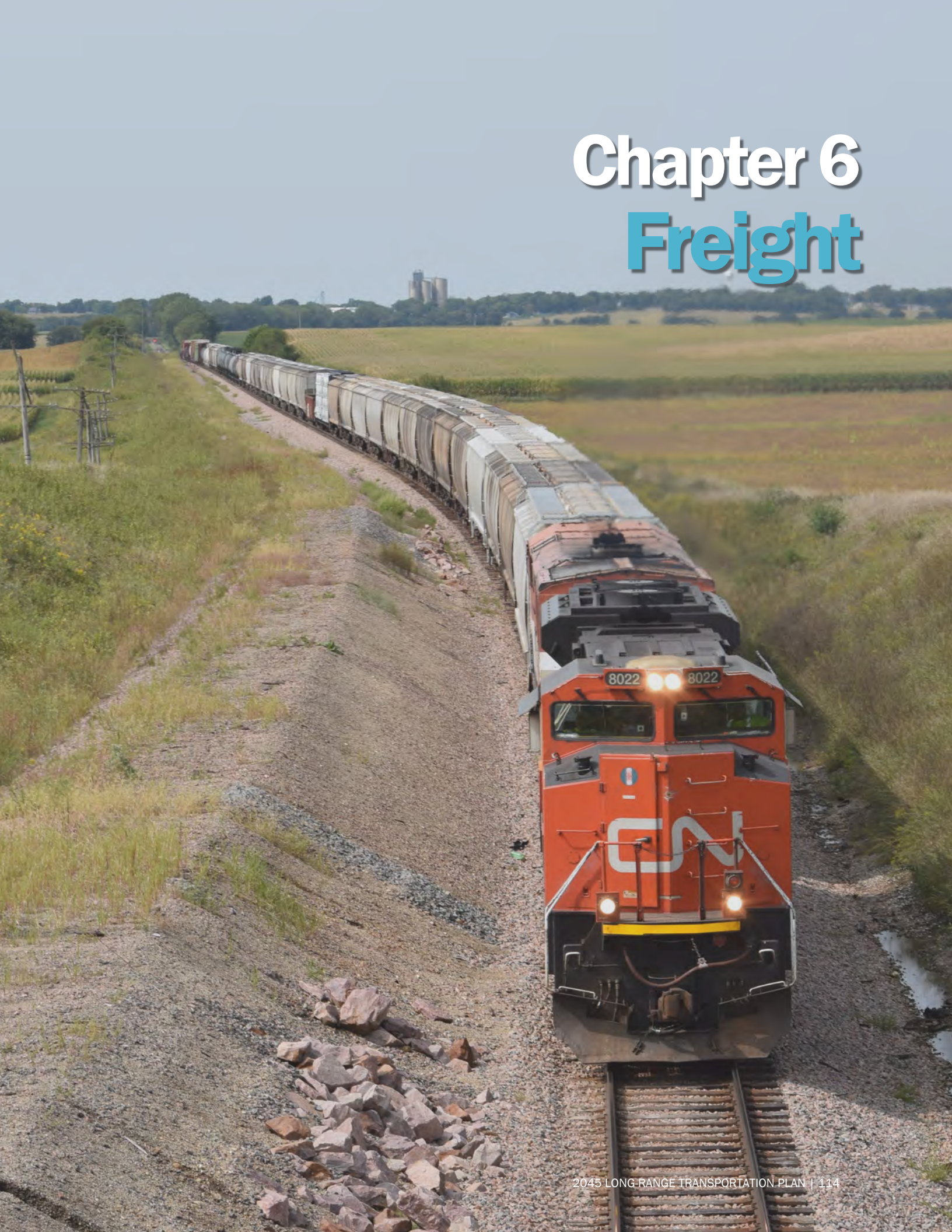
Chapter 6
Freight



Chapter 6 – Freight

Freight Background

The economic success of a region depends largely on its multimodal freight networks and connections to the rest of the world, and its ability to facilitate the movement of people and goods across and within its boundaries. There are several modes of transportation that are utilized for this purpose and are important components of this Plan. Increased competition in today's global economy often rewards those regions that actively plan for and pursue seamless transportation systems which depend on efficient connections between all modes of travel, including modes designed specifically for freight movements.

The focus of this chapter is to explore freight and multimodal transportation which often overlap. *Multimodal* can have several meanings with regard to transportation; it can mean specific containers designed to be transferred from one mode to another, such as truck to rail; it can mean freight or passenger trips that utilize more than one mode of transportation. The movement of freight frequently involves a number of 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.

Freight transportation planning is critical in that the amount of freight transported continues to grow, thus placing substantial demands on the transportation system. Due to increasing truck traffic, highways and county roads are showing increased deterioration and requiring repair and replacement sooner than anticipated. Rail lines may not be able to handle the size and weight of today's cargo and may be near capacity in areas. Pipelines are vital for the movement of oil and natural gas, and air cargo remains the quickest way to move a product across the country or world.

The significance of planning for multimodal networks and the importance of freight transportation has been emphasized by past federal transportation bills and continues with the FAST Act. Three of the FAST Act's planning factors targeted towards the multimodal system and freight are:

- 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.

The overall goal of the multimodal network, and planning for such, is to ensure the efficient and safe transport of persons and goods using the mode which is most beneficial given individual circumstances. To meet this goal, the connectivity and accessibility from all available modes is a critical factor in planning for the future transportation network of the region.

Region Stats

230
Transportation and warehousing businesses[1]

12
Miles of active rail lines[2]

69
Road-rail incidents over the past 20 years[3]

585
Miles of active pipeline[4]

[1]U.S. Census Bureau, 2017 American Community Survey 5-year Estimates

[2]Iowa DOT, REST Services, Active Rail Lines, 2018

[3]Federal Railroad Administration, Accident Data as reported by Railroads

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

While freight planning is an important part of the transportation planning process, it should be noted that it differs significantly from planning for other modes of transportation. The main reasons for this are that most freight transportation operations fall under the purview of the private sector, and, in the case of rail and pipeline, the infrastructure is owned by private companies. This results in less publicly available data for freight movements and more challenges in bringing all freight stakeholders to the discussion table. For example, some companies may be hesitant to discuss specific freight issues due to the sensitivity of freight information.

Though multimodal and freight planning can be a challenging endeavor, it is important for the region. The movement of goods and people are vital to the region's economy. If energy prices were to rise, it would become even more important to maintain quality infrastructure for all modes of transportation, and ensure that freight can be transported by the most efficient mode given the type of freight and its origin and destination.

State Freight Plans

Planning for freight has become an emphasis area for the Iowa DOT. A Freight Advisory Council was established to assist the Iowa DOT in understanding the complexities associated with freight movements in hopes to more effectively guide public investment in transportation infrastructure. The mission of the Freight Advisory Council is "*to guide the Iowa DOT in fostering a safe, efficient, and convenient multimodal freight transportation system to enhance the competitiveness of Iowa's business and industry.*" The Freight Advisory Council consists of stakeholders from a range of industries and groups associated with freight transportation. The Council has been involved in the development of several planning documents and projects including the Iowa State Freight Plan, Iowa State Rail Plan, Iowa in Motion 2045 State Transportation Plan, and the Iowa Statewide Freight Transportation Network Optimization Strategy.

Iowa State Freight Plan

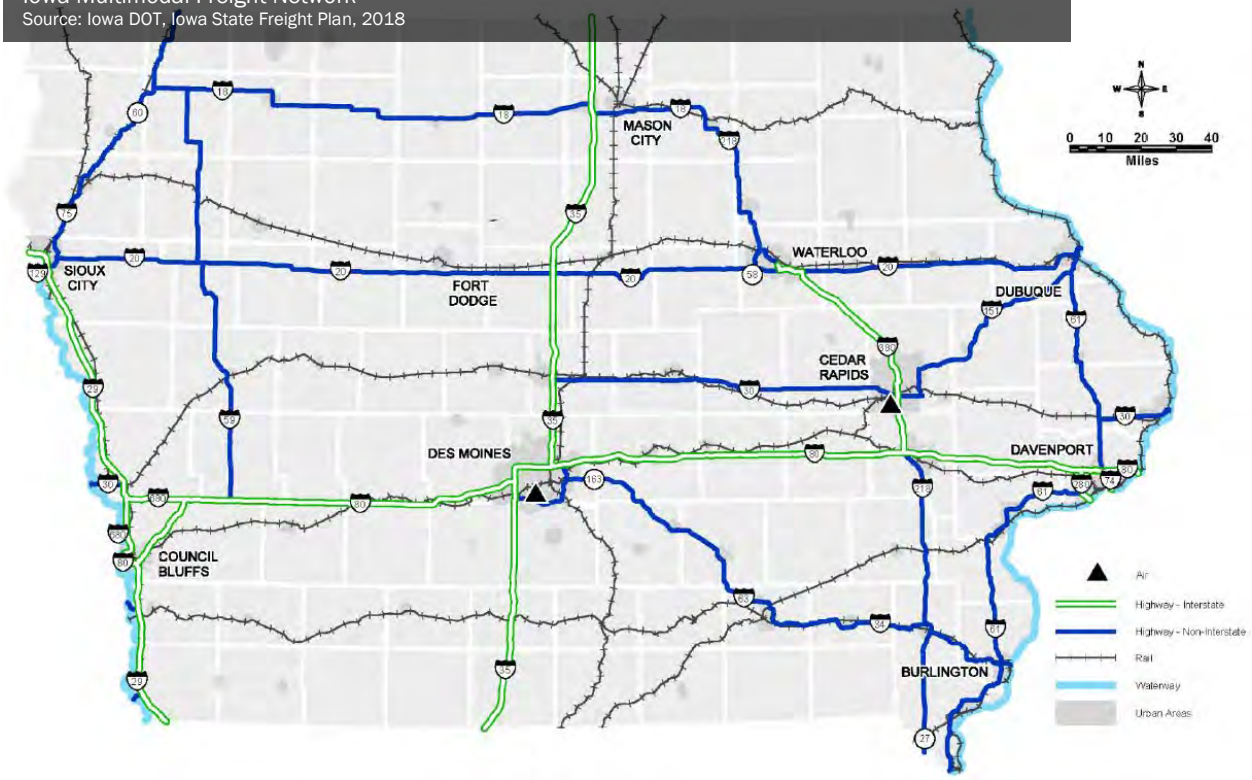
The Iowa DOT has developed a multimodal freight plan to address all modes of the freight transportation system and to incorporate freight considerations into the statewide transportation planning and programming process. The State Freight Plan serves as a platform for safe, efficient, and convenient freight transportation in the state. In recent years, the Iowa DOT has embarked on numerous freight planning activities to help achieve this objective. The State Freight Plan is a way to connect all of these initiatives and allow them to move forward toward a common goal of optimal freight transportation in the state. In addition, the Plan guides Iowa DOT's investment decisions to maintain and improve the freight transportation system. This plan also:

- Aligns with the state transportation plan: Iowa in Motion 2045.
- Meets the requirements of the FAST Act.
- Supports national freight goals.

Each of Iowa's freight-related initiatives plays a role in a collaborative planning and programming process. The tools and studies are utilized to develop system and modal plans, such as the State Freight Plan, which are consistent with the state transportation plan. Projects are then identified, studied, and programmed based on the findings and recommendations provided from each of these initiatives.

As part of the State Freight Plan development process, the Iowa DOT identified and established a new Multimodal Freight Network in the state. This network will be the target of several freight strategies and improvements for the Iowa DOT which are identified in the State Freight Plan.

Iowa Multimodal Freight Network
Source: Iowa DOT, Iowa State Freight Plan, 2018



In order to identify and prioritize candidates for freight improvements, the Iowa DOT has utilized a Value, Condition, and Performance (VCAP) matrix. This approach takes advantage of multiple tools available to the Iowa DOT including a Freight Mobility Issues Survey, Iowa Travel Analysis Model (iTRAM), Infrastructure Condition Evaluation (ICE), INRIX bottleneck ranking tool, and Iowa's annual traffic counts.

