Bi-State Regional Freight Plan Addendum

Final Report

Prepared for:

Bi-State Regional Commission

Prepared by:

In association with:

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Acronyms / Abbreviations

BSRC	Bi-State Regional Commission
AADT	Average Annual Daily Traffic
AIP	Airport Improvement Program
AL	Alabama
BEA	Bureau of Economic Analysis
BNSF	Burlington Northern Santa Fe
BTS	Bureau of Transportation Statistics
CA	California
CEDS	Comprehensive Economic Development Strategy
CP	Canadian Pacific
CPKC	Canadian Pacific Kansas City
CR	County Route
CRFC	Critical Rural Freight Corridor
CRS	Condition Rating Survey
CUFC	Critical Urban Freight Corridor
DIR	Davenport Industrial Railroad
DM&E	Dakota Minnesota and Eastern Railroad
DNR	Department of Natural Resources
DOT	Department of Transportation
DVN	Davenport Municipal Airport
EB	Eastbound
EDA	Economic Development Administration
EPA	Environmental Protection Agency
EV	Electric Vehicle
EZI	Kewanee Municipal Airport
FAA	Federal Aviation Administration
FAF	Freight Analysis Framework
FAST	Fixing America's Surface Transportation Act
FHWA	Federal Highways Administration
FL	Florida
FRA	Federal Railway Administration
GA	Georgia
GDP	Gross Domestic Product
GPS	Global Positioning System
HI	Hawaii
HPMS	Highway Performance Management System
IA	Iowa

IADOT	Iowa Department of Transportation
IAIS	Iowa Interstate Railroad
ID	Idaho
IEMA	Iowa Emergency Management Association
IIJA	Infrastructure Investment and Jobs Act
IL	Illinois
ILDOT	Illinois Department of Transportation
IMFN	Iowa Multimodal Freight Network
IN	Indiana
IPMP	Iowa Pavement Management Program
IRI	International Roughness Index
KCS	Kansas City Southern
KS	Kansas
KY	Kentucky
LA	Louisiana
LRTP	Long-Range Transportation Plan
MI	Michigan
MLI	Quad Cities International Airport
MN	Minnesota
MO	Missouri
MPA	Metropolitan Planning Area
MPO	Metropolitan Planning Organization
MS	Mississippi
MUT	Muscatine Municipal Airport
MUTCD	Manual of Uniform Traffic Control Devices
NAICS	North American Industry Classification System
NB	Northbound
NBI	National Bridge Inventory
ND	North Dakota
NE	Northeast
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
NHS	National Highway System
NJ	New Jersey
NM	New Mexico
NPIAS	National Plan of Integrated Airport Systems
NPMRDS	National Performance Management Research Data
NY	New York
OH	Ohio

OK	Oklahoma
OR	Oregon
ORD	Chicago O'Hare International Airport
PA	Pennsylvania
PCB	Polychlorinated biphenyls
PCI	Pavement Condition Index
PDO	Property Damage Only
PEL	Planning and Environment Linkages
PFN	Priority Freight Network
PHFS	Primary Highway Freight System
PM	Performance Measurement
PSR	Precision Scheduled Railroading
RDC	Railroad Development Corporation
SB	Southbound
SC	South Carolina
SD	South Dakota
SFP	State Freight Plan
SR	State Route
STB	Surface Transportation Bill
STCC	Standard Transportation Commodity Code
STRAHNET	Strategic Highway Network Connector
TMC	Traffic Message Channel
TN	Tennessee
TTTRI	Truck Travel Time Reliability
TX	Texas
UMR	Upper Mississippi River
UP	Union Pacific
USACE	United States Army Corp of Engineers
USD	United States Dollars
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USPS	United States Postal Service
VMT	Vehicle Miles Traveled
WB	Westbound
WI	Wisconsin
WY	Wyoming

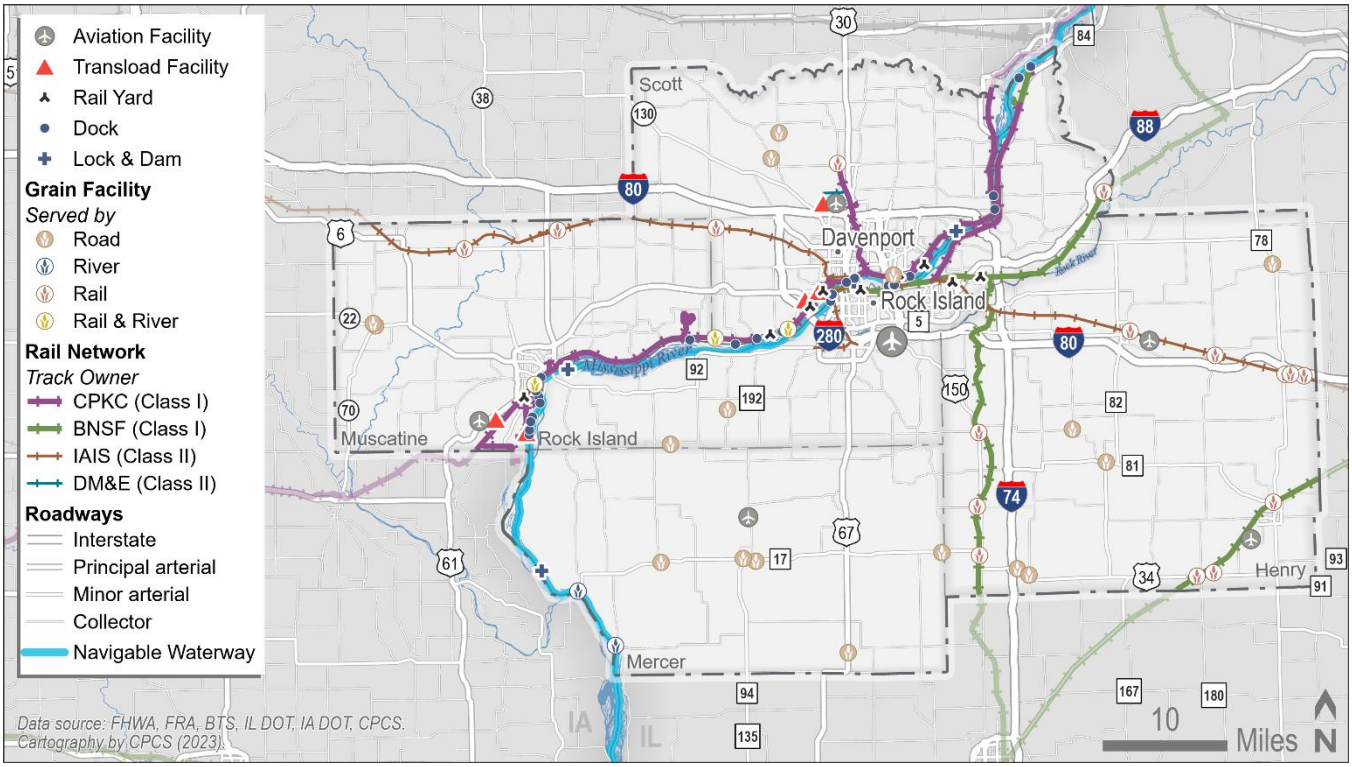
Executive Summary

Freight System Overview

Spanning the banks of the Mississippi River, the Bi-State Region comprises five diverse counties: Muscatine and Scott Counties in Iowa, as well as Rock Island, Henry, and Mercer Counties in Illinois (Figure 1). According to data from the 2020 Census, this dynamic region is home to 427,559 residents.[1]

The Bi-State Region is serviced by a network of four interstates (I-80, I-280, I-74, and I-88), which are supplemented by national and state highways such as US-61 and US-67. The region is also served by an extensive rail system on either side of the state line with two Class I railroads (Canadian Pacific Kansas City Railroad – CPKC, and Burlington Northern Santa Fe Railroad – BNSF), two short lines (Iowa Interstate Railroad – IAIS and Dakota Minnesota & Eastern – DM&E), and multiple rail yards to support rail operations. In addition to road and rail, the Bi-State Region has four locks and dams and one cargo airport (the Quad Cities International Airport).

Figure 1: The Multimodal Freight System in the Bi-State Region



The multimodal freight facilities in the region

The Bi-State Region boasts a versatile array of multimodal freight facilities, including 9 rail yards, 55 river docks, and 5 transloading facilities, with the Eastern Iowa Industrial Center Transload Facility in Davenport as a recent addition. The region supports agricultural transport through 39 grain facilities, with 16 rail-served, 2 river-served, and 3 served by both. While lacking major intermodal facilities, it's strategically located near significant hubs: 2.5 hours west of both the Center Point Intermodal Center in Joliet/Elwood, Illinois, North America's largest inland port, and UP's Global III Park in Northlake, IL.

[1] US Census Bureau, County Population Totals and Components of Change: 2020-2022, https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html, accessed on September 22, 2023.

Road System Profile

The Bi-State region's roadway network connects the region to the rest of the country, and most destinations in the U.S. are accessible within a one-day drive from Davenport.

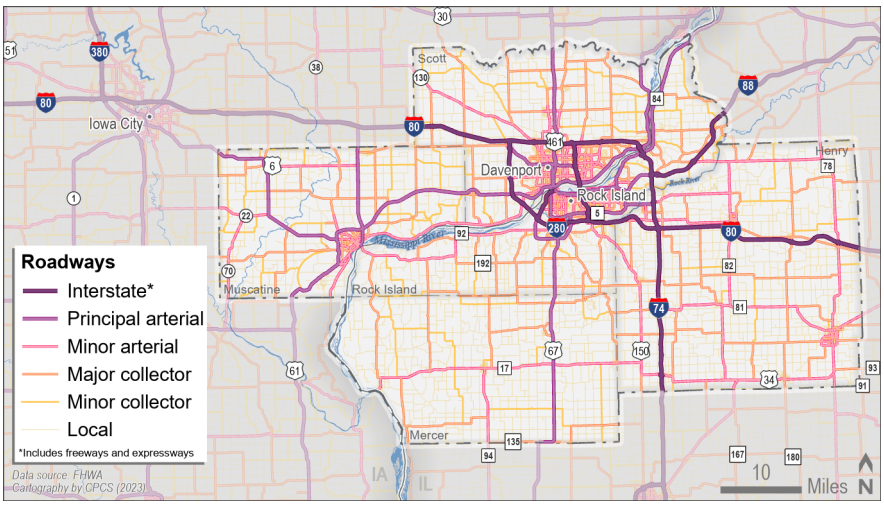
191	379	165	1,188
Miles of Interstate	Miles of National Highway System	Miles of National Highway Freight Network	Bridges

Source: CPCS analysis of IL DOT and IA DOT roadway network data

Highway System

As of 2024, nearly 6,765 miles of roads, streets, and highways run through the region (Figure 2). These highways are the cornerstone of the region's freight transportation network. They facilitate the majority of goods movement by offering trucks access throughout the region, including connections to and from the area, as well as crucial first-and-last-mile links to other modes like rail and water. Key interstate highways in the region are I-80, I-88, I-74, and I-280. These interstates provide eastern connections to Chicago and Indianapolis and western routes to Des Moines and Omaha. Additionally, US 61 and US 67 link the region southward to St. Louis and northward to Minneapolis.

Figure 2: Bi-State Regional Roadway Network, 2023

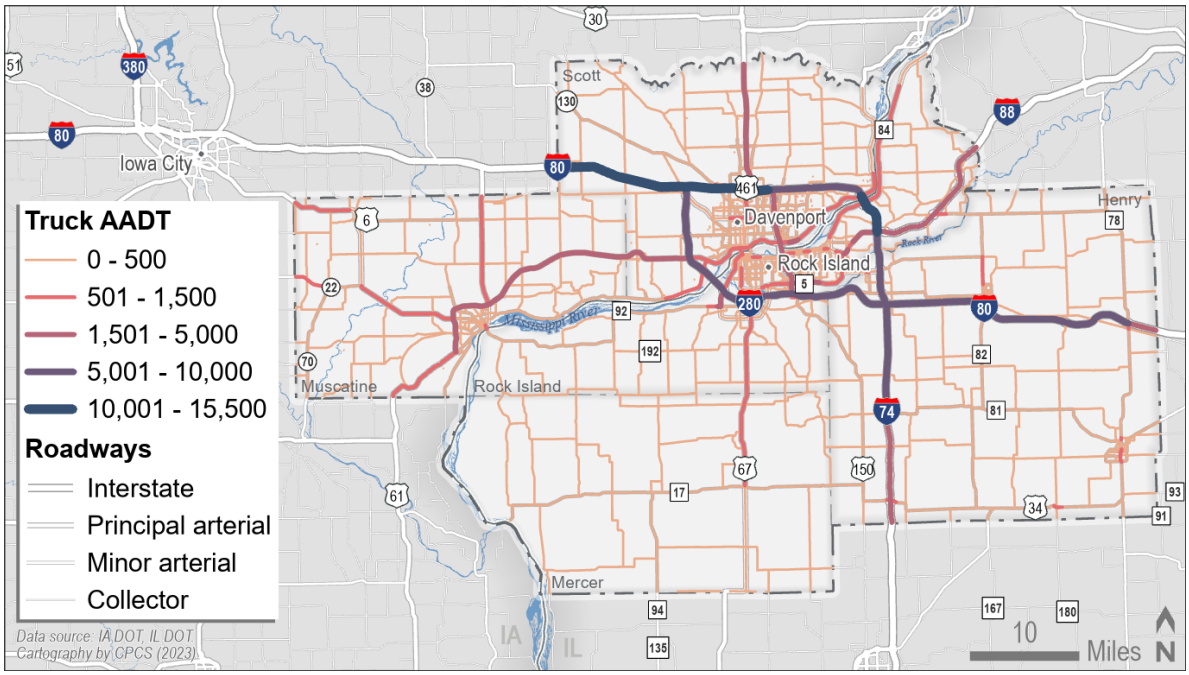


System Use

Maintaining safe and efficient routes for all users on the most heavily trafficked truck corridors is crucial for the overall efficiency of the transportation system. The four major Interstates bear the brunt of daily truck traffic (Figure 3). Particularly noteworthy are the high truck volumes on I-80 west of US 61 and near the IL/IA state line. As the primary trucking route in the region, I-80 facilitates both traffic directly serving and passing through the region. Its significance is also highlighted by its inclusion in the FHWA's Primary Highway Freight System (PHFS) designation, highlighting its role in the national freight movement.

Highways of secondary importance in terms of volumes include US 61 between Muscatine and Davenport, IA 38 north of Muscatine (connecting Muscatine to Iowa City, IA), and US 61 north of Davenport (connecting the region to Dubuque, IA to the north). IL 84 north of Rapids City plays a crucial role in connecting the region to the Clinton-Savanna area to the northeast. This route also facilitates access to key industrial sites, including the Quad Cities Generation Station nuclear power plant and the 3M facility north of Cordova. These roads are not only characterized by high truck traffic but also feature a higher proportion of trucks compared to other vehicles.

Figure 3: Truck Annual Average Daily Traffic in the Bi-State Region, 2023



Goods Handled

Trucking plays a crucial role in the Bi-State Region, responsible for transporting around 84 percent of the area's goods in terms of both volume and value. This considerable transportation of goods by trucks plays a vital role in driving the regional economy, particularly given the area's economic strengths in manufacturing and agriculture. These sectors rely heavily on freight transport to access multimodal facilities and to deliver products to their final destinations. Scott County leads the region by the total tonnage of goods served by trucks, followed by Muscatine County (Figure 4).

In the array of commodities transported, food and agriculture lead in truck-based movement, representing half of all truck-moved goods in the region. Construction materials also play a significant role, comprising 38 percent of the total truck commodity flow. Trucks also carry other goods, including manufacturing materials, chemicals, energy products, and motor vehicles (Figure 5).

Figure 4: Truck Goods Volume by County

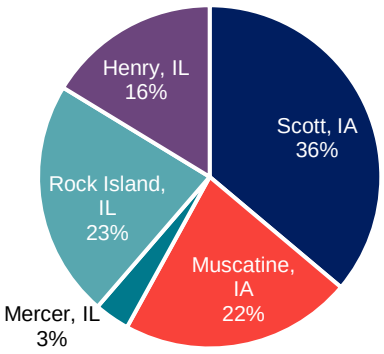
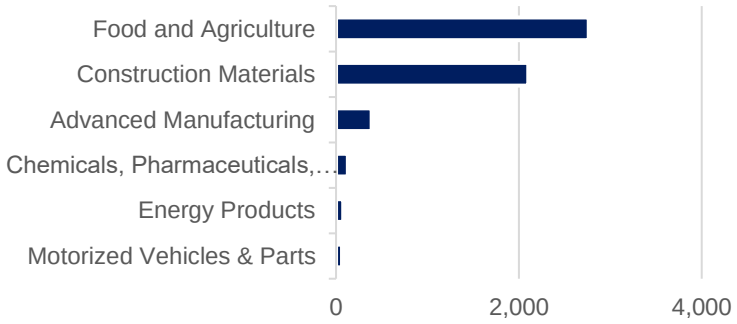


Figure 5: Top Commodities by Truck by Volume (1,000 tons)



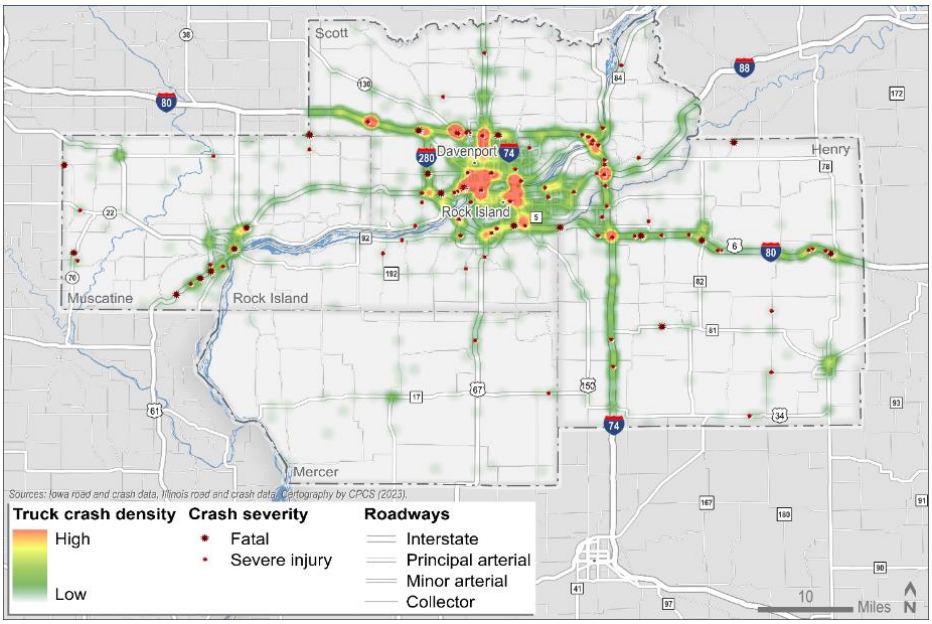
Source: WSP analysis of FHWA FAF5 data, 2023

System Performance

Safety

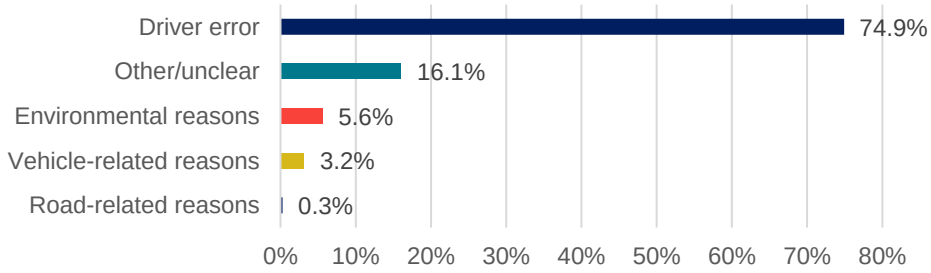
Between 2018 and 2022, 2,733 truck-involved crashes occurred in the Bi-State Region, averaging 547 crashes annually (Figure 6). The majority of these crashes (80%) were property-damage-only (PDO) crashes. Scott County, Iowa, and Rock Island County, Illinois, the two most populous counties in the region, had the highest total truck-involved crashes. Truck-involved crashes were clustered along the interstates. Fatal crashes were found primarily along the I-80 corridor with an additional cluster along US 61 in Muscatine County.

Figure 6: Truck Crash Density and Severity, 2018 - 2022



Most of the truck-involved crashes in the region were caused by reasons attributed to drivers (Figure 7). Lane and turning violations such as improper lane usage and improper backing/ turning/ passing were the cause of nearly a quarter of all truck crashes. This is followed by 18.5% of crashes resulting from drivers exceeding safe speeds or following too closely.

Figure 7: Truck-Involved Incident Causes



Source: CPCS analysis of IL DOT and IA DOT crash data, 2023

Condition

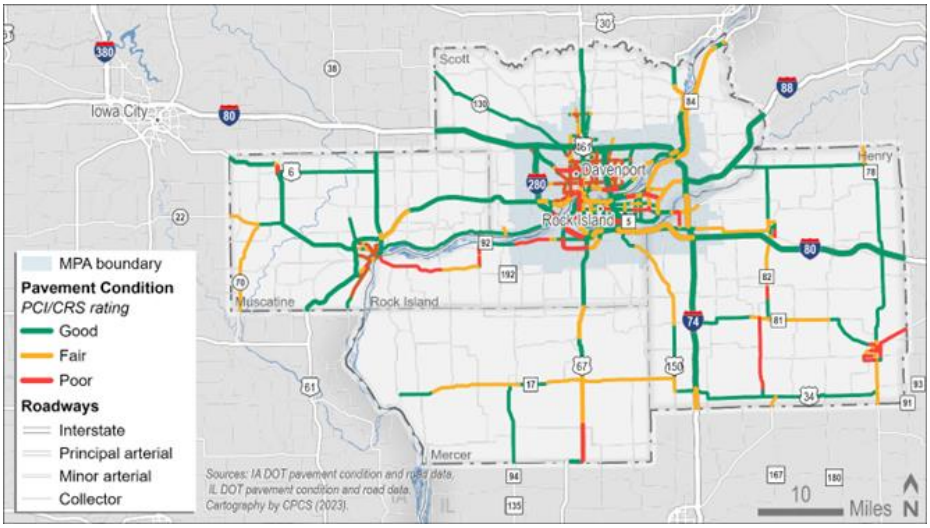
Though measured by different metrics, roadways on either side of the state line that are crucial to freight movements are in fairly good condition (Figure 8).[2] Iowa interstates are almost entirely in good condition both inside and outside of the Metropolitan Planning Area (MPA). As for Illinois, the percentage of pavements in the interstate system in good condition (56.6%) fails to meet the two- (65.0%) and four-year (66.0%) targets established by the Illinois DOT.

[2] Pavement condition ratings for the interstate in the Iowa portion of the Bi-State Region are reported using a Pavement Condition Index (PCI) provided by the Iowa DOT while pavement condition ratings for the interstates in the Illinois portion of the Bi-State Region are reported following FHWA standards for PM2.

Conditions of non-interstate highways experience slightly lower levels of performance, particularly within the MPA where traffic levels are higher.

Non-highways and local roads are in the worst condition of the regional roadways, with only Henry County recording above 50% of minor roadways in good condition. Ultimately, interstates and NHS roadways on either side of the state line are better resourced than local or rural roads for ongoing maintenance and improvements.

Figure 8: Major Roadway Pavement Condition, 2021 - 2022



Mobility

Truck bottlenecks are areas or segments on the roadway network on which the trucks experience a significant breakdown in traffic flow. Nationally, none of the roadways in the Bi-State Region have been listed among the most significant bottlenecks. According to the *Illinois State Freight Plan* (2023), the stretch of I-74 between the IL/IA state line and 6th Avenue in Moline is identified as moderate truck bottlenecks. The *Iowa State Freight Plan* (2022) has pinpointed several locations within the Bi-State Region as state-wide freight bottlenecks, including:

- US 61 at I-80 in Davenport;
- US 67 at I-74 at Davenport;
- IA 22 at US 61 in Muscatine;
- US 61 at IA 38 in Muscatine; and
- US 61 at Grandview Ave and Dick Drake Way in Muscatine

The Truck Travel Time Reliability Index (TTTRI) also lends insight to mobility along regional roadways. Over the past five years, the Bi-State Region consistently achieved its objective for the federally required freight mobility performance measure, the Truck Travel Time Reliability (TTTR) index.

Trends

- Commodity flow projection for 2055: FHWA's FAF5 forecasts a 65% increase (annual growth rate of 2.2%) in commodity flow tonnage for the Bi-State Region. The truck goods movement is expected to see the most significant rise, increasing by 74% (2.4% annually).
- Critical Corridors: The key corridors for truck commodity movement in 2055 are anticipated to remain largely unchanged.
- Rural Infrastructure: Rural infrastructure, crucial for first-mile/last-mile agricultural connections, remains critical for the regional economy. The use of larger, heavier field equipment and the trend of shipping commodities directly to processors or export terminals emphasize the importance of rural routes.

Rail System Profile

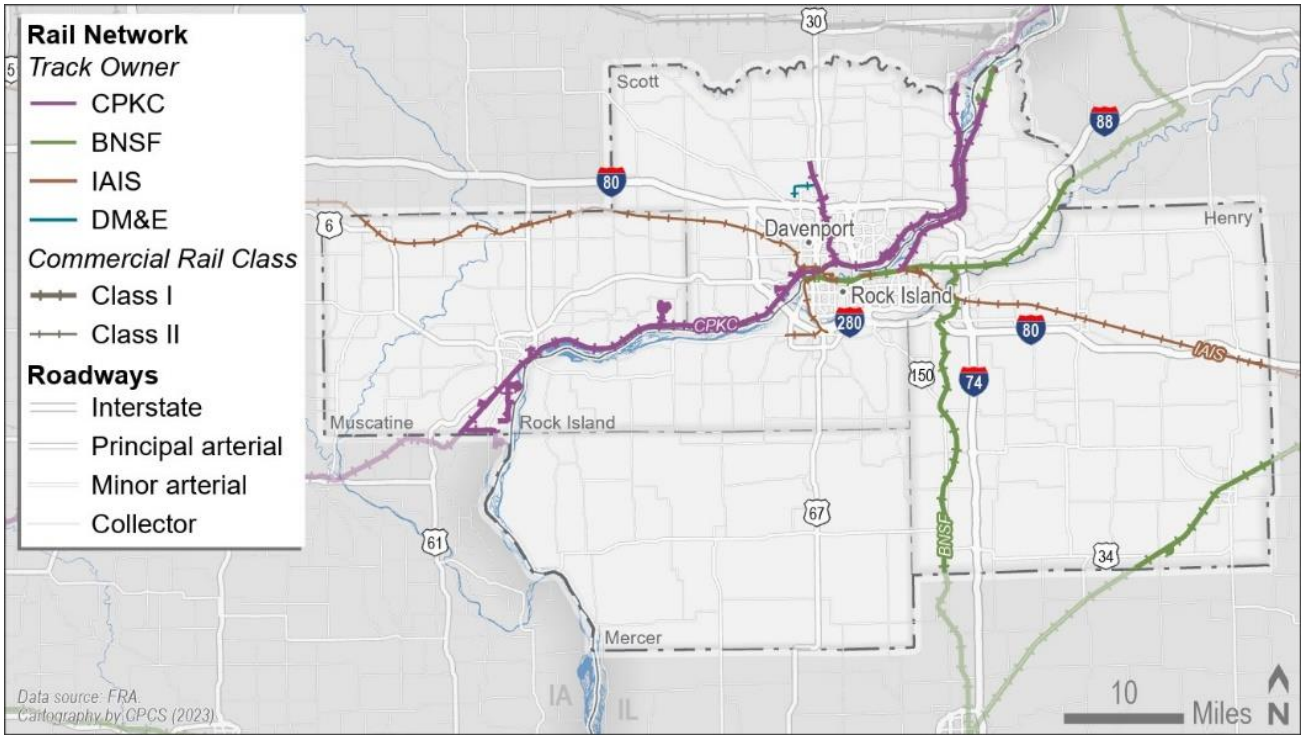
Bi-State Region's rail system plays a crucial role in its economy, supporting movements of raw materials, finished goods, and agricultural products to, from, within, and through the Bi-State Region.

346	2	2	678
Active Rail Miles	Class I Railroads	Short Line Railroads	Grade Crossings

Source: CPCS analysis of FRA Rail Network data, 2023.

Rail Network

Figure 9: Bi-State Region Rail System by Ownership and Class



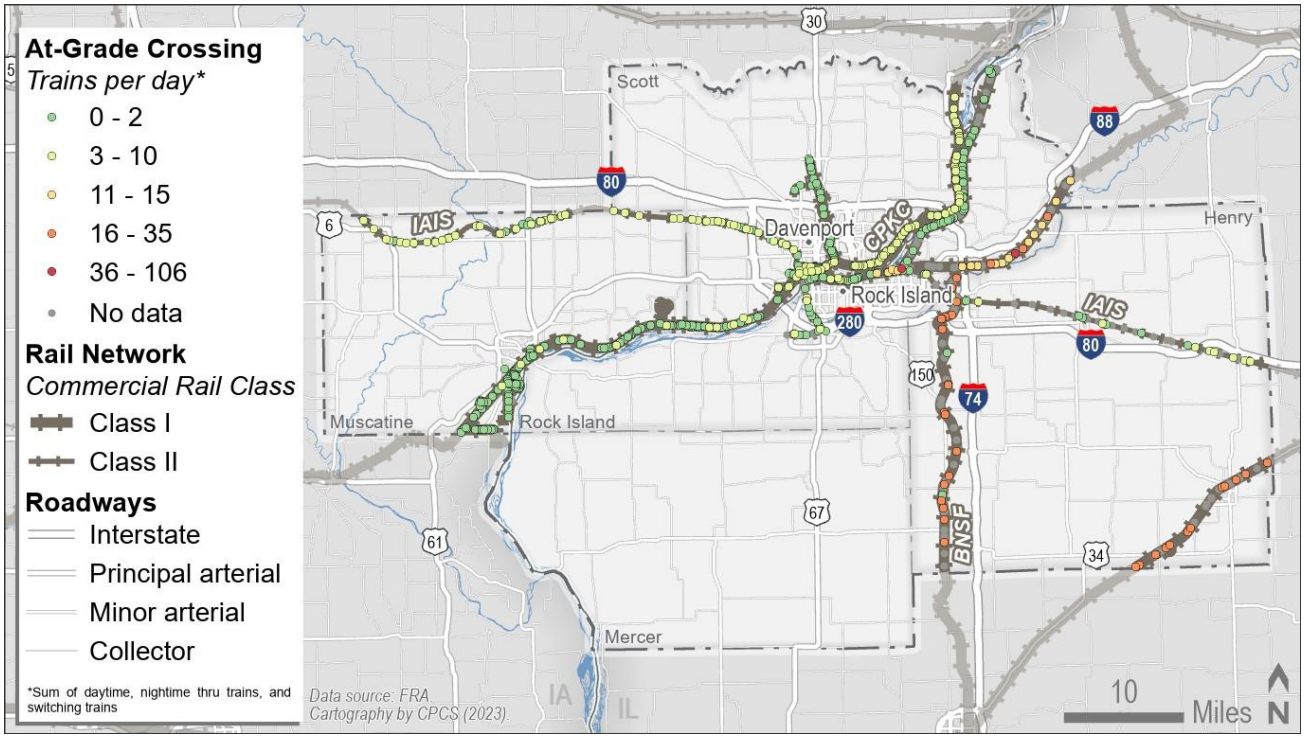
The Bi-State Region benefits from an extensive rail system on either side of the state line with two Class I railroads (Canadian Pacific Kansas City Railroad – CPKC, and Burlington Northern Santa Fe Railroad – BNSF), two short lines (Iowa Interstate Railroad – IAIS and Dakota Minnesota & Eastern – DM&E), and multiple rail yards to support rail operations (Figure 9). Owning and operating the majority of trackage in the region, CPKC's mainline runs along the Mississippi River, serving riverside ports, and grain elevators, and connecting the Bi-State Region to major markets like Chicago and Kansas City. Serving as an east/west connection, IAIS is the region's dominant short line, intersecting with both Class I lines.

Along the 346 miles of rail lines, there are 678 rail crossings with highways and local roads, the majority public and at-grade with the roadways they intersect with. Each crossing's level of access, use of warning signals, and level of traffic of the intersecting roadway or railway can have significant effects on rail and road mobility in surrounding areas.

System Use

Rail traffic is most notably found along the southern portion of the BNSF line, followed by moderate traffic along the CPKC line south of Davenport and the majority of the IAIS line (Figure 10). Providing rail connections for maritime commerce on the Mississippi River and trucks traveling along I-80, each of these lines is crucial for regional goods flow by rail.

Figure 10: Daily Train Traffic at Regional Crossings, 2023



Goods Handled

The distribution of goods flow transported by rail greatly depends on the location of rail lines throughout the region as well as subdivisions that connect mainlines to rail facilities and private businesses. As a result, Scott County transports roughly 60 percent of all goods transported by rail, followed by Muscatine County (Figure 11). The primary commodities are energy products, mainly coal, comprising over 56% of rail tonnage, and food and agricultural products, accounting for more than 30% (Figure 12).

Data from the Surface Transportation Board (STB) indicates that the annual rail tonnages for rail lines in the region have generally been below 15 million tons per year, implying limited through traffic.[3] In contrast, rail lines situated north (UP) and south (BNSF) of the region handle significantly higher volumes of traffic, typically in the range of 50 to 100 million tons per year. However, this is likely to change because of the merger between the Kansas City Southern (KCS) and Canadian Pacific (CP) rail lines, which is expected to result in a significant increase in freight train traffic in the region (see additional info in the Trends section).

[3] FHWA, Freight Rail Overview, The Freight Rail Network, 2023. https://railroads.dot.gov/rail-network-development/freight-rail-overview. Accessed on January 8, 2024.

Figure 11: Rail Goods Volume by County

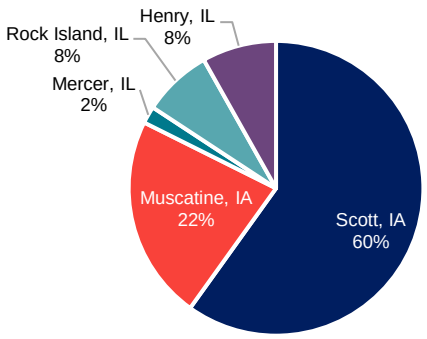
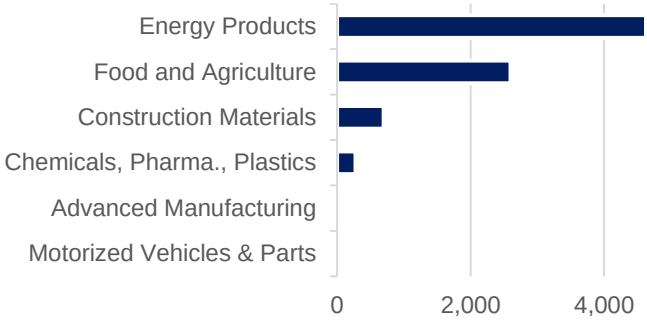


Figure 12: Top Commodities by Rail by Volume (1,000 tons)



Source: WSP analysis of FHWA FAF5 data, 2023

The top trading partner for inbound rail tons, by a wide margin, is Wyoming, which is a major producer of coal for the region. The top trading partners for outbound rail tons are Texas, Iowa, Illinois, Louisiana, and North Dakota. The rail lines in the Region serve limited pass-through traffic.

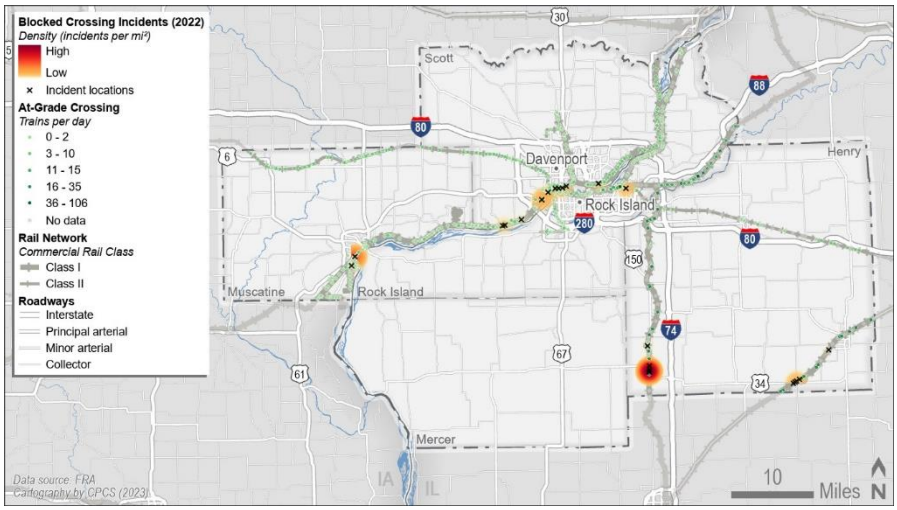
System Performance

The performance of the rail system in the Region can be evaluated by multiple metrics including the ability to accommodate modern train size and weight as well as any efficiency or safety issues at crossings with public roadways.

Mobility

The industry standard for rail car weight, which includes the weight of commodities and the rail car combined, is 286,000 pounds. The Bi-State Region has rail lines that are unable to carry the sizes and weights of railroad equipment that meet this threshold, mainly the Eldridge subdivision of the CPKC line that travels north across Davenport to the City of Eldridge, as well as portions of IAIS Subdivision One west of I-280.

Figure 13: Blocked Crossing Incident Hotspots, 2022



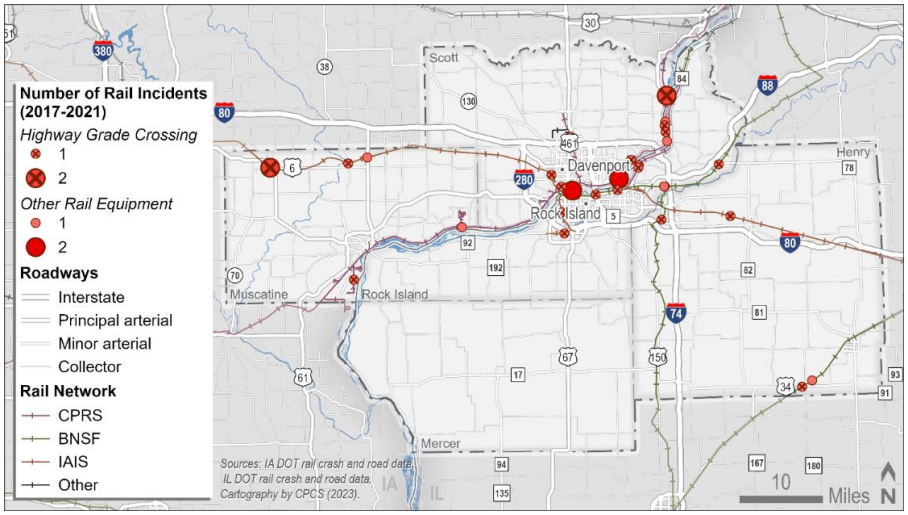
In addition, existing railroad crossings at the Government Bridge and Crescent Bridge are both over 100 years old and both bridges continue to be highlighted as both waterway freight bottlenecks and railroad freight checkpoints in the Iowa State Freight Plans (2017 and 2022). The Government Bridge currently restricts all rail traffic to 10 mph, and railcar capacity of the structure is marginal for railcars with a maximum allowable gross weight of 286,000 lbs. The Crescent bridge is functionally obsolete and cannot handle railcars exceeding 268,000 lbs. in loaded gross weight.

The frequency and configuration of trains traveling along a railway can also affect the safety and efficiency of movement at grade crossings. The delays generated by blocked crossings create mobility concerns for all travelers. Blocked crossings in the region are most common along CPKC's mainline as well as small southern portions of the regional BNSF line (Figure 13).

Safety

- Trespassing incidents are the most common type of rail incident in each county, with 34 incidents spread across the four counties with rail access in the last five years (Figure 14).
- The Region recorded 26 highway-rail grade crossing incidents over the past five years, with the primary reasons including failure of a vehicle to obey crossing warning signs and speed requirements or a vehicle stopping on the tracks.

Figure 14: Rail Incident Density, 2017 - 2021



Trends

- CPKC Merger: In March 2023, STB authorized the acquisition of Kansas City Southern (KCS) by Canadian Pacific (CP). This merger resulted in the creation of CPKC, the first single-line railway connection between Canada, the US, and Mexico. As a result, the Bi-State Region is expected to see a significant increase in freight train traffic, with CPKC's operation in Davenport projected to increase from around 7 trains per day to 17-22 trains per day, representing an annual freight volume increase of around 45.6 million tons. Within the region, the aluminum and steel manufacturing industry along with the grain and related product manufacturing industries are anticipated to experience the most direct impact from the merger. Other impacts of this merger may include reduced highway truck traffic and the pollution associated with it. Several larger cities in the region, including Davenport, Bettendorf, and Muscatine, signed agreements with CP to mitigate the effects of increased train traffic, such as improving grade crossings to allow for "quiet zones."

Figure 15: Flooded CP Track in Davenport, 2019

Source: Kate Payne, Railroad Raises Flooded Tracks, Local Concerns in Davenport, Iowa Public Radio, April 2019.

- Climate Change: The increase in the frequency and severity of weather events in the region due to climate change has created a challenge for local rail owners and operators. Rail lines, particularly those along the Mississippi River, are vulnerable to flooding and ultimately being cut off from rail-served facilities and customers (Figure 15). It's crucial for railroads to collaborate with local communities to proactively identify protective measures and implement efficient restoration strategies. These efforts should aim to return rail operations to normal with minimal disruption to crossings.

Maritime System Profile

With the Mississippi River running throughout the Region, maritime commerce is crucial to regional mobility across modes. The condition of the maritime freight infrastructure is key not only for ensuring waterway connections but also for maintaining cost-effective transportation of bulk commodities and agricultural goods.

4	55	$363 million
Locks and Dams	Docks	Maritime-Related Cargo Value, 2022

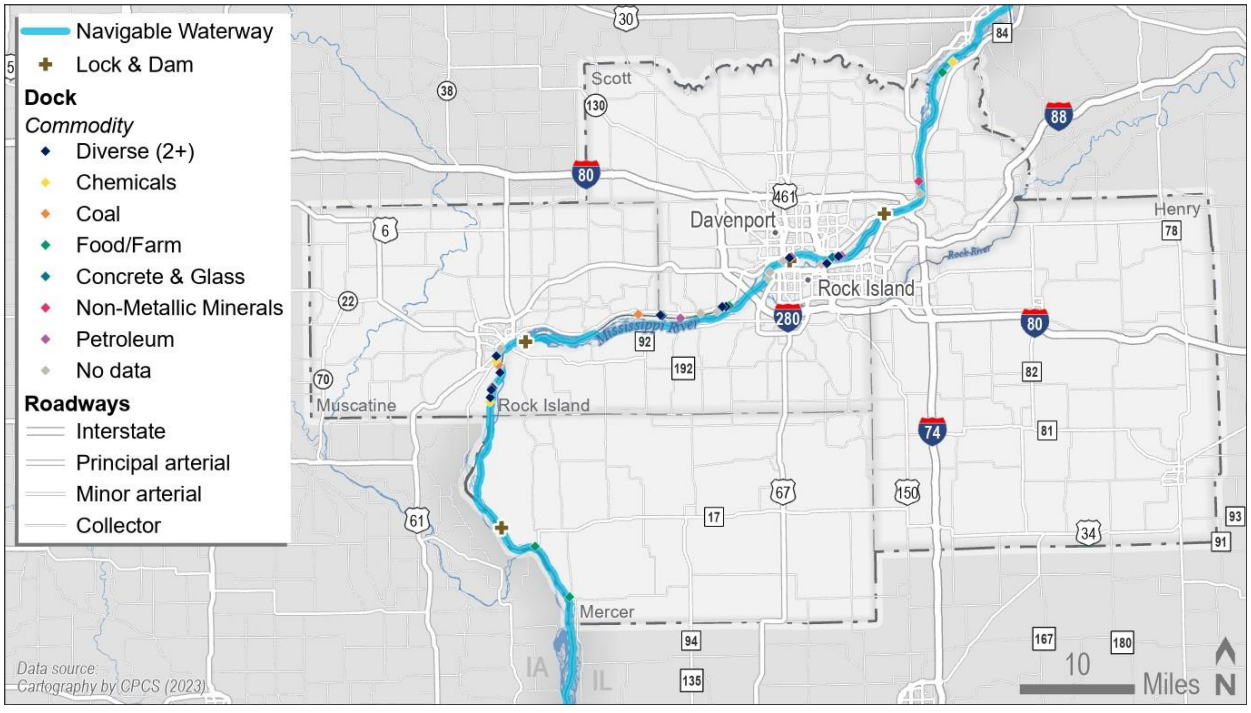
Source: CPCS analysis of USACE data, 2023; WSP analysis of FHWA FAF5 data, 2023

Waterway System

Bisecting the Bi-State Region, the Mississippi River, with its 9-ft. channel and a 10-month navigation season, stands as the nation's primary navigable inland waterway. Its journey begins near the Canadian border, winding south through the Midwest's fertile plains before reaching the Gulf, where it joins global shipping networks. While railroads and the interstate highway system have largely superseded inland waterways as the primary means of freight transport, the Mississippi River remains a viable, cost-effective route for bulk goods transport.

The Bi-State Region's central location along the Mississippi, positioned between major waterway hubs in St. Paul and St. Louis, enhances its strategic importance. It is part of the Mississippi River Ports of Eastern Iowa and Western Illinois Port Statistical Area and includes four locks and dams and is supported by a series of barge terminals, grain facilities, and roadway and rail connections (Figure 16). The river is crucial for the transport of regional goods towards the Great Lakes, southern Midwest, and southern U.S. states.

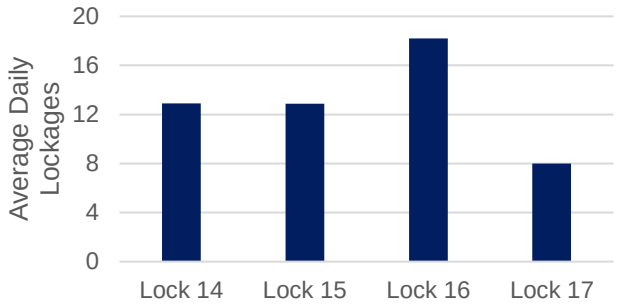
Figure 16: Bi-State Regional Waterway System and Commodities Handled



System Use

Average daily lockages at each lock differ based on the lock's size and its capacity to handle larger vessels, as well as the specific stopping points of vessels along the river. Historically, the locks in the region haven't been capable of accommodating the common 3 by 5-barge configuration pulled by a single tow. Consequently, larger vessels are often required to split into multiple tows, necessitating several cycles of filling and emptying the lock. This not only leads to an increased number of lockages but can also result in longer wait times and delays for vessels, especially during the peak navigation season (Figure 17).

Figure 17: Average Daily Lockages by Lock, 2020



Source: CPCS analysis of USACE Lock Usage data, 2023.

Goods Handled

The volume of goods managed by maritime vessels is largely influenced by the county's proximity to the river and its provision of riverside facilities for transloading waterborne goods. Consequently, Rock Island County, situated advantageously along the river, handles nearly half of the region's waterborne tonnage (Figure 18). Food and agricultural products are the predominant goods transported by vessels (Figure 19).

Figure 18: Maritime Goods Volume by County

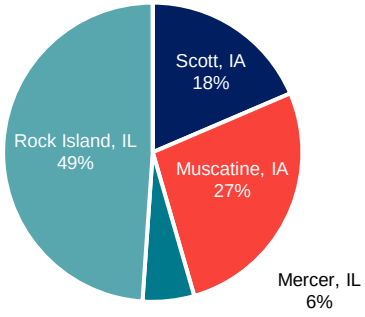
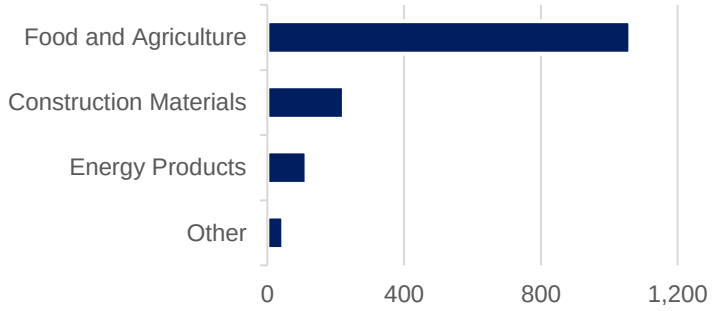


Figure 19: Top Commodities Handled by Vessels (1,000 tons)



Source: WSP analysis of FHWA FAF5 data, 2023

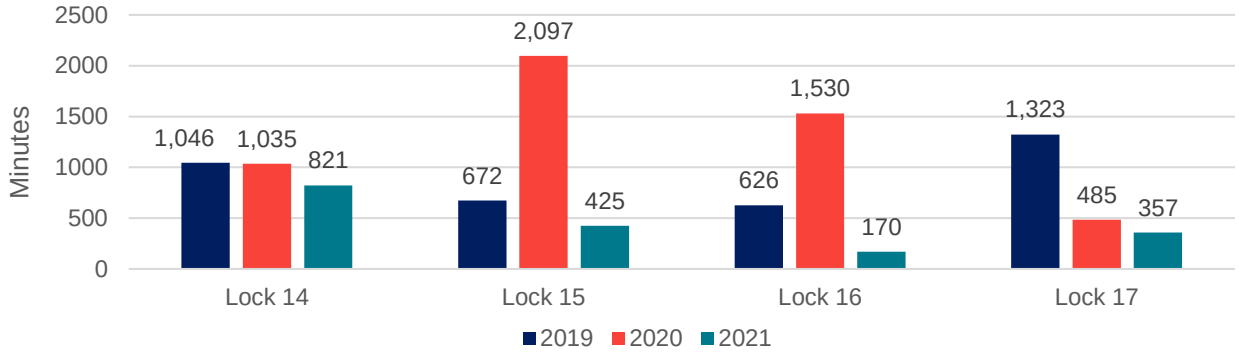
The movement of these goods is predominantly outbound, primarily to states around the Great Lakes and the southern Gulf. The leading trading partner for inbound water tonnage is Louisiana, followed by Illinois, Missouri, and Kentucky, all part of the interconnected Mississippi-Missouri-Ohio-Illinois River System. The leading trading partner – by far – for outbound water tonnage is Louisiana, where commodities barged on the Mississippi River are transferred into ocean-going vessels for export to global markets.

System Performance

The performance of locks and dams along the waterway system has the greatest impact on maritime commerce in the region. Delays and closures of these locks can arise from environmental, seasonal, and structural factors. However, regular maintenance and enhancements in resilience against severe weather events can effectively mitigate these disruptions.

Lock 14, 15, 16, and 17 each are operational 24/7 through the navigational season of early March to early December. The highest average monthly delay was recorded in 2020 and all four locks recorded their lowest average monthly delay in 2021, all under 850 monthly delay hours (Figure 95).

Figure 20: Average Monthly Delays (Tows) by Lock, 2019 - 2021



Source: CPCS analysis of USACE's Lock Queue Report, 2023

While mechanical or electrical failures often result in only temporary lockage delays, significant damage to the operating system or infrastructure of a lock can potentially cause prolonged unscheduled closures. Closures and significant delays not only have implications on queued vessels but also affect the transloading time and efficiency of trucks and freight trains waiting at regional ports. Locks in the Bi-State Region experience an average of 25 to 30 unscheduled closures a year. Closures at Locks 16 and 17 are often the most prolonged, while Locks 14 and 15 experience more frequent closures but for shorter periods (Figure 21).

Figure 21: Total Unscheduled Lock Closures, 2016-2020

Lock	Unscheduled Closures	Unscheduled Closure Hours	% of Total Closures That Were Unscheduled
Lock 14	146	379.70	86.4%
Lock 15	147	1,156.03	89.6%
Lock 16	109	2,500.35	77.3%
Lock 17	116	2,644.54	89.9%

Source: CPCS analysis of USACE's Lock Queue Report, 2023

Trends

- Increase in projected value of commodities handled: Though only projected to increase by 38% in tonnage by 2055, maritime is expected to see a 72% increase in value in the next 30 years.

- Water level fluctuation: One of the top concerns cited by stakeholders for navigable waterways in the Region is drought and occasional severe flooding. Declining water levels at locks on the lower Mississippi River create challenges for navigation downstream and cause occasional closures of entire riverway segments. Insufficient water levels not only necessitate a slower pace of travel but many barges are required to lighten their freight load for shallower channels.

  This barrier to navigation has also been exacerbated by record rainfall and irregular flooding in the upper Mississippi River Basin, causing locks to close from damage to infrastructure or insufficient overhead clearance for barges. Regular maintenance and the resiliency of lock infrastructure in the coming years will be crucial to continued travel along the Mississippi River.

Air System Profile

Despite representing less than 1% of the region's freight tonnage, air cargo is an important transportation mode for moving the region's time-sensitive and higher-value goods. The Bi-State Region, due to the limited availability of air cargo services in the area, depends on its freight network to establish connections with major air hubs, including the Chicago O'Hare International Airport.

1	29	$621 million
Cargo Airport	Quad Cities International On-Flight Freight Enplaned Tonnage*	Air-Related Cargo Value, 2022**

* 2017-2021 5-year average tonnage. Source: Bureau of Transportation All Carriers Statistics T-100 Domestic and International Market data.
** WSP analysis of FHWA Freight Analysis Framework Version 5 (FAF5) data.

Air Cargo Facility

The Bi-State Region is home to six airports, of which Quad Cities International Airport (MLI) is the only airport in the region with passenger and air cargo service. The remainder of the airports in the region primarily serve general aviation traffic (Figure 22).

Figure 22: Bi-State Region Airports

Airport Name	Identifier	Location	Role	Air Cargo Service
Quad Cities International	MLI	Rock Island, IL	Local Hub	Y
Davenport Municipal	DVN	Davenport, IA	Regional	N
Muscatine Municipal	MUT	Muscatine, IA	Local	N
Kewanee Municipal	EZI	Kewanee, IL	Local	N
Mercer County	C00	Aledo, IL	-	N
Gen Airpark	3G8	Geneseo, IL	-	N

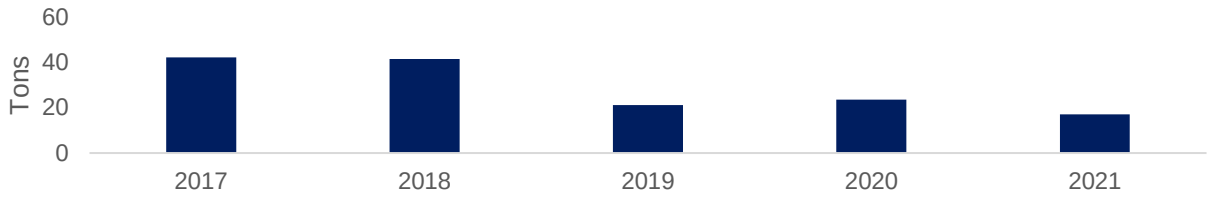
Source: CPCS analysis of BTS T-100 Domestic data and National Plan of Integrated Airport Systems classification

Spanning 2,021 acres, MLI is equipped with three runways, the longest stretching 10,002 feet. The airport hosts several air freight companies such as BAX Global, DHL, and UPS Supply Chain Solutions. Additionally, MLI is a center for ground-based industrial and consolidation operations, complemented by a nearby USPS distribution center.

System Use

The region's air cargo services rely solely on the tonnage loaded at MLI. Yet, the amount of cargo processed at the airport has consistently declined over the past five years (Figure 23). This trend highlights the region's increasing dependence on external gateways, including Chicago's ORD, located 200 miles east in Chicago, IL, for air freight services. Consequently, the efficiency and dependability of the highway transportation system have become crucial in ensuring seamless connections for air transport.

Figure 23: MLI On-Flight Freight Enplaned Tonnage, 2017-2021

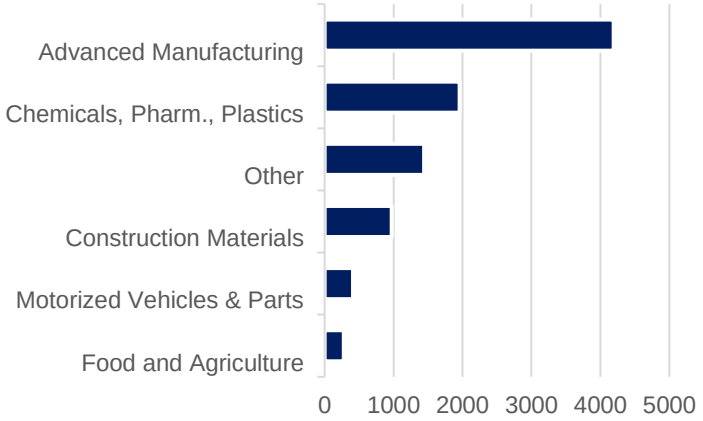


Source: CPCS analysis of Bureau of Transportation Statistics, T-100 International and Domestic Market (All Carriers) Database

Goods Handled

Analysis of FHWA's FAF data reveals that air cargo is most important for the Advanced Manufacturing commodity group, followed by Chemicals, Pharmaceuticals, and Plastics commodity groups (of which pharmaceuticals are very low in weight and very high in value, Figure 24). The leading origins for inbound shipments include Michigan, California, Texas, Pennsylvania, and Tennessee. For outbound shipments, the primary destinations are Florida, Michigan, Ohio, California, and New York.

