted, and the introduction of new aircraft into the market is slow. Sentiment in the air cargo industry indicates rates are expected to continue to increase in the near term, but surcharges from cargo carriers are likely due to network disruptions, surging fuel prices and the war in Ukraine. FedEx is one notable operator to recently apply such surcharges to most of their shipments.[77]

In relation to the deployment of UAS and UAVs, the FAA conducted a series of pilot programs with nine implementation partners throughout the Nation from 2017 to 2020 in its Integration Pilot Program (IPP). This program transitioned to the BEYOND program in October 2020, and eight of the nine IPP participants are continuing to explore UAS challenges. The BEYOND program focuses on Beyond Visual Line of Site (BVLOS) operations, leveraging industry operations, and focusing on community engagement. Several participants in the pilot program have explored package delivery in rural, suburban, and urban settings. Kansas DOT (KDOT) was one of the participants; initially focusing on rural communities, KDOT is now focusing on using the technology for public safety operations, including those dealing with pandemic and disaster relief, proper infrastructure and certification support, and developing real-time UAS data. These insights can serve as a resource for NDOT.

[76] Federal Reserve, Beige Book February 16, 2022. https://www.federalreserve.gov/monetarypolicy/files/BeigeBook_20211020.pdf

[77] Abdel Aziz, Rami. “4 Key Air Cargo Trends to Watch for in 2022.” IBA, March 21, 2022. https://www.iba.aero/insight/4-key-air-cargo-trends-to-watch-for-in-2022/.

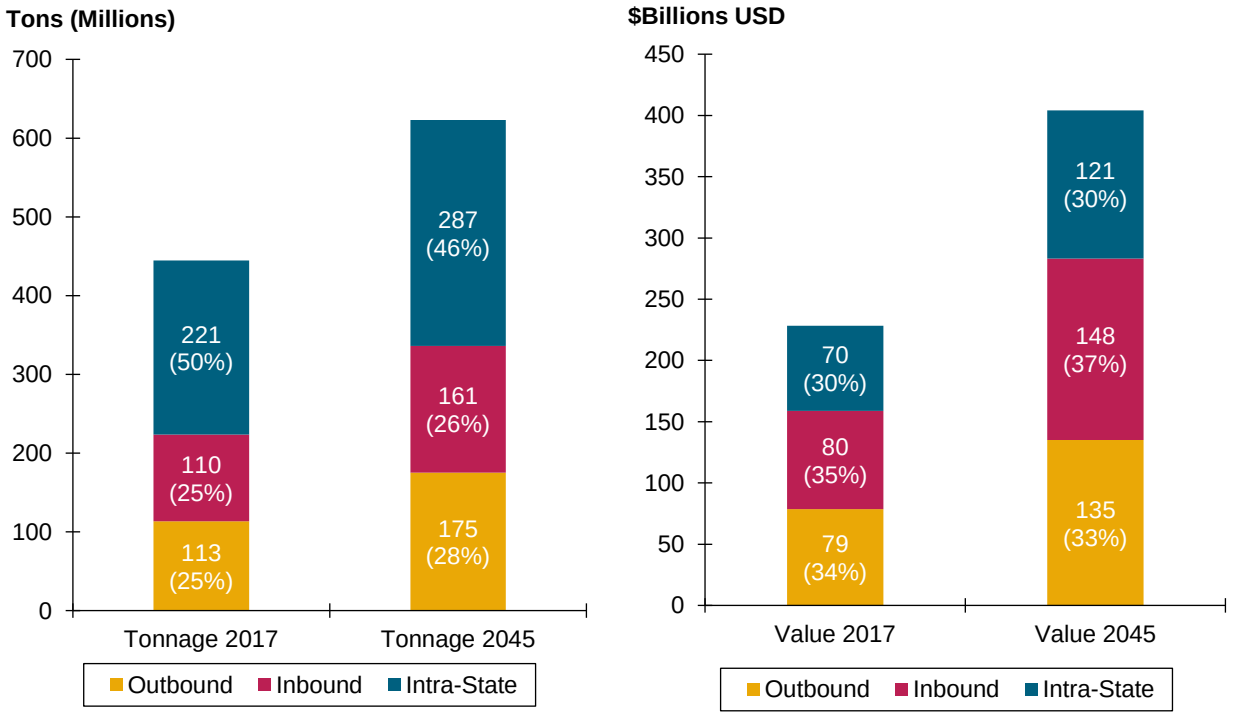
6.0 Freight Demand and Forecasts

Freight demand and forecasting establishes a baseline understanding of freight activity across the highway, railroad, pipeline, waterway, and air cargo system, and gives insights into the future economic development for Nebraska, including shifting modal usage, trading partners, and commodities.

6.1 Big Picture

In 2017, more than 444 million tons of goods valued at $228 billion moved to, from, and within Nebraska on its multimodal freight network. By 2045, the overall freight demand by weight is projected to increase by 44 percent, representing more than 623 million tons of goods. The overall freight demand by value is expected to increase at an even higher rate, a 77 percent increase by 2045 valued at $404 billion. Nebraska has a healthy, growing economy, with the higher value of freight demand in 2045 reflecting major trends discussed in the Multimodal Freight Trends, Needs, and Opportunities Chapter, including growing advanced manufacturing sectors and shifting consumer preferences towards e-commerce. Figure 6.1 shows the overall growth by tonnage and value, broken down by directional split. Inbound movements are expected to take up a larger share of future freight movements by both tonnage and value. Outbound movements comprise an even larger share of freight by tonnage, although they represent a smaller share of the overall value in 2045. Intrastate freight movements, which are those that originate and terminate within Nebraska, continue to be the largest source of tonnage movements in 2045.

FIGURE 6.1 FREIGHT FLOWS BY DIRECTION, 2017 AND 2045

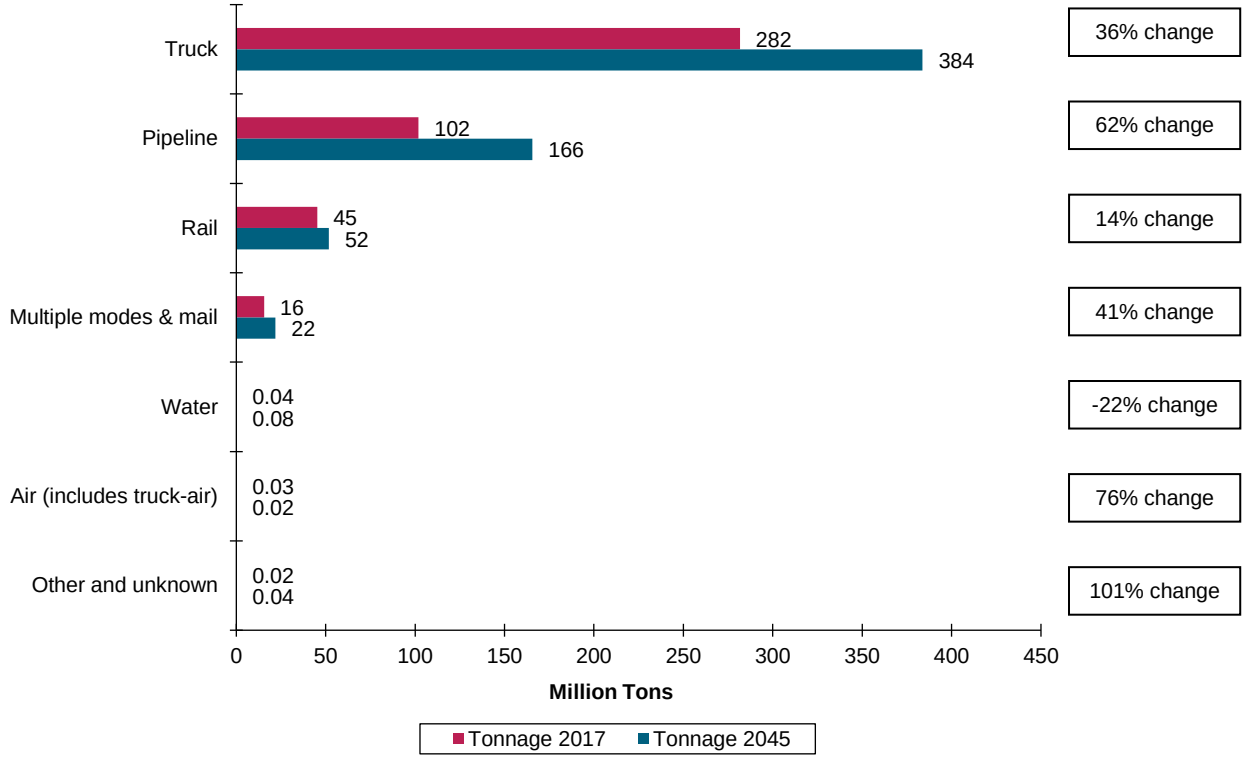


Source: Freight Analysis Framework Version 5; STB Confidential Waybill Sample.

6.2 Future Freight Flows

The majority of Nebraska's freight tonnage in 2017 was moved by trucks, comprising 63% percent of all freight tonnage move in the state or 282 million tons. Truck is projected to be the major mode of transportation in 2045 as well, moving 384 million tons or 62 percent of total freight. Pipeline is the second leading mode accounting for 23 percent (102 million tons) in 2017 and projected to account for 27 percent (166 million tons) in 2045. Figure 6.2 shows freight tonnage for all mode in 2017 and 2045. Together truck, pipeline, and rail modes account for 97 percent of freight tonnage in 2017 and 2045. The growth in each mode, shown to the right in Figure 6.2, shows that nearly are modes are expected to grow significantly. However, pipeline, multiple modes & mail[78], and air are expected to grow at much higher rates. Water freight movements are the only mode projected to grow smaller by 2045.

FIGURE 6.2 NEBRASKA MODE SHARE BY TONNAGE 2017 & 2045



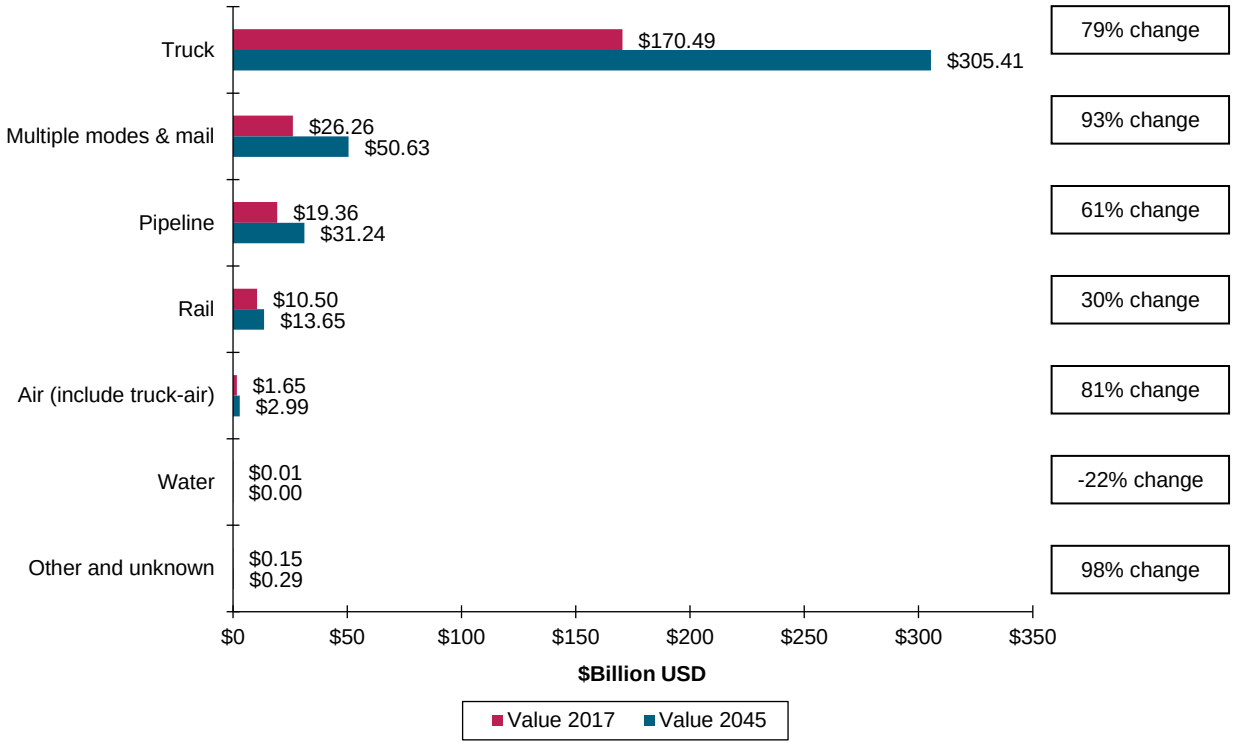
Source: Freight Analysis Framework Version 5; STB Confidential Waybill Sample.

Figure 6.3 represents freight value by mode in 2017 and 2045. Truck by value represents an even greater share of overall freight movements in 2017 moving 75 percent of freight movements by value or $170 billion of goods. In 2045, truck freight movements by value will represent 76 percent of all freight

[78] FAF and the Commodity Flow Survey (CFS) use Multiple Modes and Mail rather than intermodal to represent commodities that move by more than one mode. Intermodal typically refers to containerized cargo that moves between ship and surface modes or between truck and rail, and repeated efforts to identify containerized cargo in the CFS have proved unsuccessful. Shipments reported as Multiple Modes can include anything from containerized cargo to coal moving from mine to railhead by truck and rail to harbor. The "Mail" component recognizes that shippers who use parcel delivery services typically do not know what modes were involved after the shipment was picked up. More information available: https://www.bts.gov/sites/bts.dot.gov/files/2021-02/FAF5-User-Guide.pdf

movements by value or $305 billion. Multiple modes & mail represent a much larger share of freight movements by value than tonnage being the second largest mode in 2017 and 2045 or 12 percent ($26 billion) and 13 percent ($50 billion) of freight value respectively. Pipeline represents a much a smaller portion of the overall value compared to tonnage, nine percent ($19 billion) in 2017 and eight percent ($31 billion) in 2045. These three modes combined—truck, multiple modes & mail, and pipeline—represent 95 percent of all freight value in 2017 and 96 percent in 2045. Figure 6.3 also shows the percentage change in the freight value moved by these modes between 2017 and 2045.

FIGURE 6.3 NEBRASKA MODE SHARE BY VALUE 2017 & 2045



Source: Freight Analysis Framework Version 5; STB Confidential Waybill Sample.

Table 6.1 shows the top commodities[79] in the state ranked by tonnage. Agricultural and energy products make up the entirety of the list, and many of these products are projected to remain top commodities in 2045 as well. Together these products represent 347 million tons or 78 percent of all freight movements by tonnage in Nebraska in 2017. These industries will continue to be key areas of focus for the state through 2045 with many of these products remaining in the top 5. Fertilizers which ranked lower in 2017 by tonnage – ninth overall – ranks fifth in 2045 (not shown in Table 6.1). In 2017, 11 million tons of fertilizer were moved on Nebraska freight network and 26 million tons are projected to be moved in 2045. This represents a 135 percent increase in tonnage. Other commodities with large percentage changes in tonnage between the base year and projection year include: live Animal and fish (181 percent), pharmaceutical products (181 percent), basic chemicals (162 percent), miscellaneous manufactured products (162 percent), and other chemical products and preparations (136 percent). These five products

[79] Commodities were summarized for the following discussion using SCTG 2 digit commodity codes. More information about the commodity code classifications is available via: https://bhs.econ.census.gov/bhsphpext/brdsearch/scs_code.html

only represent three percent (14 million tons) of the total tonnage in 2017 and six percent (39 million tons) in 2045 but represent growing sectors of Nebraska's future economy.

TABLE 6.1 TOP COMMODITY BY TONNAGE 2017 & 2045

Commodity	2017 Tonnage	2045 Tonnage	2045 Rank
Cereal Grains (including seed)	131,310,518 (30%)	134,075,428 (22%)	2
Other Coal and Petroleum Products, NEC	102,235,646 (23%)	167,435,641 (27%)	1
Animal Feed, Eggs, Honey, and Other Products of Animal Origin	38,567,695 (9%)	70,137,340 (11%)	3
Agricultural Products Except for Animal Feed, Cereal Grains, and Forage Products	25,530,534 (6%)	27,028,231 (4%)	4
Other Prepared Foodstuffs, Fats and Oils	17,777,281 (4%)	24,243,118 (4%)	6

Source: Freight Analysis Framework Version 5; STB Confidential Waybill Sample.

Table 6.2 shows top commodities by value for 2017. Most commodities representing the highest freight values in 2017 are agricultural and energy products and many of these products remain top ranked commodities by value in 2045. Mixed freight refers to generic (often containerized) shipments of goods, often to warehouses and distribution centers, which may include a variety of consumer goods including items for grocery and convenience stores, supplies and food for restaurants, hardware or plumbing supplies, and office supplies, among other similar types of products. Table 6.2 represents 49 percent of all freight value in Nebraska in 2017 and 2045 or $113 billion and $200 billion respectively. The overall rank of cereal grain (including seed) is expected to decline in 2045 and is projected to be replaced in ranking by motorized and other vehicles (including parts). This commodity ranked sixth in 2017 and will rank fifth in 2045 accounting for five percent ($20 billion) of the overall freight value.

TABLE 6.2 TOP COMMODITIES BY VALUE 2017 & 2045

Commodity	2017 Value	2045 Value	2045 Rank
Meat, Poultry, Fish, Seafood, and Their Preparations	$28,478,516,165 (12%)	$41,022,209,982 (10%)	2
Live Animals and Fish	$24,740,530,161 (11%)	$69,336,322,094 (17%)	1
Other Coal and Petroleum Products, NEC	$19,929,163,481 (9%)	$32,741,804,549 (8%)	3
Cereal Grains (including seed)	$14,553,779,028 (6%)	$14,910,531,896 (4%)	11
Mixed Freight	$13,114,593,130 (6%)	$21,881,716,697 (5%)	4

Source: Freight Analysis Framework Version 5; STB Confidential Waybill Sample.

Nebraska's top trading partners by tonnage are shown in Table 6.3 for 2017. The top trading partners tend to be neighboring or nearby states such as Iowa directly to the East and connected by Nebraska one major interstate I-80 and Kansas directly to the south. All of the top trading partners in 2017 remain top trading partners in 2045. Table 6.4 shows the top trading partners by value in 2017. There are no differences in the rankings by tonnage or value, though Iowa takes a significantly larger share of overall freight when measured by value than when measured by tonnage.

TABLE 6.3 TOP TRADING PARTNERS BY TONNAGE 2017 & 2045

State	2017 Tonnage	2045 Tonnage	2045 Rank
Iowa	1,490,274 (26%)	4,153,984 (28%)	1
Kansas	1,332,030 (23%)	3,664,129 (25%)	2
Minnesota	1,135,527 (20%)	3,397,057 (23%)	3
Oklahoma	378,966 (6.5%)	519,897 (3.5%)	5
Colorado	294,734 (5.1%)	867,634 (5.9%)	4

Source: Freight Analysis Framework Version 5; STB Confidential Waybill Sample.

TABLE 6.4 TOP TRADING PARTNERS BY VALUE 2017 & 2045

State	2017 Value	2045 Value	2045 Rank
Iowa	$6,756,999,909 (47%)	$18,693,369,909 (49%)	1
Kansas	$2,304,949,994 (16%)	$6,434,879,994 (17%)	2
Minnesota	$1,468,129,987 (10%)	$4,387,999,987 (12%)	3
Oklahoma	$1,414,899,945 (10%)	$4,182,599,944 (11%)	5
Colorado	$381,679,938 (3%)	$964,119,938 (3%)	4

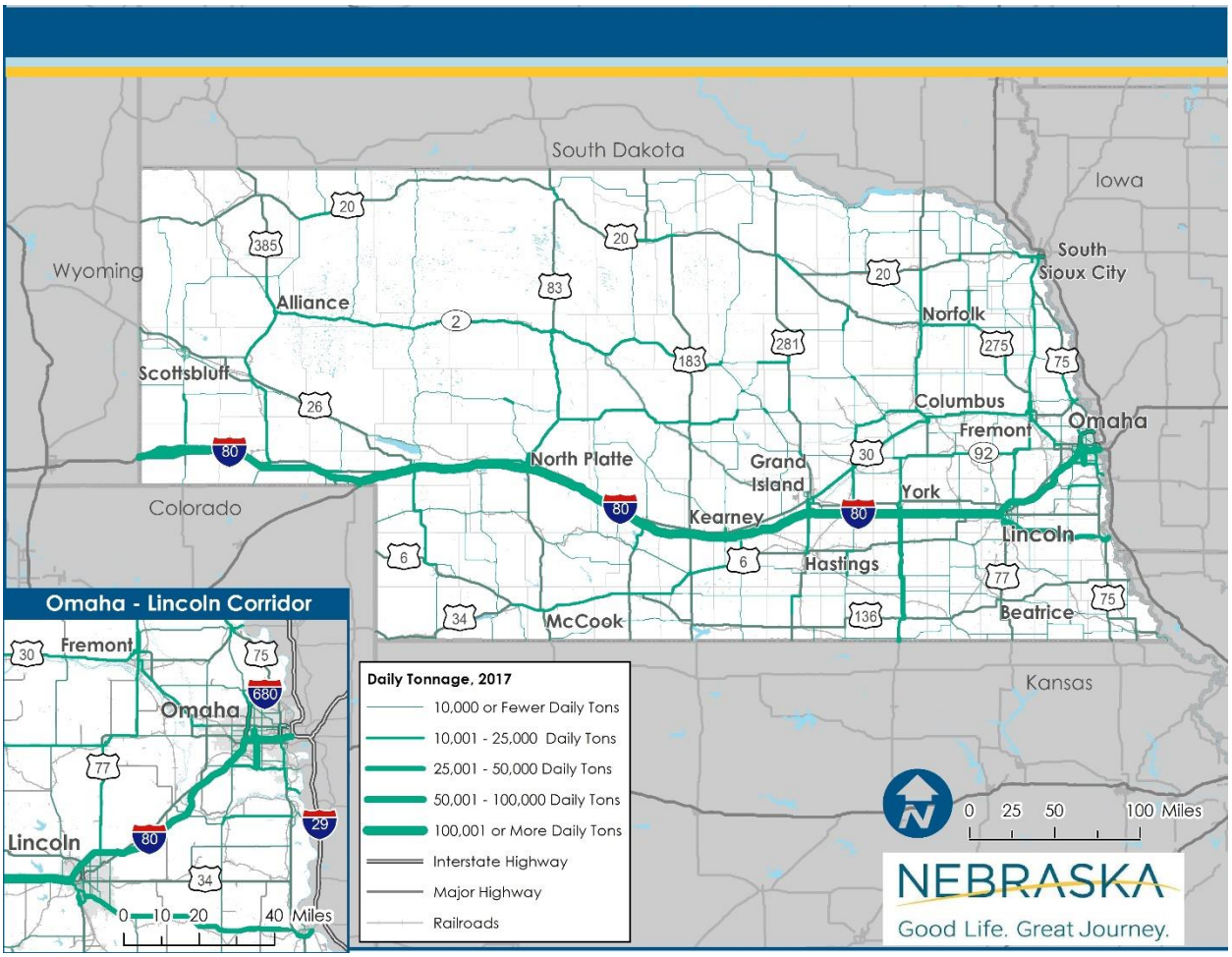
Source: Freight Analysis Framework Version 5; STB Confidential Waybill Sample.

6.3 Highway Freight Demand by Corridor

NDOT has worked to improve the understanding of freight movements across the state through investments in data and tools. One of those investments has been the Optimized Commodity Flow Tool. This tool builds on the work of the detailed domestic commodity flows detailed in Nebraska Supply Chain Optimization Model (NESCOM) database and provides a tool for estimating the value and weight of commodities using each roadway segment on the state highway system. The tool allows for a range of potential uses and investigations, including comparing freight values and flows on two different potential projects, “what if” scenarios on the impacts of highway or bridge closures and where commodity flows would reroute, and data support for grant applications.