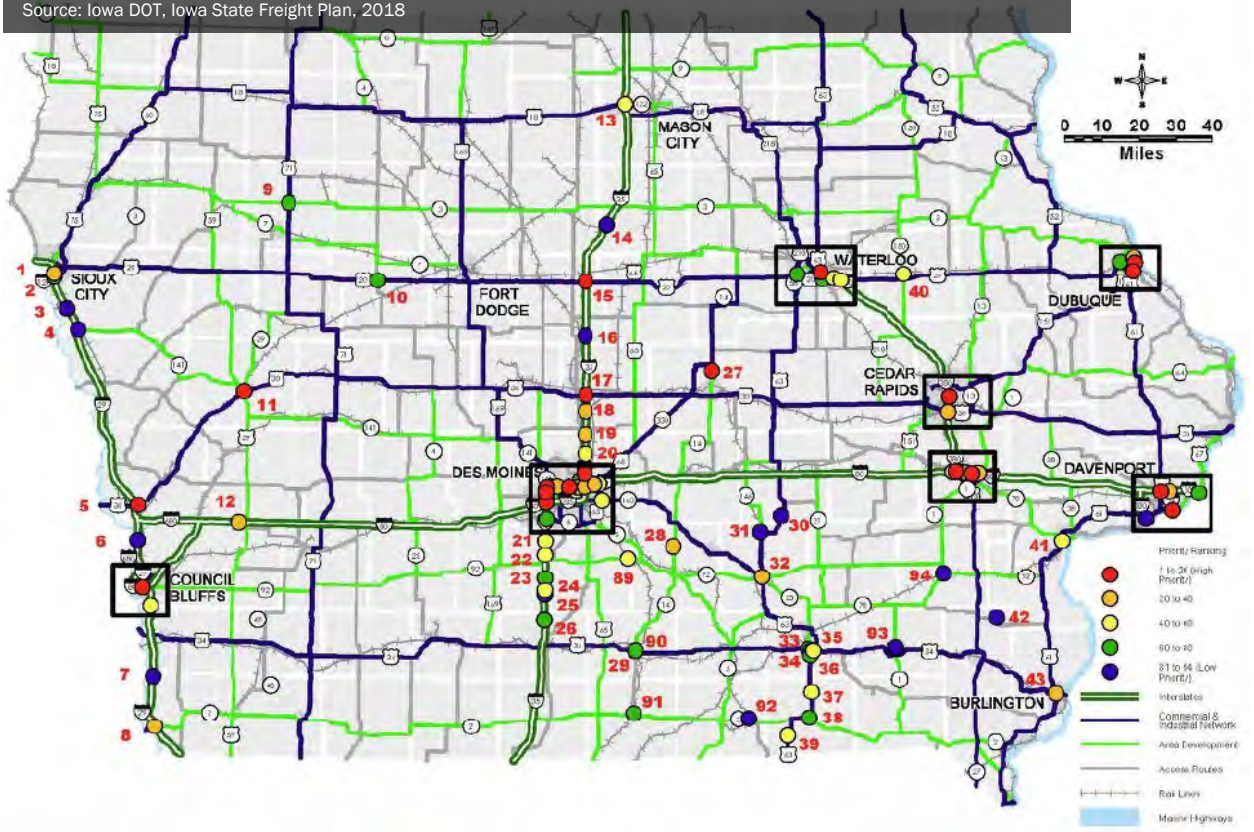
The Iowa DOT initially developed a draft list of highway locations with freight mobility issues. This was completed by analyzing INRIX traffic data to identify bottleneck locations in the state and the number of times each occurs throughout the year. This data was retrieved for 2014 and overlaid with the Iowa DOT's truck traffic count data. This draft list of bottleneck locations was sent to the Freight Advisory Council, Iowa DOT districts, metropolitan planning organizations, and regional planning affiliations for input.

The statewide travel demand model (iTRAM) was used to assess the value of each candidate location to the overall freight transportation network. ICE was used to evaluate the current condition of each location, and the INRIX bottleneck ranking tool was used to determine the performance of each candidate location.

After each candidate location was assigned a Value, Condition, and Performance rating, each was ranked using those values for each of the three categories. The average of these three rankings was calculated and the candidate locations were assigned an overall priority rank. IA Hwy 150 through Independence was identified as a highway freight priority location.

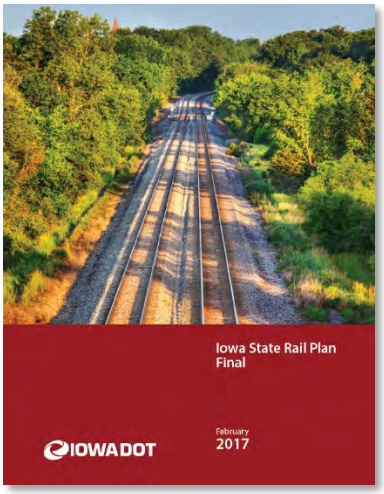
www.iowadot.gov/iowainmotion/Specialized-System-plans/State-Freight-Plan

Highway freight priority locations
Source: Iowa DOT, Iowa State Freight Plan, 2018



Iowa State Rail Plan

This document is intended to guide the Iowa DOT in its activities of promoting access to rail transportation, helping to improve the freight railroad transportation system, expanding passenger rail service, and promoting improved safety both on the rail system and where the rail system interacts with people and other transportation modes. The State Rail Plan describes the state's existing rail network and rail-related economic and socioeconomic impacts. The Plan also describes the State Rail Plan process, Iowa's rail vision and supporting goals, proposed short- and long-range capital improvements, studies, and recommended next steps to address the issues identified.



During stakeholder input, various themes arose 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
- Role of public agencies regarding rail

Based on suggestions throughout 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 were 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

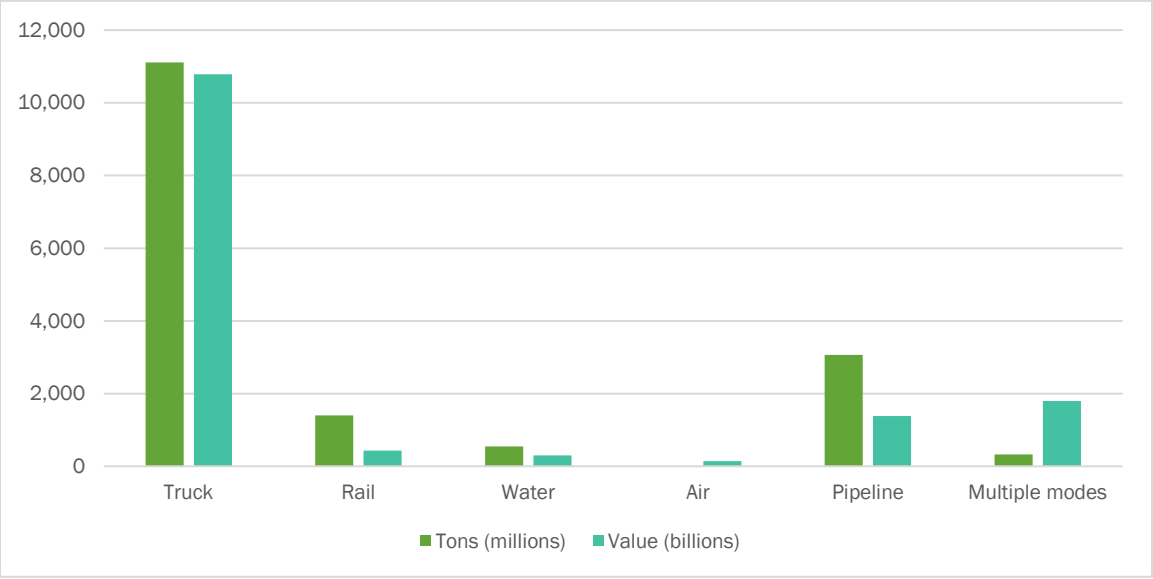
www.iowadot.gov/iowainmotion/modal-plans/rail-transportation-plan

Freight at the National Level

Freight will be discussed by weight and value. The measures vary considerably by mode. For transportation purposes, weight is often a primary consideration, as it has a direct effect on the condition of the system. Value is an important measure for economic purposes and to understand what goods and industries are having the most effect on local economies.

According to the U.S. DOT's *Freight Facts and Figures*, the national transportation system moved a daily average of 51 million tons of freight valued at more than $51.8 billion in 2018. Tonnage is projected to increase at about 1.2 percent per year between 2018 and 2045. The value of freight moved is forecasted to increase faster than the weight, rising from $1,016 per ton in 2018 to $1,455 per ton in 2045, when controlling for inflation. This increase is due to high-value, low-weight commodities growing at a faster rate than low-value, high-weight commodities. Exports at $1,599 per ton and imports at $2,185 per ton were higher than domestic shipments of $901 per ton in 2018. An important note for local planning is that 36 percent of the value and 50 percent of the weight of goods were transported less than 100 miles from their origin to their destination. Trucks carry 82 percent of the freight tonnage that travels less than 100 miles.

Figure 6.1: Weight and Value of Shipments by Mode, 2018



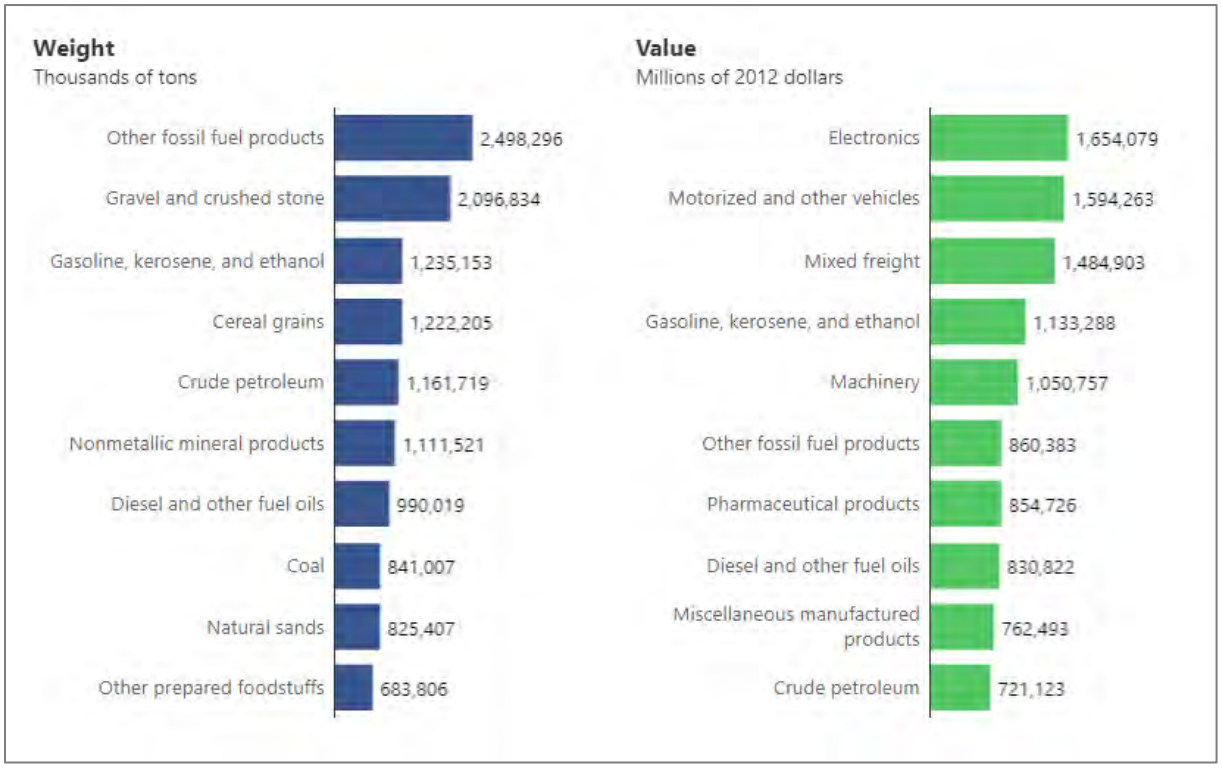
Source: U.S. DOT, Bureau of Transportation Statistics and FHWA, Freight Analysis

Figure 6.2: Total Freight Moved by Distance, 2018

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

The top ten commodities by weight accounted for 68.0 percent of total tonnage, but only 26.2 percent of the value of goods moved in 2018. In contrast, the top ten commodities by value accounted for 36.2 percent of total tonnage, but 57.9 percent of total value of goods moved. The leading commodities by weight are bulk goods, including natural gas, coke, and asphalt; gravel; gasoline, kerosene, and ethanol; cereal grains; and crude petroleum. The leading commodities by value are high value-per-ton goods, such as electronics; motorized and other vehicles; mixed freight (principally food); gasoline, kerosene, and ethanol; and machinery.

