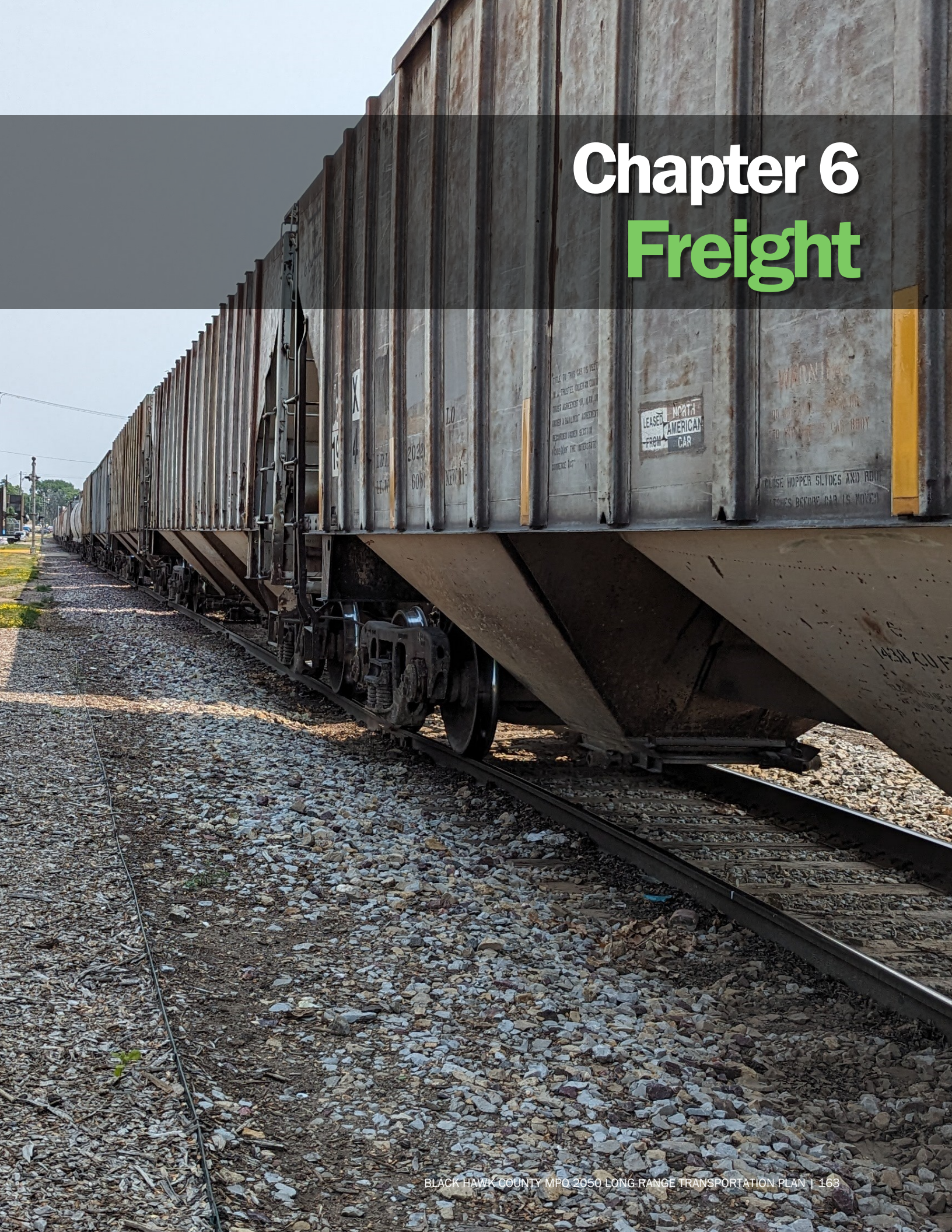


Chapter 6

Freight



Chapter 6 – Freight



Freight Background

Multimodal freight is crucial for the economic growth of Black Hawk County and nearby communities. Situated in the heart of the Midwest, this region heavily relies on smooth goods movement to fuel industries and local businesses. With varied multimodal infrastructure, the county 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 Black Hawk County area.

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.

METRO STATS

132

Transportation and warehousing businesses¹

82

Miles of active rail lines²

127

At-grade road-rail crossings²

65 & 1

Road-rail injuries and fatalities since 1976³

25

Miles of active pipeline⁴

Sources:

¹U.S. Census Bureau, 2021 County Business Patterns

²Iowa DOT, REST Services, Active Rail Lines

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

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

- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.

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 leads to less public data on freight and difficulties in involving all stakeholders. Some companies might hesitate to discuss sensitive freight matters.

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 metro area does not contain any navigable waterways.**

State Freight Plans

In 2012, the Freight Advisory Council (FAC) was formed to help understand the complexities of freight movement. Its aim is to guide public investment in transportation infrastructure through education, discussion, and review. The Iowa FAC's mission is to improve Iowa's business and industry competitiveness by fostering a safe, efficient, and convenient multimodal freight transportation system. The Council includes stakeholders from various industries and groups linked to freight transportation. It has contributed to planning documents and projects like the Iowa State Freight Plan, Iowa State Rail Plan, Iowa in Motion 2050 State Long Range Transportation Plan, and Iowa Statewide Freight Transportation Network Optimization Strategy.

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 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 now federally required to be updated every four years. The 2022 State Freight Plan is an updated and streamlined version of the original 2017 Plan with several notable enhancements that will impact the freight transportation system including:

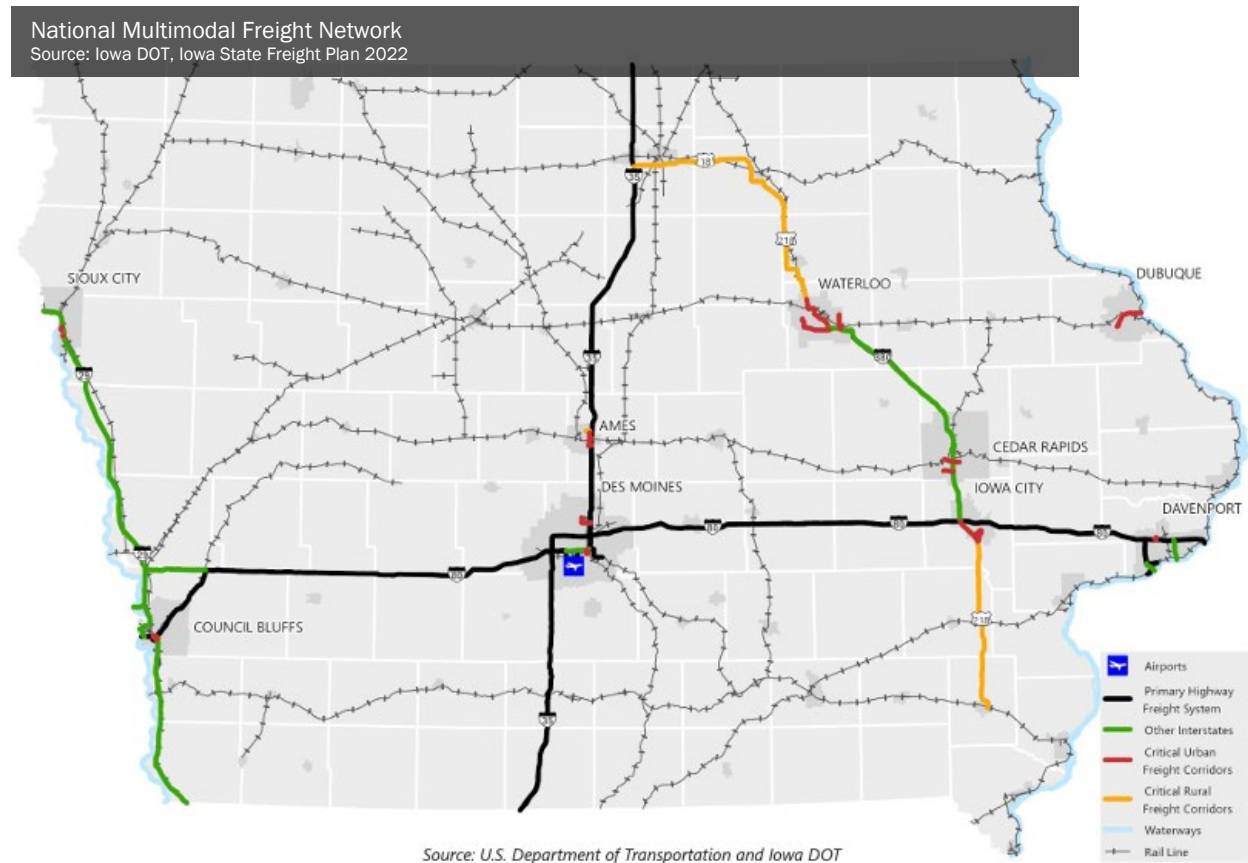
- Clearly defined system objectives
- Process for identifying multimodal bottlenecks
- Focus on infrastructure and supply chain resiliency
- Freight design considerations
- Commercial motor vehicle parking facilities assessment
- Catalog of freight-generating facilities

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 Interstates Not On 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.



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



Source: Iowa DOT

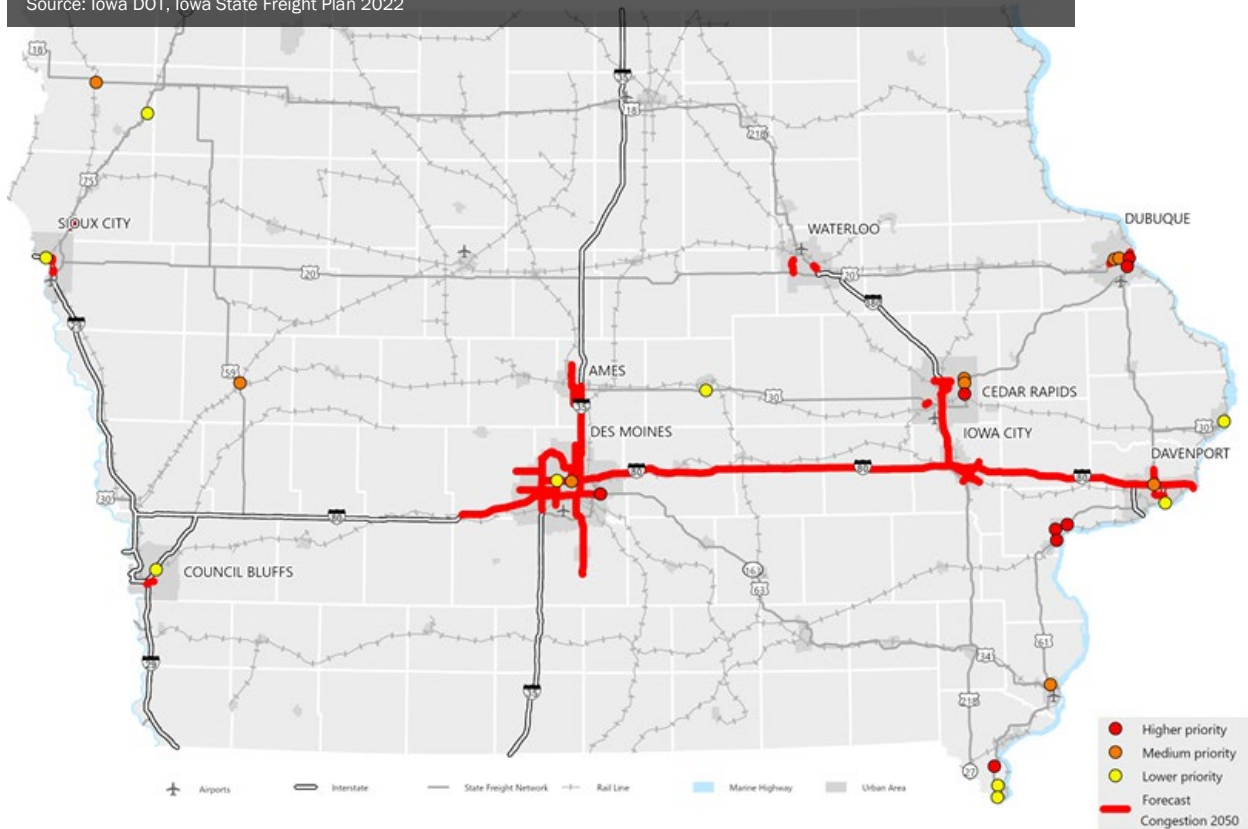
The State Freight Plan identifies specific improvements to address the freight mobility issues experienced in Iowa. These improvements are intended to support the state's freight implementation strategies, the national freight goals, and the Iowa DOT system objectives.