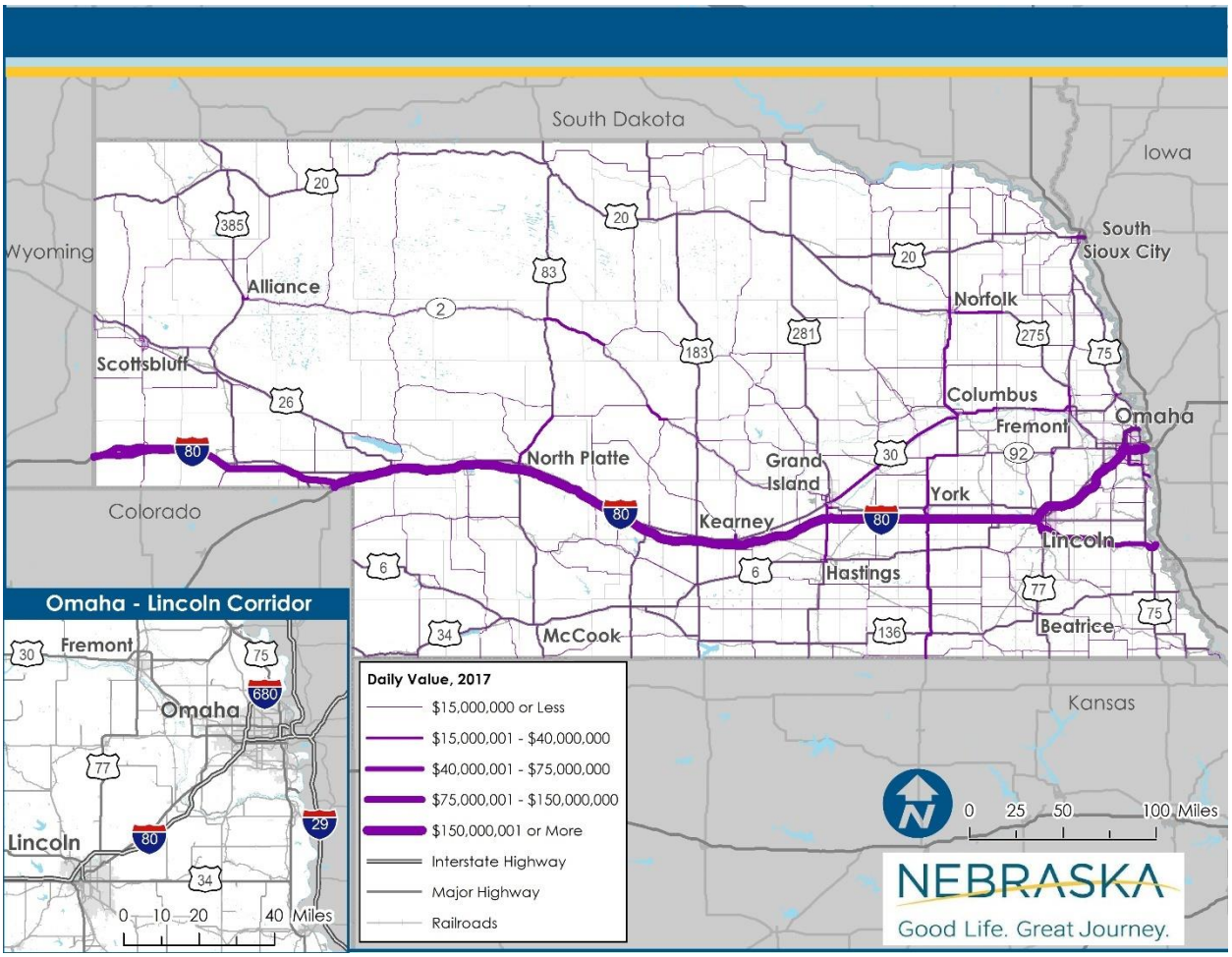
NDOT’s condition and performance data shows that I-80 handles a high share of overall freight flows, and an analysis of the Freight Analysis Framework (FAF5) data in relation to the state’s highway network confirms that – in terms of tonnage and value – I-80 is the dominant corridor across the state highway system. Figure 6.4 shows the results of the FAF5 assignment in terms of tonnage, while Figure 6.5 shows the results in terms of value. I-80 represents an important connector to businesses in surrounding states, in addition to connecting the state’s industries to domestic and international markets. However, it is evident that other corridors provide important connectivity to I-80, including U.S. 80 south of York, Highway 2 east of Lincoln, and I-480 in Omaha.

FIGURE 6.4 HIGHWAY FREIGHT DEMAND BY CORRIDOR, TONNAGE (2017)



Source: Freight Analysis Framework Version 5

FIGURE 6.5 HIGHWAY FREIGHT DEMAND BY CORRIDOR, VALUE (2017)



Source: Freight Analysis Framework Version 5

7.0 Multimodal Freight Trends, Needs, and Opportunities

Nebraska's primary freight modes of highway, rail, air, and water each have their own unique operating characteristics, commodities and markets served, and investment needs in order to maximize efficiency, productivity, and growth potential. This Chapter summarizes the major global and macroeconomic trends that have the strongest potential to impact freight activity in Nebraska, as well as the needs and opportunities identified for each freight mode, including multimodal policy needs and opportunities. This section also presents the freight performance measures that NDOT commits to track in order to monitor the performance of the freight transportation system, ensure objectives and goals are met, and identify freight bottlenecks and constraints.

7.1 Trends

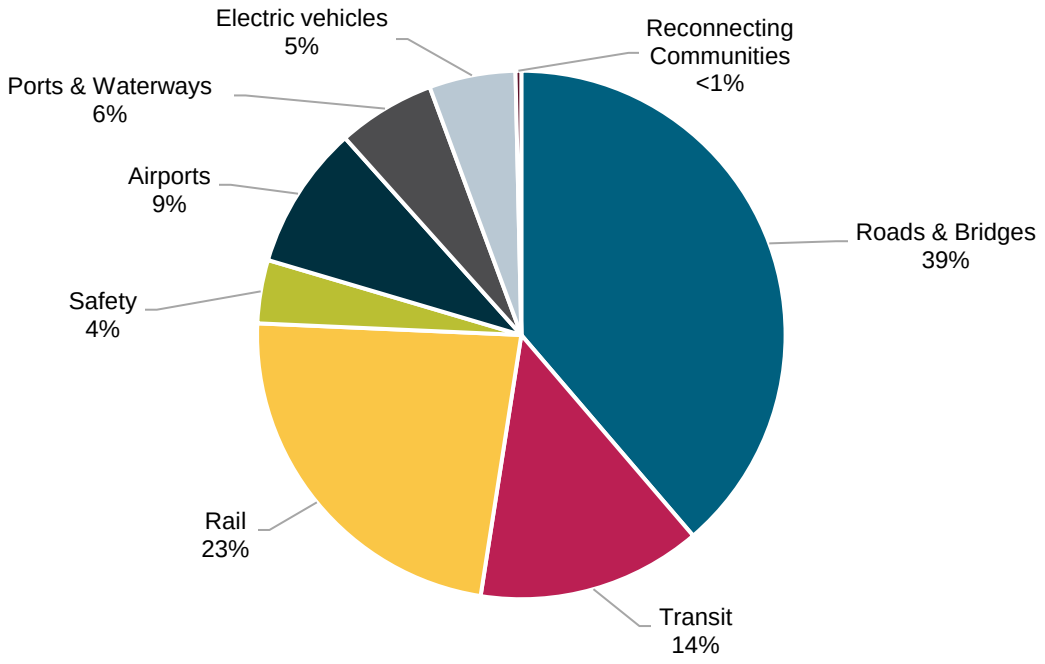
This section identifies and expands on key macroeconomic trends and the potential impacts on national and statewide freight flows and infrastructure updates. This includes an assessment of a broad range of topics and current events, including Federal policy, regulations, automation and technology, the COVID-19 pandemic, as well as related supply chain implications. Insight for each of these sections is drawn from a wide variety of sources including recently published documents, news articles, and publications.

Federal Policy

On November 15, 2021, the Infrastructure Investment and Jobs Act (P.L. 117-58)[80] was signed into law, officially enacting the Bipartisan Infrastructure Law (BIL). Over the next five years (FY2022- 2026), IIJA will provide $973 billion in funding, of which $550 billion is allocated for new investments in all modes including transportation, water, power and energy, environmental remediation, public lands, broadband and resilience. IIJA was also crafted to improve supply chain resiliency and efficiency, with funds dedicated towards upgrading, repairing, and rebuilding roads bridges, ports, and airports to strengthen supply chains and reduce costs, improve U.S. competitiveness, reduce emissions. Funds will also be used to increase investments in freight rail and intermodal infrastructure to improve long-distance inland goods movement and make supply chain infrastructure resilient against the impacts of climate change, cyber-attacks, and extreme weather events. The modernization of transportation infrastructure is a key component of the new investment funding, with $284 million directed towards modernizing and making improvements across all modes of transportation. Figure 7.1 shows the breakdown of funding by mode under IIJA.

80 https://www.congress.gov/bill/117th-congress/house-bill/3684/text/eas

FIGURE 7.1 FUNDING ALLOCATIONS UNDER THE INFRASTRUCTURE INVESTMENT AND JOBS ACT



Source: National Association of Counties

To achieve these objectives, several of the grant programs under IIJA will have a direct impact on the freight transportation**.** Table 7.1Table 7.3 identifies key funding programs dedicated to funding freight transportation projects.

TABLE 7.1 SELECT GRANT AND FORMULA FUNDING PROGRAMS FOR FREIGHT TRANSPORTATION PROJECTS

Program	2022 Funding Authorization	Description
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	$1.5 Billion	Supports a wide range of surface transportation projects of local and/or regional significance.
Infrastructure for Rebuilding America (INFRA)	$1.53 Billion	Provides funding to state and local governments for projects of regional or national significance, with a focus on freight needs. IIJA also raises the cap on multimodal projects to 30% of program funds.
Mega Projects	$1.0 Billion	Similar to RAISE and INFRA grants, Mega grants support a wide range of transportation projects, with emphasis on particularly large and complex projects.
Promoting Resilient Operations for Transformative, Efficient, and Cost-Savings Transportation (PROTECT)	$1.4 Billion (FY22-26)	Supports resilience improvements to protect surface transportation assets, including highway projects, and port facilities.
Consolidated Rail Infrastructure and Safety Improvements Program (CRISI)	$1.43 Billion	Supports projects that improve safety, efficiency, and reliability of intercity passenger and freight rail.

Program	2022 Funding Authorization	Description
Bridge Investment Program	$2.4 Billion	Authorizes funding to reduce the number of national bridges in 'poor' condition or in 'fair' condition at risk of falling into 'poor' condition.
Port Infrastructure Development Program	$450 Million	Authorizes funding to upgrade nationwide ports with an emphasis on addressing resiliency and reducing pollution.
America's Marine Highways (AMH)	$25 Million	Supports concepts for new services or expansion of existing Marine Highways, including port and landside infrastructure development.
Airport Improvement Program	$1.5 Billion	Provides grants for the planning and development of public-use airports, including for cargo-related uses.
Railroad Crossing Elimination Grant Program	$500 Million	Provides funding for the elimination or improvement of highway-rail grade crossings.
Rural Surface Transportation Grant Program	$300 Million	Improve and expand surface transportation infrastructure in rural areas to increase connectivity, improve safety, and support the movement of people and freight, in order to generate regional economic growth.
Reconnecting Communities Pilot Program—Planning Grants and Capital Construction Grants	$195 Million	Supports planning grants and capital construction grants, as well as technical assistance, to restore community connectivity through the removal, retrofit, mitigation, or replacement of eligible transportation infrastructure facilities. This includes studying the impacts related to freight mobility.

Source: National Association of Counties.

In a U.S. DOT news release[81], it was reported that Nebraska can expect to receive approximately $2.2 billion over the next five years in Federal highway formula funding for highways and bridges. This amount is approximately 31 percent greater than the average annual State Federal-aid highway formula under the previous law. Nebraska can also expect to receive approximately $48 million over five years in formula funding to reduce transportation-related emissions, in addition to about $55 million over five years to increase the resilience of its transportation system.

Impacts of COVID-19

The impact of the COVID-19 pandemic continues to have far-reaching consequences for global, national, and local supply chains. The early phases of the pandemic were characterized by strong disruptions in freight transportation and economic activity, followed by rapid upswings in demand as travel restrictions and initial lockdowns were lifted. According to the U.S. International Trade Commission[82], in early 2020 the COVID-19 pandemic interrupted global maritime shipping and air freight services, leading to canceled sailings and flights, port delays, and container shortages. These disruptions had implications for international shipping rates and delivery times. As travel restrictions were relaxed, overall commodity and

81 https://www.transportation.gov/sites/dot.gov/files/2022-01/BIL_Nebraska.pdf

82 https://www.usitc.gov/research_and_analysis/tradeshifts/2020/special_topic.html#:~:text=Beginning%20in%20early%202020%2C%20the,imports%20originating%20from%20Northeast%20Asia.

product supply was unable to keep pace with the upsurge in demand, resulting in exacerbated choke points within supply chains.

Issues of elevated demand and exacerbated supply chain choke points continued into 2021. In direct relation to Nebraska, which is second in the Nation in commercial red meat production at nearly 8 million pounds annually[83], the meat and poultry industry was suddenly thrown into the national spotlight. Risks in relation to the hyper-concentration of production by a small number of firms, ability to attract workers, and continuing risks of COVID-19 sickness to workers in confined spaces and the resulting impacts to production were particularly evident

Through 2022, the global impacts of the COVID-19 pandemic have contributed to increased inflation. National inflation, measured by the Consumer Price Index (CPI), reached a near four-decade high of 9.1 percent from a year ago in June.[84] These issues of inflation are highly complex. Although COVID-19 cases are occurring at reduced levels of severity in comparison to 2020 and 2021, the disruptions caused by the initial shock of the pandemic still persist. The most significant example of this is in relation to energy. During the sudden plunge in demand and economic activity occurring in the first half of 2020, the number of rigs drilling for oil across the U.S. plunged by more than 70 percent. Even as overall demand and economic activity have rebounded to pre-pandemic levels, the number of rigs drilling for oil remains down by nearly 30 percent compared to December 2019 levels.[85] The primary reason for the reluctance to increase drilling appears to be prudence in relation to the deployment of capital, especially as talks of a recession in 2023 arise. Secondary reasons also include environmental and social governance pressures, lack of access to financing, and Government regulations.[86] Further contributing to these issues are the geo-political ramifications of the Russia-Ukraine conflict, which have resulted in further increases in energy, steel, and grain prices, and a dispute between U.S. rail carriers and labor unions that nearly resulted in a national labor strike in September 2022.

Although June CPI numbers rose at a slower pace month-over-month, inflation continues to be of concern in Nebraska and nationally, into the second half of 2022. These elevated prices have also begun to raise the risks of possible reductions in economic activity, and recession fears into 2023. Additionally, while COVID hospitalizations remain low, current variants are proving to be highly transmissible. On the other hand, the labor market continues to remain strong. Between July/August 2021 and July/August 2022, every region of Nebraska saw reductions in unemployment rates[87], and in August 2022 Nebraska's unemployment rate was 2.1 percent, significantly lower than the national unemployment rate of 3.7 percent.[88] Additionally, although layoffs and hiring freezes have started to appear in the technology sector, particularly in the financial technology and cryptocurrency industries, these layoffs appear to be largely focused within tech hubs such as Silicon Valley, and follow previous trends of overly aggressive hiring for highly speculative positions.[89] Furthermore, employment in nearly every other industry, especially those most relevant within Nebraska, appears to be extremely strong.

83 https://nda.nebraska.gov/promotion/feature/2021-VII-COVID-Playbook.pdf

84 https://www.cnbc.com/2022/07/13/inflation-rose-9point1percent-in-june-even-more-than-expected-as-price-pressures-intensify.html

85 https://www.forbes.com/sites/rrapier/2022/03/27/oil-companies-have-increased-drilling-by-60-in-one-year/?sh=ff81a0915560

86 https://www.cbsnews.com/news/oil-production-prices-us-companies-wont-increase-2022-dallas-fed-survey/

87 https://www.dol.nebraska.gov/webdocs/Resources/Trends/August%202022/Regional%20Summaries.pdf

88 https://www.dol.nebraska.gov/Infolink

89 https://techcrunch.com/2022/07/09/data-shows-who-has-been-hit-the-hardest-in-the-great-tech-layoff-wave/

Trucking Regulations

Two related issues have heavily influenced recent trucking regulations: COVID-19 and the supply chain crisis. In response to COVID-19 impacts, the Federal Motor Carrier Safety Administration (FMCSA) activated an emergency declaration in March 2020, which lasted through October 2022. The FMCSA emergency declaration granted relief from Federal Motor Carrier Safety Regulations Part 395.3, the maximum driving time for property-carrying vehicles, with certain restrictions. The waiver was applicable to motor carriers engaged in "direct assistance in support of relief efforts" for immediate restoration of essential services, such as medical care, or essential supplies such as vaccines, related to COVID-19 outbreaks during the national emergency.

TRUCKING INDUSTRY LABOR CHALLENGES

In Nebraska, there are about 68,000 trucking industry jobs—or 1 in 12 jobs in the state—supporting 7,550 trucking companies.[90] Nebraska, like the rest of the U.S., faces many of the same issues present the trucking industry, including a lack of skilled drivers, retention of existing drivers, and truck driver quality of life issues.

To address supply chain disruptions, truck driver retention and recruitment has been an underlying issue that has been amplified during the recent crisis. According to FMCSA 2021 press release[91], for large trucking companies, driver turnover rates between companies and out of the industry for long haul drivers are over 90 percent annually. To manage supply chain bottlenecks while maintaining minimum truck driving standards, regulators have taken the following actions, but it remains to be seen what the impacts of these actions will be[92]:

- The **Apprenticeship Pilot Program for Under-21**[93] will allow 18-20-year-old CDL holders to cross state lines after extensive training. The program will consist of two probationary periods (120 hour and 280 hours). For both, a minimum number of driving hours must be with an experienced driver and meet performance benchmarks. The commercial vehicles must also be equipped with specific vehicle safety technology.

- **Entry-Level Driver Training (ELDT) requirement** require that all entry-level drivers of commercial motor vehicles receive training from a qualified provider. These regulations set the baseline for training requirements for entry-level drivers. The ELDT regulations and the Training Provider Registry were mandated under the Moving Ahead for Progress in the 21st Century Act (MAP-21).

Automation

Automation in industrial and manufacturing sectors is not a new phenomenon but has historically led to tension between increasing productivity for firms and displacement of workers previously responsible for certain tasks. Oftentimes, automation creates as many jobs as it eliminates over time; as machines increase productivity, the cost of those goods and services declines, allowing consumers to spend more, which often leads to the creation of more jobs. However, since the 1980s digital automation has contributed to labor market equality. While new well-paid, highly technical and specialized jobs have been created by this shift, other new types of service sector jobs pay much lower wages. Overall, workers who

90 https://www.nebtrucking.com/industry-facts/

91 https://www.fmcsa.dot.gov/newsroom/fmcsa-deputy-administrator-meera-joshi-convenes-meetings-midwest-discuss-truck-driving-and

92 https://prepass.com/2022/01/03/whats-ahead-for-trucking-regulations-in-2022/

93 https://prepass.com/2021/11/23/infrastructure-bill-whats-in-it-for-trucking/

can complement the new automation practices often benefit from higher wages, while workers performing similar tasks to machines that are eliminated entirely are generally left worse off.[94]

In recent years, the agriculture sector has been transformed by automation. The agriculture sector, more so than most industries, is particularly vulnerable to external, uncontrollable forces such as weather, pests, disease, and floods/droughts. These risks put pressure on profit margins, which are already thin relative to many other industrial markets. Workforce challenges exacerbated by COVID-19 have also impacted agricultural producers and made operations increasingly challenging. The U.S. Department of Agriculture (USDA) has recognized this challenge for U.S. growers, and between 2008 and 2018 it invested $287.7 million in 213 research projects that developed or enhanced the use of automation or mechanization in specialty crops, including machine learning, data analysis, drones, and sensors. Three of the most notable automation trends for agriculture include: [95]

- **Automated farm machinery** refers to “driverless” tractors to perform essential farming functions. These vehicles help reduce costs and improve yields via row-to-row accuracy and precise operations.

- **Drones** allow farms to automate certain tasks performed over huge tracts of land, including pesticide spray applications, crop inspections, and mission planning for crop protection. These devices can take on tasks that have been traditionally labor-intensive, reducing the number of workers needed to perform these same tasks while increasing speed and efficiency.

- **Vertical farming and greenhouse robotics** allows increased scalability in agriculture by constructing indoor farms that stack on top of each other. Automated technologies handle water, fertilizer, and monitoring of crops on a fraction of the land traditionally required for the same crop yield. These climate-controlled facilities also enable crops to be grown all year long rather than seasonally. Some of these facilities are also utilizing robotic picking technology to reduce waste from picking and reduce the number of workers required.

In September 2022, the Nebraska Innovation Campus in Lincoln was awarded $25 million by the U.S. Commerce Department as part of the $1 billion Build Back Better Regional Challenge, which is a program to "rebuild regional economies, promote inclusive and equitable recovery, and create thousands of good-paying jobs in industries of the future." These funds will help establish the Heartland Robotics Cluster and help Nebraska become a national leader in automation and robotics, led by Invest Nebraska and includes participation by the University of Nebraska-Lincoln College of Engineering, Northeast Community College, Metro Community College, Nebraska Innovation Studio, the Nebraska Manufacturing Extension Partnership and The Combine.[96] Because Nebraska’s unemployment rate has been so low, and workers are increasingly harder to come by, automation, robotics, and advanced manufacturing solutions can help produce more with fewer resources. The goal of this effort will be to support workforce development in these areas and allow manufacturers and agribusinesses to remain competitive.

94 https://www.brookings.edu/blog/up-front/2022/01/19/understanding-the-impact-of-automation-on-workers-jobs-and-wages/

95 https://www.automate.org/industry-insights/agtech-automation-of-agriculture

96 https://norfolkdailynews.com/commentary/once-worried-about-in-economic-development-circles-automation-now-is-nebraska-s-best-hope/article_142102b8-32a3-11ed-a01c-3f482e2e5da5.html

Technological Advances

Key technological advances have the opportunity to address and impact a number of pressing issues related to freight and logistics. In recent decades, the entire freight industry has rapidly evolved to serve the needs of a growing, and increasingly urbanized society that integrates smart phone devices and other forms of advanced communication into nearly every aspect of everyday life. On the other hand, a number of challenges remain. Issues such as roadway safety, excessive vehicular emissions, the ability to recruit sufficient and skilled drivers, as well as the need for innovative "last mile" delivery solutions, still persist. Technological advances in the fields of intelligent transportation systems, electric vehicles, and automated vehicles, may be able to play a significant role in addressing these issues in the upcoming years.

- **Intelligent Transportation Systems (ITS):** ITS is a broad term that refers to a wide range of sensing, analysis, control and communicative transportation technologies designed to improve safety, mobility, and efficiency. This includes a wide range of technologies and innovations ranging from dynamic highway messaging signs to smartphone payment or information systems.

  In relation to freight transportation, there is significant merit in these types of applications. Key examples include vehicle-to-vehicle and vehicle-to-infrastructure communication systems which can transmit useful information such as real-time truck parking availability or traffic data in relation to route selection. As an example of freight ITS implementation, the Texas Department of Transportation is currently advancing an initiative known as the Texas Connected Freight Corridors (TCFC), designed to further these technologies. Deployed along the Dallas—Houston—San Antonio 'Texas Triangle' of portions of Interstates 10, 35, and 45, TCFC is a public/private partnership focused on deploying these applications to improve safety and congestion.[97] The initiative includes deployment on over 1,000 vehicles, with a goal of collecting and transmitting data in relation to potential hazards, as well as to understand key driver and system needs.

