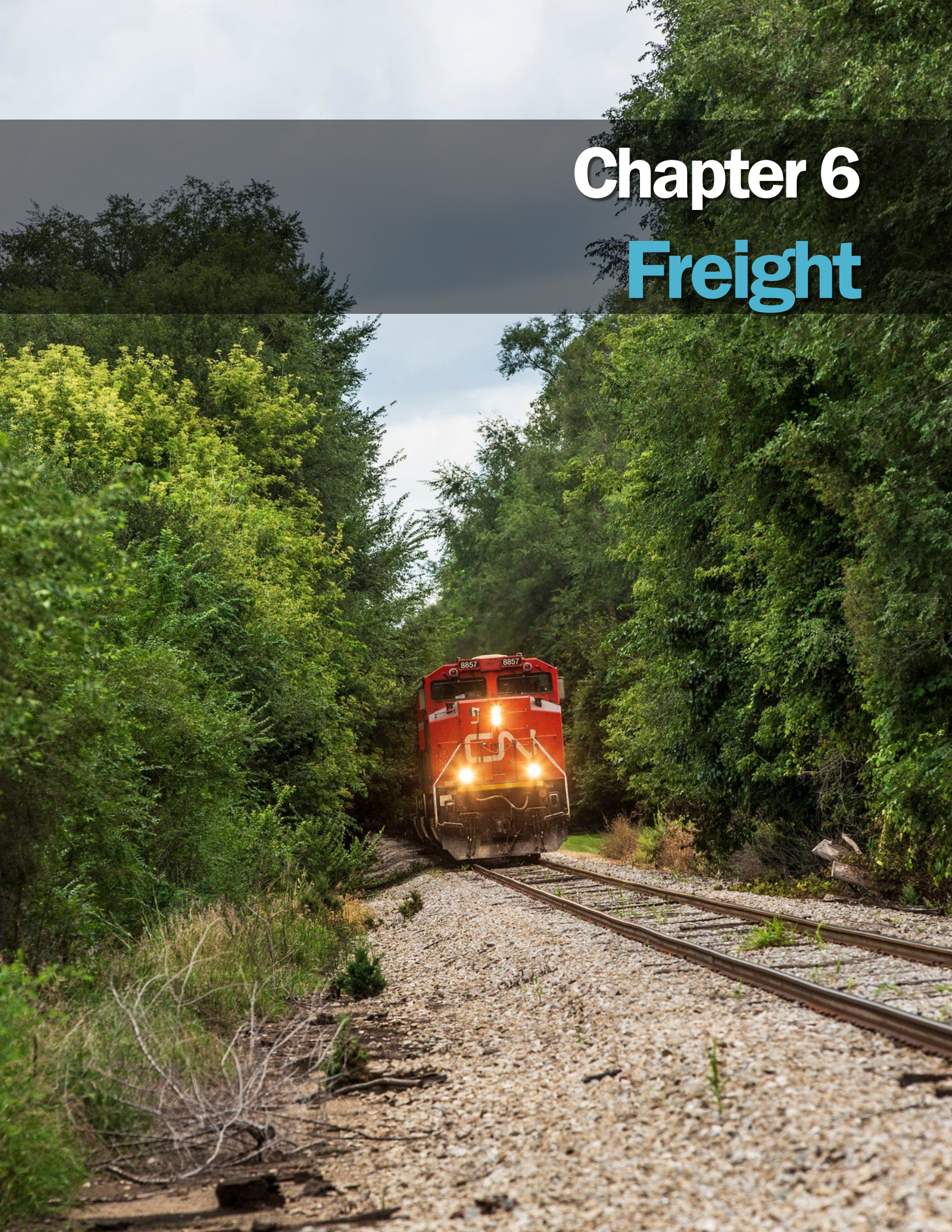
Chapter 6
Freight



Chapter 6 – Freight

Freight Background

Multimodal freight is crucial for the economic growth of the region. Situated in the heart of the Midwest, this area heavily relies on smooth goods movement to fuel industries and local businesses. With varied multimodal infrastructure, the region enjoys better connections to regional, national, and global markets. This network allows easy transfers between modes, making freight movement efficient and cost effective. Undoubtedly, multimodal freight is a vital component driving economic prosperity and advancement in the region.

The importance of freight transportation planning has grown due to the increasing volume of goods moved. With expanding global trade and consumer demand, efficient systems are vital to reduce congestion and inefficiencies. Effective planning optimizes routes, modes, and infrastructure, meeting customer expectations while cutting costs and environmental impact. Anticipating trends helps identify bottlenecks, safety problems, and innovative solutions, enabling infrastructure upgrades. Integration of technologies and sustainability practices, like electric vehicles and green logistics, addresses environmental issues.

The significance of planning for multimodal networks and freight transportation has been emphasized by past federal transportation bills and continues with the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL). Three of IIJA's planning factors targeted towards the multimodal system and freight are to:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Increase the accessibility and mobility of people and for freight.
- Enhance the integration and connectivity of the transportation system, across and between modes for people and freight.

Regional Stats

269
Transportation & Warehousing businesses[1]

276
Miles of active rail lines[2]

213
Public at-grade rail crossings

91 & 13
Road-rail injuries and fatalities since 1975[3]

588
Miles of active pipeline[4]

Sources:
[1]U.S. Census Bureau, 2022 County Business Patterns

[2]Iowa DOT, REST Services, Active Rail Lines

[3]U.S. DOT, Highway-Rail Grade Crossing Accident Data

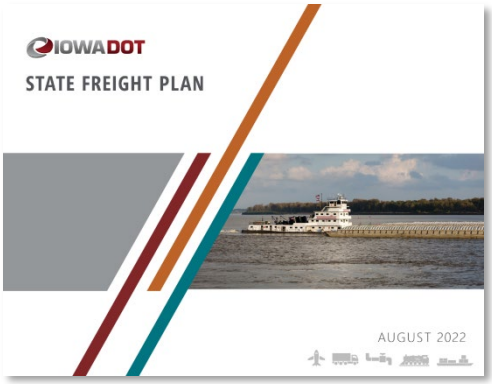
[4]U.S. DOT, Pipeline and Hazardous Materials Safety Administration, National Pipeline Mapping System

Freight planning is distinct from planning for other transportation modes. This is because it mostly involves private sector operations, especially in rail and pipeline, where infrastructure is privately owned. This results in limited public data on freight and complicates collaboration among stakeholders. Some companies may be reluctant to share sensitive freight information.

The focus of this chapter is to explore freight and multimodal transportation which often overlap. The movement of freight frequently involves several steps and potentially multiple modes of transportation. There are four modes of freight transportation available in the region – truck, rail, air, and pipeline. The region does not contain any navigable waterways.

State Freight Plans

Iowa State Freight Plan 2022



The primary purpose of the State Freight Plan is to document the immediate and long-range freight planning activities and investments in the state. More specifically, it provides guidance on how to address issues, adapt to emerging trends, and invest strategically in the freight system to grow a stronger economy, strengthen the nation's competitive advantage, and enhance the quality of life for Iowans.

Developed in coordination with the Iowa Freight Advisory Council (FAC), the State Freight Plan serves as a platform for connecting Iowa's freight-related initiatives and a tool for informed decision-making aimed at addressing the ongoing challenges of today's freight system and supply chains.

This document is the second in the current series of freight plans that are federally required to be updated every four years. The 2022 State Freight Plan is an updated and streamlined version of the original 2017 State Freight Plan with several notable enhancements that will impact the freight transportation system including:

- Clearly defined system objectives
- Process for identifying multimodal bottlenecks
- Focus on infrastructure and supply chain resiliency
- Freight design considerations
- Commercial motor vehicle parking facilities assessment
- Catalog of freight-generating facilities

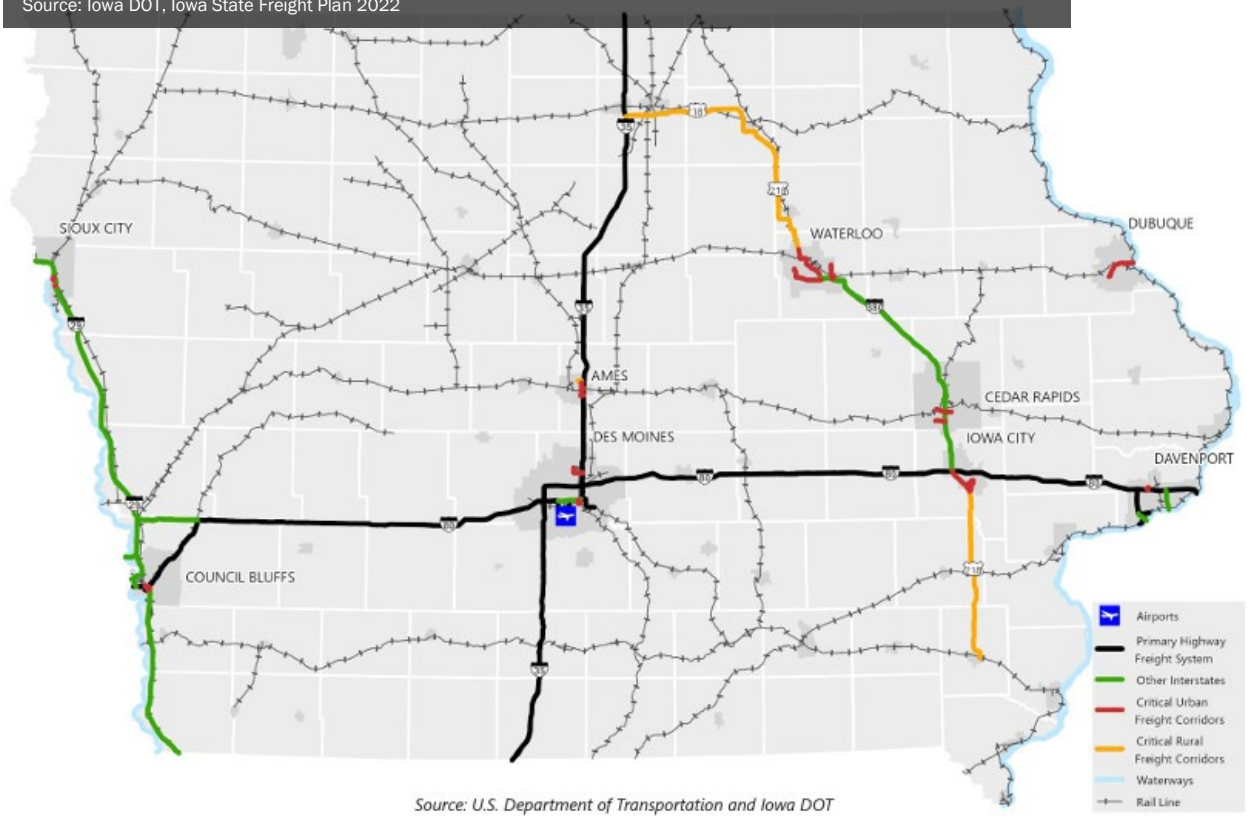
www.iowadot.gov/iowainmotion/Specialized-System-plans/2022-State-Freight-Plan

The most critical freight infrastructure in Iowa is designated as part of two freight networks – the National Multimodal Freight Network (NMFN), designated at the federal level, and the Iowa Multimodal Freight Network, (IMFN), designated at the state level. The NMFN consists primarily of infrastructure of national and international significance. The IMFN complements the national network by also identifying infrastructure critical to state and regional commerce including airports, highways, railroads, and inland waterways. Strategic military networks, specifically the Strategic Highway network (STRAHNET) and Strategic Rail Corridor Network (STRACNET), are also designated to prioritize infrastructure and connectivity needs for national defense.

The National Highway Freight Network (NHFN) is the highway portion of the NMFN and the system eligible for National Highway Freight Program (NHFP) funds distributed to the states annually. The NHFN includes the following four subsystems of roadways:

- Primary Highway Freight System (PHFS) – A network of highways designated at the federal level and identified as the most critical highway portions of the U.S. freight transportation system.
- Other Interstate portions not on the PHFS – These highways consist of the remaining portion of Interstate roads not included in the PHFS. These routes provide important continuity and access to freight transportation facilities.
- Critical Rural Freight Corridors (CRFC) – Public roads not in an urbanized area that provide access and connection to the PHFS and the Interstate from other important ports, public transportation facilities, or other intermodal freight facilities.
- Critical Urban Freight Corridors (CUFC) – Public roads in urbanized areas that provide access and connection to the PHFS and the Interstate from other ports, public transportation facilities, or other intermodal freight facilities.

National Multimodal Freight Network
Source: Iowa DOT, Iowa State Freight Plan 2022



Source: U.S. Department of Transportation and Iowa DOT

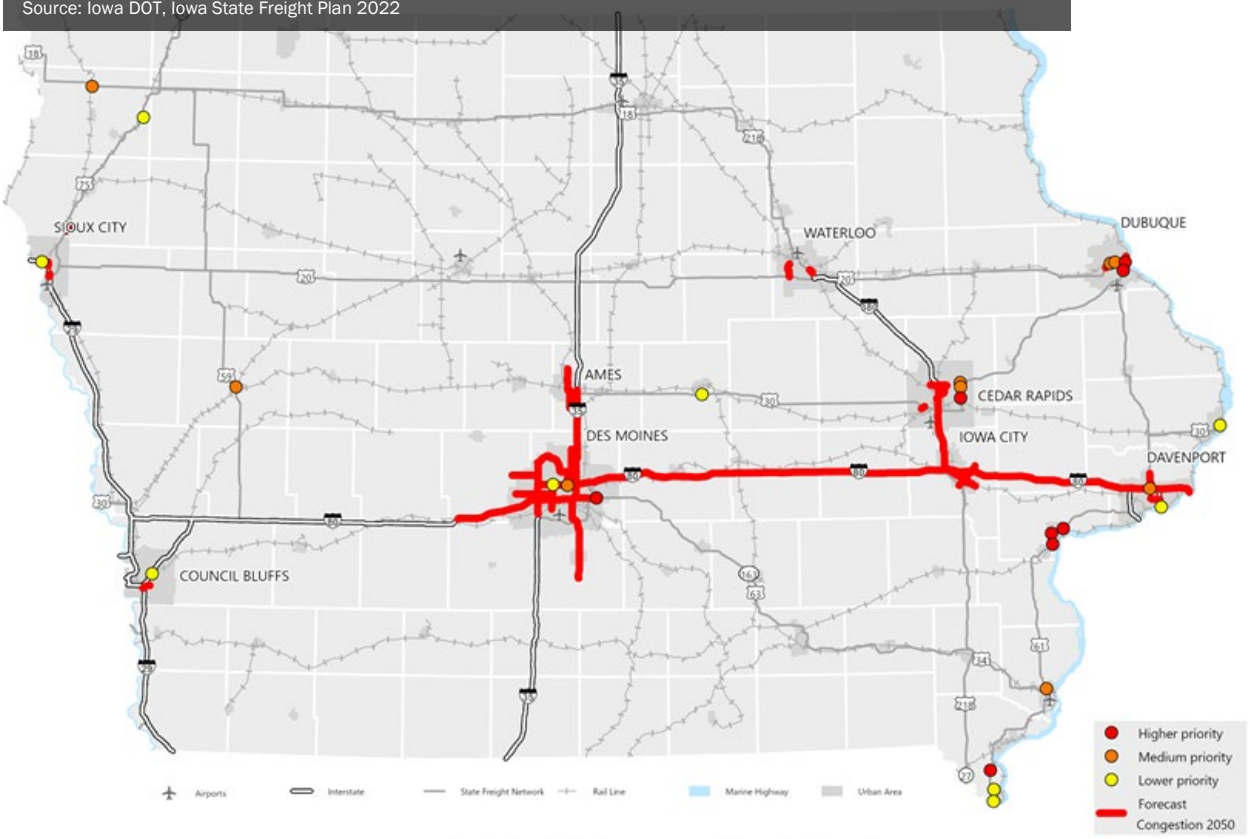
Iowa Multimodal Freight Network
Source: Iowa DOT, Iowa State Freight Plan 2022

Source: Iowa DOT

The State Freight Plan identifies specific improvements to address the freight mobility issues experienced in Iowa. These improvements are intended to support the state's freight implementation strategies, the national freight goals, and the Iowa DOT system objectives.