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 candidate 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 Black Hawk County metro area.**



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

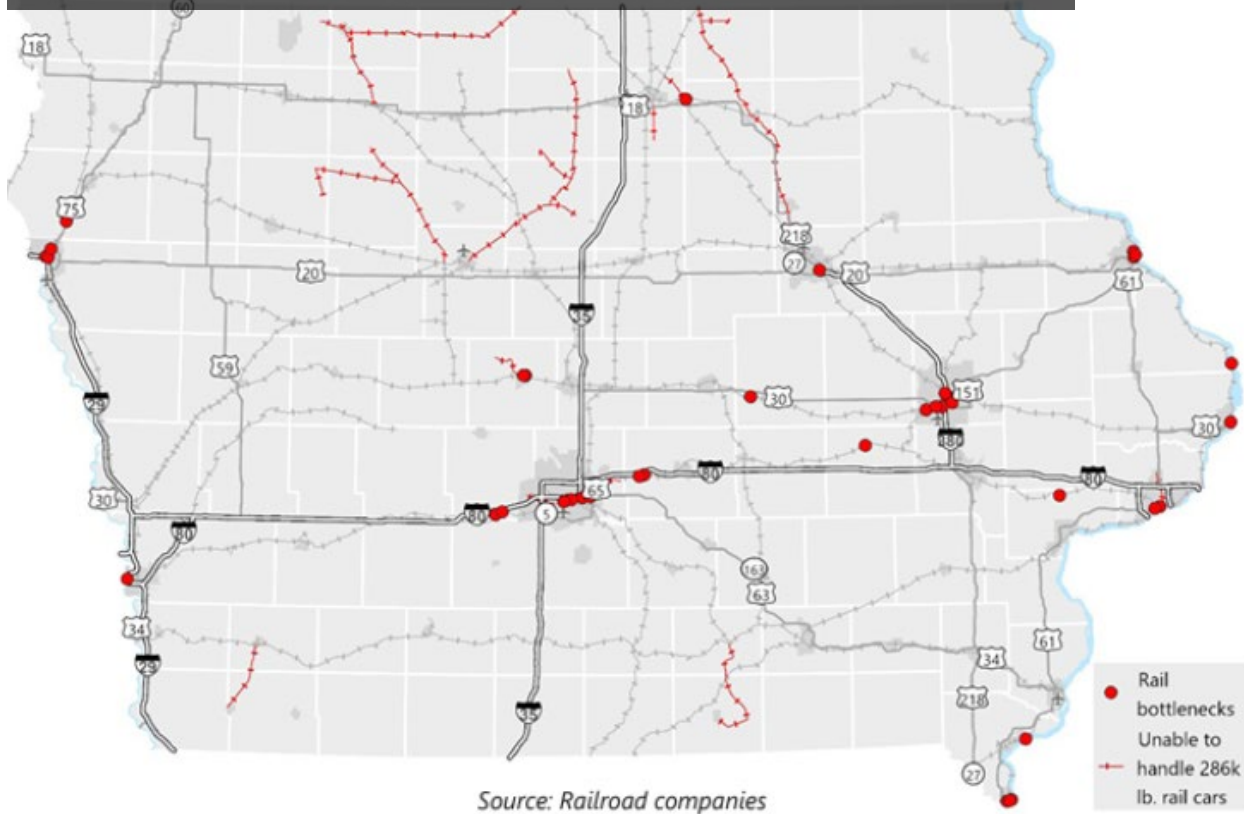
Railroad bottleneck locations (more commonly referred to as “choke points”) were identified by surveying each of the rail companies operating trackage in the state. Locations submitted primarily include structural choke points (e.g., low clearance areas and bridges with size restrictions), congested 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 identified as a railroad freight chokepoint** due to the convergence of traffic from three subdivisions resulting in insufficient classification space.

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

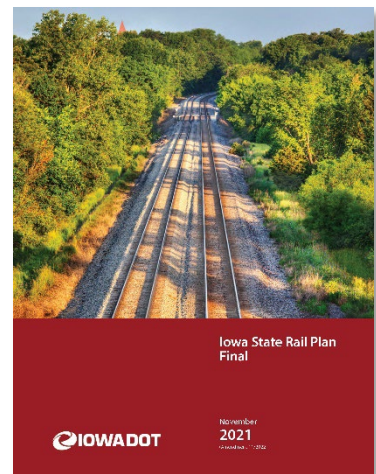


Iowa State Rail Plan 2021

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 freight
- Intercity passenger rail service
- Commuter rail service
- Rail safety and security
- Rail-related economic development
- 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>

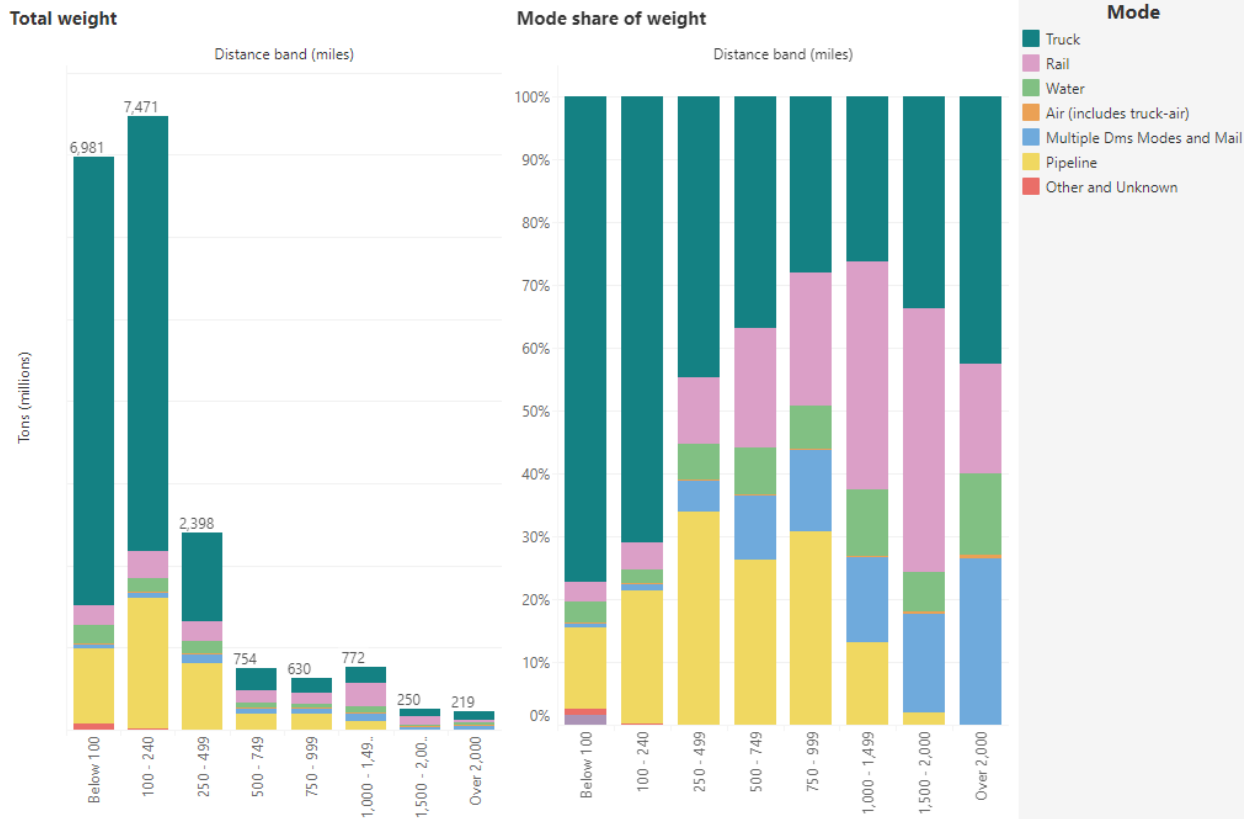
Freight at the National Level

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.





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.

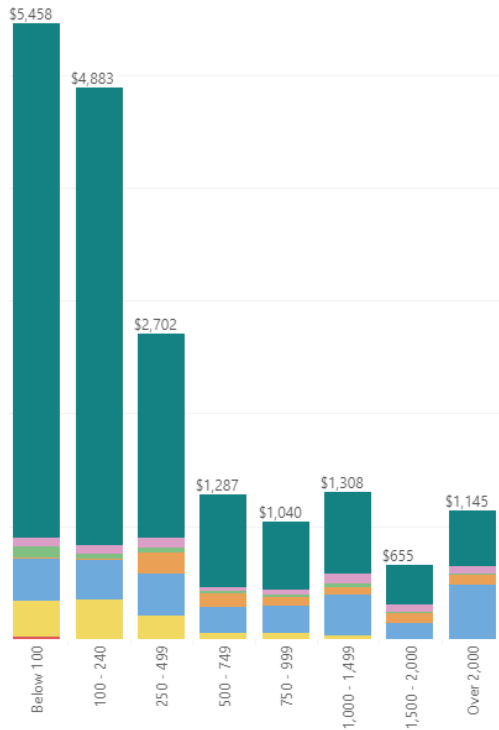
The reliance on air transport indicates the importance of speed and efficiency in covering vast distances, while the combined usage of multiple modes highlights the complexity and integrated nature of modern supply chains that span across different transportation networks.