- **Electric Vehicles:** Free of harmful tailpipe exhaust emissions, electric vehicles (EVs) are a potentially effective strategy for improving air quality and reducing fuel costs. Although medium- and heavy-duty trucks make up less than 5 percent of all vehicles on the road, they contribute more than a quarter of greenhouse gas (GHG) emissions.[98] Furthermore, given the current elevated prices of fuel, the cost to fill up a heavy-duty diesel truck in 2022 can easily exceed $1,000, leading to reduced profitability and increased consumer prices.[99]

  Previously hindered by exorbitant costs and limited battery capacity, advances in electric trucks are increasing the feasibility of large-scale implementation. In the U.S. there are multiple programs and initiatives designed to facilitate the deployment of electric vehicle infrastructure, including charging stations. A number of these are provided in Table 7.2Table 7.2[100]. In order to receive funding through the National Electric Vehicle Infrastructure (NEVI) formula program Nebraska developed a statewide NEVI plan, which was approved by FHWA in September 2022.[101] Nebraska will receive $6 million annually over a 5-year period to implement EV charging stations identified in the NEVI plan.

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97 https://www.txdot.gov/inside-txdot/division/traffic/freight-corridors.html

98 https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions

99 https://www.wdrb.com/news/business/louisville-truck-drivers-sound-alarm-on-rising-diesel-prices-as-shoppers-face-rising-costs/article_a08ba062-ec19-11ec-86ec-03a4d9669a27.html

100 https://www.transportation.gov/rural/ev/toolkit/ev-infrastructure-funding-and-financing/Federal-funding-programs

101 https://dot.nebraska.gov/media/117327/nebraska-dot-nevi-plan-final.pdf

Combined with private sector technological advances that will further lower costs capital costs of electric trucks, these programs have the potential to further advance overall market adoption of electric trucks.

TABLE 7.2 NATIONWIDE VEHICLE ELECTRIFICATION OPPORTUNITIES

Program	Funding Total	Description
Charging and Refueling Infrastructure Grant Program	$2.5 Billion	Focus on state and local governments, and MPOs, building alternative fuel corridors.
National Electric Vehicle Program (NEVI)	$5 Billion	For states to acquire, install, and maintain EV infrastructure.
Surface Transportation Block Grant (Reauthorized)	$72 Billion	Now includes vehicle charging infrastructure and vehicle-to-grid infrastructure.
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	$13.2 Billion	Now allows for funds to be used for micromobility and purchase of medium or heavy-duty zero emission vehicles and charging equipment.
Reducing Truck Emissions at Ports Program	$250 Million	Funds efforts at ports to look at electrification and emerging technology can reduce emissions from idling trucks.

Source: National Association of Counties

At the statewide level, coalitions and partnerships can further assist in the accommodation of electric trucks. Formed in 2021, Regional Electric Vehicle Midwest (REV Midwest) is a coalition of five Midwest states (Illinois, Indiana, Michigan, Minnesota, and Wisconsin) developed to accelerate electric vehicle charging infrastructure development. In specific relation to electric trucks, the coalition includes a coordinated effort to align state regulations and truck charging efforts.[102]

- **Automated Vehicles:** Automated vehicles (AVs) are a potentially effective method for addressing truck driver shortages, especially for long-haul transport, as well as “last mile” delivery needs, two complex issues impacting the nationwide freight system. Primarily spearheaded by the private sector in states with enabling testing and deployment, driverless trucks are being tested with the presence of an in-vehicle safety engineer to take over if needed. An example of this type of testing is a partnership between PACCAR, a large manufacturer of medium- and heavy-duty trucks, Aurora, an autonomous technology developer, and FedEx. Announced in 2021[103], the three-way partnership to launch a commercial pilot of autonomous trucks in linehaul operations is the first of its kind.

  With a focus on last mile solutions, personal delivery devices (PDDs) and drones/unmanned aircraft systems are increasingly being studied for package deliveries. PDDs such as FedEx’s Roxo and Amazon’s Scout are small, unmanned vehicles that can travel on sidewalks and deliver packages across short (up to approximately five miles) distances. Currently, these vehicles are being tested on

[102] https://www.michigan.gov/-/media/Project/Websites/leo/REV_Midwest_MOU_master.pdf?rev=6dd781b5a4eb4551b3b3a5b875d67fb9

[103] https://newsroom.fedex.com/newsroom/fedex-teams-up-with-aurora-and-paccar-to-test-autonomous-linehaul-technology/

sidewalks in varying cities across the U.S. to examine reliability and to identify/plan for potential hazards or unforeseen circumstances.[104] In the early stages of research, drones/unmanned aircraft systems are being studied for package delivery through the private and public sectors. Examples include Amazon's Prime Air, as well as research being conducted by Ohio Unmanned Aircraft Systems Center and the Texas Lone Star UAS Center of Excellence and Innovation of Texas A&M University.

Near-shoring

Over the past several decades, U.S. trade policy focused on supporting globalization, which allows businesses to buy and sell products more easily worldwide. Through the backing of free trade agreements, American companies took advantage of lower costs of labor in Asia and Latin America. Supply chains for even the most basic essential items became complicated. The shift away from transglobal trade began in recent years but intensified since the onset of the COVID-19 pandemic. It exposed major weaknesses in the supply chains for manufactured items, resulting in prolonged shortages of essential, needed items such as personal protective equipment. A global supply chain model prioritizes cost reduction, just-in-time production and forecasting methods that do not consider major disruptions such as a pandemic or other natural disasters. Reimagining supply chains that leverage local industries and transportation linkages could not only remediate the weaknesses exposed during the COVID-19 pandemic but could also increase jobs in manufacturing sectors and provide economic development opportunities for U.S. regions that are positioned to grow their advanced manufacturing base.[105]

The Infrastructure Investment and Jobs Act (IIJA) includes the Build America, Buy America Act. Guidance on application of the law includes an all-manufactured products in the U.S. represent more than 55 percent domestic production.[106] A permanent and more decisive policy shift would translate into diverse sourcing of commodities and products to protect U.S. supply chains. An increase in investment in domestic sourcing and/or localized manufacturing could generate increased demand from Nebraska-based firms, referred to as "near-shoring." This could result in increasing inbound and outbound freight flows relative to through-state flows, which currently comprise most freight movements in the state. Advanced manufacturing employment could increase, especially in metals manufacturing, which is already a strong sector in Nebraska. Demand for industrial space for new manufacturing or repurposed manufacturing sites could also increase. A strong workforce across agriculture, advanced manufacturing and transportation sectors may be essential as the state redefines its strengths to meet domestic demand for goods.

Other strategic policies already in place in Nebraska include Customized Job Training, which consists of grants that aim businesses selling products and/or services out of state, mostly associated with "manufacturing, processing, warehousing, distribution, and headquarters operations."[107] The Local Option Municipal Economic Development Act (LB840) provides funding from local taxes, and eligible industries include "manufacturing, research & development, processing, storage, transport, or sales of goods or commodities in interstate commerce."[108] Finally, international trade and investment is also favored by the State Trade Expansion Program (STEP). This program assists export-oriented small businesses by

[104] https://www.fedex.com/en-us/innovation/roxo-delivery-robot.html and https://www.aboutamazon.com/news/transportation/meet-scout

[105] https://www.brookings.edu/research/reshoring-advanced-manufacturing-supply-chains-to-generate-good-jobs/

[106] https://www.whitehouse.gov/wp-content/uploads/2022/04/M-22-11.pdf

[107] https://opportunity.nebraska.gov/programs/business/customized-job-training/

[108] https://opportunity.nebraska.gov/programs/community/lb-840/

providing grants to support their ways of sharing what they do to foreign audiences (through website design, showrooms, events, etc.).[109] Additional efforts from the state help overcoming prohibitive transaction costs for small exporters by centralizing the promotion of their activities, thus defusing hold-up problems (underinvestment).[110]

7.2 Needs & Opportunities

Nebraska's primary freight modes of highway, rail, air, and water each have their own unique operating characteristics, commodities and markets served, and investment needs. However, there are also common themes—including access, resiliency, and system enhancement—that are shared across certain modes, particularly for highways and railroads. Access is a critical component of an efficient freight network that meets the needs of businesses and industries. Access can be defined by a variety of factors, including actual physical access to a facility, access by a particular mode, or increased connectivity to reduce transport times. Increasing the resiliency of the freight transportation network helps to ensure that goods movement is reliable and can accommodate disruptions to the system. Disruptions can impact all modes, and in the cases of extreme weather or excessive, prolonged flooding, disruptions can impact surface transportation assets in addition to facilities, businesses, and residents located in or near the waterways system. In addition, there were other shared themes that address economic development opportunities, including new or expanded intermodal service in Omaha, leveraging air cargo services to spur new business, and potential future developments arising from the New Inland Port Authority Act. This section captures the findings gleaned from the individual modal profiles, stakeholder outreach, and industry research.

Highway Freight Needs & Opportunities

Nebraska's freight rail system needs were identified through a review of existing conditions, input gained from the Freight Advisory Committee (FAC), and the issues identified by the 2017 SFP. Identified highway freight issues include truck parking, safety, urban system connectivity and mobility, transportation technology, network resiliency, enhanced commodity data, and overweight and oversized vehicle permitting.

[109] https://opportunity.nebraska.gov/programs/business/step/

[110] https://governor.nebraska.gov/sites/governor.nebraska.gov/files/doc/press/FINAL%20International%20Strategic%20Plan%202018.pdf

Truck Parking

Truck parking continues to be an ongoing issue for Nebraska's freight highway system. This issue not only affects Nebraska but has also been impacting freight highway systems nationwide. A lack of truck parking nationally has been identified as a national issue by the American Transportation Research Initiative (ATRI), noting that a lack of truck parking has been named a top issue for the tenth year in a row.[111]

EXAMPLE OF TRUCK PARKING AT AN INTERSTATE REST AREA

Source: Freightwaves.com

Within Nebraska, the provision of public truck parking facilities has been difficult as the cost of building and maintaining these facilities, especially in rural areas, has resulted in NDOT being unable to plan an expansion of truck parking facilities. As such, the only public truck parking facilities within the state are found along Interstate 80, which is one of the Nebraska's most critical freight routes and sees the highest daily heavy truck volumes. 333 publicly provided truck parking spots were identified in the 2017 SFP.

Despite the limited public truck parking facilities, private investment has provided expanded truck parking facilities. Currently, a number of private truck parking facilities can be found throughout Nebraska. These facilities, which are mainly truck stops, often provide amenities such as food service, restrooms, and shower facilities in addition to fueling. These facilities offer an attractive location for truck operators to park and rest. The presence of these facilities presents an opportunity for NDOT to work with these private facility operators to collect data on facility location and available amenities, which can then be hosted online to aid truck operators in route planning to ensure they have access to truck parking facilities while complying with Federal hours-of-service regulations.

Recent Federal legislation authorizing the distribution of funding to states for the purpose of constructing electric vehicle charging infrastructure presents an opportunity for NDOT to identify locations for truck parking expansion. The Federal program includes a feature directly related to freight; the program requires state DOTs to designate national electric vehicle (EV) corridors that identify near- and long-term need for EV charging infrastructure that supports freight movements at strategic locations, includes the National Highway Freight Network and locations that facilitate the transfer of goods such as ports and intermodal facilities.[112] NDOT's National Electric Vehicle Infrastructure (NEVI) plan was accepted by U.S. DOT in September 2022.[113] NDOT could work with private industry on identifying locations to prioritize constructing EV charging infrastructure that supports the state's freight highway network while incentivizing investment in additional truck parking facilities.

[111] American Transportation Research Initiative, *Critical Issues in the Trucking Industry—2021*

[112] Federal Highway Administration, *National Electric Vehicle Infrastructure Formula Program*

[113] https://dot.nebraska.gov/travel/nevi/

Truck Safety

Highway safety is a major concern nationwide, with initiatives such as Vision Zero emphasizing the need to reduce severe crashes on our Nation's roadways. While Vision Zero is focused on all road users, the need to address highway safety for freight vehicles is a critical concern for Nebraska as these crashes often occur on higher-speed roadways and involve large vehicles, which increases the risk for crashes resulting in severe injuries or fatalities.

Truck safety continues to be a significant issue in Nebraska's urban areas, where higher traffic volumes correlate with more frequent accidents. As discussed in the Freight Highways Chapter, the top counties for fatal crashes during the 5-year period are all located along the Interstate 80 corridor, and many have at least one urban area. This highlights the need for proactive safety planning along the corridor.

Highway freight safety was a topic of discussion amongst the FAC as committee members commented on the intersection of planning and technology as an opportunity to improve safety conditions on the state's highway system. Specific input mentioned the need to improve information channels to aid truck operators on advanced warnings related to crash events, severe weather, and road conditions; through improving these information flows, better informed truck operators can be alert and plan for adverse conditions that pose potential safety risks.

Urban System Connectivity & Mobility

The need to support connectivity between local freight routes and the state's highway network has become more pronounced since 2017. Growth in Nebraska's metropolitan areas along with a rise in e-commerce has seen a spike in demand for a wide variety of goods. At the onset of COVID-19, retailers saw a sudden decrease in instore demand, with a consequent increase in online shopping. Carriers experienced an initial decrease in demand from business-to-business channels, with a consequent increase in demand from business-to-consumer and e-commerce channels. Rapid and substantial growth in e-commerce product orders and online food delivery demand has put increasing pressure on the last-mile delivery practices. Furthermore, growth in e-commerce demand and the build-out of the transportation and logistics systems to support that demand, have resulted in a competitive industrial real estate market, revealed land use compatibility issues at the local level, contributed to last-mile challenges such as congestion and curbside loading.

As e-commerce continues to reshape how people shop for goods and how those goods arrive to consumers, the need to provide highway freight connections and support mobility needs of trucks will continue to be a driving force in freight planning across the state of Nebraska. Large e-commerce firms, such as Amazon, have constructed delivery centers in several of Nebraska's urban areas. Communities across Nebraska have begun exploring strategies to better accommodate the multimodal transfer of goods, including port and intermodal facilities as well as logistics parks, with the intent of improving local freight operations. However, as consumer spending patterns have continued to change since inflation spiked in summer 2022, e-commerce companies including Amazon have adjusted distribution strategy, including pausing warehousing expansion, consolidating operations, and pulling back growth plans in secondary markets.[114] These shifts may lead to changes in demand in Nebraska's urban areas, and could potentially result in additional congestion and freight activity in commercial and residential areas.

[114] https://www.wsj.com/articles/amazon-is-refining-delivery-operations-as-it-resets-logistics-network-11662752668?mod=djemlogistics_h

Highway Transportation Technology

Transportation technologies related to freight highway are seeing continued development and testing, and these technologies are poised to shift how freight vehicles operate once deployed. From autonomous vehicle technology that allows for limited driver interaction to Vehicle to Infrastructure (V2I) technologies that connect vehicles to surrounding infrastructure to capture real time traffic data, technological advancements are looking to improve supply chain efficiencies while improving safety conditions for all road users.

These technologies present numerous opportunities for NDOT and the state's freight highway network. Automated driving technologies have the potential to aid the freight highway network by reducing congestion, which is one of the highest costs for freight operators, enhancing safety, and reducing energy costs and eventually labor costs via "platooning" or allowing trucks to closely follow each other.

V2I technologies can be leveraged to gather traffic data based on communication software that connects vehicles to surrounding infrastructure. This data can then be share amongst road users to inform them of safety, mobility, and/or environmental conditions that could impact their trip. V2I technologies are considered the next generation of intelligent transportation systems (ITS) and present an opportunity for NDOT to build off existing ITS infrastructure to prepare for the future.

The main concern surrounding the implementation of these emerging technologies, which was echoed by FAC members, is the ability of Nebraska's existing electrical grid to support future demand for electricity. The aforementioned electric vehicle charging infrastructure plan illustrates an effort to shift from internal combustion vehicles to those that run on electricity; this shift would put further stress on Nebraska's electrical grid. Coupling greater numbers of electric vehicles on the state's roadways with V2I and other technologies reliant upon electricity could have substantial impact on Nebraska's ability to deliver power, especially in rural areas. As these technologies continue to develop, NDOT will need to work with other state agencies and local utilities to understand current and future electrical needs and the improvements necessary to develop an efficient and resilient grid.

Network Resiliency

Impacts on the transportation system stemming from climate change, extreme weather, and other natural hazards have brought the concept of resiliency to the forefront of planning. A resilient transportation system is one that can effectively recover from an extreme weather event, including floods, extreme heat or cold, earthquakes, or a severe storm. At the DOT level, planning for a resilient transportation system is rooted in transportation systems management and operations (TSMO) and system maintenance.[115]

Recent severe weather events saw highlighted challenges to the resiliency of Nebraska highway system. Extensive and widespread flooding in spring 2019 resulted in substantial impacts to the state's highways, as many routes in the eastern part of the state were closed. Portions of Interstate 80 were closed, which greatly impacted statewide passenger and truck traffic flows due to the impacts on the state's most

[115] United States Department of Transportation, *Transportation System Resilience to Extreme Weather and Climate Change*

important corridor, while many communities were isolated due to the highways that serve them being inundated by flood water.

While it is impossible to predict the occurrence of extreme weather events, climate researchers indicate that they are likely to occur more frequently. This highlights the need for state DOTs and local agencies to collaborate on planning and constructing transportation improvements that are resilient. For Nebraska's freight highway system, this means ensuring that alternative truck routes that can be used in the event of an emergency are identified, maintenance of freight highway infrastructure is not deferred, and policy oriented towards integrating resiliency into decision-making is enacted.

FLOODING IN ARLINGTON, NE DURING SPRING 2019

Source: Omaha World Herald

FAC members spoke on the need for resiliency in the planning process as it relates to Nebraska's freight highway network. Input gained from the group highlighted programs by other states that support increasing the amount of resilient infrastructure as an opportunity for NDOT. Other input heard in FAC discussions includes the need to designate alternate highway routes that are capable of handling increased truck traffic in the event of an emergency or severe weather.

Enhanced Commodity Data

Understanding the types of commodities using various state highways could help with insights into the role of freight in various corridors. Both public and private commodity flow data sets are well known to underestimate certain commodity categories, including certain agriculture-related movements, due to challenges with approximating these types of highly complex supply chains. Investing in deepening these insights might help with prioritizing highway investments and the overall statewide freight network. The state has already invested in enhanced commodity datasets and tools, including the Nebraska Supply Chain Optimization Model (NESCOM), that provide insight into how commodities move across the state and should continue to leverage this information to support freight planning.

NDOT is currently researching ways to better use the enhanced commodity data it has invested in and estimate the types of commodities carried on each highway segment, along with the tonnage and value of each. The goal is to be able to not only understand the types of freight using the highway system, but to look at different highway scenarios and how changes to the system could impact freight commodity flows.

Overweight and Oversized Vehicle Permitting

Challenges securing truck operators continues to pose a significant challenge to the freight industry; with substantial growth in freight demand, difficulties attracting and retaining qualified drivers is affecting supply chains nationwide. Other factors including an aging workforce and health concerns associated with COVID-19 are causing industry leaders to predict a significant drop in the labor pool in the near-term which would further exacerbate the adverse impacts on local and national supply chains.

One opportunity identified by the FAC was aimed at implementing state policies that revise overweight and oversized (OSOW) vehicle permitting standards. FAC members noted that neighboring states have allowed longer combination trailers on their state system which results in more efficient freight movements as a truck operator is able to transport a higher quantity of goods. This also results in fewer heavy vehicles on the road, which has potential operational, safety, and maintenance benefits. By allowing longer combination trailers (see Figure 7.2) to operate on Nebraska's highways, the impacts of the truck operator shortage could be softened while the number of heavy trucks operating on the state highway system could be reduced.

FIGURE 7.2 EXAMPLE OF LONGER COMBINATION TRAILERS ON STATE HIGHWAY SYSTEM

Source: North Dakota Department of Transportation.

While the adoption of policy to accommodate OSOW vehicles can have economic and operational benefits, there are potential drawbacks that must be considered. A 2020 report published by the Kansas Department of Transportation discusses these drawbacks, highlighting the potential safety and infrastructure issues related to OSOW vehicles. The report found that the rates of fatal and serious injuries related to crashes involving OSOW vehicles have been increasing since 2009, which presents a substantial risk to roadway safety. Infrastructure issues related to OSOWs mainly relate to roadway design standards that do not adequately accommodate these larger vehicles and result in challenging grades, intersection geometries, and bridge structures that impact the ability of OSOW vehicle drivers to safely operate the vehicles.[116]

Freight Rail Needs & Opportunities

Nebraska's freight rail system needs were identified through a review of existing conditions, input gained from the Freight Advisory Committee (FAC), and the issues identified by the 2017 SFP. Identified freight rail needs include access, workforce challenges, system enhancement, highway-rail grade separations, intermodal facility needs, and resiliency.

Expanded Access

A major need of Nebraska's rail system is ensuring that businesses that rely on the state's rail system have adequate access to facilities in order to ship their goods. Within Nebraska, where high volumes of grain and other bulk goods are shipped via rail, the need for access to rail facilities is paramount as rail is

[116] Kansas Department of Transportation, *Understanding Oversize/Overweight Industry Freight Flow and Safety in Kansas Using the Kansas Truck Routing and Intelligent Permitting System (K-TRIPS)*

a cost-efficient means of transportation. Rail spurs, intermodal facilities and short line railroads provide pickup and drop off points for rail cargo. Many freight businesses require rail access as part of the site selection process; however, it is a significant challenge, particularly in rural Nebraska, to pay for the first and last mile of rail connectivity to these businesses. Local spurs represent a major funding gap for most states due to a lack of dedicated funding mechanisms; however, this specific issue could be addressed through targeted state funding opportunities such as the Rural Project Act (LB788) which proposed $50 million in funds in 2022. By enhancing access to the rail network, businesses can have more options to transport their products efficiently.

Workforce

Labor shortages are not only affecting Nebraska's freight highway system, but are also observed as impacting the freight rail system as well. A myriad of factors influencing the labor shortage have been identified, with issues such as wage stagnation, low rates of return from furloughs during the COVID-19 public health pandemic, and a tight labor market impacting rail carrier's ability to hire workers.[117] These issues are impacting rail carriers' ability to meet shipping demand, which in turn affects the local and national supply chains. In September 2022, a dispute between U.S. rail carriers and labor unions over wages and benefits nearly resulted in a national labor strike. A rail shutdown could have frozen almost 30 percent of U.S. cargo shipments by weight, stoked inflation, cost the American economy as much as $2 billion per day and unleashed even more supply chain disruptions affecting U.S. energy, agriculture, manufacturing, healthcare and retail sectors.[118] The Multimodal Policy Needs & Opportunities subsection goes into further detail about several ways that Nebraska can support a more competitive workforce, including in the freight rail industry.

System Enhancement

Class I railroads within Nebraska noted the challenge of balancing the flows of goods shipped on the rail system as the proportion of traffic passing through the state greatly outweighs the amount of freight originating and terminating in Nebraska; this results in a shortage of the containers needed to ship outbound goods. Short line railroads and the agricultural industry are challenged by legacy infrastructure tailored to historical practice, which can be more costly and labor-intensive to operate. As new modern large-scale transfer facilities are constructed along main lines, trucks are increasingly replacing rail for first-mile/last-mile gathering and distribution, which reduces the demand for local rail service. Finally, the shifting nature of the freight rail industry has seen the construction of intermodal facilities at the fringe of metropolitan areas to enable the containerization of international trade. As this trend continues, NDOT will need to work with communities and freight-oriented businesses to plan and construct the intermodal facilities needed to support efficient rail operations.