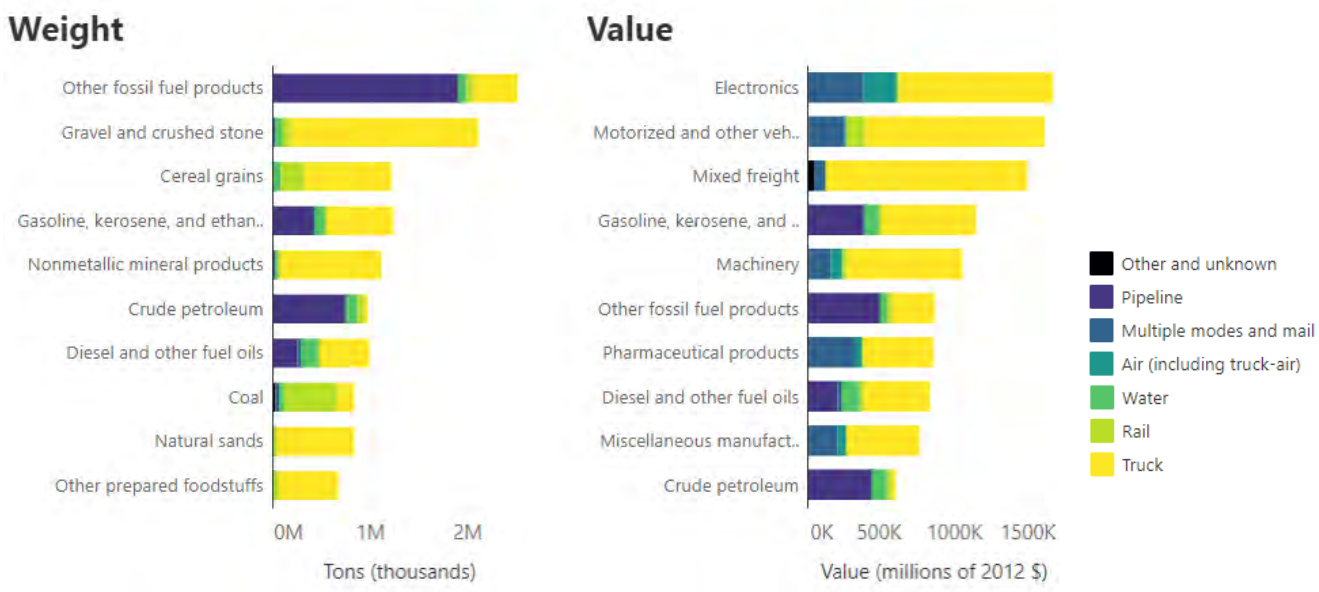
Figure 6.3: Top Commodities by Weight and Value, 2018



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

Trucks are involved in the supply chain of all top ten commodities by tonnage 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 moves high-value items such as electronics and pharmaceuticals. However, trucks moved more high-value, time-sensitive commodities than any other mode in 2018.

Figure 6.4: Top Commodities Moved by Mode, 2018

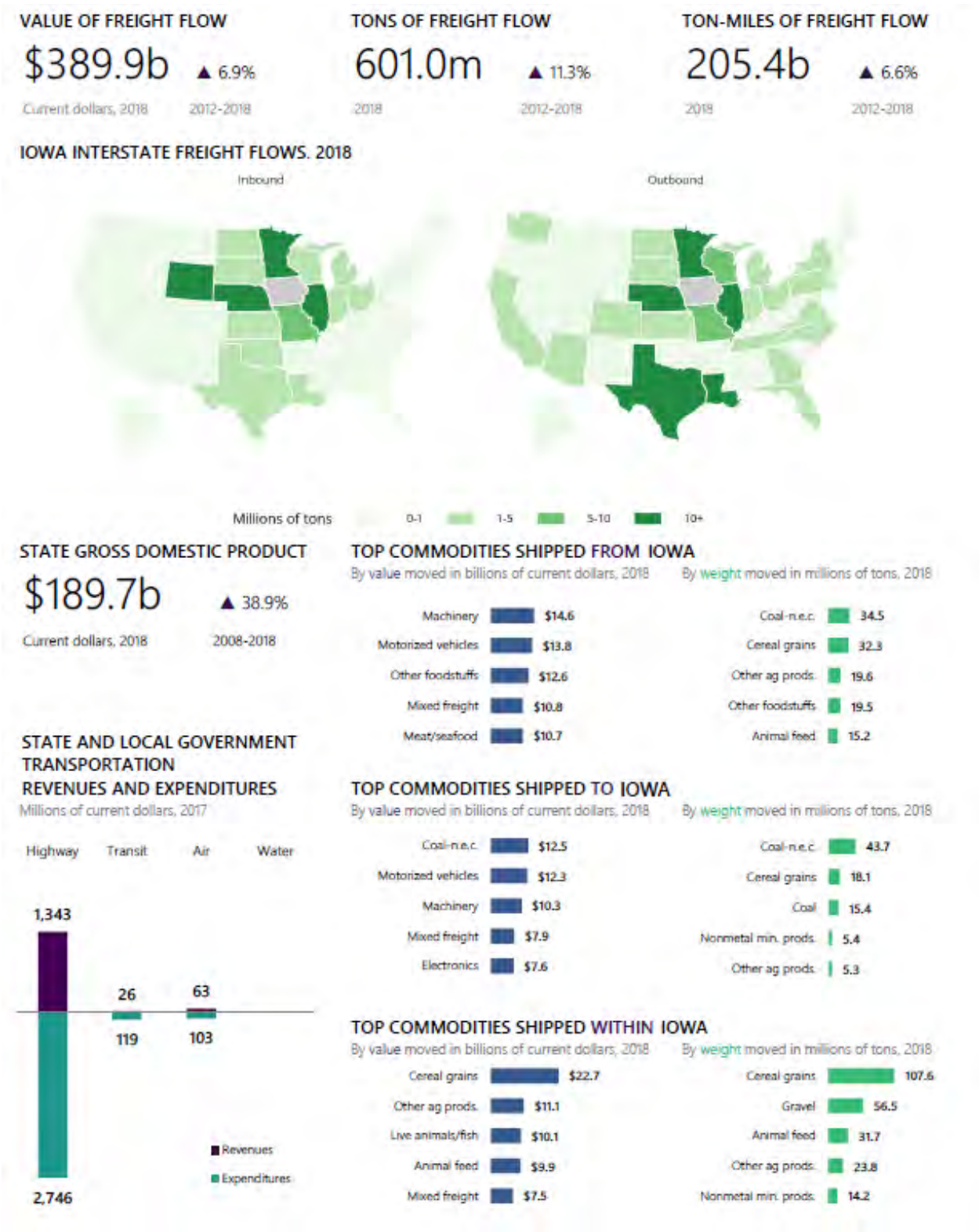


Source: U.S. DOT, Bureau of Transportation Statistics and FHWA, Freight Facts and Figures

Freight in Iowa

Iowa has a large and diverse economy that demands the efficient transportation of freight. In addition to the exports Iowa creates and goods the state imports, Iowa's position in the middle of the United States makes it a crossroads for freight movement. According to the *U.S. DOT Freight Facts and Figures*, the demand for freight transportation is driven primarily by the geographic distribution of population and economic activity. Both population and economic activity have grown faster in the South and West than in the Northeast and Midwest. Iowa's transportation system plays an important role in moving freight to the coasts. The state's transportation system is also important for the significant amount of freight that originates outside of Iowa and moves through the state to outside destinations.

According to the U.S. DOT Bureau of Transportation Statistics *Iowa Transportation by the Numbers*, Iowa has 114,745 miles of public road, 24,123 bridges, 3,834 miles of freight railroad, 490 miles of waterway, and 7 major airports. In 2018, there were 46,400 transportation industry jobs which was up 6.5 percent from 2008. The following pages provide additional freight figures from *Iowa Transportation by the Numbers.*



Source: U.S. DOT, Bureau of Transportation Statistics, Iowa Transportation by the Numbers

RAIL FATALITIES

8 ▲ 14.3%

2018 2008-2018

TRANSIT FATALITIES

0 –

2018 2008-2018

RECREATIONAL BOAT FATALITIES

8 ▲

2018 2008-2018

HIGHWAY FATALITIES

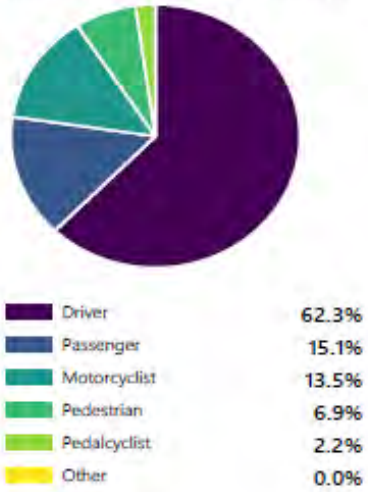
318 ▼ -22.8%

2018 2008-2018

HIGHWAY FATALITY RATE

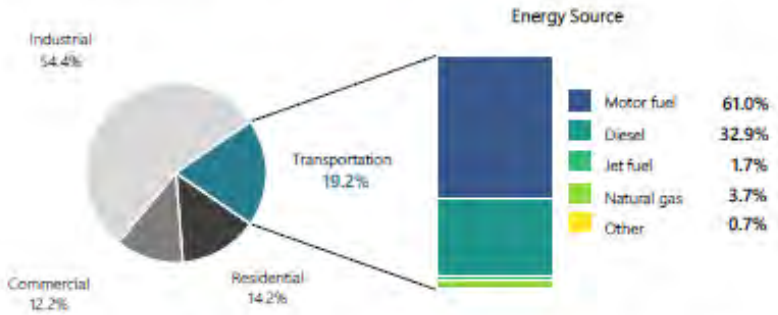
Fatalities per 100 million vehicle miles traveled, 2018

HIGHWAY FATALITIES BY PERSON



ENERGY USE BY SECTOR

Percent of Btu consumed, 2017



TRANSPORTATION ENERGY USE

Trillion Btu consumed, 2007-2017

TRANSPORTATION EMISSIONS

Million metric tons of CO_2, 2007-2017

TRANSPORTATION ENERGY USE PER CAPITA

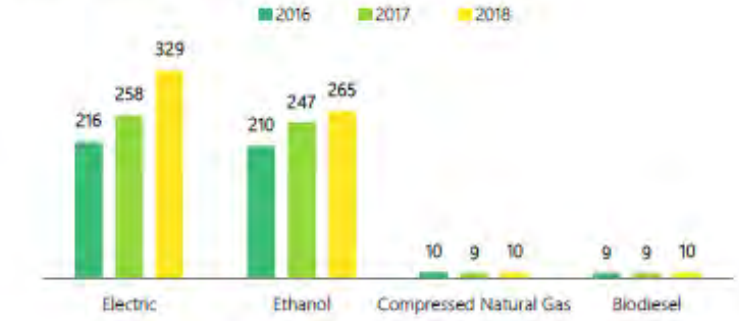
Million Btu per capita, 2017

HIGHWAY MOTOR FUEL USE PER CAPITA

Gallons per capita, 2018

ALTERNATIVE FUEL STATIONS

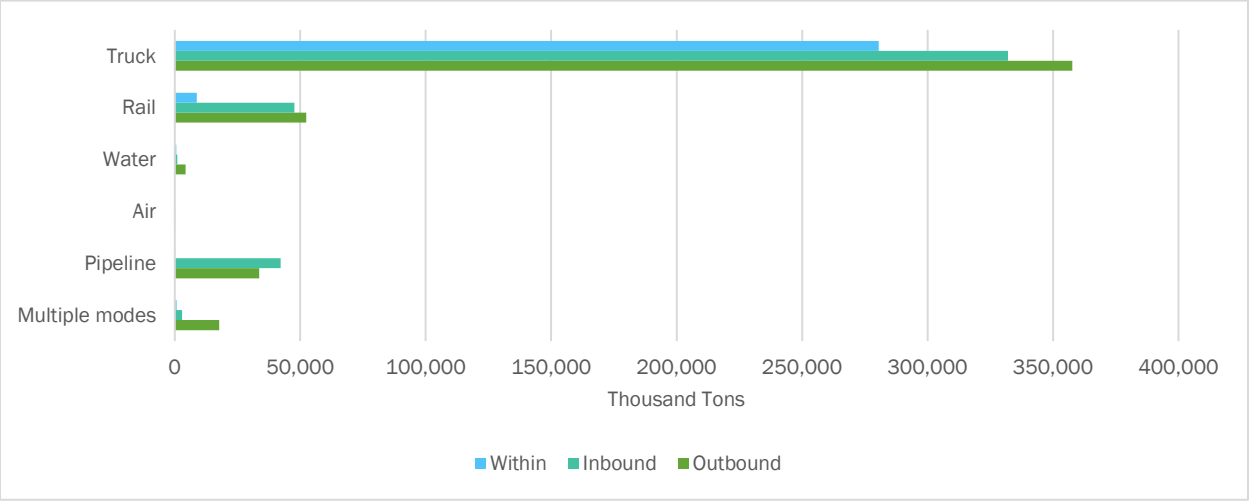
Number of stations, 2016-2018



Source: U.S. DOT, Bureau of Transportation Statistics, Iowa Transportation by the Numbers

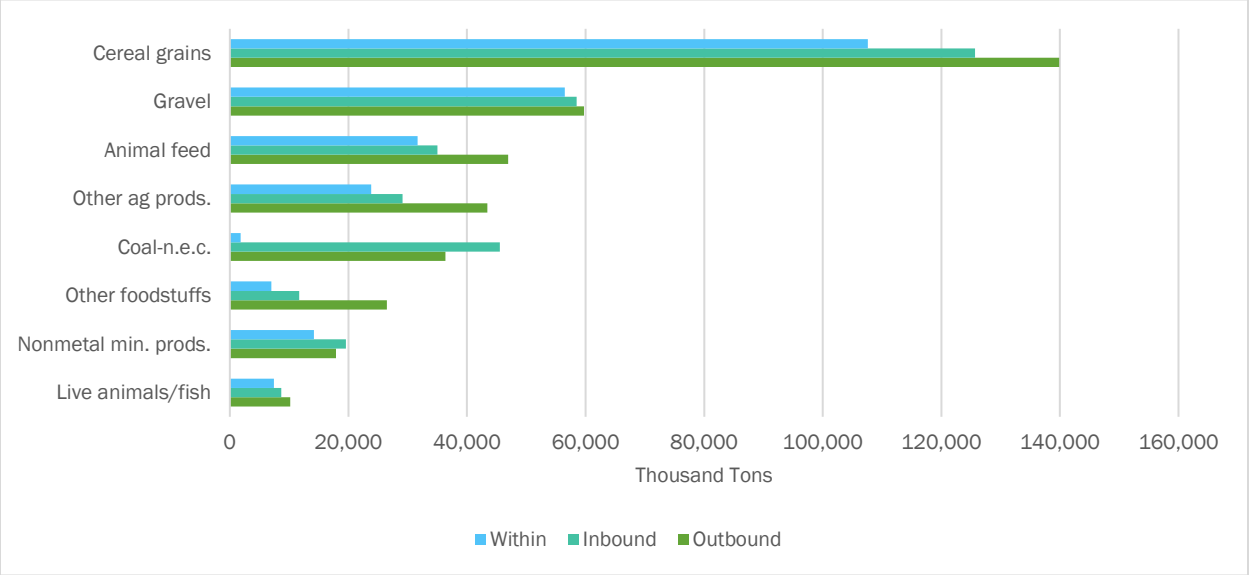
Figure 6.5 shows the weight of goods shipped within, inbound, and outbound Iowa in 2018. Similar to national figures, the majority of freight by tonnage is shipped to, from, and within Iowa by truck. Figure 6.6 shows the top commodities shipped within, inbound, and outbound Iowa by weight. The role of agriculture in Iowa is clearly visible with cereal grains, animal feed, and other agricultural products in the top commodities shipped outbound by weight.