Value of freight by mode and distance, 2021

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

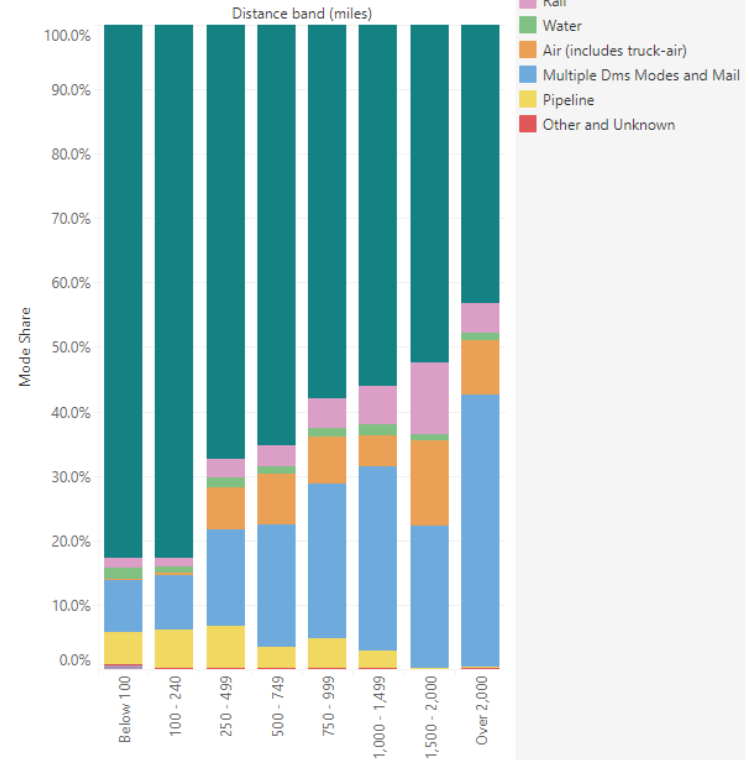
Total value

Current dollars (billions)



Mode share of value

Current dollars (billions)



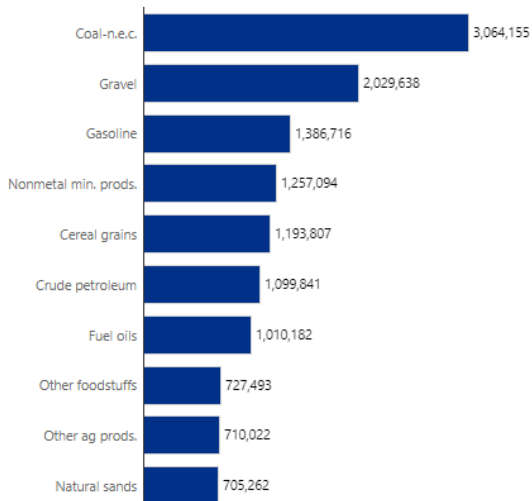
The top ten commodities by weight accounted for 65 percent of total tonnage while the top 10 by value accounted for 60 percent of total value of goods moved in 2022. The leading commodities by weight are coal-n.e.c., gravel, gasoline, and nonmetallic mineral products. The leading commodities by value 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

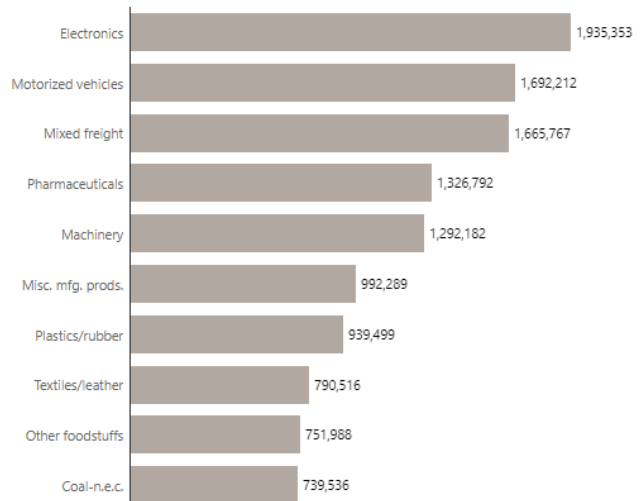
Weight

Thousands of tons

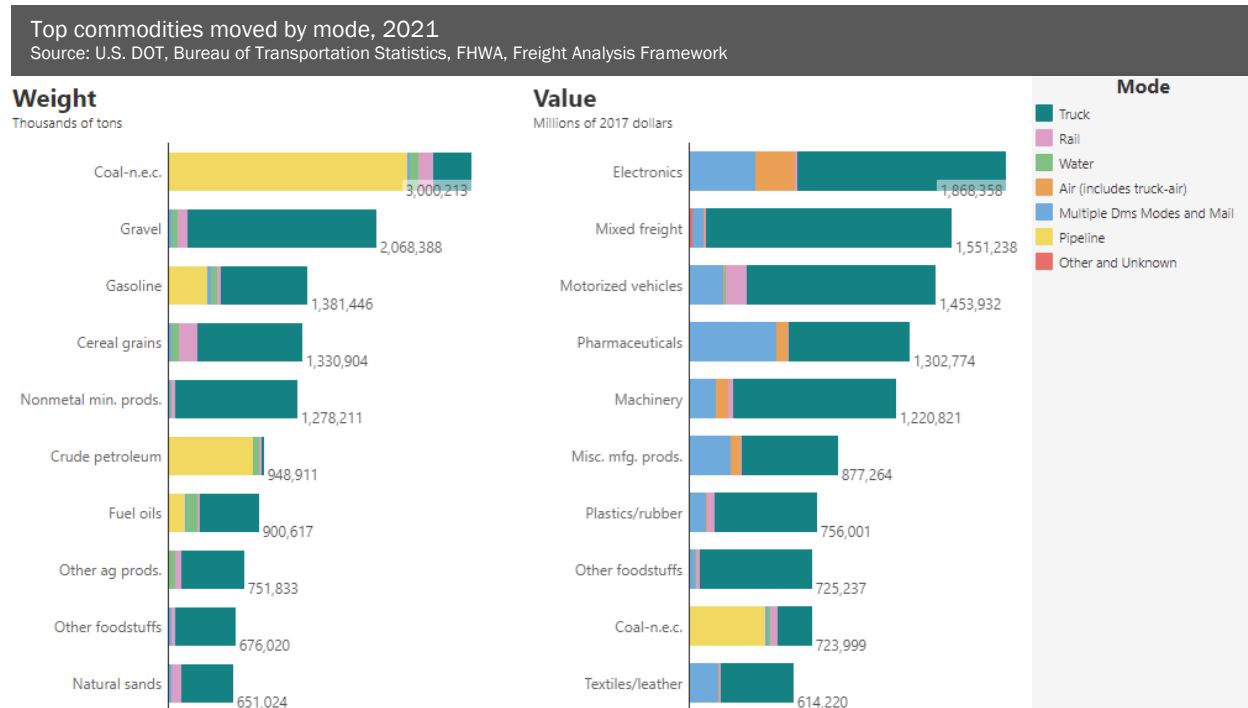


Value

Millions of 2017 dollars



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 systems boasts an extensive network of roads, bridges, railroads, waterways, 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 within 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. The gap between Iowa's imports and exports is projected to grow wider, from 40 million tons in 2017 to 115 tons in 2050.

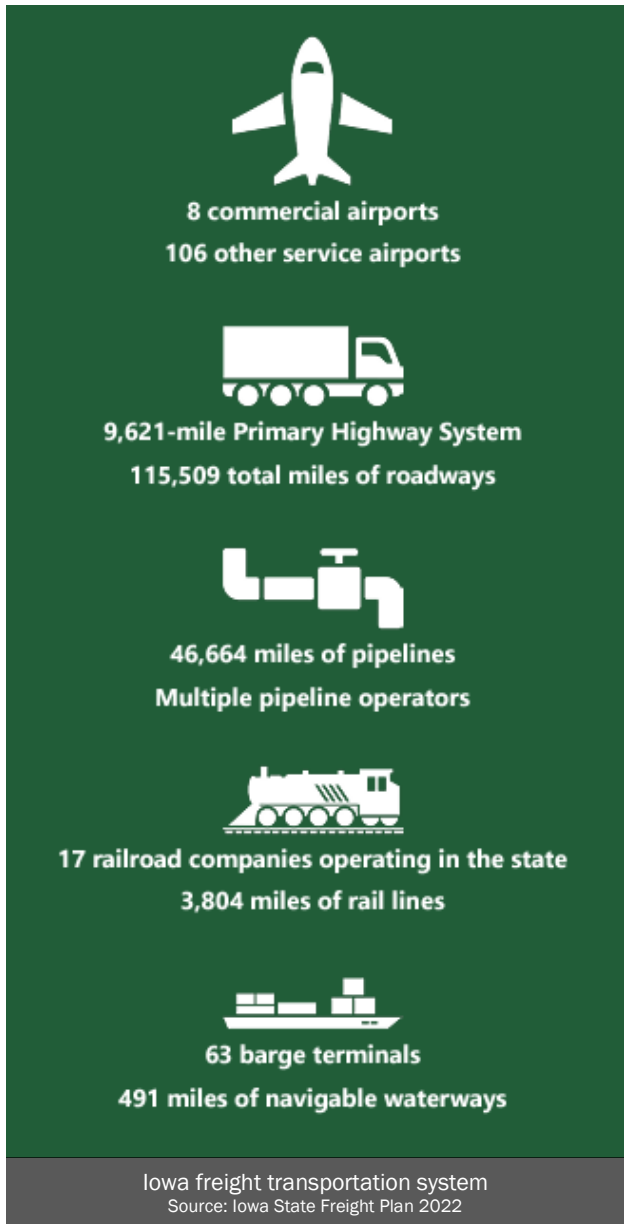
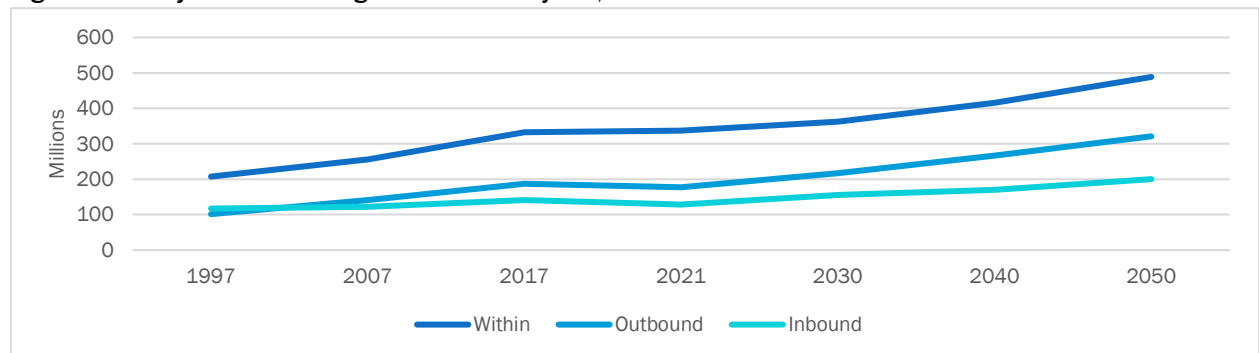
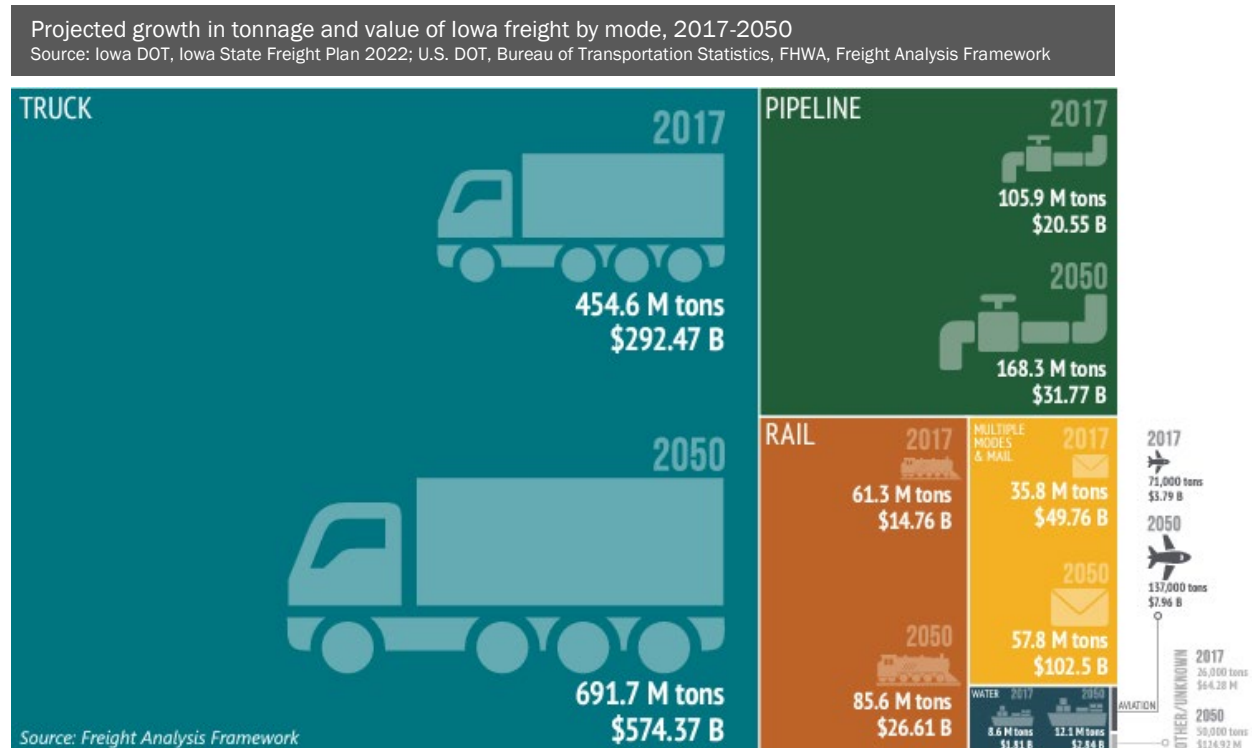