Figure 24: Top Commodities Handled by Air (tons)



Source: WSP analysis of FHWA FAF5 data, 2023

System Performance

MLI is equipped to handle virtually any type of aircraft under almost all weather conditions, thanks to its extended runways. It has successfully met all the objectives set for airfield, landside facilities, and airport services in the *Illinois Aviation System Plan* (2022). According to *the Illinois Aviation Economic Impact Analysis* (2020), the airport's economic impact is estimated at $647.3 million, positioning it as the sixth most impactful in Illinois.

Trends

- Recent Quad Cities Airport Expansion**:** In 2022, the airport began a reconstruction process to alter the layout of its airport, a $10 million project funded entirely by the FAA. The plan would add a new taxiway parallel to the airport's main commercial runway. In 2023, the Metropolitan Airport Authority Board of Commissioners approved plans to conduct a commercial spaceport planning study at the Quad City International Airport.

- Significant project growth in total commodity flow: According to the FHWA's FAF5 forecasts, air transport is anticipated to experience the most substantial growth in terms of both tonnage and value, outpacing all other modes. This growth is driven by expected rises in domestic air flows and the expanded capacity of the regional airport. By 2055, tonnage is projected to surge by 131 percent, while the value is predicted to escalate by 234 percent.

1 Introduction

The Bi-State Regional Commission (BSRC) undertook the significant task of completing a comprehensive freight plan for the region in 2015. In the intervening years since the 2015 Freight Plan, the landscape of goods movement in the region has undergone substantial transformations. Factors such as the exponential growth of e-commerce, the widespread impact of the COVID-19 pandemic, the advent of precision-scheduled railroading, and the forthcoming consolidation of two Class I railroads passing through Davenport will continue to impact the region.

Canadian Pacific-Kansas City Southern Railroad Merger

In March 2023, the Surface Transportation Board (STB) authorized the acquisition of Kansas City Southern (KCS) by Canadian Pacific (CP). This merger resulted in the creation of CPKC, the first single-line railway connection between Canada, the US, and Mexico.[4]

As a result, the Bi-State Region is expected to see a significant increase in freight train traffic, with CPKC's operation in Davenport projected to increase from around 7 trains per day to 17-22 trains per day.[5] The merger will spur side rail construction in the region, with two siding extensions planned in the CP Davenport subdivision: the Deer Creek Siding extension and the Camanche siding extension.

Figure 25: Railroad Improvements Planned Along the CPKC Lines

Source: Canadian Pacific Railroad, October 2021.

Within the region, the aluminum and steel manufacturing industry along with the grain and related product manufacturing industries are anticipated to experience the most direct impact from the merger. The merger is expected to expand the reach of these industries, connecting them more efficiently with high-consumption destinations in the Gulf region and Mexico. Other impacts of this merger may include reduced highway truck traffic and the pollution associated with it. [6]

Several larger cities in the region, including Davenport, Bettendorf, and Muscatine, signed agreements with CP to mitigate the effects of increased train traffic, such as improving grade crossings to allow for "quiet zones."[7]

[4] Surface Transportation Board, STB Approves CP/KCS Merger with Conditions and Extended Oversight Period, March 2023. https://www.stb.gov/news-communications/latest-news/pr-23-07/. Accessed on September 22, 2023.

[5] Mark Ridolfi, The North Scott Press, Rail merger will triple riverfront train traffic. https://www.northscottpress.com/stories/rail-merger-will-triple-riverfront-train-traffic,84968. November 23, 2021. Accessed on September 22, 2023.

[6] Canadian Pacific Railroad, Railroad Control Application, https://dcms-external.s3.amazonaws.com/DCMS_External_PROD/1635796798218/303143.pdf. October 29, 2021. Accessed on September 22, 2023.

[7] Trains News Wire. Bettendorf, Iowa, approves agreement with Canadian Pacific over merger plans. https://www.trains.com/trn/news-reviews/news-wire/bettendorf-iowa-approves-agreement-with-canadian-pacific-over-merger-plans/. July 7, 2022. Accessed on September 22, 2023.

Since the 2015 Freight Plan, there have been significant investments in the region's freight infrastructure. This includes the launch of the I-74 Mississippi River Corridor Project, to which $1.2 billion in federal aid has been allocated or scheduled (Figure 26). In addition to various capital projects, there are several studies around improving the region's freight assets, including a study on the alternatives to improve/replace the existing railroad crossings at the Government Bridge and Crescent Bridge and a Planning and Environment Linkages study for the I-80 bridge.

Figure 26: The Newly Constructed I-74 Mississippi River Bridge

Source: Illinois DOT, 2023 [8]

The Mississippi River Port of Eastern Iowa and Western Illinois's recent designation as a port statistical area could also be a catalyst in increasing the area's terminal and port utilization. This designation allows for accurate data to be collected along the region's segment of the Mississippi River and provides the Region with a means of monitoring modal shifts and access.

In addition to the creation of a new FedEx Freight distribution center located along IL5 Iin East Moline connected to I-80, the region has also seen an increase in private transload facilities and warehouses with rail service. For example, the City of Davenport was awarded an Economic Development Administration (EDA) grant to establish a transload facility in the Eastern Iowa Industrial Center in 2016 with indoor loading/unloading capabilities and 20,000 square feet of warehousing space. Improvements were completed in 2019 to construct two interchange tracks on the rail line servicing the facility and the addition of a fourth spur. Further expansions in warehousing and transloading services in the Eastern Iowa Industrial Center are expected in the next few years due to the location's strategic proximity to the BNSF and CP rail lines (Figure 27).

Figure 27: Eastern Iowa Industrial Center Transload Facility

Source: Engineering Rail Solutions, 2023[1]

Additionally, an evolving array of regulatory guidelines and policy priorities—emanating from federal, state, and regional authorities—continues to influence investment and management decisions related to freight logistics.**Given these dynamic changes, the moment is opportune to update regional freight data and offer an informed perspective on the current state of goods movement.**

To this end, the BSRC has launched the Freight Plan Addendum project. This project is dedicated to providing a comprehensive update on the multifaceted aspects of the region's freight system, including its utilization and performance metrics. This report is structured to offer a thorough analysis and insights across several key dimensions:

- Chapter 2 presents an expansive overview of the multimodal freight system, dissecting it by individual modes to provide a clear understanding of its composition and functioning.

- Chapter 3 revisits the region's freight system goals and introduces objectives for regional freight stakeholders to address the challenges and capitalize on the region's inherent strengths.
- Chapter 4 delivers a detailed examination of how the region's freight system is performing in relation to the established goals, providing an assessment of its efficacy and areas for enhancement.
- Chapter 5 dives into the commodity flow profile, breaking it down by mode and industry groups, and extends its vision to include forecasts up to the year 2055, offering a long-term perspective on expected trends and shifts.
- Chapter 6 encapsulates the findings from surveys and interviews conducted with freight system stakeholders, providing insights into the experiences and suggestions of those directly engaged with the freight network.

2 Bi-State's Multimodal Freight System

Key chapter takeaway

The Bi-State region is serviced by a network of four interstates (I-80, I-280, I-74, and I-88), which are supplemented by national and state highways such as US-61 and US-67. The region is also served by an extensive rail system on either side of the state line with two Class I railroads (Canadian Pacific Kansas City Railroad – CPKC, and Burlington Northern Santa Fe Railroad – BNSF), two short lines (Iowa Interstate Railroad – IAIS and Dakota Minnesota & Eastern – DM&E), and multiple rail yards to support rail operations. In addition to road and rail, the Bi-State region has four locks and dams and one cargo airport (the Quad Cities International Airport).

2.1 Roadway System

The Bi-State Region's roadway network connects the region to the rest of the country, with the majority of connections within a one-day drive from Davenport.

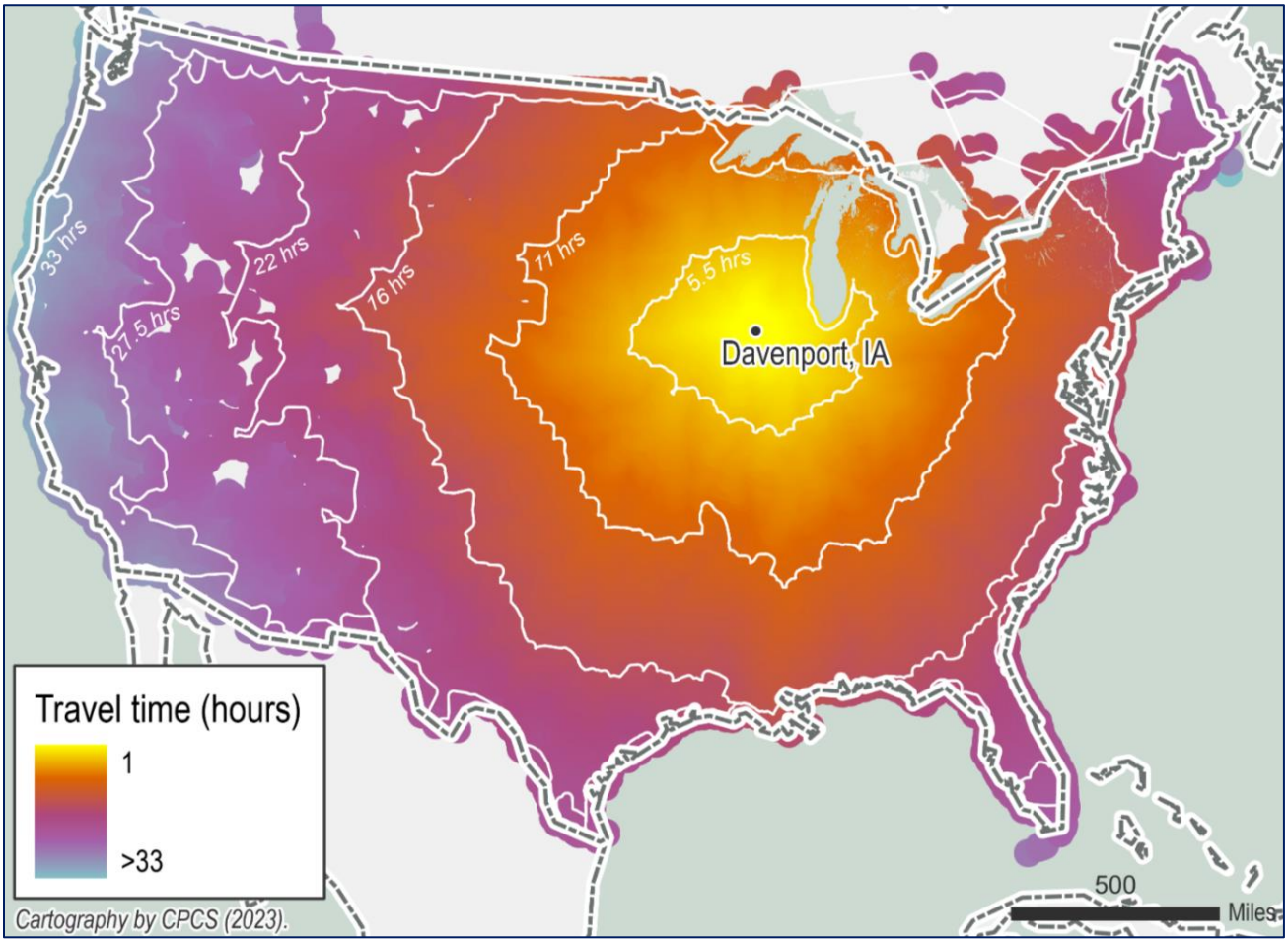
Figure 28: Bi-State Region Roadway System Fast Facts

191	379	165	1,188
Miles of Interstate	Miles of National Highway System	Miles of National Highway Freight Network	Bridges

Source: CPCS analysis of IL DOT and IA DOT roadway network data

As of 2024, nearly 6,765 miles of roads, streets, and highways run through the region. This includes over 191 miles of interstates, 379 miles of roadways on the National Highway System, and 165 miles of roadways on the National Highway Freight Network. The region's freight movement by truck is also supported by a network of state highways, as well as county and local routes. This integrated network connects the region to key destinations nationwide, and most of the US is accessible within a one-day drive from Davenport (Figure 29). Figure 30 depicts the Bi-State Region's roadway network by functional classification.

Figure 29: Truck Travel Time Bands Centered on Davenport, IA, 2023



Data Source: FHWA FAF5 data

Figure 30: Roadway Network by Functional Classification, 2023

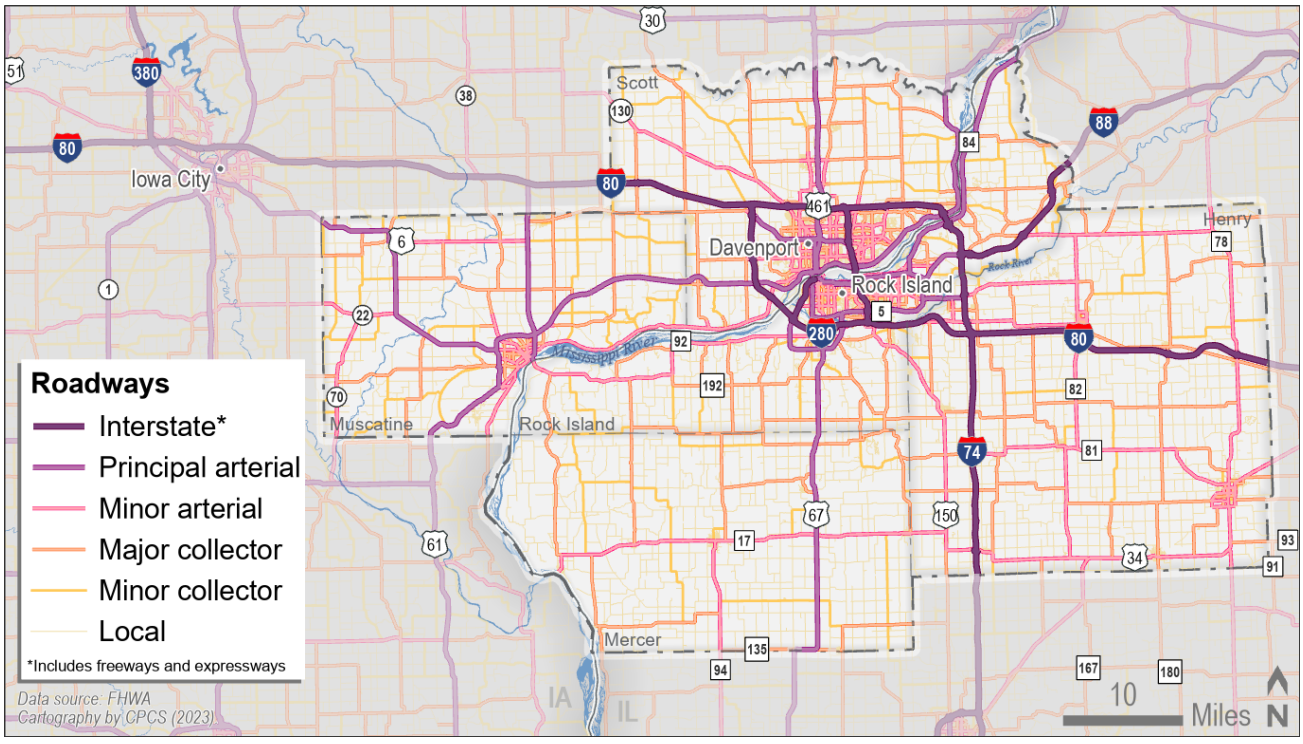


Figure 31 and Figure 32 present the roadway inventory by county and by state. Close to two-thirds of the Bi-State Region's roadway infrastructure is on the Illinois side, with Henry County, Rock Island County, and Mercer County sharing 26%, 22%, and 16% of the total roadway mileage, respectively. Scott County and Muscatine County in Iowa share the remaining 22% and 13% of the roadway mileage.

Figure 31: Summary of Highway System Facilities for the Illinois Portion of the Bi-State Region, 2023

Functional Classification	Henry County		Rock Island County		Mercer County		Bi-State Region (IL)	
	Miles	Share	Miles	Share	Miles	Share	Miles	Share
Interstate*	74	4%	73	5%	-	0%	147	3%
Other Principal Arterial	2	0%	84	6%	18	2%	104	2%
Minor Arterial	184	10%	102	7%	50	5%	336	8%
Major Collector	212	12%	185	12%	84	8%	482	11%
Minor Collector	51	3%	90	6%	79	7%	220	5%
Local	1,269	71%	956	64%	837	78%	3,061	70%
Total**	1,792	26%	1,490	22%	1,068	16%	4,350	64%

County level values may not sum to total values due to rounding.
*Includes freeways and expressways, ** Share of total Bi-State Region roadway mileage.
Source: CPCS analysis of roadway data from IL DOT[8]

Figure 32: Summary of Highway System Facilities for the Iowa Portion of the Bi-State Region, 2023

Functional Classification	Scott County		Muscatine County		Bi-State Region (IA)	
	Miles	Share	Miles	Share	Miles	Share
Interstate*	44	3%	-	0%	44	2%
Other Principal Arterial	70	5%	64	7%	133	6%
Minor Arterial	125	8%	68	7%	193	8%
Major Collector	182	12%	91	10%	274	11%
Minor Collector	74	5%	135	15%	209	9%
Local	1,013	67%	549	61%	1,562	65%
Total**	1,508	22%	906	13%	2,415	36%

County level values may not sum to total values due to rounding.
*Includes freeways and expressways, ** Share of total Bi-State Region roadway mileage.
Source: CPCS analysis of roadway data from IA DOT[9]

[8] IL DOT. Illinois Highway System File. https://apps1.dot.illinois.gov/gist2/. Accessed on September 18, 2023.

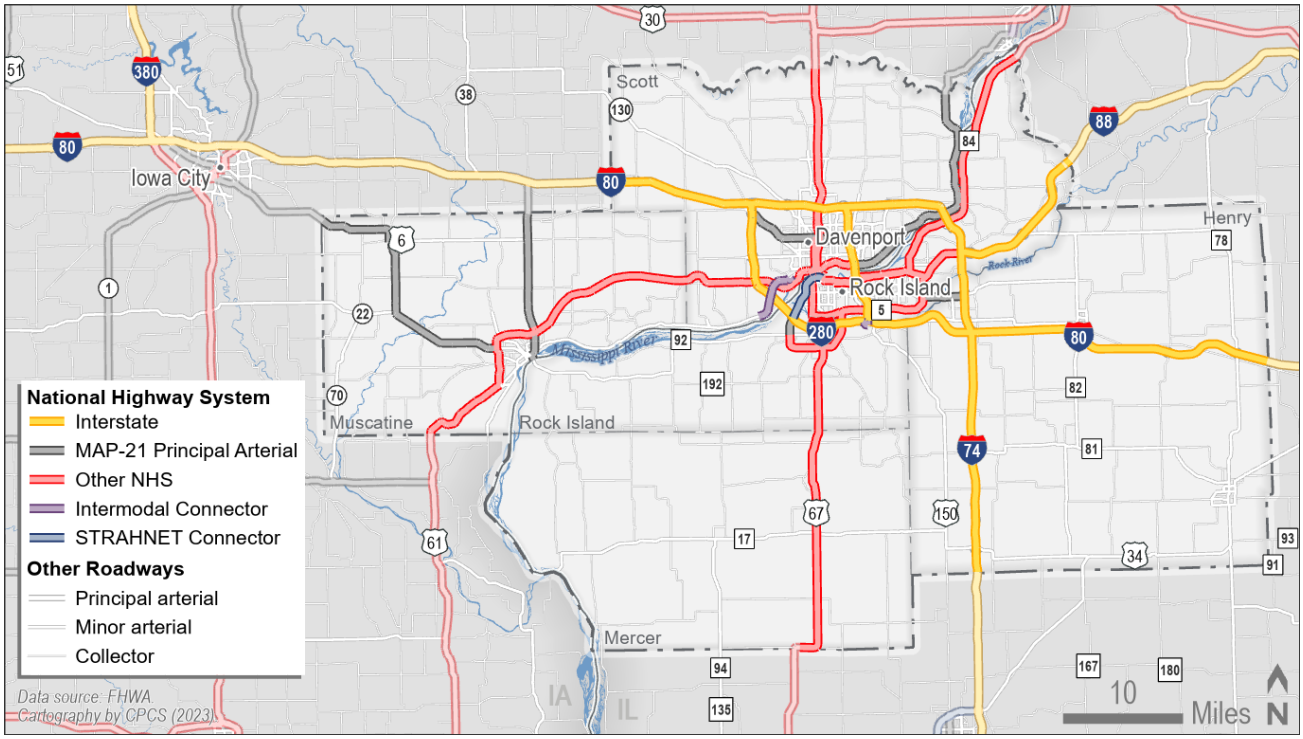
[9] IA DOT. County Federal Functional Classification (Rural Mileage). January 1, 2021. https://iowadot.gov/systems_planning/pr_guide/Mileage%20Reports/RURMILE.pdf. Accessed on September 18, 2023. County Federal Functional Classification (Urban Area System Mileage). January 1, 2021. https://iowadot.gov/systems_planning/pr_guide/Mileage%20Reports/URBMILE.pdf. Accessed on September 18, 2023. Data was cross-compared with the Road Network data from the IA DOT Open Data site. https://data.iowadot.gov/datasets/f07494c9bc6048d8a34c50af400f2264/explore. Accessed on September 18, 2023. The data reported by the IA DOT was used due to the inconsistent ways the road network GIS layer coded different roadways in the region.

National Highway System

The FHWA designates the National Highway System (NHS) which consists of roadways important to the nation's economy, defense, and mobility (Figure 33). In addition to the interstates, the NHS is primarily made up of the following:

- **Strategic Highway Network Connector (STRAHNET):** STRAHNET is a designation given to roads that provide defense access, continuity, and emergency capabilities for movements of personnel and equipment in both peace and war. There is a STRAHNET connector from I-74 to the Rock Island Arsenal.
- **Intermodal Connectors:** Intermodal connectors are roadways that provide first- and last-mile connections to intermodal facilities. Although intermodal connectors only account for a small share of the Bi-State Region's transported' highway system mileage, they are critical to the efficient and reliable movements of freight. The three NHS Intermodal Connectors in the region include SR 22 / Rockingham Rd which connects the Harvest States Peavy Port Terminal to I-280. This port primarily deals in commodities related to food and farm products and supports the Bi-State Region's agriculture industry. Similarly, SR 22/Rockingham connects to the former Quad Cities Container Terminal, via S. Rolff Street, to I-280. Roadways (US 6, 27th St, 69th Ave, and Airport Rd) serving the Quad City International Airport are also designated as Intermodal Connectors.
- **MAP-21 Principal Arterial:** Roadways added to the NHS by the MAP-21 legislation. They include US-6 between I-280 and I-74 in Scott County, US-57 between I-74 and I-80 in Scott County, Colona Road between IL-5 and I-80 in Rock Island and Henry Counties, and IA-38 and IA-22 in Muscatine County.
- **Other Principal Arterials:** These are highways in rural and urban areas that provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.

Figure 33: The National Highway System in the Bi-State Region, 2023

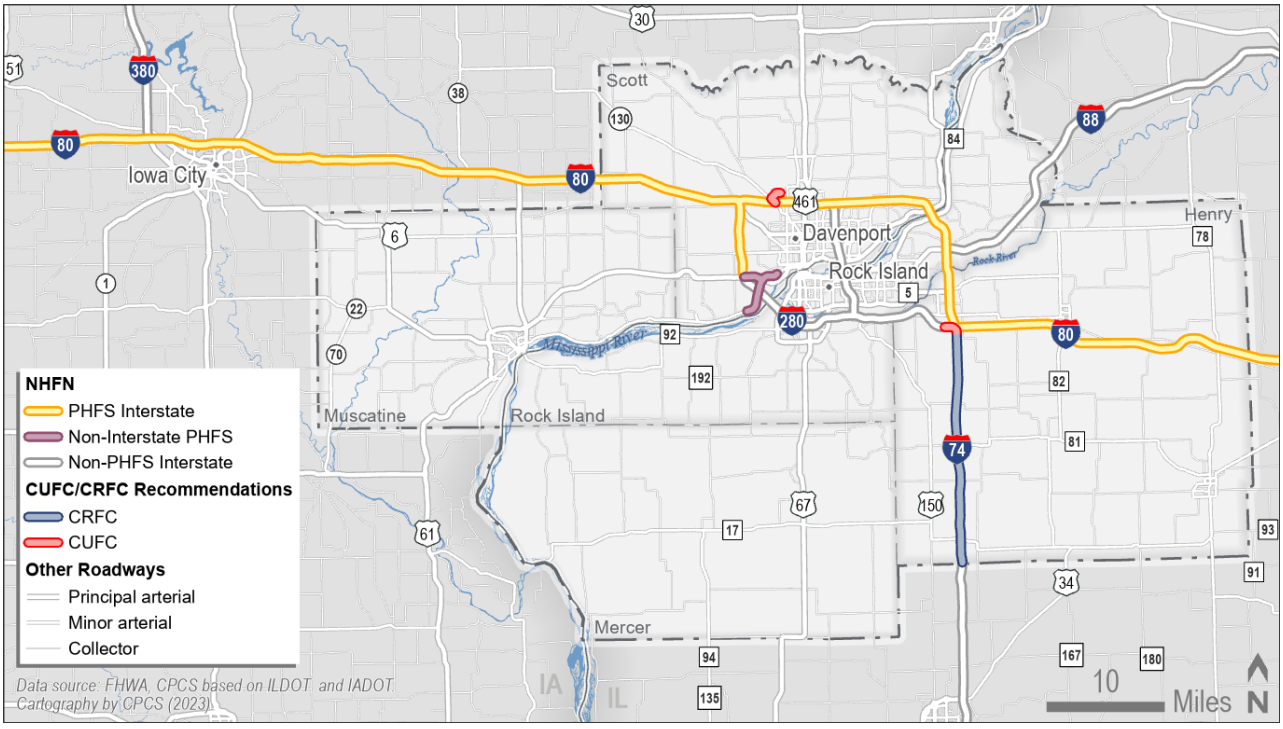


National Highway Freight Network

The FHWA designates the National Highway Freight Network (NHFN) to strategically allocate federal resources to maintain and enhance the US highway freight system (Figure 34). The NHFN guides the allocation of funds from the National Highway Freight Program (NHFP) and determines the eligibility for the Nationally Significant Freight and Highway Projects grant program. The NHFN in the Bi-State Region includes the following four roadway systems:

- **Primary Highway Freight System (PHFS):** Highway network identified as the most crucial highway portions of the US freight system, designated based on quantitative national data.
- **Other Interstate portions not on the PHFS**: Remaining portion of Interstate roads that provide continuity and critical connections to freight transportation facilities.
- **Critical Rural Freight Corridors (CRFCs):** Public roads not in an urbanized area provide access and connection to the PHFS and the Interstates, as well as freight transportation facilities, such as ports and intermodal facilities. CUFCs are designated by states and metropolitan planning organizations (MPOs) up to a maximum mileage. Illinois designated I-74 (west segment) between the I-74 southbound ramp (Ramp 74EB to 7SB) and Henry/Knox County Line as CRFCs (19.16 miles).[10] There are no CRFCs designated on the Iowa side of the region.
- **Critical Urban Freight Corridors (CUFCs):** Public roads in urbanized areas that provide access and connection to the PHFS and the Interstate, as well as freight transportation facilities. Illinois designated I-74 (west segment) between I-280 and the I-74 southbound ramp (Ramp 74EB to 7SB) as CUFCs (1.8 miles) as CUFCs. Iowa designated IA-130, Hillandale Road, Enterprise Way connecting I-80 and the Davenport Transload Facility as CUFCs (1.1 miles).[11]

Figure 34: The National Highway Freight Network in the Bi-State Region, 2023



[10] IL DOT, Office of Planning and Programming, CUFC and CRFC Recommendations, September 28, 2018.

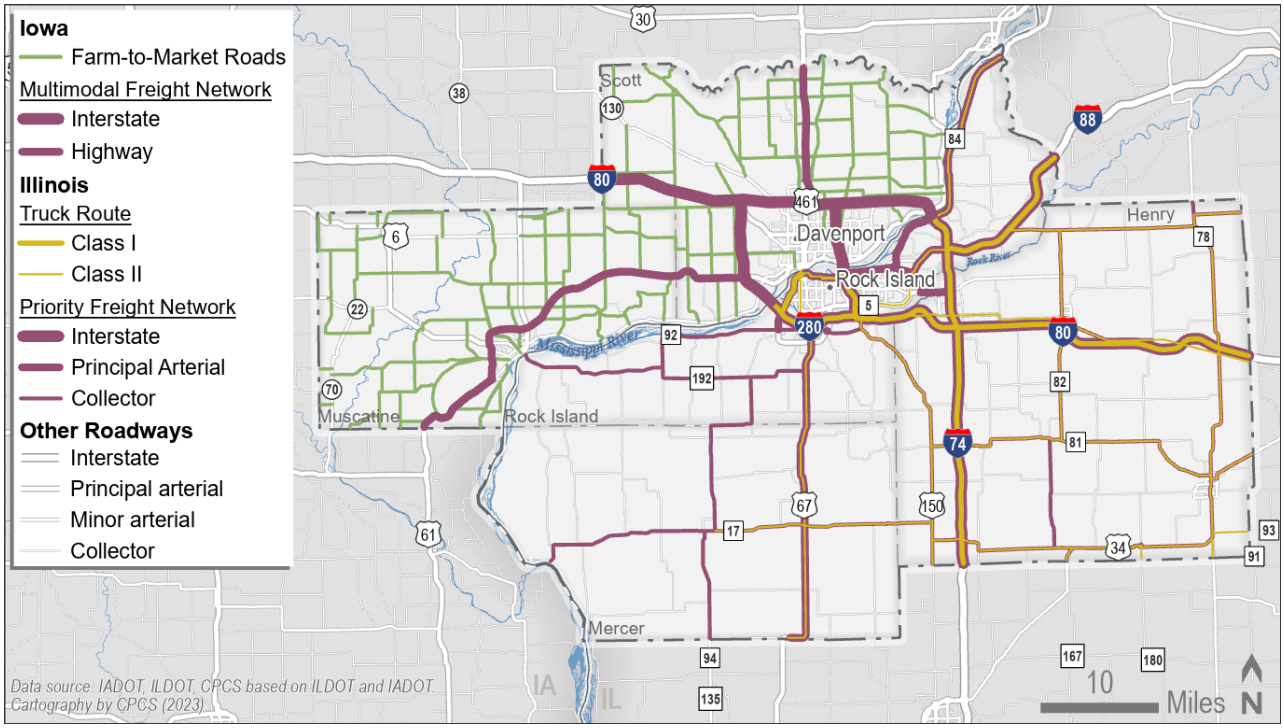
[11] IA DOT, State Freight Plan. August 2022. https://iowadot.gov/iowainmotion/files/SFP2022-State-Freight-Plan-Full-Document.pdf. Accessed on January 18, 2024.

Regional Freight Corridors

In addition to the roadways that are critical at the national level as discussed in the previous section, the states of Iowa and Illinois also identified freight corridors in the Bi-State Region that are critical for freight movement at the state level (Figure 35).

- **Iowa:** Iowa DOT designated the Iowa Multimodal Freight Network (IMFN) to recognize roadways critical to the state and region, using a set of quantitative criteria.[12] In addition to the interstates, US-61 connecting the region to the north, and US-61 connecting the Davenport urban area with Muscatine is also on the IMFN. Iowa also defines a network of Farm-to-Market Roads, which highlights intra- and intercounty roadways under county jurisdiction that serve principal traffic-generating areas and connect them to other farm-to-market routes, city streets, and primary roads.[13] The *Iowa State Freight Plan* (2022) noted that given the rapidly changing agricultural landscape, it is necessary to reassess the scale and functioning of the Farm-to-Market System.
- **Illinois:** Illinois DOT identified a Priority Freight Network (PFN) using a combination of data and stakeholder input to identify the roadways most critical to economic competitiveness, goods movement, strategic supply chains, market access, and connectivity factors for the state.[14] In addition to the interstates, US-67 connecting the region to the south, IL-81, IL-192, IL-92, and IL-17 serving the rural parts of the Bi-State Region are highlighted as part of the PFN. In addition, Illinois also designates a truck route network, with some roadways overlapping with the PFN.

Figure 35: Regional Freight Corridors in the Bi-State Region, 2023



[12] Iowa DOT, Iowa State Freight Plan, August 2022, https://iowadot.gov/iowainmotion/files/SFP2022-State-Freight-Plan-Full-Document.pdf, accessed on January 18, 2024. Designation requirements for highways: 30% truck traffic, 1,000 annual average daily truck traffic, or 1,000 oversize/overweight permitted loads annually

[13] Iowa DOT, Iowa State Freight Plan, August 2022, https://iowadot.gov/iowainmotion/files/SFP2022-State-Freight-Plan-Full-Document.pdf, accessed on January 18, 2024.

[14] Illinois DOT, Illinois State Freight Plan, July 2023, https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/reports/opp/freight/illinois-2023-state-freight-plan-20230731%20.pdf, accessed on January 18, 2024.

System Use

Key roads for truck movement are presented in the truck AADT map shown in Figure 36 and the truck share map shown in Figure 37. Unsurprisingly, the three major Interstates (I-80, I-74, and I-280) handle the highest levels of truck AADT. Highways of secondary importance in terms of volumes include US 61 stretching from Muscatine to Davenport, IA 38 extending north from Muscatine towards Iowa City, and US 61 northward from Davenport, leading to Dubuque, IA. Additionally, IL 84 north of Rapids City is pivotal for linking the region with the Clinton-Savanna area to the northeast, enhancing access to vital industrial locations such as the Quad Cities Generation Station nuclear power plant and the 3M plant near Cordova. These routes are distinguished not just by their heavy truck traffic but also by a higher ratio of trucks relative to other vehicles.

Figure 36: Truck Annual Average Daily Traffic in the Bi-State Region, 2023

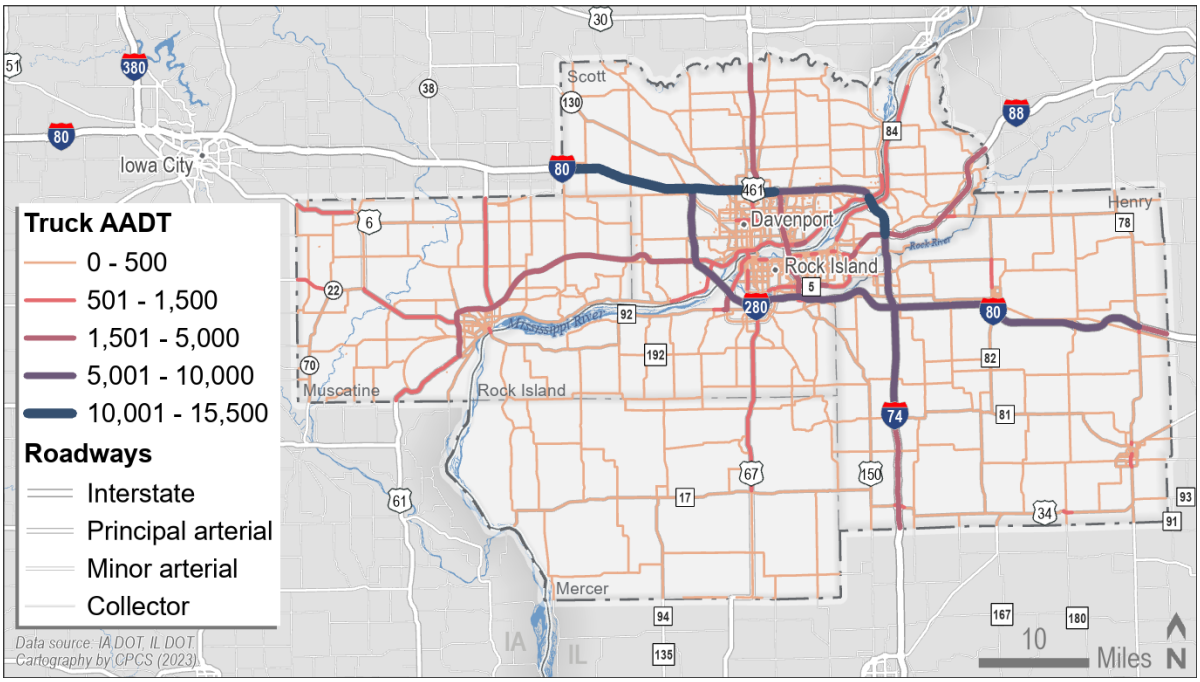
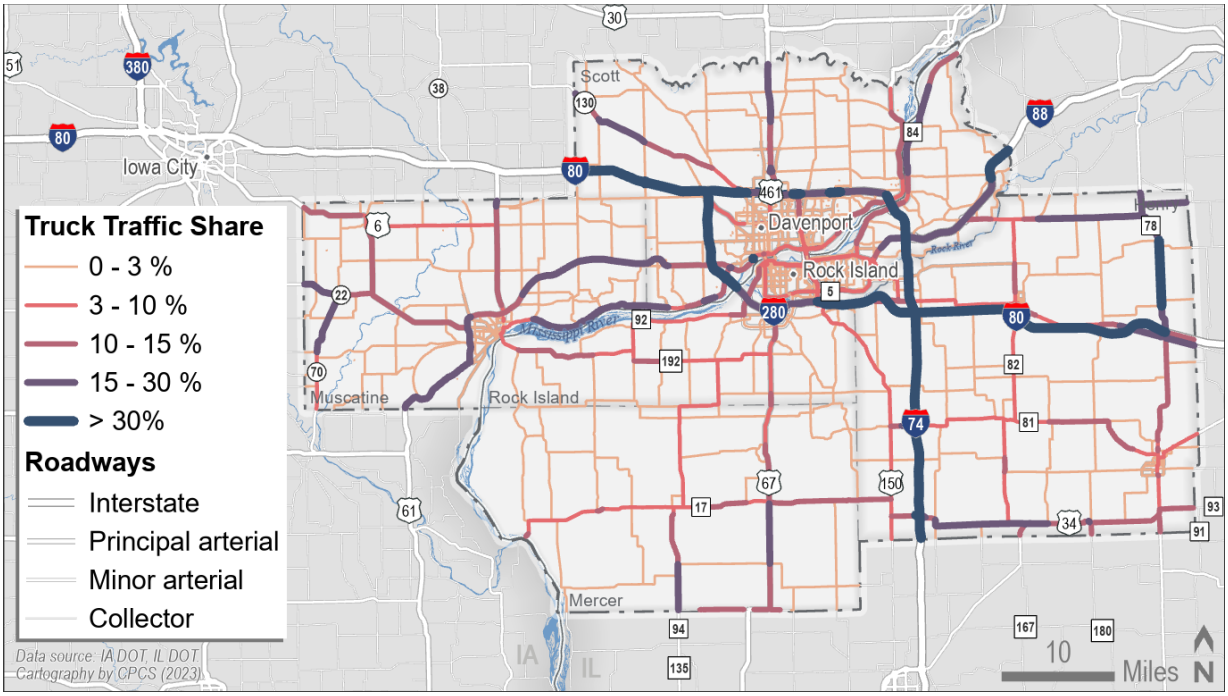


Figure 37: Truck Traffic Share in the Bi-State Region, 2023



2.2 Freight Rail System

Bi-State Region's rail system plays a crucial role in its economy, supporting movements of raw materials, finished goods, and agricultural products to, from, within, and through the Bi-State Region.

Figure 38: Bi-State Region Rail System Fast Facts

346	2	2	658
Active Rail Miles	Class I Railroads	Short Line Railroads	Grade Crossings

Source: CPCS analysis of FRA data, 2024.

Rail Network

The Bi-State Region benefits from an extensive rail system on either side of the state line with two Class I railroads (Canadian Pacific Kansas City Railroad – CPKC, and Burlington Northern Santa Fe Railroad – BNSF), two short lines (Iowa Interstate Railroad – IAIS and Dakota Minnesota & Eastern – DM&E), and multiple rail yards to support rail operations (Figure 39 and Figure 40). Owning and operating the majority of trackage in the region, CPKC's mainline runs along the Mississippi River, serving riverside terminals and grain elevators, and connecting the Bi-State Region to major markets like Chicago and Kansas City. BNSF is most crucial to the Illinois half of the region, intersecting briefly at the Mississippi with the IAIS line and riverside ports before traveling south through Henry County. Serving as an east/west connection, IAIS is the region's dominant short line, intersecting with both Class I lines.

Nearly all railroads on the Iowa side of the region are included in Iowa's priority multimodal freight network, with the exception of DM&E lines and the CPKC line traveling north through central Scott County. [15,16]

Figure 39: Bi-State Regional Rail Operators and Assets

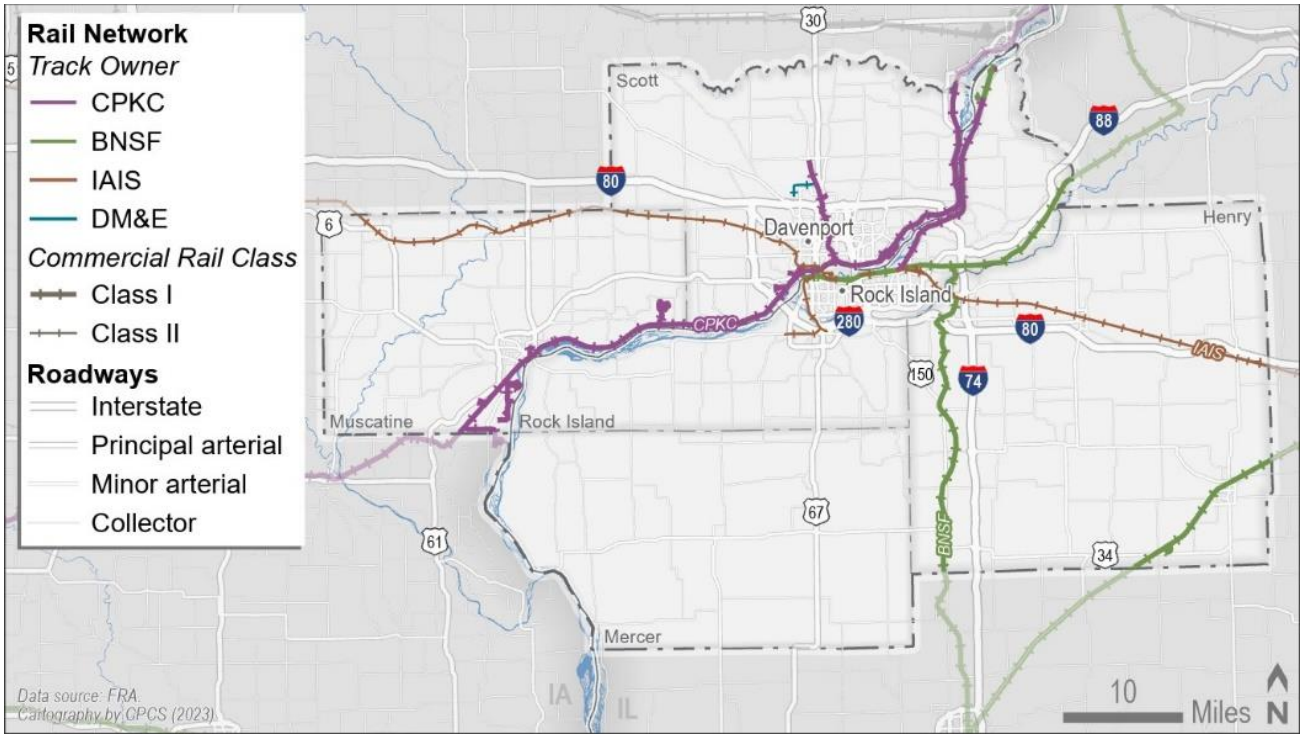
Railroad	Type	Track Mileage*	Subdivisions	Yard locations
Canadian Pacific Kansas City (CPKC)	Class I	154.8	5	Nahant, Bettendorf, West Davenport, Buffalo, Muscatine
Iowa Interstate Railroad (IAIS)	Class II	103.2	3	Rock Island, Silvis
Burlington Northern (BNSF)	Class I	85.6	2	Silvis, Barstow, Rock Island
Dakota Minnesota and Eastern (DM&E)	Class II	2.8	0	N/A

* Within the Bi-State 5-County study area

[15] Iowa DOT, Iowa State Freight Plan, August 2022, https://iowadot.gov/iowainmotion/files/SFP2022-State-Freight-Plan-Full-Document.pdf, Accessed on February 26, 2024

[16] Illinois's Priority Freight Network is designated for the highway system only. Illinois DOT, Illinois 2023 State Freight Plan, December 2023, https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/reports/opp/freight/Illinois%202023%20State%20Freight%20Plan.pdf, Accessed on February 26, 2024.

Figure 40: Bi-State Regional Rail Network by Owner



Canadian Pacific: CPKC is a Class I railroad that operates around 20,000 miles of rail across Canada, Mexico, and the United States. The region is located on its Central Corridor, which provides a direct, single-carrier route between West Coast ports in Canada and the U.S. Midwest, with access to Great Lakes and Mississippi River ports. The Nahant yard in Davenport is a principal terminal on the Central Corridor. Within the region, CPKC owns and operates the largest amount of track at roughly 155 miles and primarily travels along the Mississippi River. CPKC lines in the region intersect with all other regional rail operators at a certain point, offering each a connection to markets north and south of the region or along the Mississippi. As a result, CPKC also maintains the most rail yards in the region, with five spread across Davenport, Bettendorf, Nahant, and Riverdale.

Burlington Northern: BNSF is a Class I railroad with a rail network spanning over 32,500 miles across the Midwest and western U.S. With 85 miles of track in the Bi-State Region, BNSF connects regional industries to major markets through BNSF's Corridors of Commerce – the MidCon Corridor and the Transcon Corridor.

- The BNSF MidCon Corridor spans from Canada and Duluth, Minnesota, through the central United States to Texas's southern ports and connects with other rail lines at the Mexican border. It serves as a key channel for the nation's energy resources, including the transportation of coal to power plants and raw petroleum products. Additionally, it plays a significant role in moving large quantities of agricultural exports.
- The BNSF TransCon Corridor, which stretches from Chicago, Illinois; St. Louis, Missouri; and Atlanta, Georgia, across the heartland and the southern United States to the West Coast ports and major cities in the Southwest and West of the country, acts as a vital gateway for the import and export activities of American businesses and consumers, mainly handling high volumes of consumer goods.

BNSF intersects with both IAIS and CPKC lines in the region, providing easier access to customers in Iowa to BNSF connections.

Iowa Interstate Railway: IAIS is a Class II railroad based in Cedar Rapids, Iowa, and is owned by the Railroad Development Corporation (RDC) of Pittsburgh, PA. IAIS is the largest non-Class I railway in the region and services both Iowa and Illinois markets. IAIS operates over 100 miles of track in the region and provides east-west connectivity through Henry, Rock Island, Scott, and Muscatine Counties. Its operation in the region is supported by rail yards with transloading services in Silvis, IL.

Dakota, Minnesota, Eastern Railroad: DM&E is a Class II railway operating throughout the upper Midwest and is now owned by CPKC. Though a regional railroad, DM&E operates only a small amount of track in the Bi-State area, at 2.8 miles. Still, DM&E acts as CPKC's connection to a transload facility in Scott County, expanding transload access for truckers in the northern part of the region.

Rail-Served Facilities

Regional businesses benefit from a dense network of rail-served grain facilities, transload facilities, and rail yards for loading, unloading, and storing goods before travel (Figure 41). The CPKC rail network boasts the broadest access to these facilities, encompassing both transload and grain-related sites. Meanwhile, BNSF and IAIS provide connections to a substantial number of primarily grain elevator facilities, further enhancing the logistical capabilities within the region.

Figure 41: Regional Rail-Served Grain and Transload Facilities

Facility Name/Operator	Facility Type	Location	Rail Connection
Atkinson Grain and Fertilizer Inc.	Grain facility	Atkinson, IL	IAIS
Big River Resources Galva	Grain facility	Galva, IL	BNSF
River Valley Cooperative	Grain facility	Galva, IL	BNSF
CHS Inc.	Grain facility	Annawan, IL	IAIS
Hillsdale Elevator Company	Grain facility	Annawan, IL	IAIS
Gavilon Grain	Grain facility	Alpha, IL	BNSF
Gavilon Grain	Grain facility	Ophiem, IL	BNSF
Hillsdale Elevator Company	Grain facility	Geneseo, IL	IAIS
Hillsdale Elevator Company	Grain facility	Hillsdale, IL	BNSF
Hillsdale Elevator Company	Grain facility	Orion, IL	BNSF
Rumbold and Kuhn Incorporated	Grain facility	Kewanee, IL	BNSF
County Wide Ag Service Inc.	Grain facility	Atalissa, IA	IAIS
River/Gulf Grain	Grain facility	Bettendorf, IA	CP
Duffe Grain Inc.	Grain facility	Wilton, IA	IAIS
River Valley Cooperative	Grain facility	Eldridge, IA	CP
River Valley Cooperative	Grain facility	Walcott, IA	IAIS
CHS Elburn Elevators	Grain facility	Davenport, IA	CP
Cargill NRR Elevators	Grain facility	Buffalo, IA	CP
Cargill NRR Elevators	Grain facility	Muscatine, IA	CP
CAM II Warehouse	Transload facility	Muscatine, IA	CP
Kinder Morgan	Transload facility	Muscatine, IA	CP
Catch-Up Logistics	Transload facility	Davenport, IA	CP
Murrays Warehousing	Transload facility	Davenport, IA	CP
I&M Rail Link	Transload facility	Davenport, IA	CP

Source: CPCS analysis of ILDOT, IADOT, and BSRC data, 2023.

Rail Crossings

There are 658 total rail crossings in the Bi-State Region. Rail crossings in the region are overwhelmingly at grade with roadways (585 crossings in total), meaning the rail and road physically intersect and allow vehicles to pass over when safe (Figure 42). Though relatively few exist in the region, some crossings may also be over or under the road by means of rail or road bridge, allowing traffic on both rail and roadways to occur simultaneously. The majority of crossings in the region are also public (402 crossings in total). At public crossings, a railway intersects with a public road, meaning any motorist may have access at any time of day. At private crossings, however, the road or crossing may be maintained by an individual or company on private property, meaning its maintenance, safety equipment, and access may be limited by its owner or operator.

Figure 42: Bi-State Railroad Crossings by Position and Type

Crossing Position	Private	Public	Total
At-Grade	247	338	585
Railroad Over the Road	8	23	31
Railroad Under the Road	1	41	42
Total	**256**	**402**	**658**

Source: CPCS analysis of FRA Rail Crossing Inventory data, 2022.

FHWA provides guidance on equipping at-grade crossings with warning devices in the *Manual of Uniform Traffic Control Devices (MUTCD)*. According to the MUTCD, all public grade crossings should at least be equipped with passive warning devices to mitigate conflict between rail and other modes. Traffic control devices such as signs and markings located at or in advance of grade crossings to indicate the presence of a rail crossing are known as passive warning devices. In contrast, active warning devices such as flashing lights and gates change their aspect at the approach or passing of a train. Typically, a combination of passive and active warning devices are installed at grade crossings to improve safety.[17]

Of the 402 public crossings, roughly half are equipped with active warning devices (Figure 43). An additional 103 crossings are supported by passive safety devices but have no active warnings. Very few public crossings have no safety devices at all, at only 6.7 percent of all crossings. However, some crossings do not report the type or quantity of safety devices at their location. This is particularly the case for private crossings that are not mandated to have such devices. 253 of the 256 crossings do not specify whether their intersection is equipped with active or passive warnings.

Figure 43: At-Grade Crossing Safety Devices in Bi-State Region

Safety Device Type	Public	% of Total Public Crossings	Private	% of Total Private Crossings
Active	216	53.7%	0	0%
Passive	103	25.6%	0	0%
None	27	6.7%	3	1.2%
Not Specified	56	13.9%	253	98.8%
Total	**402**	**100%**	**256**	**100%**

Source: CPCS analysis of FRA Rail Crossing Inventory with Equipment data, 2022.

[17] FRA, Highway-Rail Grade Crossings Overview, https://railroads.dot.gov/program-areas/highway-rail-grade-crossing/highway-rail-grade-crossings-overview

Volume

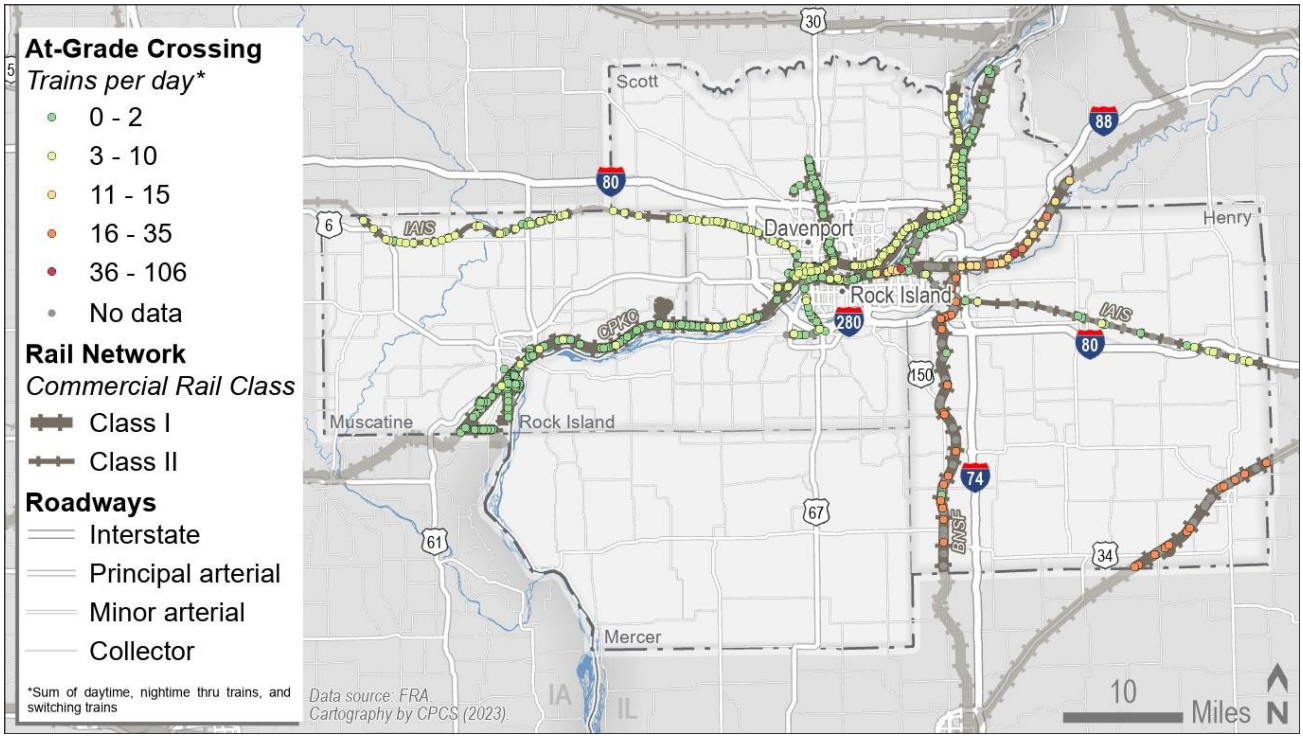
Rail volume and traffic throughout the Bi-State Region depends on a variety of factors including the capacity of regional lines, demand from rail-dependent industries, and efficiency at grade crossings.

When examining tonnage, CPKC's line south of Davenport carries the highest volume of goods (Figure 44). A section of the CPKC line in northern Scott County along the Mississippi also sees a jump in tonnage, presumably due to its proximity to a major lock and riverside facility. IAIS lines, however, also carry a noticeable amount of goods by tonnage throughout the region, carrying one to ten tons daily along the entire line.

Figure 44: Rail Traffic Density by Tonnage, 2022

When considering train count, however, the lines carrying the most traffic differ. Rail traffic is most notably found along the southern portion of the BNSF line, followed by moderate traffic along the CPKC line south of Davenport and the majority of the IAIS line (Figure 45). Providing rail connections for maritime commerce on the Mississippi River and trucks traveling along I-80, each of these lines is crucial for regional goods flow by rail.