A major challenge to enhancing the system is balancing new investment with maintaining the existing system in a state of good repair, which is a goal shared by the railroads, NDOT, and the Federal Railroad Administration. As state funding for rail infrastructure is limited, and available Federal funding for rail infrastructure must be awarded competitively, the railroads are faced with the ongoing need to strategically identify system enhancement opportunities and prioritize them for investment.

[117] Trains.com, *STB chairman says higher pay would solve railroad crew shortages*

[118] https://www.reuters.com/world/us/us-reaches-tentative-agreement-with-rail-workers-strike-2022-09-15/

Highway-Rail Grade Separations

Crashes occurring at Nebraska's at-grade highway-rail crossings involve the possibility of a train-vehicle collision, which can result in severe injury or fatality. Furthermore, many of Nebraska's highway-rail grade crossings are found within the center of smaller communities and pose safety and operational concerns. Recent Federal grant opportunities that provide funding for the planning and construction of grade-separated facilities have sparked investment in these improvements across the Nation.

Within Nebraska, most of the relatively straightforward, low-cost safety enhancements have been completed, but there is an opportunity to reconstruct a number of existing at-grade crossings as grade-separated facilities. FAC members who represent railroad operators have expressed an interest in constructing grade-separated crossings to improve safety for both rail and highway users while reducing traffic delays associated with trains occupying at-grade crossings. NDOT is in a position to support local agencies interested in pursuing Federal grants to plan and construct grade-separated facilities; it is recommended that the NDOT prioritize these investments at high volume crossings in urban areas where the greatest safety and operational benefits of a grade-separated crossing can be accrued.

New or Expanded Intermodal Service

During the stakeholder outreach process, Class I railroads identified the potential to develop a new or expanded intermodal facility near Omaha—beyond the existing UP facility in Council Bluffs, IA and the BNSF facility in Omaha, NE—that would provide expanded handling capacity for containerized freight in the Omaha-Council Bluffs Metropolitan Area. It would also lead to more competitive freight rates for long-haul truck trailer and container drayage moves by expanding intermodal rail service and cementing Omaha's status as a national intermodal hub. The development of new intermodal facilities would also result in the need to provide adequate highway connections to the new site(s) to facilitate truck ingress and egress. More discussion on methods to increase freight competitiveness in Nebraska is discussed in the Multimodal Policy Needs & Opportunities subsection.

Network Resiliency

Maintaining a resilient freight rail network is another need facing Nebraska's freight system. As with the freight highway network, the rail network can in certain geographical settings be vulnerable to extreme weather events that can greatly disrupt freight rail operations. This has been evidenced by recent flooding events in Nebraska that have resulted in service disruptions; examples of this include the temporary closure of the Nebraska Central Railway Company line between Norfolk and Columbus as well as rail bridge outages on Class I main lines near La Platte in 2019. Railroads continue to make investments to protect core infrastructure assets from flooding and subsequent washouts by raising track to higher ground and placing heavy stone 'rip-rap' along railroad embankments near water to help maintain the integrity of the roadbed.

Air Cargo Needs & Opportunities

Aviation infrastructure investments are typically made by sponsoring agencies (airport authorities, cities, etc.) with a combination of local and up to 90 percent Federal funds through the Airport Improvement Program (AIP). The Nebraska Department of Aeronautics (NDA), now part of NDOT, allocated state funds and approves the use of Federal funds for aviation projects. The AIP program funds can be used on most airport capital improvement programs and maintenance work; however, projects are prioritized and funds

allocated in a way that means that certain types of improvements, such as terminal, hangar, facility, or access improvements often remain unfunded.

Ensuring Airport Access and Connectivity

Stakeholder outreach conducted as part of this Plan did not uncover any major air cargo-related capital improvement needs in Nebraska. The facilities at Nebraska's active and growing cargo-handling airports—Eppley Airfield in Omaha and Central Nebraska Regional in Grand Island—are in good shape and functioning as needed to meet current demand. However, it will be important for Nebraska to continue ensuring airport access and connectivity for cargo as the market demands, especially if new air cargo opportunities arise for Nebraska-based shippers.

Discussions with other stakeholders revealed challenges for growing air cargo activity in the state. Funding for air cargo-specific investments can be difficult to secure. NDOT does not administer non-highway funds for capital projects. While AIP represents the primary source of airport capital improvement funding, it can be difficult to secure a local funding match; the grant covers 75 percent of eligible costs for large and medium primary hub airports and between 90-95 percent of eligible costs for small primary, reliver, and general aviation airports. Stakeholders noted that other grant opportunities exist, but those are perceived to have a complicated application process.

Capitalizing on Air Cargo Services as an Economic Development Opportunity

Opportunities exist to invest in airside freight access and connections to other modes throughout the state. In general, Nebraska has excess airside capacity that could be used as a catalyst to create economic development, and some opportunities have come to fruition in recent years. In February 2022, Amazon Air launched daily service at Eppley Airfield, receiving freight from its regional air hub in Fort Worth, Texas. The daily cargo service supports faster deliveries for Prime members in Nebraska and western Iowa, which are seeing increased demand for e-commerce since the onset of the COVID-19 global pandemic.[119] However, this development is not necessarily leading to higher air cargo volumes; rather it appears that traffic is being shifted from other carriers, such as FedEx and UPS. Eppley Airfield's main terminal will be undergoing a major expansion project beginning in 2024 to double the building size, add new gates, and consolidate the two concourses and checkpoints into one, but this project will not include any air cargo-specific enhancements.[120]

In early 2022, Central Nebraska Regional (GRI) in Grand Island began enplaning just-in-time auto parts across North America, including Niagara Falls, Tennessee, and Mexico. These parts are being trucked to GRI for distribution because of supply chain issues with securing truck drivers, equipment, and rising fuel costs; manufactures are willing to pay more to ship these goods via air to avoid millions in lost revenue from having to shut down a production line if these parts were not available. GRI is also in conversation with an online retailer about establishing a sorting facility at the airport, which could cost between $40-$50 million to construct, leading to an additional 40-60 jobs at the airport.[121]

Additionally, some stakeholders noted that there may be opportunities to use Nebraska's airports to support the development of electric vehicles (EVs) and broader adoption of renewable energy sources by

[119] https://www.freightwaves.com/news/amazon-air-launches-daily-service-to-omaha-nebraska

[120] https://www.3newsnow.com/news/local-news/eppley-airfields-renovation-and-modernization-program-resumes

[121] Stakeholder interviews.

developing solar collectors at airport facilities. This development could not only generate clean energy for EVs and other uses, but also become a potential revenue opportunity for participating airports.

Ports & Waterways Needs & Opportunities

Nebraska's waterways network moves a relatively low volume of freight compared to the rest of the multimodal network. The lack of lock and dam infrastructure on the Missouri River helps ensure the unimpeded travel of marine traffic but can lead to varying seasonal water levels in some parts of the river, making navigation more difficult. As such, it is unlikely that a significant amount of freight in Nebraska will be moved on the waterways in the future given the reliability challenges of the Missouri River. Continuing to ensure waterway access and connectivity is not an urgent need for the state given the limited demand for and investment in these assets. Still, investment in infrastructure on the Missouri River will not only help ensure continued safety for Nebraskans during extreme weather events, but also protect other surface transportation modes impacted by flooding.

Implementation of New Inland Port Authority Act

With the passing of LB156 in May 2021, up to five inland port authorities may be established in Nebraska. These port authorities will be authorized to engage in marketing activities, issues and sell revenue bonds, and acquire rights-of-way and property. Currently, there are no inland port authorities in Nebraska, but there are locations where pursuing this opportunity makes sense. Establishing a port authority in Omaha may be key to increasing the marketability of waterborne freight traffic, as it would allow the port to engage in more marketing activities.

The impacts of these port authorities will not be limited to only the waterway freight traffic; it would benefit all modes of travel. Currently, it is popular for international companies to make use of Foreign Trade Zones (FTZ) as a way to save money on taxes and duties. There may be opportunities to market this more intentionally (with the creation of a port authority) and encourage more companies to take advantage of the tax breaks, where appropriate.

Through stakeholder outreach, it was noted that rail infrastructure into the Port of Omaha could be improved. The designation of an official port authority in Omaha may make it easier to construct these additional tracks, yards, or loading/unloading areas to ensure the smoother flow of rail traffic into the port.

Other potential places that could benefit include Grand Island, NE where there is an airport that could handle limited air cargo and create additional FTZs, and Sidney, NE where there is an existing Foreign Trade Zone and limited existing infrastructure for a small railyard. The FTZ in Sidney may be especially eager to look into the designation of the area as an official port authority as it could get more traffic into the area and help provide jobs to nearby residents after recent job losses.

Repairs to Missouri River Infrastructure

The 2019 Midwest floods were some of the most devastating on record and overwhelmed and in some cases destroyed existing flood control infrastructure (right). The floods not only destroyed croplands and posed a danger to Nebraska citizens, but also left debris and sand throughout the affected areas. It took years to clear these areas of the debris and make the croplands viable again.

FLOODED FIELDS NEAR THE PLATTE RIVER IN PLATTSMOUTH

Source: DroneBase via the Associated Press

To ensure the safety of Nebraskans, an inventory of the flood protection infrastructure, especially along the Missouri River and its tributaries, will need to be completed. Levees that still may need repair after the storm should be replaced and dams will need to be reinforced if they have reached their original intended lifespans.

Additionally, these levees and dams will not only need to be repaired but should also be strengthened to reduce the risk of similar events occurring in the future. Excess snowmelt and larger rainstorms, culprits in the 2019 floods, are only predicted to worsen in the future, so additional levees may need to be built or raised to safeguard future generations of Nebraskans.

Multimodal Policy Needs & Opportunities

In addition to building and maintaining a strong freight infrastructure system, it is important for Nebraska to support and maintain a competitive environment for freight and supporting freight related development, including ensuring competitiveness of the State's economy and workforce, addressing national freight and supply chain issues and technological changes, and continuing to build economically driven policies and processes that address multimodal needs and opportunities.

Increase Freight Competitiveness

The commodity flow data evaluated for this State Freight Plan included traffic moving in, out, and through Nebraska, but did not include through-state flows, which move through the state without stopping. However, in 2015 it was estimated that 56 percent of tonnage and 59 percent of all goods was classified as through traffic, which should be similar to the distribution observed in 2017 (the base year for freight flows in this Plan). Although through traffic does not move to or from Nebraska-based businesses, it utilizes the state's transportation infrastructure, and it can be challenging for NDOT to maintain its assets that serve high volumes of traffic.

A sizable portion of Nebraska's through traffic is coal moved by rail from the Powder River Basin, also known as the Western coal region, primarily from Wyoming and North Dakota. Approximately 57 percent of the total U.S. coal production is mined in this region, and Wyoming, the largest coal-producing state in the U.S., produced 41 percent of total U.S. coal and 71 percent of the coal mined in the Western coal

region.[122] Despite the size and significance of this production, this market has been declining in recent decades due to expansion of natural gas production as well as renewable energy sources. Coal has historically been the backbone of the U.S. rail industry, and with this significant market shift, Nebraska should expect and plan for changes in railroad operations. Reduced coal volumes will free capacity for other products well-suited for rail transportation, including grain, chemicals, and containerized goods.

Nebraska's central location is an asset in terms of proximity and connectivity to many important domestic markets. However, other nearby population centers, such as Kansas City, have more carrier and facility options which helps keeps rates competitive across all modes. Still, Omaha has multimodal, uncongested transportation options—including highways, railroads, intermodal facilities, and air cargo facilities—that have the potential to be better utilized. Expanding intermodal service and rail access in Nebraska to better compete with trucking services will help improve freight rates for all shippers.

INCREASING COMPETITIVENESS

Exports from Nebraska are primarily seasonal agricultural goods. When trucks or railcars with these products leave Nebraska, they often return empty, which is a missed opportunity for an efficient utilization of rolling stock.

In addition, attracting other businesses that import high volumes of heavy, bulk goods would complement the existing agricultural base, which relies on exporting seasonal product and often struggles to secure the necessary equipment. This challenging dynamic was further exacerbated by COVID-19, as one of the many impacts of the pandemic as the slowdown in production and shipment of newly manufactured shipping containers and truck chassis, which led to further congestion and trade imbalances throughout the globe. While the coverage of impacts of this crisis were mostly focused on the coastal deep-water ports, the shortage was at times even more pronounced in central states like Nebraska, where turnaround time is critical to get containers (empty or full) back to the coast for export. In late 2021, it was reported that congestion and back-ups at coastal ports meant that ships were taking weeks, rather than days, to unload cargo, and shippers were so eager to return to Asia to pick up more goods that they often left the U.S. with empty containers, rather than wait for American farmers to return full containers with export goods.[123] This dynamic significantly hurt states with large agriculture sectors, including Nebraska.

The global supply chain crisis triggered by COVID-19 has also led to whiplash for producers, as earlier shortages have resolved, and retailers were struggling with excess inventory by mid-2022. The onset of the COVID-19 pandemic in early 2020 triggered an economic slowdown resulting from pandemic-related layoffs, shipping reductions, and production slowdowns. At the same time, surging demand for e-commerce and Federal recovery measures led Americans to purchase more durable goods such as furniture, electronics, and kitchen appliances in lieu of dining in restaurants or attending live events. Once manufacturers were able to catch up to this unexpected demand, U.S. coastal ports were swiftly overwhelmed by too many container ships, leading to long wait times, limited container availability, and rising shipping prices. Backlogs at ports further compounded delays and chokepoints, and coupled with an exceptionally tight labor market, many essential goods experienced periods of scarcity. As manufacturers tried to catch up to demand—with many expanding production capacity—consumer spending patterns shifted as the pandemic eased, and rising inflation in mid-2022 further dampened demand. Beginning in fall 2022, companies that stockpiled raw materials and manufactured goods have struggled to sell current inventories, which has impacted company financials and performance. This rapid shift from shortage to glut has led many businesses to rethink production patterns, warehousing, and

[122] https://www.eia.gov/energyexplained/coal/where-our-coal-comes-from.php

[123] https://www.nytimes.com/2021/11/14/business/economy/farm-exports-supply-chain-ports.html

storage, which will impact industrial land use and freight demand in many regions.[124] NDOT should closely watch these shifts to ensure the freight transportation network is prepared for further changes in demand.

Ensure a Competitive State Workforce

Nebraska's competitive job market has grown even more competitive since the 2017 SFP. In 2017, Nebraska's unemployment rate was at 3.0 percent while the national average was 4.4 percent. By August 2022 the state's unemployment rate was 2.1 percent, still significantly lower than the national unemployment rate of 3.7 percent. Challenges facing Nebraska's supply chains before, during, and after the pandemic, include significant constraints on the availability of a skilled workforce. Increased demand for labor in sectors such as manufacturing, warehousing, shipping, and delivery has placed pressure on ensuring Nebraska has the necessary talent to efficiently move goods throughout the state.

Worker pay is one factor that influences the availability and stability of the labor pool for freight-intensive sectors. However, for many low-income and entry-level workers, there are significant barriers to employment that hinder the ability to access and maintain employment, particularly in rural areas. These barriers to employment represent a variety of socioeconomic and geographic factors that incur costs or present logistical challenges for job seekers, including[125]:

- **Workforce readiness**, including training and certification programs that enable employees to be workforce-ready, even at entry-level positions. Training and certification for these positions often focus on helping workers to develop technical skillsets and proficiency with tools, technologies, processes and regulations involved in warehousing operations, freight movement, or industrial production. This also includes any barriers associated with obtaining a commercial driver's license in Nebraska.

- **Childcare** impacts workers with children, many of whom struggle to earn the money necessary to care for their children while securing the childcare necessary to allow them to leave the home to go to work. Addressing this challenge requires workers having access to childcare facilities that are affordable, that are proximate to their home and their workplace, and that offer services at times of day that align with the workers' workday.

- **Transportation** is the most significant barrier to accessing employment. Warehousing and manufacturing jobs are often located in areas far away from other land uses, meaning that workers must travel long distances to get to work, leading to longer commute times and higher fares. In addition, low-income workers are less likely to have access to a vehicle and will spend a higher share of their income on transportation than higher-income households. Although public transit can greatly benefit low-income workers, it can be difficult for transit to serve lower-density areas and geographically dispersed facilities.

[124] https://www.wsj.com/articles/scotts-miracle-gro-shortage-glut-inventory-fertilizer-11663261193?mod=djemlogistics_h

[125] https://www.modot.org/sites/default/files/documents/2022-06-30%20FINAL%20Supply%20Chain%20Task%20Force%20Report.pdf

» **Affordable housing** has been challenging to obtain in recent years due to significant increases in housing costs across the country. This trend has worsened even as the economy has recovered from the COVID-19 pandemic; average rents across the U.S. have risen 18 percent between 2017 and 2022, outpacing inflation. In addition, housing costs are not distributed evenly across the state, and some rural counties struggle to meet demand and many lower-income households can be cost-burdened by housing prices. There are often limited options to find homes that are proximate to work, childcare facilities, and other essential services, which can hinder employers' efforts to attract and retain employees.

NEBRASKA AFFORDABLE HOUSING TRUST

Nebraska Department of Economic Development (NDED) is already working to address challenges with affordable housing via the Nebraska Affordable Housing Trust Fund (NAHTF), which helps communities address local housing needs through ongoing development projects.

It is essential that NDOT continue to work with NDED to mitigate these types of barriers throughout the state so that Nebraska's freight-intensive and transportation sectors can attract and retain a competitive workforce.

Address Truck Driver Attraction and Retention Issues

Truck driver attraction and retention has been an issue for the trucking industry for many years. In the past, it has been referred to as a shortage of drivers, but the issue is more related to the challenges with attracting and retaining drivers in the field, as there are many aspects of truck driver training, licensing, and other resources that could be greatly improved to help increase driver attraction and retention. In 2021, the American Trucking Association (ATA) estimated that the industry will be short 80,000 drivers, a historic high. This shortage is anticipated to continue increasing beyond the current 80,000 drivers. The industry has struggled with early retirement of seasoned drivers as well as retention of new drivers. According to the ATA, driver turnover at large truckload fleets was 92 percent at the end of 2020.[126]

Truck drivers are required to comply with Federal hours of service (HOS) requirements, which are designed to increase safety on the roadways and prevent truck drivers from driving while fatigued. As a result, drivers need designated parking for staging, breaks, emergencies, rest and time off, as regulated by the Federal Motor Carrier Safety Administration. Truck parking can be challenging for drivers to locate while they are on-the-road. Beyond HOS, many other factors influence when and where a driver decides to park. For example, the driver could be carrying a load for a facility with a very strict delivery window (time when the driver can arrive on-site), and drivers can face fines or potentially lose future business if they are not there on-time. In a heavily congested area or corridor, this requirement may influence a driver to park as close to the facility as possible to not risk missing their appointment.[127] These factors put pressure on drivers and add to the stress of the job.

[126] American Trucking Association. "Turnover Remained Unchanged at Large Truckload Fleets in Fourth Quarter." Press Release. March 29, 2021.

[127] https://www.modot.org/sites/default/files/documents/2022-06-30%20FINAL%20Supply%20Chain%20Task%20Force%20Report.pdf

TRUCK DRIVER EFFICIENCY

Research conducted by the Massachusetts Institute of Technology Freight Lab estimates that truck drivers only spend on average about 6.5 hours per day driving out of 11 available hours. If shippers were able to expedite the process by utilizing appointment windows and other methods to reduce the time to load/unload a trailer, it is estimated that an additional 12 minutes per day spent on the road per driver would end the driver shortage.[128]

Another challenging aspect of the truck driver work environment is that many truck drivers are using their available HOS waiting at customer facilities to drop off or pick up loads, looking for available truck parking, trying to find customer facility, and in roadway congestion. At shipper facilities, truck drivers are often forced to wait several hours a day to load/unload freight and struggle to maximize their available time spent driving. Securing available truck parking is also a significant challenge. Beyond designated truck parking facilities, many drivers do not have access to basic amenities like bathrooms or food vending at customer facilities. Addressing these issues may help reduce the driver shortage and improve retention by improving the quality of the work environment for drivers.

The extremely tight and competitive job market in Nebraska and nationally is compounding the driver attraction and retention issues. Truck drivers continue to be an essential element of many industry supply chains, although driver pay and benefits can vary from company to company. In September 2022, it was reported that Amazon would raise pay and benefits for its delivery partners in an effort to secure its driver workforce ahead of the holiday season. While it also uses outside delivery companies—including UPS and USPS—it has increasingly relied on contract carriers to fulfill last-mile customer delivery demand.[129] Higher pay for Amazon drivers and drivers for other companies may help reduce the high turnover rates of these positions and increase the stability of the truck driver workforce in the U.S.

Continue Building Economic-Based Processes for Transportation Investment

Nebraska has continued its focus on linking transportation and economic development through programs such as the Build Nebraska Act. The Transportation Innovation Act (TIA) enacted in 2016 provided NDOT with new revenue, programs, and tools to increase mobility, freight, economic growth, and safety in Nebraska. The purpose of the TIA is to accelerate highway capital improvement, promote innovative solutions for deficient county bridges, and help finance transportation improvements that connect new and growing businesses. Further, increasing availability of data and freight planning provides NDOT the opportunity to continue improving tools and methods to better address freight and economic development related challenges in the state. NDOT's investments in bespoke data and analytical tools, including the Nebraska Supply Chain Optimization Model (NESCOM), which estimates freight costs across all modes for manufacturing, warehousing, retail, and other freight-intensive industries. These tools can provide valuable insight that can be used to guide freight transportation investments and conversations with private sector freight and industry stakeholders.

The Federal grant landscape has significantly expanded since the passage of the Infrastructure Investment and Jobs Act (IIJA) in November 2021. From FY2022 to FY2026, IIJA will provide $973 billion in funding, of which $550 billion is allocated for new investments in all modes including transportation,

[128] https://ctl.mit.edu/news/latest-us-driver-shortage-requires-long-term-solutions

[129] https://www.wsj.com/articles/amazon-to-fund-raises-for-delivery-drivers-amid-tight-labor-market-11663090484?mod=djemlogistics_h

water, power and energy, environmental remediation, public lands, broadband and resilience. Nebraska can expect to receive approximately $2.2 billion over the next five years in Federal highway formula funding for highways and bridges.[130] This amount is approximately 31 percent greater than the average annual State Federal-aid highway formula under the previous law. Nebraska can also expect to receive approximately $48 million over five years in formula funding to reduce transportation-related emissions, in addition to about $55 million over five years to increase the resilience of its transportation system. Section 7.1 details the numerous new and existing Federal grant opportunities, many of which target multimodal freight transportation projects.

FUNDING SUCCESS

Between FY2018 and FY2022, Nebraska applicants were awarded approximately $86.8 million for freight transportation projects. Continuing to leverage Federal grant opportunities will further Nebraska's focus on economic-based transportation investment decision-making.

Since the 2017 SFP, Nebraska has had tremendous success in securing grant funds through three notable freight-specific discretionary funding programs: Better Utilizing Investments to Leverage Development (BUILD) grant program (now known as the Rebuilding American Infrastructure with Sustainability and Equity, or RAISE grant program); the Nationally Significant Multimodal Freight & Highway Projects (known as INFRA); and Consolidated Rail Infrastructure and Safety Improvements (CRISI) program. These project awards are shown in Table 7.3.