Figure 6.1: Projected Iowa freight movement by ton, 1997-2050



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 small changes of less than one percent. The continued prominence of trucks coupled with the projected 52 percent increase in tonnage will have a large impact on the state's highway system, resulting in increased congestion and more rapid deterioration of pavement and structures along the roadways.

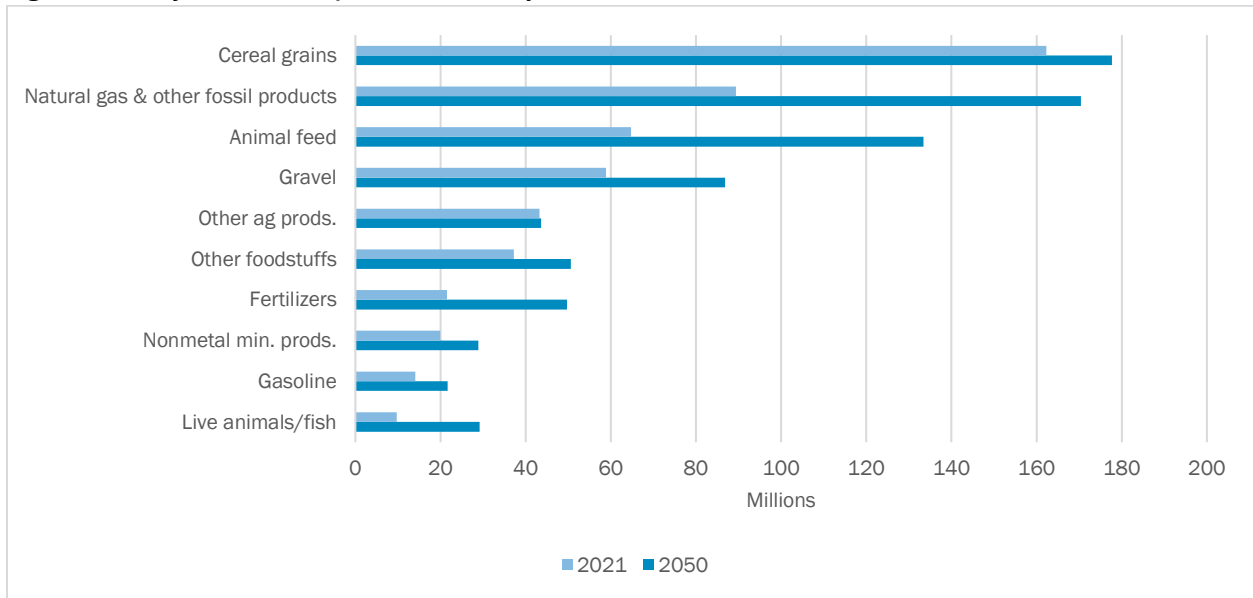


Iowa is renowned for its agricultural prowess, with cereal grains, animal feed, other agricultural products, other foodstuffs, fertilizers, and live animals and fish among its top commodities by weight. The state's fertile soil and favorable climate make it an ideal region for growing an array of cereal 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 significant portion of Iowa's top commodities along with other cereal grains. With vast fields of corn across its fertile lanes, 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 an important role in Iowa's economy for years to come.

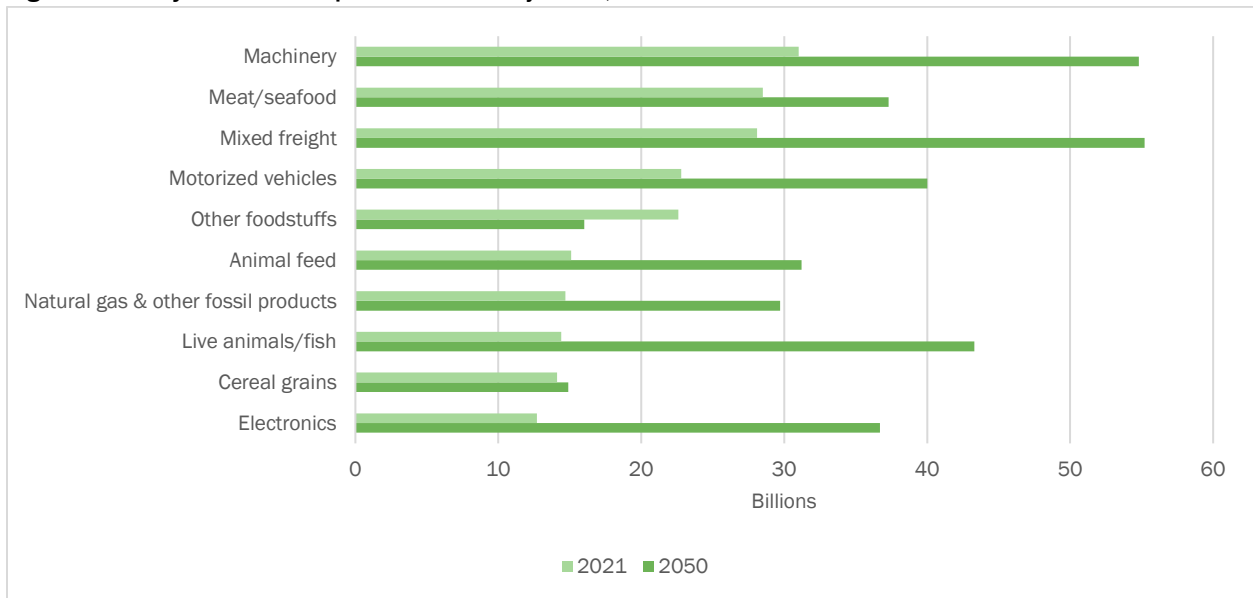


Figure 6.2: Projected Iowa top commodities by ton, 2021-2050



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

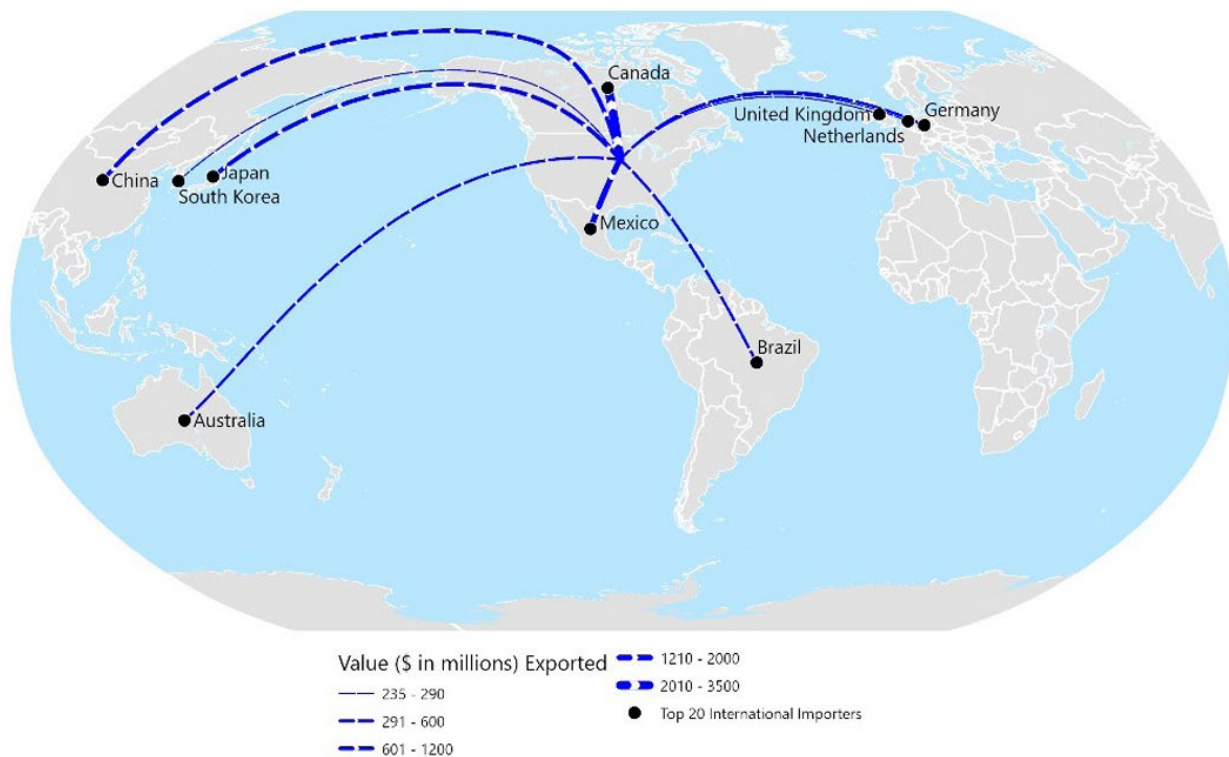


Figure 6.5: Domestic origin-destination flows from Iowa by ton (thousands)