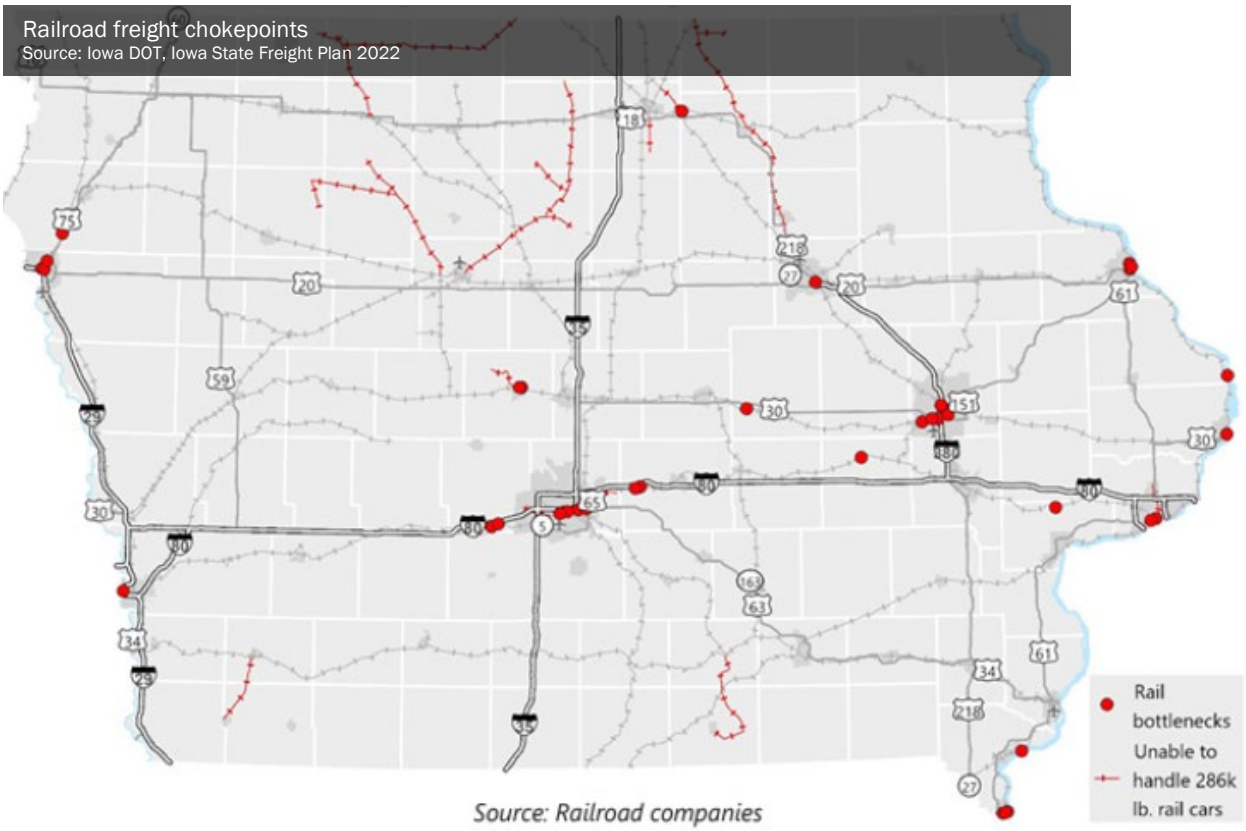
There were **27 locations identified as highway freight bottlenecks in Iowa**. Highway segments with capacity needs that impact freight mobility were also identified. To identify and prioritize candidates for highway freight improvements, the Iowa DOT utilized the Value, Condition, and Performance (VCAP) matrix. This approach takes advantage of multiple tools available at the Iowa DOT, including the Iowa Travel Analysis Model (iTRAM), Infrastructure Condition Evaluation (ICE), INRIX travel speed data, and Iowa's annual traffic counts. After each potential location was assigned a VCAP value, each was ranked for the three categories. The average of these three rankings was calculated and the locations were assigned an overall priority rank. Though the analysis shows localized areas of forecasted congestion in 2050, **none of the 27 highway freight bottlenecks identified fall within the Iowa Northland Region**.

Highway freight priority locations and capacity needs
Source: Iowa DOT, Iowa State Freight Plan 2022

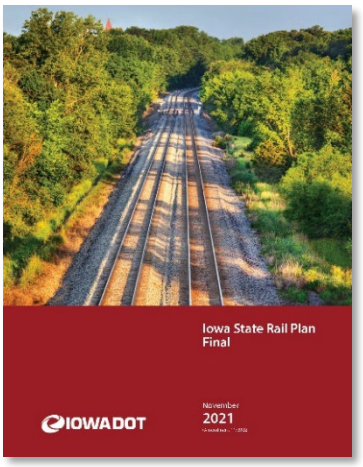


Source: Iowa Travel Analysis Model, Infrastructure Condition Evaluation, and INRIX

Railroad bottleneck locations (more commonly referred to as “choke points”) were identified by surveying each of the rail companies operating trackage in the state. Locations submitted primarily include structural choke points (e.g., low clearance areas and bridges with size restrictions), congested choke points (e.g., locations with operational issues or shared-use corridors), and low-lying areas at risk of flooding during heavy rains or high-water levels. Additionally, railroads continue to focus their attention on heavier axle-load freight equipment and longer, heavier trains to lower costs. Using larger rail cars in 100-plus car unit trains allows the greatest savings and economic benefits, as well as keeping would-be truck traffic off the highways. The industry standard for rail car weight, which includes the weight of commodities and the rail car combined, is 286,000 pounds. Iowa has rail lines that are unable to carry the sizes and weights of railroad equipment that meet this threshold. Bryant Yard at Waterloo is a railroad freight chokepoint due to the convergence of traffic from three subdivisions resulting in insufficient classification space. Additionally, the **CN rail from Cedar Falls north to Charles City and the state border cannot accommodate the sizes and weights required by industry standards**.



Railroad freight chokepoints
Source: Iowa DOT, Iowa State Freight Plan 2022



Iowa State Rail Plan 2021

This document guides the Iowa DOT in promoting rail access, improving freight and passenger rail, and enhancing rail safety. The State Rail Plan describes Iowa's rail network, its impacts, and the planning process. The Plan includes goals, capital improvements, studies, and steps to address identified issues. The document meets requirements from the Passenger Rail Investment and Improvement Act of 2008, enabling Iowa to be eligible for rail-related capital grants.

Various themes arose during the outreach process regarding existing rail issues at the local, regional, or state levels and the direction or actions that should be taken in the future. The themes described included:

- General rail benefits, opportunities, and threats
- Rail-related economic development
- Rail freight
- Intercity passenger rail service
- Commuter rail service
- Rail safety and security
- Environmental issues
- Rail financing
- The role of public agencies regarding rail

Based on suggestions obtained through outreach efforts, the Iowa DOT developed Iowa's rail vision of "*A safe, secure, and efficient Iowa rail system that ensures Iowa's economic competitiveness and development by maintaining the rail infrastructure and providing rail access and connectivity for people and goods in an environmentally sustainable manner.*"

Rail service goals aligned with the vision were developed based on the rail-related benefits, issues, and challenges that had been identified. These goals are as follows:

- Enhance safety and security of the rail system
- Maintain the rail infrastructure
- Provide access and connectivity
- Improve efficiency
- Ensure economic competitiveness and development
- Sustain the environment

https://iowadot.gov/iowainmotion/modal-plans/rail-transportation-plan

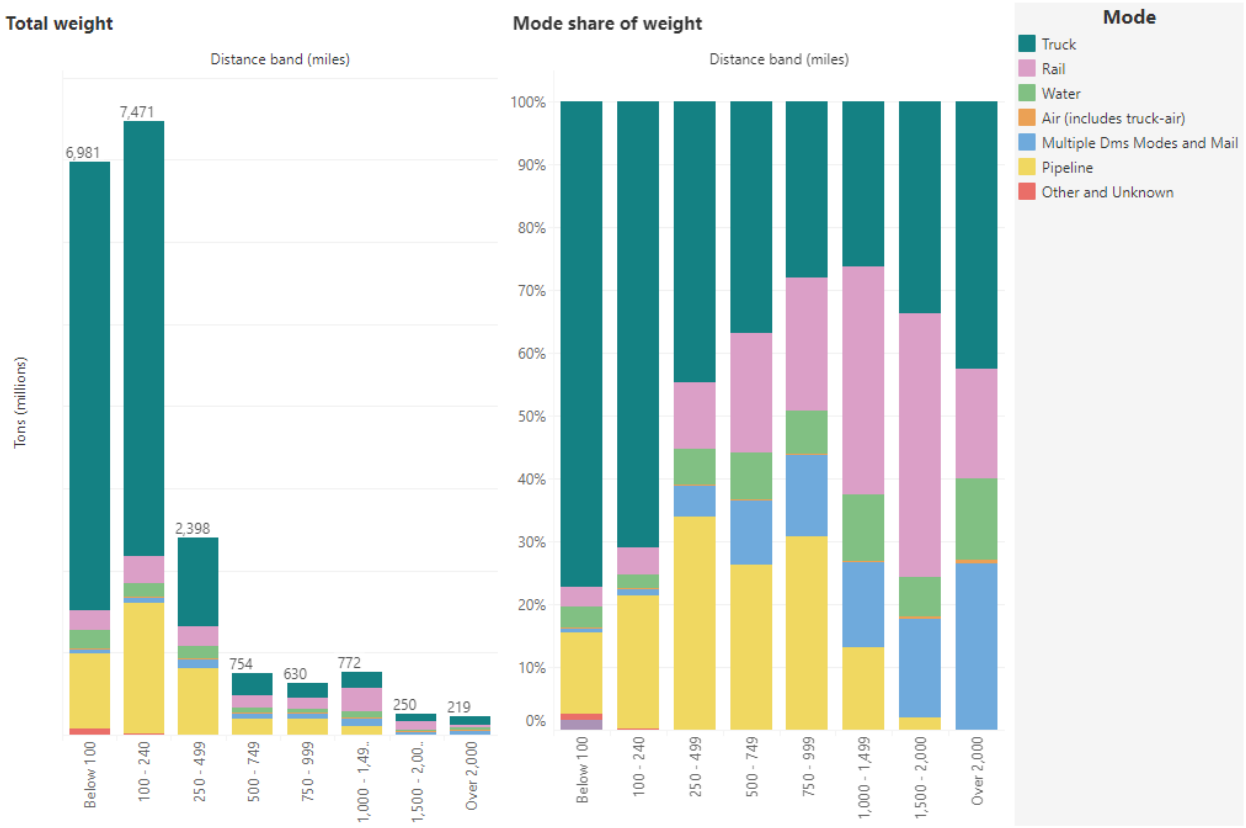
Freight at the National Level

Freight is categorized by weight and value. Weight matters for transportation and system health. Value matters economically and helps identify influential goods and industries in local economies.

In 2021, the U.S. transportation system moved **53 million tons of freight daily, worth over $50.7 billion**. The Freight Analysis Framework (FAF), produced through a partnership between the U.S. DOT, Bureau of Transportation Statistics, and FHWA estimates tonnage will increase at about 1.4 percent per year between 2022 and 2050. Freight value is predicted to increase faster, growing from $996 to $1,256 per ton (adjusted for inflation). This is due to higher growth in valuable, lightweight goods. In 2022, exports at $1,278 per ton and imports at $1,941 per ton exceeded domestic shipments at $909 per ton. By 2050, exports and imports are expected to make up 13.8 percent of tonnage and 21.7 percent of value.

The largest percentage of goods, by weight and value, are transported short distances (less than 250 miles). Approximately 73.8 percent of the weight and 55.5 percent of the value of goods moved less than 250 miles between origin and destination in 2022. In contrast, about 6.6 percent of the weight and 17.4 percent of the value of goods moved 1,000 miles or more in 2022. Trucks carry 77 percent of the freight tonnage that travels less than 100 miles.

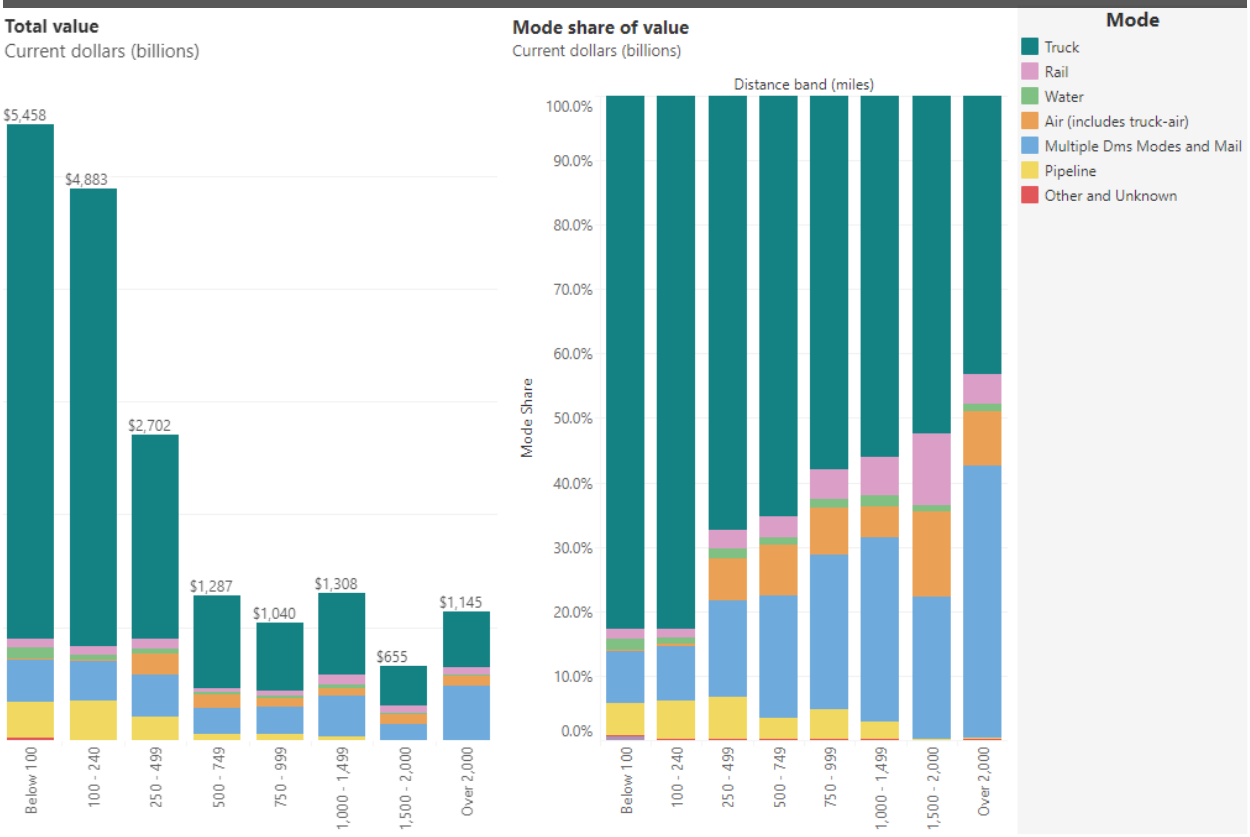
Weight of freight by mode and distance, 2021
Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework



The distribution of transportation modes used for freight movement differs based on the distance covered. When considering both current and constant dollars, trucks take the lead in carrying the most valuable shipments for distances less than 2,000 miles. This underscores their efficiency and suitability for shorter hauls. Conversely, for shipments covering distances between 1,000 and 2,000 miles in 2020, rail emerges as the dominant mode in terms of weight and ton-miles. This indicates that rail transport is particularly well-suited for hauling heavier cargo across moderate distances.