Figure 6.5: Weight of Shipments by Mode, 2018



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

Figure 6.6: Top Commodities by Weight, 2018



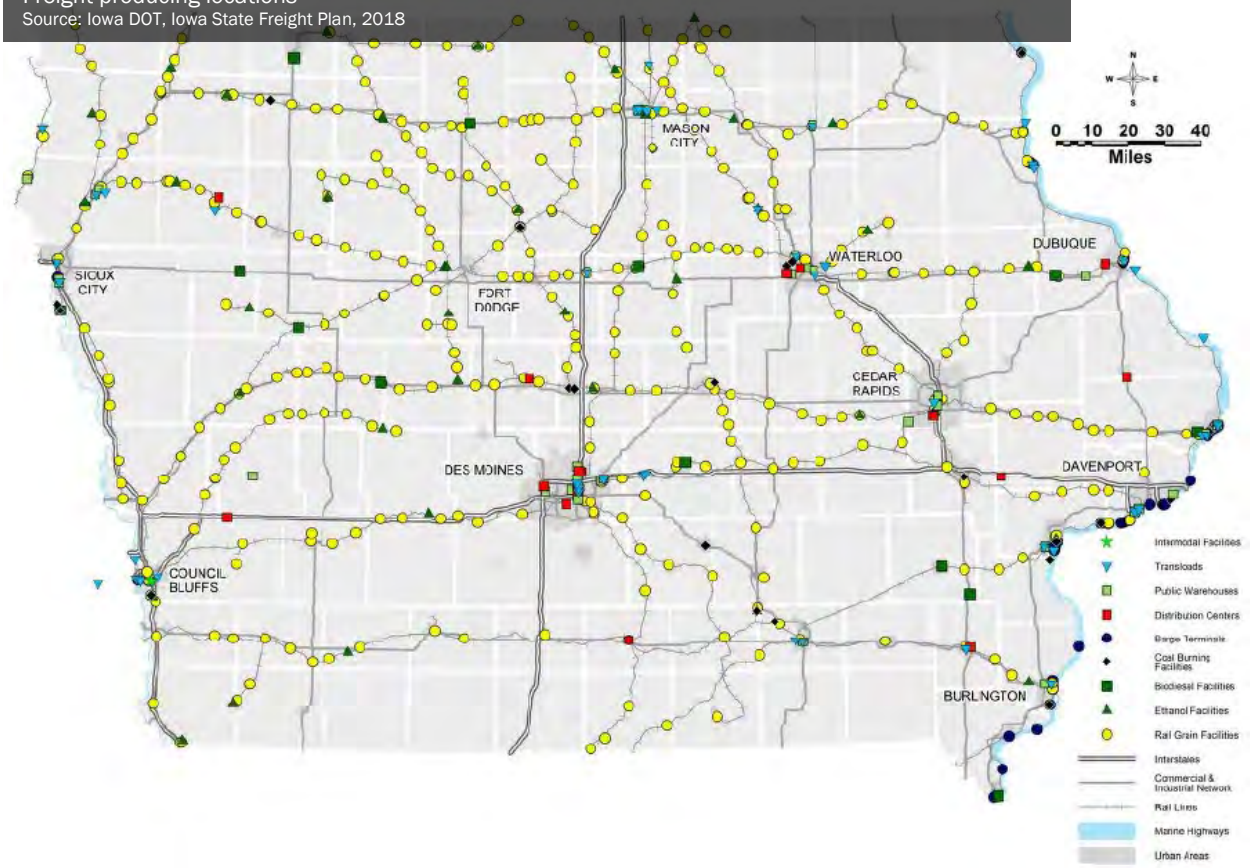
Source: U.S. DOT, Bureau of Transportation Statistics, Freight Analysis Framework

For exports from Iowa, the top five domestic trading partners by weight in 2018 were Illinois, Minnesota, Nebraska, Louisiana, and Texas. The top five trading partners for imports to Iowa were Minnesota, Nebraska, Wyoming, Illinois, and Missouri.

Iowa's freight system includes a number of facilities that enable the smooth transfer of goods from one mode to another. These facilities allow shippers to take advantage of the cost, speed, and capabilities of more than one mode. Intermodal transfer facilities are critical to provide the most efficient goods movements for various commodities. Types of transfer facilities include the following:

- Intermodal transfer facility – Transfer of freight using an intermodal container or trailer through multiple modes of transportation without the handling of the freight itself when changing modes.
- Transload facility – Transfer of freight shipments, typically bulk, from the vehicle/container of one mode to that of another at a terminal interchange point.

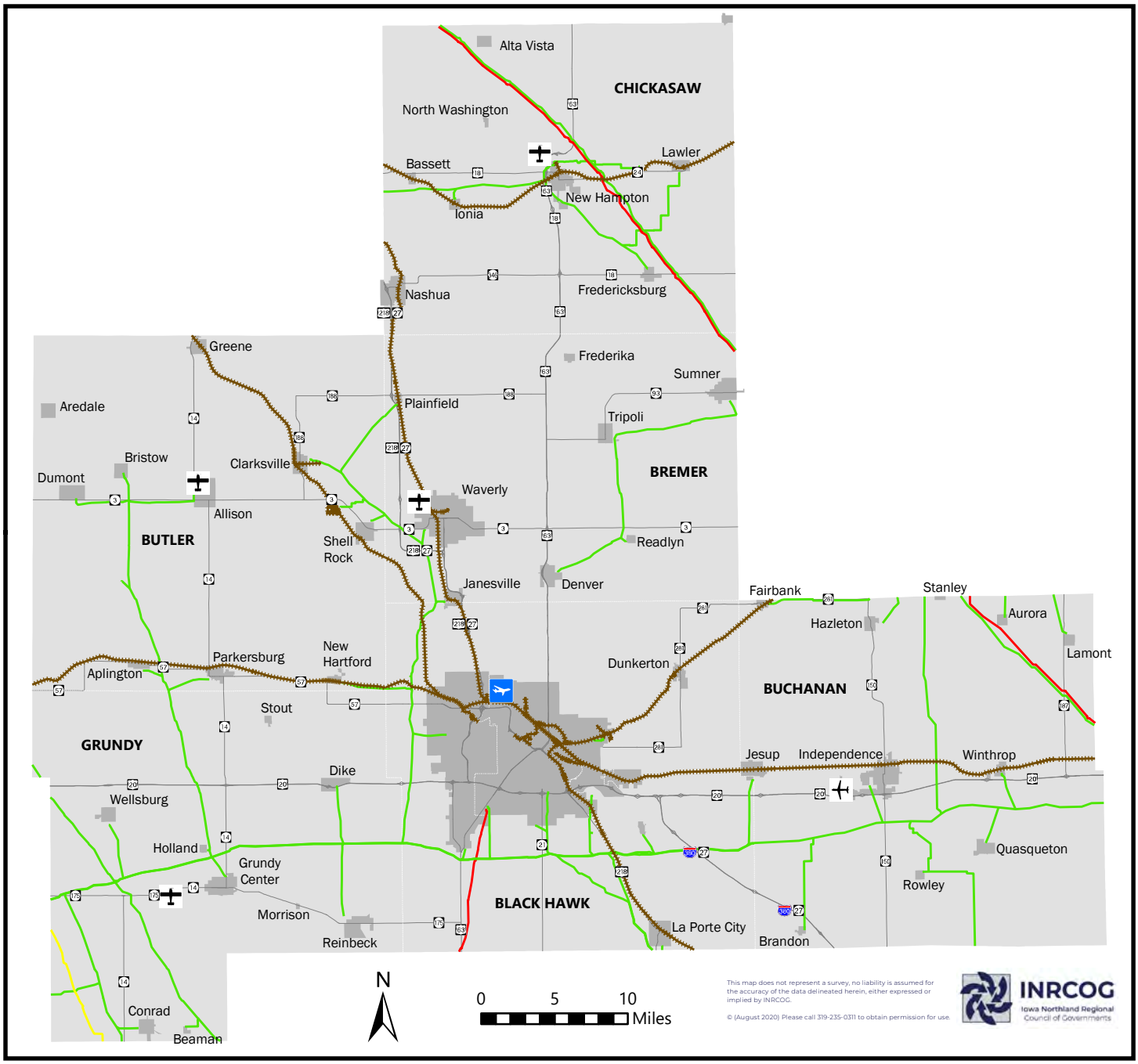
Freight producing locations
Source: Iowa DOT, Iowa State Freight Plan, 2018



Freight in the Region

The Iowa Northland Region 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 region. Map 6.1 shows the multimodal freight elements of the region.

The region is home to many manufacturing companies and industries that facilitate or rely on freight movements. As shown in the map above, there are multiple transload facilities, public warehouses, ethanol facilities, and rail grain facilities scattered around the region. There are also a variety of transportation-related companies and motor carriers homebased in the region. Figures 6.7 and 6.8 show the number of transportation and warehousing employees by county, and transportation and warehousing establishments by number of employees. According to the U.S. Census Bureau's *2017 County Business Patterns*, the region has 240 transportation and warehousing establishments with a total annual payroll of $143 million.



Map 6.1

Multimodal Freight Elements

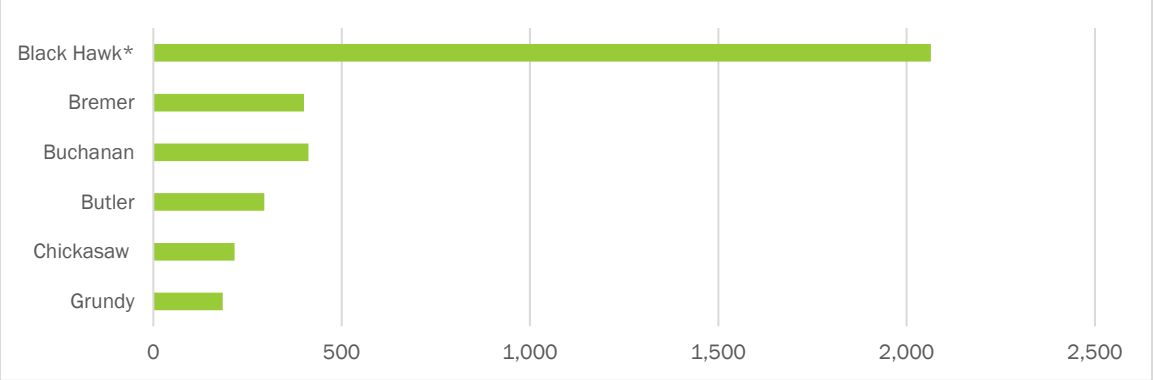
Airports

- Commercial Service Airport
- Enhanced Service Airport
- Local Service Airport
- Rail Line
- City Boundary