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

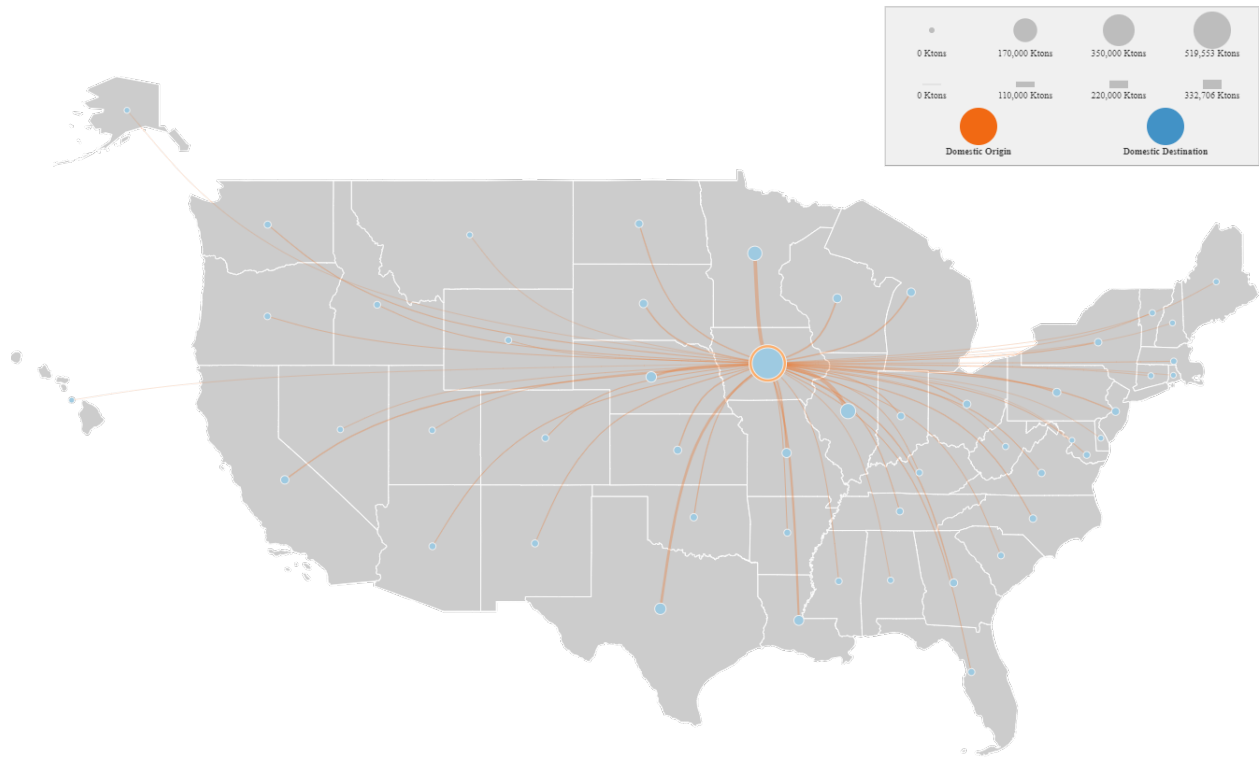
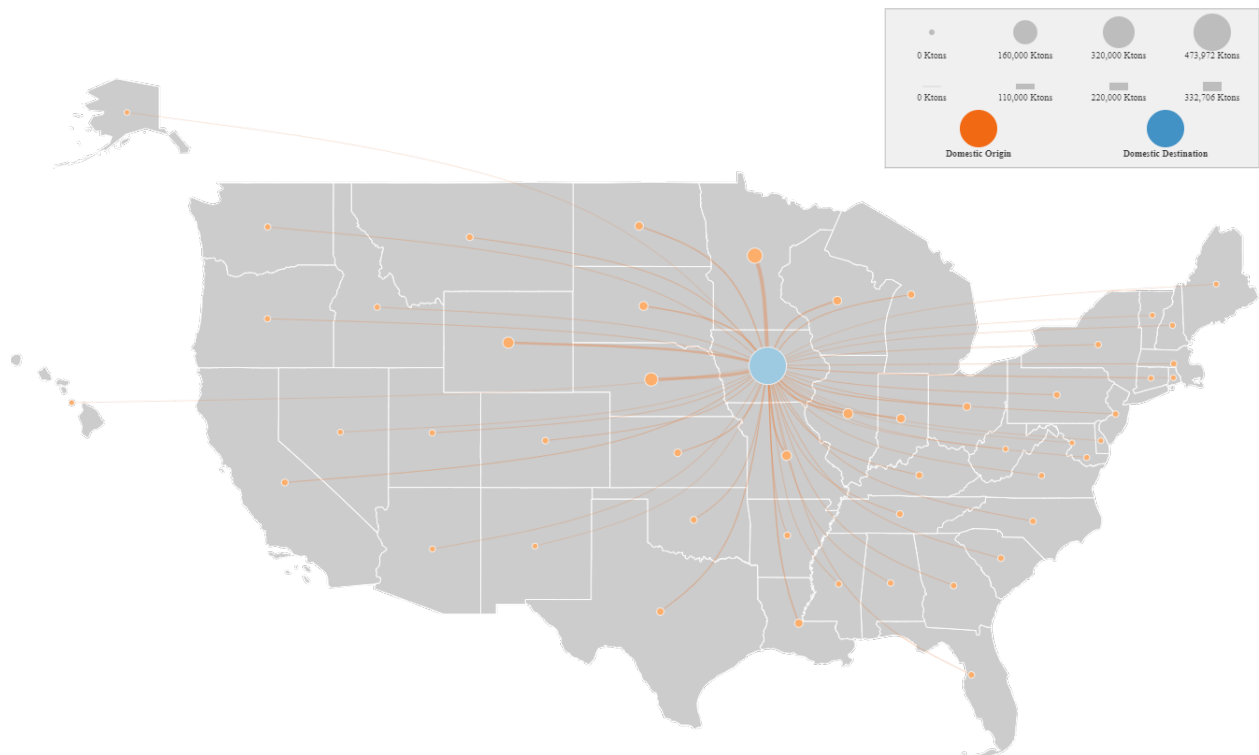
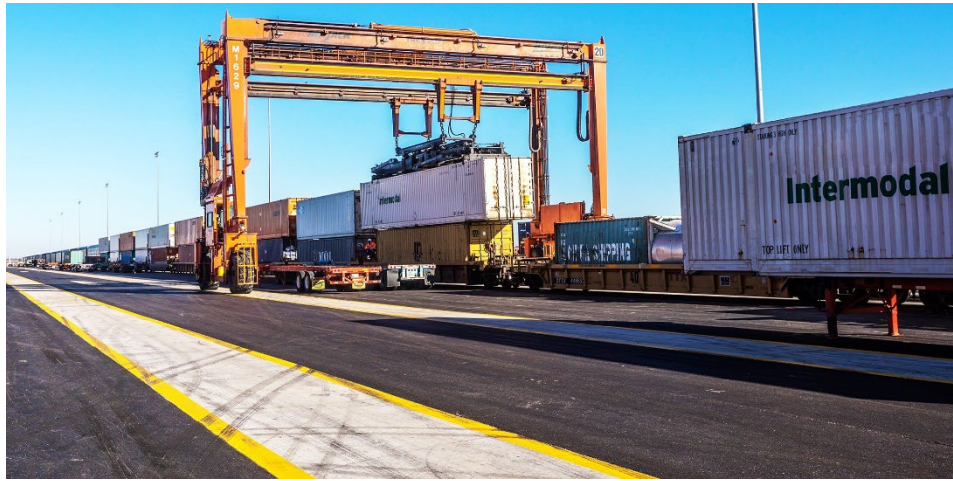


Figure 6.6: Domestic origin-destination flows to Iowa by ton (thousands)

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

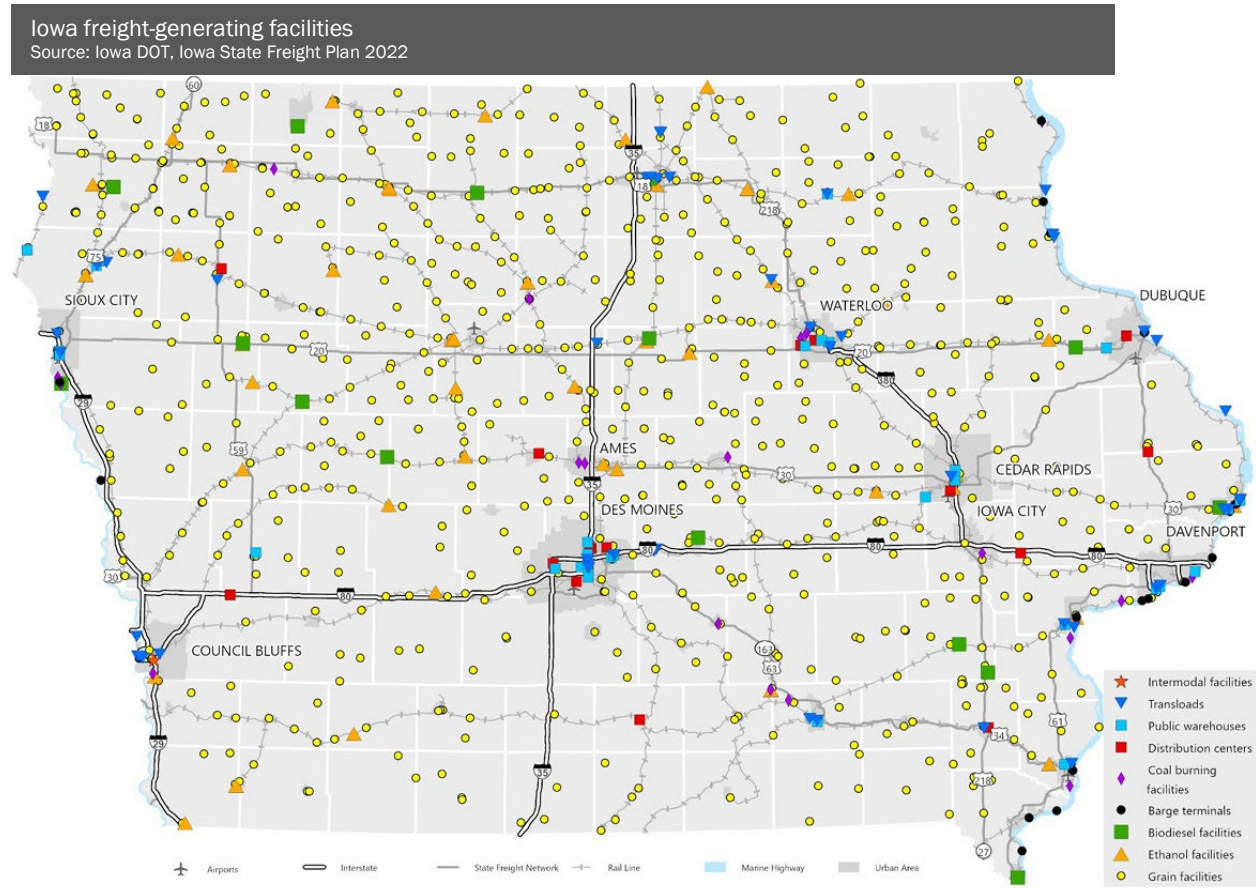


Iowa's freight system includes several intermodal facilities and transload facilities which play a pivotal role in the modern transportation and logistics industry. Intermodal facilities are key hubs where various transportation methods like rail, trucking, and shipping come together to smoothly exchange 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.