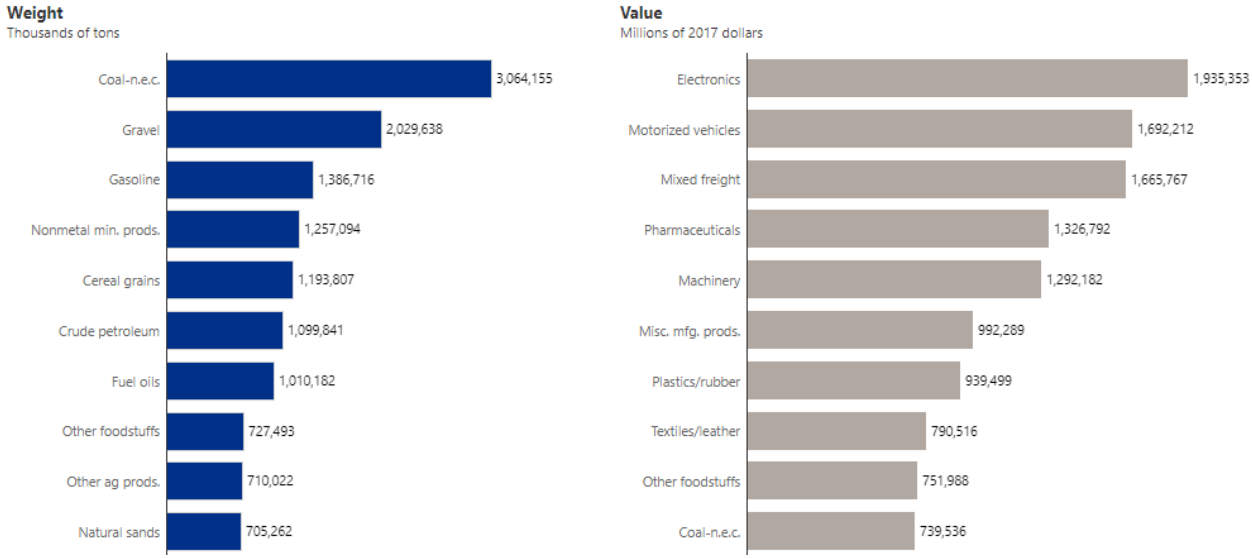
However, as distances extend beyond 2,000 miles, a different pattern emerges. Air transport, a combination of various modes including mail, water transportation, and rail, together account for more than half of the total value of shipments in this longer distance category. This suggests that these modes play a significant role in facilitating the movement of high-value goods across extensive geographical spans. The reliance on air transport indicates the importance of speed and efficiency in covering vast distances, while the combined usage of multiple modes highlights the complexity and integrated nature of modern supply chains that span across different transportation networks.

Value of freight by mode and distance, 2021
Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework

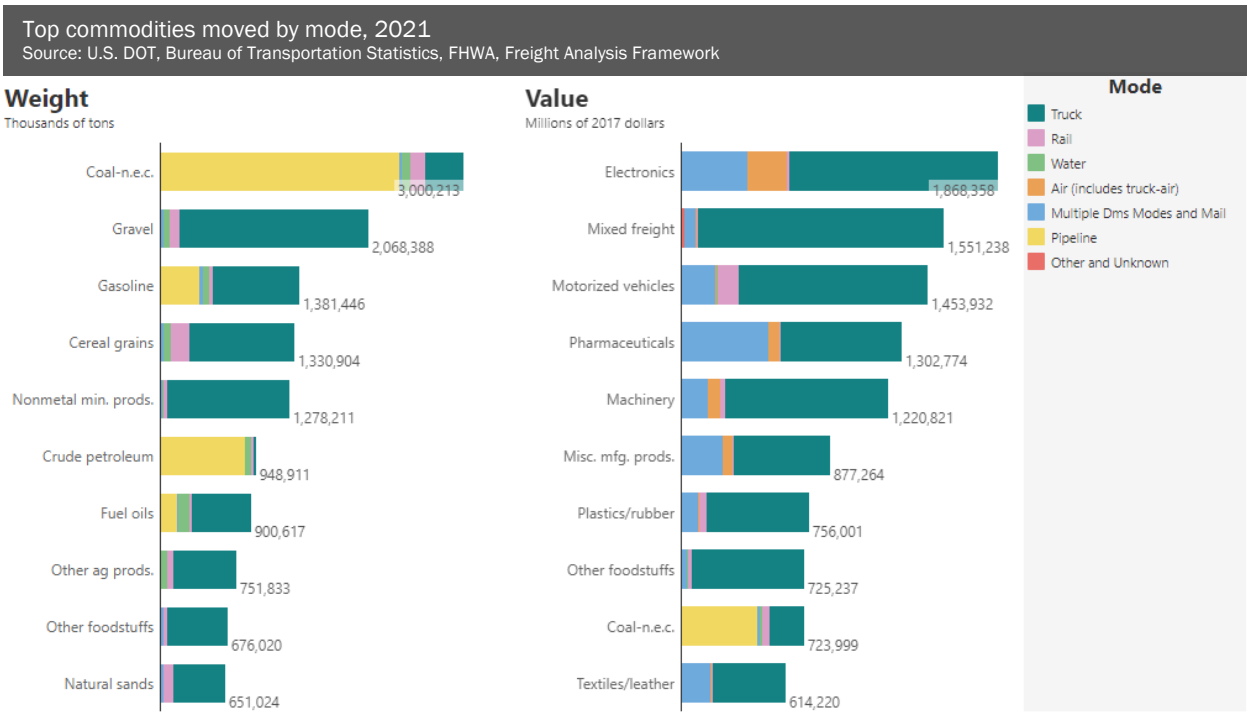


The top ten commodities by weight accounted for 65 percent of total tonnage while the top 10 by value accounted for 60 percent of total value of goods moved in 2022. The leading commodities by weight are coal-N.E.C., gravel, gasoline, and nonmetallic mineral products. The leading commodities by value are high value-per-ton goods, such as electronics, motorized vehicles, mixed freight (principally food), and machinery.

Top commodities by weight and value, 2021
Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework



Trucks engage in the supply chain of all top 10 commodities by weight and value. Trucks carry all types of goods, ranging from high-value commodities, such as mixed freight and electronics, to bulk commodities, such as gravel, grains, and gasoline. Mixed freight includes grocery and convenience store goods, office supplies, and hardware and plumbing items. In comparison, rail and water modes primarily move bulk products, while air (including truck-air transport) moves high-value items, such as electronics and pharmaceuticals. However, trucks moved more high-value, time sensitive commodities than any other mode in 2022.



www.bts.gov/product/freight-facts-and-figures

Freight in Iowa

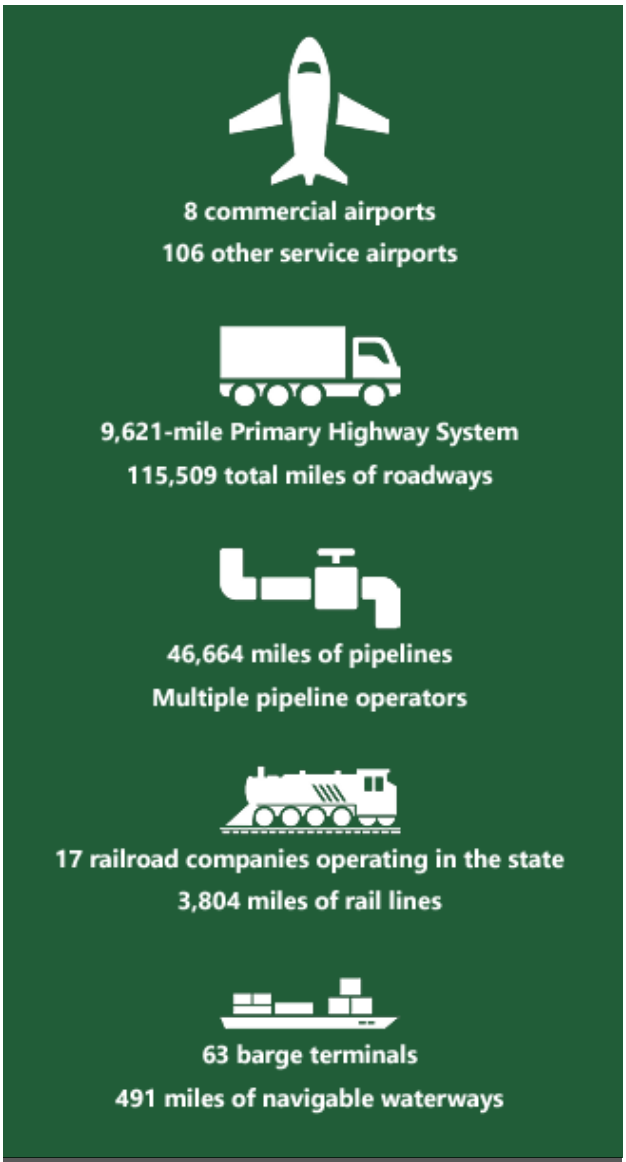
Iowa's strong economy depends on smooth freight transportation for continued growth. Known as the "Food Capital of the World," Iowa produces significant quantities of corn, soybeans, and livestock. It also has a thriving manufacturing sector making machinery, chemicals, and more. To connect its industries with markets, Iowa needs a reliable freight system. This system ensures timely deliveries of materials for production and smooth distribution of finished goods. The need for good freight transportation shows Iowa's vibrant economy and dedication to business growth and jobs.

The need for freight transportation is influenced by where people and businesses are located. In the South and West, population and economic activity have grown faster than in the Northeast and Midwest. Iowa's transportation system is vital for moving freight from coast to coast and for handling goods that pass through the state.

Iowa's current transportation system boasts an extensive network of roads, bridges, railroads, waterways, pipelines, and airports, which play a vital role in connecting the state's communities and facilitating the movement of people and goods. The state has a robust road network, enabling efficient travel withing and beyond its borders. The state's railroad system covers significant mileage, supporting freight transportation contributing to the state's economy. Iowa also benefits from its extensive network of waterways, including the Mississippi and Missouri Rivers, which allows for efficient barge transportation. The state also hosts an extensive pipeline network for the transportation of various resources. Furthermore, Iowa's airports, both commercial and general aviation, are strategically located throughout the state, offering convenient travel options for residents and businesses.

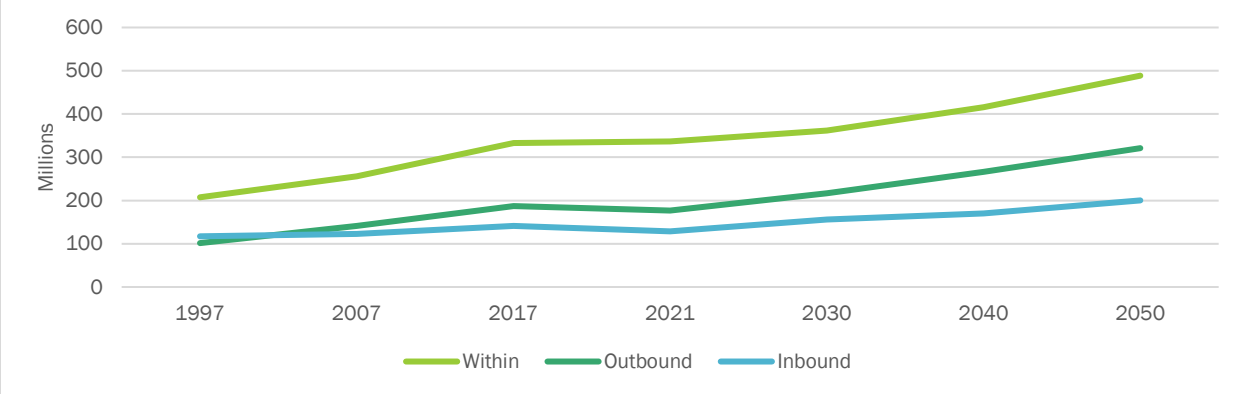
According to the FAF, freight tonnage moving in the U.S. will double in the next 20 years, challenging the overall freight transportation system. This growth will be reflected in Iowa at varying levels across all modes. **Iowa's transportation system facilitated the movement of 642 million tons of freight with an estimated value of $376 billion in 2021**. The total weight of goods imported into and exported out of the state is expected to grow.

Since the turn of the century, Iowa has remained an exporting state, meaning the state produces and exports more goods than it imports. This is true both in terms of tonnage and value. Iowa's import-export gap is projected to grow from 40 million tons in 2017 to 115 million tons by 2050.