Pipelines

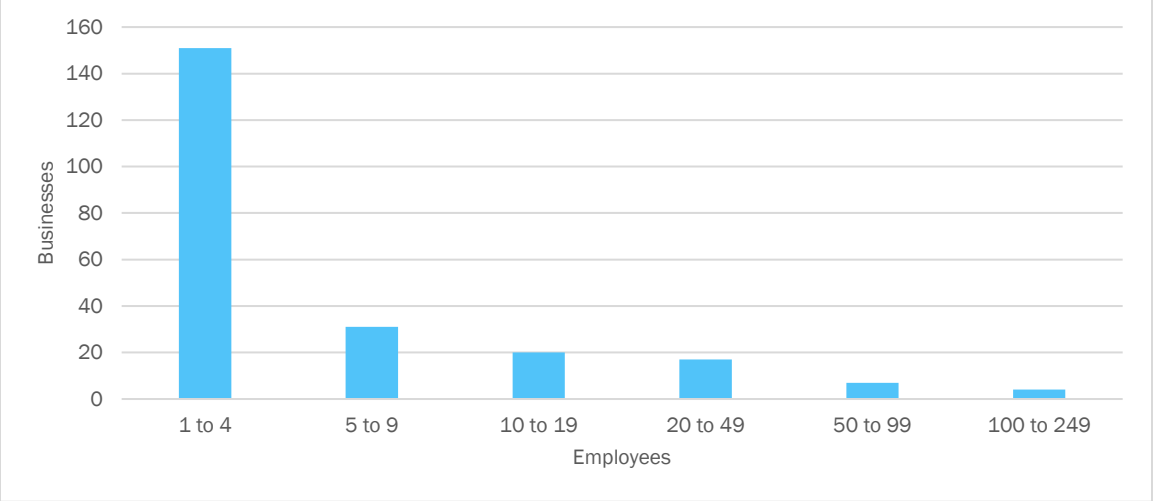
- Ammonia Pipelines
- Gas Transmission Pipelines
- Hazardous Liquid Pipelines

Figure 6.7: Number of Transportation and Warehousing Employees, by County



Source: U.S. Census Bureau, 2017 American Community Survey 5-year Estimates
*Includes jobs within the MPO boundary

Figure 6.8: Number of Transportation and Warehousing Businesses, by Number of Employees*



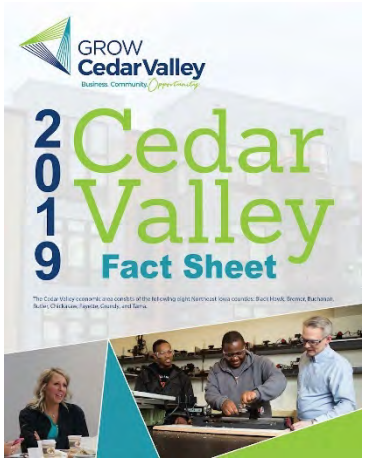
Source: U.S. Census Bureau, 2017 County Business Patterns
*Includes businesses within the MPO boundary

In addition to industries that provide or support transportation, there are 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. Table 6.1 lists the top 25 major employers in the region. Many of these employers are manufacturing and foods industries that rely heavily on freight shipments.

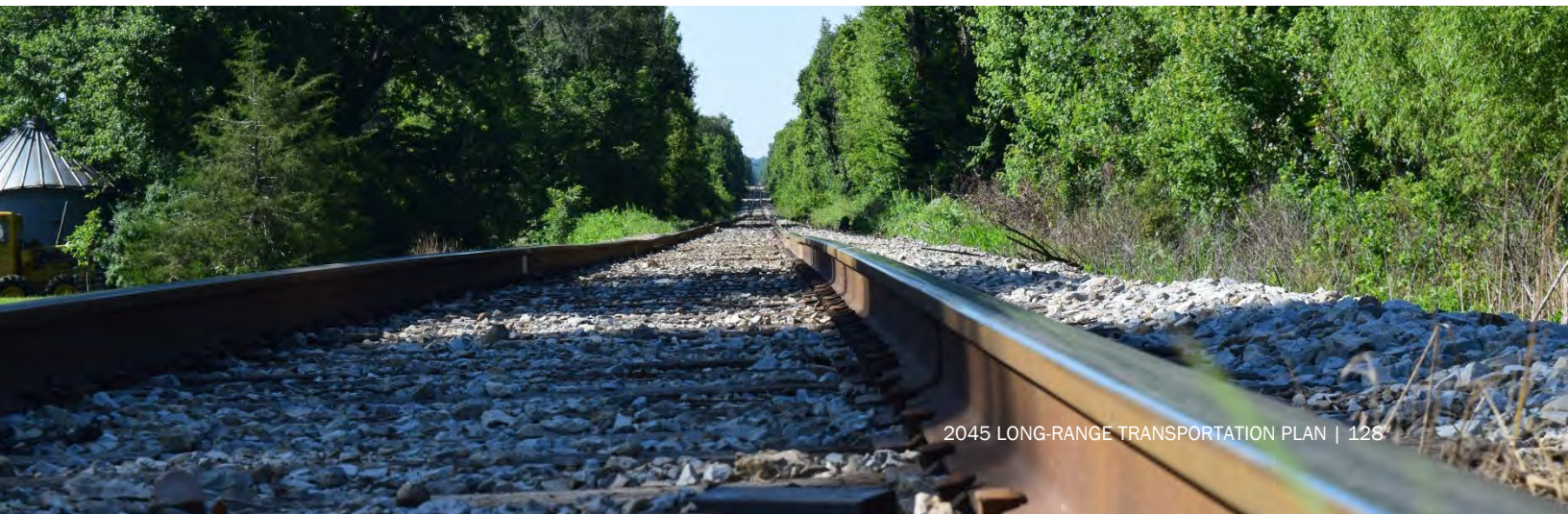
Table 6.1: Major Employers in the Iowa Northland Region

Company	Industry	Approximate Employees
John Deere Waterloo Operations	Manufacturing	5,000
Tyson Fresh Meats	Food Processing	2,980
MercyOne	Health Care	2,669
University of Northern Iowa	Education	1,811
Waterloo Community Schools	Education	1,715
UnityPoint Health	Health Care	1,499
Hy-Vee Foods Store (4)	Grocery	1,325
Western Home Communities	Health Care/Housing	1,052
CBE Companies, Inc.	Financial	982
VGM Group	Diversified	950
Cedar Falls Community Schools	Education	849
Omega Cabinets, Ltd.	Manufacturing	812
Omega Cabinet Manufacturing (2)	Manufacturing	750
Martin Brothers Distributing	Distribution	710
Hawkeye Community College	Education	700
Central Rivers AEA	Education	615
Wartburg College	Education	559
CUNA Mutual Group	Finance/Insurance	541
City of Waterloo	Government	530
Veridian Credit Union	Financial	513
Viking Pump	Manufacturing	491
Black Hawk County	Government	481
Waverly-Shell Rock Schools	Education	479
The Isle Casino and Hotel	Entertainment	456
Waverly Health Center	Health Care	450

Source: Grow Cedar Valley, 2019 Cedar Valley Fact Sheet

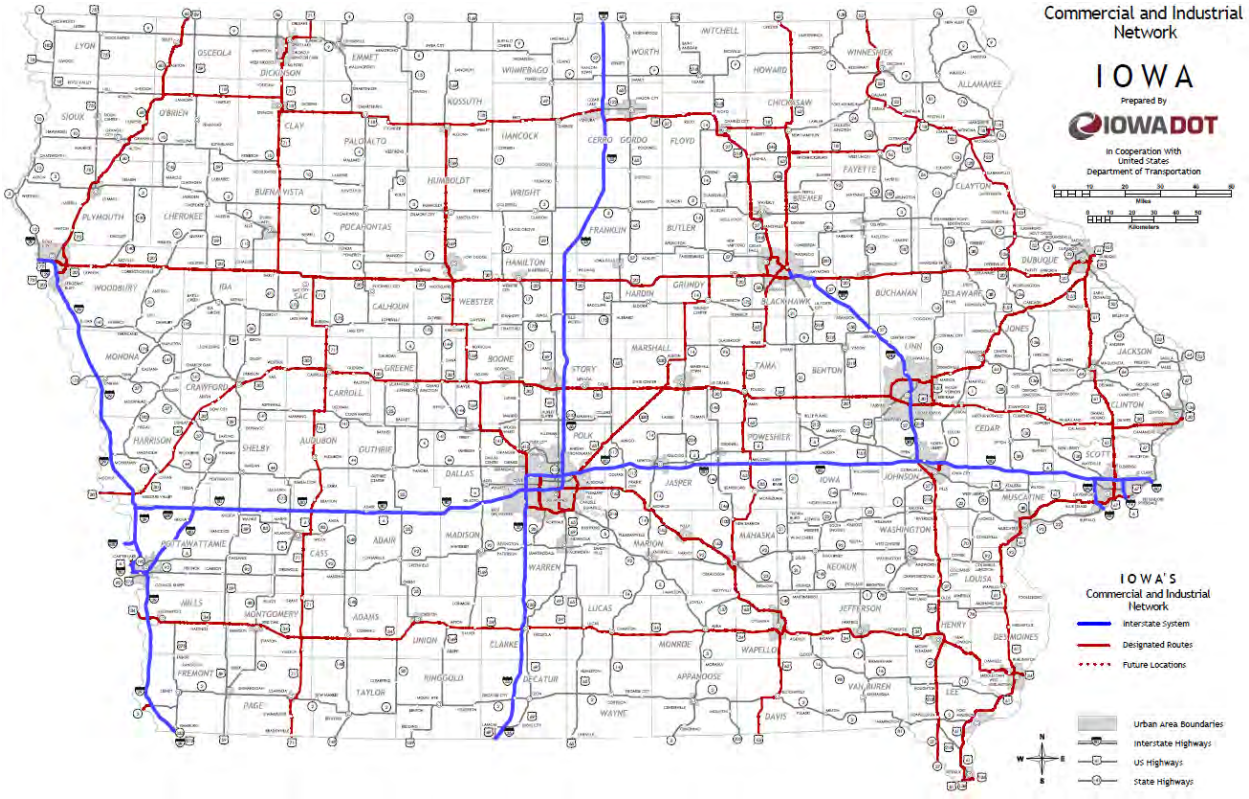


A wide variety of freight is moved throughout the region every day, much of which arrives without incident. However, accidents involving freight do occur and must be planned for accordingly. Of particular concern is the transport of hazardous materials. Each county in the region has an Emergency Management 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 manmade 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. There are two hazardous materials teams that cover the region. 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; Buchanan County is covered by the Linn County Hazmat Team.



Truck Transportation

The region has a high-quality network of highways and streets for the transportation of goods entering, leaving, or traveling through the region. Commodity movement by truck in Iowa is heavily concentrated on the Interstate Highway System and Commercial and Industrial Network, and the region is served by segments of both. These highways travel far beyond the local area and provide state and national connectivity.



Transportation by truck is the primary modal choice for shippers in Iowa and the Iowa Northland Region. This is in part due to the relatively low cost of shipping coupled with the flexibility provided by truck transport. It is essential that the availability and transport of goods be efficient and able to respond in a short time to meet just-in-time manufacturing needs. The region is fortunate to have a high-quality highway and street network to meet this need.

Highway Network

The Iowa Northland Region has a substantial inventory of principal and major arterials that connect the region to the rest of the Midwest and nation. Table 6.2 provides traffic figures for highways on the Commercial and Industrial Network. Over the years, traffic and truck traffic has increased on many of these routes. As shown, the highways that serve as through routes – Interstate 380, U.S. 20, and U.S. 218 – have a significant percentage of truck traffic.

Table 6.2: Traffic Comparison for Highways, 2006 vs. 2016

Location	AADT 2006	AADT 2016	+/-	Percent Trucks 2006	Percent Trucks 2016	+/-
I-380 at D48 interchange (Buchanan)	14,700	17,500	2,800	24.2	19.7	-4.5
I-380 at east junction U.S. 20 interchange (Black Hawk)	14,100	16,700	2,600	24.5	19.5	-5.0
U.S. 20 at IA 14 interchange (Grundy)	7,700	9,400	1,700	23.3	22.0	-1.3
U.S. 20 at T55 interchange (Grundy)	10,900	12,800	1,900	18.0	20.5	2.5
U.S. 20 at V51 interchange (Black Hawk)	12,100	13,300	1,200	13.5	13.5	0.0
U.S. 20 at IA 150 interchange (Buchanan)	8,800	10,900	2,100	17.1	18.0	0.9
U.S. 218 at C57 interchange (Black Hawk)	17,000	20,800	3,800	11.6	11.5	-0.1
U.S. 218 at IA 116 interchange (Waverly)	17,200	21,500	4,300	11.7	11.1	-0.6
U.S. 218 at IA 3 interchange (Bremer)	7,500	9,200	1,700	20.9	21.3	0.4
U.S. 218 at IA 346 interchange (Chickasaw)	7,000	10,100	3,100	21.5	21.4	-0.1
U.S. 63 at junction of IA 175 (Black Hawk)	3,720	3,790	70	12.7	13.5	0.8
U.S. 63 at intersection of C57 (Black Hawk)	7,900	9,600	1,700	10.0	10.3	0.3
U.S. 63 at IA 3 interchange (Bremer)	6,100	7,300	1,200	11.6	13.4	1.8
U.S. 63 at U.S. 18 & IA 346 interchange (Chickasaw)	3,210	4,120	910	22.9	20.1	-2.8
IA 14 at intersection of D67 (Grundy)	3,980	4,450	470	9.7	16.9	7.2
IA 14 at east junction of IA 175 (Grundy)	6,400	6,400	0	6.0	6.2	0.2
IA 14 at US 20 interchange (Grundy)	3,910	4,220	310	10.5	11.1	0.6