Figure 45: Trains Per Day at Grade Crossings

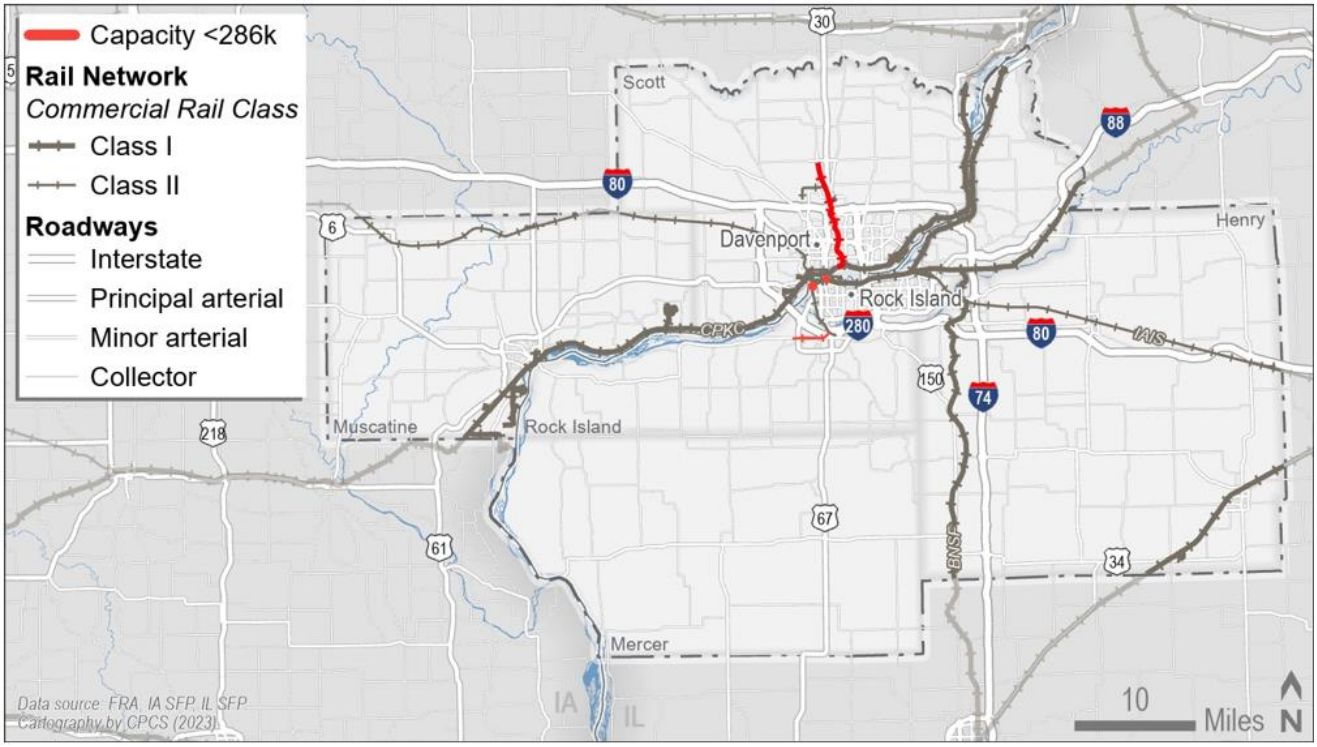


Rail Bottleneck

Like roadways, railways can experience bottlenecks in traffic due to restrictions in capacity, blocked crossings, or maintenance of infrastructure. Rail bottlenecks not only have implications on the efficiency of rail movement and goods but also efficiency at transload facilities and roadway grade crossings.

The industry standard for rail car weight, which includes the weight of commodities and the rail car combined, is 286,000 pounds. The Bi-State Region has rail lines that are unable to carry the sizes and weights of railroad equipment that meet this threshold, mainly the Eldridge subdivision of the CPKC line that travels north across Davenport to the City of Eldridge, as well as portions of IAIS Subdivision west of I-280 and Government and Crescent rail bridges (Figure 46). Though these lines with lower capacity are few throughout the region, this can significantly affect the level of rail access in the area as rail cars along main lines are not able to travel along these subdivisions. As a result, rail traffic may be diverted away to more profitable and higher-traffic lines to avoid interruptions in service. Similarly, rail-dependent businesses may not be able to move to the region due to restrictions in rail service.

Figure 46: Regional Rail Network Weight Capacity



Illinois does not identify any rail bottlenecks in its state as part of its performance evaluation. However, *Iowa's State Freight Plan (2022)* does note that rail bottlenecks exist in the Bi-State Region, primarily as a result of rail line capacity and deteriorating infrastructure. Railroad crossings at the Government Bridge and Crescent Bridge are both over 100 years old and both bridges continue to be highlighted as both waterway freight bottlenecks and railroad freight checkpoints in the Iowa State Freight Plans (2017 and 2022). The Government Bridge currently restricts all rail traffic to 10 mph, and railcar capacity of the structure is marginal for railcars with a maximum allowable gross weight of 286,000 lbs. The Crescent bridge is functionally obsolete and cannot handle railcars exceeding 268,000 lbs. in loaded gross weight.

Blocked Crossings

The frequency and configuration of trains traveling along a railway can also affect the safety and efficiency of movement at grade crossings. The delays generated by blocked crossings create mobility concerns for all travelers. Precision Scheduled Railroading (PSR) is an operating model used by Class I railroads that has led to a recent increase in the number of trains and train lengths across the nation. The model allows rail operators to assign trains to fixed schedules rather than using quotas of loaded cars to determine when a train should depart. Not only does this mean longer and more frequent trains along major lines but also the abandonment of smaller and less profitable lanes. This operation model can slow down rail movement and cause trains to wait longer for service at rail yards and transload facilities, ultimately blocking at-grade crossings.

Blocked Crossing Safety Issues

Studies have shown that drivers will attempt to clear the crossings in front of arriving trains at locations where crossings are routinely blocked for extended periods. Pedestrians may also attempt to cross the blocked crossings by crawling between stopped railcars.

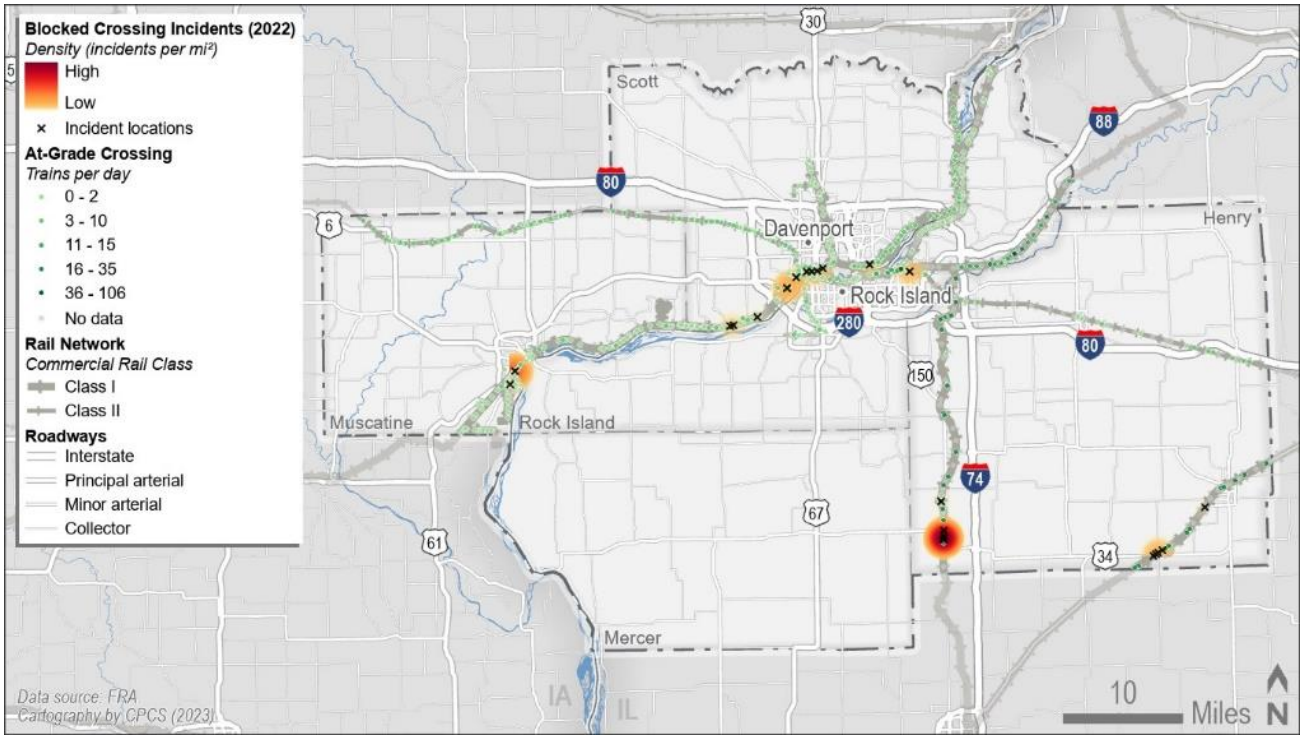
To address such safety issues, the FRA started collecting inputs from the road users and communities living near grade crossings in 2018, in order to identify the priority locations and offer effective solutions.

Source: FRA Newsroom, FRA Launches Web Portal for Public to Report Blocked Railroad Crossings, 2019.

Blocked grade crossings not only have implications on roadway traffic but also safety, as high volumes of traffic or motorists on major roadways are forced to stop for an indeterminate amount of time. Motorists or pedestrians may attempt to cross in cases where proper barriers or safety equipment are not present.

As longer and higher counts of train cars are expected along Class I railways, blocked crossings in the region are most common along CPKC's mainline as well as small southern portions of the regional BNSF line (Figure 47). This also corresponds with travel along interstates in the Quad Cities as well as south near I-74.

Figure 47: Regional Rail Blocked Crossing Hotspots, 2022



2.3 Freight Maritime System

With the Mississippi River running throughout the Region, maritime commerce is crucial to regional mobility across modes. The condition of the maritime freight infrastructure is key not only for ensuring waterway connections but also for maintaining cost-effective transportation of bulk commodities and agricultural goods.

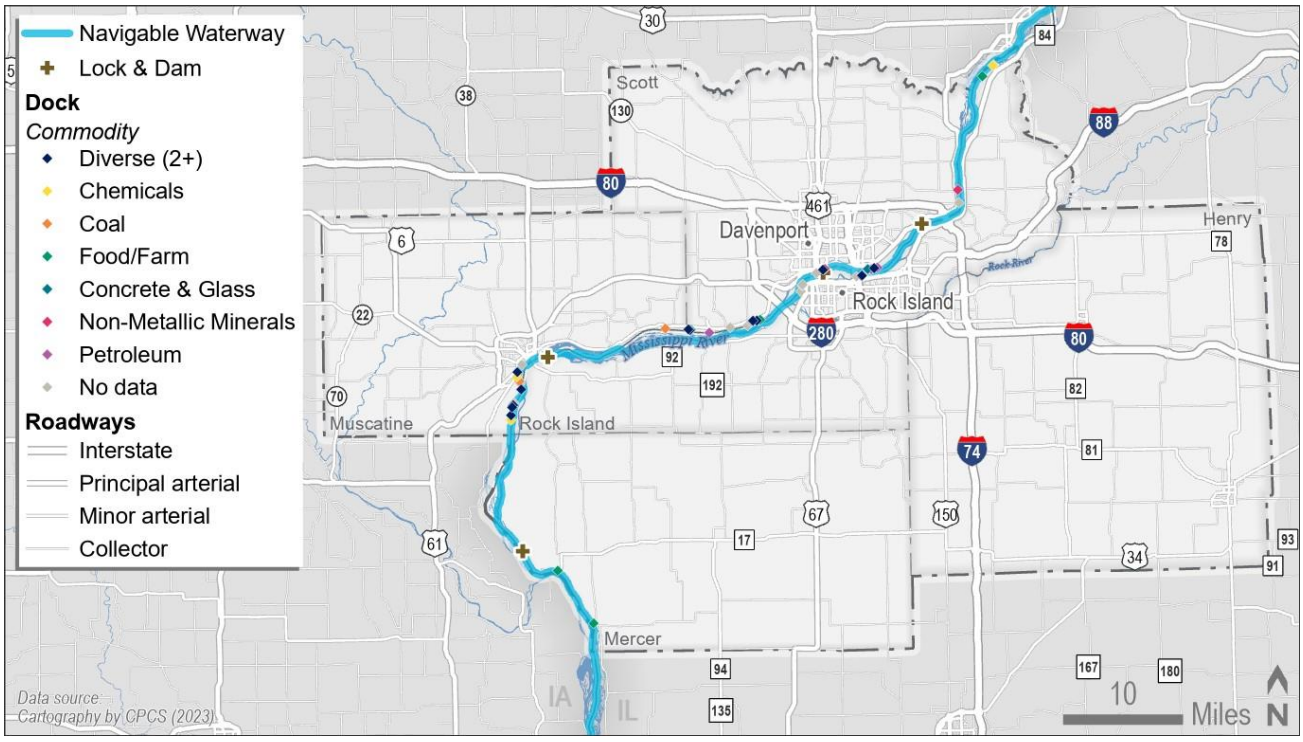
Figure 48: Bi-State Region Maritime System Fast Facts

4	55	$363 million
Locks and Dams	Docks	Maritime-Related Cargo Value, 2022

Waterway System and Facilities

Bisecting the Bi-State Region, the Mississippi River, with its 9-ft. channel and a 10-month navigation season, stands as the nation's primary navigable inland waterway. Its journey begins near the Canadian border, winding south through the Midwest's fertile plains before reaching the Gulf, where it joins global shipping networks. While railroads and the interstate highway system have largely superseded inland waterways as the primary means of freight transport, the Mississippi River remains a viable, cost-effective route for bulk goods transport.

Figure 49: Bi-State Regional Waterway System and Commodities Handled



The Bi-State Region's central location along the Mississippi, positioned between major waterway hubs in St. Paul and St. Louis, enhances its strategic importance. It is part of the Mississippi River Port of Eastern Iowa and Western Illinois Port Statistical Area, includes four locks and dams, and is supported by a series of barge terminals, grain facilities, and roadway and rail connections (Figure 49). Many of the ports and locks along the river handle a diverse range of commodities though some individual docks are dominant in single goods like coal, chemicals, or minerals. The river is crucial for the transport of regional goods towards the Great Lakes, southern Midwest, and southern U.S. states.

Of the four locks operating within the region, two are supported by auxiliary locks and dams that allow for alternate routes of travel during closures or maintenance. These auxiliary locks on Locks 14 and 15 are roughly half the size of their corresponding main locks, requiring any passing vessels to break down into multiple tows or wait in longer queues (Figure 50). At 600 feet long, the primary locks in the region are not capable of accommodating the common 3 by 5-barge configuration pulled by a single tow. Consequently, larger vessels are often required to split into multiple tows, necessitating several cycles of filling and emptying the lock. This not only leads to an increased number of lockages but can also result in longer wait times and delays for vessels, especially during the peak navigation season.

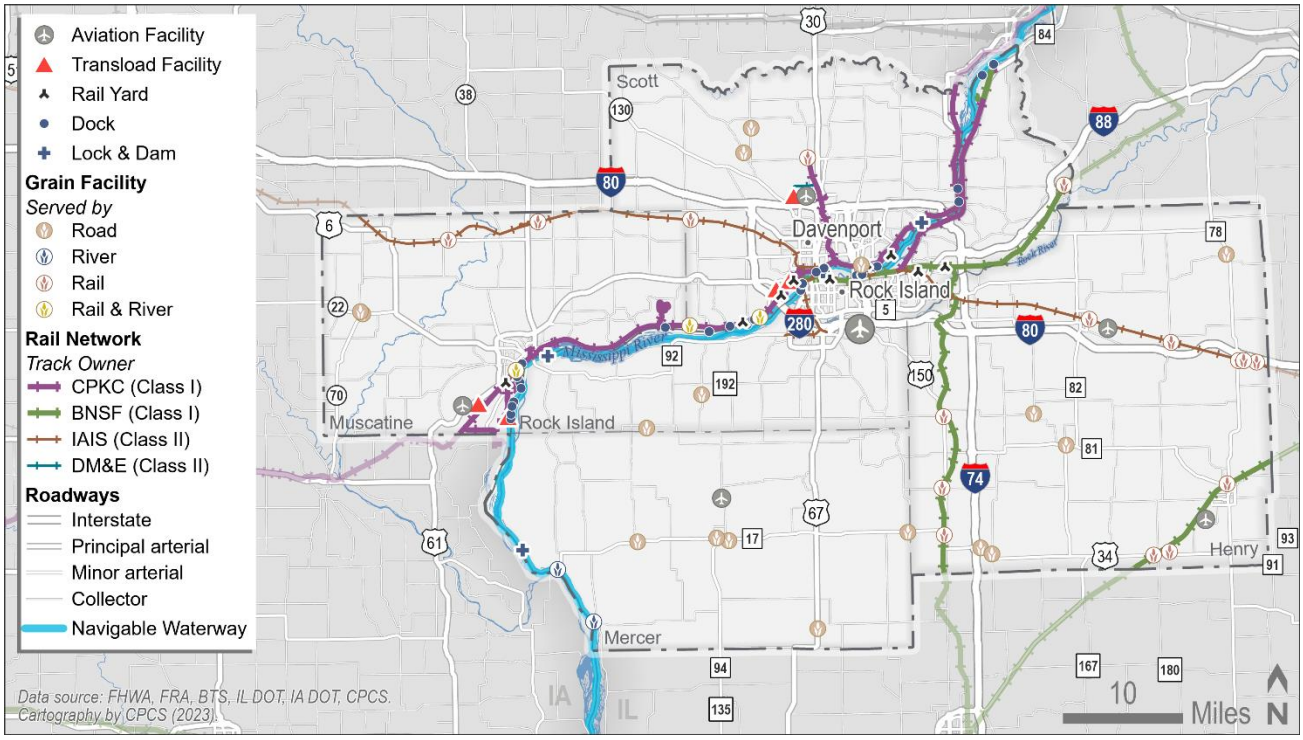
Figure 50: Bi-State Regional Lock Characteristics

Lock and Dam	River	Navigation Mile	Status	Length (ft.)	Chamber Width (ft.)	Normal Lift (ft.)
Lock 14	Mississippi	493.0	Operational	600	110	11
Aux	Mississippi	493.0	Seasonal	320	80	11
Lock 15	Mississippi	482.9	Operational	600	110	16
Aux	Mississippi	482.9	Operational	360	110	16
Lock 16	Mississippi	457.2	Operational	600	110	9
Lock 17	Mississippi	437.1	Operational	600	110	8

Source: USACE Lock and Dam Characteristics, 2022.

Though the waterway system serves a wide range of commodities, it plays a major role, particularly in the movement of grain and feed throughout the region (Figure 51). Food and agricultural goods are the top commodity transported by maritime vessels by tonnage. As a result, many of the ports and docks are equipped with grain facilities, able to store and load or unload grain from barges. Three of these facilities are not only accessible by river and road but also by rail. CPKC and BNSF both have lines connecting rail-dependent and agricultural businesses to grain facilities along the river.

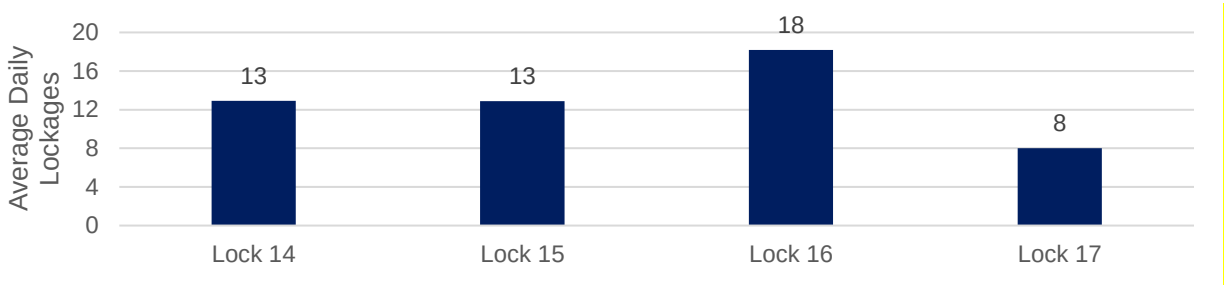
Figure 51: Bi-State Regional Grain and Transload Facilities



System Use

Average daily lockages at each lock differ based on the lock's size and its capacity to handle larger vessels, as well as the specific stopping points of vessels along the river. All locks within the Bi-State Region have a length of 600 feet and a width of 110 feet. The higher average of daily lockages at Lock 16, therefore, could be attributed to the use of auxiliary locks at Locks 14 and 15 or more regular delays or maintenance at Locks 14, 15, and 17 (Figure 52). Still, all four locks average between 8 to 17 lockages per day during the peak navigational season of March to December.

Figure 52: Average Daily Lockages by Lock, 2020



Source: CPCS analysis of USACE Lock Usage data, 2023.

2.4 Freight Air System

Despite representing less than one percent of the region's freight tonnage, air cargo is an important transportation mode for moving the region's time-sensitive and higher-value goods, including advanced manufacturing materials, chemicals, and pharmaceuticals.

Figure 53: Bi-State Region Freight Air System Fast Facts

1	29	$621 million
Cargo Airports	Quad Cities International On-Flight Freight Enplaned Tonnage[18]	Air-Related Cargo Value, 2022[19]

Source: CPCS analysis.

The Bi-State Region is home to six airports (Figure 54). Quad Cities International (MLI) is the only airport in the region with passenger and air cargo service. The remainder of the airports in the region primarily serve general aviation traffic. The Federal Airport Administration (FAA) publishes the National Plan of Integrated Airport Systems (NPIAS) every three years to identify airports deemed critical to the national airspace system. The NPIAS also determines the amount and type of airport development eligible for Airport Improvement Program (AIP) funding for NPIAS airports. According to the NPIAS:

- The Quad Cities International Airport is categorized as a local hub airport.
- The Davenport Municipal Airport, owned and operated by the City of Muscatine, is considered a regional airport.
- Muscatine Municipal Airport, owned and operated by the City of Muscatine, is considered a local airport.
- Kewanee Municipal Airport, owned by the Kewanee Airport Authority and primarily serves light general aviation aircraft, is also considered a local airport.

[18] 2017-2021 5-year average tonnage. Bureau of Transportation All Carriers Statistics T-100 Domestic and International Market data. https://www.transtats.bts.gov/Fields.asp?gnoyr_VQ=FIL.Accessed on January 22, 2024

[19] WSP analysis of FHWA Freight Analysis Framework Version 5 (FAF5) data.

- The two airports in Aledo, IL, and Geneseo, IL are not NPIAS airports and therefore not eligible for federal funding.

Figure 54: Bi-State Region Airports

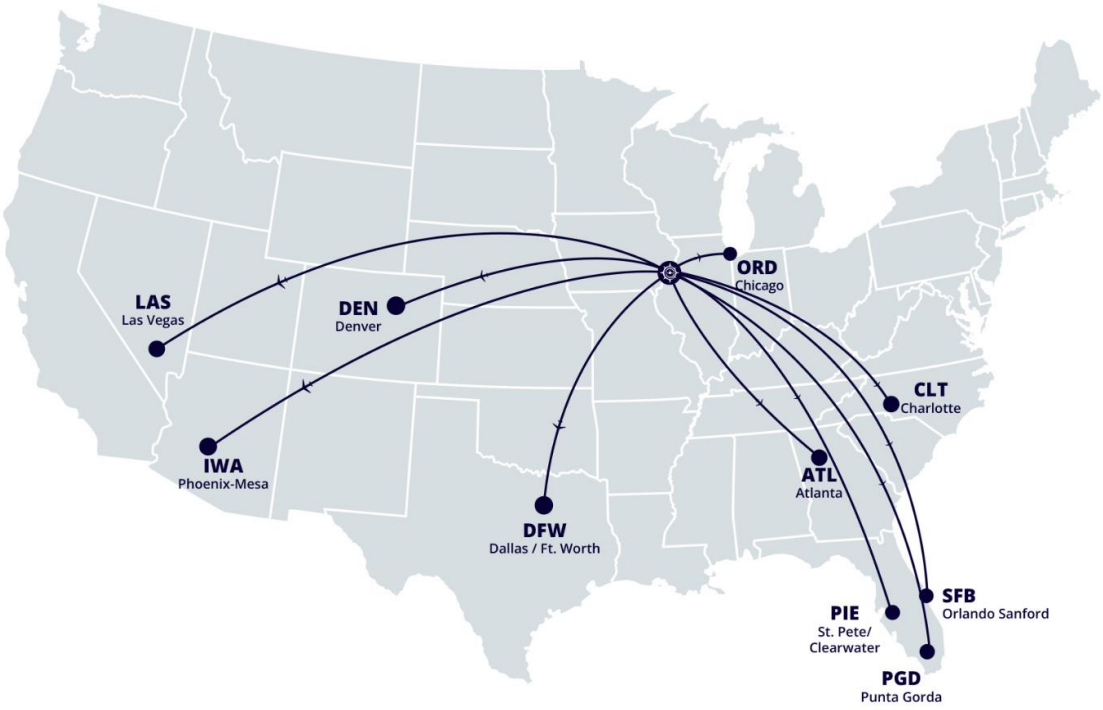
Airport Name	Identifier	Location	Role	Air Cargo Service
Quad Cities International	MLI	Rock Island, IL	Local Hub	Y
Davenport Municipal	DVN	Davenport, IA	Regional	N
Muscatine Municipal	MUT	Muscatine, IA	Local	N
Kewanee Municipal	EZI	Kewanee, IL	Local	N
Mercer County	C00	Aledo, IL	-	N
Gen Airpark	3G8	Geneseo, IL	-	N

Source: CPCS analysis of BTS T-100 Domestic data and National Plan of Integrated Airport Systems classification

2.5.1. Quad Cities International

The Quad Cities International Airport is operated by the Metropolitan Airport Authority of Rock Island County, Illinois. The airport is served by four airlines (Allegiant Air, American Airlines, Delta Airlines, and United Airlines) with nonstop flights to 10 destinations (Figure 55)[20] and domestic and international connecting flights. Among Illinois airports, Quad Cities International Airport ranked 3rd by enplanements (269,885 in 2022) and 7th by annual freight flow (23.6 tons in 2020, Figure 56).[21]

Figure 55: Non-Stop Destinations from the Quad City International Airport



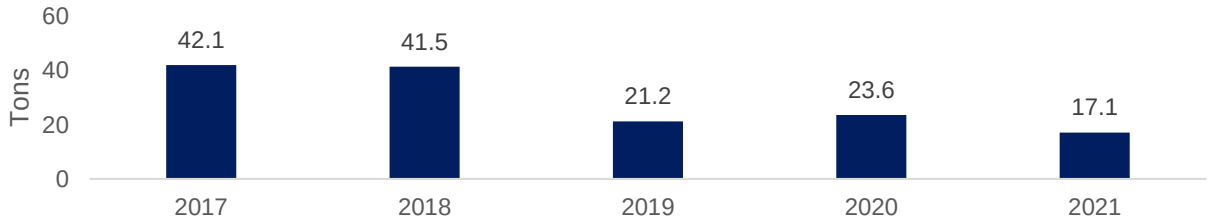
Source: Quad Cities International Airport, 2024 [22]

[20] Atlanta, Chicago O'Hare, Dallas Ft. Worth, Denver, Ft. Myers/Punta Gorda, Las Vegas, Orlando Sanford, Pheonix/Mesa, St. Pete Clearwater, and Charlotte

[21] Illinois DOT. Illinois Aviation System Plan. https://www.ilaviation.com/wp-content/uploads/2022/07/IASP-Technical-Report-Digital.pdf. 2022. Accessed on January 22, 2024.

[22] Quad Cities International Airport. Airlines and Destinations. https://www.qcairport.com/flights-airlines/airlines-destinations/. Accessed on January 22, 2024.

Figure 56: Quad Cities International Airport On-Flight Freight Enplaned Tonnage, 2017-2021



Source: CPCS analysis of Bureau of Transportation Statistics, T-100 International and Domestic Market (All Carriers) Database

The airport covers 2,021 acres and has three runways with the longest runway length at 10,002 feet.[23] Several air freight companies are located at the airport including BAX Global, DHL, and UPS Supply Chain Solutions. The airport can accommodate any aircraft in almost any weather with the long runways and has met all the facilities and service objectives for airfield, landside facilities, and airport services established in the *Illinois Aviation System Plan* (2022).[24] The *Illinois Aviation Economic Impact Analysis* (2020) noted that the economic impact of the airport is estimated at $647.3 million, ranking 6th in Illinois.

In 2022, the airport began a reconstruction process to alter its layout, a $10 million project funded entirely by the FAA. The plan would add a new taxiway parallel to the airport's main commercial runway (Figure 57). In 2023, the Metropolitan Airport Authority Board of Commissioners approved plans to conduct a commercial spaceport planning study at the Quad City International Airport.[25]

Figure 57: Proposed Alteration of Quad Cities International Airport Layout

Source: KWQC, Quad Cities Airport Starts Airfield Construction, 2022[26]

[23] Runway 9/27 size 10,002'X150', Runway 13/31 size 7,301'X150'; Runway 5/23 size 3,514'X150'. Illinois DOT, 2023 Illinois Public Use and Publicly Owned Airport Inventory Report, 2023. https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/reports/opp/aip/2023-illinois-airport-inventory-report-final.pdf. Accessed on Jan 19, 2023

[24] Illinois DOT. Illinois Aviation System Plan. https://www.ilaviation.com/wp-content/uploads/2022/07/IASP-Technical-Report-Digital.pdf. 2022. Accessed on January 22, 2024.

[25] Jonathan Turner, Our Quad Cities. Quad Cities International Airport studying potential of a spaceport. September 7, 2023. https://www.ourquadcities.com/news/local-news/qc-airport-studying-potential-of-a-spaceport/. Accessed on January 19, 2024.

[26] KWQC, Quad Cities Airport starts airfield construction, April 27, 2022. https://www.kwqc.com/2022/04/27/quad-cities-airport-starts-airfield-construction/. Accessed on January 19, 2024.

3 Freight System Goals

Key chapter takeaway

Five functional goals are proposed to guide the Bi-State Region's freight transportation planning efforts. Each goal is complemented by supporting objectives closely aligned with regional, statewide, and national freight planning principles:

- Economy Goal: Enhance the regional freight system to boost economic competitiveness and growth
- Safety Goal: Improve safety and reduce risks for all users of the regional freight system
- Mobility Goal: Improve freight system mobility by eliminating barriers and bottlenecks
- System Preservation Goal: Maintain, preserve, and extend the service life of regional freight system infrastructure
- Sustainability and Resiliency Goal: Create a more sustainable and resilient freight system

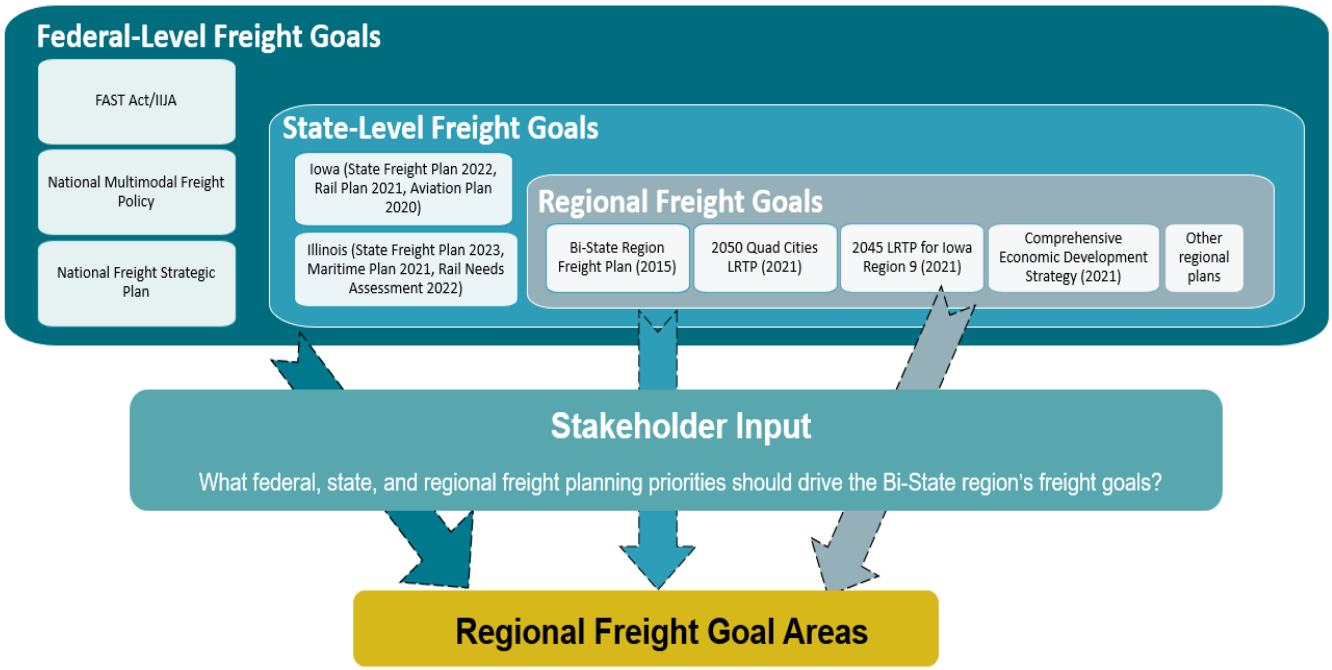
3.1 Approach

This chapter proposes an updated slate of freight system goals. It achieves this by juxtaposing the original goals, which were outlined nearly a decade ago, with the most current freight objectives featured in national, state, and regional guiding documents. Next, it identifies a series of performance measures, curated to assist the BSRC in tracking its progress toward realizing these newly articulated goals.

Figure 58 below provides an overview of the methodology used to establish the Bi-State Region's freight planning goal areas and objectives. These goals are shaped by a multi-tiered framework that incorporates federal, state, and regional planning priorities in the realm of freight transportation.

- On the **federal front**, key guidelines are extracted from legislative and policy documents such as the Fixing America's Surface Transportation (FAST) Act, the Infrastructure Investment and Jobs Act (IIJA), the US Department of Transportation's National Multimodal Freight Policy, and the National Freight Strategic Plan.
- At the **state level**, guidance is drawn from *Illinois and Iowa's State Freight Plans*, as well as their respective modal freight plans.
- On the **regional level**, a variety of plans and studies including the 2050 Quad Cities Long Range Transportation Plan (LRTP), Iowa Region 9 2050 LRTP, the Bi-State Comprehensive Economic Development Strategy (CEDS), the comprehensive plans of the five counties in the region, and other specialized studies focusing on multimodal freight movement contribute to the formulation of the region's freight goals.

Figure 58: The Process for Establishing Regional Freight Planning Goal Areas



Source: CPCS, 2023

Utilizing this multifaceted approach, we examine the specific freight-related goals, mandates, and recommendations highlighted in each of the guiding documents (Appendix A Literature Reviewed). These are then compared and contrasted with the themes and objectives outlined in the 2015 Bi-State Region Freight Plan. Two pivotal questions guided this evaluative process:

- How do the goals of the *2015 Bi-State Region Freight Plan* align with current freight planning priorities at the regional, state, and national levels?
- What emerging freight planning priorities should be considered for an updated set of regional freight goal areas?

Regional freight goal areas are identified to serve as the foundational pillars for the Bi-State Region's renewed freight planning initiatives.

Overlapping Freight Planning Goals

Despite encompassing a diverse geographical expanse that covers five counties across two states, the *2015 Bi-State Region Freight Plan* cohesively integrates a set of quintessential themes that are often reflected in freight strategies at national, state, regional, and local levels. These core themes which include mobility, access, resiliency, safety, sustainability, and economic growth serve as guiding principles for freight initiatives across various levels of governance.

While the national and state plans may vary in their level of detail and focus on different modes of transportation, they nonetheless echo many of the same priorities that were articulated in the 2015 Bi-State Region Freight Plan. In this way, the regional objectives are in alignment with broader freight planning strategies, thereby creating a synergistic approach to achieving common goals across multiple geographic and administrative tiers (Figure 59).

Figure 59: Aligning 2015 Bi-State Region Freight Plan Goal Areas with Guiding Documents

2015 Bi-State Plan Goals	FAST Act / IIJA	National Freight Strategic Plan	Iowa State Freight Plan and Modal Plans	Illinois State Freight Plan and Modal Plans	Regional Plans and Studies
Support the Region's Economy	✓	✓	✓	✓	✓
Maintain and Enhance Highway System Infrastructure	✓	✓	✓	✓	✓
Promote Freight Rail System Operational Efficiency	✓	✓	✓	✓	✓
Increase Accessibility and Mobility Options for the Region	✓	✓	✓	✓	✓
Work Towards System Resiliency and Reliability	✓	✓	✓	✓	✓

Emerging Freight Planning Goals

While the *2015 Freight Plan* was comprehensive and incorporated strategies from a wide range of previously reviewed plans, it did not fully capture the evolving issues and policy priorities underscored in the latest guiding documents. The *Illinois and Iowa State Freight Plans*, for instance, now emphasize the importance of data-centric planning and innovation. To ensure relevance and alignment, the following themes should be woven into the Bi-State Region's goal setting and planning processes:

Innovation

The *National Strategic Freight Plan* defines innovation as the commitment to enhancing freight system performance by nurturing the growth of relevant data, state-of-the-art technologies, and advanced workforce capabilities. Several local and state guiding documents also highlight this transformation through financial, regulatory, or organizational modifications:

- *The Quad Cities 2050 LRTP* emphasizes the importance of tailoring the adoption of novel technologies to the specific needs of distinct communities. It champions efficient system management and operation through technological solutions that are sensitive to context and aims to optimize traffic, transit operations, and broader transportation modal intersections.
- *The Bi-State Region Economic Development Strategy* sets forth multiple goals with the intent to drive innovation, from fostering growth in the manufacturing sector to facilitating the birth of new enterprises. These goals include augmenting workforce training opportunities, broadening information dissemination and business support, and implementing marketplace diversification. Its annual report documents the advancement of these goals via tangible performance metrics.
- Both Iowa and Illinois *State Freight Plans* map out the trajectory for innovating freight technologies and operational frameworks. While Iowa focuses on aspects like automation, augmented workforce capacity, and investments in data modeling tools, Illinois targets the redefinition of the industrial real estate domain to cater to the demands of e-commerce and traditional industry shifts.

Workforce Retention and Quality of Life

Nurturing and retaining a skilled workforce is more important now than ever and is becoming a pivotal element for the sustained expansion of freight industries. Several state and regional plans aimed to encourage a trained, diverse, and quality workforce in transportation while addressing concerns regarding hours of service, safety requirements, and staffing shortages. For example,

- *The Bi-State Region Comprehensive Economic Development Strategy (CEDS)* discusses the ways that public entities can uplift the local workforce, such as harnessing resources from academic institutions and through collaborations with economic development bodies and business support entities.
- *The Connect 2050: Quad Cities Long Range Transportation Plan* concentrates on workforce sustenance by enhancing transportation accessibility to major employment hubs and essential services. Their objective is to bolster the labor force's magnitude and productivity by ensuring a secure and effective transportation network.

Equity and Environmental Justice

The interplay between land utilization, environmental implications of changing climates, and transportation accessibility has intensified the significance of equity and environmental justice within freight and transportation. While the overarching goal remains consistent—to provide all community members with equal transportation opportunities and minimize environmental repercussions—the methodologies to realize these objectives can take several forms:

- The *Quad Cities 2050 LRTP* emphasizes equity and the minimization of environmental impact through the following strategies, including minimizing water runoff from transportation infrastructure, incorporating environmentally sustainable water infrastructure development, and expanding multimodal access to distribution and production centers.
- At the state level, both Iowa and Illinois have taken measures to decrease the climate footprint of freight transportation. Iowa's SFP quantifies environmental implications using metrics like highway Vehicle Miles Traveled (VMT). Meanwhile, Illinois pledges allegiance to the Paris Accord's climate benchmarks in their SFP, emphasizing monitoring freight emissions and promoting the adoption of eco-friendly vehicles across the state.

3.2 Bi-State Regional Freight Planning Goals

This section outlines a series of regional freight planning goals, which are formulated based on both the objectives set forth in the previous regional freight plan as well as newly identified priorities at the national, state, regional, and local levels. These goals are categorized under five overarching themes: economy, safety, mobility, system preservation, and sustainability and resiliency. Each goal is further enriched by a set of supporting objectives.

Economy Goal: Enhance the regional freight system to boost economic competitiveness and growth

Based on a location-quotient analysis using 2020 employment data[27], key industries in the five counties of the Bi-State Region present a diversified economic landscape that features strengths in manufacturing, agriculture, and transportation services:

- The backbone of the regional economy, the **manufacturing sector** is incredibly diverse; multiple counties specialize in various forms of manufacturing. These include metal-based

[27] Bi-State Regional Commission, Comprehensive Economic Development Strategy. 2021. https://bistateonline.org/documents/economic-development/4050-2021-ceds/file. Pg. 26. Accessed on September 22, 2023.

manufacturing like Aluminum Sheet, Plate, and Foil in Scott County, Farm Machinery in Rock Island and Mercer Counties, and Office Furniture in Muscatine County.

- **Agricultural activities** are not monolithic but rather specialized according to county. Mercer and Henry Counties specialize in grain farming and animal products Oilseed farming is also a key industry in these counties. Several counties are also involved in pesticide and chemical manufacturing, indicating a complex, interconnected agricultural sector.
- **Meat Processing** is a recurring key industry in three out of five counties (Scott, Rock Island, and Henry), which indicates its significance to the regional economy.
- **Transportation-based industries** are prominent in a couple of counties, supporting the extensive manufacturing and agricultural activities.
- Some counties have **highly specialized industries**, such as Aircraft Parts and Equipment Manufacturing in Scott County, Small Arms and Ordnance Manufacturing in Henry County, and the dominance of military-serving manufacturing, logistics, and base support activities in the Rock Island Arsenal located in the County of Rock Island.

While this economic diversity offers resilience, the region isn't without its challenges to continued growth. According to the *Comprehensive Economic Development Strategy (2021)*:

- General job growth is expected across all sectors, with an increase of over 12,400 jobs between 2020 and 2030, and over 27,500 jobs in the next 30 years. However, a critical concern is the **stagnation projected in freight-dependent industries.** Despite projected employment growth in transportation and warehousing of over 5%, and in construction by nearly 8% between 2020 and 2050, other freight-dependent sectors are expected to decline. The wholesale trade sector is set to be the hardest hit, with an anticipated job loss of over 10%.
- Adding to this complexity are demographic challenges, including an aging workforce and a lack of replacement workforce due to a diminishing working-age population.
- Additionally, the region is grappling with infrastructure limitations, such as a **lack of state-of-the-art industrial parks**, especially those that are large-scale and served by rail. There's also a desire for 'spec' buildings that are ready for industrial development, and pre-certified, development-ready sites that would necessitate significant investment in infrastructure and utilities.

Given these projections and challenges, the need to bolster the regional freight system becomes imperative. A strong freight system is not just a logistical asset; it is a core component of the region's economic fabric. It streamlines supply chains, bolsters exports, diversifies economic activities and heightens the area's competitive edge in the market.

To address these challenges and capitalize on the region's inherent strengths, we propose several objectives, ranging from planning support, education, and integration of freight in all planning processes.

Objectives

Improve the understanding of the importance of freight to both the public and decision-makers. This could include integrating freight considerations during public outreach activities and educating the public on how the freight industry impacts their daily lives, from the food they eat to the products they buy.

Support the integration of freight in local and regional planning processes by providing relevant resources including freight data, planning resources, and funding opportunities. Example strategies include the development and distribution of a "Best Practices" guide for integrating freight considerations into local planning activities.

Support partner agencies in promoting training programs that advance freight industry workforce development. Example strategies include collaborating with educational institutions and the industry to identify key skill gaps in the freight workforce and supporting industry-specific job fairs aimed at introducing potential employees to the range of opportunities available in the freight sector.

Develop industrial and building inventory and promote land development that is appropriate for freight-related industries, seeking the fair and equitable treatment of all communities and advocating for freight-appropriate land development opportunities such as industrial parks.

Continue monitoring advancements in freight technology, investing in innovative tech solutions, and supporting regulations that help freight industry stakeholders adopt innovative technology.

Safety Goal: Improve safety and reduce risks for all users of the regional freight system

Improving the safety of the freight system is not merely an operational concern, but a critical social and economic imperative as well. This is especially crucial given that freight vehicles, due to their size and weight, can disproportionately impact vulnerable road users like pedestrians and cyclists, who share the infrastructure with freight operators. For instance, regional and local plans have identified heavy trucks as being one of the emphasis areas for improving overall traffic safety in the region.[28] Delays due to accidents can also impact just-in-time deliveries, inventory costs, and ultimately the competitiveness of the businesses relying on freight transportation.

A safe and secure freight system helps reduce the occurrence of accidents, ensures the well-being of both operators and other system users, and minimizes disruptions that could otherwise compromise supply chains.

Several objectives can help to reduce and mitigate freight safety and security risks.

Objectives

Minimize truck-involved accidents and their severity through engineering, enforcement, education, and emergency responses. Example strategies include enhancing sight lines at intersections and bends, implementing speed control measures in high-risk zones, upgrading emergency response protocols, and making infrastructure design alterations that prioritize safety.

Enhance safety at highway-rail grade crossings and mitigate trespass risks by grade-separating crossings when appropriate, installing advanced safety warning systems, or selectively closing high-risk crossings.

Mitigate conflicts between freight and active transportation modes by prioritizing safety measures that protect vulnerable road-users such as cyclists and pedestrians who share the road with heavy freight vehicles. This could involve designating certain roads as off-limits to trucks, introducing protected bicycle lanes, and redesigning infrastructure for enhanced visibility. Additionally, slowing down vehicular travel in high-density, crash-prone areas should be considered.

Promote equitable safety measures across communities and target infrastructure improvements to bolster safety in disadvantaged communities.

[28] Bi-State Regional Commission, Quad Cities MPO 2050 LRTP Chapter 4, https://bistateonline.org/documents/transportation/quad-cities-metro-lrtp-long-range-transportation-plan/4005-2050-lrtp-chapter-4-draft/file, pg. 159, accessed on September 22, 2023.

Mobility Goal: Boost freight system mobility by eliminating barriers and bottlenecks

Improving the freight system's mobility is vital to the economic health of the Bi-State Region. This is not just about sustaining existing industries but also capitalizing on emerging opportunities such as the continued growth in renewable energy projects like wind farms in Henry County. Efficient freight movement is critical to transporting the large components needed for these renewable energy initiatives, and any delay or bottleneck could substantially inflate costs and project timelines.

The region's freight system faces several mobility challenges:

- **Congested truck corridors and aging bridges with weight and/or height restrictions** can be significant freight bottlenecks. Several regional and local plans have highlighted corridors with congestion issues that impact both passenger and freight movements, including but not limited to segments of I-74, US 61, John Deere Road, and I-80 West. In addition, the structural limitations of bridges also contribute to delays, especially when closures for maintenance or accidents occur. Over the years, the region has adopted various measures to address the issue, such as the installation of low-clearance warning signs on Harrison Street (electronic) and Highway 61, among other locations, as well as the improvements along the I-74 corridor. Nonetheless, trucks traveling the region are still at risk of being impacted by low-clearance structures.
- **Rail bottlenecks** also pose considerable challenges, often blocking crossings and hampering access to jobs. Some of the crossings in the region are being addressed by potential track consolidation or narrowing the rail or providing for staging area. Strategic partnerships with local railroad authorities have also begun to address these issues, but a comprehensive plan is essential.
- **The two rail bridges over the Mississippi River** at the Government Bridge (Iowa Interstate Railroad) and the Crescent Bridge (BNSF) have been longstanding bottlenecks for both rail and truck freight movement. The *2020 Mississippi River Rail Crossing Study* explored options for upgrading the current rail crossings at both the Crescent and Government Bridges, as well as the possibility of building a new bridge for rail traffic over the river. The study put forth three different solutions, taking into account the potential effects on the Centennial Bridge, future needs for passenger rail, and available funding. These proposed alternatives aim to increase the speed limits on these crossings from the existing 10 mph to a range of 30 to 40 mph.
- Moreover, **the region's river system demands special attention**. The existing locks on the Mississippi, for example, cannot accommodate larger barge tows, necessitating multiple lockages and significantly increasing travel time. The absence of robust intermodal facilities for efficient goods transfer between river, rail, and road exacerbates these challenges.

Eliminating key freight mobility barriers and bottlenecks will significantly improve the overall efficiency of the freight system.

Several objectives can aid in minimizing and removing obstacles that impede freight system mobility.

Objectives

Eliminate truck bottlenecks. Target congested roadways by employing strategies ranging from infrastructure redesign and dynamic lane allocations to demand management. Maintain, improve, and expand river crossing capacity.

Reduce the number and duration of blocked crossings, particularly at the crossings of IL-92 and IL-84 and the Iowa Interstate Railroad and BNSF lines at the Arsenal Bridge, where road, rail, and river modes intersect.

Eliminate bridge clearance issues and weight restrictions for key truck and rail freight routes. Refine, determine, and implement a preferred alternative as a follow-up to the *Mississippi River Rail Crossing Study* (2020) on ways to address the deficiencies of the two existing rail bridges and thus significantly improve freight mobility in the region.

Support the development of intermodal, transload, and other multimodal facilities. These investments will strengthen connectivity across various transportation modes within the freight system. Furthering the advancement of the proposed inland multimodal container terminal port facility in the City of Muscatine, which is designed to move containerized freight via river, rail, and highway, will enhance overall freight mobility.

Enhance the performance of locks and dams. Delayed maintenance and the slow pace of new project implementation compromise system reliability and contribute to congestion within the river navigation system. Advocate for increased funding to expand, improve, and maintain the aging port facilities along the Upper Mississippi River (UMR). Encourage public-private partnerships to implement solutions that improve the waterway navigation system.

Sustain Air Freight Options: Support upgrades at regional airports to maintain air cargo capacities for time-sensitive goods.

System Preservation Goal: Maintain, preserve, and extend the service life of regional freight system infrastructure

Incorporating system preservation as a goal in a regional freight plan is essential for ensuring the long-term viability and efficiency of the transportation network. Over time, infrastructure such as roads, bridges, locks, and dams deteriorate and become less reliable, which can impede the smooth flow of goods and add costs to freight operations. A well-maintained system not only reduces operational costs but also minimizes the risk of accidents, enhancing the safety and security of both the freight and the general public. Furthermore, system preservation aligns with sustainability goals by maximizing the use of existing assets and reducing the need for new construction, which can have environmental impacts.

Deteriorating infrastructure remains a pressing issue for both local municipalities and regional entities.

Although federal programs do exist to tackle some aspects of system preservation, they fall short of addressing the full scope of the problem. This shortfall puts the onus on local governments to raise taxes for essential repairs to roads and bridges, a burden that disproportionately affects smaller, rural communities. Several freight-related objectives can help to maintain, preserve, and extend the service life of existing infrastructure.

Objectives

Maintain pavement, bridge, and port facility conditions in a state of good repair. Regular, strategic investment in maintenance is vital for both preserving the current infrastructure and achieving long-term cost-effectiveness. This effort is particularly urgent given the functional and capacity issues plaguing regional key structures like locks and dams, as well as vital bridges such as the I-80 and Centennial Bridge, among others.

Increase capacity and accessibility of truck parking. Adequate truck parking is a key component in improving overall road safety, reducing freight transportation delays, and mitigating traffic congestion. The availability of truck parking needs to be increased, and technology solutions should be utilized to help drivers locate parking spaces easily.

Prioritize equity in infrastructure maintenance. It's important to recognize that disadvantaged communities often bear the brunt of the effects of inadequate infrastructure due to historical

underinvestment. Targeted maintenance and upgrades in these areas not only improve overall system reliability but also help in redressing longstanding inequities.

Sustainability and Resiliency Goal: Create a more sustainable and resilient freight system.

The freight transportation system has a significant environmental footprint. According to the US Environmental Protection Agency (EPA), the transportation sector contributed 29 percent of the greenhouse gas emissions in the US in 2021. Within the transportation sector, light-duty vehicles accounted for 58 percent, while medium- and heavy-duty trucks made up 23 percent of the emissions.[29] Freight system operations also generate noise pollution. Both forms of pollution can have profound impacts on quality of life, health, wildlife, and the climate.

Conversely, climate change and natural disasters present significant risks to the resilience and functionality of freight infrastructure. For instance, cargo tonnage moved through the region's lock system has substantially decreased since its peak in 1999. This decline can in part be attributed to major flooding events on the Mississippi River, the most severe of which occurred in 2019 and caused CP to raise the track level[30] and resulted in approximately $2 billion in overall damages along the riverfront.[31] Additionally, severe drought along the southern Mississippi River basin and decreases in overall water level have forced temporary closures of river segments, additional dredging projects, and rerouting of larger barges. Forecasted increases in the likelihood of similar flooding and drought events have prompted riverfront communities to evaluate mitigation strategies.

Freight stakeholders in the region bear the responsibility for both mitigating the environmental impacts of freight systems and adapting infrastructure to the challenges posed by climate change and natural disasters.

A variety of freight-related objectives can help in this regard.

Objectives

Advocate for the testing and implementation of innovative technologies and strategies to reduce the environmental impacts of freight activity. For instance, regional freight stakeholders can incentivize the use of electric or hydrogen-powered trucks for short-haul routes, thereby reducing greenhouse gas emissions. Another example would be to implement intelligent transportation systems that provide real-time information to optimize routing and reduce fuel consumption. These systems can significantly decrease the idling time of freight vehicles. Intermodal solutions that promote the shift from road to rail or maritime transport for long-distance hauling can further reduce the carbon footprint of freight activities.

Carry out a comprehensive study on the flow of hazardous materials to recognize and mitigate spill risks affecting supply chains, communities, and natural habitats. The freight industry transports a range of goods, some of which are hazardous and can pose severe environmental risks if spilled or leaked. By conducting these studies, it becomes easier to identify these risks and devise ways to minimize their potential impact.

Deepen the understanding of regional infrastructure vulnerability and identify and mitigate threats to system resiliency. Resiliency refers to the ability to recover from or adjust easily to disruptions. In the case of the freight system, disruptions may be caused by a variety of

[29] United States Environmental Protection Agency, Fast Facts on Transportation Greenhouse Gas Emissions, https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions, accessed on September 22, 2023.
[30] Steve Smedley, CP raises track to get around Iowa flooding, Trains Magazine, April 15, 2019, https://www.trains.com/trn/news-reviews/news-wire/15-cp-raises-track-to-get-around-iowa-flooding/, accessed on September 22, 2023.
[31] Bi-State Regional Commission, Comprehensive Economic Development Strategy. 2021. https://bistateonline.org/documents/economic-development/4050-2021-ceds/file. Pg. 55, accessed on September 22, 2023.

factors, including environmental risks like floods, extreme heat, winter storms, and human-made disasters such as cyberattacks and sudden shifts in demand. Any such threat has the potential to damage infrastructure, threaten community safety, and disrupt supply chains. The region has taken steps to conduct a vulnerability assessment and determine strategies to mitigate the effects of extreme weather on the multi-modal transportation system, with a focus on the urban areas, through the development of the *Extreme Weather and Transportation Resilience Report*.[32] An expanded review of system resiliency that includes the rural areas of the region will further prepare the entire region for a range of disruptions and risks.

[32] Bi-State Regional Commission, 2020 Quad Cities, Iowa/Illinois Extreme Weather and Transportation Resilience Report, https://bistateonline.org/documents/transportation/4006-quad-cities-iowa-illinois-mpo-extreme-weather-and-transportation-resilience-report-september-2020/file, accessed on September 22, 2023.

4 Freight System Performance

Key chapter takeaway

This section presents a summary of the performance measures proposed to evaluate the region's progress in achieving the freight system's goals and the approach taken to identify them.

4.1 Background and Analysis Framework

Performance measures are effective tools used by transportation planning agencies to assess, measure, and gauge the infrastructural and operational capabilities of their systems and guide infrastructure investment decisions. For example, USDOT employs a range of federal performance measures to guide its investment decisions in the nation's transportation infrastructure. These performance measures are part of a larger performance-based planning and programming framework designed to ensure that federal investment in transportation projects is efficient, effective, and aligned with national goals. Federal grants and funding can be linked to the achievement of the performance targets for the interstate and non-interstate National Highway Systems (NHS), thereby incentivizing effective and efficient use of funds. The Truck Travel Time Reliability (TTTR) Index along the interstates is currently the only federally required performance measure for freight.

Figure 60 illustrates the process used to identify appropriate performance measures for the Bi-State Region.

Figure 60: Identifying Regional Freight Performance Measures

Source: CPCS, 2023

Three key considerations went into narrowing down regional freight system performance measures from a wider range of possible indicators/matrices:

- **Alignment with Regional Freight Goals**: Performance measures selected should have a clear linkage with the regional freight goal areas. This ensures that these measures act not just as an accountability tool but also as a mechanism to transparently communicate the reasoning behind investment choices to the public.

- **Modal coverage**: Due to the multi-modal nature of the freight system, the freight performance measures must provide a holistic view of the different modal components. However, the shared public- and private-sector roles in the freight system also make obtaining data for certain modes, such as the railway system and the operational performance of intermodal facilities, more challenging than others.

Blocked crossing frequency in the Bi-State region

The Federal Railroad Administration (FRA) Blocked Crossing Crowdsourced Database offers details on the location, date, blockage reason, and duration of blocked crossing events as reported by the public, with updates made daily. However, the FRA emphasizes that this tool isn't intended to produce a representative sample or to generate broad statistics about blocked crossings. Data from this collection shouldn't be used in budgetary requests or regulatory proposals. While this data will be examined within the rail modal profile, it's not advised to incorporate it as a performance measure for the mobility goal.

Source: Federal Railroad Administration (FRA), https://www.fra.dot.gov/blockedcrossings/, accessed on September 22, 2023

- **Ease of implementation**: For the BSRC, which will be responsible for gauging freight performance measures and conveying their interpretation to the public, it is crucial to carefully choose the indicators that can be continuously monitored by staff. Data should be updated regularly and be easily accessible to the BSRC staff. Additionally, it should be simple to analyze using existing in-house resources. The results derived from these performance measures should be straightforward, making them easy to share with both freight stakeholders and with the public.

4.2 Recommended Freight Performance Measures

Figure 61 lists the recommended freight performance measures based on the criteria in the previous section. Items highlighted in green (within the MPA) are federally required performance measures.