Iowa freight transportation system
Source: Iowa State Freight Plan 2022

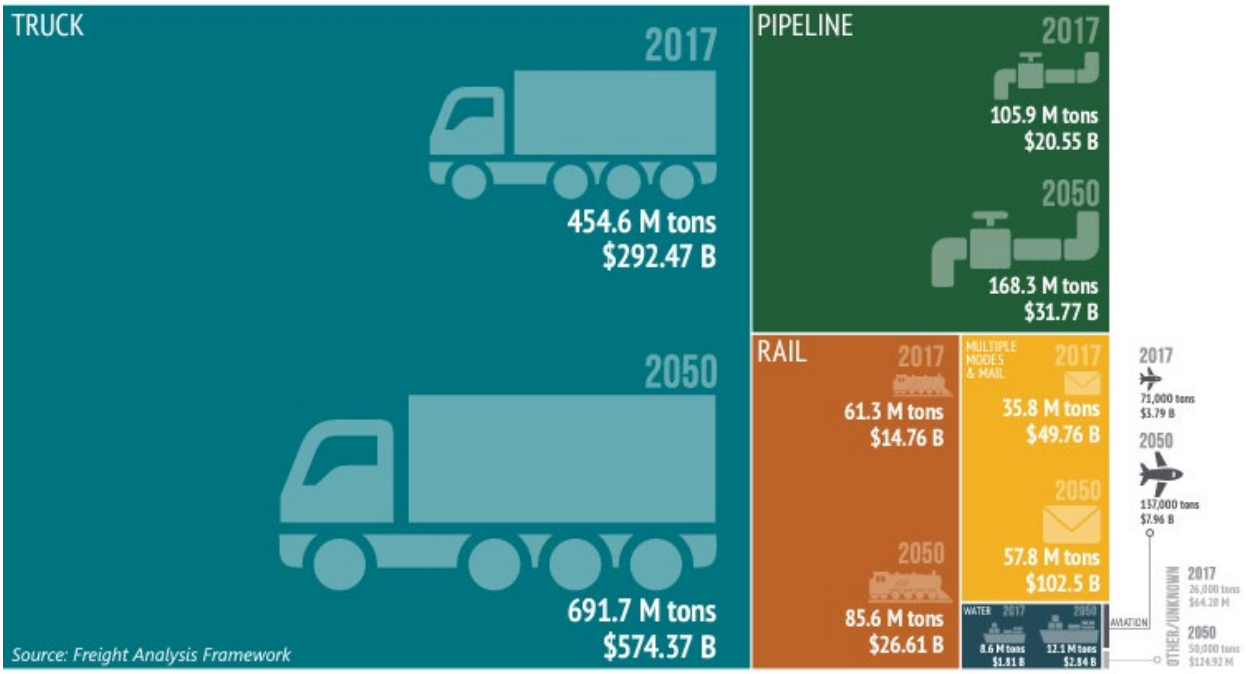
Figure 6.1: Projected Iowa freight movement by ton, 1997-2050



Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework

The graphic below shows Iowa's freight tonnage and value by mode in 2017, and the projections for 2050. **Truck, rail, and pipeline are the three top modes and collectively transport 93 percent of the tonnage to, from, and within Iowa**. These three modes are expected to maintain their prominence through 2050. In addition, the share of each mode's tonnage is expected to remain consistent with slight changes of less than one percent. The continued prominence of trucks coupled with the projected 52 percent increase in tonnage will have a significant impact on the state's highway system, resulting in increased congestion and more rapid deterioration of pavement and structures along the roadways.

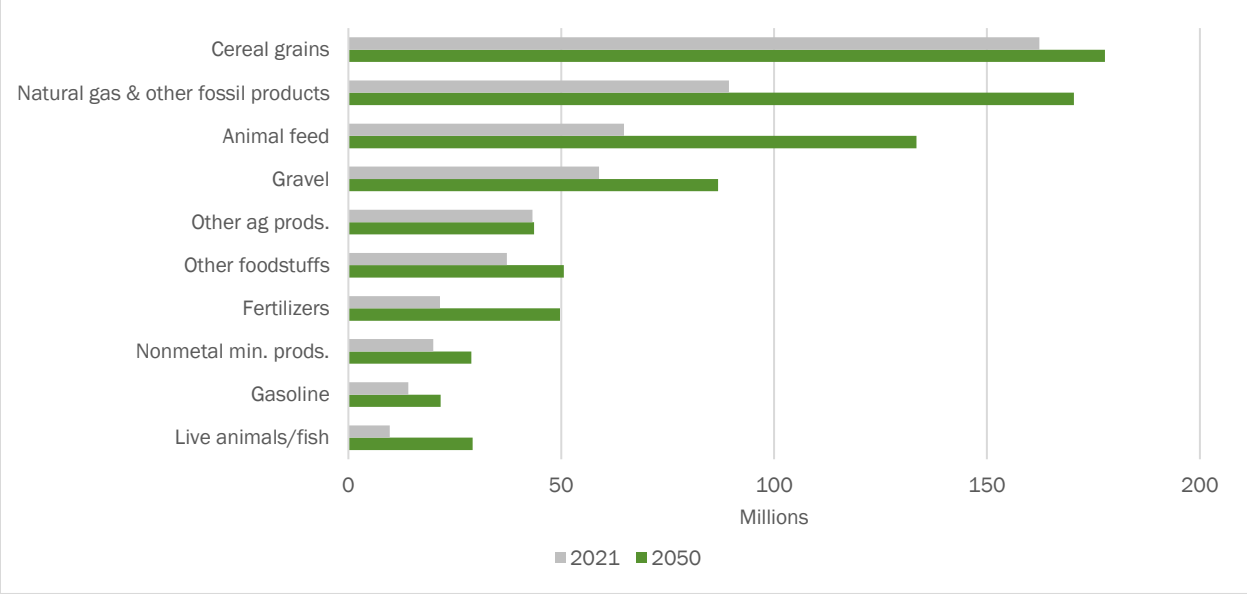
Projected growth in tonnage and value of Iowa freight by mode, 2017-2050
Source: Iowa DOT, Iowa State Freight Plan 2022; U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework



Iowa is renowned for its agricultural strength, with cereal grains, animal feed, other agricultural products, other foodstuffs, fertilizers, and live animals and fish among its tops commodities by weight. The state's fertile soil and favorable climate make it an ideal region for growing an array of cereal grains, such as corn, soybeans, and oats. These crops serve as the foundation for Iowa's thriving agriculture industry, contributing significantly to the state's economy. Iowa's cereal grains are not only used for human consumption but also play a crucial role in producing animal feed. With a robust livestock sector, including hogs, cattle, and poultry, Iowa has a high demand for animal feed to support its thriving livestock industry.

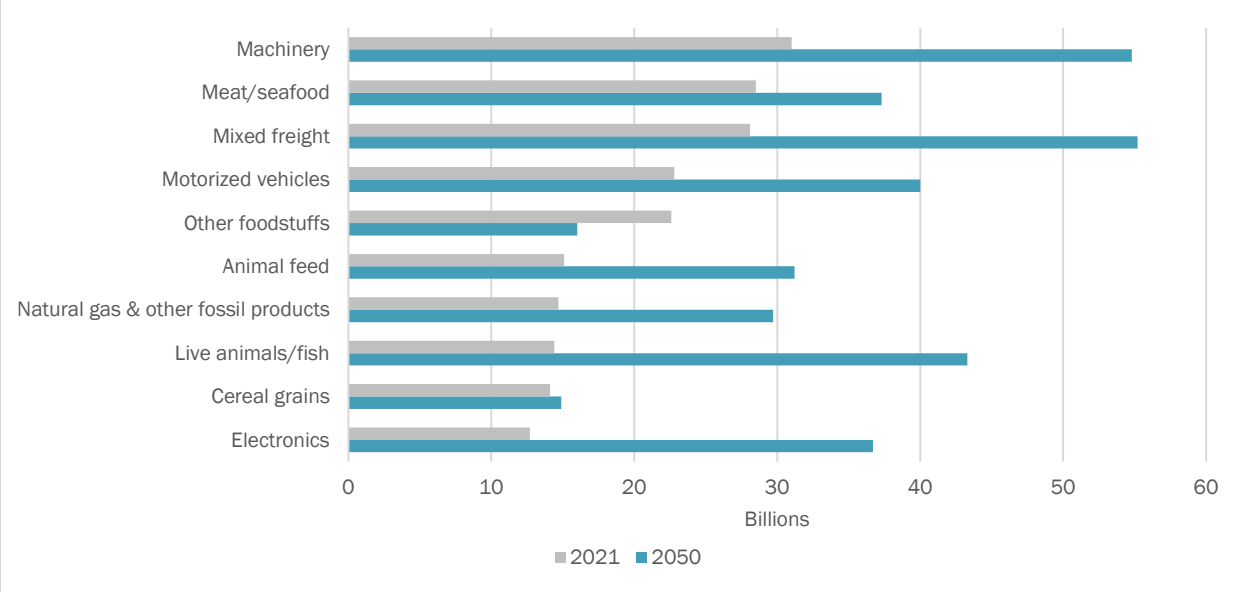
Iowa's top commodities highlight the state's agricultural ability and diverse industrial output. Corn, being a staple crop in the state, occupies a sizable portion of Iowa's top commodities along with other cereal grains. With vast fields of corn across its fertile lands, Iowa produces a substantial weight of corn, contributing to the state's agricultural economy. Soybeans, another major crop, also make a significant impact on Iowa's commodity landscape, both in terms of weight and economic value. As shown in Figures 6.2 and 6.3, agricultural products will play a key role in Iowa's economy for years to come.

Figure 6.2: Projected Iowa top commodities by ton, 2021-2050



Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework

Figure 6.3: Projected Iowa top commodities by value, 2021-2050



Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework

In 2021, Iowa's top domestic trading partner by value was Illinois, as shown in Table 6.1. By tonnage, Minnesota was Iowa's top domestic trading partner with 81 million tons imported from or exported to the state. Iowa receives most domestic imports from the Great Plains and Midwest regions, with some exports from Texas and Louisiana. Iowa exports most goods throughout the Midwest (reference Figures 6.5 and 6.6).

Table 6.1: Iowa's top five domestic trading partners by value (billions), 2021

State	Origin from Iowa	Destination to Iowa	Total
Illinois	$20.2	$15.9	$36.1
Minnesota	$16.6	$15.6	$32.2
Nebraska	$10.5	$9.7	$20.2
Missouri	$7.5	$6.9	$14.4
Texas	$9.2	$3.7	$12.9

Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework

In 2020, Iowa's top international trading partner was Canada at $3.5 billion of goods, followed by Mexico at almost $2 billion, and China at $1.2 billion. Figure 6.4 shows the locations of Iowa's top ten international trading partners, and the value of goods exported. The state of Iowa exported $12.6 billion in goods in 2020, the top commodity being corn, followed by tractors, pork, and soy products.

Figure 6.4: Iowa's top ten international trading partners (exports only) by value, 2020

Source: Iowa DOT, Iowa State Freight Plan 2022; U.S. Census Bureau and U.S. Trade Online

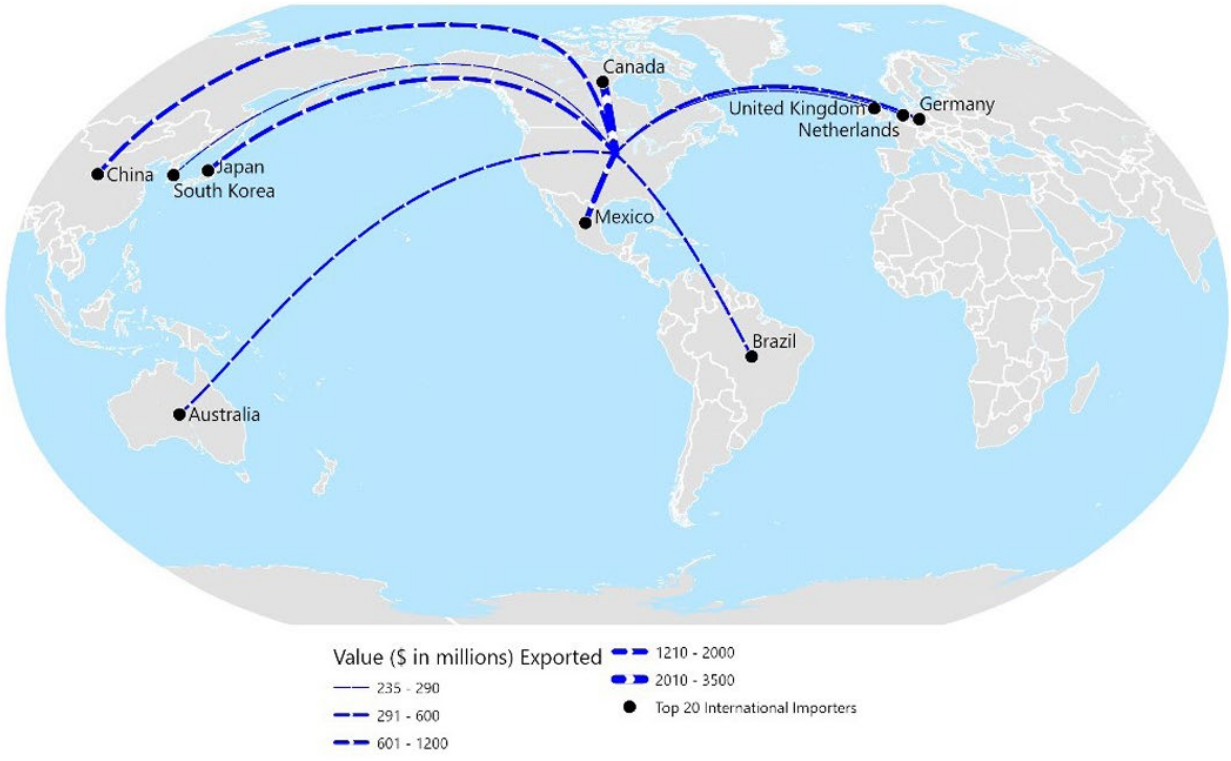


Figure 6.5: Domestic origin-destination flows from Iowa by ton (thousands)
Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework

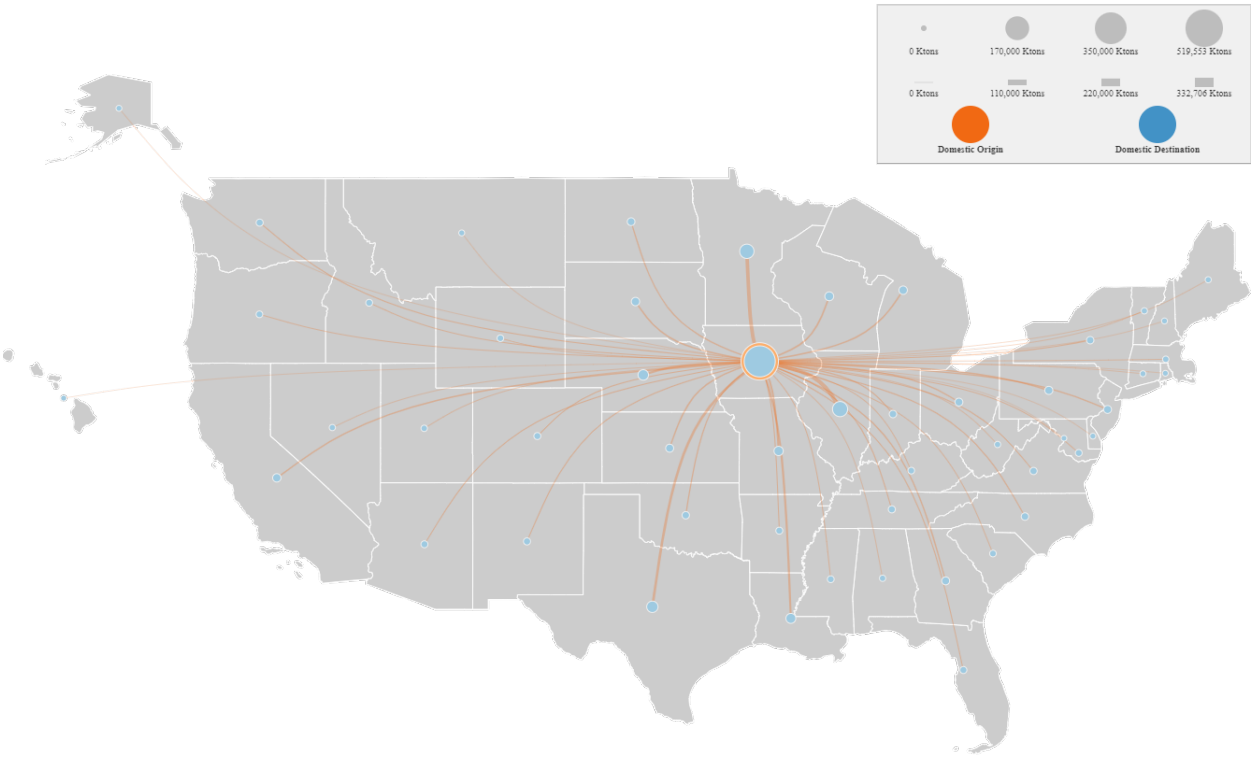
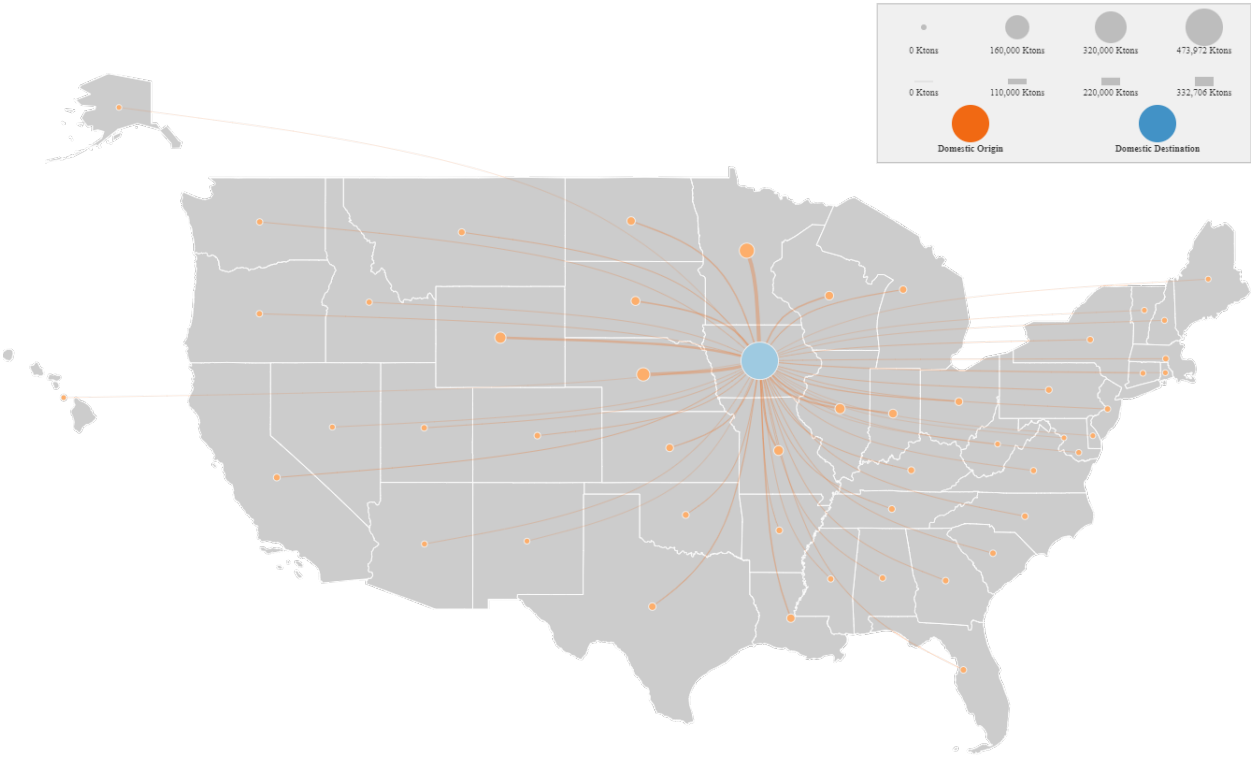
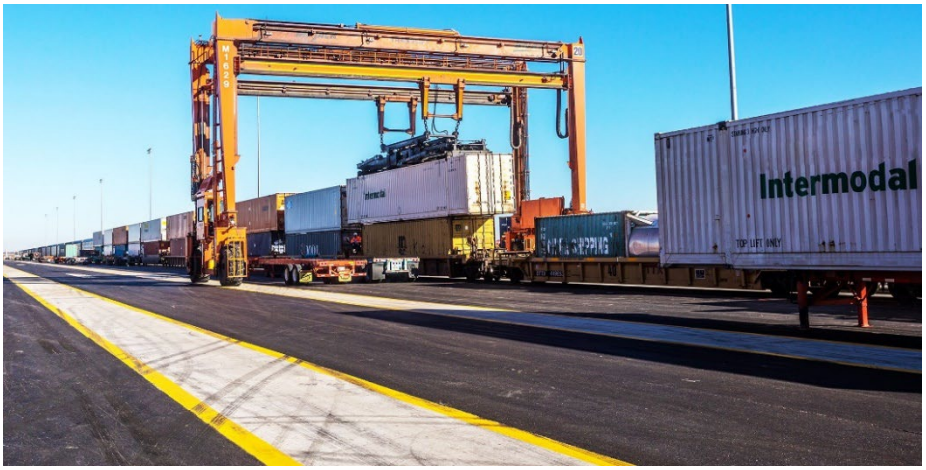


Figure 6.6: Domestic origin-destination flows to Iowa by ton (thousands)
Source: U.S. DOT, Bureau of Transportation Statistics, FHWA, Freight Analysis Framework

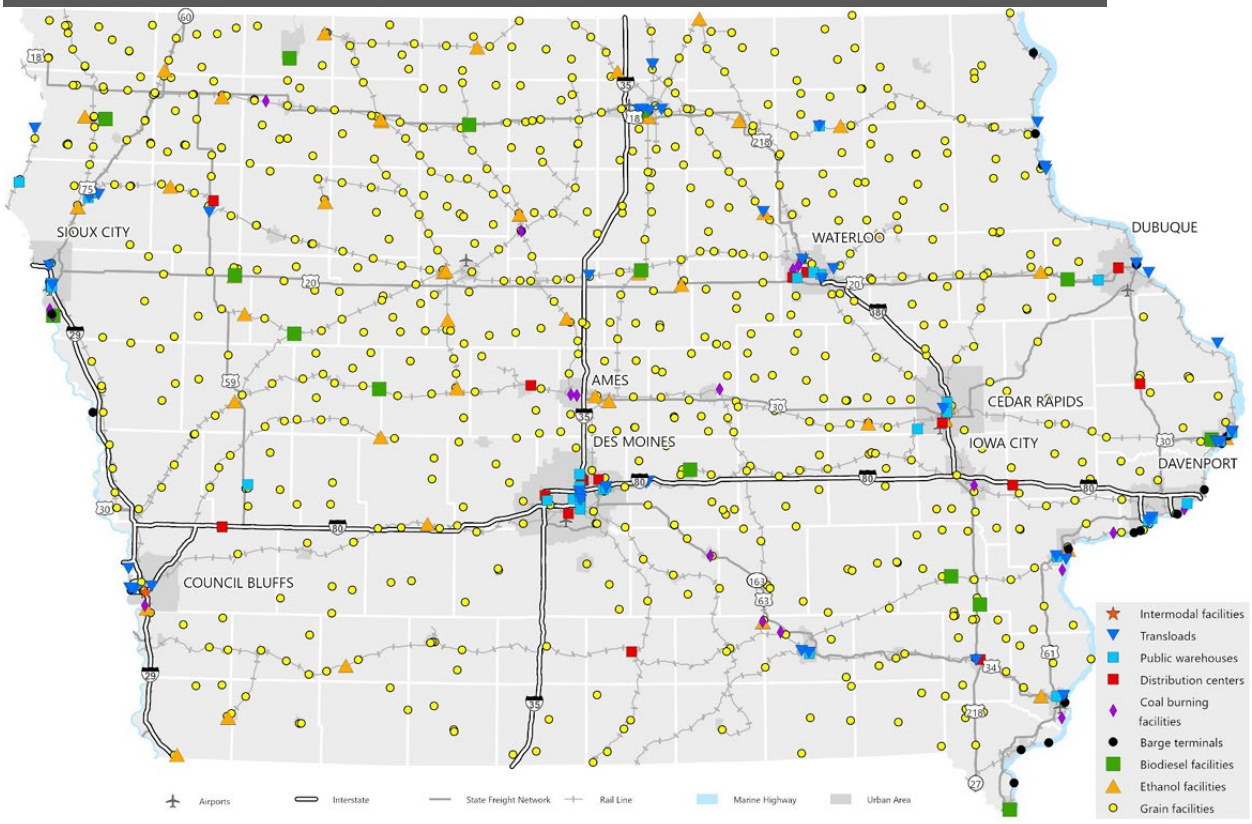




Iowa's freight system includes several intermodal facilities and transload facilities which play a pivotal role in the modern transportation and logistics industry. Intermodal facilities are key hubs where various transportation methods like rail, trucking, and shipping come together to smoothly exchange goods. They have the setup, tools, and knowledge to manage shipments efficiently, making the whole transportation process cost-effective. These places ensure containers move easily between different modes, cutting handling costs and boosting supply chain reliability. Transload facilities play a similar role, helping goods switch between transport modes like rail and truck. They are adaptable, letting transportation methods change based on cost, efficiency, and what customers need.

The multimodal options within Iowa also include several warehouse and distribution centers that collect and distribute freight. These locations can generate many truck trips from the shipping and receiving of products and commodities, making them an important part of the transportation planning process.

Iowa freight-generating facilities
Source: Iowa DOT, Iowa State Freight Plan 2022

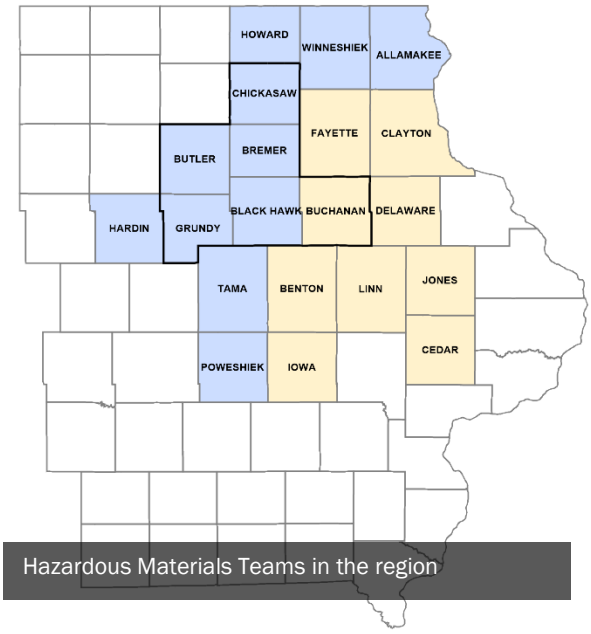


Freight in the Region

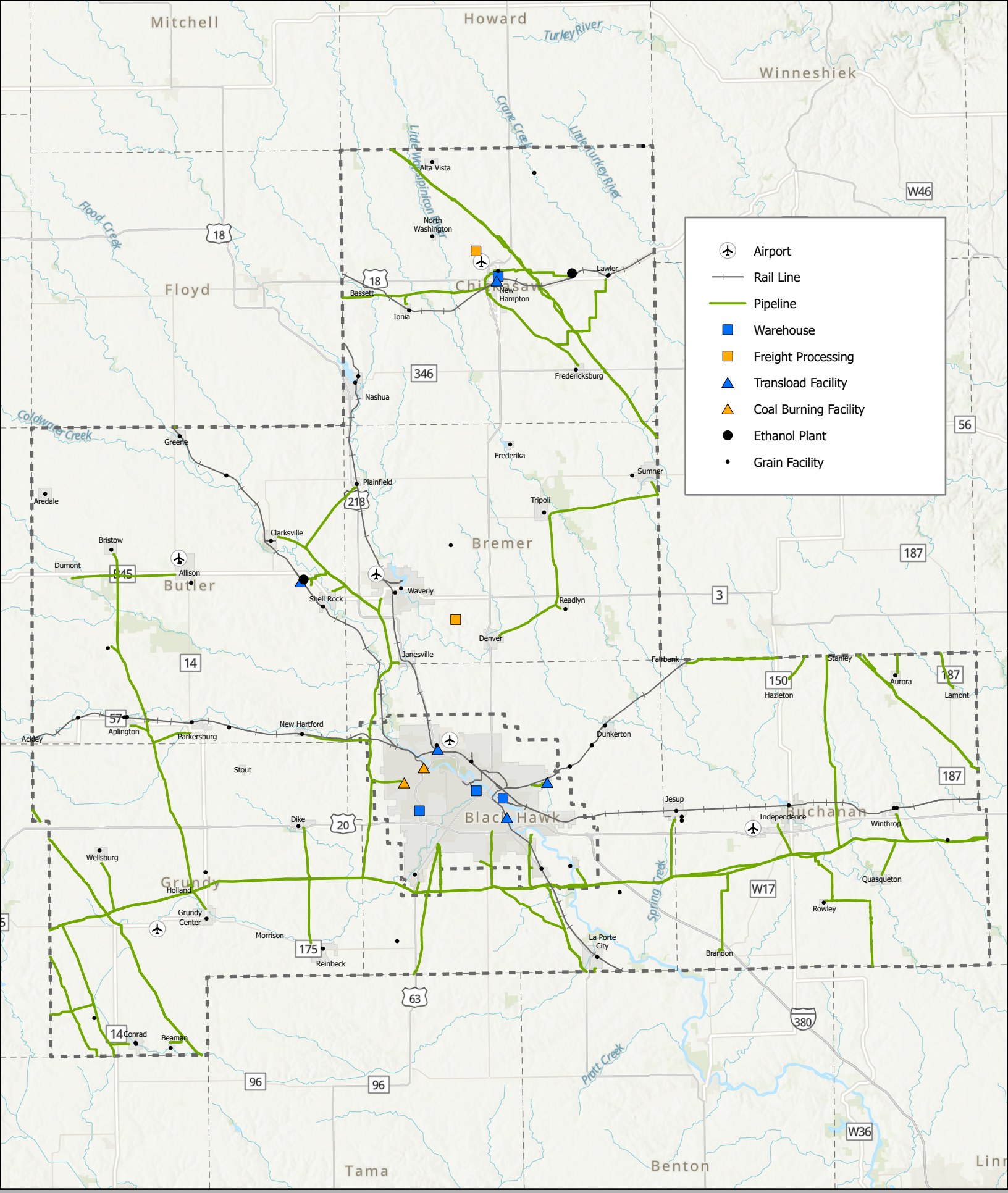
Freight in the Iowa Northland Region moves through four primary transportation modes: truck, rail, air, and pipelines. These channels facilitate the movement of goods both within the region and to and from it. Map 6.1 illustrates these multimodal freight components across the area.

The region is home to multiple manufacturing companies and industries that facilitate or rely on freight movements. There are also a variety of transportation-related companies and motor carriers homebased in the region. According to the U.S. Census Bureau 2022 County Business Patterns, the Iowa Northland Region, including the Waterloo-Cedar Falls metropolitan area, has **269 transportation and warehousing establishments with a total of 4,300 employees and annual payroll of $240.7 million**. There are also a variety of businesses in the region that rely on freight transportation. Businesses in the manufacturing, retail, and wholesale sectors require efficient transport of their products inbound and outbound.