TABLE 7.3 NEBRASKA BUILD, INFRA, AND CRISI GRANT AWARDS, FY2018—FY2022

Grant	Year	Applicant	Project Name	Project Description	Amount
BUILD	FY2018	State of Nebraska	U.S. 75 Highway Mobility Improvement Project	Reconstructs 6.83 miles of U.S. 75/U.S. 34 in Cass Co. Replaces the existing two-lane roadway with a four-lane expressway incl. a raised 22-foot-wide median and surfaced shoulders, and roadway, bridge and drainage improvements.	$25M
	FY2019	City of Omaha	120th Street Improvements	Reconstructs a segment of 120th Street incl. the heavily traveled intersection with West Maple Road, which serves as U.S. 64. The new roadway will provide a continuous 4-lane, divided cross section through the entire length of the project.	$17M
	FY2020	City of Blair	Blair South Bypass	Constructs a new connection between U.S. 75 and U.S. 30 to bypass the existing downtown. The corridor will be a three-lane section, configured as a "Super 2" with passing lanes to reduce conflicts between passenger vehicles and trucks.	$7.5M
INFRA	FY2018	NDOT	Heartland Expressway Junction L62A / U.S. 385 to Alliance	Converts an approximately 14.6-mile segment of U.S. 385 from the existing two-lane highway into a four-lane divided highway.	$18.3M

[130] https://www.transportation.gov/sites/dot.gov/files/2022-01/BIL_Nebraska.pdf

Grant	Year	Applicant	Project Name	Project Description	Amount
CRISI	FY2018	Nebraska Central Railroad Company	Nebraska Central Railroad Company Infrastructure Improvements	Improves 30 timber bridges and replaces 5 other timber bridges with a steel beam span or rail girder bridge. Replaces degraded rail along 7 miles of mainline track and defective ties along the entire 320-mile track in northeastern and central NE.	$8.2M
	FY2020	Nebraska Kansas Colorado Railway	Velocity Enhanced Rail Transportation Improving Competitiveness and Logistics Project	Installs 42,595 ties, 15,990 tons of ballast, and resurfaces 562,848 track feet in western NE and eastern CO to reduce overall trip times along the corridor by at least 4 hours and reduce operating costs by enabling crews to make a round-trip along the line within 1 day.	$4.5M
	FY2021	Nebraska Central Railroad Company	Nebraska Central Railroad Company (NCRC) Rail Enhancements	Completes preliminary engineering, environmental clearance, design, and construction of 4 rail sidings, including through 3 at-grade crossings in eastern NE to help to meet increased rail demand, alleviate congestion, increase resiliency, and provide rail access to non-rail served industries.	$6.3M

Note: Nebraska-based applicants also received three RAISE grant awards for transit and bicycle-pedestrian projects between 2018-2022.

Source: U.S. DOT Federal Highway Administration; Federal Railroad Administration.

Plan for Technological Change

Section 7.1 details key technological advances that have the opportunity to address and impact a number of pressing issues related to freight and logistics. In recent decades, the freight industry has rapidly evolved to serve the needs of a growing, and increasingly urbanized society that integrates smart phone devices and other forms of advanced communication into nearly every aspect of everyday life. Still, issues such as roadway safety, excessive vehicular emissions, the ability to recruit sufficient and skilled drivers, as well as the need for innovative “last mile” delivery solutions persist in our society. Technological advances in the fields of intelligent transportation systems (ITS), electric vehicles, and automated vehicles may be able to play a significant role in addressing these issues in the upcoming years.

Most of the transportation industry’s efforts today center on making sure technologically advanced vehicles will safely operate on our transportation system, but it is also important to assess the impacts these vehicles will have on our Nation’s infrastructure. Some technologies will allow for new efficiencies in goods distribution and may change the way that businesses operate, potentially resulting in mode shifts, fewer full-time drivers, and fuel and operational cost savings. The growing adoption of electric vehicles has led to the National Electric Vehicle Infrastructure Formula Program (“NEVI Formula”), established by IIJA, which provides funding to states to strategically deploy electric vehicle (EV) charging infrastructure and to establish an interconnected network to facilitate data collection, access, and reliability. These developments are changing the location and specifications of fueling infrastructure needed for trucks and other commercial vehicles.

Support Freight-Related Development

Nebraska has many advantages that positions it well for freight-related development, including robust and diverse agriculture, animal production, and ag-tech sectors, equipment manufacturers, and chemical manufacturing, including biofuels. In the past few years, Nebraska has seen millions of dollars of investment from private companies, including several notable developments:

- $50 million to construct a new freeze-drying manufacturing facility and employ nearly 100 jobs in Seward, NE by Petsource by Scoular, which offers diverse supply chain solutions for end-users and suppliers of grain, feed ingredients, and food ingredients around the world.[131] Just one year after opening in 2020, Petsource announced plans for a $75 million expansion that will triple its production capacity and create 80 new jobs.[132]

- Facility expansion in Holdrege, NE in 2019 by Allmand, Inc. to facilitate an increase in production capacity, innovation, and speed to market. It will create 20 new jobs and includes five new assembly lines, a prototyping lab, a new paint system and robotic weld cells, and enhanced technological infrastructure.[133]

- Kawasaki Motors Manufacturing Corp's Aerospace Division in Lincoln, NE which opened in 2017 to manufacture cargo doors for Boeing Corporation 777x aircraft. In 2021, the company announced a $200 million expansion project for assembly, paint and welding lines as well as automation processes, which will result in 550 new full-time jobs focused on fabrication, welding and assembly primarily for side-by-side products and rail car projects.[134]

As growth continues to occur, it will be important to ensure that key freight connectors such as U.S. 30, NE 50, and NE 136 are well maintained. Moreover, capital infrastructure investments that support economic growth, such as the bypass project in downtown Blair on U.S. 30, or a potential expansion of the airport facilities in Grand Island to support just-in-time automobile parts, will be important to ensure a balance between growth in freight traffic due to business investment and the needs of the surrounding communities. NDOT can use its planning capabilities and regional leadership to help in capital planning for investment projects, addressing state and local impediments to growth, and supporting development of policies and programs that support regional growth.

7.3 Freight Performance Measures

Freight performance measures are tools to evaluate the level of accountability, efficiency, and effectiveness of the various freight modes and assist with the prioritization and selection of freight improvement projects and programs. These measures are used to monitor the performance of the transportation system using timely and reliable data, to ensure objectives and goals are met, and to identify potential freight bottlenecks (Figure 7.3).

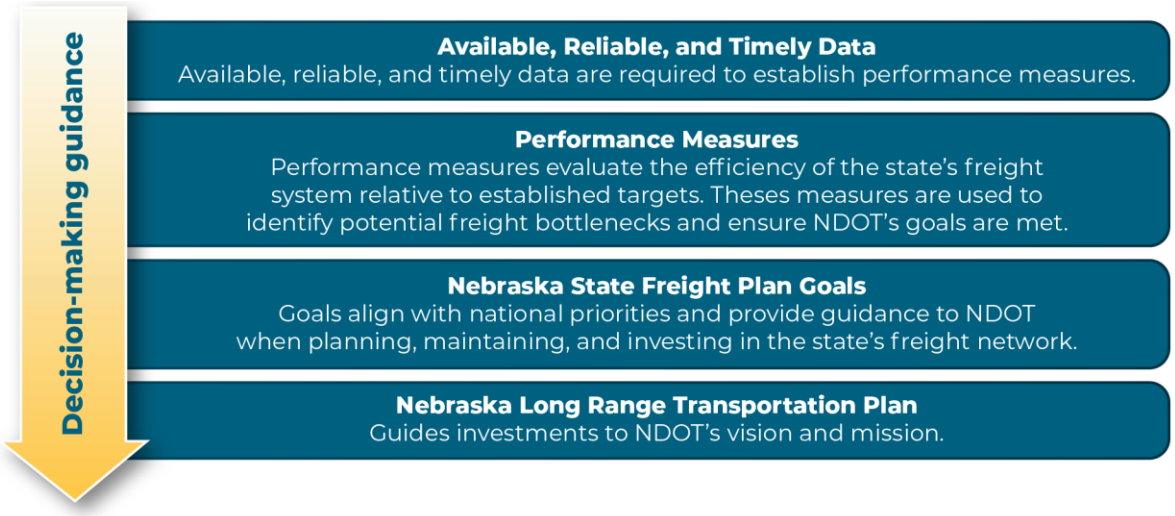
131 https://opportunity.nebraska.gov/scoular-announces-new-manufacturing-facility-to-be-constructed-in-seward-nebraska/

132 https://www.scoular.com/news/petsource-by-scoular-plans-to-triple-capacity-add-80-jobs-with-75-million-expansion-in-seward-nebraska/

133 https://opportunity.nebraska.gov/gov-ricketts-celebrates-groundbreaking-of-allmand-plant-expansion-in-holdrege/

134 https://www.1011now.com/2021/07/19/kawasaki-add-550-jobs-amid-expansion-lincoln-plant/

FIGURE 7.3 PROCESS TO DEVELOP FREIGHT PERFORMANCE MEASURES



Source: Cambridge Systematics.

Although freight performance measures vary by state depending on available data, they typically fall within five categories. These categories include:

- **Network Supply, Utilization, and Condition**: The characterization of extent, usage, and state of good repair of the freight network.
- **Travel Time and Congestion**: The ability of the freight network to provide for reliable, uncongested travel.
- **Safety**: The ability of the freight network to facilitate the movement of goods with minimal incidents.
- **Environmental Impacts**: The magnitude of negative impacts on environmental assets generated from goods movement.
- **Economic and Freight Demand**: The magnitude of the economic impacts of the freight system.

MAP-21 required all states to calculate freight travel time reliability on their Interstate highway systems using the Truck Travel Time Reliability (TTR) Index and report these findings to FHWA on a biennial basis, with two- and four-year performance targets. The 2017 SFP committed to calculating the following additional performance measures:

- Fatalities & Truck-Involved Fatalities
- Truck Travel Time Reliability & Speeds

Since the implementation of the 2017 SFP, NDOT has continued to gather and evaluate the quality of datasets to identify additional freight performance measures to aid decision-making. The 2023 SFP freight performance measures are outlined in Table 7.4 under their respective goal areas. NDOT also acknowledges the effects of freight transportation on greenhouse gas emissions and air quality and considers those impacts in project evaluation and planning.

TABLE 7.4 NEBRASKA FREIGHT PERFORMANCE MEASURES

Performance Measure	Definition	Source
Safety: Improve statewide safety by funding projects, including through the use of new technologies, that reduce injuries and fatalities on the freight transportation network.		
Number of truck or bus-involved crashes and truck-involved fatalities.	The Department tracks the number of truck and bus-involved crashes and fatalities each year	NDOT
Number of railroad grade crossing crashes	An indicator of multimodal (highways and railroads) safety performance of the freight system	Federal Railroad Administration
Economic Competitiveness: Improve intermodal transportation system connectivity, efficiency, and mobility and strengthen inter-governmental partnerships to support existing industries and increase national and regional economic competitiveness.		
Annual tonnage of freight by mode	Tracks the amount of freight moved by truck, rail, water and air to measure system utilization, economic competitiveness, and changes in modal share	FHWA Freight Analysis Framework
Value of freight by mode	Tracks the value of freight moved by truck, rail, water and air to measure system utilization, economic competitiveness, and changes in modal share	FHWA Freight Analysis Framework
Asset Preservation: Optimize road and bridge preservation investments decisions to best utilize limited funds to maintain and preserve the existing multimodal freight system.		
Percent of Interstate pavements in good condition	Required Federal performance measure; a key indicator for the state of good repair of the freight highway system	NDOT
Percent of Interstate pavements in poor condition	Required Federal performance measure; a key indicator for the state of good repair of the freight highway system	NDOT
Percent of non-Interstate National Highway System (NHS) pavements in good condition	Required Federal performance measure; a key indicator for the state of good repair of the freight highway system	NDOT
Percent of non-Interstate NHS pavements in poor condition	Required Federal performance measure; a key indicator for the state of good repair of the freight highway system	NDOT
Percent of NHS bridges by deck area classified as good condition	Required Federal performance measure; a key indicator for the state of good repair of the freight highway system	NDOT
Percent of NHS bridges by deck area classified as poor condition	Required Federal performance measure; a key indicator for the state of good repair of the freight highway system	NDOT
Number of load-posted bridges on the State Highway System	An indirect measure of mobility and economic competitiveness of the freight highway system (*e.g.*, barriers to highway freight mobility)	NDOT
Reliable, Secure & Resilient Freight Transportation: Support network resilience, reduce vulnerabilities in the statewide freight transportation system, implement redundancy, and make innovative investments that improve mobility, connectivity, accessibility, and reliability of goods movement.		
Truck Travel Time Reliability Index (TTTR) on the Interstate System	Required Federal performance measure; a key indicator of the performance freight highway system. The closer the index is to 1.0, the more reliable the corridor.	National Performance Management Research Data Set

8.0 Strategies and Actions for the Future of Freight in Nebraska

The 2023 SFP identified a number of challenges and needs across the state's multimodal freight system, as detailed in Chapter 7.0. These challenges include aging infrastructure, safety, system capacity constraints and bottlenecks, multimodal connectivity, and funding challenges.

NEBRASKA'S STRATEGY TO MEET THOSE CHALLENGES AND NEEDS ARE DESIGNED TO STRENGTHEN THE MULTIMODAL FREIGHT NETWORK AND SUPPORTING INDUSTRIES BY PROMOTING A MULTIMODAL APPROACH TO MOBILITY, RELIABILITY, EFFICIENCY, AND SAFETY, AS WELL AS SUPPORT LONG-TERM POPULATION AND DEMOGRAPHIC CHANGES, FREIGHT AND ECONOMIC GROWTH, ECONOMIC COMPETITIVENESS, AND QUALITY OF LIFE.

The SFP embraces the five plan goals as overall strategies for the future of freight in Nebraska, with 26 individual, implementable actions to move these strategies forward:

These actions include opportunities pertaining to operations and technology improvements, new or expanded programming, and changes to policy, outreach, and coordination. Specific infrastructure project opportunities—which support the policy goals outlined in this SFP—are discussed in Chapter 9.0. A summary of the strategies and actions identified for the future of freight in Nebraska, including the lead agency, supporting agencies, and timeline for implementation, is shown in Table 8.1. The following subsections provide additional detail on each strategy and action item.

TABLE 8.1 STRATEGIES & ACTIONS FOR ADVANCING MULTIMODAL FREIGHT IN NEBRASKA

Strategy	Action	Lead Agency	Partner(s)	Timeline
Asset Preservation 	Continue implementation of the Transportation Asset Management Plan (TAMP).	NDOT	N/A	Short—0-2 years
	Continually re-evaluate Primary Highway Freight System (PHFS), National Highway Freight System (NHFS), Critical Urban and Critical Rural Freight Connectors (CU/CRFCs), and National Highway System (NHS) intermodal connector designations.	NDOT	MPOs	Ongoing
Safety 	Monitor and identify opportunities to support or apply technology that improves freight safety and mobility.	NDOT	N/A	Ongoing
	Invest in Transportation Systems Management and Operations (TSMO) including enhanced ITS and driver information systems.	NDOT	N/A	Long—5+ years
	Develop a more detailed understanding of truck parking needs in the State and its impacts on efficiency and safety.	NDOT	University of Nebraska—Lincoln	Short
	Support recommendations from the Nebraska Highway-Rail Grade Crossing Action Plan.	NDOT	Railroad carriers	Short
	Improve data collection process to track injuries/fatalities for truck-involved crashes	NDOT	N/A	Short
Economic Competitiveness 	Engage in development of a statewide transportation and economic development plan, including identifying strategies to mitigate existing barriers to employment and ensure a competitive state workforce.	NDED	NDOT, Nebraska Dept. of Labor, chambers of commerce, MPOs, industry	Med—2-4 years
	Engage in ad hoc study and analysis of freight rail opportunities as they arise.	NDOT	MPOs, Class I and shortline rail carriers, industry	As needed
	Consider freight/economic development related impacts and benefits are reflected in project selection processes.	NDOT	NDED, MPOs, industry stakeholders	Ongoing
	Continue to monitor and position for Federal grant opportunities, and submit and support freight-related applications for U.S. DOT discretionary grant funding (e.g., Bridge, RAISE, Rural Surface Transportation).	NDOT	NDED, MPOs, modal agencies, industry, grant applicants	Ongoing
	Improve road & rail access to inland port facilities, air cargo facilities, transload terminals, and intermodal terminals.	MPOs, Counties	NDOT, modal agencies, industry	Med—2-4 years

Strategy	Action	Lead Agency	Partner(s)	Timeline
	Improve last-mile access roads to Nebraska's rural industries, farms, and other freight-generating facilities.	MPOs, Counties	NDOT, NDED, modal agencies, industry	Med—2-4 years
	Continue working with freight-focused stakeholders to discuss infrastructure improvements that are important to Nebraska's economic competitiveness.	NDOT	Freight and industry stakeholders	Ongoing
	Coordinate with Nebraska's MPOs and other economic development stakeholders to identify transportation projects or improvements needed to support local and regional economies.	NDOT	MPOs, NDED	Ongoing
	Promote development opportunities at Nebraska's newly established inland port districts.	NDOT	Newly established port authorities	TBD
Reliable, Secure & Resilient Freight Transportation 	Use Key Freight Corridors and Critical Freight Corridors to inform and provide support for projects that support freight mobility.	NDOT	MPOs	Short—0-2 years
	Support initiatives and investments that increase the resiliency of the multimodal freight network.	NDOT	N/A	Ongoing
	Integrate multimodal freight with regional planning activities.	NDOT	MPOs	Med—2-4 years
	Promote capacity availability and development opportunities at Nebraska's air cargo-handling airports.	NDOT	Modal authorities, MPOs	Ongoing
	Compile supporting datasets for resiliency planning, with an emphasis on goods movement that identifies and prioritizes critical multimodal infrastructure to better manage risks to the system.	NDOT	N/A	Med—2-4 years
	Leverage NDOT data and tools to conduct scenario planning and designate alternate highway routes that are capable of handling increased truck traffic in the event of an emergency or severe weather.	NDOT	MPOs, Counties	Med—2-4 years
	Support improvements to repair waterway infrastructure along the Missouri River.	USACE	NDOT	Med—2-4 years
Environmental and Community Vitality 	Consider updates to NDOT design guidance, policies, and procedures to harden against extreme weather and reduce local air pollution, flooding and stormwater runoff, and wildlife habitat loss.	NDOT	N/A	Short—0-2 years
	Support equitable outcomes in the development of the multimodal freight system	NDOT	MPOs	Ongoing
	Plan for freight-oriented EV corridor charging and support NEVI recommendations related to EV charging	NDOT	U.S. DOT	Med—2-4 years

8.1 Asset Preservation

Two actions were identified to support the strategy of optimizing road and bridge preservation investments decisions to best utilize limited funds to maintain and preserve the existing multimodal freight system:

- *Continue implementation of the Transportation Asset Management Plan (TAMP).* The purpose of a TAMP is to describe how the highway system in Nebraska will be managed given available funding resources. Implementation of the TAMP involves meeting the established targets for pavement condition and bridge condition to meet an overall desired state of good repair. Maintaining pavement and bridge conditions along freight-intensive highway corridors is especially important and challenging, since trucks have a disproportionate impact on pavement and bridge deterioration due to their size and weight. NDOT will continue implementation of the TAMP.

- *Continually re-evaluate Primary Highway Freight System (PHFS), National Highway Freight System (NHFS), Critical Urban and Critical Rural Freight Connectors (CU/CRFCs), and National Highway System (NHS) intermodal connector designations*. FHWA administers formula funding to states for freight projects located on the PHFS, portions of the Interstate Highway System not part of the PHFS, and CU/CRFCs. NDOT will continue to re-evaluate these designations, with the support of the state's MPOs, to ensure that Federal funds can go to priority projects across the state's highway system, as well as make projects more competitive for discretionary funding opportunities.

8.2 Safety

Five actions were identified to support the strategy of improving statewide safety by funding projects, including through the use of new technologies, that reduce injuries and fatalities on the freight transportation network:

- *Monitor and identify opportunities to support or apply technology that improves freight safety and mobility*. Technology can be a useful tool to improve freight safety and mobility, and NDOT will monitor and identify opportunities that align with its needs. One potential opportunity could be to consider deploying truck parking notification systems to help truck drivers find and navigate to available truck parking spaces. This investment would benefit drivers, particularly those that are not familiar with Nebraska's facilities, as well as those that are struggling to find available space during peak hours.

- *Invest in Transportation Systems Management and Operations (TSMO) including enhanced ITS and driver information systems.* TSMO is an integrated set of strategies that can be leveraged to optimize the performance of existing infrastructure. TSMO evaluates performance from a systems perspective, allowing NDOT to implement a holistic approach to meeting current and future mobility needs without adding capacity. TSMO strategies can be utilized to improve safety, reduce congestion and increase economic vitality, thus improving overall quality of life. In the Nebraska State Highway Needs Assessment (2020)[135], it was noted that NDOT has planned efforts to implement TSMO strategies to deliver safe, efficient and reliable transportation infrastructure. In order to best plan for the needs of the future, NDOT will assess Traffic Incident Management (TIM), Intelligent Transportation Systems (ITS), collaboration with regional partners, transportation data and other TSMO-related tools as a

[135] https://dot.nebraska.gov/media/114336/2020-needs.pdf

category of need under system modernization. The NDOT recently completed a 10-year strategic plan that will aid in outlining the future TSMO needs for the department.

» *Develop a more detailed understanding of truck parking needs in the State and its impacts on efficiency and safety*. As freight traffic increases nationwide while regulations impose greater restrictions on truck operations, truck parking is becoming both an acute and long term issue. With the backbone of I-80, as well as numerous freight clusters around the state, safe parking with appropriate amenities is needed to support truck traffic. Truck parking was also identified as a need by the FAC and other truck-industry stakeholders. Sufficient truck parking helps support Federal hours of service (HOS) requirements, which mandates drivers stop driving at certain points of their workday, and helps mitigate safety aspects of unlawful or undesirable parking, such as parking along highway shoulders or ramps. Developing a more detailed understanding of the truck parking needs in Nebraska will help guide potential investments or policy changes to mitigate the issue.

» *Support recommendations from the Nebraska Highway-Rail Grade Crossing Action Plan.* The Fixing America's Surface Transportation (FAST) Act mandated that all states develop and implement a Safety Action Plan (SAP). The purpose of a SAP is to identify highway-rail at-grade crossings that have experienced or are at high-risk for experiencing accidents or incidents, and identify specific strategies for improving safety at highway-rail at-grade crossings. NDOT completed its SAP in 2022 and submitted it to the Federal Railroad Administration (FRA) for approval. Once the plan has been accepted by the FRA, NDOT will support the recommendations outlined in the SAP to improve safety at critical highway-rail at-grade crossings throughout the state.

» *Improve data collection process to track injuries/fatalities for truck-involved crashes*. Currently, NDOT aggregates truck-involved crashes with bus-involved crashes, under a "heavy vehicle" category. Combining these vehicle types inhibits analysis of crash severity and location of truck-involved crashes, which often have different contributing factors and circumstances. This would allow NDOT greater visibility into the nuances surrounding these crash types.

8.3 Economic Competitiveness

Nine actions were identified to support the strategy of improving intermodal transportation system connectivity, efficiency, and mobility and strengthen inter-governmental partnerships to support existing industries and increase national and regional economic competitiveness.

» *Engage in development of a statewide transportation and economic development plan, including identifying strategies to mitigate existing barriers to employment and ensure a competitive state workforce*. A statewide strategic plan will give state agencies, including NDOT and NDED, direction and position the state for increased partnerships with local agencies and the private sector to support economic growth and the vitality of the state. A successful plan should include the following elements:

- Targeted investments in promising freight-related facilities. This can include financial packages, and/or infrastructure such as roads and utilities. In addition, the potential for site enhancement, certification or pre-development could be explored. These initial investments can greatly increase Nebraska's competitiveness.

- Partner with non-traditional stakeholders (e.g., industrial developers) to further refine the understanding of Nebraska's competitiveness for industries such as metals and food manufacturing that leverage the state's existing supply chains.

- Partner with the private sector and other agencies to build a workforce development program centered on the logistics worker of the future. As transportation and logistics is a core part of Nebraska's economy, the state can benefit from ensuring that an available workforce aligns with the needs of this sector and the state.