Figure 61: Recommended Freight Performance Measures

Goal Area	Performance Measure
Economy	Total freight-dependent industry employment
	Total freight-dependent industry Gross Domestic Product (GDP)
Safety	Truck-involved crashes
	Rail crossing incidents
Mobility	Interstate Truck Travel Time Reliability (TTTR) Index (MPA)
	Regional top bottlenecks (select minor arterials and above)
	Average monthly delay at locks (tows)
	Percent of vessels delayed at locks (all)
System Preservation	Percentage of pavements of the Interstate System in Good/Poor condition (MPA and region)
	Percentage of pavements of the non-Interstate NHS in Good/Poor condition (MPA and region)
	Percentage of NHS bridges classified as in Good/Poor condition (MPA and region)
	Percent of bridges with an 80 or lower sufficiency rating
Sustainability and Resiliency	Unscheduled Closures at Rock Island District locks
	Hazardous material spill incidents

Source: CPCS

2.4.1.1Appendix C provides detailed information on each performance measure, including data accessibility and level of analysis required.

4.3 Economy Goal Performance

The Bi-State Region's freight transportation system is essential to the region's economy, particularly to industries that rely more heavily on the movement of goods. Those freight-dependent industries are comprised of eight sectors[33]:

- Farming, fishing, forestry, and related activities
- Mining, quarrying, and oil and gas extraction
- Utilities
- Manufacturing
- Construction
- Wholesale trade
- Retail trade
- Transportation and warehousing

This section assesses the region's performance to its Economy Goal using the two performance measures on freight-dependent industry employment and GDP.

4.3.1 Freight-Dependent Industry Employment

The Bi-State Region is home to a population of approximately 425,951 individuals in 2022.[34] Over the past decade, the region has experienced a population increase of 1.2%, a growth rate that lags behind the national average of 7.4% during the same period.[35] Looking ahead to 2050, projections suggest that the population of the region is expected to range between 430,000 and 451,000, indicating a steady but modest growth trajectory.[36]

Close to 37% of the jobs in the Bi-State Region are in freight-dependent industries (92,346 jobs), with manufacturing and retail trade sectors providing the highest share of employment (12.4% and 11.2%, respectively), followed by construction (5.7%), wholesale trade (3.5%), and transportation and warehousing (2.4 %, Figure 62). Non-freight industries such as finance, health care, real estate, and other professional services represent the remaining 63.1% of the jobs in the region.

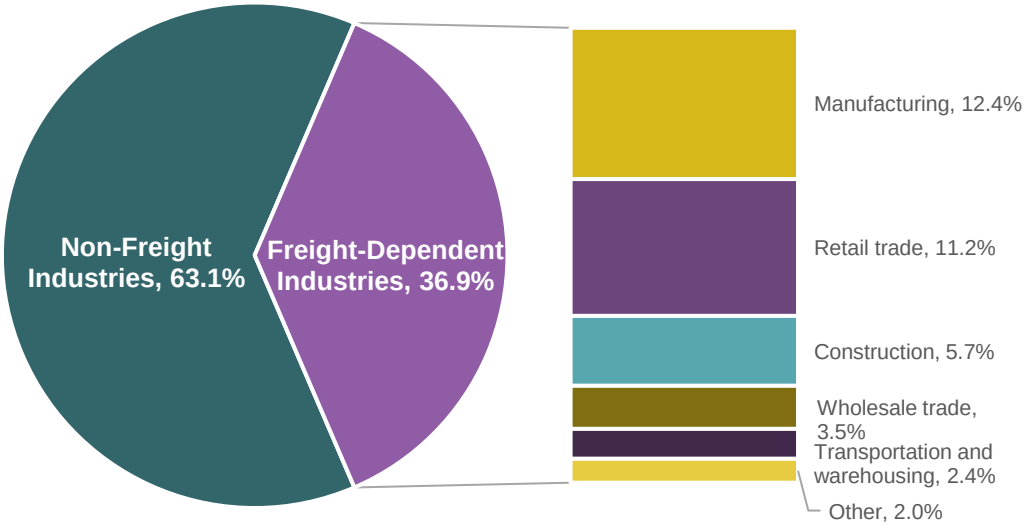
[33] These industries are identified in economic data using North American Industry Classification System (NAICS) codes, which is a standard system for classifying business statistics for analysis and reporting. Freight-dependent industries include the following: NAICS 11 Agriculture, forestry, fishing, and hunting, NAICS 21 Mining, quarrying, and oil and gas extraction, NAICS 22 Utilities, NAICS 23 Construction, NAICS 31-33 Manufacturing, NAICS 42 Wholesale trade, NAICS 44-45 Retail trade, and NAICS 48-49 Transportation and warehousing.

[34] US Census Bureau, American Community Survey 2022 5-year Estimates. https://data.census.gov/all?y=2022&d=ACS%205-Year%20Estimates%20Detailed%20Tables. Accessed on December 13, 2023.

[35] US Census Bureau, Census Stories, Aug 12, 2021. https://www.census.gov/library/stories/2021/08/more-than-half-of-united-states-counties-were-smaller-in-2020-than-in-2010.html. Accessed on Nov 14, 2023.

[36] Bi-State Regional Commission, Comprehensive Economic Development Strategy (CEDS) 2021. https://bistateonline.org/documents/economic-development/4050-2021-ceds/file. Accessed on Nov 14, 2023.

Figure 62: Employment in the Freight-Dependent Industries, 2023



Source: CPCS Analysis of BEA Employment Statistics, 2023[37]

Figure 63: Freight-Dependent Industry Clusters in the Region, 2023

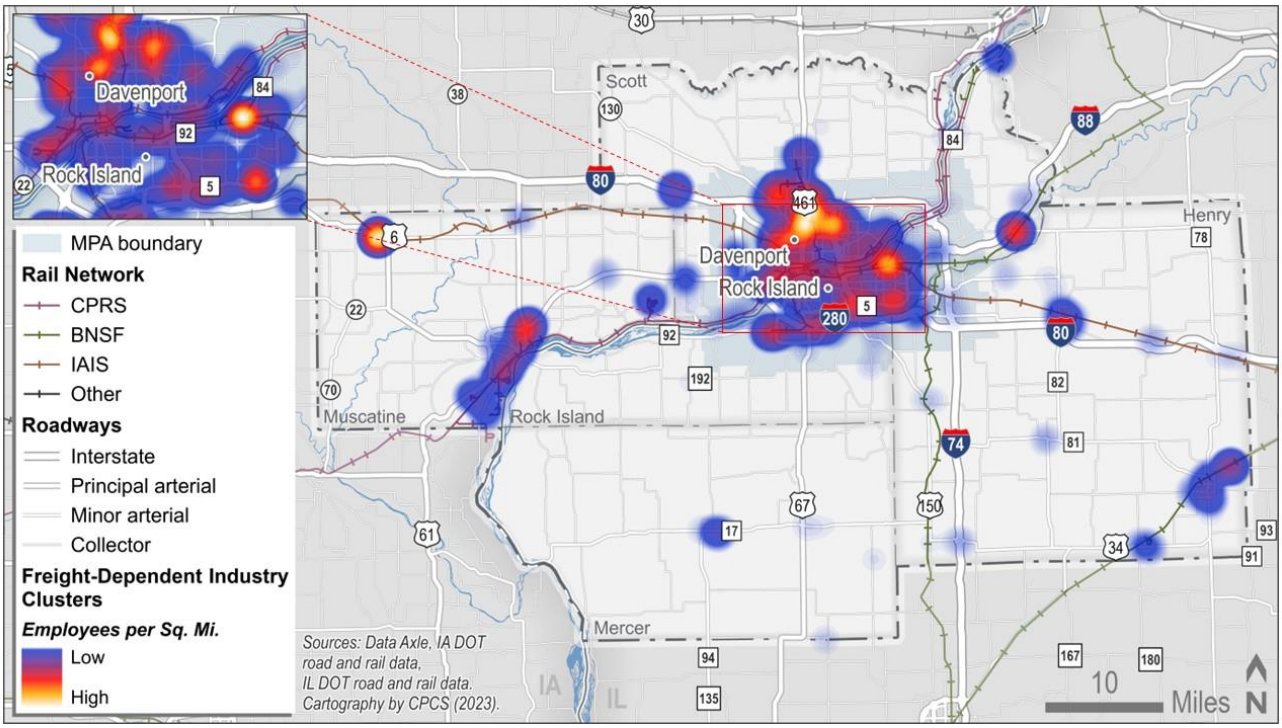


Figure 63 shows the distribution of freight-dependent industry clusters in the region. The largest concentration of these industries is found in the core urban area, bordered by the I-80 and I-280 interstates and well-served by railroads. Additionally, there is a distinct cluster in the Cities of Muscatine and Wilton in Muscatine County.

Labor Force and Education

The most significant challenge identified by regional freight stakeholders toward achieving the Economy Goal is an aging workforce. The median age in the region has risen from 39.2 in 2010 to

[37] US Bureau of Economic Analysis. Employment by County, Metro, and Other Areas, as of December 2022, https://www.bea.gov/data/employment/employment-county-metro-and-other-areas. Accessed on October 5, 2023. "Other" denotes agriculture, forestry, fishing and hunting, mining, quarrying, oil and gas extraction, and utilities sectors.

41.0 in 2022, surpassing both Illinois' and Iowa's median ages of 38.5 and 38.3 years, respectively.[38] Projections for 2027 indicate that the median age in the region would further increase to 41.7 years, potentially exacerbating the workforce challenge for the Bi-State Region.[39]

When broken down by the working-age population, shares of the population for younger and older age groups have remained roughly the same over the last decade (Figure 64). While the proportion of those aged 45 to 64 may not have changed significantly, all but two age groups have experienced a notable decline in total population. This has led to a reduction in the overall working-age population in the region by over 11,000 individuals, approximately 4%. Notably, one of the few age groups showing an increase in both numbers and proportion is those aged 60 to 64. As the total workforce size diminishes across all age groups, the growing proportion of workers aged 55 and above is becoming increasingly influential for regional companies in search of employees.

Figure 64: Working-Age Population Distribution, 2013 and 2022

Age Group	2013		2022	
	Population	Share of Working-Age Population	Population	Share of Working-Age Population
16 - 24	52,364	19.0%	51,827	19.6%
25 – 34	53,577	19.4%	53,161	20.1%
35 - 44	51,591	18.7%	54,856	20.8%
45 – 49	29,150	10.6%	23,949	9.1%
50 – 54	31,172	11.3%	25,061	9.5%
55 – 59	29,607	10.7%	25,326	9.6%
60 - 64	28,315	10.3%	30,035	11.4%
Total	275,793	100%	264,215	100%

Source: US Census Bureau, American Community Survey: Age and Sex by County, 2023.

As the Bi-State Region experiences slow population growth and a diminishing working-age population, the trend of a decreasing labor force is expected to continue. However, unemployment rates have consistently and significantly decreased since 2013, falling from 7.3% to a low of 3.8% in 2022 (Figure 65). Even in years where the composition of the labor force has changed little, the decrease in the unemployment rate is notable, pointing to the Bi-State Region's improving ability to accommodate incoming job seekers.

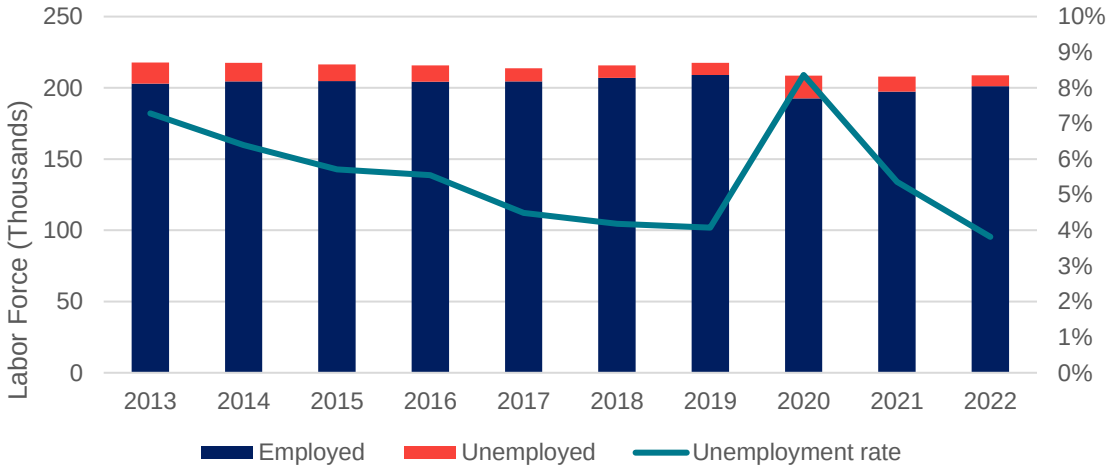
While the Region's 2022 unemployment rate is higher than Iowa's rate of 2.7%, it remains below the Illinois unemployment rate of 4.6%. Though both states and the Region have generally followed the same falling trend in unemployment since 2013, the Bi-State Region has shown quicker recovery since 2020 than its two home states. All three entities exhibited a sharp jump in the rate of unemployment in 2020 which has since decreased. However, both Iowa and Illinois have shown slower returns to a natural rate of unemployment and have seen small increases between 2022 and 2023.[40]

[38] U.S. Census Bureau, IL and IA Quick Facts. https://www.census.gov/quickfacts/. Accessed on January 2, 2024.

[39] Bi-State Regional Commission, Comprehensive Economic Development Strategy. 2021. https://bistateonline.org/documents/economic-development/4050-2021-ceds/file. Pg. 2. Accessed on November 14, 2023.

[40] Local Area Unemployment Statistics, Bureau of Labor Statistics Data Viewer, 2023. https://www.bls.gov/bls/data_finder.htm. Accessed on November 14, 2023.

Figure 65: Employment Levels and Unemployment Rate in the Bi-State Region, 2013 - 2022



Source: CPCS analysis of Labor Force Data by County, Bureau of Labor Statistics, 2023.

This quicker recovery in the Bi-State Region's unemployment rates may be influenced by its educational landscape. The proportion of adults aged 25 and over with no high school diploma is nearly three percent lower than the national share (Figure 66). Additionally, the region has a higher percentage of residents with a high school diploma (30.3%) or some college education or an Associate's degree (33.8%), compared to the national average of 26.5% and 28.7%, respectively. However, the proportion of individuals in the Bi-State Region with a Bachelor's degree or higher is 27.4%, though slightly higher than a decade ago, still lower than the U.S. average of 33.7%. This educational profile, particularly the prevalence of Associate's degrees that tend to foster workforce in manual and technical fields, aligns well with the region's industrial and manufacturing-focused economy.

Figure 66: Educational Attainment, 2021

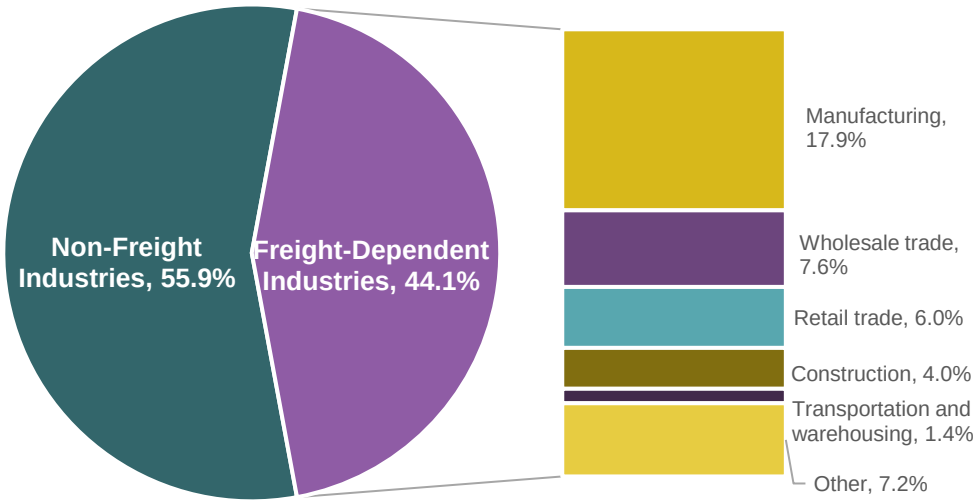
Educational Attainment	Bi-State Region	U.S. Average
No high school diploma	8.5%	11.1%
High school graduate	30.3%	26.5%
Some college or Associate's degree	33.8%	28.7%
Bachelor's degree or higher	27.4%	33.7%

Source: CPCS analysis of educational attainment data, American Community Survey (1-Year Estimates), U.S. Census Bureau, 2011-2021.

4.3.2 Freight-Dependent Industry GDP

The freight system is foundational to over 44% of the regional total GDP through its support of freight-dependent industries ($12.36 million). These industries play an integral role in driving economic expansion, job creation, and sustained GDP growth in the Bi-State region. The top freight-dependent industries by GDP are manufacturing and wholesale trade (Figure 67).

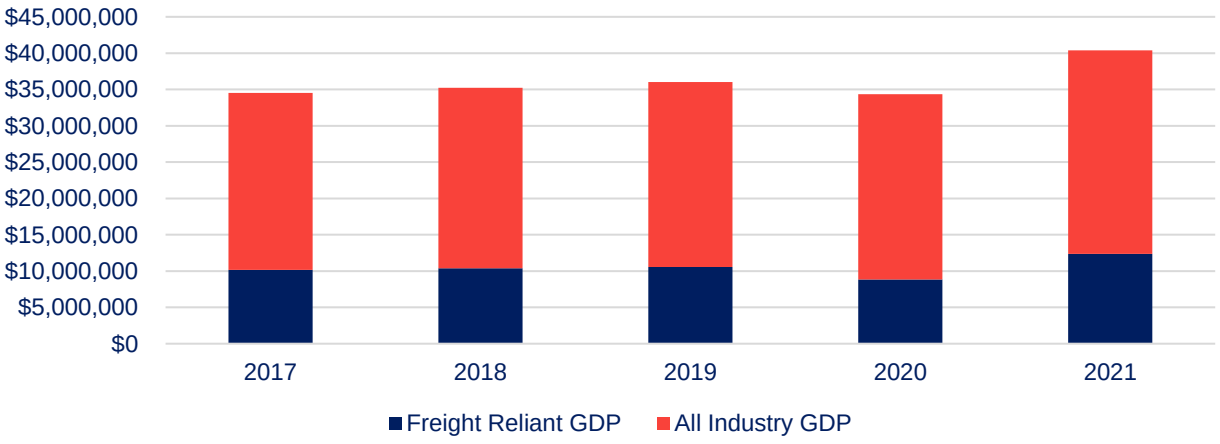
Figure 67: GDP Contribution of the Freight-Dependent Industries, 2023



Source: CPCS Analysis of BEA Regional Data[41]

Over the last five years, the upward trajectory in regional total GDP reflects a positive trend of economic expansion in the Bi-State Region. Freight-dependent industries constitute approximately 40% of the region's overall GDP during this period, displaying a substantial contribution to the local economy (Figure 68). The notable decrease observed in 2020 may be largely attributed to the far-reaching disruption caused by the COVID-19 pandemic. Despite this setback, the data shows a resilient and adaptive economy that rebounded in subsequent years, reinforcing the region's economic resilience.

Figure 68: Bi-State Region Freight-Dependent GDP Growth, 2017-2021



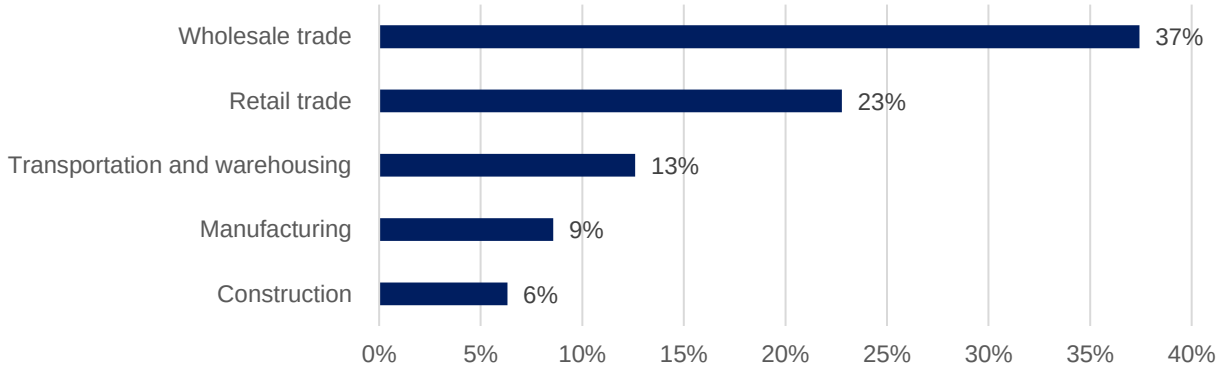
Source: CPCS Analysis of BEA Regional Data, 2023[42]

The freight-dependent industries that grew the fastest over the last five years are wholesale trade and retail trade, followed by transportation and warehousing, manufacturing, and construction (Figure 69).

[41] US Bureau of Economic Analysis, GDP by County, Metro, and Other Areas, as of December 2022, https://www.bea.gov/data/gdp/gdp-county-metro-and-other-areas. Accessed on October 5, 2023. "Other" denotes agriculture, forestry, fishing and hunting, mining, quarrying, oil and gas extraction, and utilities sectors. Note that employment figures from the Bureau of Economic Analysis are not fully available for the agriculture, mining, utilities, and transportation sector, due to the low sample size of businesses in the individual counties in the region.

[42] US Bureau of Economic Analysis, BEA Regional Data, as of December 2022, accessed on October 5, 2023, https://www.bea.gov/data/gdp/gdp-county-metro-and-other-areas

Figure 69: Growth in Real GDP by Industry, 2017-2021



Source: CPCS analysis of county-level GDP data, Bureau of Economic Analysis, 2017-2021.

4.4 Safety Goal Performance

Freight system safety is an important goal for the Bi-State Region. This chapter assesses the performance of the region's freight transportation system against its Safety Goal.

4.4.1 Truck-Involved Crashes

Between 2018 and 2022, 2,733 truck-involved crashes occurred in the Bi-State Region, averaging 547 crashes annually (Figure 70). The majority of these crashes (80%) were property-damage-only (PDO) crashes (Figure 71).[43]

- Scott County, Iowa, and Rock Island County, Illinois, the two most populous counties in the region, had the highest total truck-involved crashes from 2018 to 2022.
- Scott County, Iowa also experienced a relatively high number of truck-involved crashes that resulted in possible, minor, and severe injuries.
- Rock Island County registered the highest number of severe injury crashes at 24 during the 2018 to 2022 period.
- Muscatine County had the highest number of fatal crashes with a total of 7, followed closely by Scott and Henry counties with 6 each during the same period.

[43] Iowa DOT and Illinois DOT maintain traffic crash incident databases that record comprehensive information about motor vehicle accidents, including details about the vehicles involved, the circumstances of the crashes, and any resulting injuries or fatalities. The following vehicle types were considered in the analysis:

- Single-unit trucks
- Single-unit trucks with trailer
- Other light trucks (less than 10,000 lbs)
- Truck tractors (bobtail)
- Tractors with or without semitrailers
- Tractors/Doubles/Triples
- Other heavy trucks (greater than 10,000 lbs)

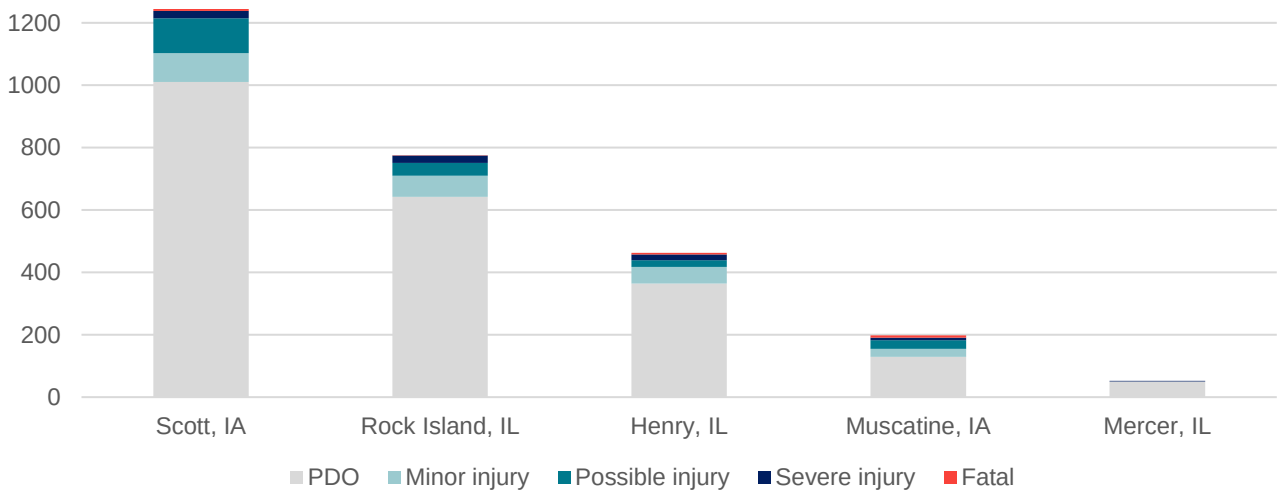
Crash severity was identified according to the injury classification systems used by each respective state.

Figure 70: Truck-Involved Crashes by County, 2018-2022

Severity	Scott County, IA	Muscatine County, IA	Henry County, IL	Mercer County, IL	Rock Island County, IL	Bi-State Region
Fatal	6	7	6	0	1	20
Severe injury	23	8	18	2	24	75
Minor injury	93	26	54	0	68	241
Possible injury	112	28	21	0	41	202
PDO	1,010	129	364	50	642	2,195
Total	1,244	198	463	52	776	2,733

Source: CPCS analysis of IL DOT and IA DOT crash data, 2023

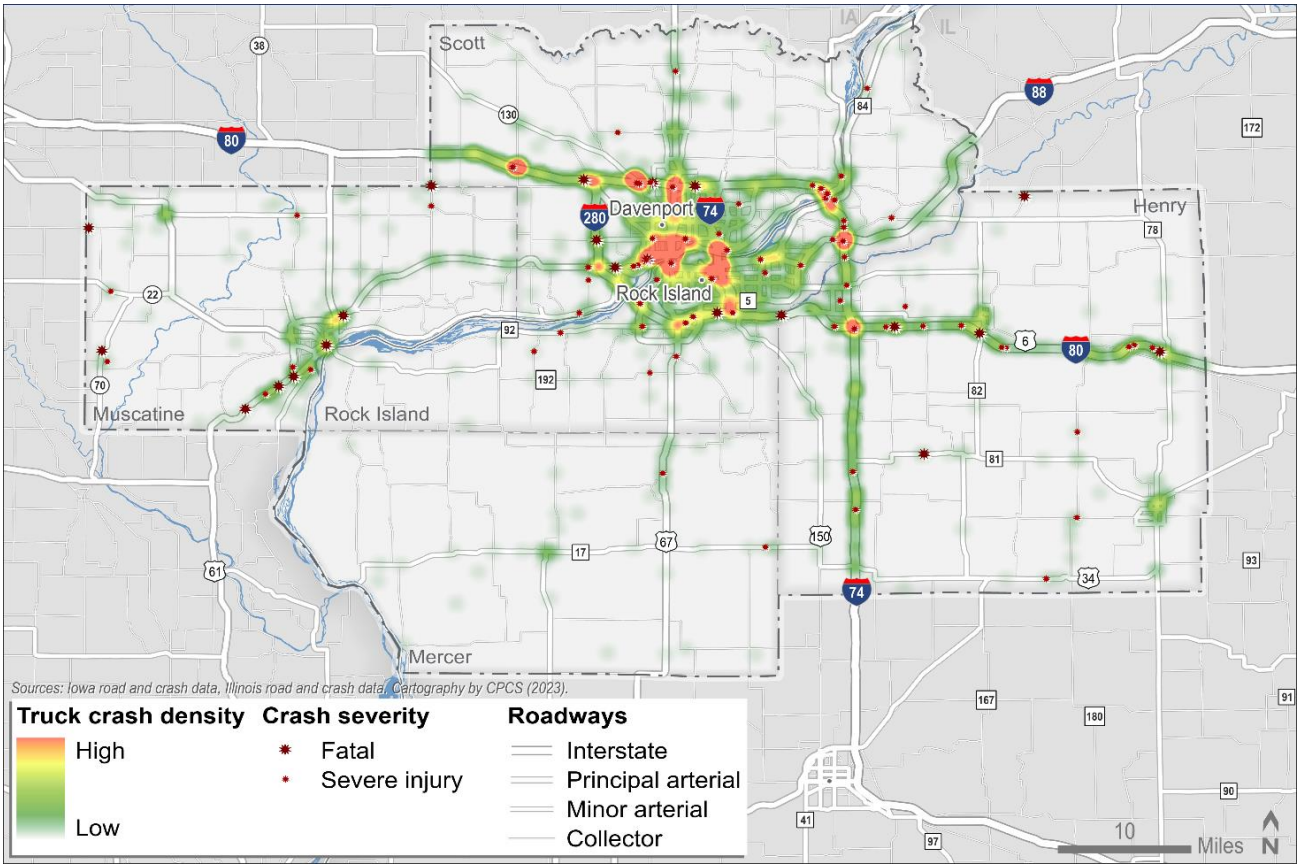
Figure 71: Truck-Involved Crashes by Severity, 2018-2022



Source: CPCS analysis of Illinois DOT and Iowa DOT crash data, 2023

Figure 72 shows the spatial distribution of all truck-involved crashes in the region that occurred between 2018 and 2022. Truck-involved crashes were clustered along the interstates. Fatal crashes were found primarily along the I-80 corridor with an additional cluster along US-61 in Muscatine County, Iowa.

Figure 72: Truck-Involved Crashes in the Bi-State Region, 2018-2022



Truck-Involved Crash Trends

From 2019 to 2020, the rate of truck-involved crashes per 100,000 VMT dropped sharply by 17.88%, which was primarily driven by a drop in the number of truck-involved crashes (13.77%) despite a 5.0% increase in total truck miles traveled (Figure 73). The downward trend in crash rate persisted through 2021 and 2022, though at a gentler rate of decline.

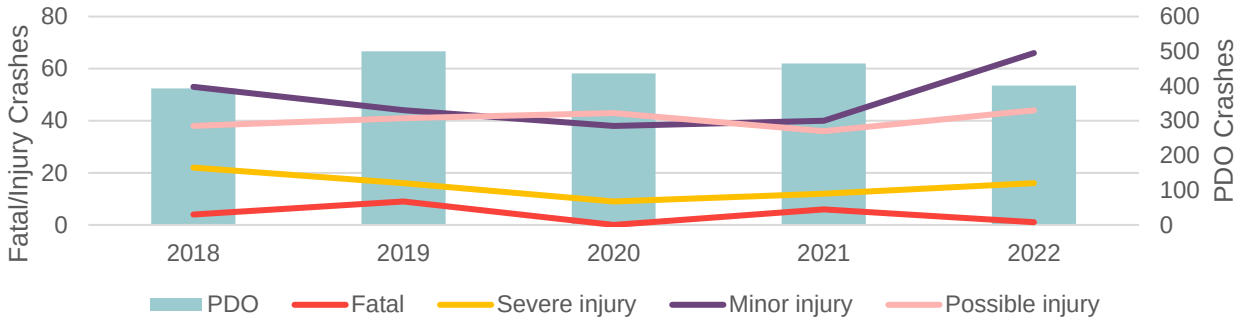
Figure 73: Truck-Involved Crashes and Daily Truck Miles Traveled, 2019-2022

Year	Daily Truck Miles Traveled		Truck-Involved Crashes		Truck Crash Rate	
	Total	% Annual Change	Total	% Annual Change	Rate (per 100,000 VMT)	% Annual Change
2019	3,401,700	-	610	-	17.93	-
2020	3,571,800	5.00%	526	-13.77%	14.73	-17.88%
2021	3,839,400	7.49%	559	6.27%	14.56	-1.13%
2022	3,733,100	-2.77%	528	-5.55%	14.14	-2.86%

Source: CPCS analysis of Replica data for truck VMT estimation and IL DOT and IA DOT crash data for crash analysis

In terms of severity, fatal truck-involved crashes peaked in 2019 with a total of 9 occurring across the region (Figure 74). Fatal truck-involved crashes reached their lowest point the following year during the pandemic with zero truck accident fatalities recorded in 2020. However, this number began to rebound in 2021 and 2022. Severe and minor injury truck crashes, both reaching low points during the pandemic, have also rebounded with severe injuries in 2022 reaching 2019 levels and minor injury crashes surpassing pre-pandemic levels in 2022.

Figure 74: Truck-Involved Crashes by Year, 2018-2022



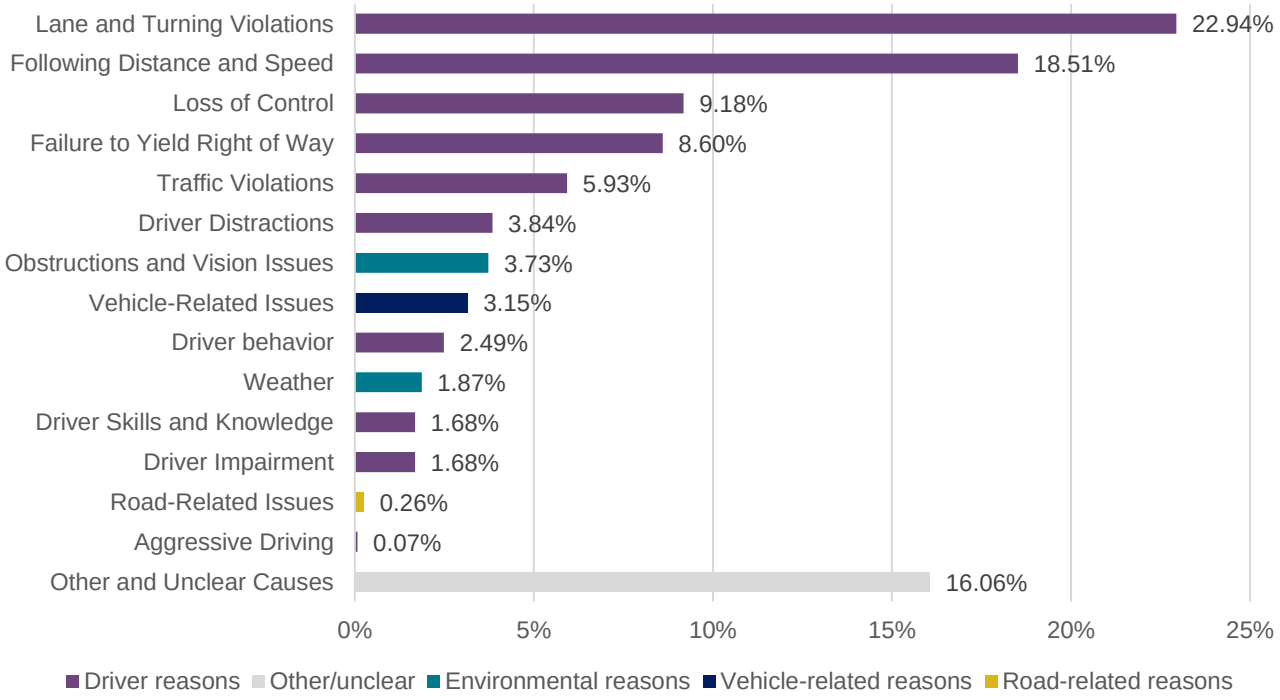
Source: CPCS analysis of IL DOT and IA DOT crash data, 2023

Crash Reasons

During the 2018 to 2022 period, 75% of truck-involved crashes were caused by reasons attributed to drivers. (Figure 75).

- Lane and turning violations such as improper lane usage and improper backing/turning/passing were the cause of nearly a quarter of all truck crashes.
- This is followed by 18.5% of crashes resulting from drivers failing to reduce speed to avoid collisions, exceeding safe speeds, or following too closely.
- Environmental causes, including weather reasons or obstructions and vision issues, road-related issues, and vehicle-related issues, such as cargo shift, account for 9% of all truck-involved crashes in the region.

Figure 75: Primary Reason of Crash, 2018-2022



Source: CPCS analysis of IL DOT and IA DOT crash data, 2023

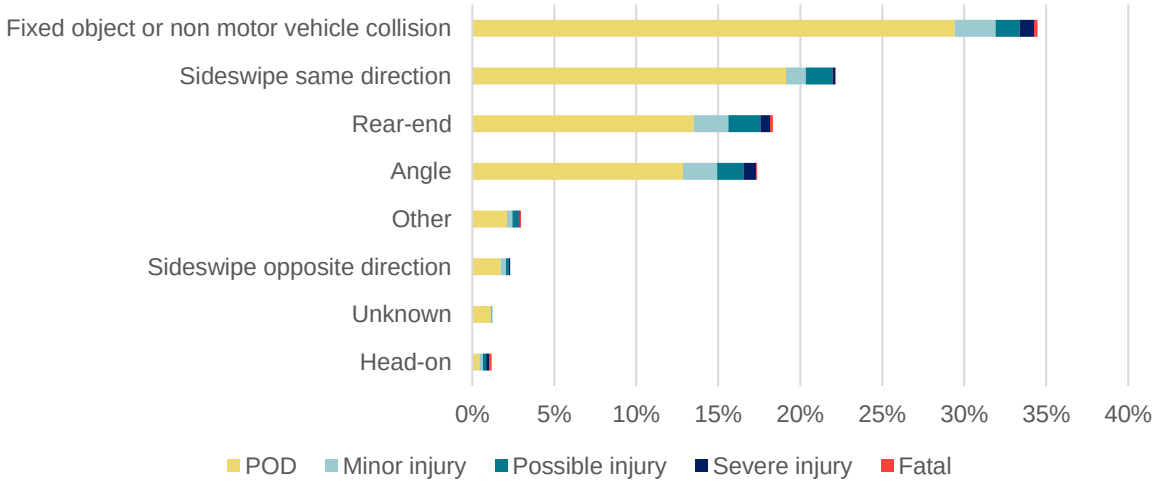
From 2018 to 2022, a total of 7 crashes were identified as primarily road-related issues leading to the accidents. Most of these incidents (6 out of 7) took place in Rock Island County, with only one occurring in Henry County. All incidents took place before 2021 and resulted in zero injuries. Out of these 7 crashes, 5 were categorized as non-motor vehicle collisions, while the remaining 2 were angle crashes. Half of these crashes were attributed to road engineering, surface, or marking defects, while the rest were linked to ongoing road construction or maintenance activities. During the observed period, no single location had more than one road-related crash.

Crash Types

An analysis of the types of truck-involved crashes in the region (Figure 76) shows:

- Over a third of all truck-involved crashes were collisions with fixed objects or non-motor vehicles, of which 85% did not result in any injury.
- Crashes caused by sideswipes of the same direction were the second most common, representing 22% of all crashes. Same-direction sideswipe crashes have a similarly low injury rate with less than 14% resulting in any type of injury.
- Rear-end, angle, other, and opposite-direction sideswipe crashes make up the next highest categories at 18%, 17%, 3%, and 2% of crashes in the region, respectively. The injury rate is relatively higher for these crash types at 26% for rear-end crashes and angle crashes, 28% for other crash types, and 25% for opposite-direction sideswipes.
- While head-on crashes make up the smallest share of truck crashes at 1%, they have a significantly higher injury rate with nearly two out of three head-on crashes resulting in injury. Fatalities occurred in 13% of head-on crashes, which is significantly higher than any other crash type recorded.

Figure 76: Truck-Involved Crashes by Type and Severity, 2018-2022



Source: CPCS analysis of IL DOT and IA DOT crash data, 2023

Truck-Bridge Crashes

From 2018 to 2022, 100 crashes occurred between a truck and a bridge in the region. The majority of these crashes (87%) occurred near rail crossings along the Iowa Interstate Railroad (IAIS) (Figure 77, 1), particularly at Harrison Street (30 crashes) and Brady Street (37 crashes). To address this, the City of Davenport worked with Iowa DOT on interventions at these sites.

- At Harrison Street, where the road slopes downward, trucks are warned by flashing lights to turn before reaching the bridge at 5th Street (Figure 77, 2). Additionally, signs indicating the

bridge's low clearance were installed one mile north, near Locust Street (Figure 77, 3) and subsequently after that.

- Similarly, at Brady Street, flashing lights were installed to alert drivers (Figure 77, 4). Signs warning of the bridge's low clearance are placed about a quarter mile south, near E 2nd Street (Figure 77, 5).

Traffic violations (36%) and driver behavior (31%) were cited as the leading causes of crashes at these rail crossings. Though less pervasive than rail-bridge crashes,13 crashes occurred at structures passing over highways.

Figure 77: Truck-Bridge Crash Locations (2018-2022) and Signs at and Near Harrison Street and Brady Street Bridges, 2023

Source: CPCS analysis of IL DOT and IA DOT crash data, 2023. Imagery from ESRI; Street view from Google Maps. 2: Signs and flashing lights approaching the bridge at Harrison Street; 3: low clearance bridge sign north of Locus Street; 4: Signs and flashing lights approaching the bridge at Brady Street; 5: low clearance bridge sign north of E 2nd Street

Truck-Non-Motorist Crashes

During the 2018 to 2022 period, 16 crashes occurred between a truck and a non-motorist[44] in the region. Five of the 16 crashes that occurred were fatal (see Crashes for information on the crash details).

[44] Non-motorists include pedestrians, cyclists, or other personal or animal conveyance.

- Two fatal crashes and a severely injured crash between a truck and a non-motorist occurred on either side of the I-80 interchange at US 61 in Davenport. Evasive swerving action by the truck driver resulted in one severe injury.
- There were another two fatal crashes between a truck and a non-motorist on US 61 at north and south Muscatine. Driver behavior was cited as the cause of one of the crashes.
- A fatal truck crash occurred on US 61 in Davenport, with the non-motorist action reported as a contributing factor to the crash.

Truck and non-motorist crashes were most common in Scott County with 8 occurring between 2018 and 2022, followed by Rock Island County with 4, Muscatine County with 3, Henry County with 1, and zero in Mercer County.

4.4.2 Rail Incidents

Though both states partner with the Federal Railroad Administration (FRA) to monitor and improve rail safety, both Iowa and Illinois have created individual entities to regulate statewide rail safety. In Iowa, the state DOT's Rail Transportation Bureau administers federal funds for rail safety improvements, carries out regular track inspections, and administers a surface repair program for the maintenance of pavement at highway-rail grade crossings. Similarly, Illinois's Commerce Commission partners with the FRA to establish rail safety requirements for the track, facilities, and equipment on state rail lines.

Rail Incident Types

The concentration of major railways in the Bi-State Region generates higher numbers of highway-grade crossings and the potential for more trespassing incidents, totaling 90 during 2017 and 2021 (Figure 78).

- Trespassing incidents are the most common type of rail incident in each county, with 34 incidents spread across the four counties with rail access in the last five years.
- Equipment incidents where there is a failure of equipment or damage to crossing infrastructure are the second most common but rarely result in injury in the Region.
- The Region recorded 26 highway-rail grade crossing incidents over the past five years, with the primary reasons including failure of a vehicle to obey crossing warning signs and speed requirements or a vehicle stopping on the tracks.

Scott County, Iowa consistently records the highest number of all incident types and recorded one trespasser fatality in the last five years (Figure 79).

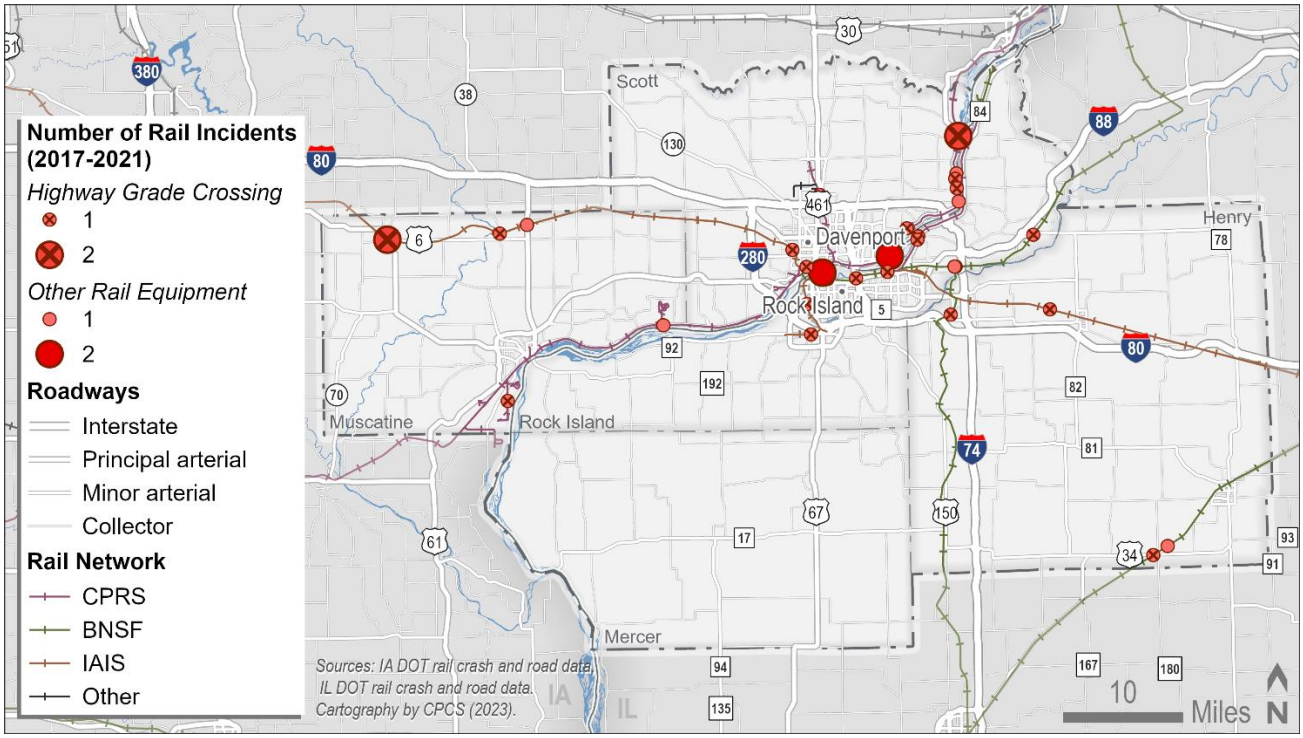
Figure 78: Rail Incidents by County, 2017-2021

Types	Scott County	Muscatine County	Rock Island County	Henry County	Total
Highway-rail grade crossing incidents	10	6	8	2	26
Trespassing	16	11	4	3	34
Other/equipment incidents	14	7	4	5	30
Total Incidents	40	24	16	10	90

Source: CPCS analysis of FRA, Incidents by County, DOT, 2023[45]; FRA, Trespasser Dashboard, DOT, 2023[46].

[45] FRA, Incidents by County, DOT, 2023, https://railroads.dot.gov/accident-and-incident-reporting/highwayrail-grade-crossing-incidents/incidents-county, accessed on October 12, 2023.
[46] FRA, Trespasser Dashboard, DOT, 2023. https://explore.dot.gov/views/TrespasserDashboard/TrespasserCalendarDashboardCY?iframeSizedToWindow=true&%3Aembed=y&%3AshowAppBanner=false&%3Adisplay_count=no&%3AshowVizHome=no, accessed on October 12, 2023.

Figure 79: Rail Incidents, 2017-2021

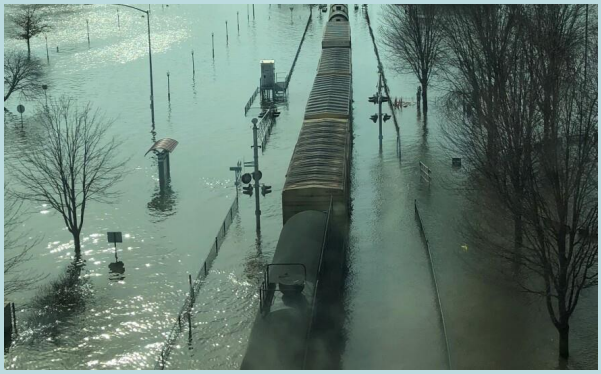


Note the geographic location information of the trespassers incidents is only available at the county level

CP Track Raising 2019 – 2021

Due to abnormally high flooding in the Davenport area in 2019 (Figure 80), Canadian Pacific (CP) decided to raise three miles of mainline track along the Mississippi River roughly 3.5 feet. This effort, while mitigating the effects of flooding on rail infrastructure over two years, cut off seven waterfront highway-grade crossings. Temporary asphalt ramps were immediately built at a few of the crossings, with access to all seven crossings being fully reestablished by the end of 2021. While asphalt ramps offered temporary solutions to drivers on the Mississippi waterfront, safety concerns, and limited access meant rail service and car volumes along the river were not restored to pre-flooding levels until 2021. Inconsistent and temporary solutions to crossing access restoration could point to the increase in crossing incidents in 2019 and 2021.[47]

Figure 80: Flooded CP Track in Davenport



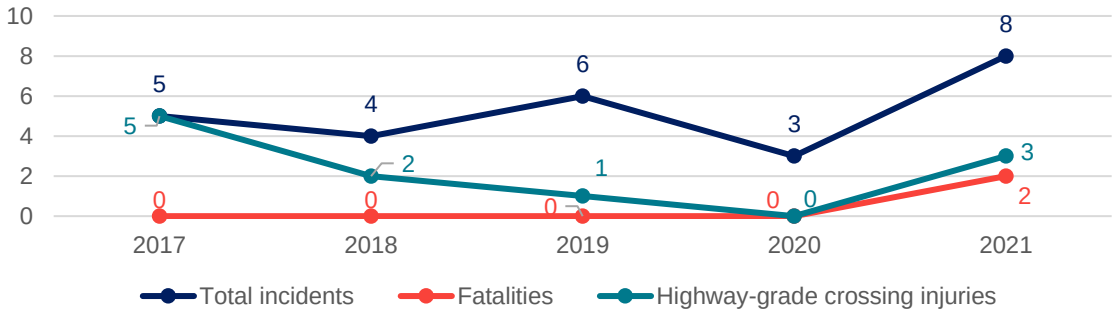
Source: Kate Payne, Railroad Raises Flooded Tracks, Local Concerns In Davenport, Iowa Public Radio, April 2019.

[47] Kate Payne, Railroad Raises Flooded Tracks, Local Concerns In Davenport, Iowa Public Radio, April 2019. https://www.iowapublicradio.org/2019-04-08/railroad-raises-flooded-tracks-local-concerns-in-davenport. Accessed on January 4, 2023.

Rail Incident Trends

Within the five years examined, trends vary based on the type of incident. Highway grade crossings, both public and private, have varied each year in quantity and severity. The year 2021 recorded the highest number of highway-rail grade crossing incidents, with two fatalities and one injury. Until 2021, injuries had generally decreased, and fatalities remained at zero (Figure 81).

Figure 81: Highway-Rail Grade Crossing Incidents in the Bi-State Region, 2017-2021

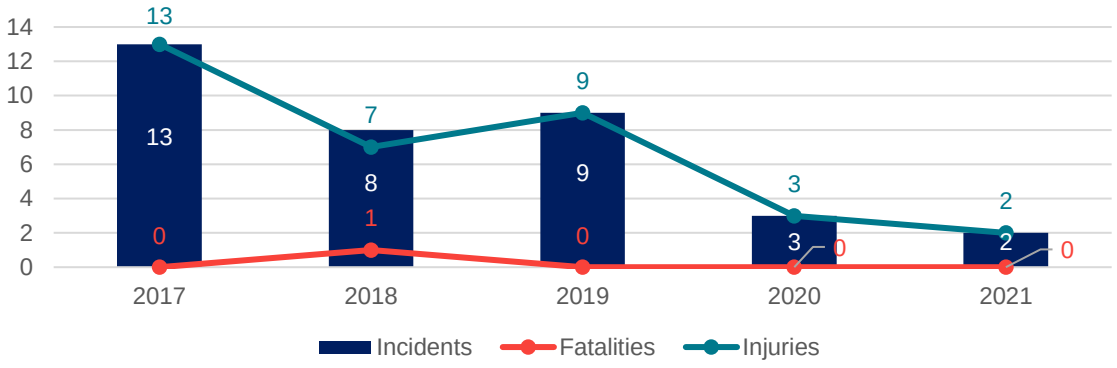


Source: CPCS analysis of FRA, Incidents by County, DOT, 2023[48]

Though Scott County often records the highest number of highway-rail grade crossing incidents, few crossings have seen more than one incident in the five-year period that was studied. Only Iowa Interstate Railroad crossings at Marquette St. in Davenport and Calhoun St. in West Liberty have seen more than one incident since 2017, recording two and three incidents respectively. The Iowa Interstate Railroad has recorded 11 incidents total since 2017, followed by eight crossing incidents on the CP mainline that runs through Scott, Muscatine, and Rock Island County.

Trespassing incidents in the Bi-State Region follow a noticeably different trend than grade-crossing incidents. Between 2017 and 2021, trespassing incidents and injuries have generally decreased, falling from 13 in 2017 to two in 2021 (Figure 82). The number of injuries tends to correspond with the number of incidents, with each incident resulting in at least one injury. One trespasser incident was fatal in 2018 with the remaining years having zero fatal incidents.

Figure 82: Rail Trespassing Incidents in the Bi-State Region, 2017-2021



Source: CPCS analysis of FRA, Trespasser Dashboard, DOT, 2023.[49]

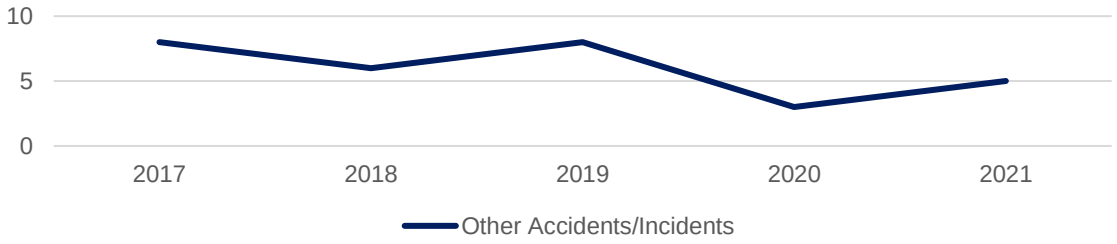
Like trespassing incidents, equipment, and infrastructure incidents have also become rarer in the Region, falling from eight incidents in 2017 to five in 2021 (Figure 83). All but three incidents in the last five years have resulted in derailments, the others causing delays or safety issues at highway grade

[48] FRA, Incidents by County, DOT, 2023, https://railroads.dot.gov/accident-and-incident-reporting/highwayrail-grade-crossing-incidents/incidents-county, accessed on October 12, 2023.

[49] FRA, Trespasser Dashboard, DOT, 2023. https://explore.dot.gov/views/TrespasserDashboard/TrespasserCalendarDashboardCY?iframeSizedToWindow=true&%3Aembed=y&%3AshowAppBanner=false&%3Adisplay_count=no&%3AshowVizHome=no, accessed on October 12, 2023.

crossings. The causes have been wide-ranging, though repeating causes include failure to comply with restricted speed requirements in metro areas, missing or damaged spikes, and rail or bridge misalignment or failure. CP and BNSF mainlines are the lines with the most equipment incidents, occurring most often in Rock Island and Scott County.

Figure 83: Equipment/Other Rail Incidents in the Bi-State Region, 2017–2021



Source: CPCS analysis of FRA, Incidents by County, DOT, 2023[50]

4.5 Mobility Goal Performance

Efficient mobility in a transportation system is crucial for freight movement, as it ensures timely and cost-effective delivery of goods. Hindered mobility and reliability lead to inefficiencies, imposing additional costs on shippers, users of the transportation system, and society overall, which can negatively impact the economic vitality of a region. This chapter assesses the performance of the region's freight transportation system against its Mobility Goal.

4.5.1 Interstate Truck Travel Time Reliability (TTTR) Index

Truck Travel Time Reliability (TTTR) is the ratio of average truck travel time in peak hours to free-flow truck travel time and indicates the degree to which travel time delays are unexpected to road users. The TTTR is defined as the 95th percentile truck travel time divided by the 50th percentile truck travel time[51].

- A TTTR Index close to 1 suggests that travel times are generally reliable and predictable, with minimal variance between typical (50th percentile) and less frequent, longer (95th percentile) travel times.
- A TTTR Index much greater than 1 suggests that travel times can be very unpredictable. Trucks are more likely to experience significant delays, and the difference between a "typical" day and a "bad" day can be substantial.

This is the only federally required freight performance measure and is a useful indicator to illustrate the level of reliability of truck travel in the most heavily traveled parts of the region. The TTTR is reported on the FHWA's National Performance Management Research Data (NPMRDS) platform, for the interstates within the Metropolitan Planning Organization's planning area.

Figure 84 illustrates that, over the past five years, the region consistently achieved its objective, with all TTTR measures remaining below the target threshold of 1.5.