A wide variety of freight is moved throughout the region every day, much of which arrives without incident. However, accidents involving freight do occur and must be planned for accordingly. Of particular concern is the transport of hazardous materials. Each county has an Emergency Management Agency (EMA) and EMA Coordinator whose emergency management efforts include mitigating future risk from hazards, and developing a Hazard Mitigation Plan which outlines the potential for natural and humanmade disasters and the potential impact of those disasters on the community and the transportation system. In the event of a crash, spill, or derailment involving hazardous materials, it is imperative that local jurisdictions be prepared to respond in an expeditious manner. Waterloo serves as the base for the Northeast Iowa Response Group, which handles hazmat incidents across an 11-county area, including Black Hawk, Bremer, Butler, Chickasaw, and Grundy Counties. Meanwhile, Buchanan County falls under the jurisdiction of the Linn County Regional HAZMAT Team, which covers a nine-county region.



Hazardous Materials Teams in the region

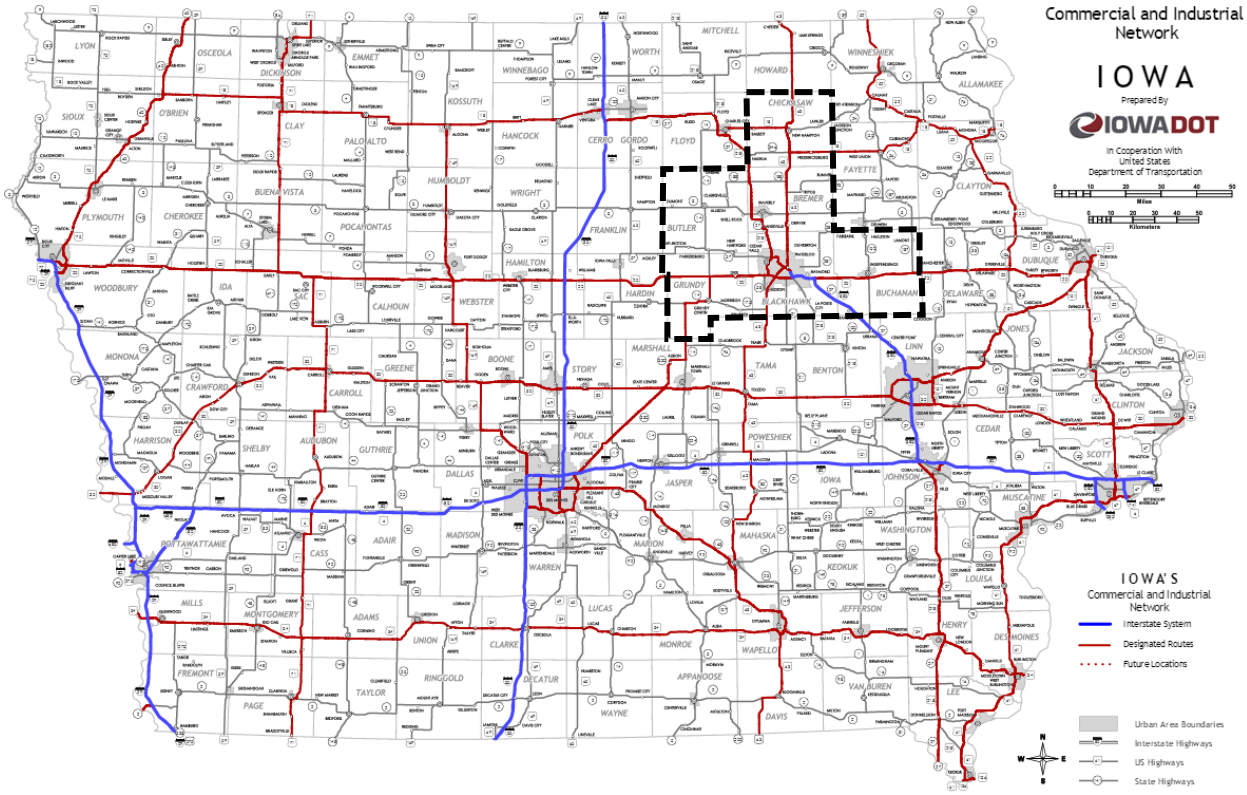


Map 6.1
Freight Generating Facilities

INRCOG
Iowa Northland Regional Council of Governments

Truck Transportation

The region has an extensive highway network that makes moving goods easy and helps the local economy. The highway system connects different business areas within and outside of the region, making it simple for companies to transport their products to other places. Most truck movement happens on the Interstate System and the Commercial and Industrial Network. These highways stretch beyond the region, connecting it to the state and the whole country. These great roads do not just help local businesses, they also bring in industries and help the economy grow by giving them reliable access to bigger networks.



Truck transportation is crucial for shippers in the region for a few key reasons. Iowa's vast highway network makes trucking easy and accessible. Trucks can reach both cities and remote places, delivering goods efficiently. They are fast and direct, which is important for time-sensitive items like agriculture and manufacturing products. Trucks are versatile, fitting all sorts of cargo sizes and types. Plus, they give shippers control with tracking and adjusting delivery times. Overall, these factors make trucks the top choice for shippers in the region.

Highway Network

The region has a substantial inventory of principal and major arterials that connect the area to the rest of the Midwest and nation. Table 6.2 provides a comparison of traffic figures for segments of these highways from 2016 to 2022. During the COVID-19 pandemic, Iowa experienced a notable decrease in total traffic as restrictions and lockdown measures limited travel and commuting. However, in contrast to the decline in passenger vehicles, freight traffic witnessed an increase during this time. The heightened demand for essential goods, medical supplies, and e-commerce deliveries led to a surge in freight movement across the state and the region. Freight traffic remained robust as trucking companies and logistics providers adapted to meet the evolving needs of the pandemic era.

Table 6.2: Highway traffic comparison, 2016 to 2022

Location	AADT 2016	AADT 2022	Percent Trucks 2016	Percent Trucks 2022	+/- Percent Trucks
I-380 at D48 interchange (Buchanan)	17,500	17,900	19.7	27.0	**7.3**
I-380 at east junction U.S. 20 interchange (Black Hawk)	16,700	16,900	19.5	27.6	**8.1**
U.S. 20 at IA 14 interchange (Grundy)	9,400	10,000	22.0	27.7	**5.7**
U.S. 20 at T55 interchange (Grundy)	12,800	13,600	20.5	21.4	0.9
U.S. 20 at V51 interchange (Black Hawk)	13,300	11,900	13.5	16.3	**2.8**
U.S. 20 at IA 150 interchange (Buchanan)	10,900	9,500	18.0	23.6	**5.6**
U.S. 218 at C57 interchange (Black Hawk)	20,800	21,100	11.5	12.2	0.7
U.S. 218 at IA 116 interchange (Waverly)	21,500	20,500	11.1	12.1	1.0
U.S. 218 at IA 3 interchange (Bremer)	9,200	9,700	21.3	22.3	1.0
U.S. 218 at IA 346 interchange (Chickasaw)	10,100	11,000	21.4	16.5	-4.9
U.S. 63 at junction of IA 175 (Black Hawk)	3,790	3,500	13.5	16.4	**2.9**
U.S. 63 at intersection of C57 (Black Hawk)	9,600	8,300	10.3	12.1	1.8
U.S. 63 at IA 3 interchange (Bremer)	7,300	8,700	13.4	11.6	-1.8
U.S. 63 at U.S. 18 & IA 346 interchange (Chickasaw)	4,120	5,600	20.1	17.4	-2.7
IA 14 at intersection of D67 (Grundy)	4,450	3,990	16.9	12.4	-4.5
IA 14 at east junction of IA 175 (Grundy)	6,400	5,700	6.2	7.2	1.0
IA 14 at U.S. 20 interchange (Grundy)	4,220	4,770	11.1	11.1	0.0

Source: Iowa DOT, Traffic Books

Truck Transportation Planning Issues

One of the primary planning issues facing truck transportation is the state's aging infrastructure. Many highways, roads, and bridges need repair and expansion to accommodate the growing demands of truck traffic. Insufficient capacity, outdated interchanges, and inadequate truck rest areas can lead to congestion, delays, and increased costs for shippers and carriers. Addressing these infrastructure challenges requires a strategic and prioritized investment plan to enhance roadway conditions and support the efficient movement of freight.

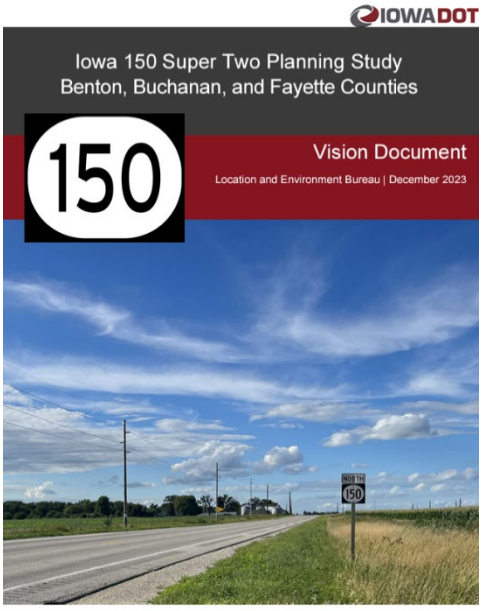
Safety is paramount in truck transportation planning. Although efforts have been made to improve safety measures on Iowa's roadways, crashes involving trucks remain a concern. Factors such as driver fatigue, inadequate training, and inadequate enforcement of regulations can contribute to crashes and jeopardize public safety. Enhancing safety in truck transportation requires a multi-faceted approach, including driver education, stricter compliance with regulations, and investment in technology to monitor and improve safety conditions.

Increasing demand for e-commerce and last-mile deliveries present new challenges that require proactive measures and strategic solutions. The rise of online shopping has amplified the need for efficient and timely delivery of goods to consumer's doorsteps. This surge in small package deliveries necessitates a reevaluation of truck transportation planning to optimize routes, manage congestion, and enhance delivery efficiency in urban areas. Another emerging issue is the integration of evolving technologies, such as autonomous trucks and electric vehicles, into the trucking industry. As these technologies evolve and become more prevalent, transportation planners must address infrastructure requirements, safety regulations, and charging or refueling infrastructure to facilitate their adoption.

Truck transportation is associated with environmental impacts such as emissions, noise pollution, and energy consumption. The ongoing emphasis on sustainability and environmental concerns calls for incorporating eco-friendly practices into truck transportation planning, such as incentivizing the use of alternative fuels and promoting energy-efficient trucking practices to reduce the carbon footprint. To address this issue, the state needs to encourage the adoption of cleaner and more fuel-efficient vehicles, promote alternative fuels, and explore innovative technologies to mitigate the environmental impacts of truck freight transportation. By actively addressing these emerging issues, Iowa can adapt its truck transportation planning to meet the evolving needs of a changing industry and promote a more efficient, sustainable, and resilient freight network.

Iowa has made significant strides in the production of renewable energy, particularly in the fields of wind energy and biofuels. The state's abundant wind resources have positioned it as a leader in wind energy generation, with numerous wind farms dotting its landscape. Additionally, Iowa has emerged as a major producer of biofuels, primarily ethanol and biodiesel, derived from its substantial corn and soybean crops. The increased production of renewable energy in Iowa has a direct impact on truck transportation planning. The transportation of wind turbine components, such as blades and tower sections, requires careful logistical planning to accommodate their size and weight. Specialized trucks and trailers, permits, and route considerations are necessary to ensure the safe and efficient delivery of these components. Similarly, the transportation of biofuels necessitates a well-coordinated trucking network to distribute these products to fueling stations across the state. The added truck traffic can also accelerate the rate of deterioration on roads and bridges. As Iowa continues to expand its renewable energy production, truck transportation planning will play a vital role in supporting the movement of equipment, feedstocks, and end products, contributing to a more sustainable and greener future.

Planned highway initiatives that would impact truck transportation are addressed in Chapter 3. The projects primarily focus on the preservation of the major corridors in the region while improving safety at specific locations. One significant freight-related project is the Iowa Highway 150 Super Two Planning Study, completed in 2024. This initiative concentrated on assessing and planning improvements to IA Highway 150, with a particular focus on upgrading sections of the route into a "Super Two" highway. A "Super Two" highway consists of two lanes with periodic passing lanes and other enhancements designed to improve traffic flow and safety. This study is significant for the region as it aims to accommodate increasing traffic and freight volumes. Overall, the study is expected to play a crucial role in shaping the region's transportation infrastructure to better support the needs of freight carriers and other road users. The RTA hopes to work closely with the Iowa DOT to identify funding solutions that will enable the implementation of the identified improvements.



https://bhcmpo.org/rta/

Rail Transportation

Rail is typically second to trucks in terms of freight movement across the nation, Iowa, and the region. While railroad mileage in the state is less than half of what it was early in the 20th Century, the volume of rail traffic continues to increase. According to the *2021 Iowa State Rail Plan*, Iowa remains in the top 15 states in the total miles of rail (11th), rail tons originated (12th), rail carloads originated (15th), rail tons carried (7th), and rail carloads carried (7th). Iowa also ranks highly among all states for rail movements in many individual commodities. For commodities originating by state, Iowa ranks highly in food products (1st), chemicals (4th), and farm products (7th).

There are several rail lines operating in the region including:

- Canadian National rail line running east-west through the region, whose primary operators are the Chicago Central and Pacific Railroad and Cedar River Railroad Company.
- Canadian National rail line that comes from the north paralleling U.S. Hwy 218 before merging with the east-west route. The primary operator is the Cedar River Railroad Company.
- Iowa Northern Railway Company line running northwest-southeast through the region, with a haulage agreement with Union Pacific.
- Union Pacific rail line running from downtown Waterloo to the township of Dewar. The line continues northeast to Oelwein under the D&W Railroad Company. Iowa Northern Railway Company is the primary operator.
- Canadian Pacific rail line running east-west through Chickasaw County. Dakota, Minnesota, and Eastern Railroad Company is the primary operator.

Railroads in the United States are designated as Class I, Class II, or Class III according to revenue thresholds adjusted for inflation established by the Surface Transportation Bureau (STB).

Table 6.3: Railroads Operating in the Metro Area, by Class

Class	Revenue Threshold	Railroads in the Area	Miles Owned in Iowa	Percent of Total Iowa Rail Network
Class I	$467 million or more	Union Pacific (UP)	1,291	33.5
		Canadian National Railway (CN)	605	15.7
		Canadian Pacific Railway (CP)	654	17.0
Class II “regional”	$37.4 - $467 million			
Class III “short line”	Less than $37.4 million	D&W Railroad (DWRV)	22	0.6
		Iowa Northern Railway Company (IANR)	167	4.3

Source: Iowa DOT, 2021 Iowa State Rail Plan

The carriers serving the region depend on the transportation of bulk commodities such as grain, coal, and chemicals as their primary freight. These carriers also transport intermediate and finished manufactured products outbound from the region. There are multiple businesses located in the area that rely on rail to provide portions or all their freight transportation needs.