- Strategies to mitigate existing barriers to employment and ensure a competitive state workforce. Especially for many low-income and entry-level workers, there are significant barriers to employment that hinder the ability to access and maintain employment, particularly in rural areas. These barriers to employment represent a variety of socioeconomic and geographic factors that incur costs or present logistical challenges for job seekers, and include challenges pertaining to childcare, transportation, affordable housing, and workforce readiness.

» *Engage in ad hoc study and analysis of freight rail opportunities as they arise.* The freight rail network in Nebraska is privately owned and operated by a variety of Class I and Class II/III (short line) carriers. Those owners are responsible for the maintenance of, and investment in, the network. However, freight rail access is critical to many of Nebraska's industries, in particular those that transport significant quantities of bulk commodities (e.g., agriculture). Studies of freight rail opportunities, as they arise, would help evaluate the potential for cost-effective shipping across the state of Nebraska as well as improvements in the safety and efficiency of freight movements. Many freight stakeholders expressed strong support for expanded rail access and service to businesses throughout the state to facilitate and increase multimodal freight activity. When appropriate, NDOT should coordinate with shippers, economic development authorities, freight rail carriers, and other stakeholders to identify opportunities for enhanced rail access and service, and assist, as appropriate, in moving those projects forward.

» *Consider freight/economic development related impacts and benefits in project selection processes.* Looking at projects through a "freight lens" and tracking performance of the freight system will ensure that projects support the needs of Nebraska's industries. NDOT will continue this approach and leverage discretionary funding programs that focus on projects that benefit freight and economic development.

» *Continue to monitor and position for Federal grant opportunities and submit and support freight-related applications for U.S. DOT discretionary grant funding (e.g., Bridge, RAISE, Rural Surface Transportation)*. NDOT should continue to position itself to take advantage of Federal funding opportunities for freight-related investments to best leverage state dollars, as well as private investment. Nebraska's ongoing commitment to investment through Build Nebraska and other programs position the state as an attractive potential grantee.

» *Improve road & rail access to inland port facilities, air cargo facilities, transload terminals, and intermodal terminals*. Nebraska's multimodal freight facilities are an essential element of the state's freight transportation network, providing multimodal connections between multiple modes to enable the efficient movement of freight. Roadway access to these sites is often a local or minor road connecting to a major highway. These local or minor roads may not be designed to support high volumes of truck traffic. Rail access is also a highly sought-after amenity at many of these facilities, and it is critical to ensure that rail spur track is adequately developed and maintained to support freight activity. Regional and local planners, modal authorities, owners/operators, developers, and other freight stakeholders are encouraged to collaborate to improve both road and rail access at freight facilities to ensure the safe and efficient movement of multimodal freight shipments.

- *Improve last-mile access roads to Nebraska's rural industries, farms, and other freight-generating facilities*. Many of Nebraska's most critical businesses and industries are located in rural areas, such as farms, manufacturing plants, and other freight-generating facilities. Often the rural roadways supporting these sites handle a low volume of passenger vehicle traffic, but require structural design and geometry to support trucks, including oversize/overweight (OS/OW) trucks. In addition, because there is typically less connectivity and fewer alternative routes available in these rural areas, maintaining primary freight routes is critical to operations.

- *Continue working with freight-focused stakeholders to discuss infrastructure improvements that are important to Nebraska's economic competitiveness.* The FAC was established to guide the update of the SFP, and includes key freight and industry stakeholders, many of whom participated in the 2017 SFP development process. These conversations and relationships are valuable to NDOT, and NDOT will continue working with a group of freight-focused stakeholders after the completion of the 2023 SFP to discuss infrastructure improvements, as they arise, that are important to the state's economic competitiveness.

- *Coordinate with Nebraska's MPOs and other economic development stakeholders to identify transportation projects or improvements needed to support local and regional economies.* Economic development stakeholders, including NDED and MPOs, are often aware of local needs and opportunities for economic development. Economic development stakeholders are encouraged to continue their engagement with modal authorities and other owners to identify the infrastructure needed to support local and regional economies.

- *Promote development opportunities at Nebraska's newly established inland port districts.* With the passing of LB156 in May 2021, up to five inland port authorities may be established in Nebraska. As of November 2022, numerous cities and counties have investigated the creation of a port authority, but no port authority has been officially designated yet. Nebraska Department of Economic Development (NDED) will officially begin accepting applications in October 2022, and port districts are expected to be designated in 2023. After the designations are made official, NDOT should promote development opportunities at these newly established facilities, support economic development opportunities with data, and consider opportunities for transportation infrastructure investment.

8.4 Reliable, Secure, and Resilient Freight Transportation

Seven actions were identified to support the strategy of supporting network resilience, reducing vulnerabilities in the statewide freight transportation system, implementing redundancy, and making innovative investments that improve mobility, connectivity, accessibility, and reliability of goods movement:

- *Use Key Freight Corridors and Critical Freight Corridors to inform and provide support for projects that support freight mobility.* The FAST Act established the National Highway Freight Network (NHFN), which is comprised of Interstate and non-Interstate highway mileage identified as the most critical highway portions of the U.S. freight transportation system. States are also permitted to designate critical rural freight corridors (CRFCs) and critical urban freight corridors (CUFCs) to be included as part of the NHFN. Nebraska is permitted to designate up to 600 miles of CRFCs and up to 150 miles of CUFCs to be included in the national designation. Moving forward, NDOT will use key freight corridors and CU/RFCs to inform and provide support for projects that support freight mobility.

- *Integrate multimodal freight with regional planning activities*. NDOT conducts statewide freight planning activities and produces a State Freight Plan every five years (now being reduced to every four years as part of IIJA). However, there are numerous regional planning authorities (including MPOs) that contribute to the totality of transportation planning activities in Nebraska. Regional planning authorities are encouraged to begin, continue, or enhance their freight planning activities where feasible. The NDOT should commit to the ongoing support of these regional planning activities with data and other collaborative efforts.

- *Promote capacity availability and development opportunities at Nebraska's air cargo-handling airports.* Air cargo capacity is available at Nebraska's air-cargo handling facilities, including Eppley Airfield and Grand Island Central Regional Airport. Reaching out to the current and potential new users of the air cargo-handling airports in Nebraska and promoting the capacity availability and development opportunities can help to grow those areas where it is possible within existing networks. Utilizing this mode of freight transportation to its full capacity can add value to the freight network in the state, keeping freight rates competitive and expanding expedited freight services to Nebraska shippers and receivers.

- *Compile supporting datasets for resiliency planning, with an emphasis on goods movement that identifies and prioritizes critical multimodal infrastructure to better manage risks to the system.* Disruptions can happen across all freight transportation modes, leading to concerns about safety and reliability of freight shipments and overall mobility. In parts of the state with limited access to one or more freight modes, disruptions can mean that freight stops moving entirely, or is forced to be routed many miles off course, leading to increased shipping times and costs. These types of situations threaten the safe and efficient movement of freight to and from Nebraska's industries and consumers. Initiatives and investments that increase the reliability and resiliency of the multimodal freight network should be pursued to provide Nebraska businesses and residents with reliable access to goods, many of which are critical to quality of life.

- *Support initiatives and investments that increase the resiliency of the multimodal freight network.* NDOT can continue to support initiatives and investments, as they arise, that increase resiliency and minimize disruption of flows across the multimodal freight network.

- *Leverage NDOT data and tools to conduct scenario planning and designate alternate highway routes that are capable of handling increased truck traffic in the event of an emergency or severe weather.* NDOT has made significant investments in data and tools that can be leveraged to help with scenario planning and resiliency planning for handling truck traffic during an emergency or severe weather event. This will maximize the value of these investments and provide NDOT with additional resources to plan for and handle disruptions on the highway network.

- *Support improvements to repair waterway infrastructure along the Missouri River.* The U.S. Army Corps of Engineers (USACE) is responsible for maintaining 12,000 miles of inland and intracoastal waterways with 218 lock chambers at 176 sites: and 1,067 coastal, Great Lakes, and inland channels and harbors comprising 13,000 miles of channels and 23 locks. In partnership with local port authorities, USACE personnel oversee dredging and construction projects at hundreds of ports and harbors at an average annual cost of over $1.3 billion to keep the Nation's waterways navigable.[136] However, one of the longstanding issues for condition and performance on the inland waterways system is the aging lock and dam infrastructure. In Nebraska, there are levees along the Missouri

[136] https://www.iwr.usace.army.mil/Missions/Value-to-the-Nation/Navigation/

River that were recently inundated and damaged during excessive flooding in 2019, causing widespread flooding to residents, businesses, and communities. Increased damage from flooding events makes investing in facility resiliency a top priority, albeit hampered by limited funding availability.

8.5 Environmental and Community Vitality

Three actions were identified to support the strategy of improving the use of data, policies, or guidance to support the avoidance, minimization, and/or mitigation of impacts—including air quality and impacts on vulnerable communities and the environment—to natural and cultural resources on freight-related projects:

» *Consider updates to NDOT design guidance, policies, and procedures* to *harden against extreme weather and reduce local air pollution, flooding and stormwater runoff, and wildlife habitat loss.* This could have a measurable, positive impact on the following environmental concerns:

- **Air pollution** emitted from transportation contributes to poor air quality conditions, which has negative impacts on the health and welfare of residents. Pollutants that contribute to poor air quality include particulate matter (PM), nitrogen oxides (NO_x), and volatile organic compounds (VOCs). Some modes of freight transportation can lead to more air pollution relative to other modes, and facility/vehicle design and access can also have an impact.

- **Extreme weather and other natural disasters**, such as flooding, can have a significant impact on freight mobility across all modes. The flooding event of 2019 had a profound impact on the use of surface transportation assets throughout Nebraska that were submerged and/or damaged. The resulting flood-related damage required emergency maintenance and repairs to critical components of the system. While it is not always possible to prevent flooding during these types of extreme weather events, changes to design guidance, policies, or procedures may mitigate the impacts of these events.

- It is also important to consider the impacts of freight movement on **flooding and stormwater runoff**, as system design can lead to issues as well. This includes optimizing use of multimodal freight services, including rail and barge modes, over constructing new highways or roadways which may exacerbate flooding and stormwater runoff during extreme weather events. Appropriate changes to design guidance, policies, or procedures may mitigate the impacts of freight movement on flooding and stormwater runoff, and the impacts of extreme weather and natural disasters on freight mobility.

- **Wetlands** also provide a critical role in holding floodwaters and slowing down flows into major creeks and waterways, in addition to providing a home for critical ecosystems. Nebraska contains more acres of wetlands than any surrounding state, including marshes, lakes, river and stream backwaters, oxbows, wet meadows, fens, forested swamps, and seeps.[137] These natural assets are home to critical **wildlife habitat** that contribute to a healthy and functioning ecosystem. Construction projects, including transportation infrastructure, can have an impact on the surrounding environment and wildlife. The impacts of freight on wildlife habitat (including habitat loss) should be considered in any changes to design guidance, policies, or procedures.

[137] http://outdoornebraska.gov/nebraskawetlands/

- *Support equitable outcomes in the development of the multimodal freight system*. Transportation equity refers to the distribution of benefits and costs of the transportation system, and whether that distribution is fair and appropriate. Transportation policy and investment decisions have significant equity impacts, including allocation of public resources, quality of life, and external costs that are imposed on communities. Freight project planning and decision-making should consider the distribution of benefits and burdens on communities (including access, mobility, options, affordability, safety, employment opportunities, involvement, noise and other forms of pollution), with an emphasis on historically marginalized or disadvantaged communities.

- *Plan for freight-oriented EV corridor charging and support NEVI recommendations related to EV charging.* NDOT received approval from U.S. DOT in September 2022 on its National Electric Vehicle Infrastructure (NEVI) plan[138], which enables it to receive $30.2 million of the $5 billion NEVI formula funds to deploy electric vehicle charging infrastructure annual from FY2022 to FY2026. NDOT is focusing those program dollars on the I-80 corridor and segments of U.S. 6 in the Omaha metro area, which were identified to provide the potential to greatly enhance opportunities for charging commercial vehicles, as those routes generally carry a higher percentage of heavy commercial vehicles, often traveling longer distances. NDOT will move forward the NEVI recommendations to provide charging opportunities for commercial vehicles, helping to reduce emissions on key freight corridors, and will continue to plan for future EV corridor charging infrastructure to bolster the state's network.

[138] https://dot.nebraska.gov/media/117327/nebraska-dot-nevi-plan-final.pdf

9.0 Fiscally Constrained Freight Investment Plan

NEBRASKA'S FREIGHT INVESTMENT PLAN

Nebraska's apportionment of the NHFP funds for the period spanning 2022-2026 is **$42 million**. These funds will go towards **1 project on I-80**, which was determined to best meet NDOT's immediate and upcoming freight needs and has state matching funds available to meet Federal requirements.

This chapter presents the Infrastructure Investment and Jobs Act (IIJA)-compliant Freight Investment Plan (FIP). This fiscally constrained document outlines the projects that will receive Federal apportioned freight funding, and highlights the process used to reach that list.

The FIP must be fiscally constrained and document an investment approach for Federal funding including sources of state matching funds. Funding eligibility covers all planning, feasibility, preconstruction, mitigation, and construction activities for highway, bridge, and multimodal capacity, safety, and operational projects. Investments in technology, safety, operations, parking, security, and alternative fuels to improve system performance are also funded. Strategic planning, analysis, and data collections efforts are also funded through this program. With the passage of IIJA, up to 30 percent of NHFP funds each year may be used for intermodal or freight rail projects, including improvements located within private facilities.

Projects must be identified in the Statewide Transportation Improvement Program (STIP) and be consistent with Long Range Plans in order to be in the Freight Investment Plan. With the passage of IIJA in November 2021, state freight plans must now provide an eight-year fiscally constrained Freight Investment Plan that describes how the funds would be invested. Eligible projects, which must contribute to the efficient movement of freight on the National Highway Freight Network, include elements such as planning, construction, intelligent transportation systems and bridges.

The fiscally constrained FIP includes the proposed use of National Highway Freight Program funds distributed to Nebraska. Nebraska's apportionment of the NHFP funds for the period spanning 2023-2026 is $42 million. Requisite funding for freight projects in Nebraska far exceeds available resources. Because the FIP must be fiscally constrained, a selection process was used to identify the projects to which NDOT will apply freight formula funds. One project was selected by NDOT and shown in Table 9.1. This project, the I-80 Reconstruction Project, was determined to best meet NDOT's immediate and upcoming needs and has state matching funds available to meet Federal requirements, and may be amended in the future in consultation with FHWA to meet changing needs in the state.

The I-80 Reconstruction Project intersects with Census Tract 9680, which contains Justice 40 Transportation Disadvantaged Communities, which is a composite metric that flags census tracts where four or more of the six measures of disadvantage are present, as defined by U.S. DOT[139]. Figure 9.1 shows the intersection of the project and Census Tract 9680. Moving forward with the I-80 Reconstruction Project will provide the disadvantaged communities in Census Tract 9680 with safer and more reliable access to I-80.

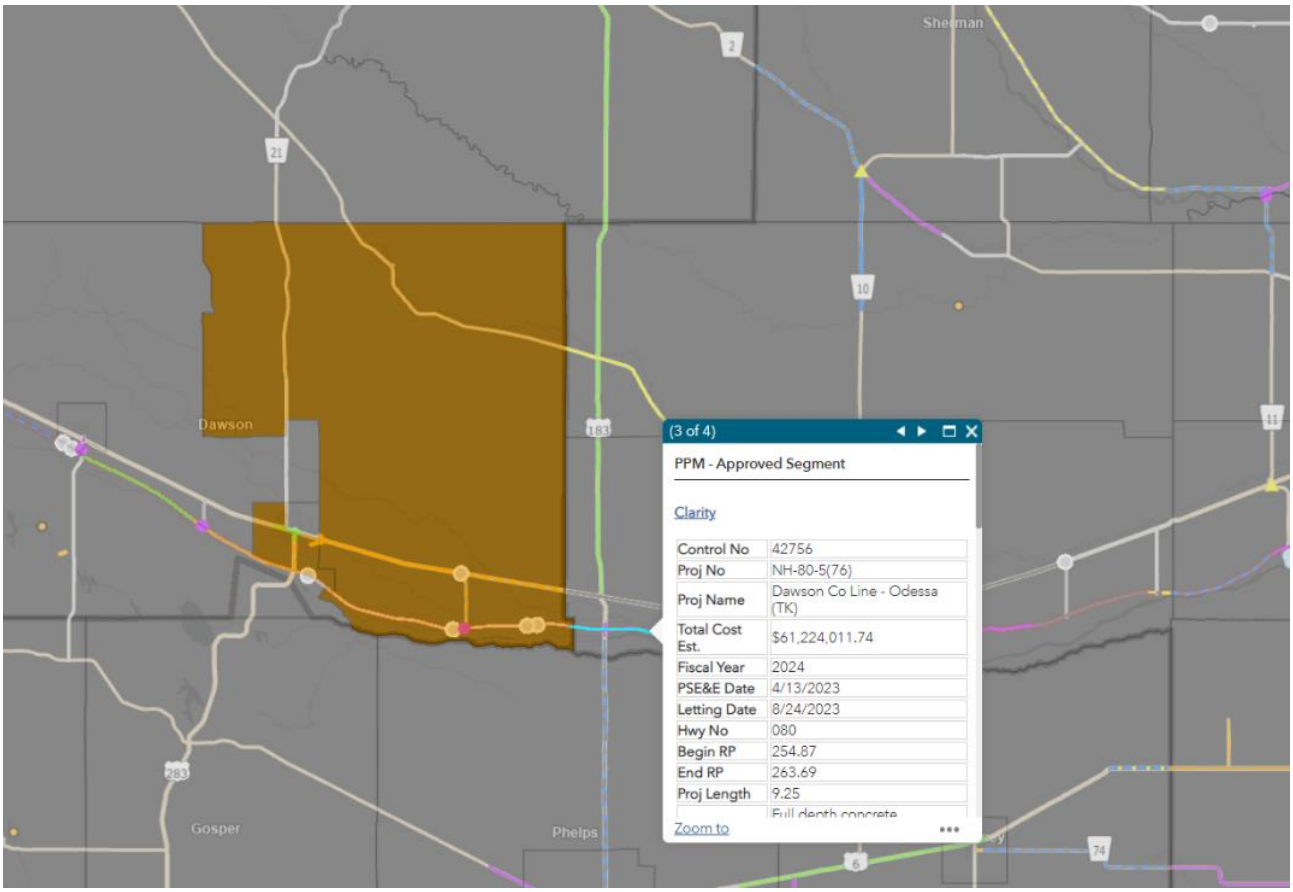
[139] https://www.whitehouse.gov/environmentaljustice/justice40/

TABLE 9.1 NEBRASKA FREIGHT INVESTMENT PLAN, FY2023-FY2026

Control No.	Project Description	NHFN Impacted	Funding Source ($000s)	FY2023	FY2024	FY2025	FY2026	Total
42756	Replace 9.3 miles of 4 lane Interstate concrete from Dawson County Line to Odessa	I-80 (PHFS) MP 254.87 to MP 263.69	NHFP	$10,500	$10,500	$10,500	$10,500	$42,000
			State Match (State HWY Case Fund)	$1,050	$1,050	$1,050	$2,135	$5,285
			Other (Federal NH, STP Funds)	-	-	-	$9,762	$9,762
			Total	**$11,550**	**$11,550**	**$11,550**	**$22,397**	**$57,047**

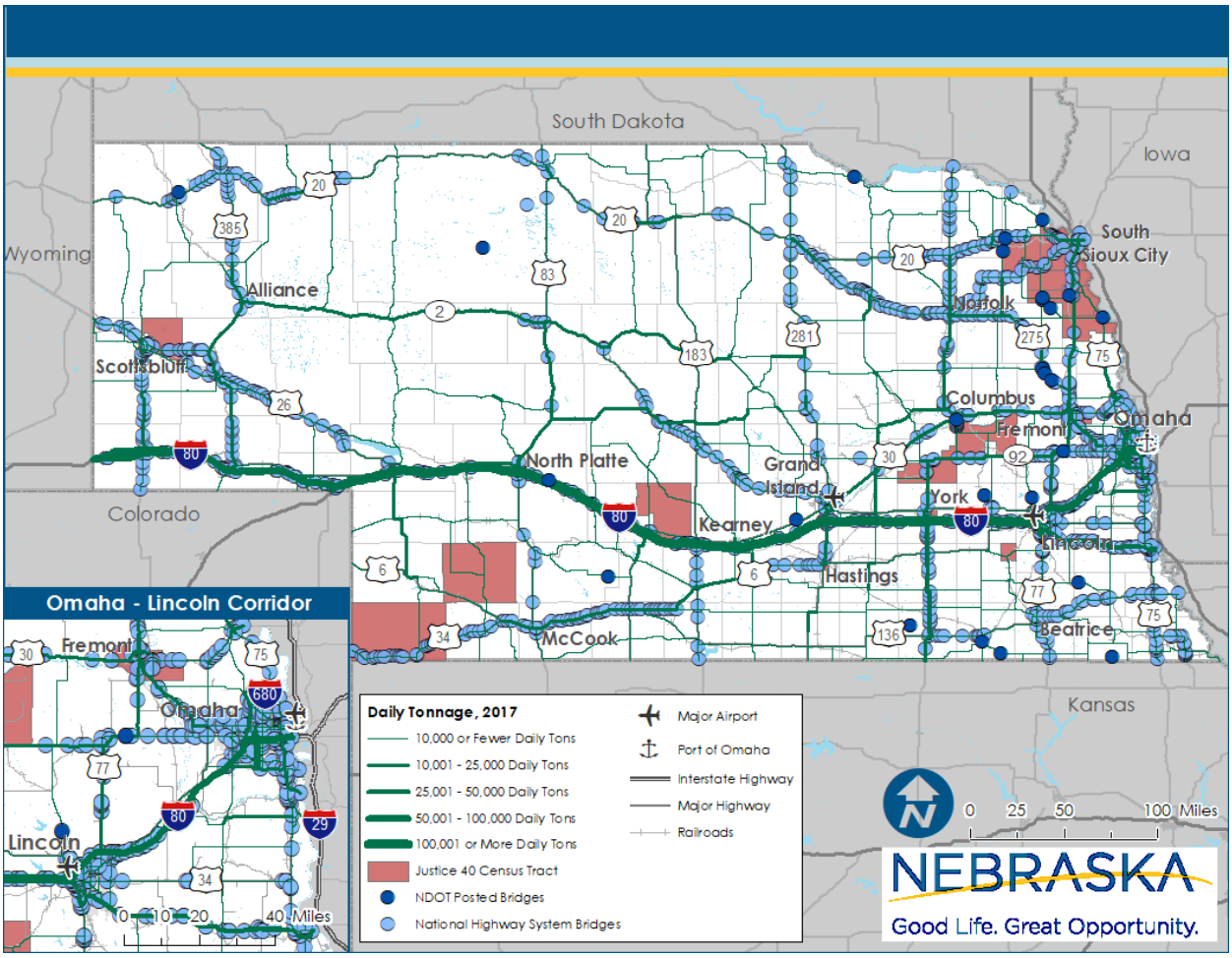
Note: NHFP investment priorities have not been established beyond the final year of the current STIP. NHFP investment priorities for 2027 through 2030 to be determined in future STIP cycles.

FIGURE 9.1 INTERSECTION OF FIP PROJECT LOCATION AND JUSTICE 40 CENSUS TRACT



Source: NDOT

FIGURE 9.2 JUSTICE 40 CENSUS TRACTS IN RELATION TO TONNAGE FLOWS, NHS BRIDGES, AND POSTED BRIDGES



Source: NDOT, U.S. DOT.