Figure 84: Truck Travel Time Reliability Index, 2019-2023

Target	2019	2020	2021	2022	2023*
Less than 1.5	1.26	1.17	1.21	1.19	1.16

Source: NPMRDS Analytics, MAP-21 Truck Travel Time Reliability Index (for interstate roads only), 2023 data up to November

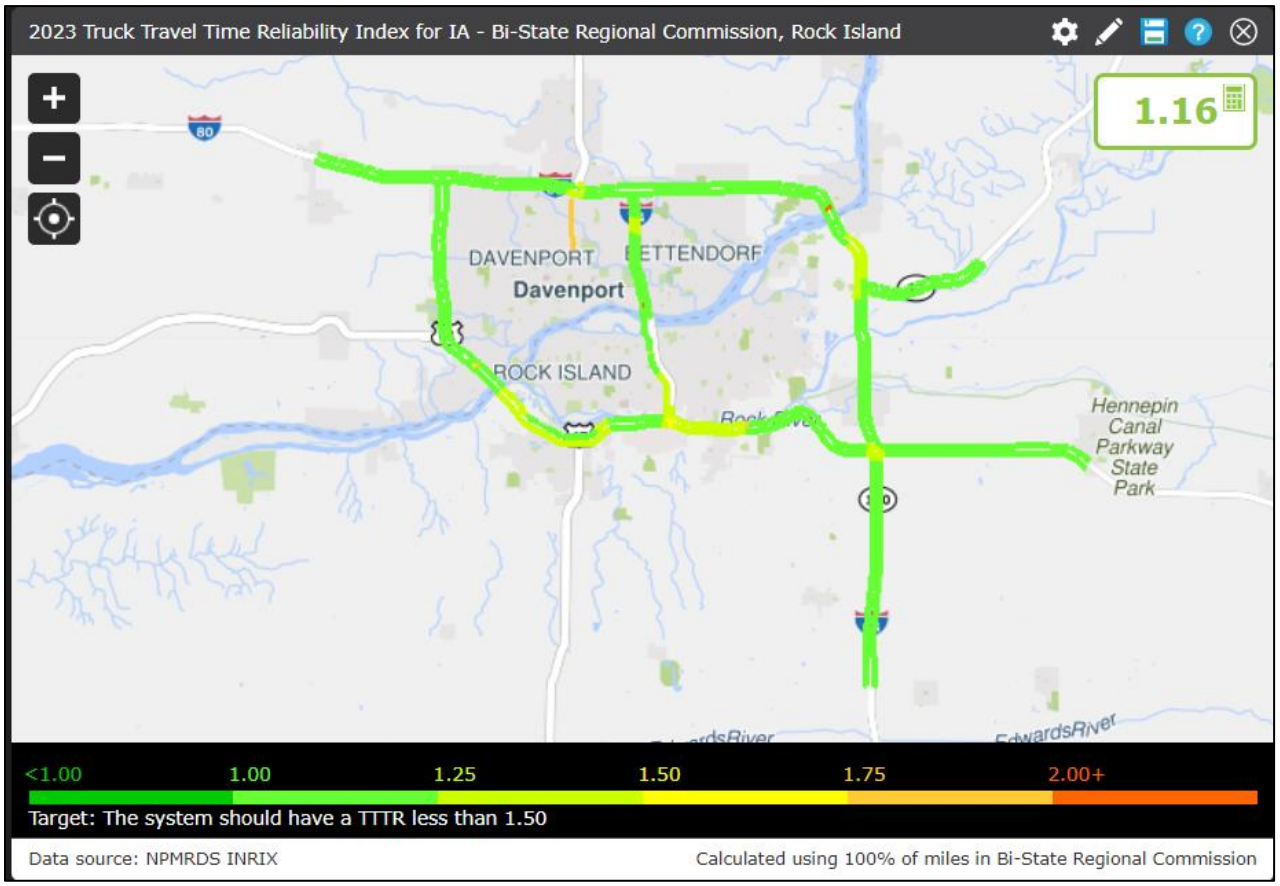
[50] FRA, Incidents by County, DOT, 2023, https://railroads.dot.gov/accident-and-incident-reporting/highwayrail-grade-crossing-incidents/incidents-county, accessed on October 12, 2023.

[51] The TTTR is calculated for five time periods of each interstate segment known as a Traffic Message Channel (TMC). The maximum TTTR for each TMC is multiplied by the length of the TMC. Then the sum of all length-weighted segments divided by the total length of the Interstate will generate the TTTR Index

Figure 85 provides a detailed view of the TTTR Index for 2023, expanding its scope to include results from non-interstate segments. Highlighted within this figure is a list of major roadway segments where the TTTR Index exceeded the 1.5 threshold, pinpointing areas where travel time reliability did not meet the set target.

- US-61 (southbound) between I-80 and Kimberly Rd
- The I-74 and I-280 interchange
- The I-74 and US-6 interchange
- The I-74 and US-67 interchange
- The I-80 and US-67 interchange
- The I-280 and IA-22 interchange

Figure 85: Truck Travel Time Reliability Index, 2023



Source: NPMRDS Analytics, 2023

4.5.2 Regional Top Truck Bottlenecks

Truck bottlenecks are areas or segments on the roadway network on which the trucks experience a significant breakdown in traffic flow. According to the FHWA, a bottleneck may cause congestion, but congestion is not always the result of a bottleneck.

The RITIS Probe Data Analytics Suite[52], available to BSRC via the DOTs, provides a Bottleneck Ranking Tool that identifies and ranks bottlenecks in the region based on a weighted total delay matrix. The calculation of the total delay matrix is based on a base impact measure. This measure is derived from the cumulative length of traffic queues throughout the bottleneck. It is then weighted by the disparity between the free-flow travel time and the actual observed travel time. This difference is multiplied by the Average Annual Daily Traffic (AADT) and further adjusted with a factor that accounts for variations across different days of the week. By default, this tool ranks regional highway bottlenecks for all vehicular traffic. The bottleneck segments reflect the accumulation of traffic.

RITIS Probe Analytics Suite Data Sources

The RITIS Probe Data Analytics Suite primarily uses data from GPS-equipped vehicles and mobile devices to generate its speed, congestion, and bottleneck matrices. Major data providers include HERE, INRIX, and TomTom. The data sources can be categorized into the following categories:

- **GPS Data from Vehicles:** This includes data from commercial vehicles, fleets, and passenger cars equipped with GPS devices. The data typically consists of speed and location information, which is crucial for analyzing traffic flow and identifying congestion and bottlenecks.
- **Mobile Device Data:** This is derived from smartphones and other GPS-enabled mobile devices. These devices constantly transmit location data, which, when aggregated, provide valuable insights into traffic patterns.
- **Data from Traffic Apps and Services:** Apps and services that provide real-time traffic information often contribute data to the RITIS platform. Users of these apps, through their travel patterns and speed, provide real-time traffic condition data.
- **Data Aggregation and Fusion:** RITIS often integrates data from various sources, including public transportation systems, toll transponders, and other sensor networks. This aggregated data provides a more comprehensive view of traffic conditions.

To highlight the bottlenecks that are most impactful for truck traffic, the total delay matrix was adjusted by the share of truck traffic volume. Figure 86 and Figure 87 show the ranking of bottlenecks for interstates and non-interstates, respectively.

It is important to note that these rankings provide a snapshot in time of the delays encountered by truck traffic across the Bi-State Region for the year 2022. Such delays may have been influenced by various factors, including construction projects and traffic accidents. It's also noteworthy that these rankings are specific to the Bi-State Region's road network. Nationally, none of the roadways in the Bi-State Region have been listed among the most significant bottlenecks.[53] According to the *Illinois State Freight Plan (2023),* the stretch of I-74 between the IL/IA state line and 6th Avenue in Moline is identified as a moderate truck bottleneck. [54] Furthermore, the *Iowa State Freight Plan (2022)* has pinpointed several locations within the Bi-State Region as state-wide freight bottlenecks:

[52] RITIS Probe Data Analytics Suite. https://pda.ritis.org/suite/, accessed on November 22, 2023.

[53] FHWA, Freight Mobility Tool, 2023. https://explore.dot.gov/t/FHWA/views/FHWAFMMBottlenecks5_1/NationalBottlenecks?%3Aembed=y&%3Aiid=2&%3AisGuestRedirectFromVizportal=y. Accessed on December 14, 2023.

[54] IL DOT. Illinois State Freight Plan GIS tool, 2023. https://experience.arcgis.com/experience/02ff4ea2b70f479fb6add581317c310e/page/Page/?views=Bottlenecks. Accessed on December 14, 2023.

- US 61 at Grandview Ave and Dick Drake Way in Muscatine;
- IA 22 at US 61 in Muscatine;
- US 61 at IA 38 in Muscatine;
- US 61 and I-80 in Davenport; and
- US 67 and I-74 at Davenport [55]

Figure 86: Interstate Truck Bottlenecks, 2022

Rank	Bottleneck	Segment	Total Duration (Cumulative)	Base Impact	Base Impact Weighted by Total Delay	Base Impact Weighted by Truck Delay
1	I-80 N	1St Avenue and IL/IA Stateline	1 d 18 h 5 m	6,452	6,751,898	2,104,225
2	I-80 S	I-280 and I-80	1 d 4 h 2 m	1,922	1,083,531	498,641
3	I-80 E	I-74 and US-67	7 h 45 m	2,356	1,385,748	433,824
4	I-80 W	US-61 and Exit 301	5 h 55 m	687	1,293,342	413,893
5	I-80 W	Middle Rd/Exit 301 and Exit 1	5 h 19 m	1,405	1,141,461	350,666
6	I-80 S	US-6 and I-88	7 h 9 m	1,112	877,091	306,152
7	I-74 N	IL/IA Stateline and Exit 3	3 d 7 h 4 m	3,927	9,802,966	296,434
8	I-80 W	CR-Y40 and US-61	3 h 34 m	1,207	569,159	253,488
9	I-280 E	IL/IA Stateline and I-80	19 h 58 m	1,103	577,487	223,855
10	I-80 E	CR-Y30 and US-6	2 h 8 m	659	491,779	213,621
11	I-80 E	Exit 301 and IL/IA Stateline	3 h 39 m	500	389,811	121,816
12	I-80 E	I-280 and Exit 280	11 h 3 m	880	400,628	119,320

Source: CPCS analysis of RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

Figure 87: Non-Interstate Truck Bottlenecks, 2022

Rank	Bottleneck	Segment	Total Duration (Cumulative)	Base Impact	Base Impact Weighted by Total Delay	Base Impact Weighted by Truck Delay
1	IA-38 S	I-80 and US-61	247 d 5 h 34 m	4,974	1,109,357	134,292
2	Cleveland Rd E	IL-84 and I-80	264 d 11 h 53 m	13,255	1,797,080	125,299
3	US-61 N	IA-22 and Park Ave	31 d 17 h 2 m	4,746	880,936	119,550
4	IL-5 W	I-74 and 7th St	1 d 16 h 39 m	3,728	2,033,928	104,685
5	US-67 E	I-74 and 26th St	38 d 16 h 15 m	10,118	1,949,928	93,501
6	US-67 S	Mound St and I-74	8 d 12 h 31 m	5,258	2,174,387	90,241
7	US-67 N	W 10th Ave and E 1st Ave	91 d 21 h 59 m	10,845	1,425,457	84,699

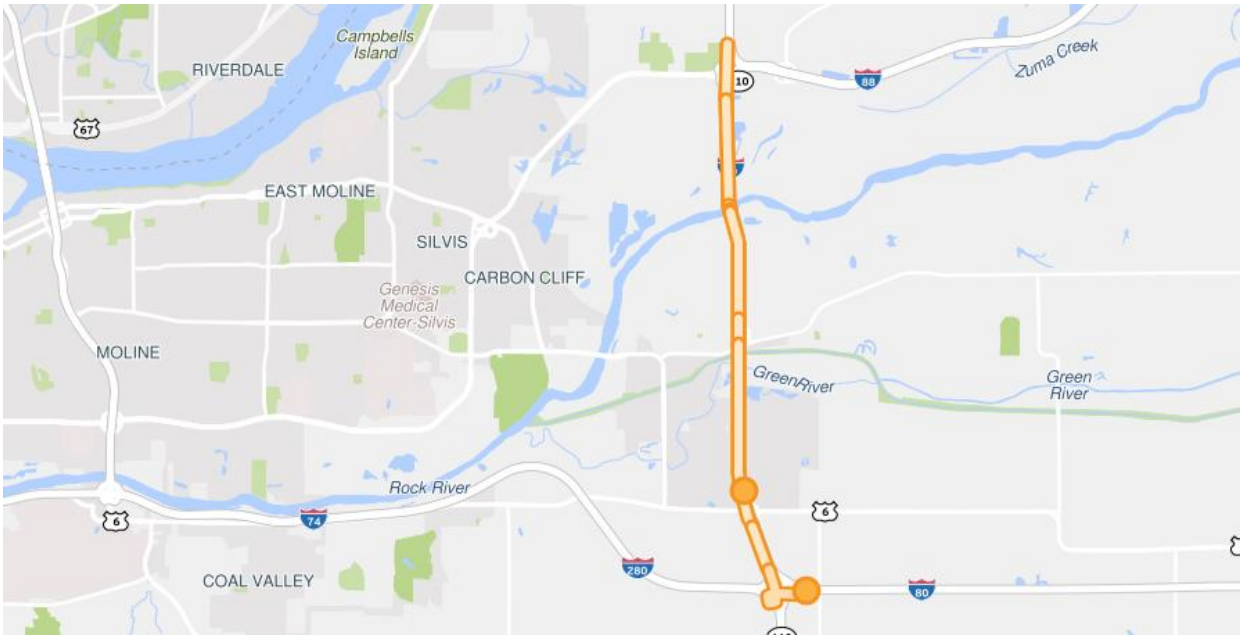
Source: CPCS analysis of RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

[55] IA DOT. Iowa State Freight Plan. 2022. https://iowadot.gov/iowainmotion/files/SFP2022-State-Freight-Plan-Full-Document.pdf. Accessed on December 14, 2023.

The analysis shows the following bottleneck segments on the interstate system in 2022:

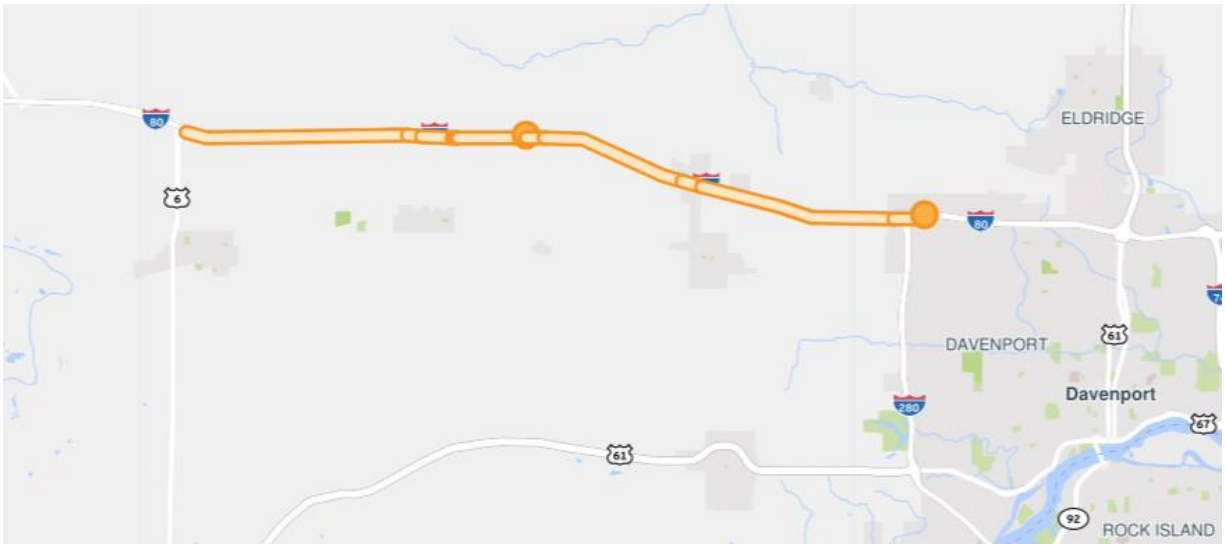
- Bottleneck segments with high truck traffic share (over 37%):
  - I-80 (southbound) between I-88 and I-80 (Figure 88; Rank 2 and 6 in Figure 86).[56]
  - I-80 (eastbound) between US-6 and I-280 (Figure 89; Rank 10 and 12 in Figure 86)

Figure 88: Bottleneck at I-80 (southbound) between I-88 and I-80, 2022



Source: RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

Figure 89: Bottleneck at I-80 (eastbound) between US-6 and I-280, 2022



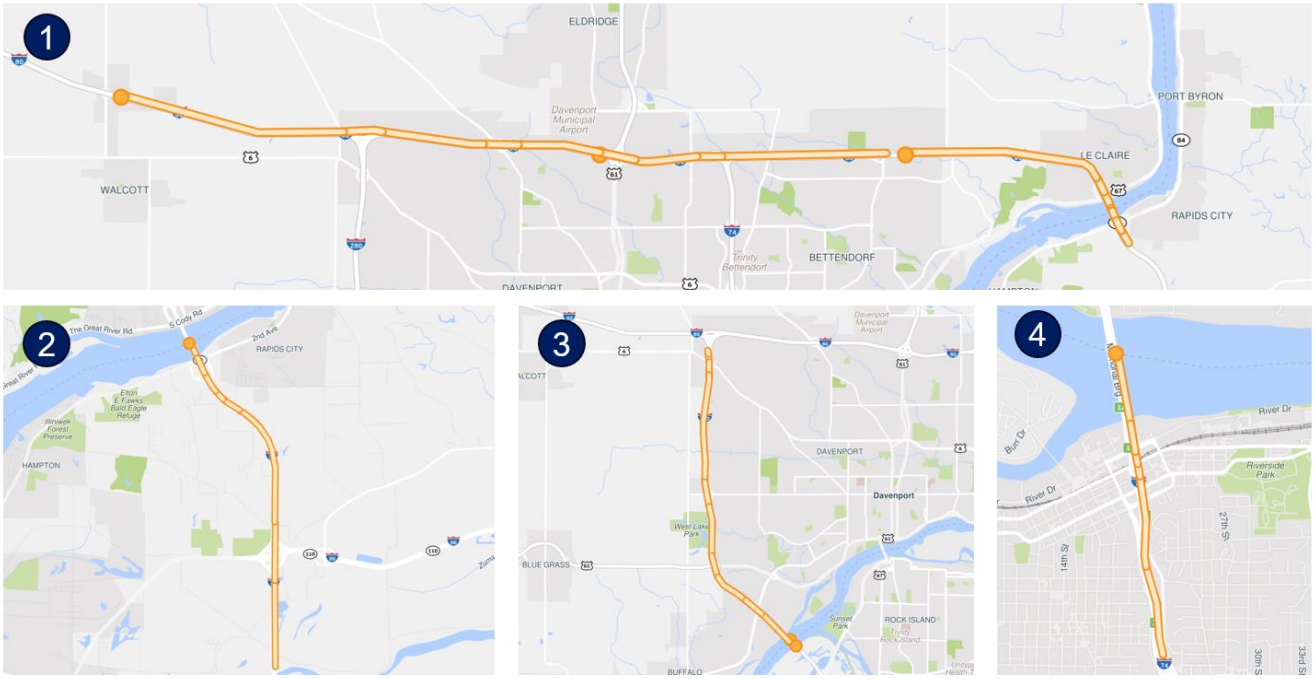
Source: RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

- Bottleneck segments due to frequent traffic events or incidents

[56] Pavement patching work on I-74 from the I-74/80/280 interchange to IL 81 from March to May 2022 may have also contributed to the delay on this segment of I-80. IL DOT Quad Cities Projects, 2022. https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/maps---charts/rebuild-illinois/project-maps/rbi_qc_map.pdf. Accessed on December 14, 2023.

- I-80 (westbound) between IL/IA Stateline and Exit 284 (Figure 90, 1; Rank 4, 5, and 8 in Figure 86)
- I-80 (northbound) between 1 St Ave N and IL/IA Stateline (Figure 90, 2; Rank 1 in Figure 86)
- I-280 (southbound) between I-80 and the IL/IA Stateline (Figure 90, 3; Rank 9 in Figure 86)[57]
- I-74 (northbound) between 19th St Entrance and IL/IA Stateline (Figure 90, 4; Rank 7 in Figure 86)[58]

Figure 90: Interstate 80 Bottleneck Due to Frequent Traffic Events or Incidents, 2022



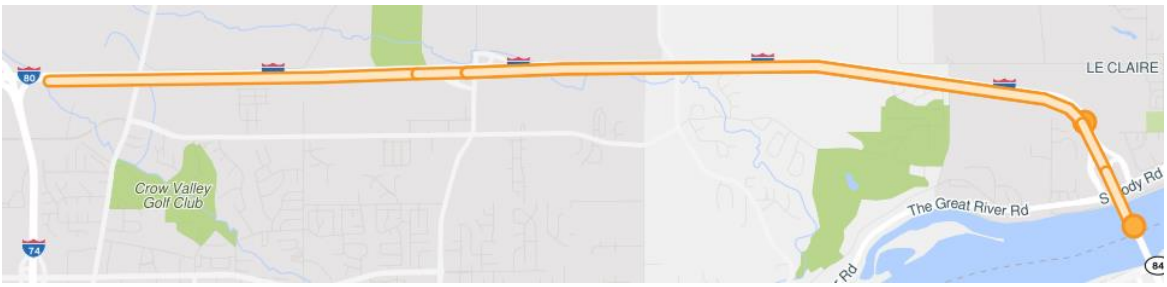
Source: RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

[57] Bridge painting and deck replacement work on I-280 bridge over Mississippi River from March 2022 into 2023 contributed to the delay. IL DOT Quad Cities Projects, 2022. https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/maps---charts/rebuild-illinois/project-maps/rbi_qc_map.pdf. Accessed on December 14, 2023.

[58] Landscaping work on I-74 from Mississippi River to the Avenue of the Cities during the summer and fall of 2022 may have contributed to the delay trucks experience on this segment. IL DOT Quad Cities Projects, 2022. https://idot.illinois.gov/content/dam/soi/en/web/idot/documents/transportation-system/maps---charts/rebuild-illinois/project-maps/rbi_qc_map.pdf. Accessed on December 14, 2023.

- Bottleneck segments due to overall slow traffic speed
    - I-80 (eastbound) between I-74 and the IL/IA Stateline (Figure 91; Rank 3 and 11 in Figure 86)

Figure 91: Bottleneck at I-80 (eastbound) between I-74 and the IL/IA Stateline, 2022

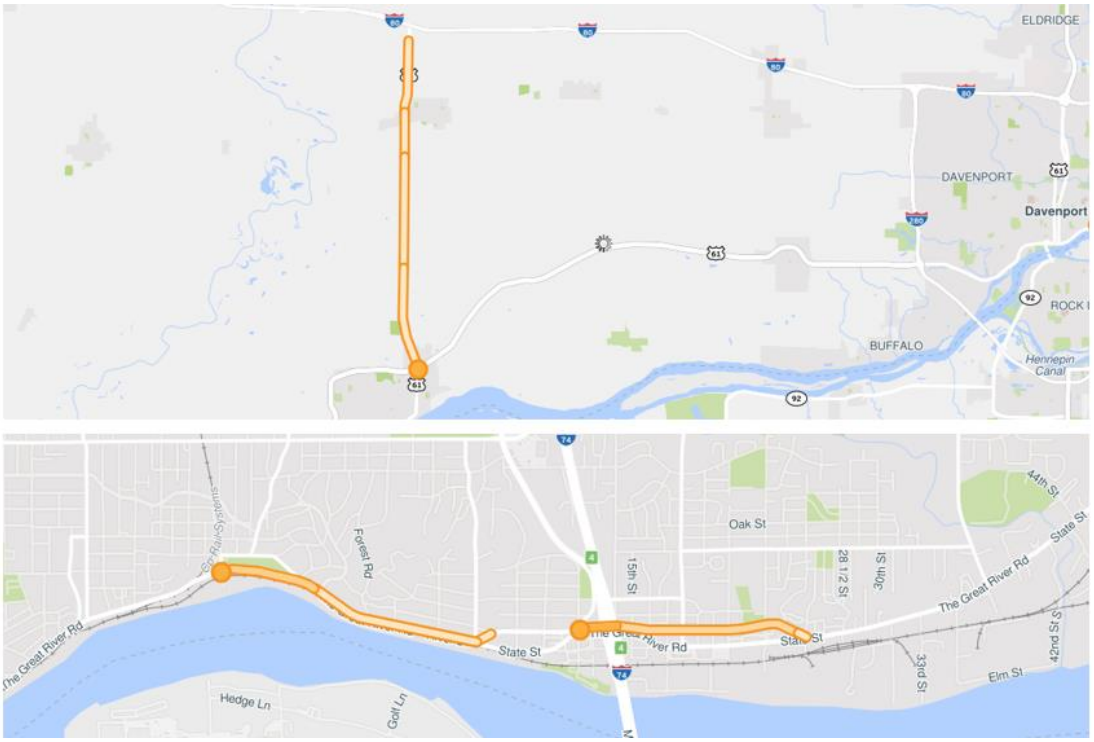


Source: RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

The non-interstate bottlenecks include:

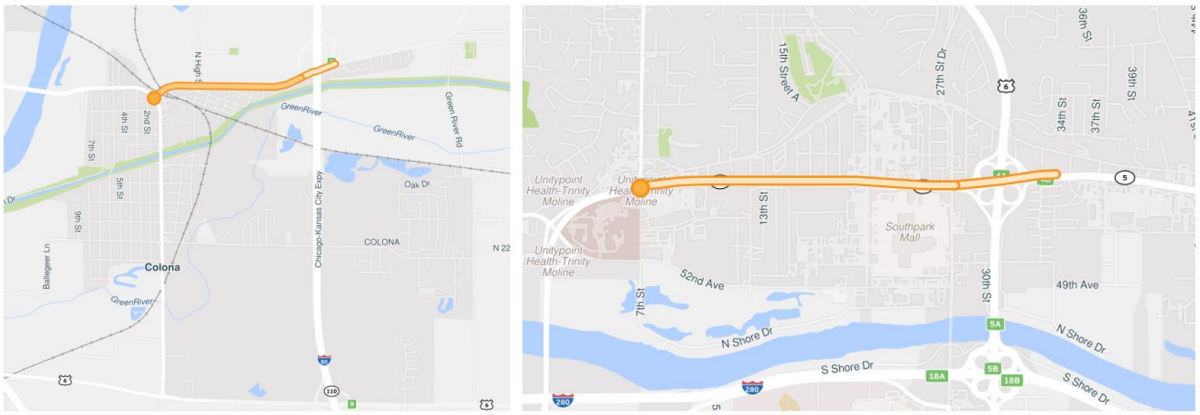
- Bottleneck segments that provide access to the interstates
    - IA-38 (southbound) between I-80 and US-61 connecting I-80 with Muscatine (Figure 92, top; Rank 1 in Figure 87)
    - US-67 (eastbound) between Mound St and 26th St in Davenport and Bettendorf (Figure 92, bottom; Rank 5 and 6 in Figure 87)
    - Cleaveland Rd (eastbound) between IL-84 and I-80 in Colona (Figure 93, left; Rank 2 in Figure 87), which is also impacted by BNSF and IAIS railroad traffic on the eastern end.
    - IL-5 (westbound) between I-74 and 7th St in in Moline (Figure 93, right; Rank 4 in Figure 87)

Figure 92: Bottleneck at IA-38 (southbound) and US-67 (eastbound), 2022



Source: RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

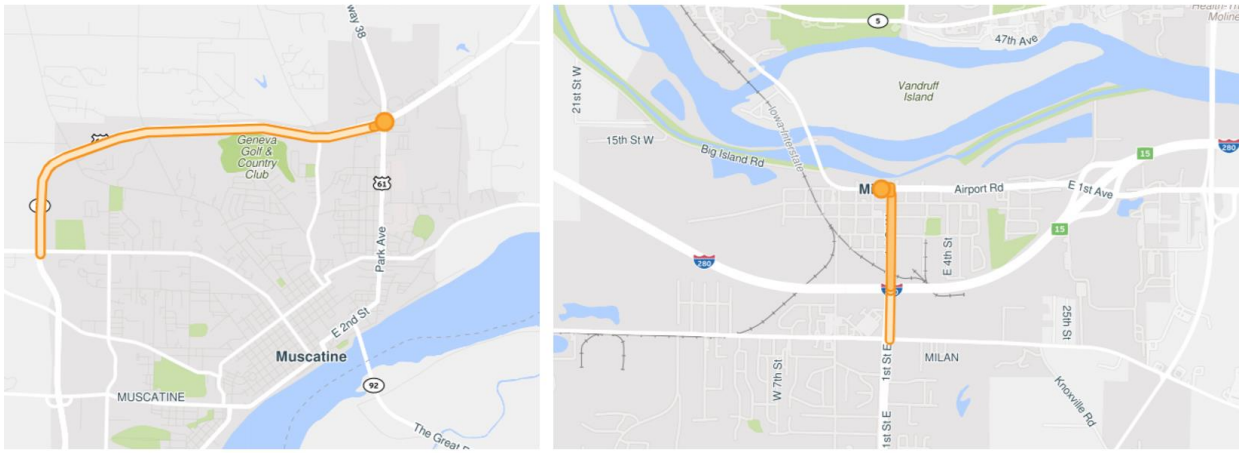
Figure 93: Bottleneck at Cleaveland Rd (eastbound) and IL-5 (westbound), 2022



Source: RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

- Bottleneck segments that provide access to freight-intensive land uses
    - US-61 (northbound) between IA-22 and Park Ave in Muscatine (Figure 94, left; Rank 3 in Figure 87)
    - US-67 (northbound) between W 10th Ave and E 1st Ave in Milan (Figure 94, right; Rank 7 in Figure 87)

Figure 94: Bottleneck at US-61 (northbound) and US-67 (northbound), 2022



Source: RITIS Probe Analytics Suite, Bottleneck Ranking – Using INRIX TMC data

Though the bottleneck ranking tool forms the cornerstone of this analysis, it is important to note that this tool exhibits certain limitations, particularly when it comes to pinpointing regional truck traffic bottlenecks:

- **Data Coverage and Quality:** While RITIS uses a vast array of data sources, there may be gaps in coverage, particularly in rural or less-trafficked areas. The accuracy and completeness of the data, especially in areas with fewer GPS-equipped vehicles or mobile devices, can affect the reliability of bottleneck identification.
- **Network Coverage:** Due to the data coverage limitation, RITIS's bottleneck ranking is restricted to a select set of roadways. This set encompasses all roadways within the National Highway System and includes additional minor arterials. Therefore, other truck bottlenecks may not be adequately captured by the tool.
- **Specificity to Freight Traffic:** RITIS collects data from a variety of vehicles, not exclusively from freight trucks. This means the tool may not always differentiate between congestion

caused by passenger cars and freight traffic. Specific freight traffic patterns, like stop-and-go movements at warehouses or ports, might not be as accurately captured.

- **Differentiation within Freight Traffic:** There is an observable disparity in data coverage between larger commercial fleets and smaller trucking companies. This is primarily due to larger fleets more commonly employing GPS tracking systems, leading to a skewed representation favoring larger operators over smaller ones in the data.

Given these limitations, to enhance the validity of the results, we plan to incorporate inputs from freight stakeholders within the region. Their insights will be used in contextualizing and refining the findings.

4.5.3 Average Monthly Delay at Locks (Tows)

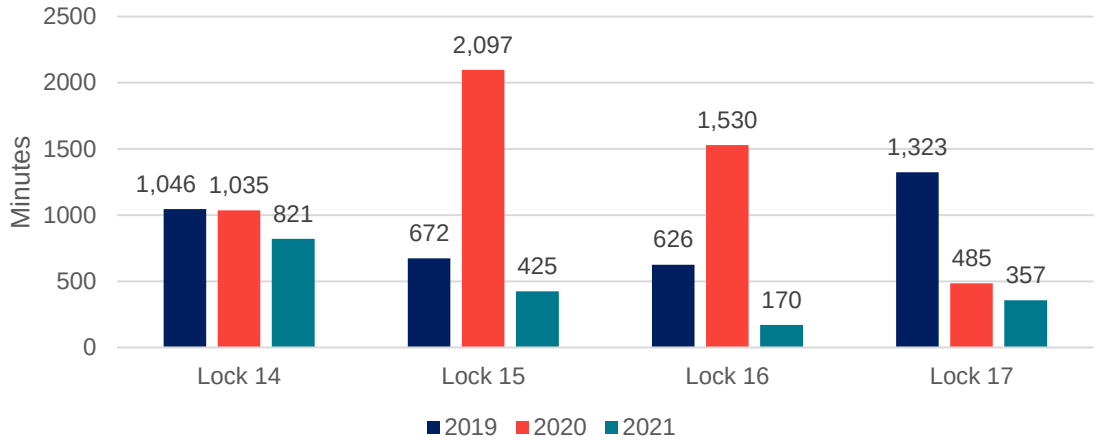
Four locks and dams are located within the Bi-State Region. The Bi-State portion of the Mississippi River falls within the Rock Island District monitored by the US Army Corps of Engineers (USACE). The district covers all the upper Mississippi River though some of the river's largest locks and dams are located within the Bi-State Region. All four locks in the region have been operational since the 1930s and are part of a regular rehabilitation and repair project ongoing since 1975[59]. In 2021 Locks 14 and 15 were dewatered, new guide walls were built, and miter gates and equipment were repaired, completing one of the largest repair projects to these locks in 20 years.[60] As each of these locks has significantly exceeded their life expectancy, regular maintenance and performance monitoring are crucial to ensure the continual and efficient operation of the Bi-State Region's waterways.

Lock 14, 15, 16, and 17 each are operational 24/7 through the navigational season of early March to early December. As a result, scheduled maintenance and closures are often done in the off-season during which auxiliary locks at Locks 14 and 15 are used for any occasional vessel. Delays during the navigational season, though, are still possible due to electrical and mechanical failures or growth in vessel traffic. USACE releases annual reports of average hours of delay by vessel and by month, counting the number of hours that a vessel must queue beyond the lock's standard time to fill and empty. Examining the change in traffic, monthly delays, and recent maintenance projects in recent years can give insight into any ongoing issues with freight movement on the region's waterways.

In the last three recorded years, each lock in the study area has experienced unique trends in average monthly delays (Figure 95). The highest average was recorded in 2020 at Lock 15 at 2,097 minutes. Delays by vessels between 2019 and 2020 at Lock 15 increased by nearly 24 hours. Lock 16 also recorded its highest average in 2020, though this was due to a significant increase in vessel traffic rather than a notable increase in processing time. Lock 14 and 17, by contrast, have both steadily decreased in the last three years. Additionally, all four locks recorded their lowest average monthly delay in 2021, all under 850 monthly delay minutes.

[59] Rock Island District, Backlog of Maintenance, USACE, October 2023. https://www.mvr.usace.army.mil/About/Offices/Programs-and-Project-Management/District-Projects/Projects/Article/1164618/backlog-of-maintenance/, accessed on October 22, 2023.
[60] KWQC, Work Set to Begin to Repair Guidewall at Locks and Dam 15, September 2018. https://www.kwqc.com/content/news/Work-Set-to-Begin-to-Repair-Guidewall-at-Locks-and-Dam-15-492791601.html, accessed on January 4, 2023.

Figure 95: Average Monthly Delays (Tows) by Lock, 2019 - 2021



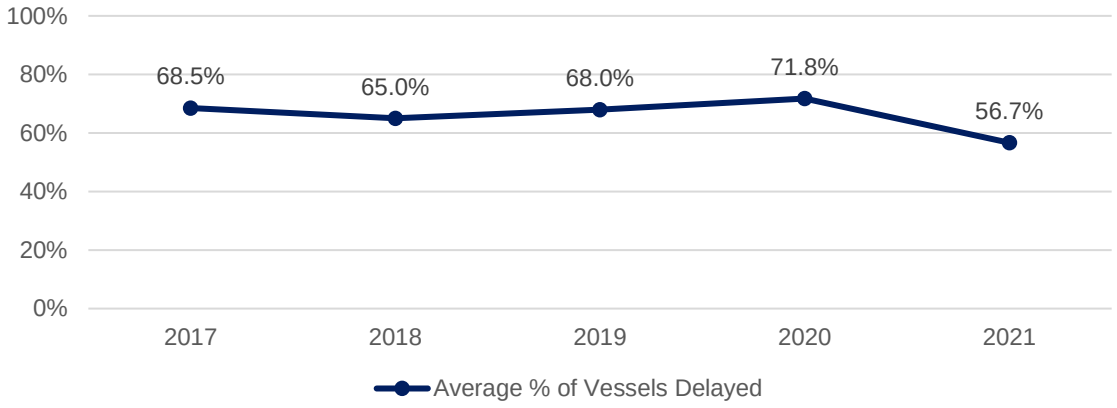
Source: CPCS analysis of USACE's Lock Queue Report, 2023

4.5.4 Percentage of Vessels Delayed at Locks

In addition to using the average monthly delay to monitor lock and waterway performance, USACE records the percentage of commercial and non-commercial vessels delayed at each lock and dam. This measure counts any vessel that is queued for longer than the time it takes a lock to fill and empty for a single tow. This measure can illustrate to what degree the delays are typical for vessels in this portion of the Mississippi River basin.

The four locks in the Bi-State Region have experienced similar rates of vessel delay in the last five years, each ranging roughly between 60 and 70 %. Averages generally increased between 2017 and 2020 growing from 68.5 % to 71.75 %. In 2021, the percentage of vessels delayed fell to 56%, the lowest in five years (Figure 96).

Figure 96: Average Percent of Vessels Delayed at Bi-State Regional Locks, 2017–2021



Source: CPCS analysis of USACE's Lock Queue Report, 2023

Vessels experiencing the bulk of delays at Bi-State Region locks are barges that require multiple tows. Not only do commercial vessels experience longer-than-average delays, but they also account for roughly 99 % or more of all lockages in the Region. Individual recreational vessels recorded in USACE's Lock Queue Report typically experience under 30 minutes of delays per lockage.

4.6 System Preservation Goal Performance

This chapter presents the analysis of the roadway pavement and bridge conditions in the Bi-State Region to measure its performance under the System Preservation Goal. The pavement condition of the roadway system in the Bi-State Region is reported for each state and the portions inside and outside of the Bi-State Regional Commission's Metropolitan Planning Area (MPA) separately. The reason these are reported separately is that the portion of the interstate and non-interstate national highway system that is within the MPA is governed by federally required performance measures (PM2). PM2 requires state DOTs and MPOs to establish targets for:

- Percentage of pavements of the Interstate System in Good/Poor condition (discussed in detail in Section 4.6.1)
- Percentage of pavements of the non-Interstate National Highway System (NHS) in Good/Poor condition (discussed in detail in Section 4.6.2)
- Percentage of NHS bridges classified as in Good/Poor condition (discussed in detail in Section 4.6.3)

The Bi-State Regional Commission's Technical[61] and Policy[62] Committees opted to endorse Illinois and Iowa DOT's targets for their respective portions of the network in the region. However, other portions of the roadway network, namely the NHS outside of the MPA, and the non-NHS roadways in the region, particularly the NHS connectors, are all important freight assets and should be assessed to gain a comprehensive understanding of the system's condition. Therefore, Sections 4.1-4.4 also include discussions on this additional analysis.

Federally Required Pavement and Bridge Condition Performance Measures

Moving Ahead for Progress in the 21st Century, (MAP-21), enacted in 2012, and the subsequent Fixing America's Surface Transportation Act (FAST Act), enacted in 2015, established a national performance measurement system for the highway and transit programs. The U.S. Department of Transportation (USDOT) instituted this performance management requirement by establishing performance measures for four categories through rulemaking:

- Highway Safety (PM1)[63]
- Pavement and Bridge Condition (PM2)
- System Performance (PM3)
- Transit Asset Conditions (PM4)

The state departments of transportation (state DOTs) and MPOs are required to establish targets for each highway performance measure while transit agencies and MPOs set targets for transit asset conditions. MPOs have 180 days after DOTs adopt statewide targets to choose either quantitative targets for their metropolitan planning areas or to commit to the state's targets. For the highway measures, after each performance period, the USDOT assesses whether "significant progress" has been made toward achieving the highway targets, which is defined differently depending on the measure. If states do not make significant progress, they are required to submit documentation to the FHWA to explain how they will reach the targets; in certain cases, states are required to program more federal funds toward improving conditions. No penalties are assessed on MPOs or transit agencies.

[61] Minutes of the Quad Cities, Iowa-Illinois Urbanized Area Transportation Technical Committee, March 14, 2023, https://bistateonline.org/documents/meetings/quad-cities-transportation-technical-committee/minutes-13/4395-2023-03-14-qcttc-minutes/file. Accessed on Nov 13, 2023.

[62] Minutes of the Quad Cities, Iowa-Illinois Urbanized Area Transportation Policy Committee, March 28, 2023, https://bistateonline.org/documents/meetings/quad-cities-transportation-policy-committee/minutes-12/4424-2023-03-28-qctpc-minutes/file. Accessed on Nov 13, 2023.

[63] The safety performance measures require state DOTs and MPOs to establish safety targets as five-year rolling averages on all public roads for the number and rate of facilities, serious injuries, and non-motorized fatalities and serious injuries.

4.6.1 Percentage of Pavements of the Interstate System in Good/Poor Condition

Interstate System Conditions: Iowa Portion

Pavement condition ratings for the interstate in the Iowa portion of the Bi-State Region are reported using the Pavement Condition Index (PCI) provided by the Iowa DOT.

The PCI is a composite index from 0 to 100 with classifications ranging from Very Poor to Excellent. While not directly comparable to the FHWA's Good/Fair/Poor standard classifications (Figure 98), for analytical congruency, PCI classifications are collapsed into three categories: Poor (Very Poor and Poor), Fair (Fair), and Good (Good and Excellent).

Based on PCI ratings, nearly 100% of interstate pavement on the Iowa side of the MPA is in Good condition. Just 0.9% of interstate pavement in the MPA region is in Poor condition. 100% of the interstate pavement outside of the MPA is in Good condition (Figure 97).

Figure 97: Interstate Pavement Condition – Iowa, 2023

Interstate	Good	Fair	Poor
MPA	99.1%	0.0%	0.9%
Bi-State Region outside of the MPA	100.0%	0.0%	0.0%

Source: CPCS analysis of IA DOT data. Note that this table is not directly comparable with the targets in Figure 98. Data collection year: 2022

Figure 98: Interstate Pavement Condition Targets – Iowa, 2022-2025

Performance Measure	Baseline (CY 2021)	2-year target	4-year target
Percentage of pavements of the Interstate System in Good condition*	58.8%	55.0%	55.0%
Percentage of pavements of the Interstate System in Poor Condition*	0.4%	3.0%	3.0%

Source: IA DOT. * Based on total lane miles in Iowa by highway system: 3,305 interstate; and 12,656 NHS non-interstate (DOT and local). Based on 715 interstate bridges and 2,580 NHS non-interstate (DOT and local) bridges.

Interstate System Conditions: Illinois Portion

Pavement condition ratings for the interstates in the Illinois portion of the Bi-State Region are reported following FHWA standards for PM2 (Figure 99). Within the MPA, the percentage of pavements in the interstate system in Good condition (56.6%) fails to meet the two- (65.0%) and four-year (66.0%) targets (Figure 100). Outside the MPA, interstate pavement in Good condition is just slightly below the two- and four-year targets at 61.3%.

Interstate pavement in Poor condition makes up 1.5% of interstate mileage within the MPA, failing to meet the two- and four-year targets of 1.0% and 0.7%, respectively. Outside the MPA, however, the percentage of interstates in Poor condition (0.4%) meets the targeted threshold of 1.0% (two-year) and 0.7% (four-year).

Figure 99: Interstate Pavement Condition – Illinois, 2023

Interstate	Good	Fair	Poor
MPA	56.5%	36.9%	1.5%
Bi-State Region outside of the MPA	61.3%	34.2%	0.4%

Source: CPCS analysis of IL DOT data. Data collection year: 2022

Figure 100: Interstate Pavement Condition Targets – Illinois, 2022-2025

Performance Measure	Baseline (2021)	2-year target	4-year target
Percentage of pavements of the Interstate System in Good condition*	65.8%	65.0%	66.00%
Percentage of pavements of the Interstate System in Poor Condition*	0.4%	1.0%	0.7%

Source: IL DOT. * Based on 2,185 interstate lane miles in Illinois. Based on 16,674 non-interstate NHS lane miles. There are 2,320 interstate bridges in Illinois and a total of 4,815 bridges on the NHS, or 2,495 non-interstate NHS bridges.

4.6.2 Percentage of Pavements of the Non-Interstate NHS in Good/Poor Condition

Non-Interstate NHS Conditions: Iowa Portion

Pavement condition ratings for the non-interstate NHS in the Iowa portion of the Bi-State Region are reported using the Pavement Condition Index (PCI) provided by the Iowa Pavement Management Program data from Iowa DOT. Based on PCI ratings, within the MPA, less than 30% of the non-interstate NHS is in Good condition, while half of the non-interstate NHS is in Poor condition (Figure 101). The Bi-State Region outside of the MPA in Iowa performs better with 48.9% of non-interstate NHS pavement in Good condition and over 21% in Poor Condition (Figure 102).

Figure 101: Non-Interstate NHS Pavement Condition – Iowa, 2023

Non-Interstate NHS	Good	Fair	Poor
MPA	29.1%	20.9%	50.0%
Bi-State Region outside of the MPA	48.9%	29.8%	21.3%

Source: CPCS analysis of IL DOT data. Note that this table is not directly comparable with the targets in Figure 102. Data collection year: 2022

Figure 102: Non-Interstate NHS Pavement Condition Targets – Iowa, 2022-2025

Performance Measure	Baseline (CY 2021)	2-year target	4-year target
Percentage of pavements of the non-Interstate NHS in Good condition	37.9%	35.0%	35.0%
Percentage of pavements of the non-Interstate NHS in Poor condition	3.7%	6.0%	6.0%

Source: IA DOT

Non-Interstate NHS Conditions: Illinois Portion

Non-interstate NHS pavement conditions, both within the MPA and outside the MPA in Illinois, are currently above the two- (29.0%) and four-year (30.0%) targets for Good condition (Figure 103, Figure 104)

In terms of non-interstate NHS in Poor condition, both the MPA and outside-of-MPA parts meet both the two (8.9%) and four-year (8.5%) targets.

Figure 103: Non-Interstate NHS Pavement Condition – Illinois, 2023

Non-Interstate NHS	Good	Fair	Poor
MPA	31.7%	60.0%	7.4%
Bi-State Region outside of the MPA	30.7%	60.9%	7.6%

Source: CPCS analysis of IL DOT data. Data collection year: 2022[64]

[64] 81% of Non-Interstate NHS pavement miles in Illinois was rated in 2021, while 19% was rated in 2022.

Figure 104: Non-Interstate NHS Pavement Condition Targets – Illinois, 2022-2025

Performance Measure	Baseline (2021)	2-year target	4-year target
Percentage of pavements of the non-Interstate NHS in Good condition	29.5%	29.0%	30.00%
Percentage of pavements of the non-Interstate NHS in Poor condition	8.0%	8.9%	8.5%

Source: IL DOT

NHS Connectors

Figure 105 below presents the International Roughness Index (IRI) ratings of the NHS Intermodal Connectors in the Bi-State Region, the federal standard for assessing pavement smoothness. Lower values represent smoother conditions while higher values represent more roughness. FHWA has adopted ranges of IRI that are classified from Very Poor to Very Good[65]:

- Very good: IRI <60 in/mi
- Good: 60 to 95 in/mi
- Fair: 96 to 170 in/mi
- Poor: 171 to 220 in/mi
- Very poor: > 220 in/mi

Based on these classifications, the pavement on SR 22 / Rockingham Road at the Harvey States Peavy Port Terminal on average can be considered in Good condition. The IRI of the pavement on SR 22 / Rockingham Road of the Quad Cities Container Terminal pavement has pavement ranging from Good to Very Poor condition, with an average IRI of 140 (fair). The S. Rolff Street portion of this intermodal connector has a very high IRI of 348, representing very poor surface conditions. The Quad City International Airport pavement IRI on its highest trafficked portions (U.S. 6, 27th Street, and 69th Avenue) can be considered in fair condition. Airport Road, however, is in poor condition with an IRI of 217.

Figure 105: NHS Intermodal Connector Conditions, 2023

NHS Intermodal Connector	Roadways	Average IRI	IRI Range	Avg. AADT (year)	Avg Truck AADT (%)
Harvest States Peavy Port Terminal	SR 22 / Rockingham Rd.	94	81 - 103	2,418 (2021)	685 (28.3)
Quad Cities Container Terminal	SR 22/ Rockingham Rd.	140	83 - 403	8,064 (unknown year)	N/A
	S Rolff St.	348	N/A	600 (unknown year)	N/A
Quad City International Airport	U.S. 6	135	N/A	15,900 (2021)	650 (4.1%)
	27th St.	104	N/A	9,550 (2020)	N/A
	69th Ave.	104	N/A	7,600 (2021)	N/A
	Airport Rd.	217	N/A	4,150 (2020)	N/A

Source: CPCS analysis of IA DOT and IL DOT data. Data collection year: 2021-2022[66]

[65] US DOT, FHWA LTPP Guidelines For Measuring Bridge Approach Transitions Using Inertial Profilers, December 2016. https://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltpp/16072/003.cfm. Accessed on November 13, 2023.

[66] Quad City International Airport and Quad Cities Container Terminal were rated in 2021. Harvey States Peavy Port Terminal was rated in 2022.

Non-NHS Roadways

On non-NHS roadways, IA and IL use different pavement condition rating systems.

- Iowa DOT's Pavement Management Program (IPMP) utilizes the PCI which is a composite index of pavement distress on a 0 to 100 scale with classifications ranging from Very Poor to Excellent where zero represents total road failure.
- The Illinois DOT uses the Condition Rating Survey (CRS) to assess pavement condition, an automated calculation that results in a rating on a 1.0 to 9.0 scale where a rating of 1.0 represents total roadway failure. The rating system is classified from Poor to Excellent.

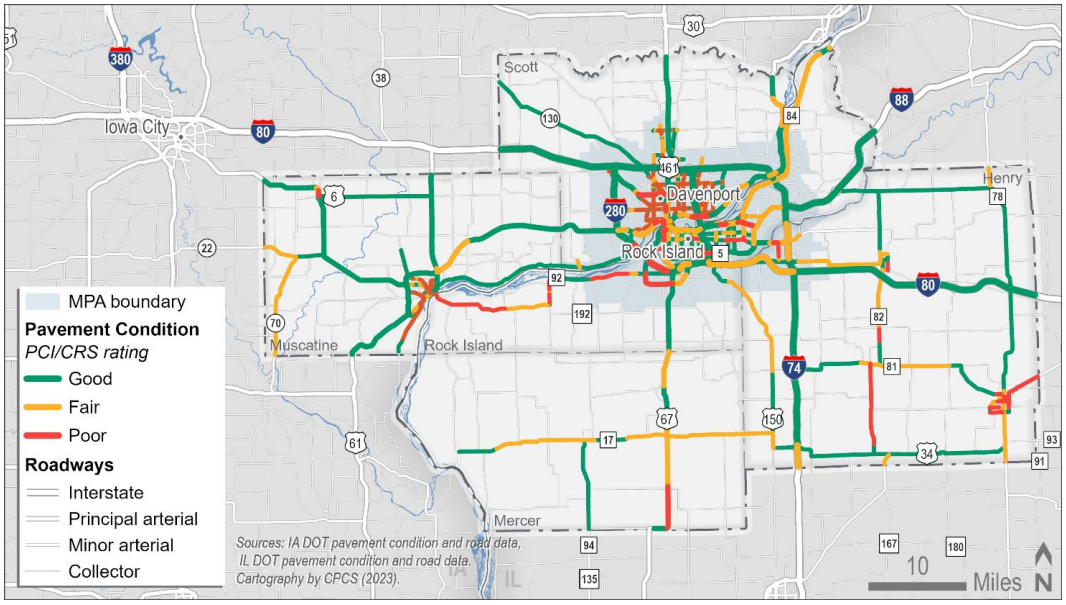
For this analysis, the two indices were amalgamated according to the classification below:

- Good: Illinois (CRS >6), Iowa (PCI > 62)
- Fair: Illinois (CRS: 4.6-6), Iowa (PCI > 46-62)
- Poor: Illinois (CRS: <4.6), Iowa (PCI<45)

Figure 106 and Figure 107present the pavement condition according to this classification scheme by federal functional class and county.

- Henry County has the highest proportion of non-NHS pavement in Good condition overall (58.5%). Henry County is followed by Muscatine County (51.1%), Rock Island County (46.4%), Mercer County (43.5%), and Scott County (30.8%) in this regard.
- Henry County is the only county in the Bi-State Region with over 50% of both non-NHS minor arterial and major collector pavement in Good condition.
- Muscatine County has the highest share of major collectors in Good condition (75.7%) and the lowest share of major collectors in Poor condition (10.9%).
- Scott County has the highest proportion of non-NHS minor arterial and major collector pavement in Poor condition in the region, at 39.8% and 29.3% respectively.
- Most of arterials and collectors in Mercer County are rated to be in Fair or Good condition, while all local streets lower than minor collectors are rated to be in Poor condition (Figure 107).

Figure 106: Major Roadway Pavement Conditions in the Bi-State Region, 2023



Source: CPCS analysis of IA DOT and IL DOT data. Data collection year: 2021-2022.[67]

Figure 107: Pavement Condition by Functional Class and County, 2023

County	Function Class (not including NHS)	Good	Fair	Poor
Scott County, IA	Minor Arterial	44.9%	15.3%	39.8%
	Major Collector	41.1%	29.5%	29.3%
	Minor Collector	45.2%	50.2%	4.5%
	Local Streets	23.6%	23.2%	53.3%
	All non-NHS	30.8%	24.2%	45.0%
Muscatine County, IA	Minor Arterial	44.3%	33.1%	22.6%
	Major Collector	75.7%	13.4%	10.9%
	Minor Collector	82.4%	12.7%	4.9%
	Local Streets	32.0%	33.4%	34.6%
	All non-NHS	51.1%	25.6%	23.3%
Rock Island County, IL	Minor Arterial	49.7%	27.5%	22.8%
	Major Collector	44.3%	27.4%	28.3%
	Minor Collector	62.4%	9.6%	28.0%
	Local Streets	32.4%	37.4%	30.2%
	All non-NHS	46.4%	27.8%	25.8%
Henry County, IL	Minor Arterial	57.5%	30.5%	12.0%
	Major Collector	63.3%	18.1%	18.6%
	Minor Collector	39.1%	38.8%	22.2%
	Local Streets	26.7%	15.4%	57.9%
	All non-NHS	58.5%	26.2%	15.2%
Mercer County, IL	Minor Arterial	42.7%	57.3%	0.0%
	Major Collector	43.9%	38.1%	17.9%
	Minor Collector	100.0%	0.0%	0.0%
	Local Streets	0.0%	0.0%	100.0%
	All non-NHS	43.5%	49.6%	6.8%

Source: CPCS analysis of IA DOT and IL DOT data. Data collection year: 2021-2022[68]

4.6.3 Percentage of NHS Bridges Classified as Good/Poor Condition

NHS Bridge Condition: Iowa Portion

The percentage of NHS bridges in Iowa that are classified as being in Good, Fair, or Poor condition is presented in Figure 108. The MPA region is significantly below the Iowa DOT two- (53.5%) and four-year (56.0%) targets (Figure 109) with just 24.3% of NHS bridges in Good condition. Outside of the MPA, ratings are higher with 43.5% of NHS bridges in Good condition, while below the targeted levels.

Just 2.9% of NHS bridges within the MPA in the Iowa region are in Poor condition, which meets both the two- (5.0%) and four-year (6.6%) targeted thresholds. Outside of the MPA, there are zero NHS bridges in Poor condition.

[67] IL DOT data covering NHS pavement were rated in 2022, while 82% of non-NHS pavement was rated from 2022-2021 with the remainder of non-NHS pavement rated in prior years. IA DOT data covering the NHS is from 2022, while non-NHS data is from 2021.
[68] [68] IL DOT data from 2022 includes 82% of non-NHS pavement rated from 2022-2021, with the remainder rated in prior years. IA DOT data covering non-NHS roadways is from 2021.

Figure 108: NHS Bridge Condition – Iowa, 2023

NHS bridges	Good	Fair	Poor
MPA	24.3%	72.9%	2.9%
Bi-State Region outside of the MPA	43.5%	56.5%	0.0%

Source: CPCS analysis of FHWA National Bridge Inventory. Data collection year: 2023

Figure 109: NHS Bridge Condition Targets – Iowa, 2022-2025

Performance Measure	Baseline (CY 2021)	2-year target	4-year target
Percentage of NHS bridges classified as in Good condition	48.6%	52.5%	56.0%
Percentage of NHS bridges classified as in Poor condition	2.4%	5.0%	6.6%

Source: IA DOT

NHS Bridge Condition: Illinois Portion

In Illinois, the percentage of NHS bridges in the MPA in Good condition (Figure 110) meets Illinois DOT two- (18.5%) and four-year (15.8%) targets (Figure 111). Outside the MPA, however, just 9.3% of bridges are currently in Good condition, below the state targets.

For the percentage of NHS bridges in Poor condition, both the MPA portion (7.4%) and regions outside the MPA (9.3%) in Illinois meet the two-year (12.4%) and four-year (12.0%) targets.