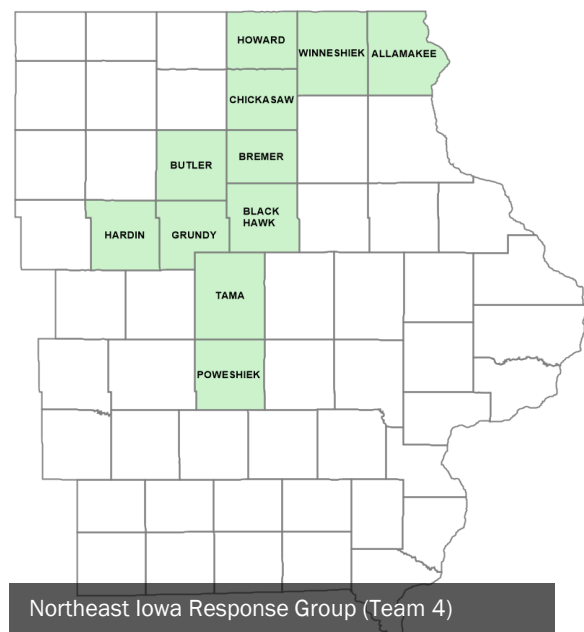
Freight in the Metropolitan Area

The Black Hawk County metro area offers four modes of transportation for freight: truck, rail, air, and pipelines. These modes are all utilized for the movement of goods within, to, and from the metropolitan area. Map 6.1 shows the multimodal freight elements in the area.

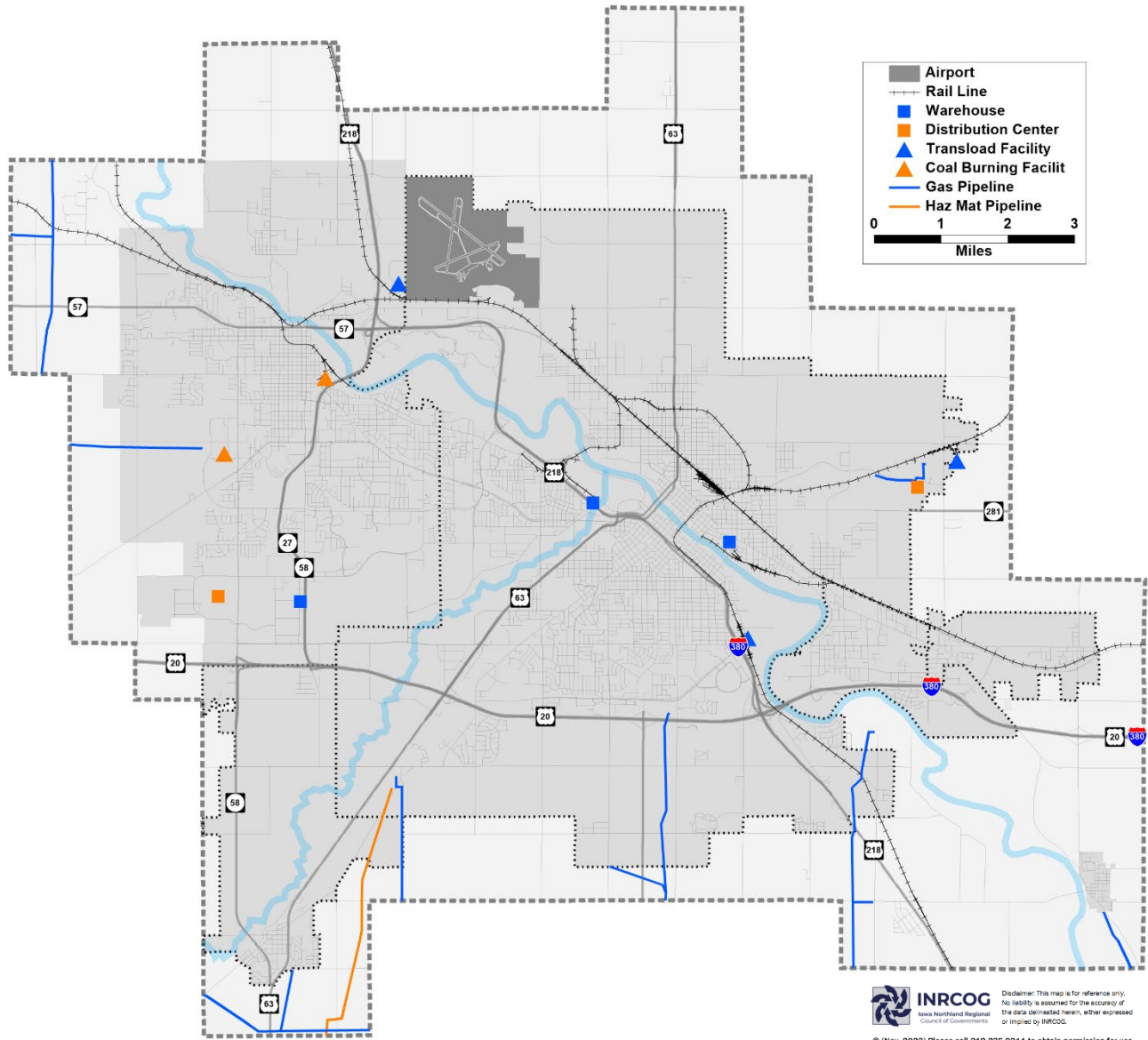
Black Hawk County is home to multiple manufacturing companies and industries that facilitate or rely on freight movements. There are also a variety of transportation-related companies and motor carriers homebased in the metropolitan area. According to the U.S. Census Bureau 2021 County Business Patterns, **Black Hawk County has 132 transportation and warehousing establishments with a total of 3,300 employees and annual payroll of \$183.4 million.** There are also a variety of businesses in the MPO that rely on freight transportation. Businesses in the manufacturing, retail, and wholesale sectors require efficient transport of their products inbound and outbound. As shown in Table 2.4 in Chapter 2, two of the top five employers in the metro area rely heavily on freight shipments.



A wide variety of freight is moved throughout the metro area 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. Black Hawk 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 is the base for the Northeast Iowa Response Group which responds to hazmat incidents in an 11-county area including Black Hawk, Bremer, Butler, Chickasaw, and Grundy Counties.



Map 6.1: Freight Generating Facilities in the Metropolitan Area



Truck Transportation

Black Hawk County 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 the county, 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, both of which Black Hawk County has. These highways stretch beyond the county, 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 metro area 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 metro area shippers.

Highway Network

Black Hawk County has a substantial inventory of major arterials that connect the region to the rest of the Midwest and nation. Table 6.2 provides a comparison of traffic figures for segments of these highways from 2014 to 2020. 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 metro area. 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, 2014 vs 2020

Location	AADT 2014	AADT 2020	Percent Trucks 2014	Percent Trucks 2020	+/- Percent Trucks
I-380 at D38 (Poyner Rd) interchange	15,500	14,100	24.2	28.9	4.7
I-380 at Evansdale Dr interchange	29,400	24,700	19.1	23.1	4.0
I-380 at W Junction U.S. Hwy 20/218 interchange	40,900	33,800	15.2	19.3	4.1
I-380 at Mitchell Avenue	25,200	23,100	11.2	14.7	3.5
U.S. Hwy 20 at IA Hwy 58 interchange	13,300	12,600	25.7	20.1	-5.6
U.S. Hwy 20 at I-380/U.S. Hwy 218 W interchange	25,440	20,700	15.7	18.3	2.6
U.S. Hwy 218 at IA Hwy 27/57 interchange	28,900	27,500	9.2	8.8	-0.4
U.S. Hwy 218 at W 11 th St	26,700	25,500	10.5	11.2	0.7
U.S. Hwy 63 at Ansborough Ave	6,700	5,400	9.1	8.5	-0.6
U.S. Hwy 63 at Donald St	10,900	10,200	4.6	5.2	0.6
IA Hwy 27/58 at Viking Rd	17,000	15,600	6.5	6.7	0.2
IA Hwy 58 at University Ave	21,600	20,100	6.6	7.1	0.5

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, accidents involving trucks remain a concern. Factors such as driver fatigue, inadequate training, and inadequate enforcement of regulations can contribute to accidents 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 consumers' 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.

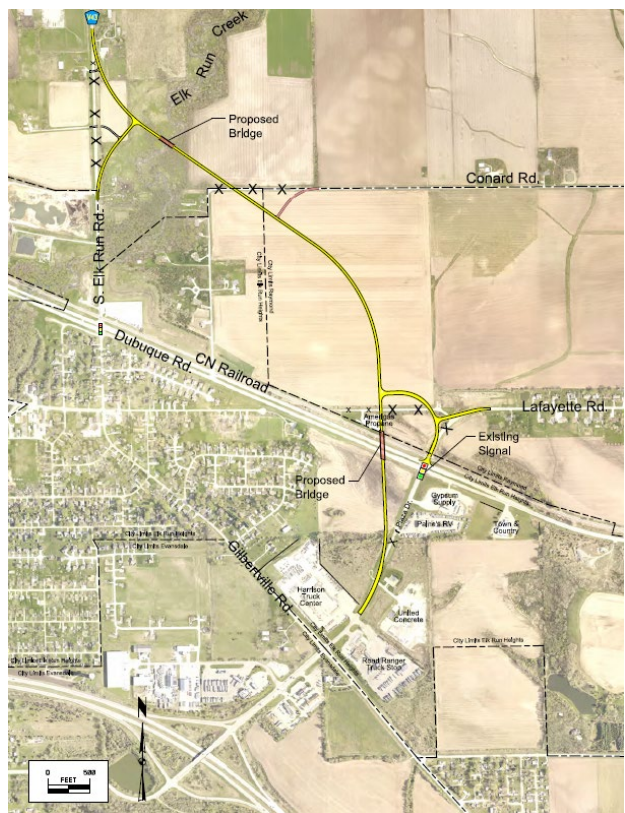
Truck transportation is associated with environmental impacts such as emissions, noise pollution, and energy consumption. The ongoing emphasis on sustainability and environmental concerns calls for incorporating eco-friendly practices into truck transportation planning, such as incentivizing the use 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, feedstock, 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 metropolitan area while improving safety and capacity at specific intersections. A specific freight-related project involves the Northeast Industrial Area in Waterloo. This area has several large industrial and manufacturing businesses, resulting in a high volume of freight traffic moving to and from the area. Traffic counts indicate 15 to 35 percent truck traffic, and these figures are anticipated to increase over the next 25 years. There are several safety, capacity, and traffic access concerns associated with the truck traffic accessing this area. To address these issues, a planning study was initiated by the MPO with a focus on freight traffic. The Planning Study was completed in 2019.