The 2023 Nebraska State Freight Plan has resulted in valuable insight into Nebraska's freight assets, commodity flow volumes, and disadvantaged communities, as shown in Figure 9.2. There are several Justice 40 Census Tracts located along I-80, Nebraska's most heavily trafficked truck freight corridor. Posted bridges, which have weight restrictions that limit vehicle size and could pose a damage risk to the bridge in the event of an excessive load, are present in several Justice 40 Census Tracts, most notably in the South Sioux City region. Other NHS bridges provide critical roadway access for other disadvantaged communities. NDOT will continue to monitor these assets in relation to Nebraska's Justice 40 communities, and incorporate those considerations into project selection.

Appendix A. Nebraska State Freight Plan Compliance with Federal Requirements

The 2023 Nebraska State Freight Plan meets and exceeds the requirements set out by the Federal Highway Administration (FHWA) under the Infrastructure Investment and Jobs Act (IIJA). Table A.1 describes the location of key elements within the plan summary and main body of the report.

TABLE A.1 NEBRASKA STATE FREIGHT PLAN COMPLIANCE WITH IIJA

IIJA Requirement	State Freight Plan Reference(s)
Plan Contents—A State Freight Plan shall include, at a minimum:	
Identification of significant statewide freight trends, needs and issues	*Chapters 4, 5, 6, 7*
Description of freight policies, strategies and performance measures that will guide freight-related transportation investment decisions	*Chapters 7, 8, 9*
Critical multimodal rural freight facilities and rural and urban freight corridors	*Chapter 5*
Link to national multimodal freight policy and highway freight program goals	*Chapter 2*
Description of how innovative technologies and operational strategies (including ITS) that improve the safety and efficiency of freight movements were considered	*Chapters 7, 8*
Description of improvements to reduce roadway deterioration by heavy vehicles (including mining, agricultural, energy cargo or equipment and timber vehicles)	*Chapters 5, 7, 8, 9*
Inventory of facilities with freight mobility issues and a description of the strategies the state is employing to address the freight mobility issues	*Chapters 5, 7, 8, 9*
Description of significant congestion or delay caused by freight movements and any mitigation strategies	*Chapters 5, 7, 8, 9*
Freight investment plan that includes a list of priority projects and describes investment and matching funds	*Chapter 9*
Consultation with the state freight advisory committee	*Chapter 3, Appendix B*
Assessment of commercial motor vehicle parking facilities	*Chapter 5*
Description of supply chain cargo flows	*Chapters 4, 6*
Inventory of commercial ports	*Chapter 5*
Discussion of the impacts of e-commerce on freight infrastructure	*Chapter 4*
Considerations of military freight	*Chapter 5*
Strategies and goals to decrease a) the severity of impacts of extreme weather and natural disasters on freight mobility, b) the impacts of freight movement on local air pollution, c) the impacts of freight movement on flooding and stormwater runoff, and d) the impacts of freight movement on wildlife habitat loss	*Chapter 8*

Appendix B. Stakeholder Engagement Summary

B.1 Freight Advisory Committee #1 Polling Results

FIGURE B.3 WHICH FREIGHT TRANSPORTATION MODES ARE YOU MOST KNOWLEDGEABLE ABOUT?

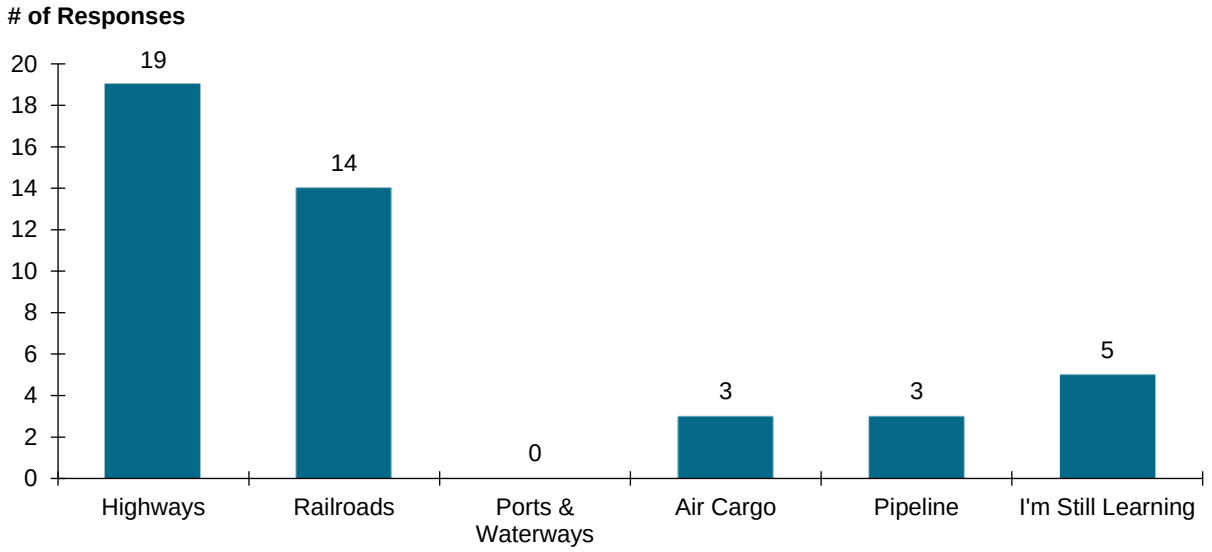


FIGURE B.4 HOW IMPORTANT ARE THE FOLLOWING GOAL AREAS, FROM NOT IMPORTANT TO VERY IMPORTANT?

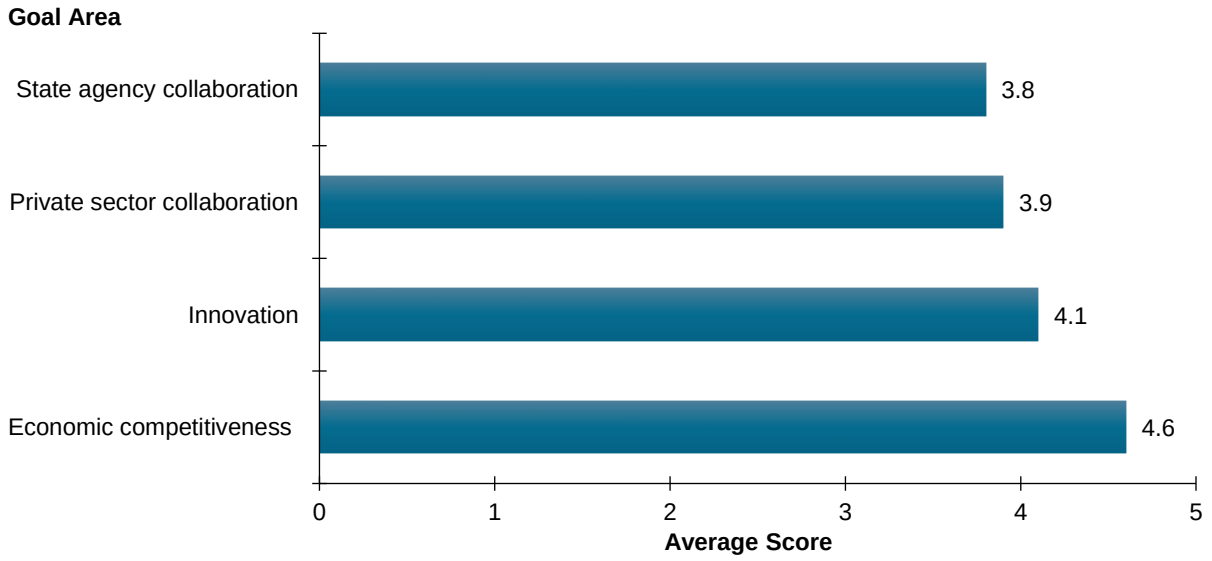


FIGURE B.5 ARE THERE ANY ADDITIONAL THEMES YOU'D LIKE TO SEE INCORPORATED INTO THE FREIGHT PLAN VISION AND/OR GOALS?

FIGURE B.6 WHAT WOULD YOU LIKE TO SEE COME OUT OF THIS STATE FREIGHT PLAN UPDATE?

FIGURE B.7 IN ADDITION TO THIS GROUP, WHO ELSE SHOULD WE TALK TO AS PART OF THE FREIGHT PLAN UPDATE?

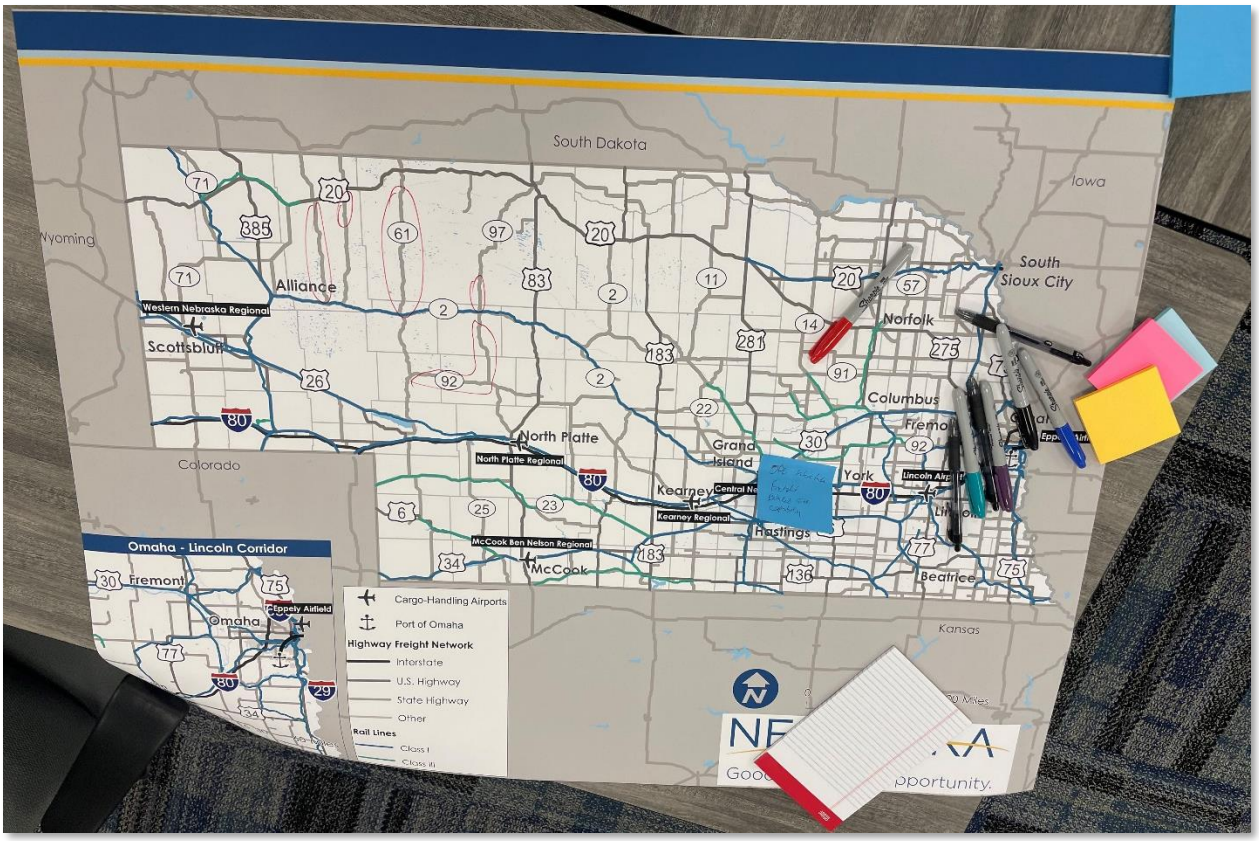
B.2 Freight Advisory Committee #2 Breakout Group Notes

Group 1

- Identify opportunities for investing in improvements for last mile rail connections through Nebraska's Economic Opportunities Program.
- The question was raised whether or not this plan could potentially come up with new priorities for the 1988 Expressway Plan and make changes to it? Nebraska has changed, can we be a nimble state to make investment decisions that reflect these changes.
- It was noted that the standards for highways in terms of cross-section dimensions (shoulder widths, etc.) vary between states. A specific example provided was U.S. 83 / U.S. 183 between NE and Kansas. Can we coordinate with adjacent states?
- There was some discussion about the current plans for 6-laning I-80 to Grand Island. Where is that priority for the state currently, and how does that fit with other priorities including the expressway system.
- It was noted that some surrounding states allow for longer combination trailers and that makes freight movement more efficient for shippers in those states. Fewer trucks on the roads and more freight transferred per driver. We discussed safety—obviously the bigger trucks are a safety concern but is removing more heavy trucks from the highway system a net safety benefit?

- There was some discussion that on lower volume roads designated for expressway improvements, it might make sense to consider a “super-two” cross-section (higher design standards, wide shoulders, passing lanes, but only two-lane highways)
- It would be good to be able to understand the value of freight moved in various corridors.
- Are there technologies that the state should be investing in to make the system more efficient and ready for the future? Vehicle-to-Infrastructure (V2I) for instance. And these investments should not just focus on I-80.
- It would be good to understand what the business case is for investments in EV charging stations are in the state, so that we can help build Public-Private Partnerships. Can the state sponsor this research on ROI?
- There was some discussion of the potential to 4-lane U.S. 81 from Norfolk to the south Dakota border. This route could draw some trucks off of other routes and help facilitate connections to the Dakotas and Canada for Nebraska.
- Safety concerns were noted on U.S. 30 between Columbus and Grand Island.

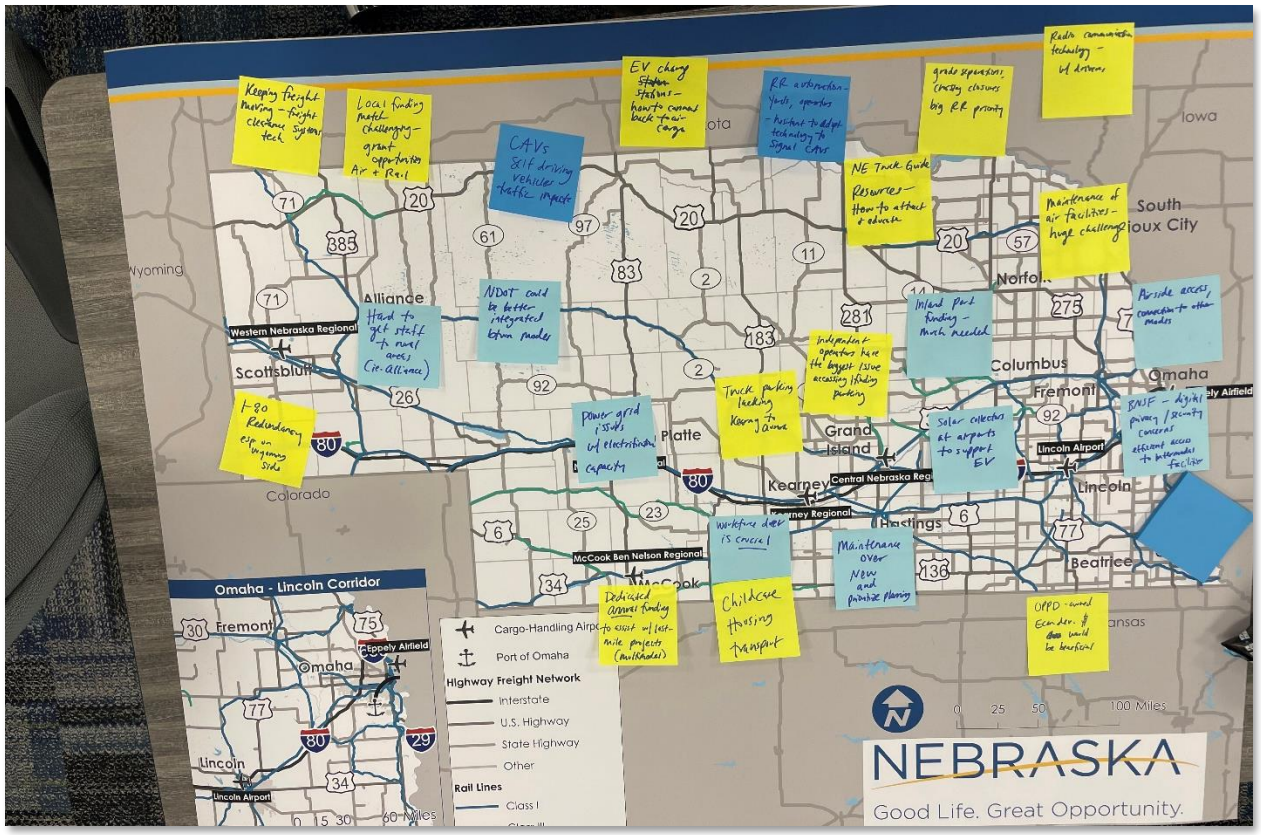
Group 2



- Union Pacific and BNSF are competitive yet partners—both advocate for railroad grade separation projects.
- Threats vs. Opportunities. Is infrastructure the solution? Or do policy changes need to be part of the answer.
- Example: Oversized loads and indivisible loads on interstates. Size capacities are limiting some manufacturing companies, which leads to an increase of freight traffic on certain highways.
- Policy changes might be able to help, i.e., increasing truck lengths with driver shortage.
- UPRR: Coal loads have declined. Looking at autonomous train and vehicle technology, and how it looks when those intersect.
- Electrification: NPPD representative: Electrification is a critical need for future infrastructure, and will need to expand to help serve all modes.
- UPRR: Safety is always on UP's mind; trying to reduce the number of at grade rail crossings. Thread the needle between longer trains and trying to not block at-grade crossings—balance between safety and operational efficiency.

- Resiliency: UPRR: Some states have programs/funds that support increasing resilient infrastructure, i.e., California's climate-centric fund. 2019 flooding: Bridges rebuilt good enough to restore rail service. But not to withstand another major event. Flooding and fires also show the importance of alternate routes: Can they sustain heavier traffic? Will more expressways be constructed?
- Pavement conditions: overall good, but there are trouble spots near Valentine, which cause problems for livestock producers.
- Value vs. volume: How should we look at commodities when making decisions on where to spend investments?
- Strategic look at commodities and the role they play. Ex: Food scarcity. How can we export a higher-value product, rather than base-level grains?
- Lack of labor force, and availability of CDL. CDL can be difficult to get and pay to renew.
- Delays in ag freight = financial losses, typically.
- The reliability of data and availability of Federal funds for bridges can impact reliability within the state.

Group 3



- System condition

- Really important to prioritize maintenance over new stuff. Also important to prioritize planning. Requires a culture shift—currently not the case in Nebraska.

» Technology/Electrification

- Electrification is big, but power grid issues may limit capacity for deployment.
- Important to study/understand the impacts of CAVs, self-driving vehicles, etc. on traffic in Nebraska
- Opportunity to develop solar collectors at airports to support EVs
- BSNF struggling with digital privacy/security concerns over its use of eye scans at intermodal facility. It enables efficient access to facilities, but Illinois is suing BNSF for breach of privacy. Concerns that it will lead to enormous back-ups and reduced efficiency for intermodal freight in the region.
- RR industry is hesitant (according to BNSF) to adopt automation technologies to signal to CAVs—they do not like having to adapt to the CAV industry.

» Redundancy

- This can be very challenging on I-80 when road closures occur and there are very limited alternatives for travel. This is particularly problematic on the Wyoming side of I-80. Even when WYDOT gives advanced notice, back-ups can occur for miles and be very disruptive to freight/business.

» Workforce

- Challenging to get people to locate to rural areas (BNSF mentioned Alliance specifically). Makes it hard to expand business even in areas that make sense to grow/intensify freight activity.
- Workforce development is crucial—really hot issue right now impacting nearly every industry.
- Childcare, housing, transportation—also essential in the discussion of workforce retention and attraction.

» Trucking/Truck Parking

- Truck parking gaps exist in central Nebraska, specifically from Kearney to Aurora
- Independent operators have the biggest issue in finding/accessing truck parking. Big companies often have contracts with certain facilities to guarantee/reserve spots for drivers
- Resources exist by NDOT to help support truckers in figuring out permitting, etc. But are there better ways to educate drivers? Seems to be difficult for new carriers to get the right info they need from NDOT.

- Need to improve radio communication technology with drivers that are on-the-road—alert to hazards, truck parking, etc.

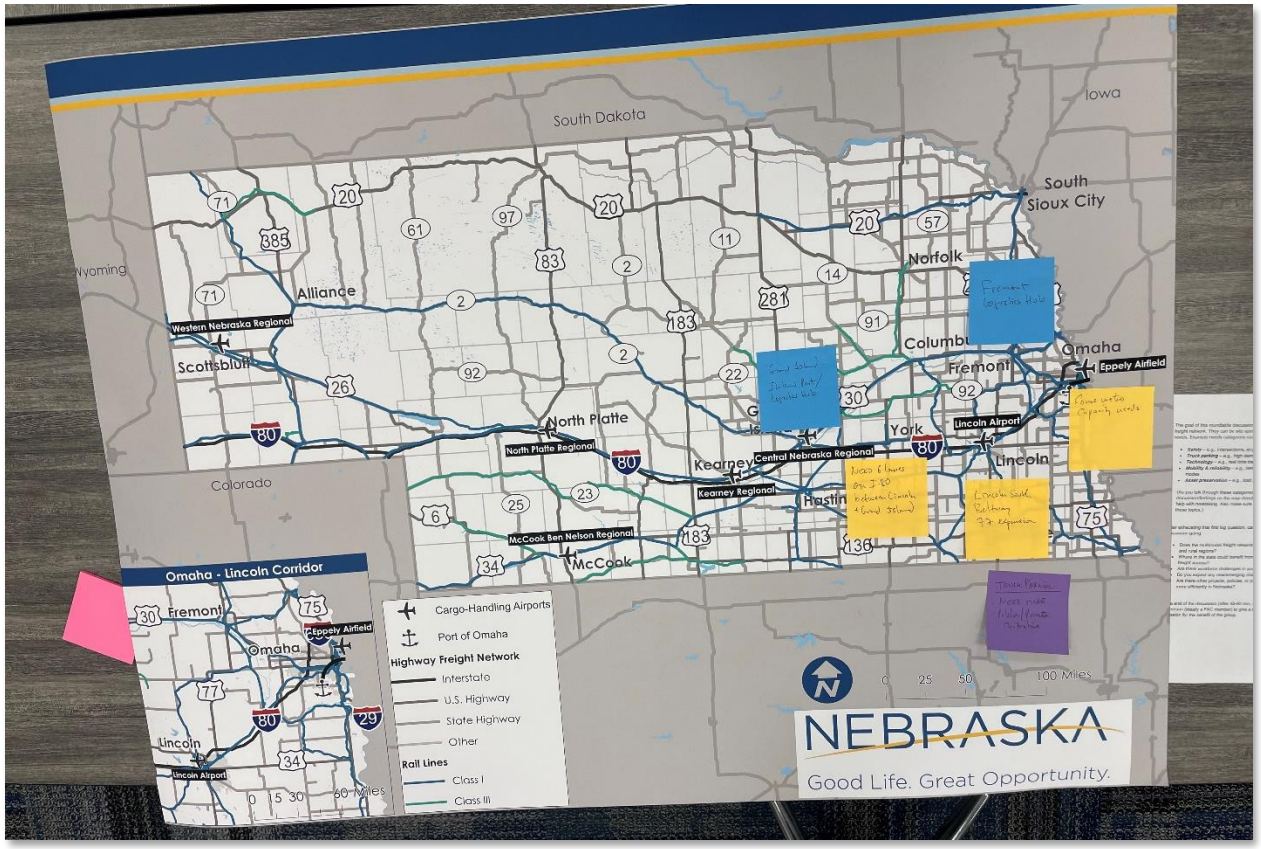
» Multimodal

- NDOT could be better integrated between modes. Not much discussions happening between modal agencies. Frustrations with lack of non-highway funds administered by NDOT.
- Inland port funding—much needed to help ensure these facilities can be successful.
- Airside access and connection to other modes, opportunity to invest
- Local funding matching for air & rail projects is challenging to secure, grant opportunities exist but are hard to apply for

» Safety

- Grade separations, crossing closures continue to be a major Railroad priority. All long-hanging fruit has been completed at this point—what's left are pretty capital-intensive upgrades.