Source: Iowa DOT Traffic Books

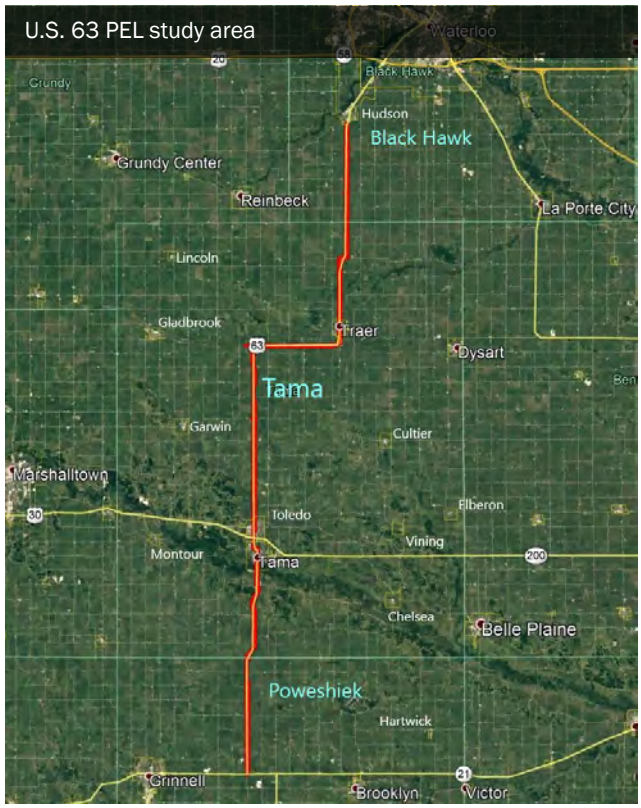
Truck Transportation Planning Issues

Planned initiatives that would impact truck transportation are addressed in Chapter 3. These projects focus primarily on the preservation of the major corridors in the region. Recent highway corridor projects have significantly improved the connectivity of the region to the rest of Iowa and the nation. One of those projects is the completion of the four-lane divided U.S. 20 across northern Iowa. Completed in 2018, the U.S. 20 corridor extends 302 miles to link Sioux City with Fort Dodge to Dubuque. With direct connections to Interstates 129, 29, 35, and 380, the corridor is being touted as an efficient route for people and commerce.

An ongoing initiative that will positively impact truck transportation in the region involves upgrading a portion of U.S. 218 in Black Hawk and Bremer Counties to a fully controlled-access highway. U.S. 218 was originally opened as a partial controlled-access facility from Cedar Falls to Waverly in 1995. This segment is designated as a part of the Avenue of the Saints which is a four-lane route linking St. Paul, Minnesota to St. Louis, Missouri. Completion of this stretch of U.S. 218 resulted in substantial traffic growth as well as significant safety and operational issues. In 2005, the Iowa DOT initiated a Corridor Study to identify potential safety improvements and options for access control. Three projects that were identified include the construction of interchanges at the intersections of U.S. 218 and C50 in Janesville, C57 north of Cedar Falls, and 260th Street north of Janesville. As part of the proposed and completed improvements, all at-grade intersections within the corridor will be permanently closed. Construction of the interchanges at C50 and C57 were completed in 2012 and 2016. Construction of the interchange at 260th Street is programmed in FY 2024.

One planning focus area that would specifically have an impact on truck transportation in the region involves IA Hwy 150 from U.S. 20 in Independence to IA Hwy 3 in Oelwein. This corridor has been of particular concern due to the significant growth in truck and automobile traffic over the past two decades. IA Hwy 150 serves as a north to south link to the Commercial and Industrial Network. The current roadway configuration and alignment through Independence acts as a bottleneck for truck traffic. In 2018, the RTA programmed $100,000 in STBG funds as matching monies for a corridor study. The project is currently programmed in FY 2022. The goal is to partner financially with the Iowa DOT to complete a corridor study of IA Hwy 150 through

Independence. RTA staff have been participating in IA Hwy 150 Coalition meetings held over the past two years and will continue to participate in meetings and discussions.



Another planning initiative is the Planning and Environmental Linkage (PEL) study for U.S. 63 from U.S. 6 in Poweshiek County to Hudson in Black Hawk County. A PEL study is an early planning level study model intended to identify transportation issues and environmental concerns before any project construction funding is identified. The study allows planning staff to consider a wide range of factors – environmental constraints, community concerns, and economic goals – to identify and prioritize future projects. Iowa DOT staff began the PEL study for this corridor in 2019 by evaluating existing pavement and bridge conditions, infrastructure design, crash history, and related projects. Public information meetings were held online in March and July, 2020.

Iowa continues to be a leader in the production of renewable energy, in particular biofuels and wind energy. According to Iowa Corn, Iowa leads the nation in ethanol production, creating nearly 30 percent of all U.S. ethanol. Iowa's ethanol industry can produce more than 4.1 billion gallons annually, using more than 1.3 billion bushels of corn. Ethanol plants have created new, more localized demand for corn, thus changing the transportation needs of the agriculture industry. For many plants, corn is frequently delivered by truck from farms or grain storage locations. Outbound shipments of ethanol and distiller grains are often transported by truck. In addition, large turbine components and machinery used to construct wind farms must also be transported along Iowa and county highways and bridges. According to the Iowa DOT, it takes up to 12 truckloads per wind turbine tower. Each turbine also requires cranes, concrete, gravel, and construction. The added heavy truck traffic accelerates the rate of deterioration on roads and bridges.

Another issue impacting the rural road system is the increasing size of farm equipment. The number of farms has decreased over the years with a simultaneous increase in the average farm size. With larger farms and continuously improving farming techniques, the need to increase production and efficiency has affected farm equipment carrying capacity. Particularly, larger and heavier agriculture equipment is being operated both off and on public roads, at times exceeding posted weight limits. Rural roads and bridges bear the brunt of heavy agricultural equipment loads which are rarely constructed to withstand these occasional but significant stresses. These expenses are often passed down to the county which may lack adequate revenues to continue full maintenance on all roads and bridges. As the region's bridges continue to age, the issue will be magnified.

While not all projects programmed in the region are focused on freight, all roadway projects on federally classified roads should be planned with freight considerations in mind. The design of roads is critical to freight movement, and issues such as inadequate shoulders, turning radii, or travel way width can be a hindrance to the efficient movement of freight.

Rail Transportation

Rail is typically second to trucks in terms of freight movement across the U.S., 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 Iowa DOT *2017 Iowa State Rail Plan*, Iowa ranks in the top 15 among states in total miles of rail, rail tons originated, rail carloads originated, rail tons carried, and rail carloads carried. There are several rail lines being operated in the region including:

- Canadian National rail line running east-west through Butler, Black Hawk, and Buchanan Counties, 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. 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 Butler, Bremer, and Black Hawk Counties, with haulage agreement with Union Pacific.
- Union Pacific rail line running from downtown Waterloo to 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 though Chickasaw County. Dakota, Minnesota and Eastern Railroad Company is the primary operator.

Rail carriers are classified based on their historical annual operating revenues (Table 6.3).

Table 6.3: Railroads Operating in the Region, by Class

Class	Annual Operating Revenue	Railroad Company in the Region	Miles Owned in Iowa	Percent of Total Iowa Rail Network
Class I	$250 million or more	Union Pacific Railroad (UP) Canadian National Railway (CN)	1,291 605	33.5 15.7
Class II "regional"	$20 - $250 million			
Class III "short line"	Less than $20 million	D&W Railroad (DWRD) Iowa Northern Railway Company (IANR)	22 117	0.6 3.0

Source: Iowa DOT, Iowa State Rail Plan, 2017

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

There are two major freight rail yards in the six-county region, both of which are located 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 I-380 and San Marnan Drive interchange in Waterloo. 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 Iowa rail network.

Transload facilities

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
Butler Logistics Park	Shell Rock								IANR
Kinder Morgan/Black Hawk Terminal	Waterloo	X		X			X	X	UP
New Hampton Transfer and Storage	New Hampton	X		X	X		X	X	CP
Standard Distribution Rail Facility	Cedar Falls	X		X	X		X	X	CN

Source: Iowa DOT, Iowa State Rail Plan, 2017

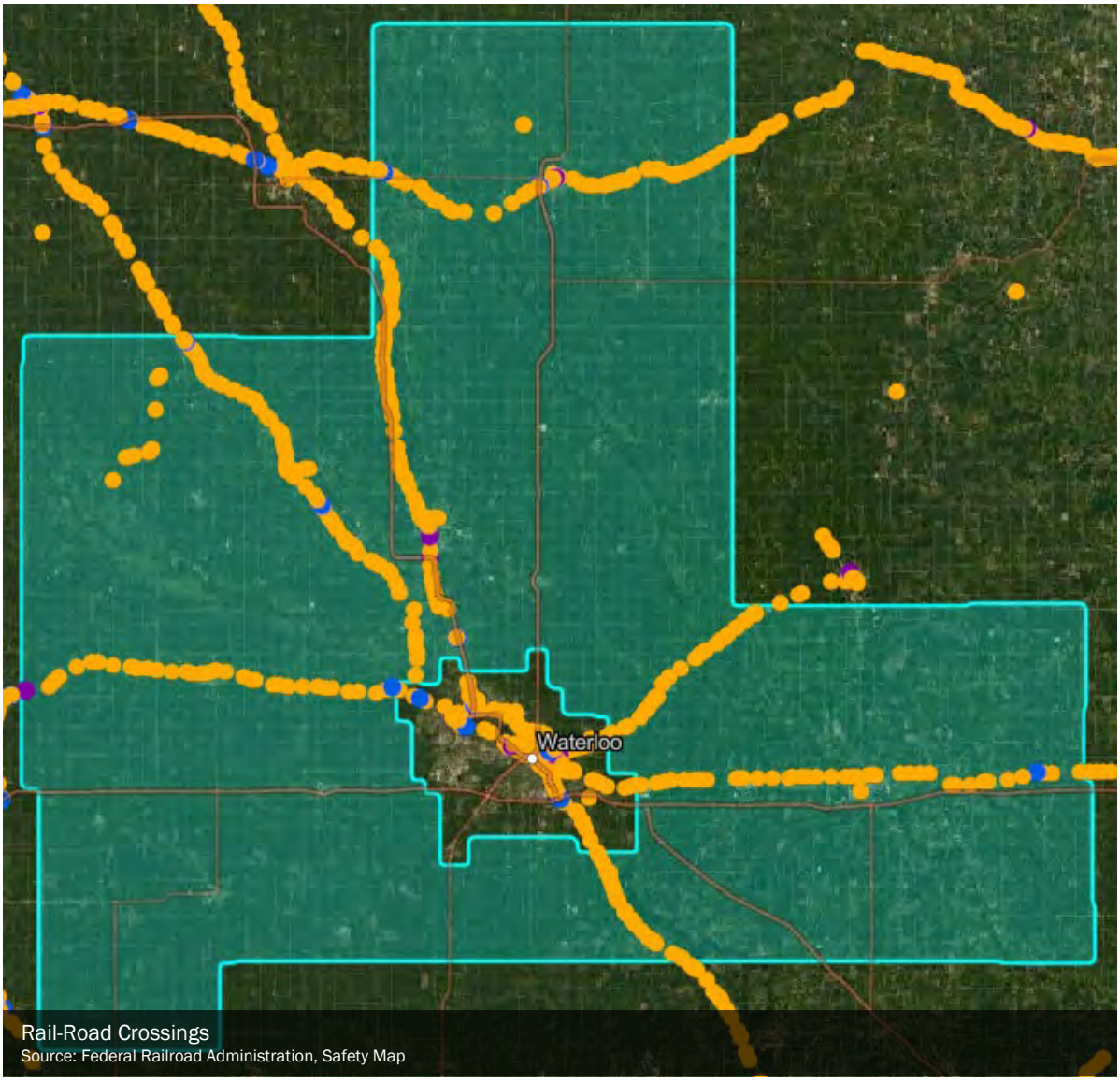
Passenger Rail

Currently there are no passenger rail services in the region. The only Amtrak routes that cross Iowa are the California Zephyr with stations in Burlington, Mt. Pleasant, Ottumwa, Osceola, and Creston; and the Southwest Chief with a station in Fort Madison. Planned intercity services include new passenger trains between Chicago and Iowa City, and between Chicago and Dubuque. The Iowa DOT is studying the extension of the Chicago-Iowa City service west to Des Moines and Council Bluffs/Omaha. Other routes that may be studied include the extension of a Chicago-Dubuque service west to Waterloo/Cedar Falls.

Existing and Potential Future Passenger Rail Routes in Iowa
Source: Iowa DOT, Iowa State Rail Plan, 2017

Rail Transportation Planning Issues

One of the most visible rail transportation planning issues are safety and delays at road crossings. Outside of the Waterloo/Cedar Falls metropolitan area, there are 331 at-grade road-rail and pedestrian-rail crossings. Railroad crossings remain a safety concern despite widespread use of active warning systems to clear the tracks for oncoming trains. From 1999 to 2019, there were 69 highway-rail incidents at public and private crossings in the region which resulted in 3 fatalities and 29 injuries. The rail crossing on 29th Avenue SW in Waverly has experienced four incidents since 2008, three of which resulted in injuries. Public frustration with frequent delays can lead to choices such as crossing a stopped train or driving around lowered rail crossing gates, both of which are illegal and incredibly dangerous.