Several feasible alternatives have been identified to address concerns. Alternatives include spot improvements at intersections, capacity improvements, and partial and new roadway alignments. The Planning Study provides conceptual alternatives that can be used to guide future planning and development of projects in the study area. The next steps will involve identifying alternatives to move forward with preliminary design and environmental review. Improvements identified for Plaza Drive/Elk Run Road and North Elk Run Road are shown in the fiscally constrained table of projects in Chapter 3; large-scale projects are also identified outside of the financial constraint of this Plan.



Rail Transportation

Rail is typically second to trucks in terms of freight movement across the nation, Iowa, and the Black Hawk County metropolitan area. 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 metropolitan area including:

- Canadian National rail line running east-west through the metro area, 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 metro area, with 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.

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
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 above carriers 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 metropolitan area. There are multiple businesses located in the metro area that rely on rail to provide portions or all their freight transportation needs.

Rail Network

The rail network in the metro area plays a vital role in the transportation infrastructure of the region. Covering a significant mileage, the current rail network in the area provides essential connections for freight services. With 88 miles of tracks spanning the metro area, it enables the efficient movement of goods and commodities to and from various industries, including manufacturing, agriculture, and distribution. Its extensive reach contributes to the economic development and connectivity of the Black Hawk County metropolitan area, supporting the growth and prosperity of the community.



There are two major freight rail yards in Black Hawk County, 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 three transload facilities in the metro area where freight can be transferred between truck and rail. Table 6.4 identifies specific multimodal facilities in the area 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

Source: Iowa DOT, 2021 Iowa State Rail Plan

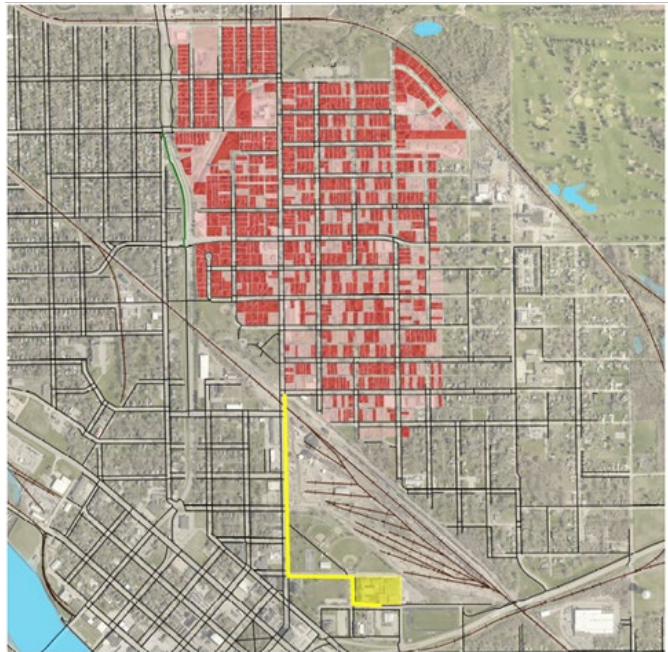


Rail Transportation Planning Issues

The most visible issue regarding rail transportation planning is safety and delays at at-grade road crossings. Within the metro area, there are 127 at-grade rail crossings, a couple of them intersecting with off-road trails. Railroad crossings remain a safety concern despite widespread use of active warning systems to clear the tracks for oncoming trains.

The CN carries manufactured and industrial goods across the Midwestern and Southern U.S. and Canada. Throughout Iowa, CN's largest railyard and facility network is in Waterloo. While the city supports the movement of commerce goods, the specific location of the railyard poses longstanding issues related to environmental justice, community connection, and public safety.

CN's railyard is located between East 4th Street and Martin Luther King Jr Drive in downtown Waterloo. Its adjacency to the second most populous high school in the city and near the downtown area causes numerous disruptions. Stopped trains cause extensively blocked crossings that inhibit residents, employees, school students, and a historically, disproportionately disadvantaged community. The image to the right highlights the shortest path of travel to and from East High School. This path is often blocked, affecting a substantial portion of the population. According to U.S. Census Bureau data, 78 percent of this population are persons of color. Public frustration with frequently blocked crossings has led to safety concerns and serious injuries to pedestrians and motorists. Since 1976, a total of 65 injuries and 1 fatality have occurred in the metropolitan area, of which 67 percent have occurred in Waterloo alone. Since 1991, at least five people have lost limbs because of railroad accidents, resulting in civil lawsuits against CN.



Addressing the community's social and safety issues associated with the current location of CN's railyard is a high priority for the city and MPO. In 2019, the City of Waterloo funded a preliminary study to assess relocating the railyard. The proposed relocation site is approximately ten miles away

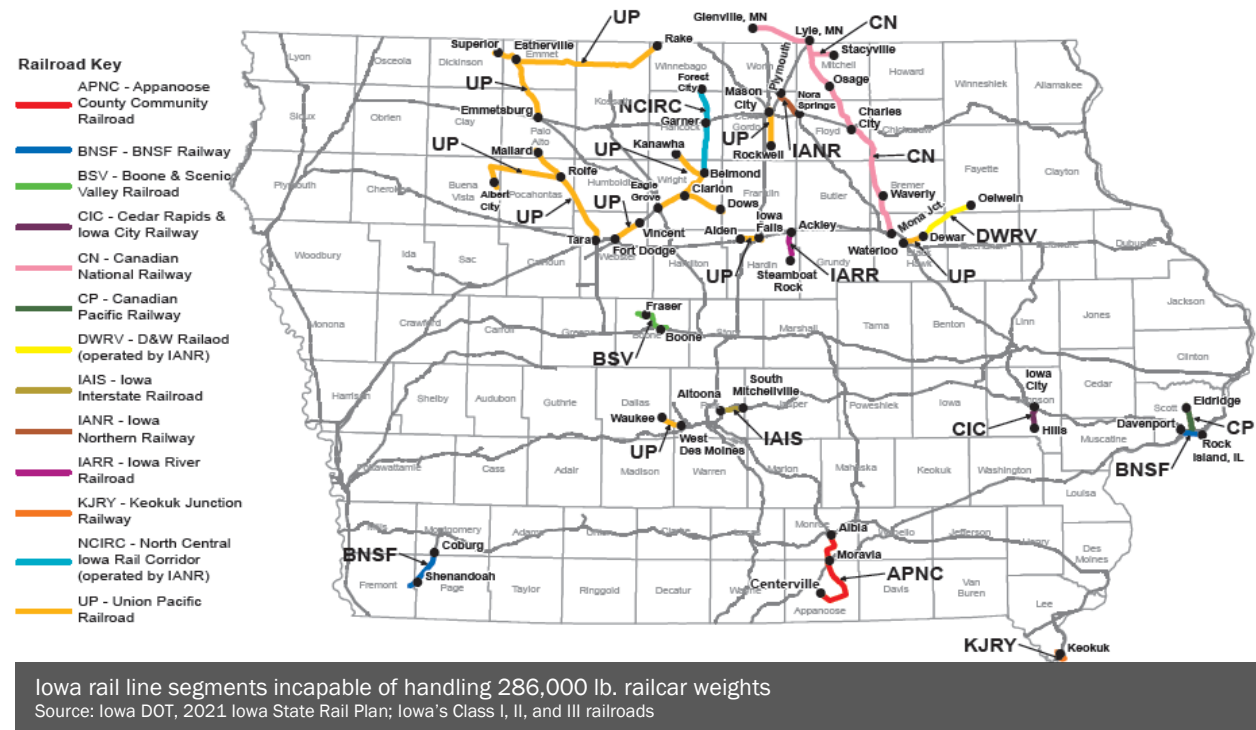
from the downtown area, is a safe distance away from residential neighborhoods and schools and provides a significantly greater amount of land for future economic growth. Further discussions about relocating the railyard were cut short due to financial constraints. However, in 2022 the U.S. DOT unveiled the Reconnecting Communities and Neighborhoods Program and the Railroad Crossing Elimination Grant Program to address various safety and connectivity issues across the nation. The City of Waterloo is interested in collaborating with railroads operating in the city to pursue federal funding for railroad improvement projects. In 2023 the City

applied for Reconnecting Communities and Neighborhoods Program funds for a Downtown Railyard Relocation and Railroad Crossing Improvement Study. The project aims to conduct a comprehensive analysis of the current rail network, with a focus on assessing its generational impact on disadvantaged communities. This study will identify barriers created by the existing rail infrastructure, explore public health and safety solutions, and develop alternatives to address the degraded quality of life resulting from a history of redlining and segregation that still affects the community. The study will be conducted in close collaboration with the CN Railroad, local authorities, community stakeholders, and transportation experts.

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, like making better intermodal hubs and using modern tech. This will make rail transport more efficient and attract even more rail traffic. This increase might lead to parts of rail lines in the metro area being too busy.

Railroads everywhere are dealing with a big problem: not having enough space for all the freight they need to carry. One major reason for this is that increased goods need to be transported by rail as industries grow. This is putting stress on the current rail systems. Some main routes do not have enough space, which can cause things to get stuck or slow down. There's also not enough room in terminals and yards, which can make things stop moving smoothly. Some rail systems are old and need fixing or updating to manage more freight. Dealing with these capacity problems is a top concern to make sure railroads can manage the growing needs for transporting goods.

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 Black Hawk County 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.



Pipeline Transportation

Pipelines play a crucial role in the transportation infrastructure, serving as a vital lifeline for various industries and facilitating the movement of essential resources. Iowa has many pipelines that move energy like oil, gas, and fuel around the state and beyond. This helps make sure there is enough energy and helps the economy grow. Using pipelines is a reliable and cheap way to move things, helping businesses save money and be more competitive. It also reduces the need for trucks and trains, which means less traffic, pollution, and better safety. Thus, the importance of pipeline transportation in Iowa and the metropolitan area cannot be overstated, as it serves as a critical backbone for the state'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 2022, there are 19,179 miles of pipeline and 58 operators in Iowa. In the metro area, there are approximately 21 miles of gas transmission pipeline, and 4 miles of hazardous liquid pipeline.