Figure 110: NHS Bridge Condition – Illinois, 2023

NHS bridges	Good	Fair	Poor
MPA	22.1%	70.5%	7.4%
Bi-State Region outside of the MPA	9.3%	81.4%	9.3%

Source: CPCS analysis of FHWA National Bridge Inventory. Data collection year: 2022

Figure 111: NHS Bridge Condition Targets - Illinois, 2022-2025

Performance Measure	Baseline (2021)	2-year target	4-year target
Percentage of NHS bridges classified as in Good condition	22.8%	18.5%	15.8%
Percentage of NHS bridges classified as in Poor condition	12.4%	12.4%	12.0%

Source: IL DOT

4.6.4 Percentage of Bridges with an 80 or Lower Sufficiency Rating

Bridge sufficiency ratings indicate the adequacy of a bridge for continued use and provide a comprehensive view of the state of good repair of bridges. This rating is based 55% on structural evaluation, 30% on the obsolescence of the bridge design, and 15% on the importance of the bridge to the public. Illinois reports sufficiency using the same sufficiency rating calculation as FHWA, while Iowa uses the Bridge Condition Index, which is a similar measure to the FHWA sufficiency rating created by FHWA but is more sensitive to changes in condition rating for the different bridge components.[69]

[69] Iowa DOT, 2023 Annual Bridge Report. https://iowadot.gov/bridge/2023%20Annual%20Bridge%20Report.pdf. Accessed on Oct 18, 2023.

Bridge Condition by County

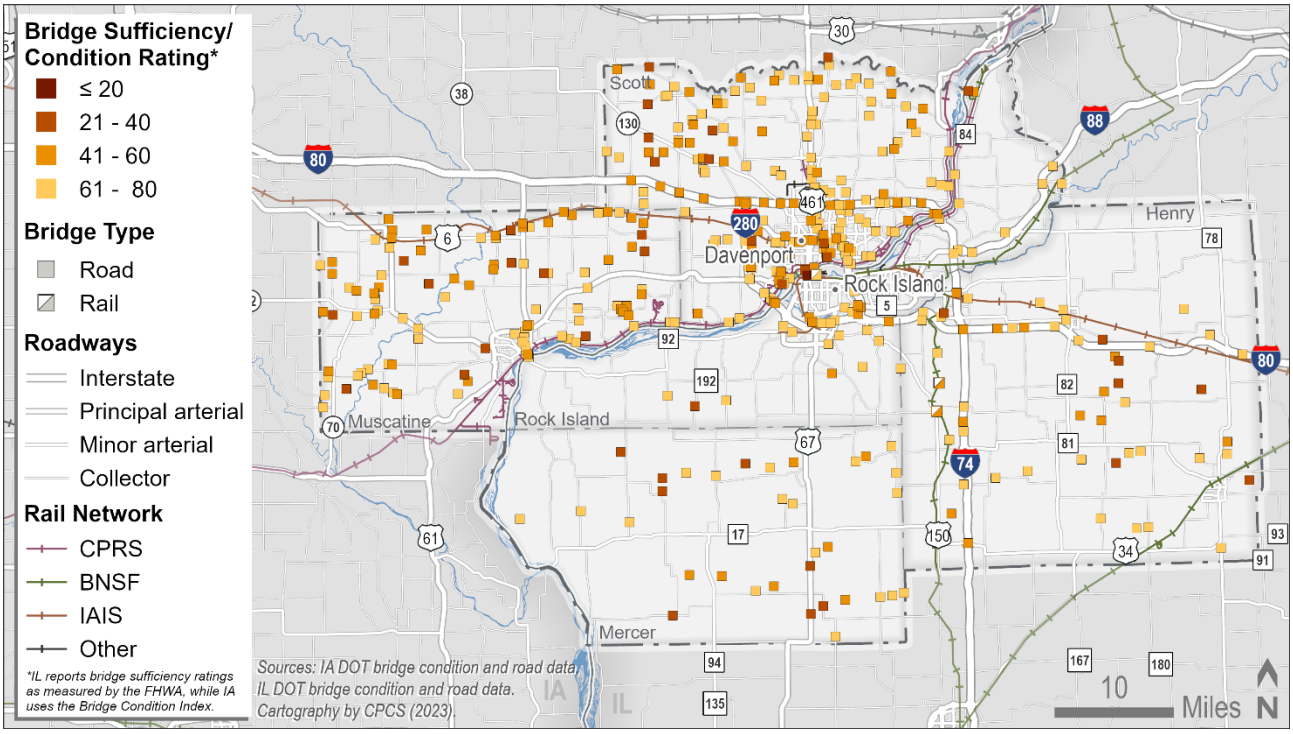
Figure 112 below shows the percentage of bridges that are of sufficient condition in the region. Over 80% of bridges in all three counties in Illinois have a sufficiency rating of greater than 80. However, Scott County and Muscatine County in Iowa report that less than 30% of bridges in each county have a condition index rating of over 80. In Scott County, just 22.1% of the county's 276 bridges are rated over 80. Figure 113 presents the distribution of the bridges with a low sufficiency rating.

Figure 112: Sufficiency/Condition Ratings by County, 2023

County	Rating 80 or below	Rating above 80	
Henry, IL	59 (17.5%)	278 (82.5%)	337
Rock Island, IL	46 (17.0%)	225 (83.0%)	271
Mercer, IL	32 (19.6%)	131 (80.4%)	163
Scott, IA	215 (77.9%)	61 (22.1%)	276
Muscatine, IA	102 (72.3%)	39 (27.7%)	141

Source: CPCS analysis of IADOT and ILDOT bridge inventories[70], 2023. Data collection year: 2022 (IL), 2023 (IA)

Figure 113: Bridges with a Rating under 80, 2023



Source: CPCS analysis of IADOT and ILDOT bridge inventories, 2023

Conditions of Mississippi and Rock River Bridges

Figure 114 presents the bridges across the major rivers in the region (there are two blocks for each bridge, representing both ends of a bridge span). Six bridges traverse the Mississippi River, connecting the two states across their natural border, while ten bridges cross the Rock River tributary in IL.

Figure 115 lists the conditions of the bridges. Existing railroad crossings at the Government Bridge and Crescent Bridge are both over 100 years old with movable swing spans to accommodate river traffic. Multiple regional and state studies have confirmed the need for replacement/rehabilitation of the two bridges to support rail traffic as the current structures are identified as rail network bottlenecks. A BSRC

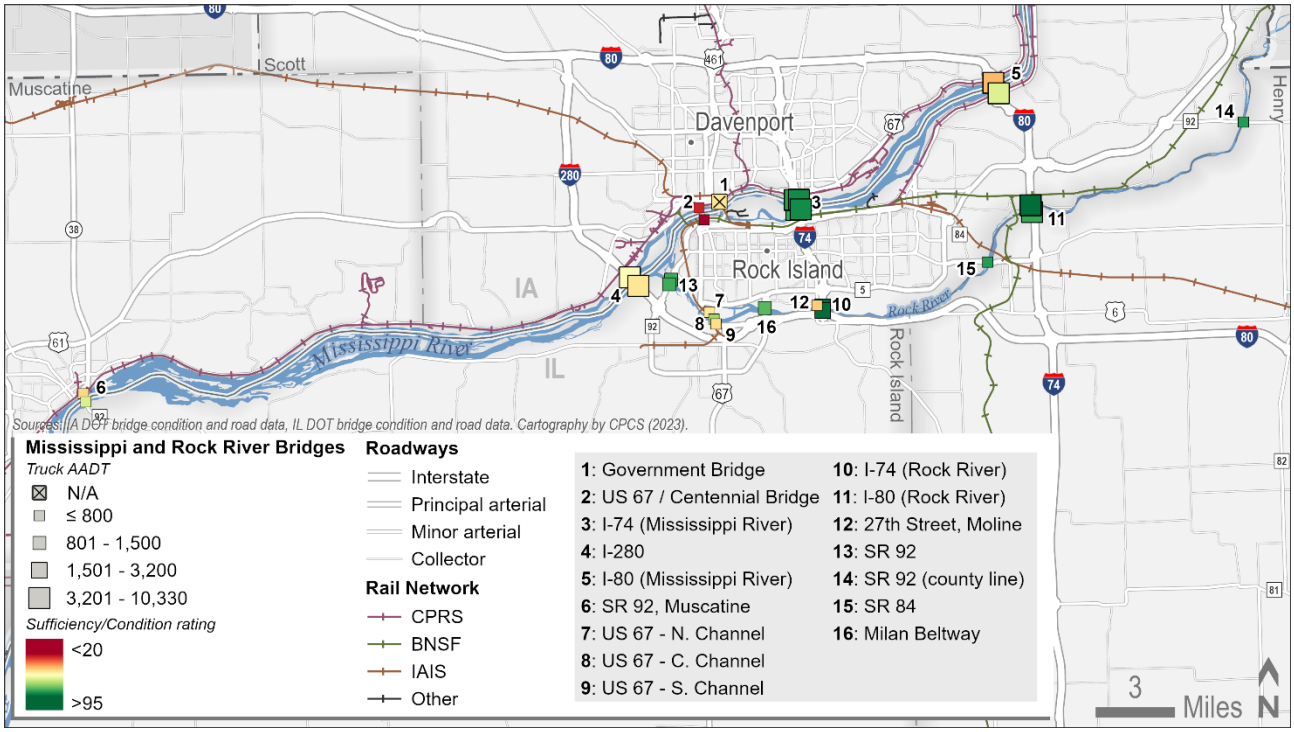
[70] Bridges that cross drainages or creeks are not included in the analysis.

study conducted in 2020[71] evaluated several possible alternatives for new bridge scenarios, and proposed the following:

- The two primary alternatives recommended for further study rely on a high-fixed crossing on the Mississippi River in the vicinity of the Crescent Bridge that would separate rail operations from river navigation and grade-separate the majority of roadway crossings along their respective corridors. The preferred alternative between these two alignment alternatives depends heavily on whether the decision is made to replace the existing Centennial Bridge.
- If there is insufficient funding for the construction of a high-fixed crossing near the Crescent Bridge, the proposed alternative is to construct a bridge that runs parallel to the existing Government Bridge immediately downriver from it. This alternative would require a moveable span and rail traffic stop for river navigation, resulting in delays to freight and passenger movements across the bridge.

The study identified a string of next steps for area freight stakeholders to move forward with refining the design, identifying funding and financing options, and implementing the proposed improvements.

Figure 114: Mississippi and Rock River Bridges, 2023



Source: CPCS analysis of IADOT and ILDOT bridge inventories and roadway (AADT) data, 2023

The I-74 bridge over the Mississippi River carries a significant amount of truck traffic, averaging 3,235 trucks per day. The high sufficiency rating of the I-74 bridge is attributable to the reconstruction of the bridge which opened to traffic in 2021. The old I-74 suspension dual bridges which were built in 1936 (westbound) and 1960 (eastbound) suffered from congestion driven by population and employment growth in the region. The new bridge is nearly double the width with additional, reconfigured traffic lanes for efficiency, safety, and reliability as well as pedestrian and cycling facilities.[72]

The I-80 and I-280 bridges, located on the northwest and southeast corners of the urbanized area, carry a high volume of traffic across the Mississippi River, with 2022 average annual daily traffic truck volumes of 10,327 and 7,416, respectively. Both bridges are heavily relied on by trucks which make up roughly 30% of all daily traffic on these bridges. Both have relatively low sufficiency/condition index

[71] BSRC, Mississippi River Rail Crossing Study, 2020. https://bistateonline.org/documents/transportation/3845-river-rail-crossing-study-alternatives-analysis-report/file. Accessed on October 18, 2020/

[72] I-74 River Bridge. IA DOT. https://iowadot.gov/i74riverbridge/Home. Accessed on Oct 18. 2023.

ratings. The I-80 bridge, which has required significant rehabilitation and repairs in recent years, is currently the subject of a Planning and Environment Linkages (PEL) study to develop proposed improvements or alternatives.[73,74] The ILDOT released a preferred alternative alignment in November 2023 for the I-80 bridge replacement. IL DOT completed the replacement of the I-280 bridge decks in November 2023.[75] The ILDOT is under contract in 2023 to conduct preliminary engineering on US 67 Centennial Bridge to determine improvement alternatives.

Figure 115: Mississippi and Rock River Bridges, 2023

	Bridge	Bridge Condition (IADOT)	Sufficiency Rating (ILDOT)	Year of Inspection/ Rating	Truck AADT (%)	AADT Year
Mississippi River						
1	Government Bridge	50.4	N/A	2022	N/A	N/A
2	US 67 / Centennial Bridge	24.8	18.9	2022 (IA), 2021 (IL)	646 (3%)	2022
3	I-74	87.7 (EB), 86.0 (WB)	91.7 (EB), 91.4 (WB)	2022 (IA), 2021 (IL)	3,235 (4%)	2022
4	I-280	57.0	51.7	2023 (IA), 2019 (IL)	7,416 (31%)	2022
5	I-80	44.0	65.0	2021 (IA), 2012 (IL)	10,327 (28%)	2022
6	SR 92, Muscatine	49.0	65.6	2021 (IA), 2008 (IL)	525 (6%)	2022
Rock River						
7	US 67 (N Channel)		52.1	2016	800 (8%)	2021
8	US 67 (C Channel)		74.2	2021	800 (8%)	2021
9	US 67 (S Channel)		50.4	2014	800 (8%)	2021
10	I-74		96.3 (NB), 97.3 (SB)	2013	2,200 (8%)	2021
11	I-80		96.5 (NB), 86.4 (SB)	2011	8,205 (35%)	2021
12	27th Street, Moline		47.2	2019	456 (4%)	2020
13	SR 92		87.5 (NB), 87.5 (SB)	2016	1,125 (11%)	2021
14	SR 92 (Henry/Rock		88.6	2013	170 (8%)	2021

[73] I-80 Mississippi River Bridge. ILDOT. https://www.i80mississippibridge.com/copy-of-about. Accessed on Oct 18. 2023.

[74] Preferred Alternative Identified for the I-80 Mississippi River Bridge Study. IL DOT. Nov 15, 2023. https://www.i80mississippibridge.com/_files/ugd/9b4089_9946d5522a5d4aa6bf5df99a832b1160.pdf. Accessed on December 13, 2023.

[75] Gov. Pritzker Celebrates Completion of I-280 Over Mississippi River in Quad Cities. IL DOT. November 29, 2023. https://idot.illinois.gov/news/press-release.28367.html#:~:text=The%20new%20deck%20is%20the,eastbound%20bridge%20deck%20in%202022. Accessed on December 13, 2023.

	Bridge	Bridge Condition (IADOT)	Sufficiency Rating (ILDOT)	Year of Inspection/ Rating	Truck AADT (%)	AADT Year
	Island County Line)					
15	SR 84		88.5	2017	340 (3%)	2021
16	Rock Island-Milan Beltway		82.8	2013	1,323 (7%)	2020

Source: CPCS analysis of IADOT and ILDOT bridge inventories and roadway (AADT) data, 2023

4.7 Sustainability and Resiliency Goal Performance

4.7.1 Unscheduled closures at Rock Island District locks

Unscheduled closures are largely due to fluctuations in water level, power outages, miter gate failure, and concrete failure due to damage from transiting tows. Regular maintenance of infrastructure is critical to maintain the flow of freight through the region.

Unscheduled Closures at Rock Island District Locks

While mechanical or electrical failures often result in only temporary lockage delays, significant damage to the operating system or infrastructure of a lock can potentially cause prolonged unscheduled closures. In the event of an unscheduled closure, vessels will be notified through USACE and directed to wait or to use auxiliary locks when available. As scheduled repairs and closures are typically completed during the off-peak season, unscheduled closures during the navigation season of March through December can cause significant disruptions to the flow of freight in the Bi-State Region. Closures and significant delays not only have implications on the number of vessels queued and idling in the waterway, but also affect the transloading time and efficiency of trucks and freight trains waiting at regional ports.

Locks in the Bi-State Region experience an average of 25 to 30 unscheduled closures a year compared to 1 to 10 closures scheduled and announced by the USACE each year on the Upper Mississippi River overall. Unscheduled closures often last less than 48 hours each. However, yearly delay totals over the last five years have ranged from 20 hours of delay in a year to 2,050 hours.

Lock 17 experiences the greatest number of unscheduled closure hours though Lock 15 has recorded the highest number of individual unscheduled closures (Figure 116). This suggests that closures at Locks 16 and 17 are often the most prolonged, while Locks 14 and 15 experience more frequent closures but for shorter periods.

Figure 116: Total Unscheduled Lock Closures, 2016-2020

Lock	Unscheduled Closures	Unscheduled Closure Hours	% of Total Closures That Were Unscheduled
Lock 14	146	379.70	86.4%
Lock 15	147	1,156.03	89.6%
Lock 16	109	2,500.35	77.3%
Lock 17	116	2,644.54	89.9%

Source: CPCS analysis of USACE's Lock Queue Report, 2023

Unscheduled Lock Causes

Closures and delays in 2020 can in part be attributed to major repairs done to miter gates at Locks 14 and 15 and the Lock 15 guide wall that were completed over a year. Unscheduled closures, however, have most recently been caused by fluctuations in water level, power outages, miter gate failure, and

concrete failure due to damage from transiting tows. Additionally, the USACE Rock Island District has seen a growing backlog of maintenance since 2019, requiring repairs to occur simultaneously or during the navigation season to meet USACE standards. This period of consolidating repair projects occurred between 2020 and 2023 and has now concluded, minimizing the amount of unexpected future disruptions to freight flow along the waterway.[76]

One of the top concerns cited by stakeholders for navigable waterways in the Region is drought and occasional severe flooding. The Mississippi River has experienced historically low water levels for the last two years, particularly between St. Louis, Missouri, and Baton Rouge, Louisiana. While locks can maintain a pool of water for each 9-foot-deep channel, declining water levels at locks on the lower Mississippi River create challenges for navigation downstream and cause occasional closures of entire riverway segments. Insufficient water levels not only necessitate a slower pace of travel but many barges are required to lighten their freight load for shallower channels, increasing the number of trips a larger vessel would normally take.

This barrier to navigation has been exacerbated by record rainfall and irregular flooding in the upper Mississippi River Basin, causing locks to close from damage to infrastructure or insufficient overhead clearance for barges. This trend in insufficient or unsafe water levels is expected to continue as water levels have plummeted since 2020 and the frequency of extreme weather events continues to grow. Regular maintenance and the resiliency of lock infrastructure in the coming years will be crucial to continued travel along the Illinois Waterway and all of the Mississippi River.

4.7.2 Hazardous Material Spill Incidents

Hazardous material spill incidents contribute to unexpected disruptions in travel along the freight network and put human and/or environmental safety at risk. From January 2018 to August 2023, 96 hazardous material spills occurred along the freight network[77] in the Bi-State Region (Figure 117). Scott County recorded the highest number of hazmat incidents during this period, followed by Henry County, Muscatine County, Rock Island County, and Mercer County.

Figure 117: Total Hazmat Spills per County, 2018 – August 2023

County	No. of Incidents
Scott County, IA	44
Henry County, IL	25
Muscatine County, IA	15
Rock Island County, IL	10
Mercer County, IL	2
Total	96

Source: CPCS analysis of IA DNR and IEMA data, 2023

Types of Spills

The most common type of incident was petroleum spills, accounting for 78.1% of all spills along the freight network (Figure 118).

- All petroleum spills that occurred within the region resulted in 300 gallons or less of petroleum being released into the environment.
- One-third of petroleum spills were under 15 gallons and one-third were between 16 and 50 gallons.

[76] US Army Corps of Engineers, Rock Island District Website, https://www.mvr.usace.army.mil/page-not-found?original_path=/Missions/Navigation/Navigation-Status/, accessed on October 22, 2023.

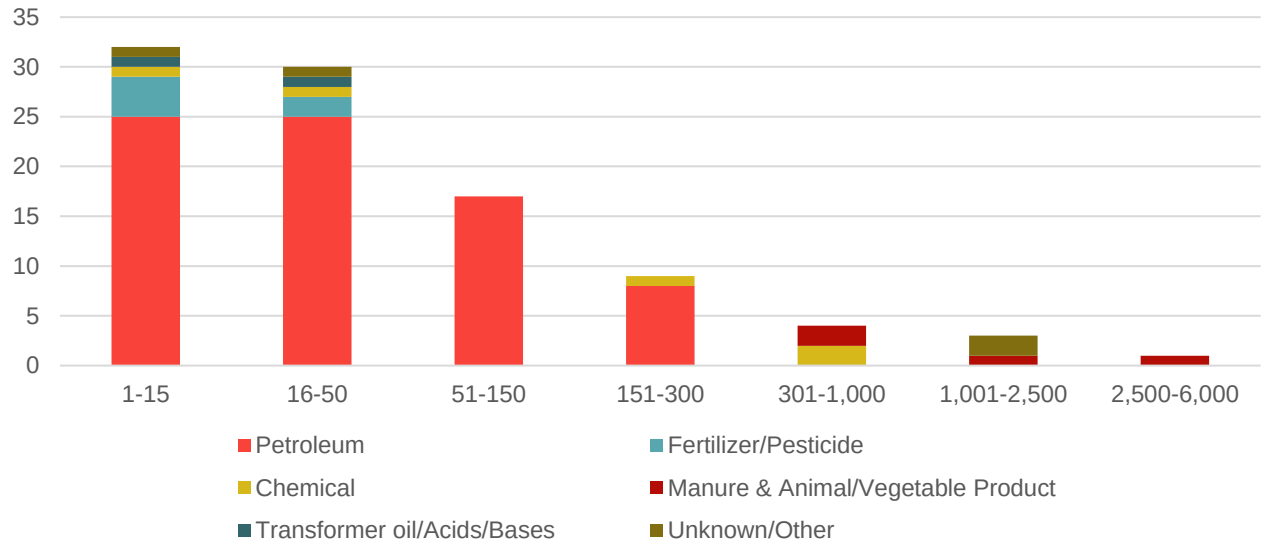
[77] This includes incidents occurring on the road or rail network.

- The remaining third of incidents were more severe, resulting in between 51 to 300 gallons of petroleum released.

Petroleum spills are followed by fertilizer/pesticide spill incidents, accounting for 6.3% of all incidents. Most (4 out of 6) pesticide spills were under 15 gallons, though 2 resulted in up to 50 gallons released.

Fertilizer/pesticide spills are followed by chemical and manure and animal/vegetable product spills in terms of frequency, accounting for 5% and 4% of hazardous spill incidents. Despite a relatively low frequency, manure spills tended to be of a larger scale than petroleum spills, with two spills recorded over 1,000 gallons. The remaining 6% of incidents were spills of transformer oil/ acids/bases spills, and other or unknown materials.

Figure 118: Hazardous Material Spill Incidents by Quantity Released and Material Type, 2018 – Aug 2023

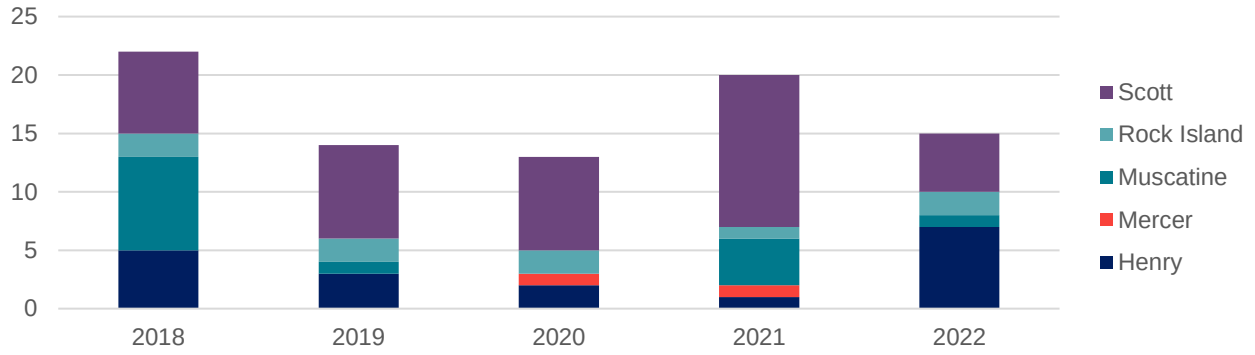


Source: CPCS analysis of IA DNR and IEMA data, 2023

Incident Trends

- The Bi-State Region experienced an average of around 17 hazmat spill incidents on the freight network per year during the 2018 to 2022 period (Figure 119).
- The highest number of incidents in the region occurred in 2018 with Muscatine County accounting for 8 out of the 22 spills that occurred that year. However, Muscatine experienced a sharp decline with only 1 spill in 2019 and zero in 2020. This rebounded slightly in 2021 with 4 spills then dropping again to 1 by 2022.
- Scott County accounts for the highest number of spills overall, largely due to an increase to 13 spills in 2021 from previous years of 7-8. However, by 2022, Scott County achieved its lowest number of spills in 5 years with just 5 total.
- Henry County, while on the decline each year from 5 spills in 2018 to just 1 in 2021, experienced a jump to 7 spills in 2022.
- Rock Island County has hovered between 1 to 2 spills per year.
- Mercer County experienced just 2 spills total with one in 2020 and one in 2021.

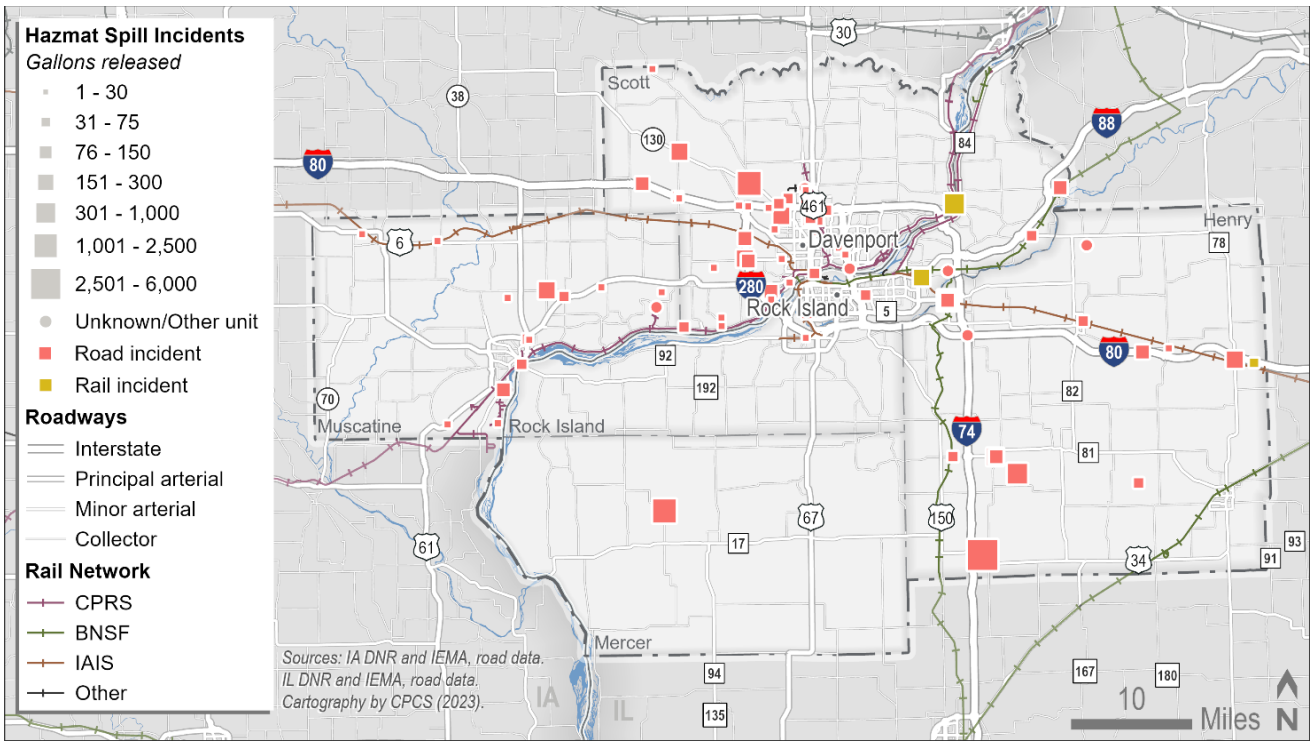
Figure 119: Hazardous Spills Per Year, 2018-2022



Source: CPCS analysis of IA DNR and IEMA data, 2023

Nearly all (92 out of 96) hazardous material spills during this period occurred on the road network with just four total rail incidents (Figure 120).

Figure 120: Hazardous Material Spills, 2018 - August 2023



Source: CPCS analysis of IA DNR and IEMA data, 2023

Incidents Near the Rivers

The Mississippi River is a primary water source for the region, and hazmat spills can pose a serious contamination risk to drinking water. From 2018 to August 2023, 24 spill incidents occurred within one mile of the Mississippi River and the Rock River, with two that are reported to have potential consequences for the water source.

- In May 2019, 150 gallons of diesel fuel were released during an event in which a truck driver hit something on the roadway and ruptured the passenger side saddle tank. Fuel ran into the parking lot that the driver pulled into and entered a storm sewer that flowed to a small creek before entering the Mississippi River.
- A smaller incident occurred in September 2022 in which about 5 gallons of non-PCB transformer oil may have made it into a storm drain.

In January 2020, a derailment occurred in LeClaire, Iowa on Canadian Pacific rail tracks along the Mississippi River. It was reported that nonylphenol was leaking from the derailed tankers which resulted in between 300-500 gallons released into the soil, but there were no reports of the product reaching the river or storm drain. Other derailment incidents in the region, including the one at Nahant Marsh in June 2023, didn't result in a hazmat spill[78]. However, rail and truck incidents continue to pose a threat to the health and well-being of the natural resources and residents in the Bi-State Region.

[78] Sarah Watson, Quad-City Times, Train cars derail near Nahant Marsh in Davenport. June 28, 2023. https://qctimes.com/news/local/government-politics/train-cars-derail-near-nahant-marsh-in-davenport/article_ef39cb82-8641-546a-bad2-3eb2486ca2aa.html. Accessed on October 18, 2023.

5 Commodity Flow Profile

Key chapter takeaway

The Bi-State region generated a total of 83.2 million tons of freight worth nearly 80.6 billion dollars in 2022. The most important domestic mode is trucks, moving commodities of 68.9 million tons (83% of the total) worth $67.9 billion in value (84%). The next most important mode is rail, moving 9.4 million tons (11%) of commodities worth $2.6 billion in value (3%). The Region's commodity flow profile represents the region's roots in manufacturing, as well as the heavy influences of animal and crop production in rural areas.

Commodity flow tonnage for the Bi-State Region is forecast to grow from 83.2 in 2022 to 137.4 million tons in 2055, an increase of 65% representing a healthy 2.2% annual growth. 61% of the added tonnage will be outbound. Trucking will represent 94% of the tonnage growth, and 83% of the commodity value growth between 2022 and 2055.

5.1 Introduction

To support the Bi-State Freight Plan Addendum, a commodity flow database was developed with estimates of tonnage and value moving to, from, and within the BSRC counties, with the following specifications:

- Timeframes
  - Historical Data: Year 2022
  - Forecast Data: Year 2055
- Geographic Focus:
  - BSRC counties -- Scott (IA), Muscatine (IA), Rock Island (IL), Henry (IL) and Mercer (IL)
  - External counties and states
  - Foreign country groups (Canada, Mexico, Rest of the Americas, Europe, Africa, Southwest Asia, East Asia, Oceania)
- Domestic freight modes
  - Truck, rail, air (including air-truck), water, and multiple modes
- Commodity Categories:
  - Classified under 2-digit Standard Transportation Commodity Code (STCC) codes
  - Grouped into seven sectors: Advanced Manufacturing, Chemicals and Pharmaceuticals, Construction Materials, Energy Products, Food and agriculture, Motorized Vehicles and Parts, and Others

The database was developed from the US Department of Transportation's Freight Analysis Framework (FAF) version 5.5 model.[79] The FAF is created by compiling information from federal sources (Commodity Flow Survey, US Department of Agriculture data, transborder data, rail waybill data, air cargo data, and others) and applying domestic and global trade forecasts developed by S&P Global for USDOT.

The main limitation of FAF, as published, is its level of geographic specificity. Origins and destinations are aggregated into multi-county Business Economic Areas. The BSRC counties are part of two larger groupings – "remainder of Illinois" and "remainder of Iowa" -- which include counties in both states that

[79] FHWA, Freight Analysis Framework. https://ops.fhwa.dot.gov/freight/freight_analysis/faf/. Accessed on Jan 8, 2024.

are outside of major metropolitan regions. To make FAF useful for the analysis of BSRC commodity flows, it was disaggregated to estimate flows at the level of individual counties. The disaggregation process included the following steps:

1. Download FAF version 5.5 (FAF or FAF5).
2. Obtain county-level data on employment and output by industry classification code.

   Within each Business Economic Area, estimate the share of production and consumption of key commodities at the county level based on the intensity of activity in different industries and the types of commodities that are inputs to or outputs from those industries, and apply these county-level shares to the FAF data for each Business Economic Area. This process was applied to the full country and all BEAs.
3. Validate the resulting BSRC region data by:
   a. Reassigning modal flows away from counties where that modal capability does not physically exist. This resulted in the elimination of water tonnage for one county.
   b. Confirming rail volumes. County-level totals were compared to STB Rail Waybill totals. The waybill data is confidential, so it was not possible to substitute waybill data for FAF data or to 'calibrate' FAF data to waybill totals. However, it was possible to confirm that the FAF disaggregation estimates are reasonably close to waybill totals and suitable for planning and reporting purposes. As a result, the FAF disaggregation contains no confidential information and can be openly shared.
   c. Confirming water volumes. Recent county-level totals for Illinois are available from the Illinois Department of Transportation's Transearch dataset and differ substantially from the initial FAF disaggregation estimates. The FAF estimates were therefore re-scaled to match the IL DOT data. The Iowa Department of Transportation also provided county-level water estimates but were not sufficiently recent to support adjustments, so the Iowa BSRC counties were scaled in the same manner as the Illinois BSRC counties.
4. Map BSRC truck flows by:
   a. Converting truck tonnage to equivalent truck units
   b. Assigning truck flows with a BSRC origin or destination to the National Highway System based on commodity group and origin-destination
5. Estimate and map pass-through truck flows by:
   a. Assigning truck flows with a non-BSRC origin and a non-BSRC destination to the National Highway System and estimating the volumes that appear on highway routes within the BSRC region.
6. Next, the disaggregated and validated FAF model was analyzed using a software package called Tableau.

   A Tableau "Dashboard" with corresponding data analyses and visualizations will be provided separately. Key data metrics were extracted and are reported in this Working Paper, in the following order:
   a. Regionwide Profile, with high-level data summaries;
   b. Modal Profiles, with additional detail specific to each transportation mode; and
   c. 2055 Forecast, focusing on growth between 2022 and 2055

All tabular and graphic data presented in this Working Paper is sourced from analysis of the disaggregated FAF unless otherwise noted.

5.2 Regionwide Profile

5.2.1 Regionwide Summary

The Bi-State Region – defined as the counties of Scott IA, Muscatine IA, Rock Island IL, Henry IL, and Mercer IL – generated a total of 83.2 million tons of freight worth nearly 80.6 billion dollars in 2022 (Figure 121). This includes freight moving outbound from the region, inbound to the region, or within the region (between BSRC counties or within individual BSRC counties). Only around 2 percent of tonnage and value moved within the region; 98 percent was traded outside the region, and the direction of trade was largely balanced, with 50 percent of tonnage and value outbound and 47 to 48 percent of tonnage and value inbound.

Figure 121: Tonnage and Value of Total Freight Flows by Direction, 2022

Direction	Tons	Percentage of Total	Value ($)	Percentage of Total
Outbound	41,942,366	50.39	40,323,345,077	50.05
Inbound	39,505,970	47.46	38,631,480,133	47.95
Within	1,788,914	2.15	1,618,619,518	2.01
Total	83,237,249	100.00	80,573,444,728	100.00

Data source: FHWA FAF5 estimates. Analysis by WSP.

5.2.2 Tons and Value by Mode

Commodity flows serving the Bi-State Region are moved by five domestic modes (Figure 122).[80] The most important domestic mode is trucks, moving commodities of 68.9 million tons (83% of the total) worth $67.9 billion in value (84%). The next most important mode is rail, moving 9.4 million tons (11%) of commodities worth $2.6 billion in value (3%). Multiple modes, which include movements using combinations of modes (truck-rail, etc.) and typically include high-value consumer and industrial commodities moving in intermodal containers via rail, estimated to move 3.5 million tons (4%) of cargo worth $9.0 billion in value (11%).[81] Maritime cargo movements via river barge are estimated to be 1.4 million tons (2%) worth $0.4 billion (1%), while air has negligible tonnage but $0.6 billion (1%) of value.

Figure 122: Total Tonnage and Value by Mode, 2022

Mode	Tons	Value ($)
Truck	68,883,945	67,925,134,234
Rail	9,419,052	2,569,720,865
Air	9,254	620,993,024
Maritime	1,447,202	363,646,228
Multiple Modes	3,477,796	9,093,950,378
Total	83,237,249	80,573,444,728

Data source: FHWA FAF5 estimates. Analysis by WSP

5.2.3 Tons and Value by County

When calculating the tonnage and value for each county, transportation of goods between BSRC counties is recorded differently compared to the method described in section 1.2. Specifically, these inter-county moves within the BSRC region are recorded as incoming (inbound) for the receiving county and outgoing (outbound) for the originating county. As a result, this method effectively counts these

[80] Some freight connects to international moves and travels across land borders via truck or rail, or beyond North America via air or water, but FAF tracks move between the BSRC region and the remainder of the US, including international gateway points, as domestic moves.

[81] Intermodal service offers higher reliability, speed, visibility, and security -- at a higher price -- and is therefore used primarily to move higher-value goods in domestic trade.

movements twice in the overall tally. Consequently, the aggregate tonnage and value figures presented in Figure 123 at the county level (83,996,619 tons and $81,275,548,314) are marginally higher than those shown in Figure 121 (82,237,249 tons and $80,573,444,728). It's important to note, though, that the volume of freight moved within the region is relatively small. Therefore, this double-counting results in only a minor discrepancy (1,759,370 tons and $702,103,586) in the total figures.

- Scott County has the largest tonnage (32.5 million, 39%), followed by Muscatine (18.5 million, 22%), Rock Island (18.0 million, 22%), Henry (12.5 million, 15%), and Mercer (2.7 million, 2%)
- Scott County has the largest value ($34.4 billion, 43%), followed by Rock Island ($24.9 billion, 31%), Muscatine ($13.2 billion, 16%), Henry ($7.4 billion, 9%), and Mercer ($1.4 billion, 2%)

Figure 123: Total Tonnage and Value by County, 2022

County	Tons	Value ($)
Scott, IA	32,494,779	34,381,797,161
Muscatine, IA	18,514,652	13,215,232,715
Mercer, IL	2,657,317	1,368,325,301
Rock Island, IL	17,791,242	24,904,217,373
Henry, IL	12,538,629	7,405,975,764
Total	83,996,619	81,275,548,314

Data source: FHWA FAF5 estimates. Analysis by WSP.

5.2.4 Top Industry Commodity Group Profiles

FAF reports data for 42 separate commodity groups. For purposes of analysis, these can be grouped into seven larger industry categories:

- **Advanced Manufacturing Industry**, which includes commodity groups of Machinery, Electronics, Transportation Equipment, Precision Instruments, Miscellaneous Manufactured Products, and Mixed Freight
- **Chemicals, Pharmaceuticals, and Plastics Industry,** which includes commodity groups of Basic Chemicals, Pharmaceuticals, Chemical Products, and Plastic and Rubber
- **Construction Materials Industry,** which includes commodity groups of Building Stone, Natural Sands, Gravel, Non-Metallic Minerals, Wood Products, and Non-Metallic Mineral Products
- **Energy Products Industry,** which includes commodity groups of Coal, Crude Oil, Gasoline, Fuel Oils, and Natural Gas
- **Food & Agriculture Industry,** which includes commodity groups of Cereal Grains, Other Agricultural Products, Other Foodstuffs, Animal Feed, Milled Grain Products, Live Animals/Fish, Meat/Seafood, and Alcoholic Beverages
- **Motorized Vehicles and Parts Industry**, which corresponds to the Motorized Vehicles and Parts commodity group in FAF5
- **All Other Commodities,** which includes commodity groups of Fertilizers, Base Metals, Waste/Scrap, Articles of Base Metal, Furniture, Logs, Newsprint/Paper, Paper Articles, Textiles/Leather, Printed Products, and Tobacco Products

The Bi-State Region's commodity flow profile represents the region's roots in manufacturing, as well as the heavy influences of animal and crop production in rural areas.

- In terms of tonnage, the largest share is from the Food and Agriculture Industry (39.8%), with nearly half (18.7%) from cereal grains (Figure 124). The next largest share is from the Construction Materials Industry (26.7%) with the majority (16.0%) from gravel, followed by All Other (18.8%), with around half (9.2%) from fertilizers. The next largest shares are from the Energy Products Industry (6.7%), followed by the Advanced Manufacturing (5.7%) Industry, the Chemicals, Pharmaceuticals, and Plastics (2.2%) Industry, and the Motor Vehicles and Parts (0.9%) Industry.
- In terms of value, the largest share is from the Advanced Manufacturing Industry (43.3%), where the main contributors are machinery (11.0%) and mixed freight (which includes warehouse/distribution traffic, at 10.3%). The next largest share is from All Other (22.7%), with contributions from manufacturing inputs (base metals and articles of base metals) as well as fertilizers, followed by the Food and Agriculture (19.6%) Industry, the Chemicals, Pharmaceuticals, and Plastics Industry (10.2%), the Motor Vehicles and Parts Industry (9.3%), the Construction Materials Industry (3.4%), and the Energy Products Industry (0.8%).

Figure 124: Share of Region-Based Tonnage and Value by Industry, 2022

Industry Group	Commodity	Share of Bi-State Tonnage	Share of Bi-State Value
Advanced Manufacturing	Mixed freight	2.30%	10.38%
	Miscellaneous manufactured products	1.26%	4.63%
	Machinery	0.94%	10.99%
	Electronics	0.29%	6.26%
	Precision instruments	0.03%	1.52%
	Transportation equipment	0.02%	0.22%
	Subtotal	**4.85%**	**34.00%**
Food and Agriculture	Cereal grains	18.66%	2.57%
	Other agricultural products	6.86%	3.02%
	Other foodstuffs	5.33%	5.26%
	Animal feed	5.19%	1.69%
	Milled grain prods.	1.48%	1.25%
	Live animals/fish	0.91%	1.65%
	Meat/seafood	0.73%	3.16%
	Alcoholic beverages	0.64%	1.04%
	Subtotal	**39.80%**	**19.64%**
Construction Materials	Gravel	16.02%	0.28%
	Non-metallic mineral products	7.18%	1.77%
	Natural sands	1.71%	0.05%
	Non-metallic mineral products	0.87%	0.13%
	Wood products	0.78%	0.90%
	Metallic ores	0.12%	0.27%
	Building stone	0.03%	0.01%
	Subtotal	**26.71%**	**3.41%**
	Plastics/rubber	1.43%	4.81%

Industry Group	Commodity	Share of Bi-State Tonnage	Share of Bi-State Value
Chemicals, Pharmaceuticals, Plastics	Chemical products	0.48%	2.17%
	Basic chemicals	0.31%	0.37%
	Pharmaceuticals	0.04%	2.85%
	Subtotal	**2.26%**	**10.20%**
Energy Products	Coal	5.52%	0.17%
	Natural gas and other fossil products	0.97%	0.49%
	Gasoline	0.12%	0.07%
	Fuel oils	0.09%	0.06%
	Crude petroleum	0.00%	0.00%
	Subtotal	**6.70%**	**0.80%**
Motor Vehicles and Parts	**Subtotal**	**0.86%**	**9.25%**
All Other Commodities	Fertilizers	9.20%	3.78%
	Base metals	4.43%	7.96%
	Waste/scrap	2.67%	0.68%
	Articles of base metal	1.37%	4.94%
	Furniture	0.38%	2.82%
	Logs	0.29%	0.02%
	Newsprint/paper	0.24%	0.33%
	Paper articles	0.09%	0.32%
	Textiles/leather	0.08%	1.53%
	Printed products	0.08%	0.29%
	Tobacco products	0.00%	0.02%
	Subtotal	**18.83%**	**22.69%**
Total		**100.00%**	**100.00%**

Data source: FHWA FAF5 estimates. Analysis by WSP.

Advanced Manufacturing

Share of Bi-State Tonnage	Share of Bi-State Value
4.85%	**34.00%**

The Advanced Manufacturing Industry's commodity flow tonnage and value is concentrated primarily in Scott and Rock Island counties, with significant activity in Muscatine and Henry counties, and less activity in Mercer County (Figure 125). Reflecting the region's longstanding manufacturing heritage, key players in this industry include companies such as 3M (Rock Island County), Arconic (Scott County), and John Deere (Rock Island County and Scott County). Additionally, the defense industry significantly contributes to the regional economy, especially in Rock Island County, which is notable for hosting the Rock Island Arsenal, the largest government-operated weapons and munitions manufacturing facility in the US. The defense sector's presence is further bolstered by companies such as Armalite, Cobham, Rock River Arms, Mandus Group, Lewis Machine & Tool, and Les Baer Custom, among others.[82]

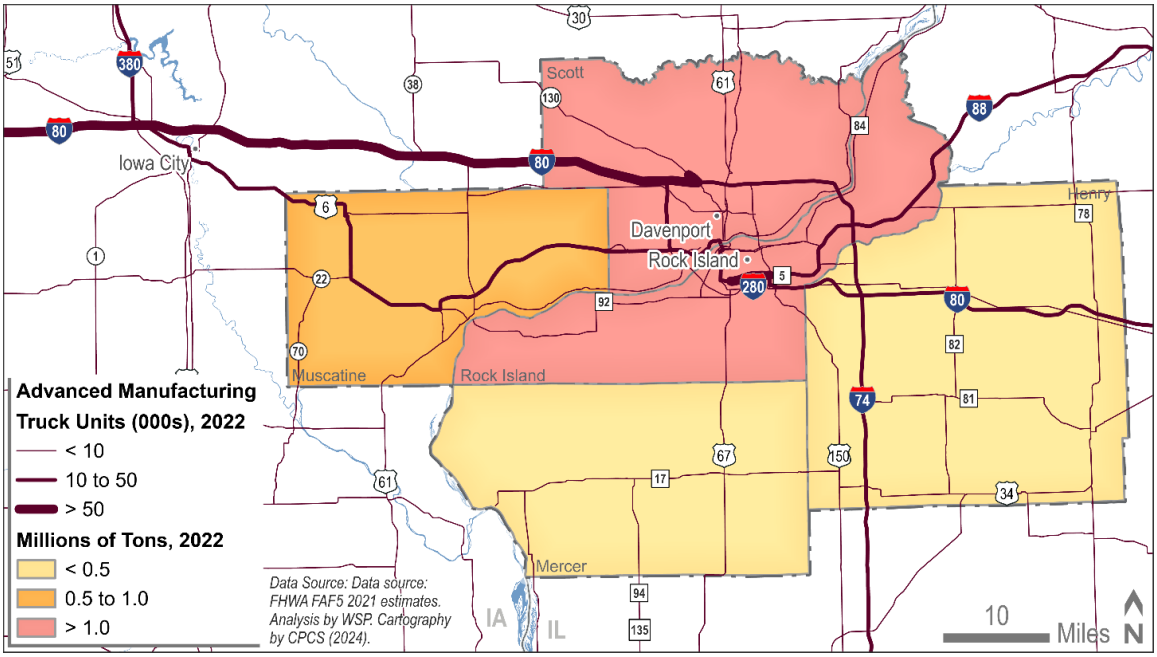
Figure 125: Advanced Manufacturing Industry Commodity Flows, 2022

County	Tons	Value ($)
Scott, IA	1,762,250	11,671,670,782
Muscatine, IA	498,626	2,627,781,717
Mercer, IL	46,419	275,795,381
Rock Island, IL	1,503,483	11,098,973,619
Henry, IL	261,461	1,914,984,097

Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 126 shows the truck corridors most heavily utilized for the movement of commodities in the Advanced Manufacturing Industry group, led by I-80 connecting the region with Iowa City, Cedar Rapids, and Des Moines to the west, with strong support by other interstates as well as US-6, IA-70, IA-22, and US-61(Blues Highway).

Figure 126: Advanced Manufacturing Truck Units and County Tonnage, 2022[83]



[82] Bi-State Regional Commission, Comprehensive Economic Development Strategy. 2021. https://bistateonline.org/documents/economic-development/4050-2021-ceds/file. Pg. 26. Accessed on January 8, 2024.

[83] The traffic assignments are made based on centroid to centroid connectors. The mapping is a representative depiction of county-level flow data and becomes useful at higher levels of geography, particularly state level and national moves and especially pass through flows. For local moves within the region and individual counties this level of analysis doesn't provide local road volumes. To get the local level information, it's necessary to load Transearch (or other) truck estimates as trip tables in a local traffic analysis model.

Food and Agriculture

Share of Bi-State Tonnage	Share of Bi-State Value
39.80%	**19.64%**

The Food and Agriculture Industry's commodity flow tonnage and value are significant for every county, albeit with lower levels of activity for Mercer (Figure 127). Henry is the leading tonnage county followed by Scott and Muscatine. Scott is the leading value county followed by Muscatine and Rock Island.

Figure 127: Food and Agriculture Industry Commodity Flows, 2022

County	Tons	Value ($)
Scott, IA	8,856,608	5,247,467,178
Muscatine, IA	6,193,785	3,635,764,664
Mercer, IL	2,189,140	670,214,024
Rock Island, IL	5,438,507	3,625,334,900
Henry, IL	10,649,286	2,746,661,794

Data source: FHWA FAF5 estimates. Analysis by WSP.

This commodity flow profile underscores the region's deep-rooted tradition in food processing and manufacturing, also highlighting agriculture's pivotal role in the local economy. Prominent companies in this field include Tyson Foods, Kraft-Heinz, Nestle Purina, Kent Corporation, West Liberty Foods, Whitey's Ice Cream, and Mississippi River Distilling Company.[84] Notably, meat processing ranks among the top five industries in Scott, Rock Island, and Henry Counties by employment. In Mercer and Henry Counties, grain and oilseed farming are particularly significant by employment. [85]

Figure 128: Food and Agriculture Industry Truck Units and County Tonnage, 2022

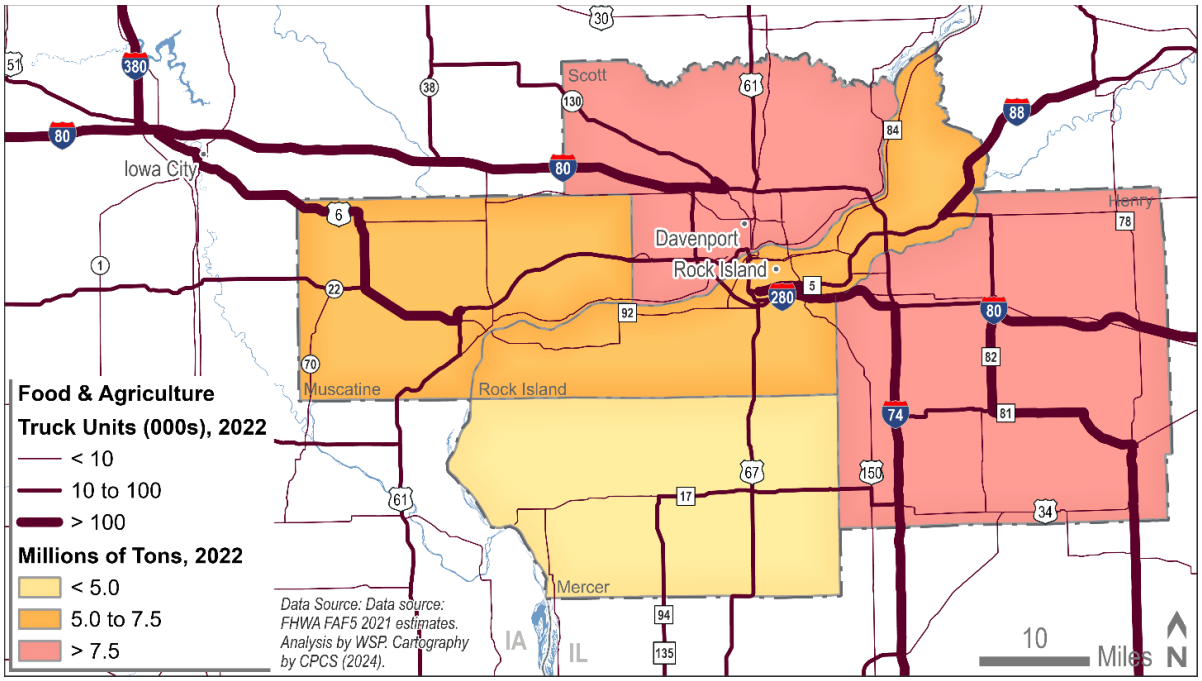


Figure 128 shows the truck corridors most heavily utilized for the movement of commodities in the Food and Agriculture Industry group. The interstates that connect the region with major metropolitan areas in Iowa (Iowa City, Cedar Rapids, and Des Moines to the west) and Illinois (Chicago to the east and Peoria to the south) are critical corridors that move the food and agricultural goods for the Region.

[84] Bi-State Regional Commission, Comprehensive Economic Development Strategy. 2021. https://bistateonline.org/documents/economic-development/4050-2021-ceds/file. Pg. 26. Accessed on January 8, 2024.
[85] Bi-State Regional Commission, Comprehensive Economic Development Strategy. 2021. https://bistateonline.org/documents/economic-development/4050-2021-ceds/file. Pg. 26. Accessed on January 8, 2024.

Construction Materials

Share of Bi-State Tonnage	Share of Bi-State Value
26.71%	**3.41%**

Commodities in the Construction Material Industry include building stone, natural sands, gravel, and other materials used in producing construction materials or directly in construction. Construction Materials tonnage and value are highest in Scott County and significant in Rock Island and Muscatine counties, with less activity in Henry and Mercer counties (Figure 129).

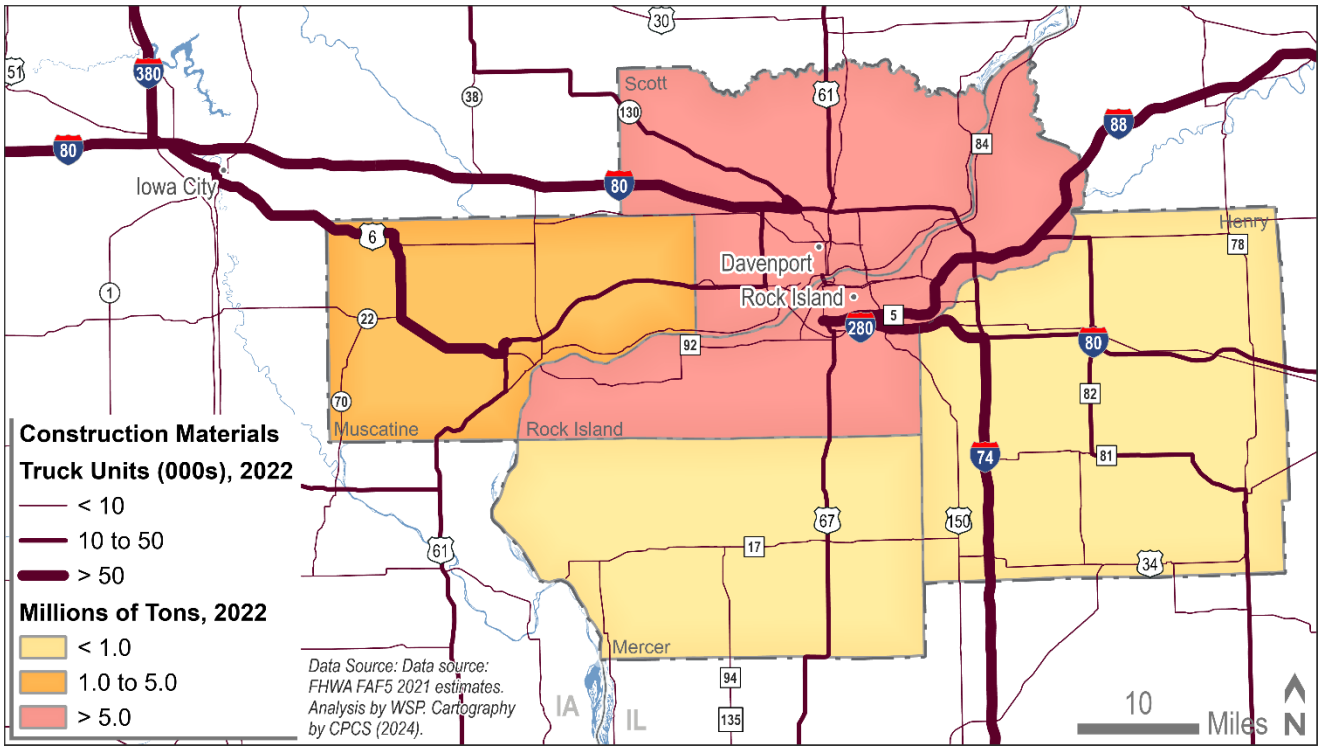
Figure 129: Construction Materials Industry Commodity Flows, 2022

County	Tons	Value ($)
Scott, IA	11,081,077	1,188,304,685
Muscatine, IA	3,631,860	892,287,875
Mercer, IL	217,554	12,116,157
Rock Island, IL	6,739,438	543,540,748
Henry, IL	802,516	161,208,427

Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 130 shows the truck corridors most heavily utilized for the movement of construction materials. These corridors are particularly vital due to their role in facilitating the delivery of materials to construction sites predominantly located in the Bi-State Region's urban areas. Consequently, routes providing essential access to these urban centers are the most heavily trafficked.