Rail Network

The rail network is a crucial component of the region's transportation infrastructure, spanning 276 miles of tracks that provide essential connections for freight services. This extensive network facilitates the efficient movement of goods and commodities to and from key industries such as manufacturing, agriculture, and distribution. Its extensive reach contributes to the economic development and connectivity of the region, supporting the growth and prosperity of the community.

There are two major freight rail yards in the region, both of which are in Waterloo. The CN Waterloo Yard is located northeast of Downtown Waterloo between East 4th Street and Martin Luther King Jr. Boulevard. The IANR Bryant Yard is located to the east of the Interstate 380 and San Marnan Drive interchange. There are five rail transload facilities in the region where freight can be transferred between truck and rail. Table 6.4 identifies specific multimodal facilities in the region with connections to the rail network.

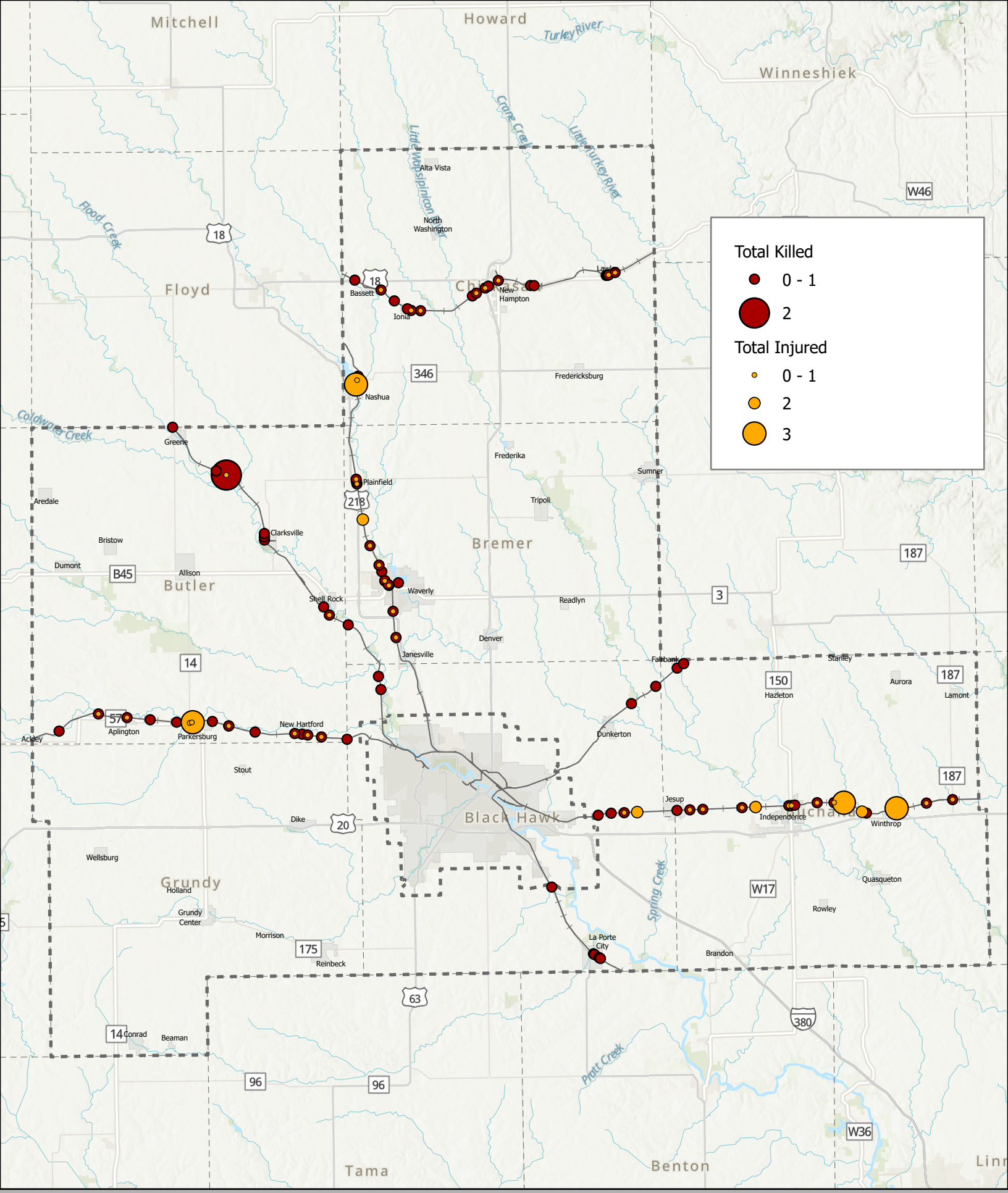
Table 6.4: Inventory of Multimodal Facilities with Connections to the Iowa Rail Network

Name	City	Public Facility	Intermodal	Transload	Cross-Dock	Team Track	Warehouse	Truck to Rail	Known Railroad Connections
Bryant Yard	Waterloo	X		X	X		X	X	IANR
Kinder Morgan/Black Hawk Terminal	Waterloo	X		X			X	X	UP
Standard Distribution Rail Facility	Cedar Falls	X		X	X		X	X	CN
Butler Logistics Park	Shell Rock								IANR
New Hampton Transfer and Storage	New Hampton	X		X	X		X	X	CP

Source: Iowa DOT, 2021 Iowa State Rail Plan

Rail Transportation Planning Issues

The most pressing challenge in rail transportation planning is the safety and delays associated with at-grade road crossings. In the Iowa Northland Region, outside of the Waterloo-Cedar Falls metropolitan area, there are 213 public at-grade rail crossings. Despite the widespread implementation of active warning systems designed to alert drivers and clear tracks for oncoming trains, these crossings continue to pose significant safety risks. Since 1975, the region has experienced 207 highway-rail incidents, leading to **13 fatalities and 91 injuries**. These statistics underscore the ongoing need for enhanced safety measures and infrastructure improvements to reduce the risk of future accidents and minimize disruptions to traffic flow. The issue remains a key focus area in regional transportation planning, highlighting the balance between maintaining efficient rail operations and ensuring public safety.



Map 6.2

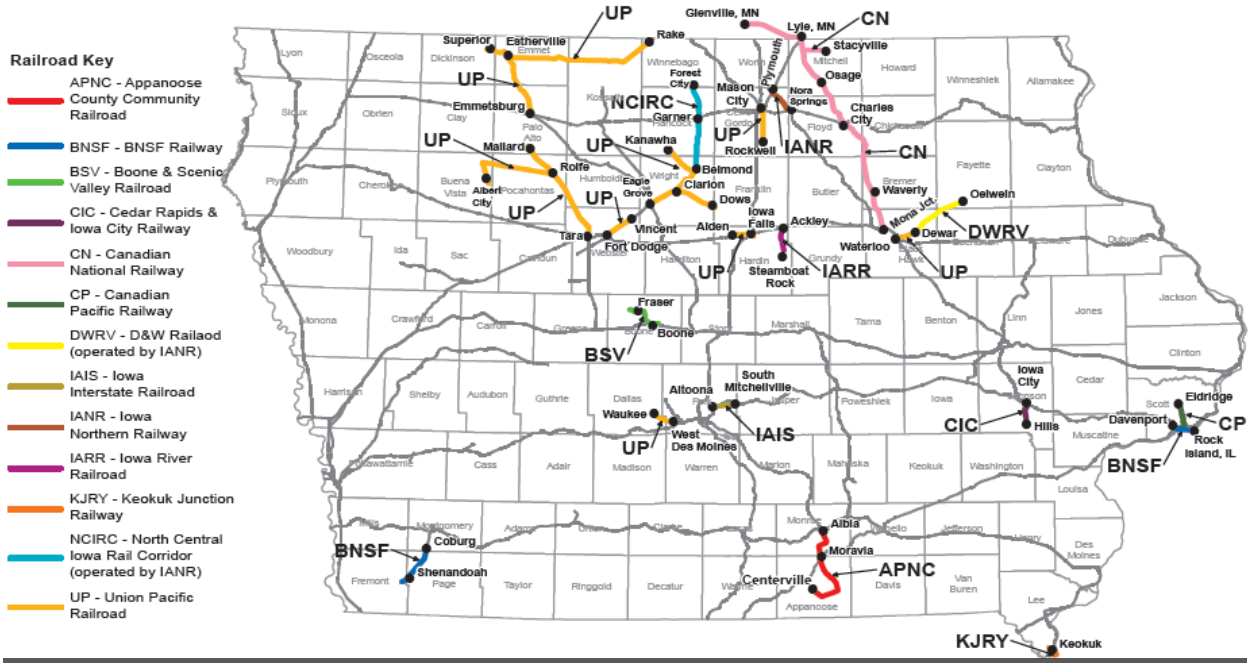
Highway-Rail Crossing Fatalities and Injuries

INRCOG
Iowa Northland Regional Council of Governments

Iowa is poised to experience a significant increase in total rail traffic in the coming years. Being in the center of the Midwest helps Iowa connect to both local and global trade. From 2021 to 2050, the amount of goods transported by rail, coming in, going out, and moving within Iowa, could go up by 48 percent. Several things contribute to this growth. Iowa's strong farming, especially corn, soybeans, and livestock, needs rail transport. Plus, the state's factories and distribution centers add to rail use. There are also plans to improve rail systems, such as making better intermodal hubs and using modern technology. This will enhance the efficiency of rail transport and attract additional rail traffic. However, this increase could result in certain sections of the region's rail lines becoming overly congested.

Railroads are facing a significant challenge: a shortage of capacity to handle the growing volume of freight. A key factor behind this issue is the increased demand for rail transport as industries expand. This surge in goods transportation is putting considerable strain on the existing rail infrastructure. Certain major routes lack sufficient capacity, leading to bottlenecks and slowdowns. Additionally, limited space in terminals and yards can disrupt the smooth flow of operations. Some rail systems are outdated and require repairs or upgrades to handle increased freight volumes. Addressing these capacity issues is a top priority to ensure railroads can meet the growing demands for goods transportation effectively.

Iowa's railroads have made considerable progress in the last two decades to upgrade track and bridges to accommodate heavier railcars with maximum allowable gross weights of 286,000 pounds. These rail cars are becoming an industry standard for railroad transportation. **At present, there are three lines in the Iowa Northland Region that are incapable of handling 286,000-pound railcar weights**. As a result, additional rail traffic may be diverted onto local roads, thus increasing highway maintenance and rehabilitation costs.



Iowa rail line segments incapable of handling 286,000 lb. railcar weights
Source: Iowa DOT, 2021 Iowa State Rail Plan; Iowa's Class I, II, and III railroads

Pipeline Transportation

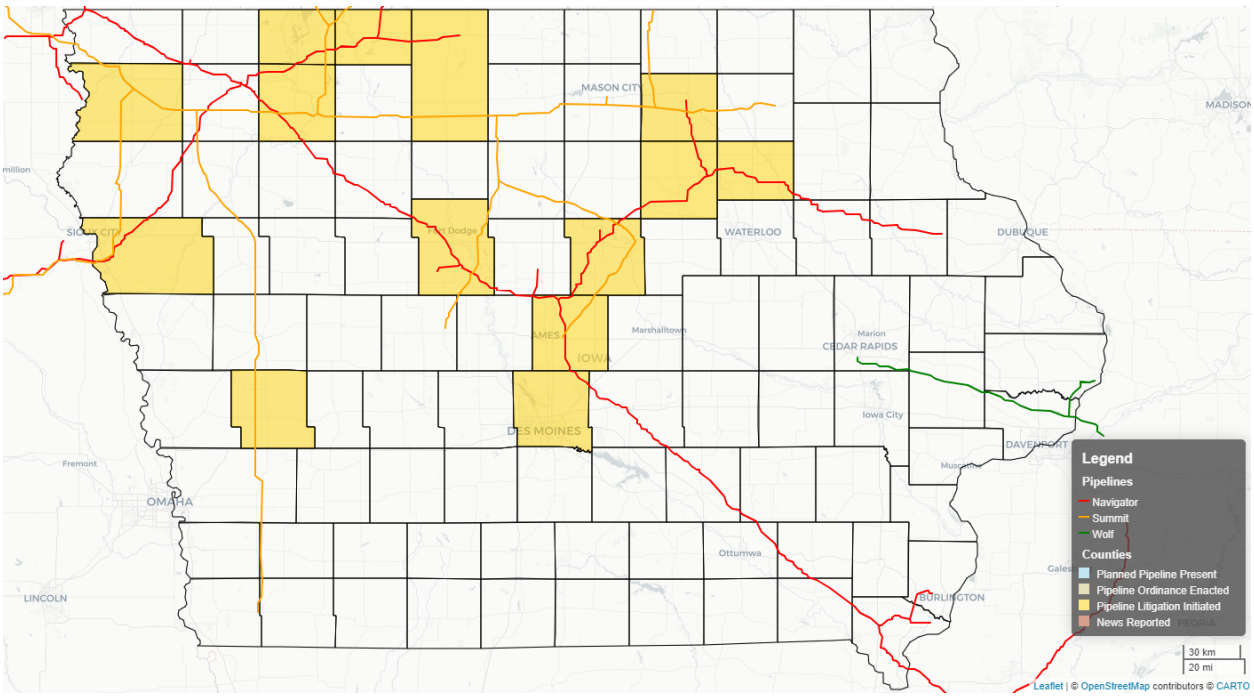
Pipelines are essential to Iowa's transportation infrastructure, moving oil, gas, and fuel efficiently across the state and beyond. They ensure a steady energy supply, support economic growth, and offer a cost-effective alternative to trucks and trains, reducing traffic, pollution, and enhancing safety. Pipeline transportation is crucial for Iowa's energy supply and economic prosperity.

Pipeline Network

The U.S. DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) serves as the regulatory authority for pipeline safety and hazardous materials regulations, developing and enforcing standards, regulations, and inspection protocols to protect public safety, the environment, and infrastructure. Since 1970, PHMSA has collected data about pipeline infrastructure from operators. As of 2024, there are 12,629 miles of pipeline and 37 operators in Iowa. In the region, there are approximately 588 miles of pipeline.

Pipeline Transportation Planning Issues

Planned carbon pipeline construction across Midwest states, including Iowa, has sparked significant debate, particularly around transportation planning and public concerns. These pipelines, designed to capture and transport carbon dioxide from industrial sources to underground storage sites, raise critical issues related to land use, environmental impact, and safety. Transportation planning must address the potential disruptions to existing infrastructure, the safety of pipeline crossings, and the long-term effects on rural and agricultural communities. Public concerns are also prominent, with many residents worried about the risks of leaks, land rights disputes, and the overall environmental impact of such projects. These factors have made carbon pipeline development a contentious issue in the region, requiring careful consideration of both economic benefits and potential hazards. The Hubbell Environmental Law Initiative (HELI) has published a digital interactive map to help users identify local Iowa counties impacted by proposed carbon pipelines.