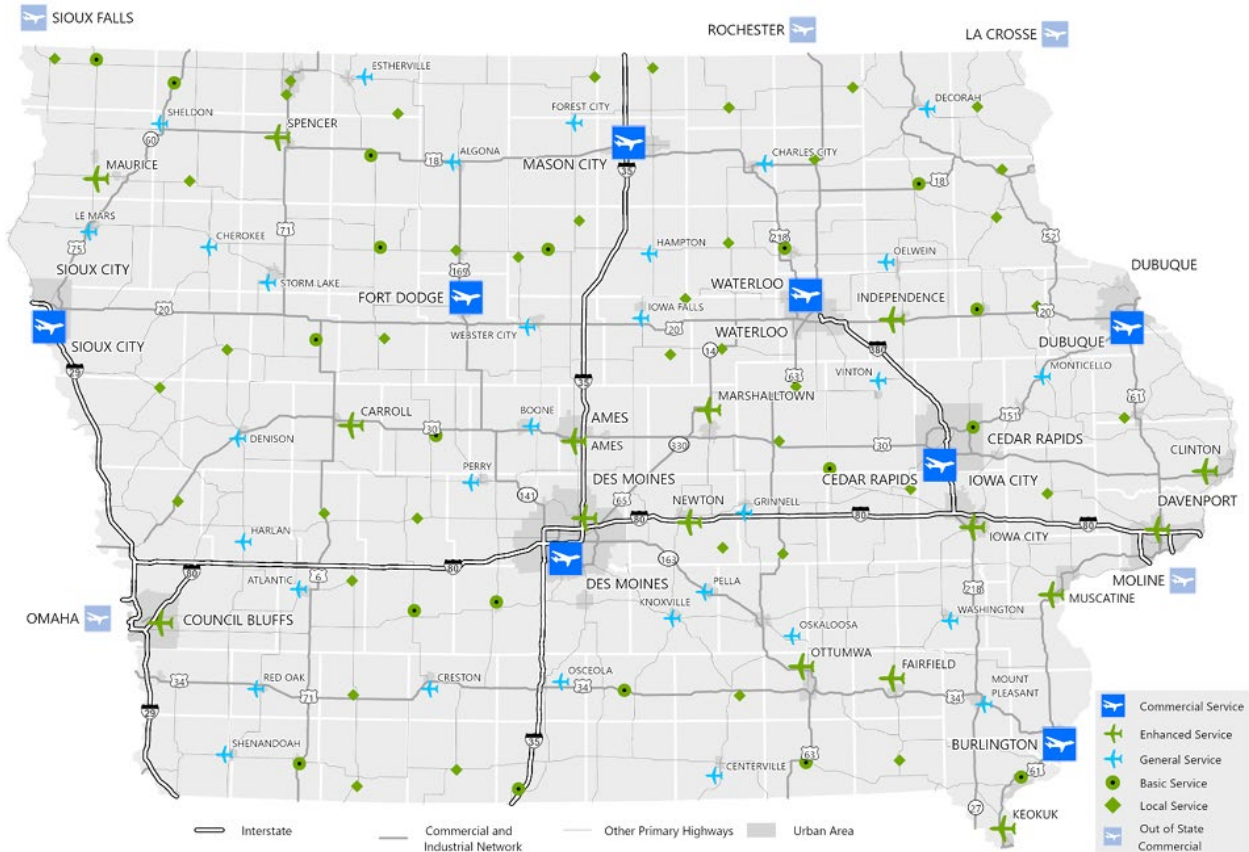


Pipeline Transportation Planning Issues

Pipelines are typically privately owned, and any deficiencies or infrastructure improvements would be completed by the owner. Planning issues to be considered include awareness of their locations and product type, and preparedness to manage any type of pipeline incident. A serious incident could require evacuation efforts around that location which could have major transportation implications.

Air Transportation

Iowa has a variety of airports that serve different 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) is located on Airport Boulevard immediately off U.S. Hwy 218 in the northwest corner of Waterloo. Transit service is not currently available to and from the airport. The facility is owned and operated by the City of Waterloo and is overseen by a seven-member Airport Board appointed by the Mayor of Waterloo. The airport is classified as a non-hub primary commercial service airport, offering general aviation and commercial service. The Iowa Army National Guard uses the airport as a major base. While the airport does facilitate some air cargo, most of its operations are commercial, general aviation, and military. ALO does not have a dedicated air cargo operator.

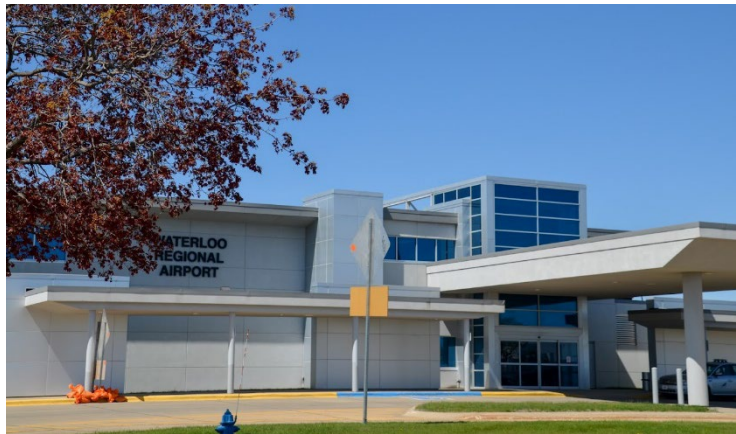


WATERLOO
REGIONAL AIRPORT

The Waterloo Regional Airport features two runways and a variety of facilities to serve air transportation. The primary runway is 12/30, oriented northwest to southeast. The runway is 8,4000 feet long, 150 feet wide, and consists of grooved asphalt. The second runway, 18/36, is oriented north to south; the runway is 6,000 feet long, 150 feet wide, and consists of grooved asphalt. This runway services the needs of all aircraft when winds are not favorable for the primary runway. A third runway, 06/24, was closed in February of 2020 due to maintenance costs and surrounding development. Runway 12/30 features high intensity runway lights, and runway 18/36 has medium intensity runway lights.



ALO has a series of connecting and parallel asphalt taxiways ranging from 50 to 75 feet in width and lit with blue taxiway edge lights. The terminal building opened in 1948 and has experienced a series of renovations and additions. The main floor provides airline ticketing, airline boarding, baggage claim, car rental, and lounge. Short- and long-term parking is provided for travelers. Hangar facilities are located directly west and east of the terminal building along with aprons for general aviation aircraft. The airport shares the use of the airfield with the Iowa Army National Guard – 194th Air Cavalry. The Guard facilities are not on airport property but are located just east of the airport with access to the runway and taxiway system. The unit operates several helicopters from these facilities.



The Federal Aviation Administration (FAA) owns and operates an air traffic control tower located on the southeast part of the airport. 100LL and Jet A aviation fuel is stored in a consolidated fuel farm southwest of the passenger terminal building.

The airport is home to Livingston Aviation, a full-service fixed base operator (FBO) providing aeronautical services to the general aviation public. There are two limited FBO's providing certain types of

service to the general aviation public. The FBO has its own terminal facilities. ALO is home to around 75-based aircraft.

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 allocated 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 at the Waterloo Regional Airport that have been funded by these grant programs in the past five years are summarized below.

Table 6.5: Airport Improvement Program Grants, FY 2018-2022

Fiscal Year	Project	AIP Funding (\$)	CARES Funding (\$)	State Funding (\$)
2018	Hangar Improvements	--	--	61,563
2019	Hangar and Terminal Improvements	--	--	102,354
2020	Reconstruct Taxiway	3,206,039	250,000	
2020	Reconstruct Apron	1,316,479	83,336	
2020	Hangar and Terminal Improvements	--	--	129,342
2021	Hangar Rehabilitation	--	--	67,090
2022	Large Concessions	--	20,135	
2022	Hangar Rehabilitation	--	--	126,752

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

Rehabilitation and improvement of airport facilities are necessary to ensure the viability of the airport as a passenger and freight transportation option. The 2022-2026 Capital Improvement Program for the Waterloo Regional Airport outlines anticipated projects over a five-year period. Table 6.6 provides a summary of projects.

Table 6.6: Summary of projects in the 2022-2026 CIP for the Waterloo Regional Airport

Fiscal Year	Project	Federal	Local	Total Cost
2022	Obstruction Mitigation, Reconstruction of Terminal Apron – Phase 4, Reconstruction of Taxiway B, Clean/Reseal Joints – East Terminal Apron	4,703,605	152,249	4,855,854
2023	Pavement Maintenance (Runway 12/30) - Pavement rejuvenator, crack sealing, pavement marking	801,000	89,000	890,000
2025	Taxiway A West Reconstruction, Airfield Pavement Marking (Runway 18/36 and Taxiways), Updated Pavement Management Program	2,756,071	306,230	3,062,301
2026	Runway 18/36 and Runway 12/30 Intersection Rehabilitation Inside of the Runway Safety Area	1,031,184	114,576	1,145,760

Source: 2022-2026 Capital Improvement Program for the Waterloo Regional Airport

Air Transportation Planning Issues

Recent planning uses 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 planning for air transportation will be marked by a range of significant issues that demand careful consideration and proactive strategies. One key challenge is managing the anticipated growth in air travel demand. As populations continue to grow and economies develop, the demand for air travel is expected to increase. Planning for this growth involves expanding airport capacity, improving infrastructure, and optimizing airspace utilization. Another pressing concern is environmental sustainability. As the aviation industry aims to reduce its carbon footprint and mitigate the impact of emissions, future planning will need to focus on developing and implementing sustainable aviation fuels, adopting more fuel-efficient technologies, and exploring alternative propulsion systems.

2022 Public Input Survey

In September 2022, the personnel of the MPO conducted a pair of internet-based surveys. These surveys were aimed at collecting feedback from residents within the jurisdictions of the MPO. The subsequent details provided here highlight survey responses that hold significance within the context of this chapter.

Figure 6.7: Public Input Survey, Round Two asking respondents how our roads and bridges could be improved (e.g., conditions, connectivity, capacity, etc.):

- “At the intersection of Hammond and Ridgeway in Waterloo please consider stop lights. I’ve witnessed too many people blow through those stop signs and traffic backs up there. More bridges or tunnels around rail roads along and near 218. 3x I’ve waited 30+ minutes while the train stops then backs up then pulls forward then stops again. Often I’m trapped between cars and can’t back out to find alternate routes. Not sure if this is your department but PLEASE MORE STREET LIGHTS. My street is so dark.”

Figure 6.8: Public Input Survey, Round Two asking respondents what their biggest transportation challenge is in the MPO:

- “Trains and congestion. I have lived here my whole life and it’s only in the past couple of years that I feel like we have started to have “rush hours.” And when a train is thrown in the mix we get backed up often for long periods of time and people get overwhelmed and make poor driving decisions. I’ve witnessed people running through red lights on 218, briefly driving down the wrong way to get around a stopped train, semis not having enough space to turn due to backed up traffic, etc.”