Figure 130: Construction Materials Truck Units and County Tonnage, 2022



Chemicals, Pharmaceuticals, and Plastics

Share of Bi-State Tonnage	Share of Bi-State Value
2.26%	**10.20%**

The commodities in this group include basic chemicals, pharmaceuticals, chemical products, and plastics and rubber. These commodities may operate as stand-alone products or, in the case of plastics and rubber, for example, as elements of a supply chain. Chemicals, Pharmaceuticals, and Plastics tonnage and value are highest in Scott County and significant in Rock Island County, and less activity in Muscatine, Henry, and Mercer counties (Figure 131).

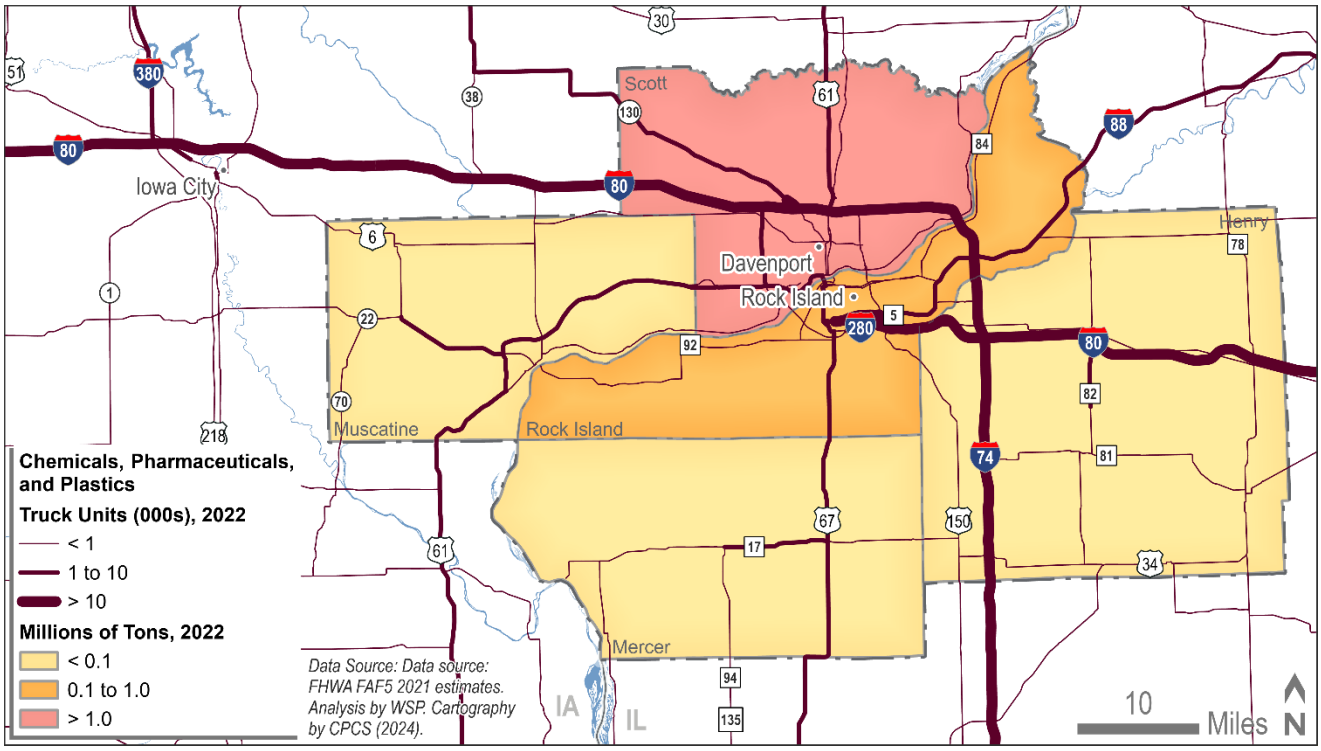
Figure 131: Chemicals, Pharmaceuticals, and Plastics Industry Commodity Flows, 2022

County	Tons	Value ($)
Scott, IA	1,196,778	3,937,848,204
Muscatine, IA	58,400	697,702,483
Mercer, IL	27,644	124,309,949
Rock Island, IL	563,007	3,064,999,988
Henry, IL	42,285	416,160,213

Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 132 shows that the movements of commodities in the Chemicals, Pharmaceuticals, and Plastics industry group are primarily facilitated by the interstate system.

Figure 132: Chemicals, Pharmaceuticals, and Plastics Truck Units and County Tonnage, 2022



Energy Products

Share of Bi-State Tonnage	Share of Bi-State Value
6.70%	**0.80%**

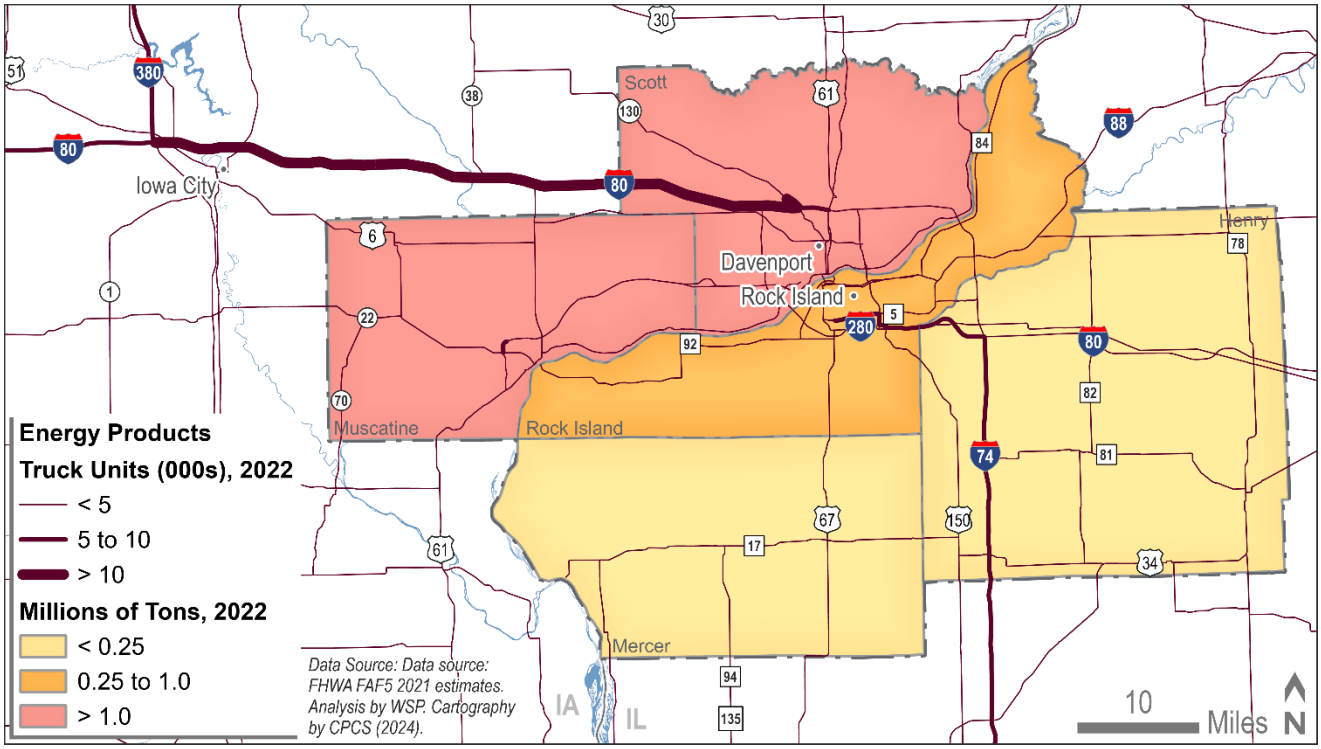
The Energy Products Industry Group includes commodities such as coal, crude petroleum, gasoline, fuel oils, and natural gas. Energy products tonnage and value are highest in Scott County, with significant tonnage in Muscatine and significant value in Rock Island, and with less activity in Henry and Mercer counties (Figure 133). I-80 is the most heavily utilized corridor for the movement of energy products by trucks (Figure 134).

Figure 133: Energy Products Industry Commodity Flows, 2022

County	Tons	Value ($)
Scott, IA	4,175,052	419,781,390
Muscatine, IA	1,103,837	72,580,107
Mercer, IL	2,667	1,325,804
Rock Island, IL	250,464	125,944,326
Henry, IL	44,378	22,647,777

Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 134: Energy Products Truck Units and County Tonnage, 2022



Motorized Vehicles and Parts

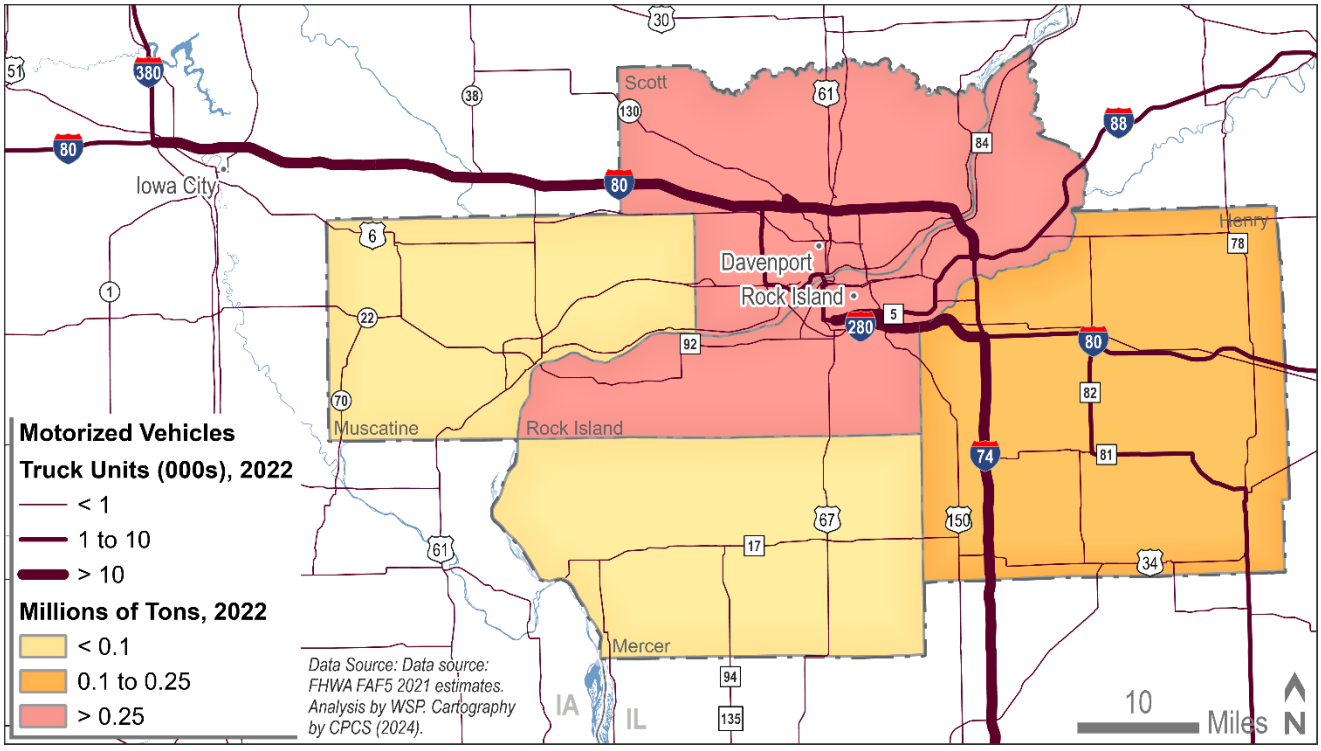
Share of Bi-State Tonnage	Share of Bi-State Value
0.86%	**9.25%**

Motor Vehicles and Parts represent low tonnage but high value for the region. This industry provides important input for advanced manufacturing of transportation equipment. The highest activity is in Scott County, followed by Rock Island and Henry, with less activity in Muscatine and negligible activity in Mercer (Figure 135).

Figure 135: Motorized Vehicles and Parts Commodity Flows, 2022

County	Tons	Value ($)
Scott, IA	314,974	3,250,793,203
Muscatine, IA	8,432	89,132,785
Mercer, IL	0	2,044
Rock Island, IL	273,576	2,855,763,789
Henry, IL	124,677	1,311,831,833

Figure 136: Motorized Vehicles and Parts Truck Units and County Tonnage, 2022



All Other Commodities

Share of Bi-State Tonnage	Share of Bi-State Value
18.83%	**22.69%**

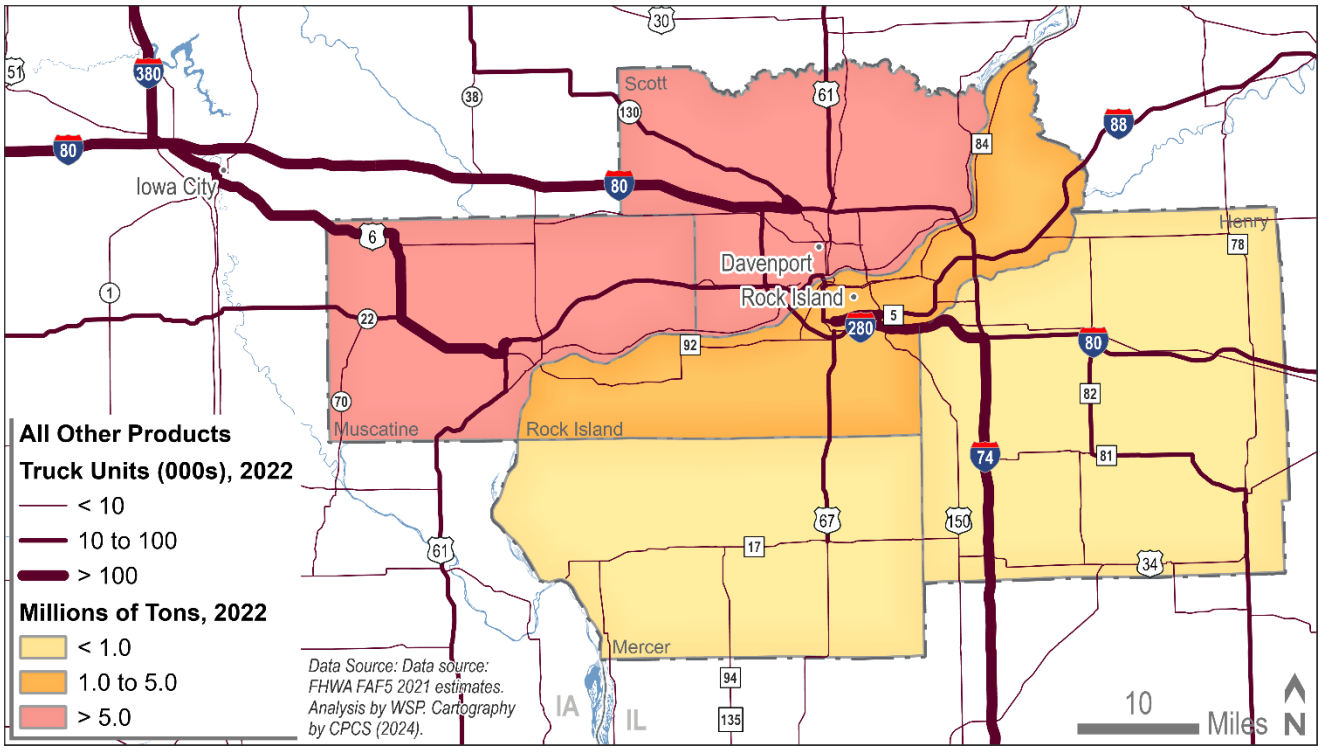
As previously noted, the All Other industry group includes important precursors to agricultural production (fertilizers) and manufacturing (metals and articles of base metals) as well as other commodities. Sivyer Steel Castings and SSAB are among the prominent companies in these sectors. The largest share of tonnage is in Muscatine, followed by Scott and Rock Island, with less activity in Henry and Mercer. The largest share of value is in Scott, followed by Muscatine and Rock Island, with less activity in Henry and Mercer (Figure 137). A combination of the interstate system and US and state highways serve as the main corridors for the movement of the commodities in this industry group by trucks (Figure 138).

Figure 137: Other Industries Commodity Flows, 2022

County	Tons	Value ($)
Scott, IA	5,108,041	8,665,931,719
Muscatine, IA	7,019,711	5,199,983,085
Mercer, IL	173,893	284,561,943
Rock Island, IL	3,022,767	3,589,660,003
Henry, IL	614,026	832,481,624

Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 138: Other Industries Truck Units and County Tonnage, 2022



5.2.5 Top Trading Partners

For the 98 percent of tonnage and value that is traded by the Bi-State Region with other parts of the country (including domestic origins as well as international gateway points), key trading partners can be identified at both the state level and the county level, looking separately at inbound and outbound activity.

Top Trading Partners by Tonnage

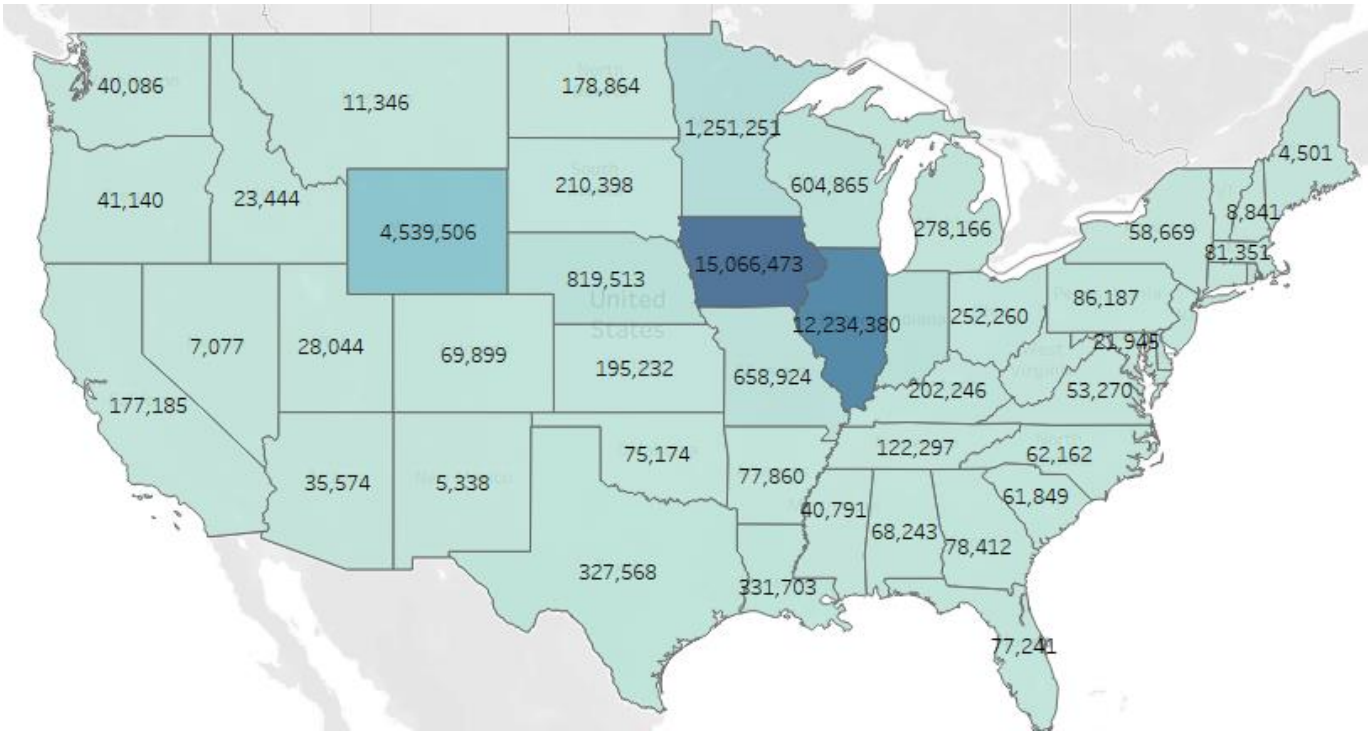
The two leading states for inbound tonnage are Iowa and Illinois, which account for 69% of the tonnage, followed by WY at 12% (primarily due to inbound movements of coal from mines in Wyoming), with significant but lower tonnage from Minnesota, Indiana, Nebraska, Missouri, Wisconsin, Louisiana, and Texas (Figure 139). The two leading states for outbound tonnage are also Iowa and Illinois, which account for 69% of tonnage, followed by Minnesota, Louisiana, Texas, Nebraska, Missouri, South Dakota, Indiana, and Wisconsin. Overall, around two-thirds of BSRC trade is with its adjoining states of Illinois and Iowa. The most important counties for inbound tonnage are Campbell County, WY, and Polk County, IA (home of Iowa's capital city Des Moines), and the most important county for outbound tonnage is Polk County, IA (Figure 142).

Figure 139: Top Trading Partners (States) by Tonnage, 2022

Trading Partner Inbound (State)	Tons Inbound	Trading Partner Outbound (State)	Tons Outbound
IA	15,066,473	IA	15,104,697
IL	12,234,380	IL	13,691,639
WY	4,539,506	MN	1,558,510
MN	1,251,251	LA	1,313,988
IN	828,729	TX	1,045,667
NE	819,513	NE	1,020,887
MO	658,924	MO	735,544
WI	604,865	SD	726,495
LA	331,703	IN	700,211
TX	327,568	WI	665,882
All Other	2,843,058	All Other	5,378,846

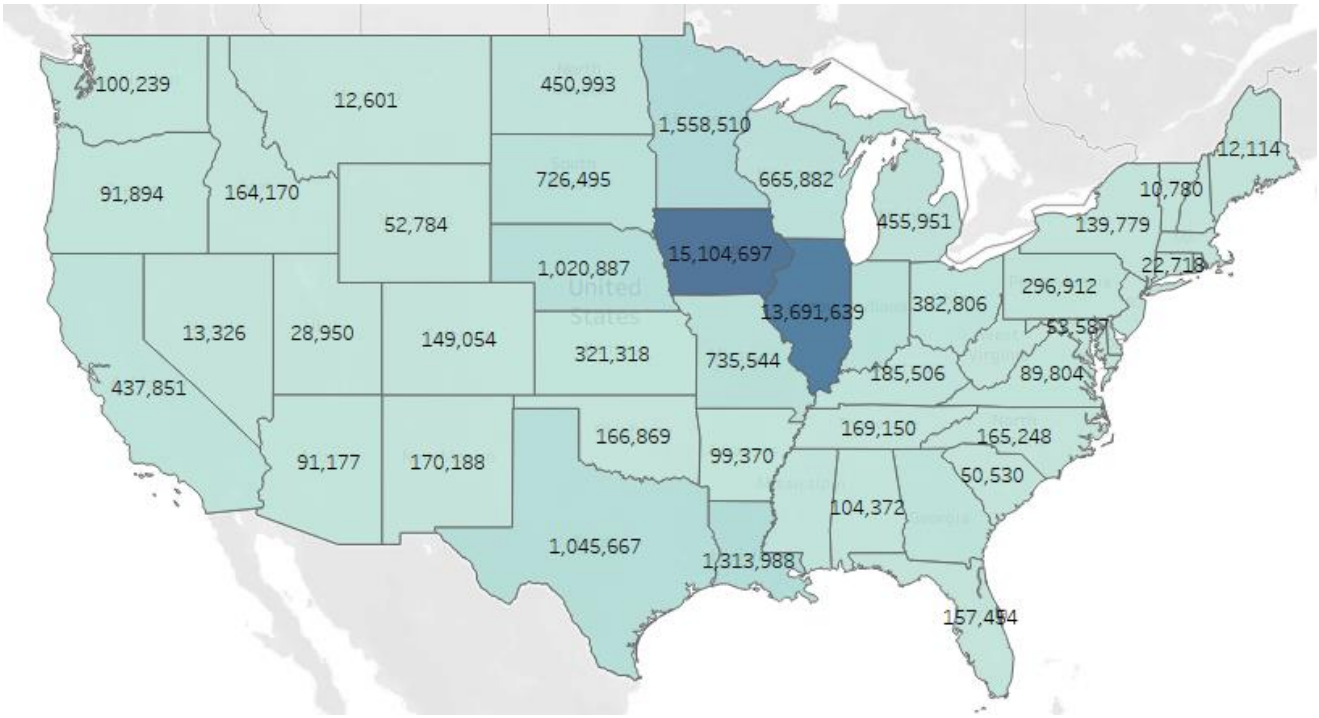
Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 140: Map of Trading Partners (States) by Inbound Tonnage, 2022



Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 141: Map of Trading Partners (States) by Outbound Tonnage, 2022



Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 142: Top Trading Partners (Counties) by Tonnage, 2022

Trading Partner Inbound (County)	Tons Inbound	Trading Partner Outbound (County)	Tons Outbound
Campbell, Wyoming	3,990,457	Polk, Iowa	2,345,419
Polk, Iowa	3,295,690	Linn, Iowa	922,750
Linn, Iowa	993,565	Black Hawk, Iowa	785,426
Johnson, Iowa	917,200	Cook, Illinois	748,429
Black Hawk, Iowa	857,651	Winnebago, Illinois	742,154
Winnebago, Illinois	753,771	Woodbury, Iowa	647,559
Ogle, Illinois	752,478	Tazewell, Illinois	628,829
Adams, Illinois	731,120	St. Clair, Illinois	577,972
Hardin, Iowa	720,239	Champaign, Illinois	539,635
Dubuque, Iowa	593,759	Jefferson, Louisiana	528,809

Data source: FHWA FAF5 estimates. Analysis by WSP.

Top Trading Partners by Value

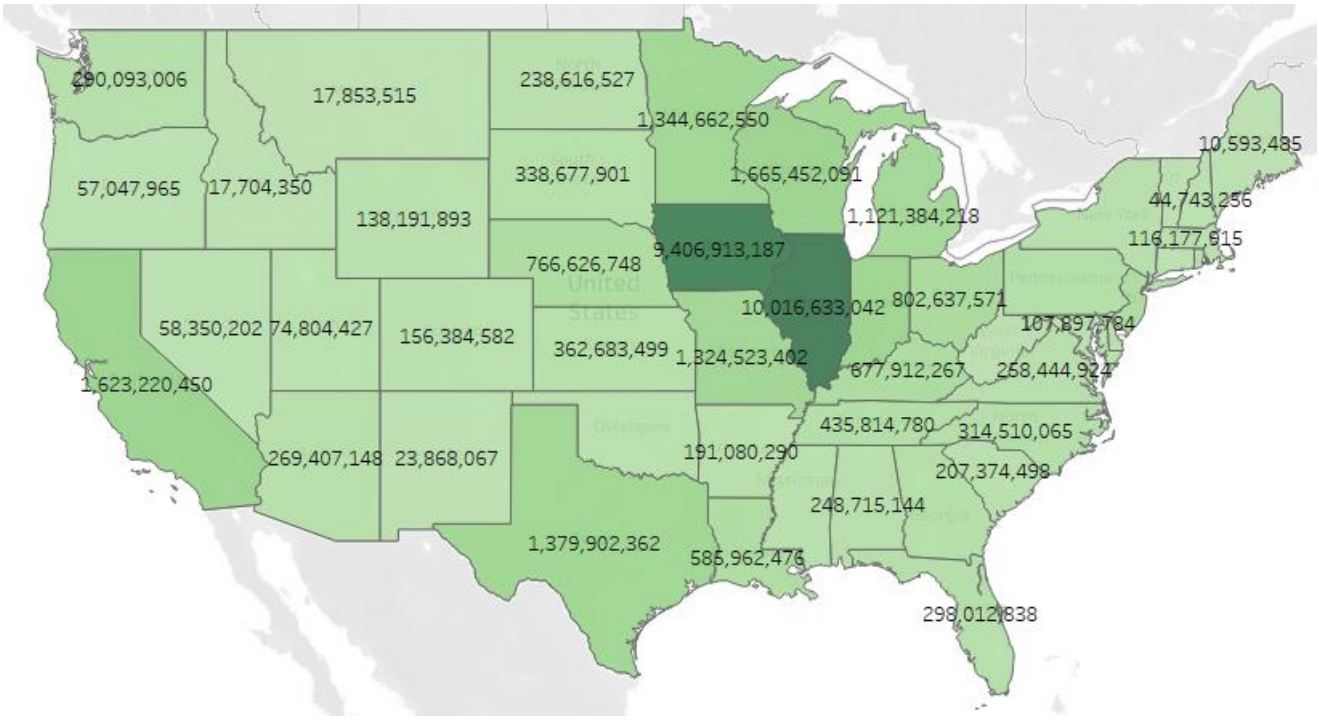
The two leading states for inbound value are – unsurprisingly -- Iowa and Illinois, but they represent a smaller share of total inbound value (50%) than they do for inbound tonnage (69%), which indicates the BSRC region's trade in higher-value goods has more involvement from non-adjacent states. This can be seen from the relatively strong volumes from trading and manufacturing states such as California, Texas, and Ohio. The same observation can be made for outbound trading partners, where Iowa and Illinois represent 51% of value, but other states that are consumers of BSRC goods and/or key international gateways – Missouri, Minnesota, Texas, Indiana, Wisconsin, Michigan, California, and Nebraska – are significant (Figure 143). The most important counties for inbound value are Polk County, IA, and Cook County, IL, with Los Angeles, CA, ranking fifth; the most important counties for outbound value are also Polk County, IA, and Cook County, IL, with Los Angeles, CA, ranking tenth (Figure 146).

Figure 143: Top Trading Partners (States) by Value, 2022

Trading Partner Inbound (State)	Value Inbound	Trading Partner Outbound (State)	Value Outbound
IL	10,016,633,042	IA	11,521,003,023
IA	9,406,913,187	IL	8,941,927,293
WI	1,665,452,091	MO	1,551,155,750
CA	1,623,220,450	MN	1,524,281,672
IN	1,561,316,323	TX	1,400,068,245
TX	1,379,902,362	IN	1,277,943,517
MN	1,344,662,550	WI	1,216,544,368
MO	1,324,523,402	MI	1,197,357,137
MI	1,121,384,218	CA	1,135,011,823
OH	802,637,571	NE	1,104,599,827
All Other	8,384,834,937	All Other	9,453,452,422

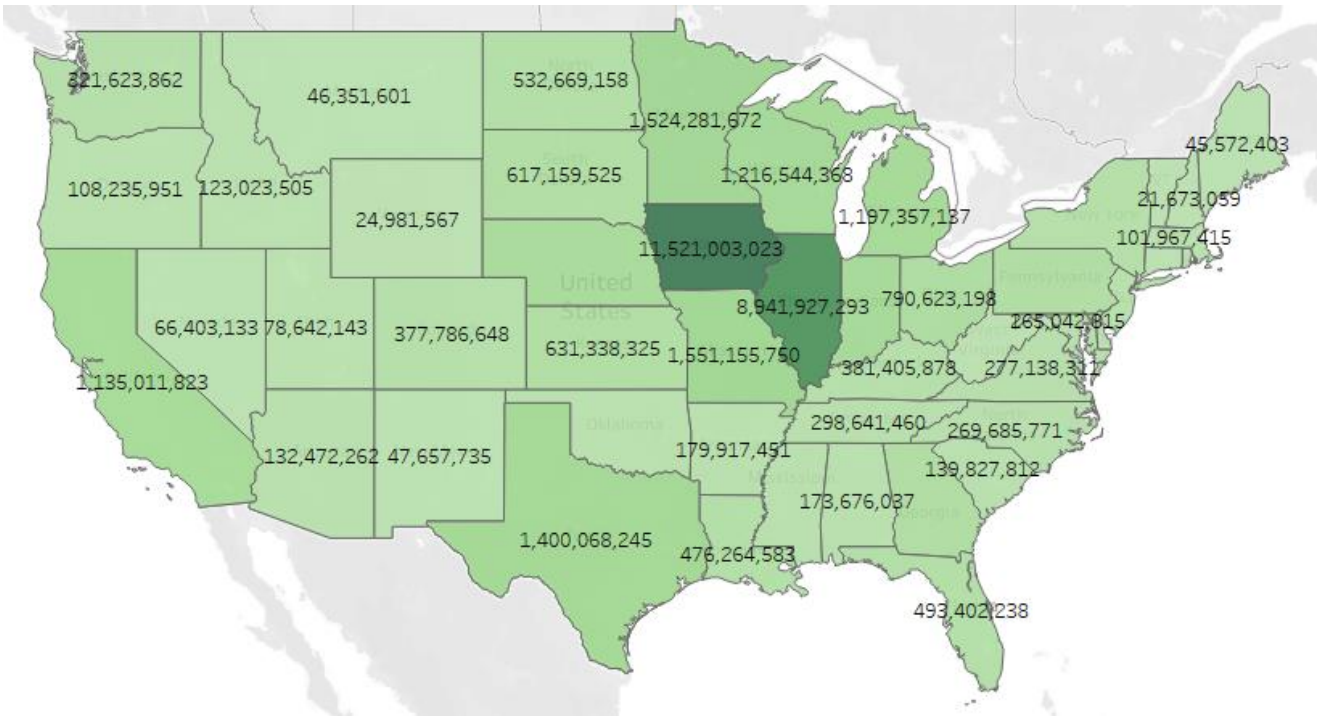
Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 144: Map of Trading Partners (States) by Inbound Value, 2022



Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 145: Map of Trading Partners (States) by Outbound Value, 2022



Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 146: Top Trading Partners (Counties) by Value, 2022

Trading Partner Inbound (County)	Value Inbound	Trading Partner Outbound (County)	Value Outbound
Polk, Iowa	1,715,852,019	Polk, Iowa	2,264,460,130
Cook, Illinois	1,279,201,660	Cook, Illinois	1,343,360,250
Linn, Iowa	1,011,185,550	Linn, Iowa	1,004,126,342
Winnebago, Illinois	844,505,646	Black Hawk, Iowa	727,180,070
Los Angeles, California	703,034,248	Winnebago, Illinois	692,131,228
DuPage, Illinois	682,441,267	Woodbury, Iowa	593,465,853
Peoria, Illinois	575,680,933	Dubuque, Iowa	524,367,795
McLean, Illinois	570,883,756	DuPage, Illinois	469,522,009
Black Hawk, Iowa	531,231,562	Peoria, Illinois	376,641,122
Lake, Illinois	509,146,083	Los Angeles, California	360,037,414

Data source: FHWA FAF5 estimates. Analysis by WSP.

5.3 Modal Profiles

5.3.1 Truck

Bi-State Region-Based Truck Traffic and Freight Tonnage

For tonnage and value moved inbound to, outbound from, or within the BSRC region by truck, the leading tonnage county is Scott, followed by Muscatine, while the leading value county is Scott, followed by Rock Island, with the lowest tonnage and value in Mercer (Figure 147).

Figure 147: Truck Tons and Value by County, 2022

County	Tons	Value ($)
Scott, IA	25,148,503	28,830,974,904
Muscatine, IA	15,232,220	11,346,232,238
Mercer, IL	2,318,350	1,199,824,986
Rock Island, IL	15,574,750	20,899,623,563
Henry, IL	11,343,120	6,325,970,313

Data source: FHWA FAF5 estimates. Analysis by WSP.

The largest share of truck tonnage is associated with Food and Agriculture, followed by Construction materials and All Other commodities. The largest share of truck value is associated with Advanced Manufacturing, All Other Commodities, and Food and Agriculture (Figure 148).

Figure 148: Truck Tons and Value by Industry Group, 2022

Industry Group	Tons	Value ($)
Advanced Manufacturing	3,896,328	23,169,629,184
Chemicals, Pharmaceuticals, Plastics	1,292,425	6,353,244,235
Construction Materials	21,028,911	2,615,387,561
Energy Products	785,535	453,170,070
Food and Agriculture	27,644,117	13,798,256,932
Motorized Vehicles & Parts	655,323	6,224,630,138
Other	13,581,305	15,310,816,093

Data source: FHWA FAF5 estimates. Analysis by WSP.

Tons and value by truck are relatively balanced in terms of direction, and as previously noted, within-region moves represent a small share of tonnage and value (Figure 149).

Figure 149: Truck Tons and Value by Direction, 2022

Direction	Tons	Value ($)
Inbound	32,501,544	32,141,093,363
Outbound	34,659,363	34,234,599,358
Within	1,723,037	1,549,441,513

Data source: FHWA FAF5 estimates. Analysis by WSP.

The top trading partners for both inbound and outbound truck tons are Iowa and Illinois, with a variety of other states rounding out the list of top ten partners (Figure 150).

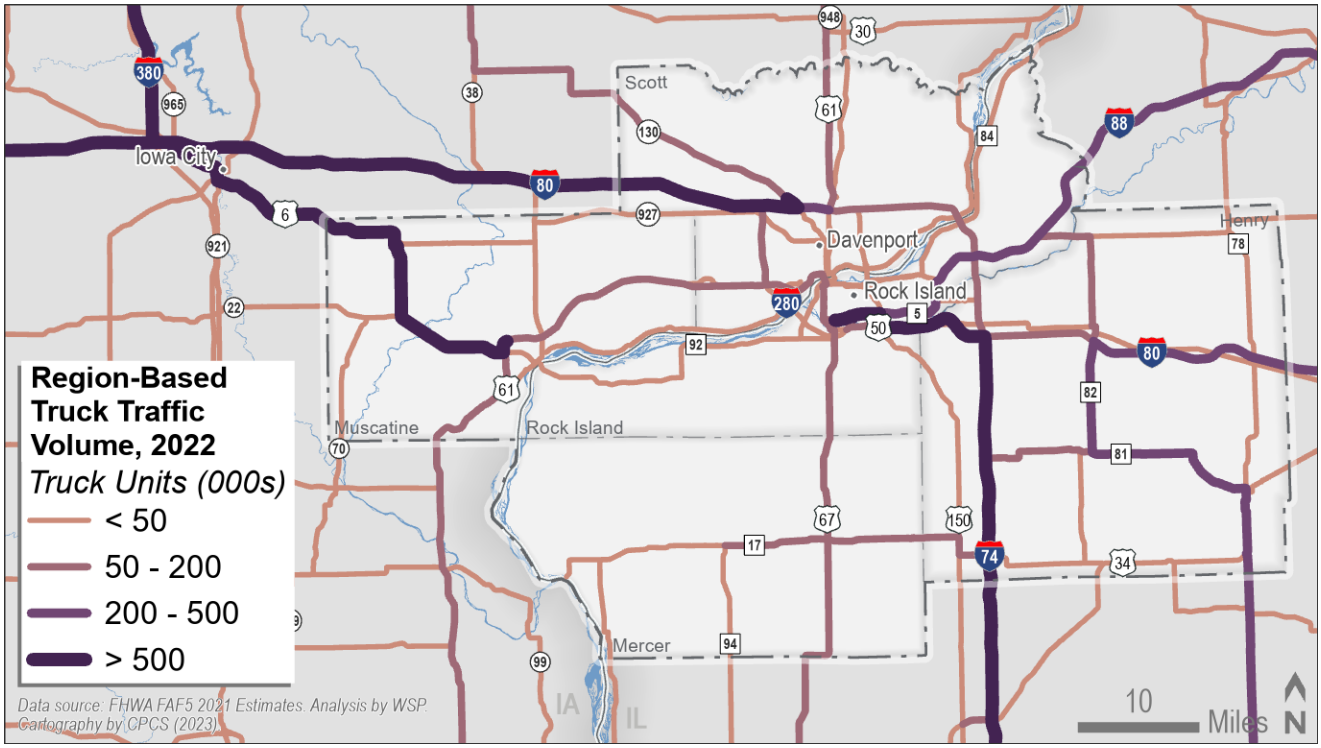
Figure 150: Top Trading Partner by Truck by Tonnage, 2022

Trading Partner (Inbound)	Tons (Inbound)	Trading Partner (Outbound)	Tons (Outbound)
IA	14,778,763	IA	14,383,605
IL	11,703,857	IL	12,963,698
MN	1,067,592	MN	1,397,432
IN	728,517	NE	975,193
NE	725,466	MO	620,003
MO	544,888	WI	616,436
WI	535,959	SD	614,206
MI	228,625	IN	519,364
OH	217,777	KS	240,540
SD	192,619	TX	238,445

Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 151 shows the major roadways that carry the region-based truck commodity flows. Segment of I-80 west of US-61, US-6 north of US-61, I-74 south of US-50. I-280 between I-74 and I-80, and John Deer Road east of I-74 facilitate the heaviest flows of truck commodity movements.

Figure 151: Region-Based Truck Commodity Flows, 2022

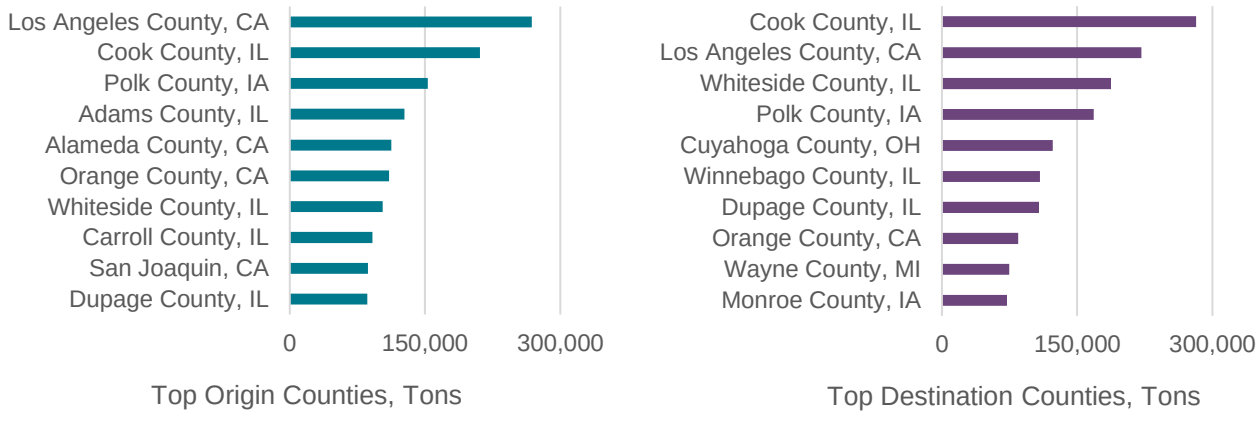


Pass-Through Truck Traffic and Freight Tonnage

The Bi-State Region's importance in supporting national freight commodity flows is illustrated by the region's level of pass-through truck traffic. The commodity flow analysis indicates that around 76% of the truck commodity flows that touch the region are pass-through flows.

Figure 152 shows the top origins and destinations that generate the commodity flows that pass through the Bi-State Region. The Bi-State Region serves as an important connector for commodity flows serving California, the Chicago land in Illinois, Des Moines in Iowa, as well as the Cleveland area in Ohio, and the Detroit area in Michigan.

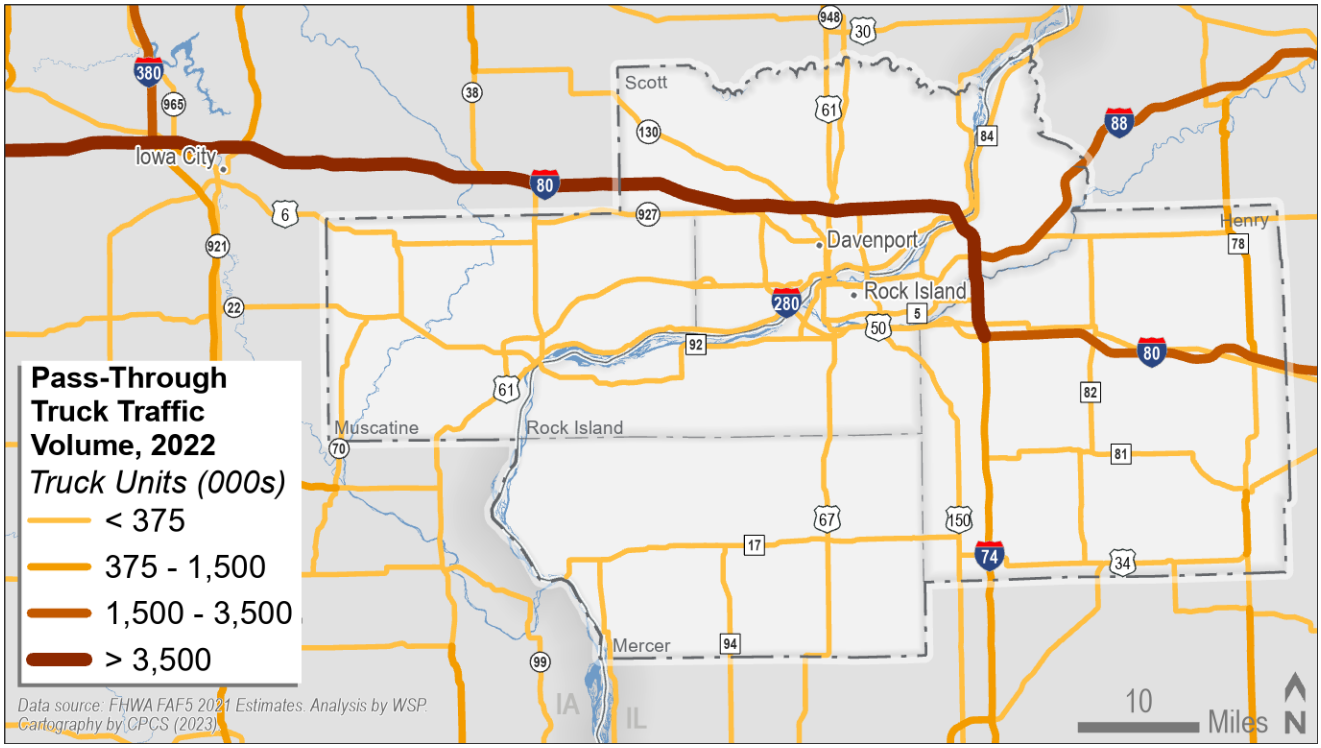
Figure 152: Top Origins and Destinations of Commodity Flows that Pass Through the Region, 2022



Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 153 shows the corridors that facilitate the pass-through truck commodity flows. I-80 west of I-280 connects the region with Des Moines, IA, and California to the west, and I-88 east of I-80 connects the region with Chicago, Ohio, and Michigan to the east are the most important corridors facilitating pass-through commodity flows.

Figure 153: Pass-Through Truck Commodity Flows, 2022



Data source: FHWA FAF5 estimates. Analysis by WSP.

5.3.2 Rail

For tonnage and value moved inbound to, outbound from, or within the BSRC region by rail, the leading tonnage county is Scott, followed by Muscatine, Henry, and Rock Island, while the leading value county is Scott, followed by Muscatine, Rock Island, and Henry, with the lowest tonnage and value in Mercer (Figure 154).

Figure 154: Rail Tons and Value by County, 2022

County	Tons	Value ($)
Scott, IA	5,651,909	1,361,656,218
Muscatine, IA	2,119,149	510,247,608
Mercer, IL	177,655	55,900,745
Rock Island, IL	716,910	433,954,006
Henry, IL	769,302	216,628,885

Data source: FHWA FAF5 estimates. Analysis by WSP.

The largest share of rail tonnage is associated with Energy Products, followed by Food and Agriculture and All Other commodities. The largest shares of rail value are associated with All Other commodities, and Food and Agriculture commodities, followed by Chemicals, Pharmaceuticals, and Plastics (Figure 155).

Figure 155: Rail Tons and Value by Industry Group, 2022

Industry Group	Tons	Value ($)
Advanced Manufacturing	34,211	183,852,618
Chemicals, Pharmaceuticals, Plastics	276,581	334,974,634
Construction Materials	697,900	62,723,495

Energy Products	4,627,668	158,834,091
Food and Agriculture	2,598,654	854,218,035
Motorized Vehicles & Parts	13,497	116,284,239
Other	1,170,542	858,833,753

Data source: FHWA FAF5 estimates. Analysis by WSP.

Rail tonnage is strongest in the inbound direction and features the movement of lower-value energy products and bulk goods. Rail value is strongest in the outbound direction and features the movement of higher-value manufacturing and agricultural products. Rail moves within the region are extremely low due to the short travel distances involved (Figure 156).

Figure 156: Rail Tons and Value by Direction, 2022

Direction	Tons	Value ($)
Inbound	5,664,902	739,617,833
Outbound	3,706,311	1,795,868,905
Within	47,839	34,234,127

Data source: FHWA FAF5 estimates. Analysis by WSP.

The top trading partner for inbound rail tons, by a wide margin, is Wyoming, which is a major producer of coal for the region. The top trading partners for outbound rail tons are Texas, Iowa, Illinois, Louisiana, and North Dakota (Figure 157).

Figure 157: Top Trading Partner by Rail by Tons, 2022

Trading Partner (Inbound)	Tons (Inbound)	Trading Partner (Outbound)	Tons (Outbound)
WY	4,534,926	TX	636,445
IL	210,771	IA	585,275
IA	200,987	IL	432,128
MN	144,611	LA	316,211
ND	100,665	ND	294,685
TX	84,408	MI	171,994
NE	78,741	ID	145,822
IN	56,058	NM	134,842
WI	37,767	GA	91,124
MI	36,734	OH	90,982

Data source: FHWA FAF5 estimates. Analysis by WSP.

It was not possible to assign the FAF rail data to a national network, but the Federal Railroad Administration produces a map of national rail tonnage assignments which can be used to conclude the utilization of the Bi-State Region rail network. The BSRC counties are served directly by three railroads – the Canadian Pacific, BNSF, and the Iowa Interstate – as shown in Figure 158. In Figure 159, national rail tonnages over the Bi-State Region network (indicated with a dotted blue circle) are in the under 15 million tons per year range, suggesting limited pass-through traffic. Rail lines with much more substantial east-west traffic, in the 50 to 100 million tons per year range, are located north of the region (UP) and south of the region (BNSF), as indicated by the green lines.

Figure 158: BSRC Region Railroads, 2023

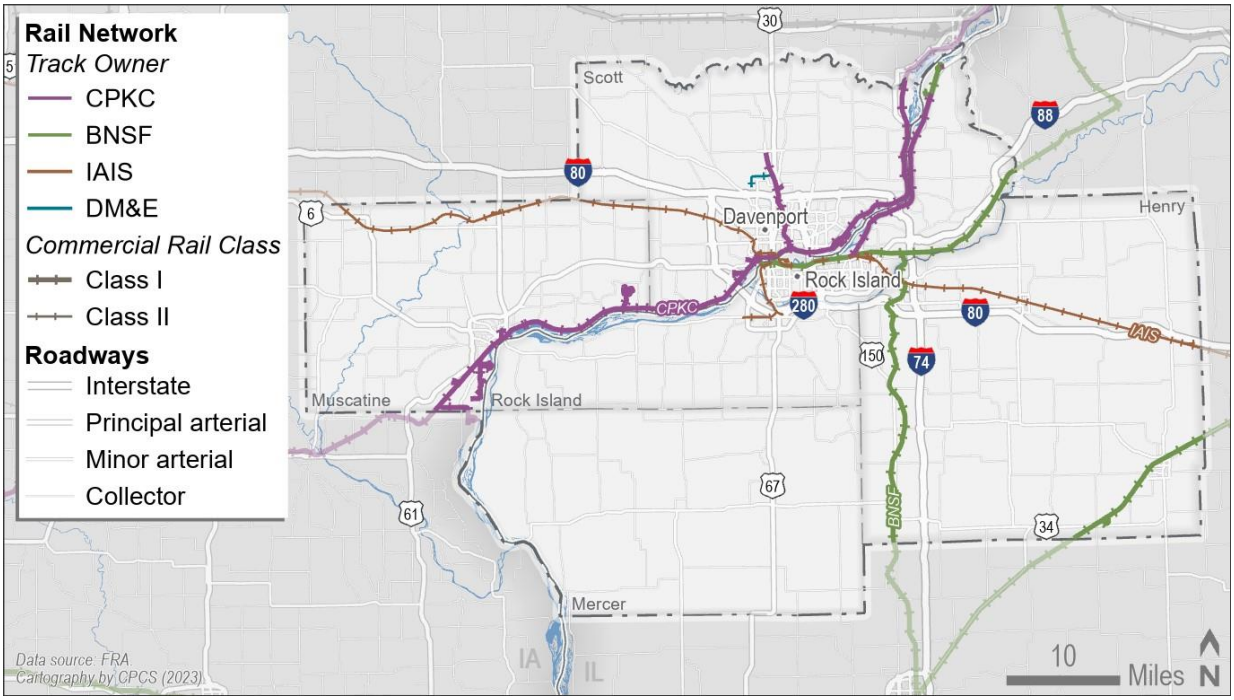
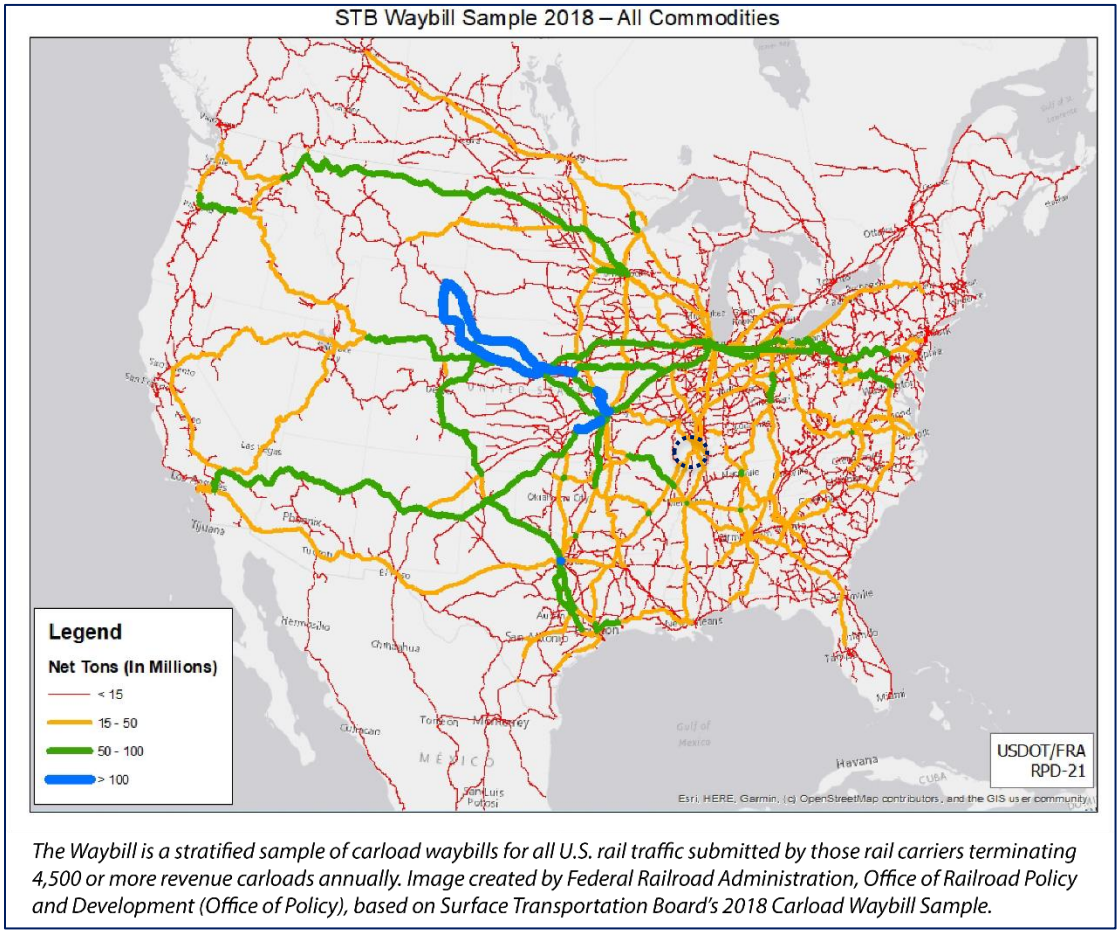


Figure 159: Federal Railroad Administration Freight Rail Network Tonnage, 2018



Source: FHWA, Freight Rail Overview, The Freight Rail Network, 2023.[86]

[86] FHWA, Freight Rail Overview, The Freight Rail Network, 2023. https://railroads.dot.gov/rail-network-development/freight-rail-overview. Accessed on January 8, 2024.

5.3.3 Air

The FAF disaggregation shows air cargo tonnage in every BSRC county, even those that do not have air cargo facilities. This is because FAF tabulates air cargo volumes as linked moves, including truck moves to and from airports from non-airport counties. As previously noted, air cargo tonnage is limited but it handles a meaningful amount of value, and is vitally important for certain supply chains, particularly the time-sensitive movement of manufacturing components and products. The highest tonnage and value are associated with Rock Island County (the location of Quad Cities International Airport and John Deere's aviation facility), followed by Scott County, home to the Davenport Municipal Airport (Figure 160).

Figure 160: Air Tons and Value by County, 2022

County	Tons	Value ($)
Scott, IA	2,851	135,410,313
Muscatine, IA	489	26,793,952
Mercer, IL	154	12,504,072
Rock Island, IL	4,890	380,331,159
Henry, IL	872	66,019,950

Data source: FHWA FAF5 estimates. Analysis by WSP.

In terms of commodities, air cargo is most important for the Advanced Manufacturing group, followed by Chemicals, Pharmaceuticals, and Plastics (of which pharmaceuticals are very low in weight and very high in value, Figure 161).

Figure 161: Air Tons and Value by Industry Group, 2022

Industry Group	Tons	Value ($)
Advanced Manufacturing	4,192	499,225,826
Chemicals, Pharmaceuticals, Plastics	1,958	61,913,945
Construction Materials	973	3,086,621
Energy Products	0	10,682
Food and Agriculture	278	1,356,962
Motorized Vehicles & Parts	412	18,531,335
Other	1,443	36,867,653

Data source: FHWA FAF5 estimates. Analysis by WSP.