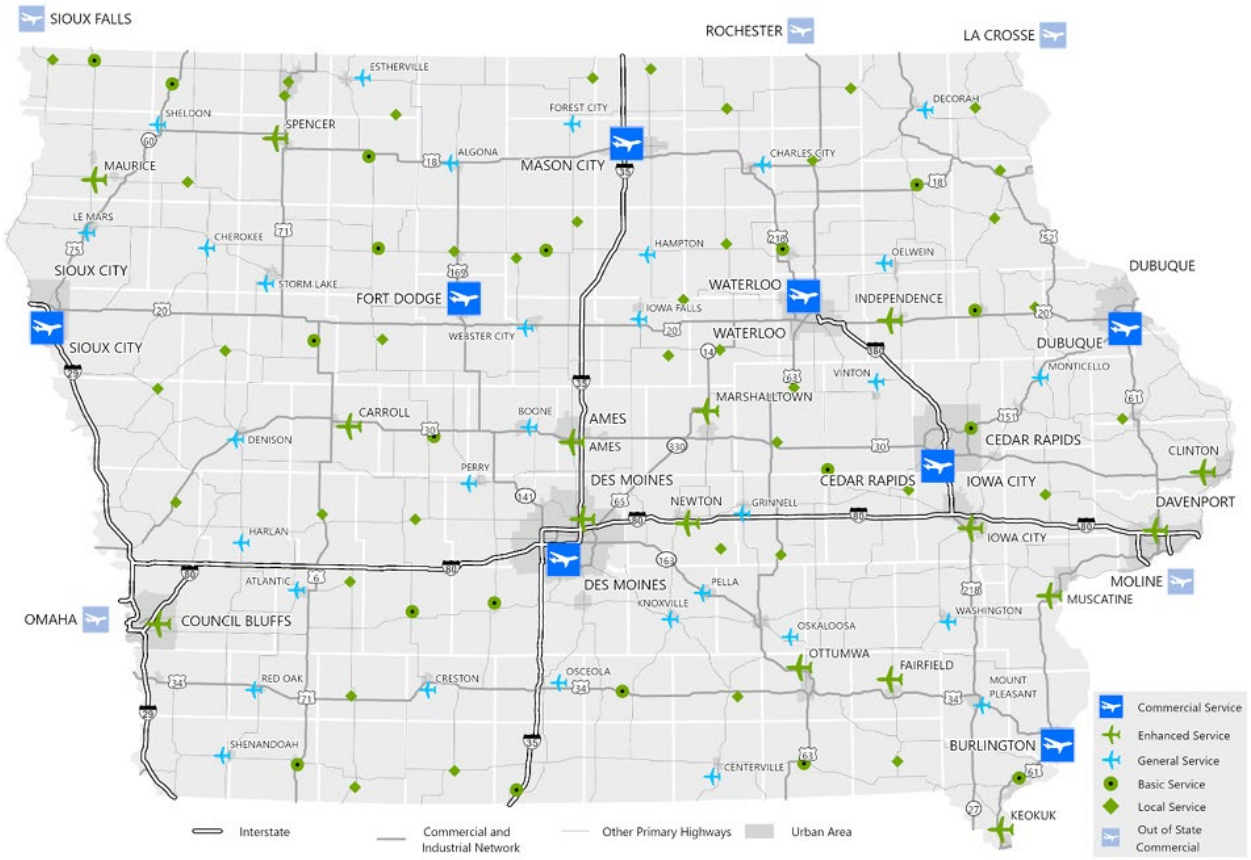


Iowa Carbon Pipelines Digital Map
Source: Hubbell Environmental Law initiative (HELI), University of Iowa

https://s-lib024.lib.uiowa.edu/Iowa-Carbon-Pipelines/

Air Transportation

Iowa has a variety of airports that serve diverse needs for people and businesses. Most of Iowa's population lives within 30 minutes of an airport, thanks to the state's airport system. There are big airports connecting to many places, which are busy with travelers and cargo. Iowa also has smaller regional airports across the state. These are important for smaller communities and are used by private pilots, recreational flyers, and businesses. They offer services like training, maintenance, and help with farming. The need for these smaller airports changes based on things like local economy, tourism, and recreational activities.



Iowa airports by role and bordering commercial airports
Source: Iowa DOT, Iowa in Motion 2050

Air Network

The Waterloo Regional Airport (ALO), situated off U.S. Hwy 218 in northwest Waterloo, is the largest airport in the region. It is owned by the City of Waterloo and overseen by a seven-member Airport Board. As a non-hub primary commercial service airport, it supports general aviation, commercial, and military operations, including serving as a major base for the Iowa Army National Guard. The airport features two runways—an 8,400-foot primary runway and a 6,000-foot secondary runway—and a closed third runway. Facilities include a terminal building with ticketing, baggage claim, and parking, along with hangars and a fuel farm. The Federal Aviation Administration (FAA) operates an air traffic control tower on-site, and Livingston Aviation, along with two other limited fixed base operators (FBO), provides services to general aviation. The airport does not have transit service.

The region hosts several smaller municipal airports, each serving local aviation needs with varying facilities.

Independence Municipal Airport (IIB), situated three miles southwest of Independence, is an enhanced service airport featuring a 5,500-foot paved concrete runway, 31 hangar spaces, and 24-hour jet fueling. It supports a growing number of aircraft and operations, with projections indicating an increase from 28 aircraft and 7,000 operations in 2010 to 36 aircraft and 9,000 operations by 2030.

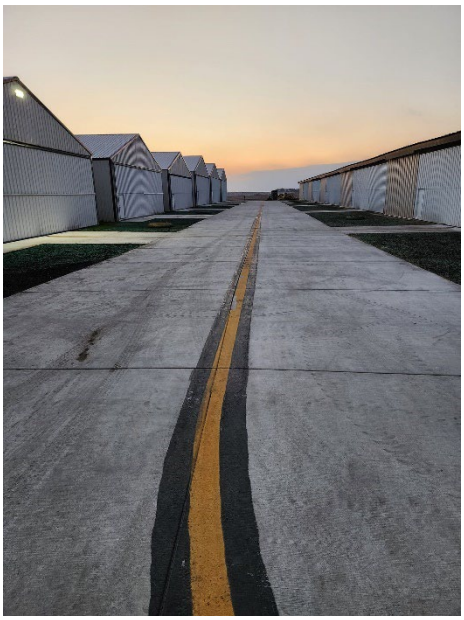
Allison Municipal Airport (K98) is located on the northwest edge of Allison and offers a 1,790-foot turf runway, six hangar spaces, and two tie-down locations. It is expected to see a modest increase in aircraft and operations, from five aircraft and 1,250 operations in 2010 to six aircraft and 1,500 operations by 2030.

Grundy Center Municipal Airport (6K7), about three miles west of Grundy Center, has a 2,250-foot turf runway and limited hangar and tie-down facilities. The airport is projected to maintain its current operations, with one aircraft and 250 operations in 2010.

New Hampton Municipal Airport (1Y5), located northwest of New Hampton, features a 2,900-foot paved asphalt runway and a secondary turf runway. With four hangar spaces and two tie-down locations, it is expected to keep its current level of activity, like its 2010 figures of one aircraft and 250 operations.

Waverly Municipal Airport (C25), situated two miles northwest of Waverly, provides a 2,800-foot paved asphalt runway, 23 hangar spaces, and jet fueling. It anticipates growth, increasing from 23 aircraft and 5,750 operations in 2010 to 29 aircraft and 7,250 operations by 2030.

Facility improvements are funded through a variety of federal, state, and local programs. At the federal level, the FAA sponsors an Airport Improvement Program (AIP) which allocates a trust fund both on an entitlement and discretionary basis. The entitlement provision in the AIP supplies local airports with funds based on average annual passenger boardings. Discretionary funds are based on highest priority and selected from each airport's five-year Capital Improvement Program (CIP) through an 18-month grant process. Funds from this source require a ten percent local match and can be used to improve runways and purchase equipment, signs, lighting, and other non-operating expenses.



The Iowa DOT also sponsors an AIP and has developed a grant process in which state aviation fuel taxes are redistributed to airports. Like the FAA's discretionary AIP funds, capital improvement projects are selected from a five-year Capital Improvement Program and must be used to modernize and improve the facilities at Iowa airports. Projects in the region that have been funded by these grant programs in the past five years are summarized in Table 6.5.

Table 6.5: Airport Improvement Program Grants, FY 2019-2023

Fiscal Year	Airport	Project	Federal Funding ($)	State Funding ($)
2023	Independence	Install Runway Vertical/Visual Guidance System, Reconstruct Runway Lighting, Reconstruct Taxiway Lighting	477,000	
2023	Independence	Construct Apron	1,000,000	
2023	Independence	Construct Apron	98,000	
2023	Waterloo	Reconstruct Taxiway, Seal Runway Pavement Surface/Pavement Joints	1,477,510	
2023	Waterloo	Improve/Modify/Rehabilitate Terminal Building, Install Security Cameras	402,790	
2023	Waterloo	Improve/Modify/Rehabilitate ARFF Building	241,073	
2023	Waterloo	Reconstruct Taxiway	1,936,017	
2023	Waverly	Construct Taxiway	519,407	
2023	Waverly	Construct Taxiway	159,691	
2023	Waterloo	Hangar Rehabilitation		124,145
2023	Waverly	Reconstruct South T-Hangar Taxilane		213,687
2022	Independence	Install Weather Reporting Equipment	162,000	
2022	Waverly	Large Concessions	20,135	
2022	Independence	Taxiway and Apron Expansion		297,627
2022	Waterloo	Hangar Rehabilitation		126,752
2021	Independence	Construct/Modify/Improve/Rehabilitate Hangar	47,780	
2021	Independence	CRRSA Act Funds	13,000	
2021	Independence	General ARPA	32,000	
2021	Waterloo	CRRSA Act Funds	1,008,018	
2021	Waterloo	CRRSA Act Concessions	5,034	
2021	Waterloo	General ARPA	1,115,838	
2021	Waverly	CRRSA Act Funds	9,000	
2021	Waverly	General ARPA	22,000	
2021	Waterloo	Hangar Rehabilitation		67,090
2020	Independence	Seal Apron Pavement Surface/Pavement Joints	214,830	
2020	Independence	Seal Taxilane Pavement Surface/Pavement Joints	147,778	
2020	Waterloo	Reconstruct Taxiway	6,662,078	
2020	Waterloo	Reconstruct Apron	2,716,294	
2020	Waverly	Extend Runway	113,668	
2019	Independence	Construct Taxiway	625,834	
2019	Waverly	Extend Runway	2,714,060	
2019	Waverly	Extend Runway	723,824	

Source: Federal Aviation Administration, Grant History Summaries; Iowa DOT, Aviation Program Funding

The Waverly, Independence, and New Hampton airports were consulted to identify projects as part of their long-range needs assessments, aimed at enhancing airport infrastructure and services to meet future demands (reference Table 6.6). These projects focus on improving runway conditions, expanding hangar capacity, and ensuring compliance with evolving safety regulations. Each airport aims to address the anticipated growth in both general aviation and regional air traffic by investing in necessary upgrades that enhance operational efficiency, safety, and overall service quality.

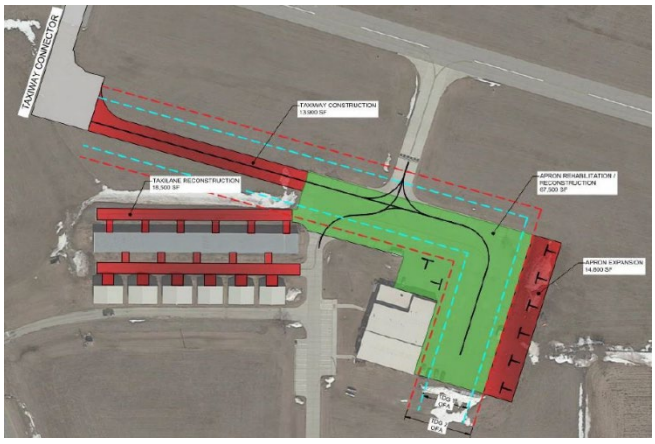


Table 6.6: Airport Long-Range Needs

Fiscal Year	Airport	Project	Total Cost ($)
2025	Independence	Airport Master Plan/ALP	333,333
2025	Waverly	Reconstruct North T-Hangar Taxilane	336,050
2026	Independence	Rehabilitate Runway & Parallel Taxiway (Joint & Crack Sealing) LCD 2007, 2008, 2009	550,000
2026	Waverly	Reconstruct Apron	792,800
2027	Independence	Wildlife Study	40,000
2028	Independence	Rehabilitat Apron Pavement LCD 2007, 2008, 2010	333,333
2028	Waverly	Expand Apron	570,150
2029	Independence	T-Hangar	1,100,000
2029	Waverly	Master Plan Update (FAA AGIS Implementation, ALP Drawings)	200,000
2029	Waverly	Construct 4-Unit T-Hangar (Phase I)	384,900
2030	Waverly	Construct T-Hangar Taxilanes (Phase I)	258,800
2030	Waverly	Expand 4-Unit T-Hangar to 10-Unit T-Hangar (Phase II)	420,000
2031	Waverly	Construct T-Hangar Taxilanes (Phase II)	350,000
2032	Waverly	Construct Parallel Taxiway (Apron to RWY 29 end)	1,500,000
2033	Waverly	Environmental Assessment (for Ultimate Runway 18/36, 35' BRL & RPZ's)	250,000
2034	Waverly	Land Acquisition (for Ultimate Runway 18/36, 35' BRL & RPZ's)	3,200,000

Air Transportation Planning Issues

Recent planning issues have been shaped by the dynamic landscape created by the COVID-19 pandemic. The pandemic significantly disrupted the global aviation industry, leading to challenges in forecasting future demand, managing capacity, and ensuring the safety of passengers and staff. Airports and airlines had to adapt quickly to rapidly changing travel restrictions and health protocols. Planning efforts focused on implementing stringent hygiene measures, reconfiguring airport layouts to allow for social distancing, and optimizing passenger flow to minimize contact points. As the industry has navigated the recovery phase, planning efforts have been centered around fostering resilience, enhancing operational flexibility, and ensuring the ability to respond effectively to future disruptions.

Future air transportation planning will face critical challenges, particularly managing the projected growth in air travel demand as global populations and economies expand. To address this, substantial investments will be needed to expand airport capacity, upgrade infrastructure, and optimize airspace to handle increased flight operations while maintaining safety and efficiency.

Joby Aviation eVTOL
Source: www.global.toyota/en

Environmental sustainability is also a pressing concern. The aviation industry must focus on developing and adopting sustainable aviation fuels, fuel-efficient technologies, and alternative propulsion systems like electric or hybrid-electric aircraft to reduce its carbon footprint. Additionally, personal electric vertical takeoff and landing (eVTOL) aircraft could transform local and regional transport by reducing road congestion and offering new mobility options such as electric aerial ridesharing. Their integration will require careful planning, including new infrastructure and regulatory adjustments, to fully realize their benefits while addressing associated challenges.

2024 Public Input Survey

In September 2024, RTA staff conducted two online surveys designed to gather feedback from residents across the six-county region. Although the surveys did not specifically include a question about "freight," several responses touched on issues related to freight transportation. These responses included:

- Deteriorating road and bridge conditions
- County roads and gravel roads specifically in Chickasaw County, with semi traffic going to the ethanol plant
- Funding improvements on two-lane roads that need to be four-lane
- Transition to electric vehicles and the infrastructure for that
- More road space/wider roads in the country
- At-grade railroad crossing safety in rural areas