Rail-Road Crossings
Source: Federal Railroad Administration, Safety Map

Iowa Code 327G.32 prohibits a railroad from blocking a crossing for longer than ten minutes with four exceptions: when necessary to comply with signals affecting the safety of the movement of the trains; when necessary to avoid striking an object or person on the track; when the train is disabled; or when necessary to comply with governmental safety regulations, including speed ordinances and speed regulations. Citations for non-compliance may be issued by local law enforcement authorities, but this is seldom effective. Communities

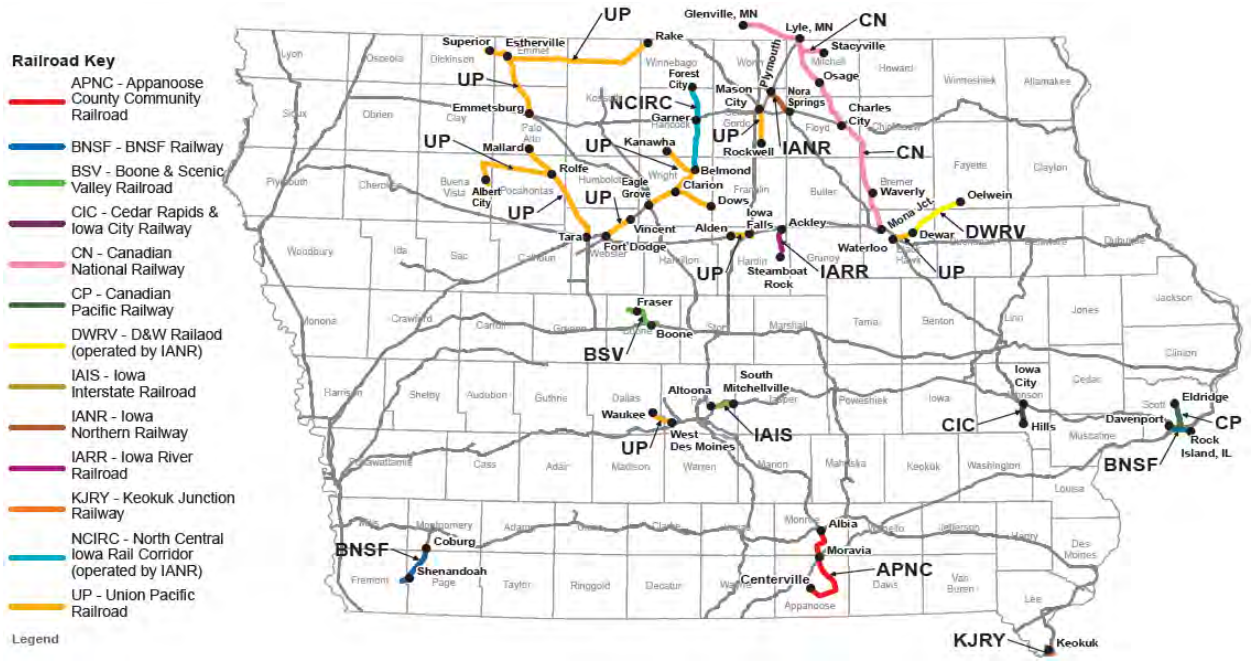
are encouraged to work with the railroads to identify solutions. The Iowa DOT Rail Transportation Bureau can provide community representatives with information and appropriate railroad contacts. The department is also available to help coordinate and foster community/railroad relationships to resolve these problems. Federal and state monies – STBG, Iowa's TAP, and Highway/Rail Crossing Safety Program – are available to fund rail crossing studies, safety improvements, and pedestrian crossing infrastructure.

Rail-Road crossing on 29th Avenue SW in Waverly
Source: Google Maps, Streetview

Total rail traffic is projected to increase substantially over the life of this Plan. According to the Iowa DOT's *2017 Iowa State Rail Plan*, the total rail traffic inbound, outbound, and within the state is anticipated to grow 25 percent, 44 percent, and 80 percent per year respectively from 2013-2040. Total tonnage for freight rail traffic for all directional categories in the same time period is anticipated to increase by 52 percent. This growth would result in portions of rail lines in the region near or over capacity. Increase in ethanol production could have a significant local impact on rail companies due to the large amounts of corn and gasoline as inputs and the shipment of ethanol and distiller grains as outputs. Other driving factors for projected increases in rail traffic include the expansion of the Panama Canal and increases in domestic intermodal transportation.

Capacity is also an industry-wide issue as in the past many railroad lines were closed and smaller branch lines were sold. Now, as the railroad industry is experiencing growth, capacity is becoming more of a concern. Increased use of existing rail lines is likely to occur, and the likelihood of new rail lines being constructed is uncertain. Rail capacity will continue to be an issue for the region as the volume of rail traffic moving across existing lines increases.

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 railcars are becoming an industry standard for railroad transportation. At present, there are three lines in the 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-pound railcar weights
Source: Iowa DOT, Iowa State Rail Plan, 2017

Pipeline Transportation

Pipelines are a crucial part of the transportation infrastructure, delivering oil, natural gas, and other products. According to the U.S. DOT Pipeline and Hazardous Materials Safety Administration, there are 13,044 miles of active pipeline in Iowa. In the six-county region, there are 585 miles of active pipeline. Table 6.5 provides a breakdown of pipeline mileage by county

Table 6.5: Miles of Transmission Pipeline, by County

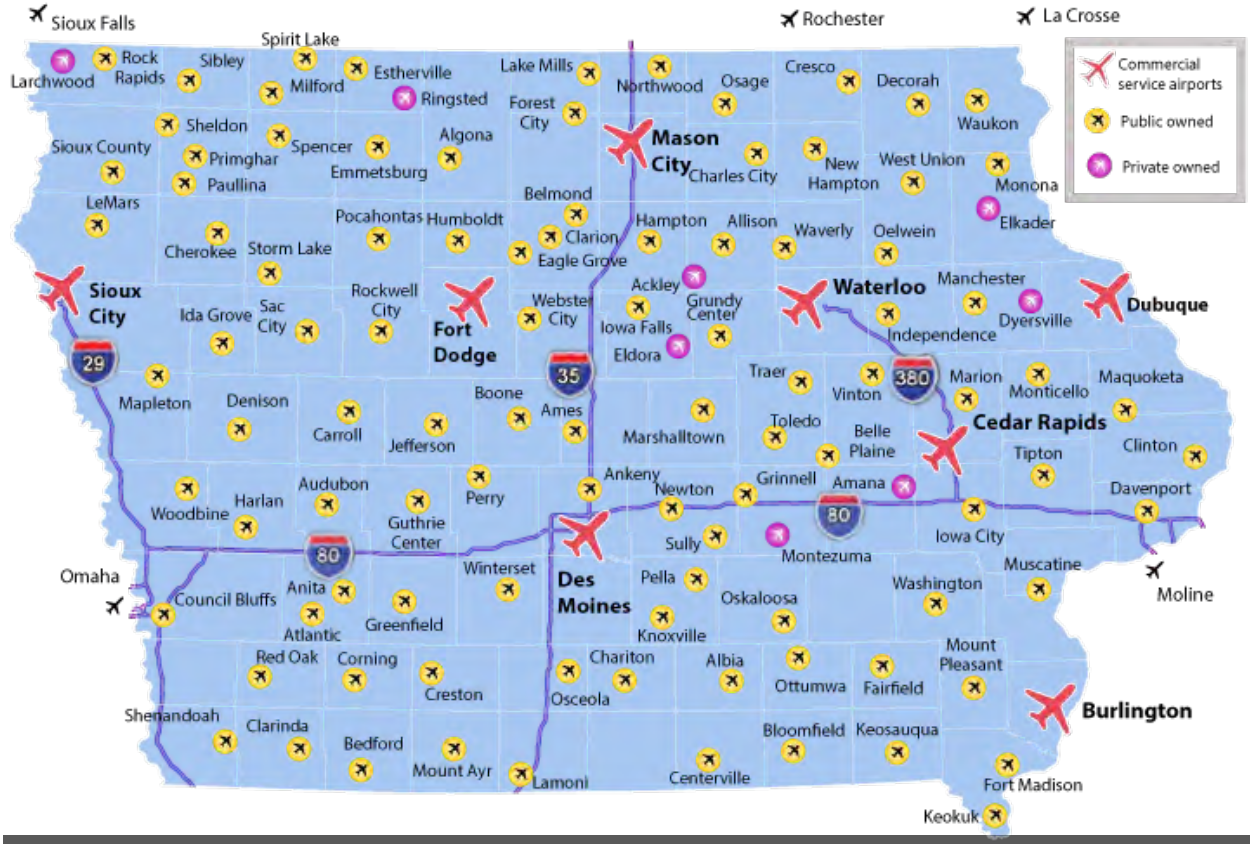
County	Gas Transmission Mileage	Hazardous Liquid Mileage	Total Mileage
Black Hawk*	108.5	10.7	119.2
Bremer	37.5	1.6	39.2
Buchanan	122.1	12.8	134.9
Butler	47.9	0.0	47.9
Chickasaw	68.0	29.4	97.4
Grundy	137.2	9.2	146.4
Region	**521.3**	**63.7**	**585.0**

Source: U.S. DOT, Pipeline and Hazardous Materials Safety Administration, Active Pipeline Mileage by County
*Includes mileage within the MPO boundary

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 deal with any type of pipeline incident. A serious incident could require evacuation efforts around that location which could have major transportation implications.

Air Transportation

Airports are classified into one of five roles based upon their capability to support various types of aircraft and aviation users: commercial service, enhanced service, general service, basic service, and local service. Iowa has eight commercial service and 99 general aviation airports that are publicly owned. An additional eight privately-owned airports are open for public use. The region is served by six airports of which one is classified commercial, one enhanced, and four as local service.



Airports in Iowa
Source: Iowa DOT Aviation Bureau

Waterloo Regional Airport (ALO)

The Waterloo Regional Airport is located on Airport Blvd in the northwest corner of Waterloo. The airport is accessible from U.S. 218 but is not currently served by the transit system. The airport is owned and operated by the City of Waterloo and is overseen by a seven-member Airport Commission appointed by the mayor. The airport is classified as a non-hub primary commercial service airport, offering general aviation and commercial service. The airport is also a major base for the Iowa Army National Guard. While the airport does facilitate some air cargo, the majority of its operations are commercial, general aviation, and military.

The Waterloo Regional Airport features two runaways and a variety of facilities to serve air transportation. The primary runway is 12/30, oriented northwest to southeast. The

runway is 8,400 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-foot-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. All runways are lighted with runway 12/30 having high intensity runway lights, and runway 18/36 having medium intensity runway lights.

The airport has a series of connecting and parallel asphalt taxiways. They range from 50 to 75 feet in width and are lit with blue taxiway edge lights. The airport's terminal building opened in 1948 and has experienced a series of renovations and additions over the past two decades. The main floor provides airline ticketing, airline boarding, baggage claim, car rental, and lounge. Airport administration and two national weather service offices are located on the second floor. Short- and long-term parking is provided for travelers.

Hangar facilities are located directly west and east of the existing terminal building. The airport currently has 115,700 square feet of hangar space including 30 individual T-hangars to accommodate based aircraft. There are also 54,000 square yards of apron for general aviation aircraft, 1,700 square feet of general aviation terminal facilities, and 41 parking spaces to support the general aviation facilities. 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. The tower has radar and non-radar capabilities and is designated as a Level 5 Terminal Radar Approach Control. Aviation fuel is stored in a consolidated fuel farm southwest of the passenger terminal building. The existing aviation fuel farm consists of two above ground 20,000-gallon tanks dedicated to jet fuel storage, two above-ground 12,000-gallon tanks for avgas storage, and 1,000 gallons of storage for MOGAS.

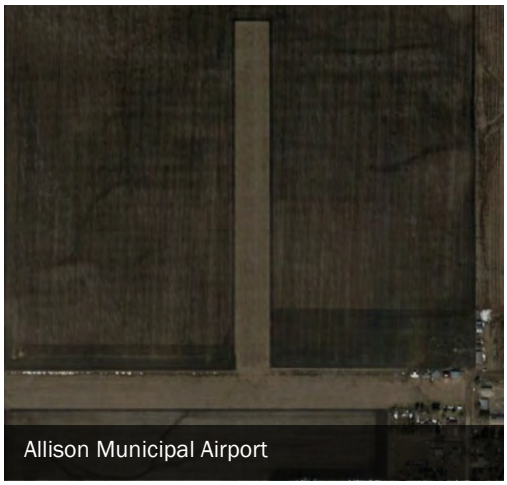
The airport is home to Livingston Aviation, a full-service fixed base operator (FBO) providing aeronautical services to the general aviation public. There are two limited FBO's providing certain types of service to the general aviation public. The FBO has its own terminal facilities.