Group 4



- System reliability is the biggest concern. NDOT does not own incidents, and thus must rely on other agencies and jurisdictions to manage and resolve them. As a result, incidents are often not addressed as quickly or as efficiently as they could, thereby causing unnecessary delays to highway system users.

- Truck Parking. Representative from Werner said it was their most important issue, but he deferred to Kent Grisham of the NE Trucking Association to identify where capacity shortfalls exist. Only about 330 public truck parking spaces exist in the state, but there are quite a few private facilities. General consensus among the group was that private solutions are appropriate and should be developed.

- Asset management. Interestingly, the discussion began with one of the participants stating how important it was, and then various folks describing the great job NDOT does in maintaining their assets. They did note that most highways (apart from I-80) have fewer than 10k vehicles daily, so the demand for highway expansion is driven more by perceived than actual need.

- Safety—It's [mostly] about communication, not infrastructure.

  - Focus needs to be on improving information flow to commercial vehicle operators, including advanced warnings about weather and road conditions, implementation of dynamic speed limits (currently only advisory, but need to be made enforceable), improve incident management.

  - Better training and information for non-professional users, such as ranchers and farmers who generally own trucks to haul crops and supplies.

  - CDL training—needs to be stepped up. Also, need to address language gap, as many truckers are English learners and thus not proficient.

- Electrification. State is currently completing their federally mandated NEVI study. Focus is on I-80, but eventually all primary routes will have coverage at least 50 miles apart. With Nebraska being a large rural state, there is concern about grid capacity to support charging, particularly in the more remote areas.

- Resilience. More needs to be done, particularly adding options for alternative routes where currently only one exists.

- Tidbits

  - Opportunities for inland trade hubs, logistics parks, manufacturing sites near major highways and rail main lines. Fremont and Grand Island were identified as particularly attractive locations.

  - Nebraska has excess airside capacity that could be used as a catalyst to create economic development.

  - New industrial/trade hubs should be designed to reduce truck traffic.

B.3 Freight Advisory Committee #3 Polling Results

FIGURE B.8 HOW WOULD YOU PRIORITIZE THESE ACTIONS FOR ASSET PRESERVATION?

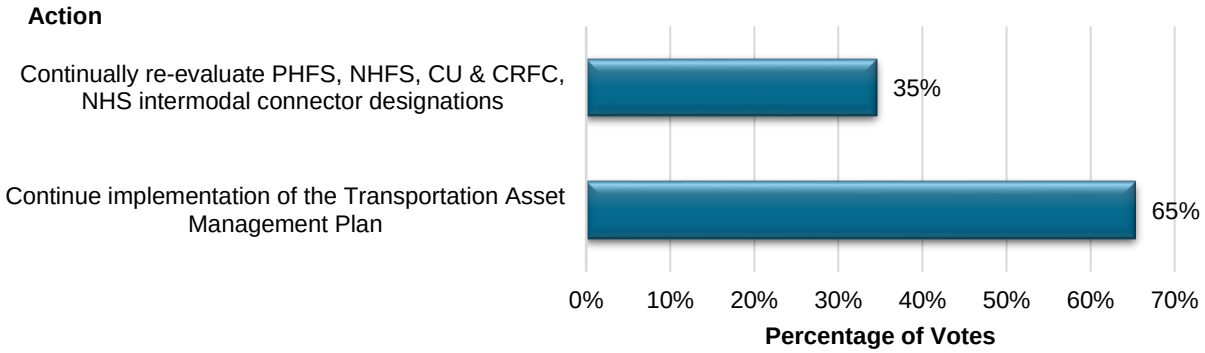


FIGURE B.9 HOW WOULD YOU PRIORITIZE THESE ACTIONS FOR RELIABLE, SECURE & RESILIENT FREIGHT TRANSPORTATION?

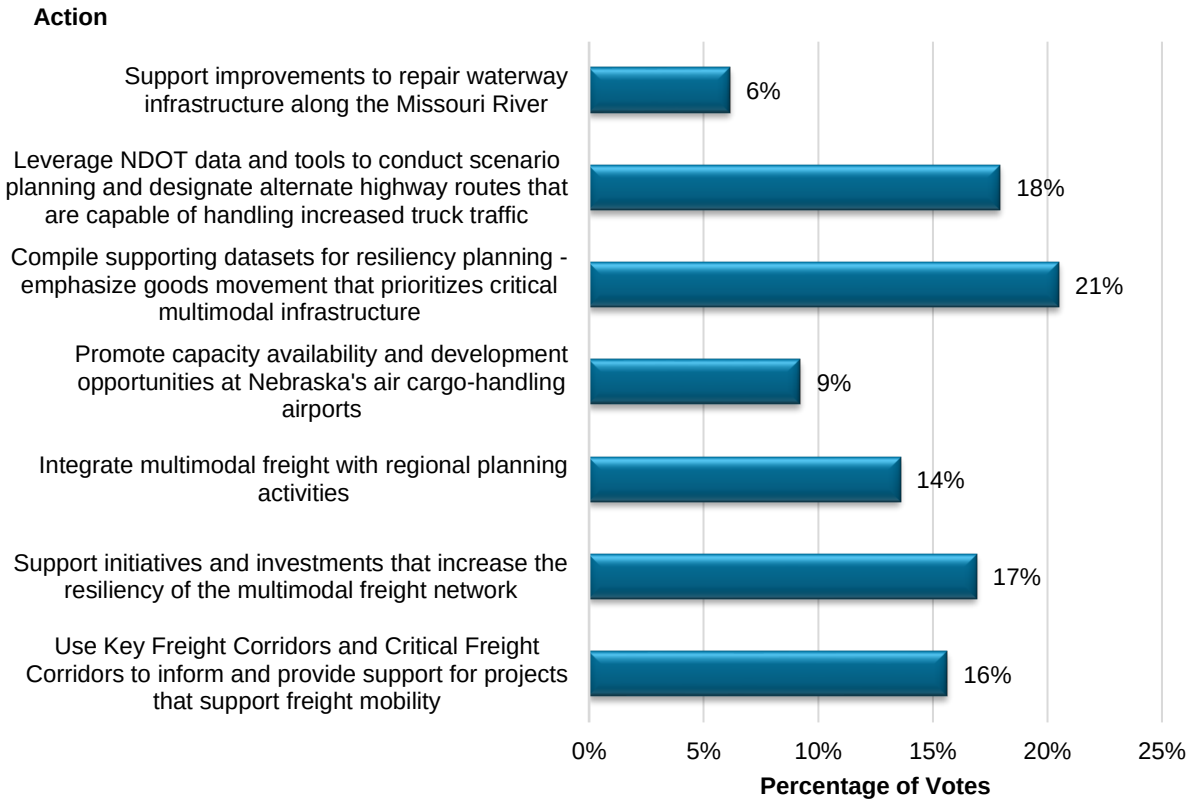


FIGURE B.10 HOW WOULD YOU PRIORITIZE THESE ACTIONS FOR ECONOMIC COMPETITIVENESS?

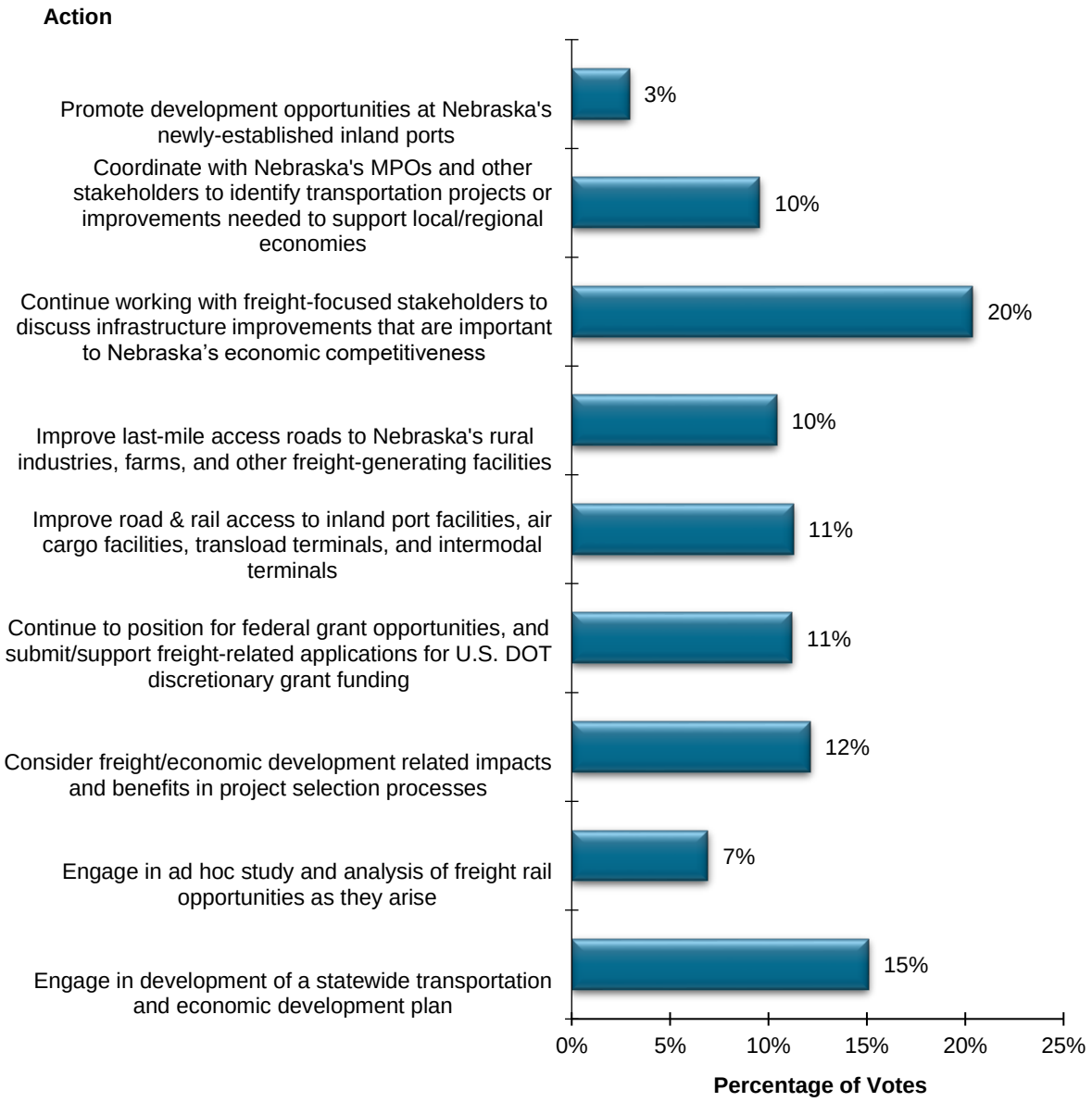


FIGURE B.11 HOW WOULD YOU PRIORITIZE THESE ACTIONS FOR SAFETY?

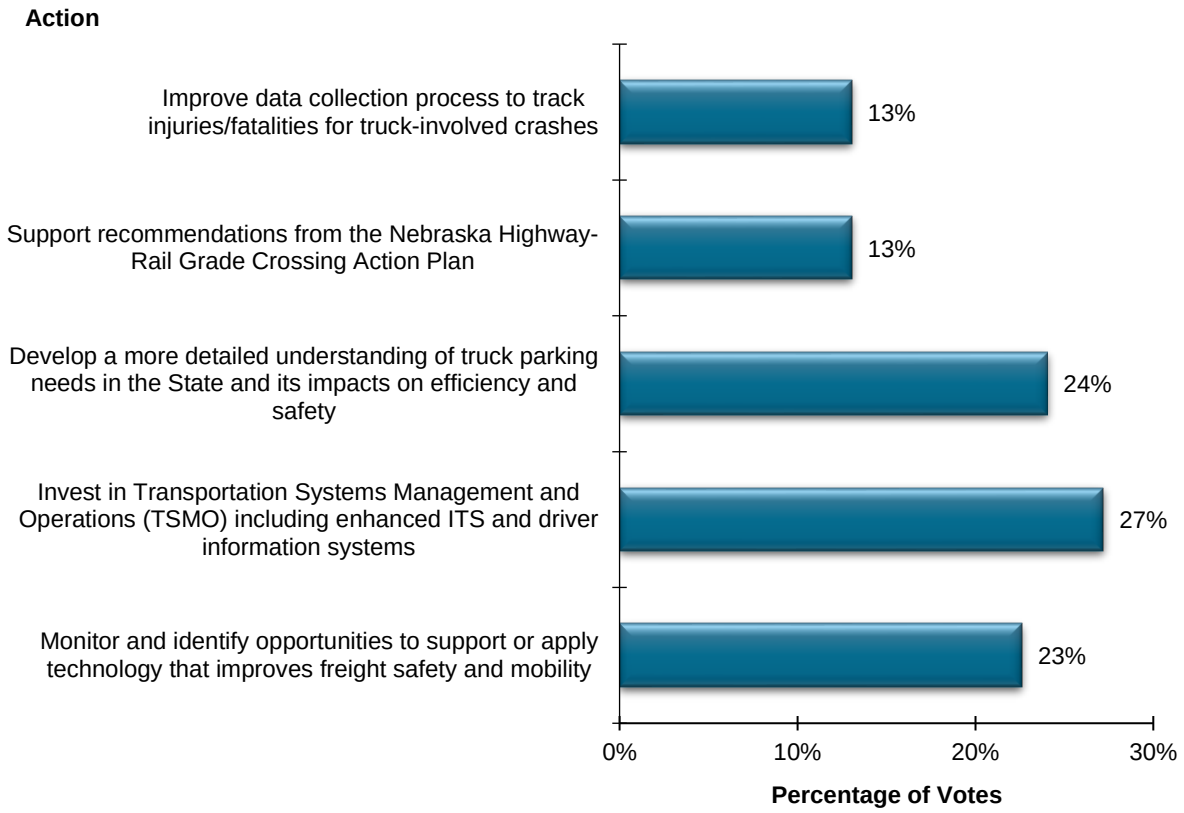


FIGURE B.12 HOW WOULD YOU PRIORITIZE THESE ACTIONS FOR ENVIRONMENTAL AND COMMUNITY VITALITY? (NON-NDOT RESPONDENTS ONLY)

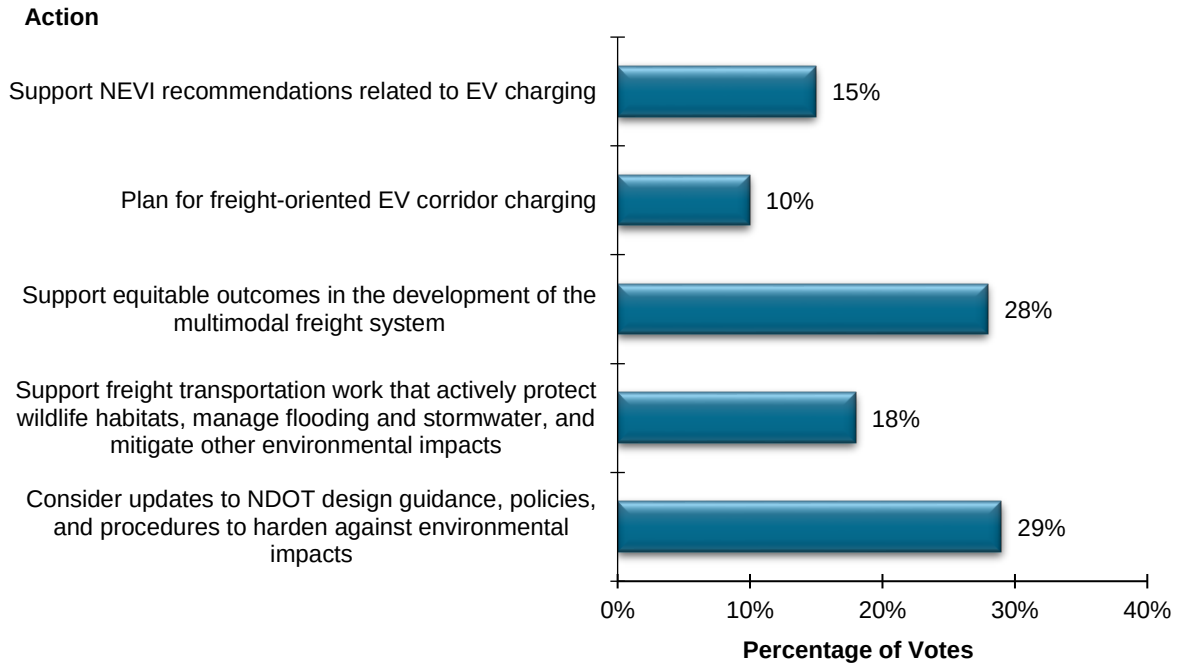
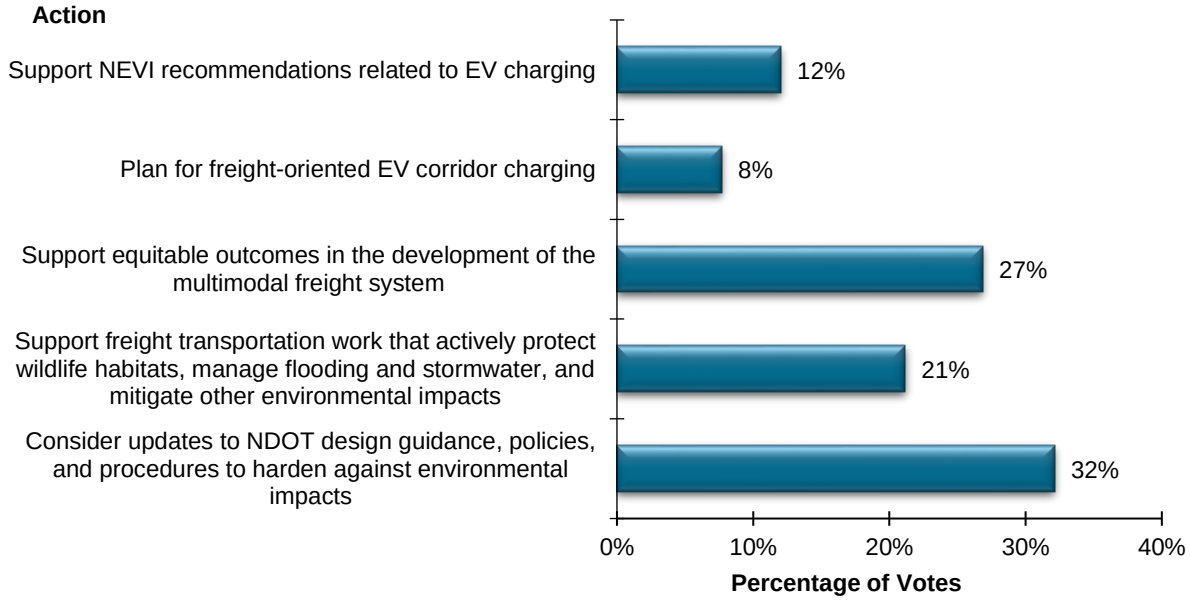


FIGURE B.13 HOW WOULD YOU PRIORITIZE THESE ACTIONS FOR ENVIRONMENTAL AND COMMUNITY VITALITY? (ALL RESPONDENTS)



Appendix C. Critical Freight Corridors

TABLE C.2 CRITICAL RURAL AND URBAN FREIGHT CORRIDORS IN NEBRASKA

	Route	City/County	Start	End	Length (mile)
Critical Rural Freight Corridor (CRFC)	Cloverly Road	Dodge	U.S. 77	Old U.S. 275	1.5
	E 29th Avenue	Platte	U.S. 30	8th Street	1.0
	Lincoln South Beltway	Lancaster	S 84th Street	N-2	3.0
	N 148th Street	Lancaster	N-2	I-80 via U.S. 6	14.0
	N-36	Douglas	Reichmuth Road	U.S. 275	0.5
	N-44	Buffalo	I-80	Railroad Street	2.0
	N-92	Scotts Bluff	U.S. 26	Stable Club Road	2.0
	Omaha Avenue	Madison	S 25th Street	U.S. 275	1.0
	S Bell Street / Old U.S. 275 / Reichmuth Road	Dodge / Douglas	Cumming Street	N-36	5.0
	South Beltline Highway	Scotts Bluff	Stable Club Road	N-92	2.0
	U.S. 26	Scotts Bluff	County Road 20	Highland Road	3.0
	U.S. 275	Madison	S 20th Street	S Chestnut Street	3.0
	U.S. 275	Stanton / Cumming	Oak Street / 56th Ave	16th Road	29.0
	U.S. 275	Douglas	N-36	U.S. 6	9.5
	U.S. 30	Lincoln	Young Street	U.S. 83	7.0
	U.S. 30	Platte	33rd Avenue	E 40th Avenue	5.0
	U.S. 34	Adams	W 33rd Street	U.S. 6 / W J Street	3.0
	U.S. 34	Cass	Murray Road	N-66	6.0
	U.S. 34	Cass	U.S. 75	Oak Hill Road	4.0
	U.S. 385	Box Butte / Morrill	L62A	Country Club Road / W 3rd Street	24.0
	U.S. 6 / U.S. 34	Adams	BNSF Rail	BNSF Rail	1.0
	U.S. 75	Cass	N-66	Oak Hill Road	1.0
	U.S. 81	Platte	33rd Avenue	53rd Avenue	1.5
	U.S. 81	Polk / York / Butler	U.S. 34	N-64	41.0
	U.S. 81	Madison	U.S. 275	Monroe Avenue	0.5

	Route	City/County	Start	End	Length (mile)
Critical Urban Freight Corridor (CUFC)	U.S. 83	Lincoln	U.S. 30	I-80	2.5
	Storz Expressway / Abbot Drive / Cuming Street	Omaha	Ames Avenue	Cuming Street	7.0
	Dakota Avenue	South Sioux City	I-129	Pine Street	2.0
	Pershing Drive / Abbot Drive	Omaha	Craig Avenue	Storz Expressway	4.0
	Old U.S. 77	Lincoln	U.S. 6	I-80	3.0
	Lincoln South Beltway	Lincoln	U.S. 77	S 84th Street	5.0
	NW 12th Street	Lincoln	Cornhusker Highway	Highland Boulevard	1.0
	Relocated U.S. 281	Grand Island	U.S. 281	U.S. 34	7.0
	NE-2	Lincoln	U.S. 77	S 96th Street	9.0
	U.S. 275	Omaha	I-80	Nebraska/Iowa Border	8.0
	U.S. 275	Omaha	W Center Road	I-80	4.0
	U.S. 30	Grand Island	Johnstown Road	Capital Avenue	3.5
	U.S. 6	Lincoln	U.S. 77	Roundhouse Road	1.0
	U.S. 6	Lincoln	Old U.S. 77	N 84th Street	2.0
	U.S. 6	Omaha	U.S. 31	72nd Street	11.5
	U.S. 50	Omaha	U.S. 275	N-370	5.0
	U.S. 75	Omaha	I-480	Storz Expressway	3.0
	U.S. 75	Omaha	Fairview Road	I-80	9.0
	U.S 75	Omaha	Fairview Road	U.S. 34	2.0
	L28B	Omaha	U.S. 275	U.S. 6	3.5
	72nd Street	Omaha	U.S. 275	U.S. 6	3.0
	N-133	Omaha	Irvington Road	Douglas Co Border	6.5
	U.S. 77	Lincoln	I-80	U.S. 6	0.5
	U.S. 77	Lincoln	Lincoln South Beltway	I-80	10.0

Source: NDOT; FHWA.