Independence Municipal Airport

Independence Municipal Airport (IIB)

The Independence Municipal Airport is located approximately three miles southwest of Independence's central business district on the west side of the city and is accessible via U.S. 20 and IA Hwy 150. The facility is classified as an enhanced service airport offering a 5,500-foot-long, 100-foot-wide paved concrete runway; 31 hangar parking spaces; seven apron aircraft tie-down locations; rotating beacon; AWOS weather reporting; lighted wind indicator; runway snow removal; and 24-hour jet fueling. In 2010, there were 28 aircraft based at the airport generating approximately 7,000 annual operations. These figures are projected to increase to 36 aircraft and 9,000 annual operations by 2030.

Allison Municipal Airport (K98)
The Allison Municipal Airport is located on the northwest edge of the city and is accessible via IA Hwy 14 and 7th Street. The facility is classified as a local service airport offering a 1,790-foot-long, 175-foot-wide turf runway; six hangar parking spaces; and two aircraft tie-down locations. In 2010, there were five aircraft based at the airport generating 1,250 annual operations. These figures are projected to increase to six aircraft and 1,500 annual operations by 2030.


Allison Municipal Airport

Grundy Center Municipal Airport (6K7)
The Grundy Center Municipal Airport is located approximately three miles west of the city and is accessible via IA Hwy 175. The facility is classified as a local service airport offering a 2,250-foot-long, 60-foot-wide turf runway; three hangar parking spaces; and three aircraft tie-down locations. In 2010, there was one aircraft based at the airport generating 250 annual operations. These figures are projected to remain static.

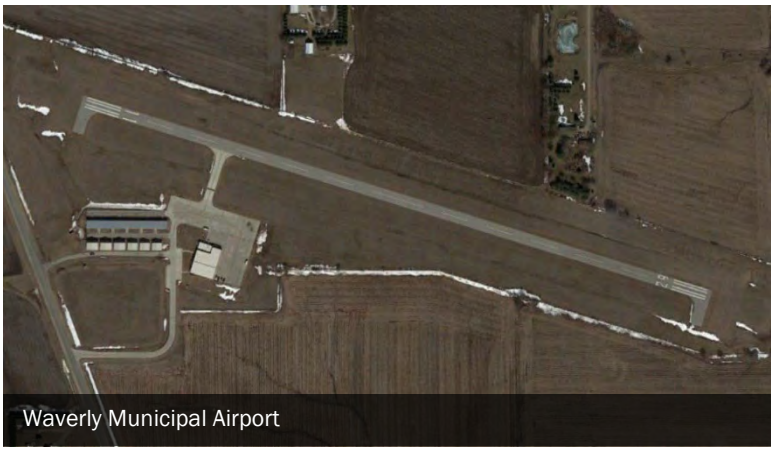

Grundy Center Municipal Airport

New Hampton Municipal Airport (1Y5)
The New Hampton Municipal Airport is located approximately two miles northwest of the city and is accessible from U.S. 18 via Kenwood Avenue. The facility is classified as a local service airport offering a 2,900-foot-long, 75-foot-wide paved asphalt primary runway; a 2,300-foot-long, 105-foot-wide turf secondary runway; four hangar parking spaces; two apron aircraft tie-down locations; lighted wind indicator; and runway snow removal. In 2010, there was one aircraft based at the airport generating 250 annual operations. These figures are projected to remain static.

Waverly Municipal Airport (C25)
The Waverly Municipal Airport is located two miles northwest of Waverly's central business district and is accessible from U.S. 218 via 210th Street. The facility is classified as a local service airport offering a 2,800-foot-long, 50-foot-wide paved asphalt runway; 23 hangar parking spaces; 13 apron aircraft tie-down locations; rotating beacon; lighted wind indicator; runway snow removal; and jet fueling. In 2010, there were 23 aircraft based at the airport generating approximately 5,750 annual operations. These figures are projected to increase to 29 aircraft and 7,250 annual operations by 2030.


New Hampton Municipal Airport

Recent and Planned Improvements


Waverly Municipal Airport

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 CIP and must be used to modernize and improve the facilities at Iowa airports. Projects that have been funded by these grant programs in the past five years are summarized in Table 6.6.

Table 6.6: Airport Improvement Program Grants, FY 2015-2019

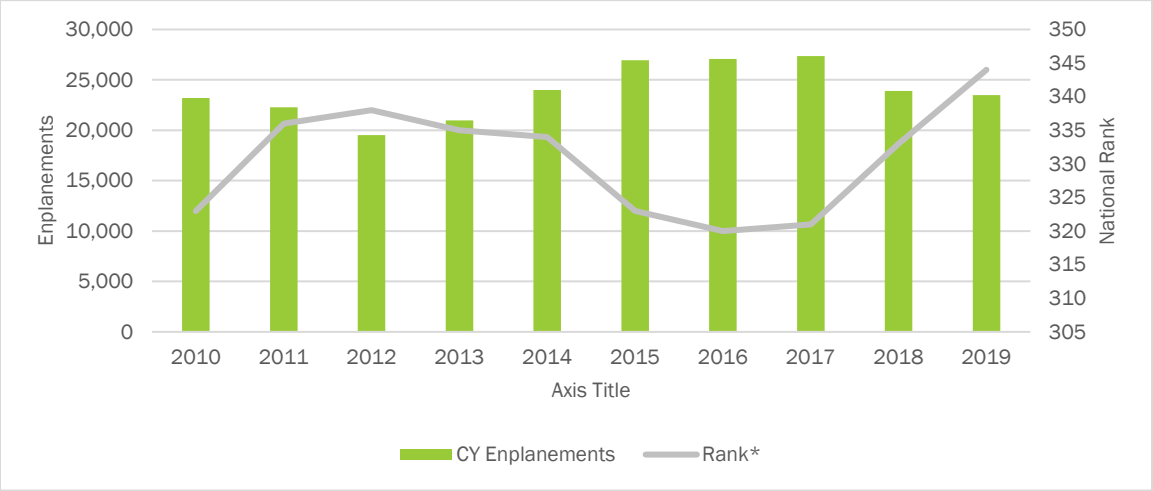
Fiscal Year	Airport	Project	Federal/State	AIP Dollars
2019	Independence Municipal	Construct Taxiway	Federal	312,917
2019	Waverly Municipal	Extend Runway	Federal	1,357,030
2019	Waverly Municipal	Extend Runway	Federal	361,912
2019	Waterloo Regional	Hangar and Terminal Improvements	State	102,354
2018	Independence Municipal	Construct Taxiway	Federal	59,400
2018	Waverly Municipal	Extend Runway	Federal	137,637
2018	Waverly Municipal	Bulk Hangar Insulation Renovation	State	22,950
2018	Waterloo Regional	Hangar Improvements	State	61,563
2017	Waverly Municipal	Extend Runway – 11/29	Federal	399,903
2017	Waterloo Regional	Reconstruct Taxiway, Rehab Runway – 12/30, Rehab Runway – 18/36	Federal	2,655,686
2017	Independence Municipal	Taxilane Widening	State	69,729
2017	New Hampton Municipal	Rehab Airfield Pavement	State	352,374
2017	Waterloo Regional	General Aviation Terminal Building Rehab and Hangar Five Rehab	State	101,699
2016	Waverly Municipal	Extend Runway – 11/29	Federal	164,672
2016	Waterloo Regional	Hangar Rehab and Baggage Area Renovation	State	101,196
2015	Independence Municipal	Construct Snow Removal Equipment Building	Federal	377,178
2015	Waverly Municipal	Rehab Runway – 11/29	Federal	1,529,168
2015	Waverly Municipal	Extend Runway – 11/29	Federal	712,569
2015	Waterloo Regional	Rehab Taxiway	Federal	958,739
2015	Waterloo Regional	Upgrade Emergency Generator to Meet EPA RICE NESHAP Requirements; Window replacement and Exterior Masonry Sealing; Terminal Electrical Improvements and Door Replacement	State	101,032

Source: Federal Aviation Administration, Grant History Look Up

Commercial Service

Waterloo Regional Airport is currently served by American Airlines with two daily flights to and from Chicago O'Hare. In 2018, American Airlines signed a two-year contract extension to continue providing twice daily flights through the federal Essential Air Service program. American Airlines, which has been Waterloo's sole carrier since 2012, provides flights on 50-seat regional jets operated through the regional brand American Eagle. Figure 6.9 shows annual commercial enplanements at the Waterloo Regional Airport over the past ten years.

Figure 6.9: Annual Enplanements, Waterloo Regional Airport



Source: Federal Aviation Administration, Passenger Boarding for U.S. Airports
*Out of 558 airports

Air Transportation Planning Issues

Issues that have impacted the region in recent years include the limited jet service at the Waterloo Regional Airport, and the lack of service to multiple destinations. Currently, there are two regional jet flights per day, both to and from Chicago. The airport has completed a true market study and leakage analysis to determine the size and characteristics of the airport's catchment area true market.

In the past decade, the aviation industry has experienced a steady increase in air traffic. According to the FAA *Aerospace Forecast FY 2020-2040*, system enplanements are forecast to grow at an average annual rate of 2.0 percent a year. Aviation demand is driven by economic activity, and a growing U.S. and world economy provides the basis for aviation to grow over the long run. The COVID-19 pandemic had an extreme and almost immediate effect on the airline industry. According to S&P Global, worldwide air passenger traffic for 2020 dropped 60-70 percent compared to 2019. Experts predict a gradual recovery to pre-COVID-19 traffic levels by 2024.

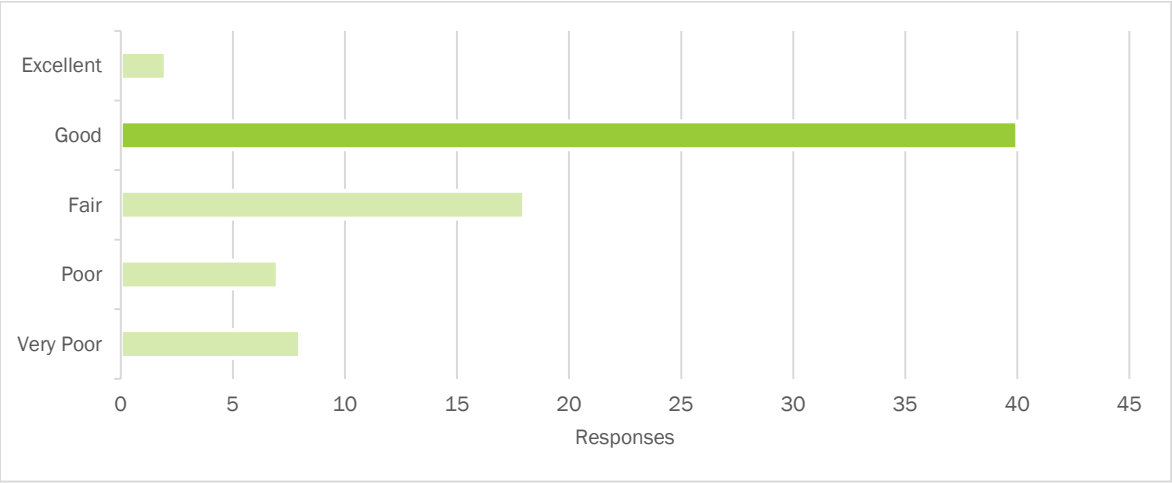
All modes of transportation have risks and safety concerns associated with them, and aviation is no different. Establishing compatible land uses around airports helps reduce the safety concerns for airport operations and persons located in close proximity to the airport. According to the National Transportation Safety Board (NTSB), the highest number of aircraft accidents occur on airport property; the vast majority of off-airport accidents occur within five miles of the airport runway, most of which occur within one mile of the airport. The primary goal of airport land use compatibility planning is to temper some of the risk by eliminating safety hazards surrounding airports. INRCOG staff facilitated the update of airport zoning ordinances for the Waterloo Regional Airport and Independence Municipal Airport, and the creation of a new airport zoning ordinance for the Grundy Center Airport. Each ordinance creates a three-dimensional set of regulations that limit land uses in certain areas around each airport, in particular at the end of each runway.

2020 Public Input Survey

In September 2020, RTA staff conducted a public input survey to gain input from across the Iowa Northland Region. Surveys were mailed to 1,000 randomly generated households in the region, and 118 were returned.

Respondents were asked how they would rate the infrastructure for five transportation modes. Figure 6.10 shows the total number of responses per rating for air. 36 respondents selected "Neutral/No Opinion".

Figure 6.10: Responses for Rating Transportation Modes, Air



Respondents were also asked what the number one transportation problem in their life is, and what will be the biggest transportation challenge in the next 25 years. Notable findings pertinent to this chapter include the following:

What is the number one transportation problem in your life?

- Three survey respondents mentioned issues with freight or farm equipment.
- Four survey respondents commented on air service including limited direct flights.

What will be the biggest transportation challenge in the next 25 years?

- 5.9 percent of survey respondents indicated challenges with freight, semi-traffic, or farm equipment.
- One survey respondent said airline fees, and another hopes air service will remain in Waterloo and Mason City.

Additional Comments

- One survey respondent said there is a need for more than two flights daily out of the Waterloo Regional Airport, and another respondent said the Waterloo Regional Airport is good.
- One survey respondent said railroads are terrible.
- One survey respondent said getting to an airport that provides reasonable rates.