Air cargo tonnage is slightly higher in the outbound direction, while air cargo value is slightly higher in the inbound direction (Figure 162). The amounts shown for air cargo moving within the region are negligible and almost certainly reflect artifacts of the modeling process rather than real activity, and can be ignored.

Figure 162: Air Tons and Value by Direction, 2022

Direction	Tons	Value ($)
Inbound	4,209	373,188,605
Outbound	5,044	247,723,027
Within	1	81,392

Data source: FHWA FAF5 estimates. Analysis by WSP.

For air cargo tonnage, the top partners for inbound moves are Michigan, California, Pennsylvania, Tennessee, and Texas; the top partners for outbound moves are Florida, Michigan, Ohio, California, and New York (Figure 163).

Figure 163: Top Trading Partners by Air by Tons, 2022

Trading Partner (Inbound)	Tons (Inbound)	Trading Partner (Outbound)	Tons (Outbound)
MI	741	FL	512
CA	600	MI	492
PA	303	OH	472
TN	268	CA	401
TX	246	NY	292
OH	209	KY	253
NY	193	MO	205
KY	173	OR	193
FL	170	PA	188
NJ	148	TN	180

Data source: FHWA FAF5 estimates. Analysis by WSP.

5.3.4 Maritime

For tonnage and value moved inbound to, outbound from, or within the Bi-State Region by water, the leading tonnage and value county is Rock Island, followed by Muscatine, Scott, and Mercer counties (Figure 164). FAF does not report linked trips for water as it does for air, so the zero tonnage and value in Henry reflects the absence of freight-handling river terminals, although customers in Henry may use trucks to reach river terminals in other counties.

Figure 164: Maritime Tons and Value by County, 2022

County	Tons	Value ($)
Scott, IA	268,866	68,628,840
Muscatine, IA	390,450	103,736,113
Mercer, IL	80,740	19,290,716
Rock Island, IL	708,272	172,173,685
Henry, IL	0	0

Data source: FHWA FAF5 estimates. Analysis by WSP.

The largest share of water tonnage and value is associated with Food and Agriculture, with additional moves of Construction Materials (by tonnage) and Advanced Manufacturing products (by value, Figure 165). Water tonnage and value is strongest in the outbound direction. Food and Agriculture products tend to flow outbound, while Energy products tend to flow inbound (Figure 166).

Figure 165: Maritime Tons and Value by Industry Group, 2022

Industry Group	Tons	Value ($)
Advanced Manufacturing	2,449	37,268,571
Chemicals, Pharmaceuticals, Plastics	9,977	8,387,024
Construction Materials	223,995	12,641.051
Energy Products	114,777	12,627,649
Food and Agriculture	1,061,721	276,662,692
Motorized Vehicles & Parts	10	156,936
Other	34,273	15,902,305

Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 166: Maritime Tons and Value by Direction, 2022

Direction	Tons	Value ($)
Inbound	406,065	89,804,166
Outbound	1,038,907	273,632,813
Within	2,231	209,249

Data source: FHWA FAF5 estimates. Analysis by WSP.

The leading trading partner for inbound water tonnage is Louisiana, followed by Illinois, Missouri, and Kentucky, all part of the interconnected Mississippi-Missouri-Ohio-Illinois river system. The leading trading partner – by far – for outbound water tonnage is Louisiana, where commodities barged on the Mississippi River are transloaded into ocean-going vessels for export to global markets (Figure 167).

Figure 167: Top Trading Partners by Maritime by Tons, 2022

Trading Partner (Inbound)	Tons (Inbound)	Trading Partner (Outbound)	Tons (Outbound)
LA	151,972	LA	914,447
IL	132,716	IL	97,631
MO	55,545	MN	5,663
KY	38,235	TN	4,459
AL	13,750	MS	3,996
IA	11,927	TX	3,806
TX	1,484	MO	3,603
MI	319	AL	2,299
NJ	35	KY	2,019
HI	15	NJ	451

Data source: FHWA FAF5 estimates. Analysis by WSP.

5.3.5 Multiple Modes

For tonnage and value moved inbound to, outbound from, or within the Bi-State Region by multiple modes, the leading tonnage and value county is Scott, followed by Rock Island, Muscatine, Henry, and Mercer Counties (Figure 168). As previously noted, this modal group includes intermodal rail, which likely represents a substantial share of the reported tonnage and value – even though the BSRC region does not host an intermodal rail facility, its counties are served by intermodal rail facilities elsewhere via truck connections. However, this group may also include other combinations of modes, based on how freight shippers responded to the Commodity Flow Survey that underlies FAF.

Figure 168: Multiple Modes Tons and Value by County, 2022

County	Tons	Value ($)
Scott, IA	1,422,650	3,985,126,887
Muscatine, IA	772,345	1,228,222,804
Mercer, IL	80,418	80,804,782
Rock Island, IL	786,421	3,018,134,960
Henry, IL	425,335	797,356,616

Data source: FHWA FAF5 estimates. Analysis by WSP.

The largest share of multiple-mode tonnage is associated with Food and Agriculture, while the largest share of multiple-mode value is associated with Advanced Manufacturing, which includes warehouse/distribution traffic (Figure 169).

Figure 169: Multiple Modes Tons and Value by Industry Group, 2022

Industry Group	Tons	Value ($)
Advanced Manufacturing	96,006	3,507,432,034
Chemicals, Pharmaceuticals, Plastics	302,917	1,461,461,199
Construction Materials	281,376	65,385,402
Energy Products	47,000	16,837,869
Food and Agriculture	1,819,772	896,781,247
Motor Vehicles & Parts	46,529	1,090,042,119
Other	884,197	2,056,010,508

Data source: FHWA FAF5 estimates. Analysis by WSP.

Multiple mode tonnage tends to be higher in the outbound direction, reflecting the shipment of food and agriculture products, while multiple mode value tends to be higher in the inbound direction, reflecting the receipt of high-value advanced manufacturing and warehouse/distribution products (Figure 170). As with air, tonnage and value reported as moving within the Bi-State Region most likely represents an artifact of the disaggregation and can be ignored.

Figure 170: Multiple Modes Tons and Value by Direction, 2022

Direction	Tons	Value ($)
Inbound	929,250	5,287,776,167
Outbound	2,532,741	3,771,520,974
Within	15,805	34,653,238

Data source: FHWA FAF5 estimates. Analysis by WSP.

The top trading partner for inbound multiple-mode tonnage is Illinois, followed by Louisiana, Iowa, Texas, and Missouri. The top trading partner for outbound multiple-mode tonnage is Illinois, followed by Georgia, California, Texas, and Indiana (Figure 171).

Figure 171: Multiple Modes Top Trading Partners by Tons, 2022

Trading Partner (Inbound)	Tons (Inbound)	Trading Partner (Outbound)	Tons (Outbound)
IL	186,907	IL	198,148
LA	101,578	GA	194,386
IA	74,788	CA	189,654
TX	52,233	TX	166,867
MO	51,876	IN	142,002
IN	44,134	MN	138,800
MN	38,992	IA	135,815
OH	32,609	PA	121,519
WI	31,124	MS	109,963
SC	29,322	OK	104,581

Data source: FHWA FAF5 estimates. Analysis by WSP.

5.4 2055 Forecast

5.4.1 Introduction

As part of its production of FAF version 5, USDOT included forecasts through the year 2050, which are based on domestic and global economic forecasts provided to USDOT by S&P Global. To align the FAF disaggregation to BSRC's 2055 planning horizon, the 2050 volumes were extrapolated to 2055 to include an additional five years of growth at the rates projected by FAF.

2.4.1.1 Forecasted Commodity Flow

Forecast results are summarized by direction, mode, commodity group, and BSRC county in Figure 172 through Figure 175. Each figure indicates tons and value in 2022 and 2055; percent growth (2055 number divided by 2022 number less 100%); percent annual growth (the compound annual growth rate); and the percent share of the increment (what share of the growth added between 2022 and 2055 is associated with each direction, mode, commodity, or county).

By Direction: Commodity flow tonnage for the Region is forecast to grow from 83.2 in 2022 to 137.4 million tons in 2055, an increase of 65% representing a healthy 2.2% annual growth. 61% of the added tonnage will be outbound, 36% inbound, and 3% within the region. The value of the commodity flow is forecast to grow from $80.6 billion to $173.6 billion, an increase of 116% (3.4% annual growth). 51% of the added value will be outbound, 47% inbound, and 2 % within the region (Figure 172).

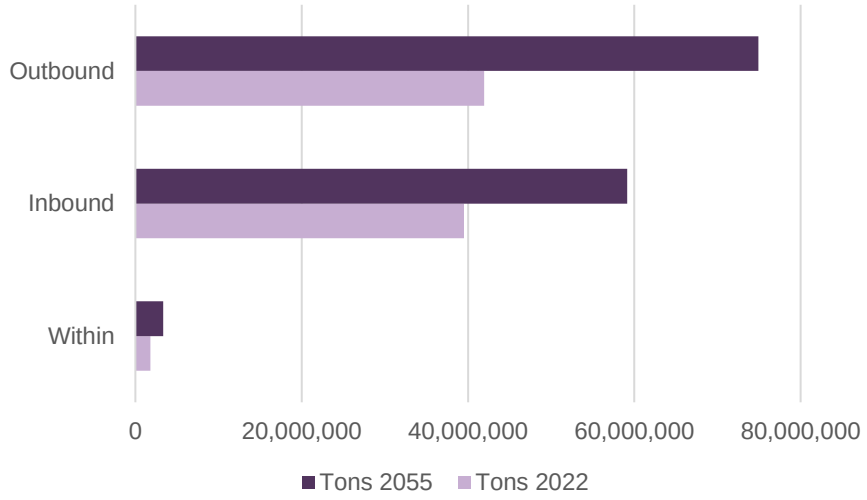
By Mode: Based on tonnage, trucking will grow by 74% (2.4% annual growth); rail will decline by 3% (-0.1% annual growth); air will grow by 131% (3.7% annual growth); maritime will grow by 38% (1.4% annual growth); and multiple modes will grow by 90% (2.8% annual growth). Trucking will represent 94% of the tonnage growth between 2022 and 2055. Based on value, trucking will grow by 114% (3.4% annual growth); rail will increase by 76% (2.5% annual growth); air will grow by 234% (5.4% annual growth); maritime will grow by 72% (3.8% annual growth); and multiple modes will grow by 135% (3.8% annual growth). Trucking will represent 83% of the value growth between 2022 and 2055 (Figure 173).

By Industry: Based on tonnage, advanced manufacturing will grow by 145% (4.0% annual growth); chemicals by 228% (5.3% annual growth); construction materials by 57% (2.0% annual growth); food and agriculture by 31% (1.2% annual growth); motorized vehicles and parts by 84% (2.7% annual growth); all other commodities by 151% (4.1% annual growth), while energy products will decline by 58% (-3.7% annual growth). Based on value, advanced manufacturing will grow by 116% (3.4% annual growth); chemicals by 205% (5.0% annual growth); construction materials by 75% (2.5% annual growth); energy products by 9% (0.4% annual growth); food and agriculture by 60% (2.1% annual growth); motorized vehicles and parts by 87% (2.8% annual growth); and all other commodities by 144% (3.9% annual growth, Figure 174).

By County: Forecasted growth will accrue primarily to Scott (37.6% of tons, 47.2% of value), Muscatine (36.2% of tons, 21.2% of value), and Rock Island (20.4% of tons, 24.5% of value, Figure 175).

Figure 172: Tonnage and Value of Total Freight Flows by Direction, between 2022 and 2055

Direction	Tons					Value (Millions $)				
	2022	2055	% Growth	% Annual Growth	% Share of Increment	2022	2055	% Growth	% Annual Growth	% Share of Increment
Outbound	41,942,366	74,910,263	79%	2.6%	60.9%	40,323	87,824	118%	3.4%	51.0%
Inbound	39,505,970	59,128,740	50%	1.8%	36.2%	38,631	81,982	112%	3.3%	46.6%
Within	1,788,914	3,340,017	87%	2.8%	2.9%	1,618	3,836	137%	3.8%	2.4%
Total	83,237,249	137,379,021	65%	2.2%	100.0%	80,573	173,643	116%	3.4%	100.0%



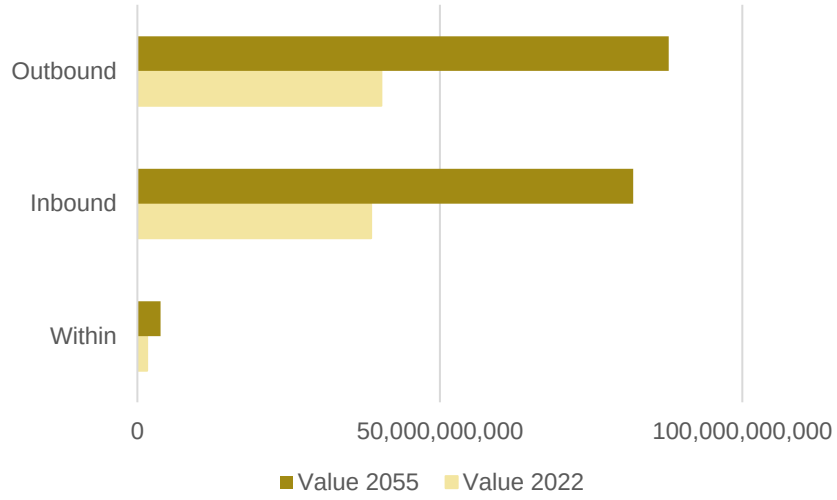
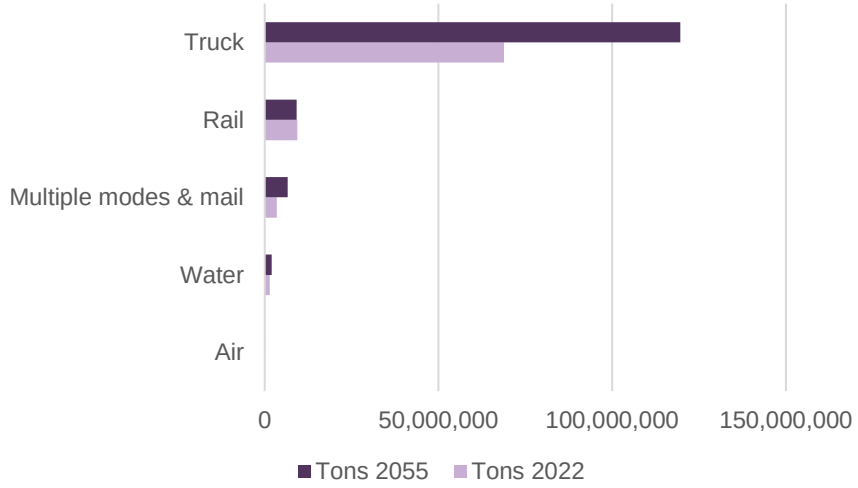


Figure 173: Tonnage and Value of Total Freight Flows by Mode, between 2022 and 2055

Mode	Tons					Value (Millions $)				
	2022	2055	% Growth	% Annual Growth	% Share of Increment	2022	2055	% Growth	% Annual Growth	% Share of Increment
Truck	68,883,945	119,608,259	74%	2.4%	93.7%	67,925	145,044	114%	3.4%	82.9%
Rail	9,419,052	9,148,188	-3%	-0.1%	-0.5%	2,569	4,522	76%	2.5%	2.1%
Air	9,254	21,334	131%	3.7%	0.0%	620	2,076	234%	5.4%	1.6%
Maritime	1,447,202	1,997,076	38%	1.4%	1.0%	363	624	72%	2.4%	0.3%
Multiple Modes	3,477,796	6,604,164	90%	2.8%	5.8%	9,093	21,374	135%	3.8%	13.2%
Total	83,237,249	137,379,021	65%	2.2%	100.0%	80,573	173,643	116%	3.4%	100.0%



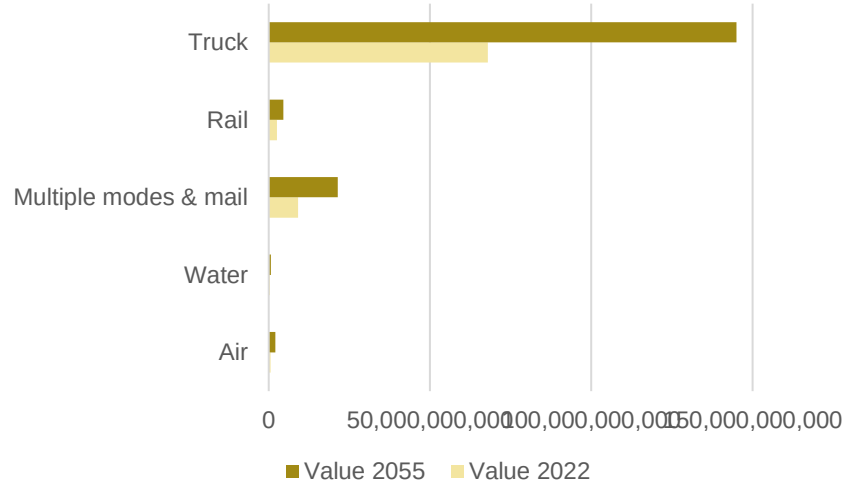
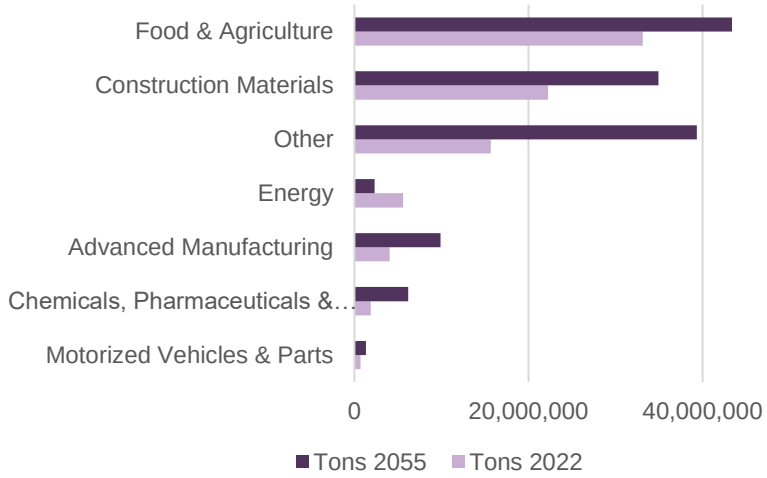


Figure 174: Tonnage and Value of Total Freight Flows by Commodity Group, between 2022 and 2055

Industry	Tons					Value (Millions $)				
	2022	2055	% Growth	% Annual Growth	% Share of Increment	2022	2055	% Growth	% Annual Growth	% Share of Increment
Advanced Manufacturing	4,033,186	9,890,476	145%	4.0%	10.8%	27,397	59,293	116%	3.4%	34.3%
Chemicals, Pharmaceuticals & Plastics	1,883,857	6,178,974	228%	5.3%	7.9%	8,219	25,058	205%	5.0%	18.1%
Construction Materials	22,233,156	34,945,783	57%	2.0%	23.5%	2,759	4,822	75%	2.5%	2.2%
Energy Products	5,574,979	2,329,911	-58%	-3.7%	-6.0%	641	696	9%	0.4%	0.1%
Food & Agriculture	33,124,540	43,375,737	31%	1.2%	18.9%	15,827	25,297	60%	2.1%	10.2%
Motorized Vehicles & Parts	715,772	1,315,888	84%	2.7%	1.1%	7,449	13,920	87%	2.8%	7.0%
Other	15,671,759	39,342,252	151%	4.1%	43.7%	18,278	44,554	144%	3.9%	28.2%
Grand Total	83,237,249	137,379,021	65%	2.2%	100.0%	80,573	173,643	116%	3.4%	100.0%



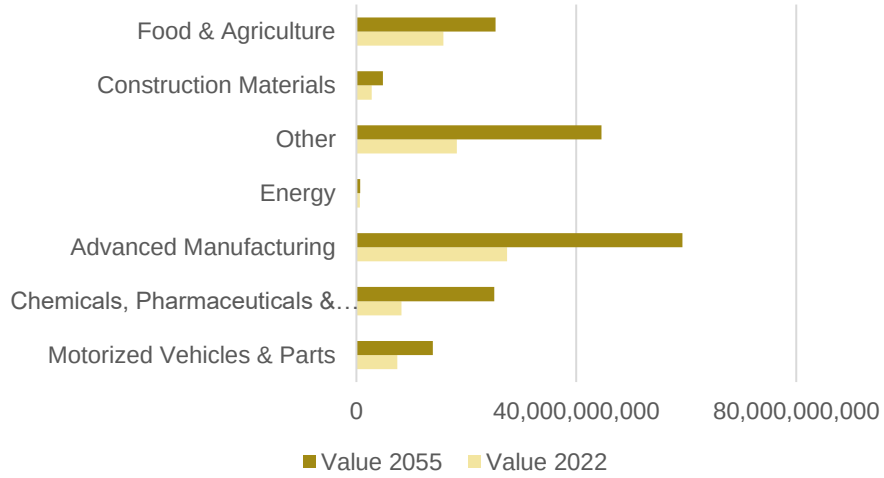
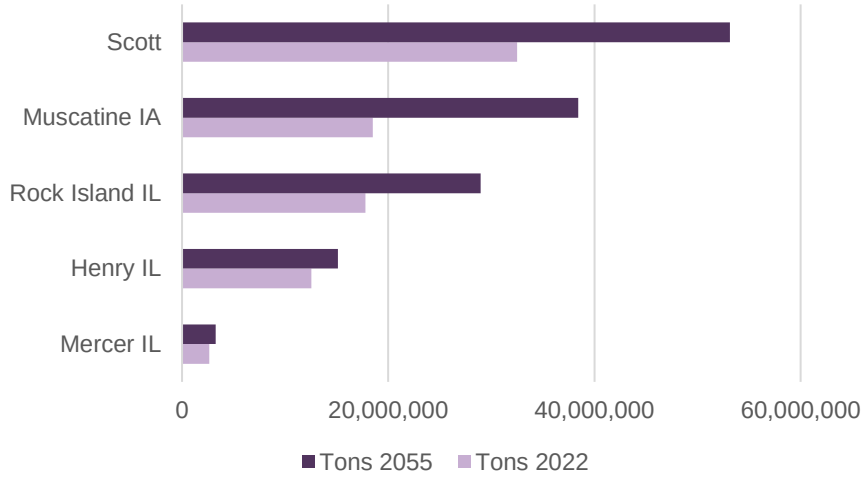
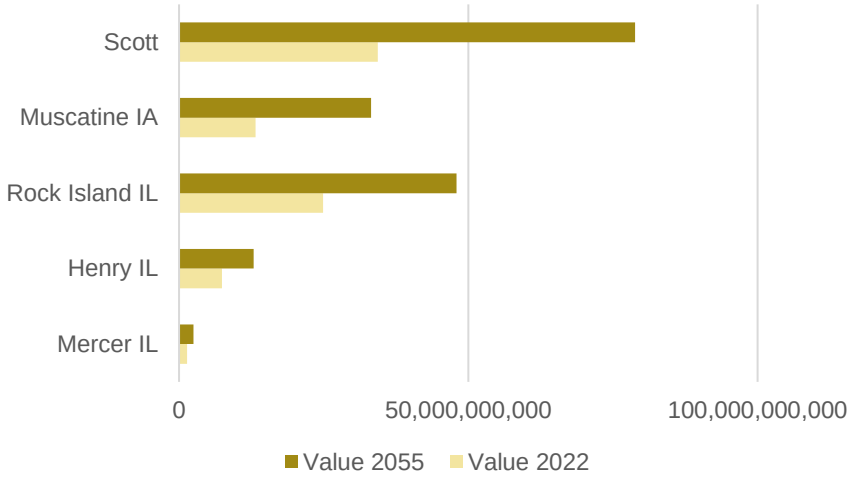


Figure 175: Tonnage and Value of Total Freight Flows by County, between 2022 and 2055

County	Tons					Value (Millions $)				
	2022	2055	% Growth	% Annual Growth	% Share of Increment	2022	2055	% Growth	% Annual Growth	% Share of Increment
Scott, IA	32,494,779	53,147,120	64%	2.2%	37.6%	34,381	78,816	129%	3.7%	47.2%
Muscatine, IA	18,514,652	38,421,021	108%	3.2%	36.2%	13,215	33,185	151%	4.1%	21.2%
Mercer, IL	2,657,317	3,264,883	23%	0.9%	1.1%	1,368	2,519	84%	2.7%	1.2%
Rock Island, IL	17,791,242	28,976,537	63%	2.1%	20.4%	24,904	47,960	93%	2.9%	24.5%
Henry, IL	12,538,629	15,122,643	21%	0.8%	4.7%	7,405	12,884	74%	2.4%	5.8%
Total	83,996,619	138,932,204	65%	2.2%	100.0%	81,275	175,366	116%	3.4%	100.0%





5.4.2 Truck Traffic Growth, between 2022 and 2055

Region-Based Truck Traffic Growth

Figure 176 shows the 2055 forecasts for region-based truck commodity flows on the roadway network. The critical corridors that are projected to carry the heaviest flows of region-based truck movements remain largely consistent with 2022 estimates, with segments of I-80, US-6, I-74, and I-280 projected with the highest volumes. The importance of I-88 east of I-74 is projected to increase, signaling a stronger connection between the region and the Chicago area on the east. Incremental region-based truck commodity flows (Figure 177) indicate that I-80 and US-6 are expected to see the most growth for serving truck commodity flows originating from, destined to, and traveling within the region.

Figure 176: Region-Based Truck Commodity Flows, 2055

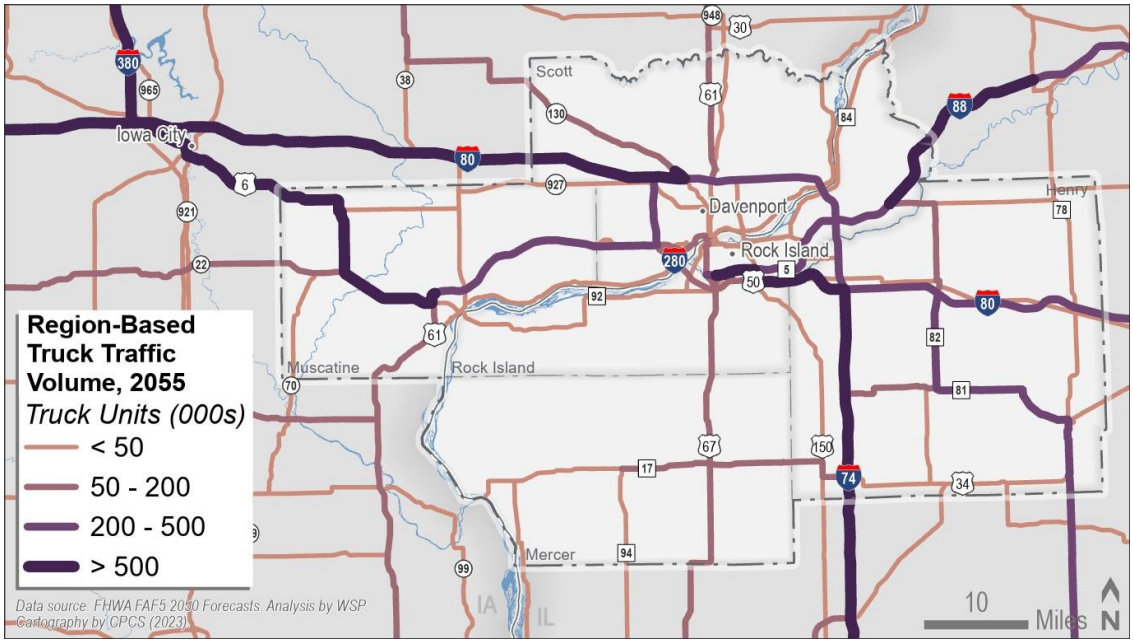
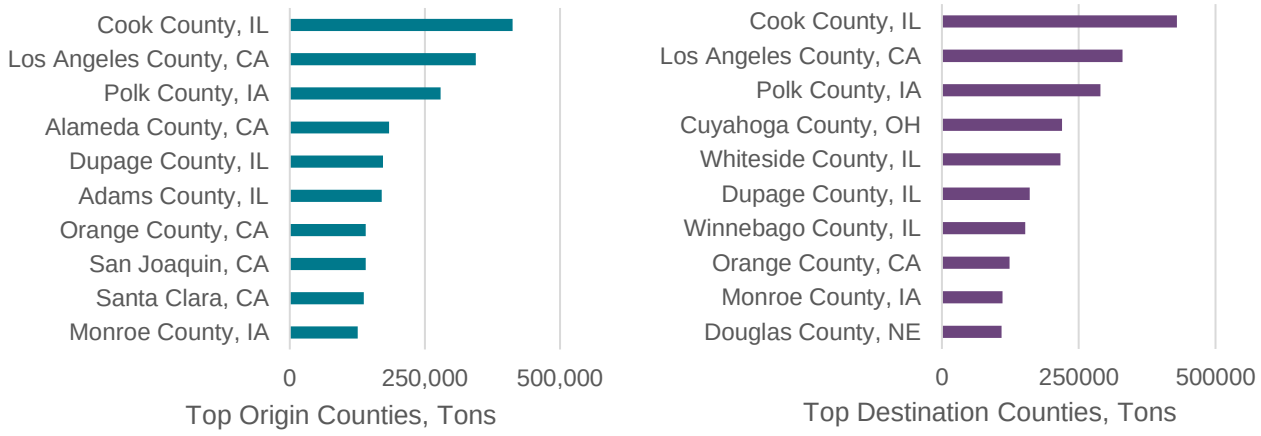


Figure 177: Incremental Region-Based Truck Commodity Flows, between 2022 and 2055

Pass-Through Truck Traffic Growth

The share of pass-through commodity flows over the total commodity flows that touch the Bi-State Region in 2055 is projected to remain largely similar to its 2022 level at 77%. Though the top origins and destination of these pass-through traffic (Figure 178) are also projected to trend with the 2022 pattern, the volume of pass-through truck traffic is projected to increase by over 60% by 2055, similar to the rate of growth projected for the region-based truck commodity flows at 65%.

Figure 178: Top Origins and Destinations of Commodity Flows that Pass Through the Region, 2055



Data source: FHWA FAF5 estimates. Analysis by WSP.

Figure 179: Pass-Through Truck Commodity Flows, 2055

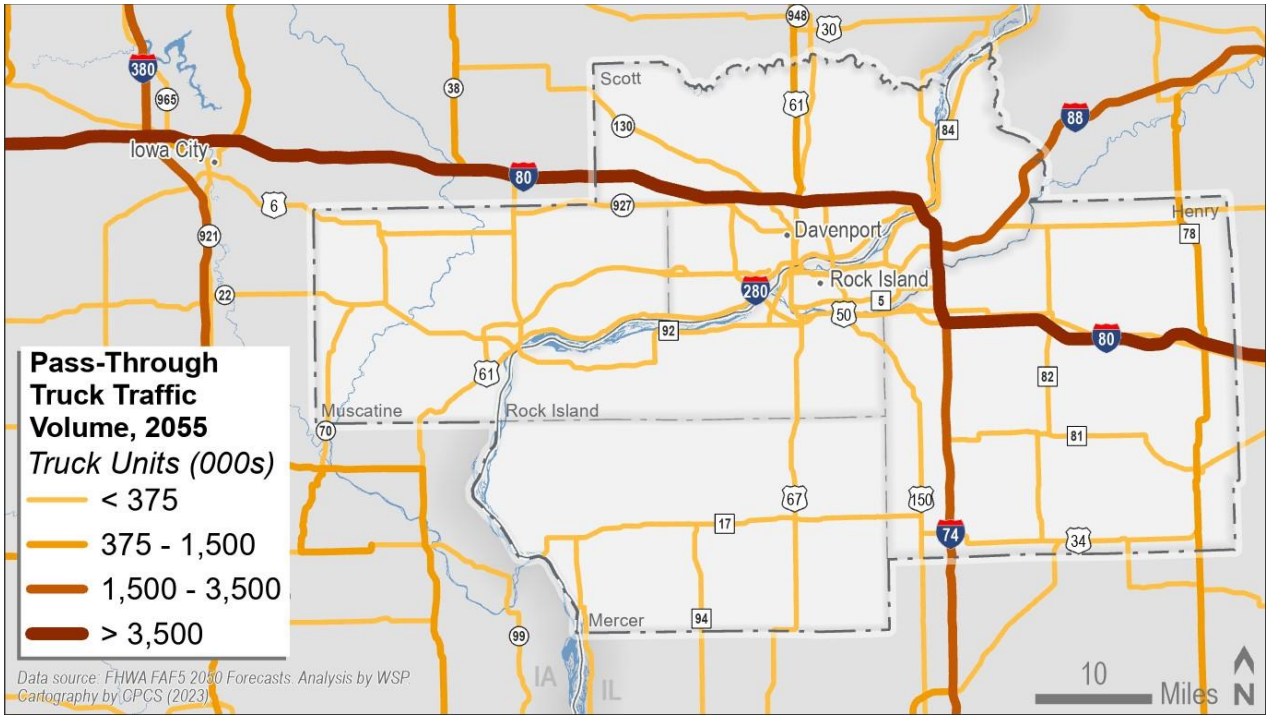
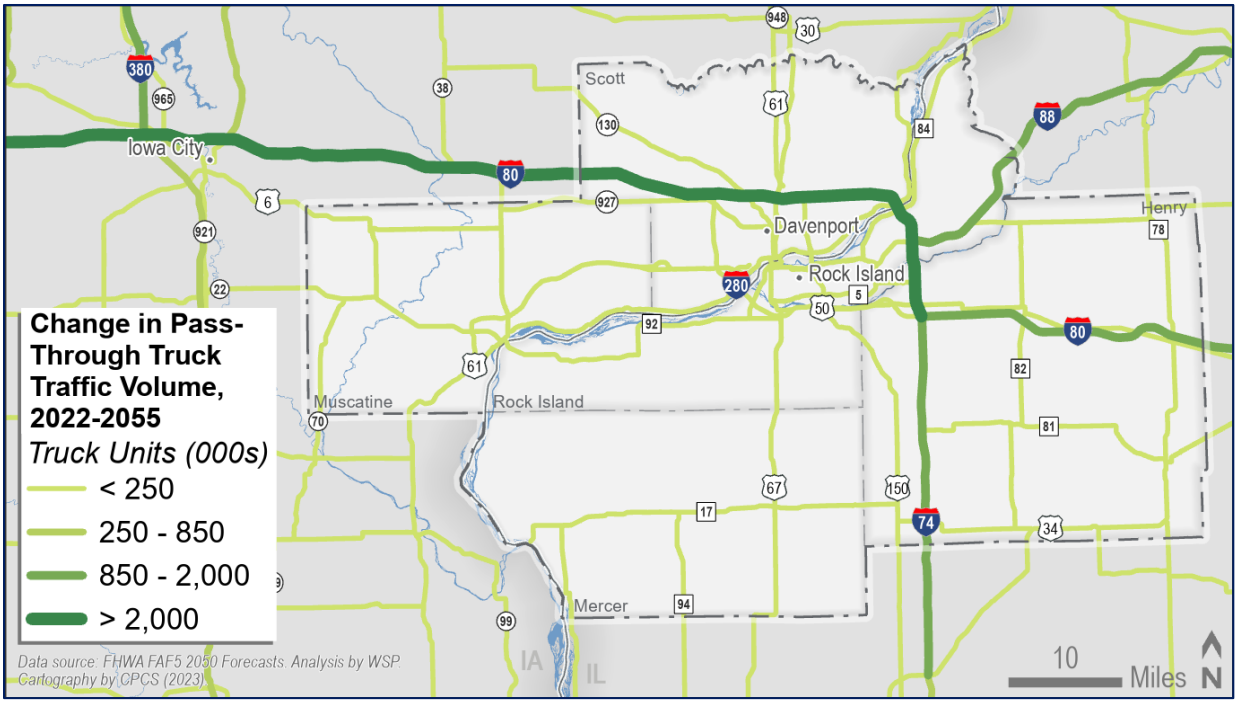


Figure 179 shows the projected truck commodity flows that pass through the region in 2055. Figure 180 presents the incremental changes in the pass-through truck commodity flows on the regional roadway network. I-80, I-88, and I-74 continue to facilitate the vast majority of pass-through traffic, indicating the Bi-State Region's sustained role as a nexus for commodity flows serving California and Des Moines, IA to the west, and the Chicago area and Cleveland area to the east.

Figure 180: Incremental Pass-Through Truck Commodity Flows, between 2022 and 2055



6 Stakeholder Outreach Findings

Key chapter takeaway

Maintenance and improvements in infrastructure are recurring themes of issues cited by stakeholders across modes of transport, underscoring the need for targeted investments in roadway, rail, and port facilities to address congestion, enhance capacity, and improve access.

Specific issues such as weight restrictions, inadequate road conditions, and the need for expanded intermodal service facilities highlight the importance of addressing both general and mode-specific challenges to optimize the freight mobility in the Bi-State Region.

Stakeholders underscore a critical need for addressing workforce challenges and improving infrastructure to support the expansion and efficiency of freight and logistics operations in the Bi-State Region. Regulatory changes, environmental concerns, and the CPKC merger are also on the radar of businesses, indicating a complex landscape of factors influencing shipping capabilities. There's a clear call for infrastructure improvements, policy support, and increased funding aimed at bolstering the region's freight and logistics industries.

6.1 Introduction

To get a more comprehensive understanding of the Bi-State Region's freight needs, issues, and opportunities, the project team underwent a phase of stakeholder engagement. This process gathered the feedback of multiple freight stakeholders including local business owners, planners, and freight-related organizations. This process used contacts from the *2015 Bi-State Region Freight Plan* in addition to other businesses previously working with the regional Chamber of Commerce to gather qualitative and quantitative data on the use of freight systems in the Region.

Between October and November 2023, stakeholders were sent a survey with 15 questions, with additional questions for respondents that identified specific modes used by their business. Survey questions were divided into three sections: respondent context, modal issues and system performance, and regional trends. The survey also included a map for respondents to mark locations where they have experienced issues with infrastructure. While no respondents partook in the additional map survey, the primary survey received 18 respondents across all counties in the Region and multiple sectors. Detailed summaries of the survey responses can be found in Appendix B.

Following the survey, respondents who volunteered contact information participated in brief 30-minute interviews with the project team. The interviews consisted of questions regarding their general impressions of freight infrastructure in the Region, issues regarding their primary and secondary modes, and questions pertaining to their descriptions of issues identified or other comments.

6.2 Survey Findings

6.2.1 Responded Context

Respondent businesses are spread across each county in the region and multiple sectors. However, respondents were predominantly manufacturers from Scott and Rock Island Counties that rely heavily on trucking and rail. Respondents also came from relatively smaller companies in terms of employees and revenue.

6.2.2 System Performance and Needs by Mode

Trucking Insights

- **Predominant Issues**: Roadway condition/maintenance (53%), congestion/reliability (41%), and size and weight limits (35%) are the top concerns for trucking in the Bi-State Region.
- **Critical Roadway Projects:** The highest priorities for improving freight mobility include roadway and bridge maintenance (60%), highway capacity improvements (53%), and dedicated truck lanes (33%).
- **Specific Concerns:** Respondents highlighted issues such as inadequate rural road conditions for grain transport, size, and weight restrictions affecting business efficiency, and the additional costs and competition challenges posed by distant rail access to ports.

Rail Insights

- **Major Challenges:** Congestion/bottlenecks (71%) and limited access to Class I services and intermodal facilities (43%) are significant rail issues.
- **Priority Rail Projects:** Enhancements in rail capacity (100%) and the establishment of new transload/intermodal facilities (63%) are viewed as crucial for improving rail freight mobility.
- **Specific Concerns:** Notable issues include weight restrictions on the CPKC's Eldridge Subdivision and anticipated service degradation with increased traffic.

Maritime Insights

- **Key Issues:** Terminal access, system condition, and congestion (each 50%) are the primary concerns when shipping by water.
- **Priority Port Projects:** Expansion or addition of port facilities (66%), improved connections to road or rail (50%), and channel maintenance (50%) are essential for enhancing maritime freight mobility.
- **Specific Concerns:** Challenges include the logistical inefficiencies and costs associated with transporting goods to ports and the impact of water levels on grain shipping.

Air Freight Insights

- **Priority Air Freight Projects:** Expanding air cargo service at Quad City International Airport is unanimously seen as vital for improving air freight mobility.

Intermodal Insights

- **Core Issue:** The sole respondent highlighted the need for better availability of transload or intermodal facilities and quality equipment.
- **Critical Intermodal Projects:** Improvements in rail/port connections, new transload/intermodal facilities, and rail capacity enhancements are key to advancing intermodal freight mobility.

6.2.3 Trends and Opportunities

Trends Affecting Shipping Capabilities

- **Workforce Availability:** The lack of an available and skilled workforce is the most cited trend impacting shipping operations, with 88% of respondents highlighting this issue.
- **Regulatory and Trade Changes:** Customs, tariffs, and changes in international trade, along with the CPKC merger, were noted by 24% of respondents as significant factors.
- **Environmental Concerns:** Climate change, extreme weather, and environmental regulations were mentioned by 12%, indicating a growing awareness of environmental impacts on shipping.

Anticipated Business Changes

- **Expansion Dominates:** A vast majority (86%) of businesses anticipate expansion within the next 10-25 years, suggesting optimism about growth prospects in the region.
- **Rail Accessibility:** One respondent specifically mentioned expansion possibilities if able to ship via rail, highlighting the importance of rail infrastructure to regional business development.

Support for Freight and Logistics Growth

- **Infrastructure and Policy Support:** Respondents suggest that public sector agencies could support growth by advocating for infrastructure improvements (e.g., three lanes on each side of I-80), increasing funding for rail capacity projects, and applying pressure on Class I railroads to improve service levels.
- **Skilled Workforce:** The need for a skilled workforce is reiterated.

6.3 Interview Findings

Once the online survey concluded, ten respondents offered to follow up in an interview to contribute more feedback and detail to their respective responses. Of those ten respondents, four were ultimately available during the process for a virtual meeting. Interviewees came from multiple counties and four different sectors, allowing insight into system performance across modes and industries. Though varying across modes and sectors, interviewees provided common feedback on matters of capacity, regional business trends, and environmental issues.

6.3.1. Davenport Industrial Rail

The interview with the General Manager of Davenport Industrial Rail (DIR), highlights several challenges and opportunities for rail freight in the region. DIR, which operates a crucial 3-mile track that serves as a connector to the Eastern Iowa Industrial Center, faces significant operational hurdles due to the weight restrictions of CPKC's Eldridge subdivision line that travels north across Davenport to the City of Eldridge.

Figure 181: CPKC's Railroad Trestle in Deavenport, 2023

Source: Google Maps, 2023

The industry standard for rail car weight, which includes the weight of commodities and the rail car combined, is 286,000 pounds. This branch line of CPKC has a 263,000 pounds weight limit, primarily due to the presence of the historic railroad trestle north of East River Dr and west of Mound St (Figure 181), originally built in 1870s. This weight limitation severely hampers DIR's ability to offer continuous service and accommodate the increasing freight volumes, leading to inefficiencies and increased costs for businesses relying on rail services. CPKC's reluctance to support regional projects or capacity increases due to perceived insufficient traffic on these sub-lines exacerbates these challenges.

Despite these obstacles, there is a clear demand for expanded rail services among businesses in the area, highlighted by DIR need for an additional day of service from CPKC, which has been declined. The potential economic impact of these restrictions is significant, as illustrated by the case of Atlas Roofing, which reconsidered its expansion plans due to the inability to meet its rail service requirements.

DIR emphasizes the strategic rail infrastructure to the economic health and development potential of the region. The lack of support for necessary upgrades and maintenance on critical infrastructure not only limits current operations but also discourages new businesses from establishing operations in the region. The final remarks underscore a broader vision for economic diversity and development beyond warehousing, stressing the urgent need for infrastructure improvements to support varied and higher-paying industries.

6.3.2. Continental Cement

Continental Cement operates primarily in the Midwest, focusing on providing cement and related materials for construction projects. The company relies on roadways for outbound truck shipments and utilizes barge and rail for both inbound and outbound logistics. During the interview, the company's Supply Chain and Logistics Manager noted the following issues:

- Safety hazards and service failures due to blocked entrances by CPKC railcars and the need for improved rail service to mitigate congestion and safety issues are highlighted.
- Flooding and climate change are impacting infrastructure resilience, with specific mention of the effects on rail bridges and maritime infrastructure.
- The aging locks on the upper Mississippi, causing delays and inefficiencies, especially during seasonal flooding and reopening periods. Coordination and scheduling of winter maintenance for locks could improve efficiency.
- There's also a concern about the aging workforce and a need for local workforce development and training programs to meet the industry's evolving needs.

Over the next decade, the priority is on increasing rail service to address blockages and safety issues and expanding operations. The CPKC merger is viewed with concern, pushing the company towards more barge use, though it's not a complete solution for reaching all markets.

6.3.3. Midland Davis

Midland Davis, a recycling business situated in Rock Island County, specializes in recycling wood, plastics, and corrugated metals, serving the Quad Cities and Central Illinois. The company, which employs about 50 people, relies heavily on truck logistics for collecting recycling materials and faces challenges related to road conditions, especially in winter, and the adequacy of roadway capacity for larger trucks or those navigating construction-heavy routes. The need for dedicated truck lanes and increased capacity is highlighted during the interview alongside concerns about the availability of a skilled workforce. The president of Midland Davis underscores the company's role in recycling various materials and its reliance on major interstate routes like I-80 for connecting with markets.

Looking forward, the company identifies the necessity of road or lane widening, particularly on I-80, to improve traffic flow. Data access and communication regarding construction activities are noted as areas for improvement. The new I-74 bridge has notably enhanced its operational efficiency by reducing backups. Midland Davis also mentions challenges in recruiting experienced truck drivers, a problem exacerbated by an aging workforce, and indicates a previous shift away from rail logistics, highlighting a focus on road transport as their primary mode of freight movement.

6.3.4. Rock Island County Farm Bureau

The Rock Island Farm Bureau, a farmer-controlled membership organization with 650 voting members in the county, engages in advocacy, legislation lobbying, and provides economic assistance to local farmers. A significant issue highlighted by the Manager of the Bureau during the interview is the impact of flooding on both truck and waterborne transportation critical to the agricultural industry. Farmers frequently transport grain directly from fields to grain elevators or barge locations, encountering difficulties due to rural road conditions and the closure of ports because of fluctuating water levels. These closures force farmers to either store grain onsite or transport it to alternate locations, complicating logistics and increasing costs.

The challenges related to grain elevator operations were also discussed, including weather-related shutdowns, the impact of drought on barge traffic, and the constraints imposed by local roads with weight restrictions. The variability in elevator operations and the need for resilience in transportation strategies were emphasized, noting that alternatives often lead to increased travel times and fuel expenses. Despite these challenges, the current season has seen smoother operations due to mild weather, though some elevators have faced early closures due to staffing limitations. There's an ongoing effort to increase storage capacities at elevators, particularly during the harvest season. While some plans incorporate rail transport, most are hindered by location constraints. Additionally, the Bureau is involved in organizing "Rule of the Road" seminars to address trucking regulations and Commercial Driver's License (CDL) requirements, including necessary drug and alcohol testing, aiming to mitigate safety issues, particularly those related to on-farm storage facilities.

Appendix A. Literature Reviewed

Figure 182 lists the documents reviewed.

Figure 182: List of Literature Reviewed

Level	Document	Agency	Year
State	Iowa State Freight Plan	IA DOT	2022
State	Iowa State Freight Plan Annual Performance Report	IA DOT	2022
State	Iowa State Rail Plan	IA DOT	2022
State	Iowa Statewide Aviation System Plan	IA DOT	2021
State	Illinois State Freight Plan	IL DOT	2023
State	Illinois Rail Needs Assessment Final Report	IL DOT	2022
State	Illinois Maritime Transportation System Plan	IL DOT	2021
Regional	Bi-State Region Freight Plan	BSRC	2015
Regional	Comprehensive Economic Development Strategy	BSRC	2021
Regional	Region 9 2045 LRTP	BSRC	2021
Regional	Quad Cities 2050 LRTP	BSRC	2022
Regional	Illinois 92 Corridor Study	BSRC	2020
Regional	Mississippi River Rail Crossing Study	BSRC	2020
Local	Rock Island County Comprehensive Plan	Rock Island County	2020
Local	Mercer County Comprehensive Plan	Mercer County	2006
Local	Henry County Comprehensive Plan	Henry County	2023
Local	Scott County Comprehensive Plan	Scott County	2008
Local	Muscatine County Comprehensive Plan	Muscatine County	2018

Appendix B. Online Survey Responses

The online survey was divided into three sections of mostly multiple-choice questions to determine the respondent's type of business, operational issues related to transportation, and the effect of regional and national trends on business efforts. While all respondents had the opportunity to respond to 32 total questions in all though mode-specific questions showed based on the primary, secondary, and tertiary modes selected.

As all questions were optional and occasionally dependent on previous answers, some questions received less than the maximum possible 18 responses. Similarly, when selecting issues or potential solutions related to mode, respondents could select multiple options. As a result, the percentages displayed in the section below may not total 100% in all cases. Finally, percentages are calculated based on the number of respondents participating in each question, rather than the maximum possible 18 responses.

Respondent Context

This section of questions polled the general operations of each respondent's business, including name, location, and scale by employees and revenue. These questions allowed the project team to assess whether the survey reached a sufficiently diverse group of stakeholders and determine what means of transportation are primarily used in the region.

Respondent businesses are spread across each county in the region and multiple sectors. However, respondents were predominantly manufacturers from Scott and Rock Island Counties that rely heavily on trucking and rail. Respondents also came from relatively smaller companies in terms of employees and revenue.

Where is your company located in the Bi-State Region? (You may select multiple) – 18 respondents

County	Response Count	Percent Responded
Scott County, IA	9	50%
Rock Island County, IL	8	44%
Muscatine, IA	2	11%
Henry County, IL	1	6%
Mercer County, IL	1	6%
Outside the Bi-State Region	1	6%

What category does your company fit into? (You may select multiple) – 18 respondents

Category	Response Count	Percent Responded
Manufacturer	11	61%
Shipper/receiver	8	44%
Carrier	3	17%
3PL provider	2	11%
Other (Short line Railroad)	1	6%
Other (Agriculture)	1	6%

Which industry classification most accurately describes your company? – 18 respondents

Classification	Response Count	Percent Responded
Manufacturing	10	56%
Transportation and warehousing	4	22%

Agriculture	2	11%
Wholesale trade	1	6%
Waste management	1	6%

Approximately how many employees does your company employ in the Bi-State Region? – 17 respondents

Employee Count Range	Response Count	Percent Responded
1 – 121	12	71%
121 – 241	3	18%
481 - 601	2	11%

What is the annual revenue of your company in the Bi-State Region? (Million USD) – 17 respondents

Revenue Range	Response Count	Percent Responded
0 - 40	5	29%
40 - 80	10	59%
80 - 120	1	6%
160 - 200	1	6%

What mode is primarily used by your company to send and receive goods? – 18 respondents

Mode	Response Count	Percent Responded
Truck	11	61%
Rail	3	17%
Waterborne	3	17%
Intermodal	1	6%

What secondary mode does your company use to typically send and receive goods? – 16 respondents

Mode	Response Count	Percent Responded
Rail	7	44%
Truck	5	31%
Air	3	19%
Waterborne	1	6%

By what other mode does your company typically send and receive goods? – 12 respondents

Mode	Response Count	Percent Responded
Truck	8	66%
Waterborne	2	18%
Rail	1	8%
Air	1	8%

System Performance and Needs by Mode

This section assessed system performance by modes selected in the previous section. Trucking received the highest number of responses, most commonly identifying poor road conditions and insufficient road size/accommodations for oversized vehicles. Issues identified for waterborne commerce and rail were mainly about access to ports along the Mississippi as an obstacle to business operations and the CPKC merger as having a significant effect on efficiency. Cited across trucking, rail, and maritime issues are concerns regarding the frequency of flooding and resulting closure of freight facilities.

Reports of issues or opportunities relating to air freight or intermodal operations were minimal. Improved proximity of intermodal and transload facilities to airports and regional businesses is a recurring suggestion, in addition to improvements to intermodal facility capacity and storage.

Trucking

When shipping by trucking in the Bi-State Region, which of these are issues for your business? (You may select multiple) – 17 respondents

Issue	Response Count	Percent Responded
Roadway condition/maintenance	9	53%
Congestion/reliability	7	41%
Size and weight limits	6	35%
Access to ports, rail, or intermodal connectors	5	29%
Safety	2	12%
Vertical clearance	1	6%
Other (driver availability)	1	6%

Describe the issues you identified.

Response
Many of our farmers are hauling grain right from the field to the grain elevator or barge location. Our rural roads aren't always the best and they deal with ports being closed due to high or low water.
Loaded Railcar weight on CPKC's Eldridge Subdivision which services Davenport Industrial Railroad. The weight Limit is 263k lbs per car when industry standard is 286k lbs This results in a restriction in business DIR can pursue due to inefficient restrictions
Heavy products – can fill a weight limit quickly
During winter picking up residential toters are difficult in alleys. Any congestion due to construction adds time. I will say the new I 74 bridge is great! There's never backup on the bridge
Directly at our facility, we are on a frontage road. The frontage road is not wide enough for multiple trucks nor is it well cared for with multiple holes.
Closest access to rail to get to a port of export is Chicago adding to costs and making it difficult to compete with our competitors in larger areas.

In the Bi-State Region, which of the types of roadway projects below are most critical to improving freight mobility? Please select the top three that you think are most critical– 15 respondents

Project	Response Count	Percent Responded
Roadway and bridge maintenance	9	60%
Highway capacity improvements	8	53%
Dedicated truck lanes	5	33%
Improving load/unload times	4	27%
System management/operational strategies	3	20%
Truck parking	3	20%
EV fleet and charging infrastructure adoption	1	7%
Other (Traffic lights timed to the posted speed limit)	1	7%

Rail

When shipping by rail in the Bi-State Region, which of these are issues for your business? (You may select multiple) – 7 respondents

Issue	Response Count	Percent Responded
Congestion/bottlenecks	5	71%
Access to Class I services, short lines, and intermodal services	3	43%
System condition/maintenance	2	29%
Rail bridges	2	29%
Safety	1	14%
Flooding	1	14%
At-grade rail crossings	1	14%
Other	1	14%

Describe the issues you identified.

Response
CPKC's Eldridge Subdivision is restricted at the East Davenport Trestle. CPKC has been unwilling to invest in raising the weight limit due to what they see is limited traffic on the Eldridge Sub
CPKC service failures will probably get worse as they increase traffic through the area

In the Bi-State Region, which of the types of rail projects below are most critical to improving freight mobility? Please select the top three that you think are most critical– 8 respondents

Project	Response Count	Percent Responded
Rail capacity enhancements	8	100%
New transload/intermodal facility	5	63%
Bridge maintenance	3	38%
Improve transload times	2	25%
Availability of equipment	2	25%
Eliminate at-grade crossings	2	25%
Improve road/rail connections at existing transload facilities	1	13%

Maritime

When shipping by water in the Bi-State Region, which of these are issues for your business? – 6 respondents

Issue	Response Count	Percent Responded
Terminal access to ports, road/rail connectors	3	50%
System condition/maintenance	3	50%
Congestion/bottlenecks	3	50%
Safety	1	17%

Describe the issues you identified.

Response
Must truck to rail, then rail to port causing more time and costs
Our farmers depend on barges to ship a lot of our local grain. When the water is too high or too low, those ports close, leaving farmers to have to store grain onsite or haul it to a different location. Grain facilities get overloaded when barges are closed.
Low water/flooding

In the Bi-State Region, which of the types of port and waterway projects below are most critical to improving freight mobility? Please select the top three that you think are most critical – 6 respondents

Project	Response Count	Percent Responded
Expand or add port facilities	4	66%

Improve connections to road or rail	3	50%
Improved channel maintenance	3	50%
Lock improvements along the Mississippi River	2	33%
Other (Manpower)	1	17%

Air

When shipping by air in the Bi-State Region, which of these are issues for your business? – 2 respondents

Issue	Response Count	Percent Responded
Airport landside access	2	100%

Describe the issues you identified (no responses)

In the Bi-State Region, which of the types of air freight projects below are most critical to improving freight mobility? Please select the top three that you think are most critical – 2 respondents

Project	Response Count	Percent Responded
Expand air cargo service at Quad City International	2	100%
Attract air cargo service to other regional airports	1	50%
Expand Quad City International	1	50%

Intermodal

When shipping with intermodal facilities in the Bi-State Region, which of these are issues for your business? – 1 respondent

Issue	Response Count	Percent Responded
Availability of transload or intermodal facilities	1	100%
Availability/quality/capacity of equipment	1	100%

Describe the issues you identified (No responses)

In the Bi-State Region, which of the types of intermodal projects below are most critical to improving freight mobility? Please select the top three that you think are most critical – 1 respondent

Project	Response Count	Percent Responded
Improve rail/port connections	1	100%
New transload/intermodal facility	1	100%
Rail capacity enhancements	1	100%

How long on average (hours) does it take for your primary mode of transportation not load/unload at intermodal facilities? – 6 respondents

Time Range (Hours)	Response Count	Percent Responded
3 to 7.2	4	66%
19.8 to 24	2	33%

How satisfied are you with the amount of time it takes for loading/unloading at intermodal or transload facilities in the region? – 6 respondents

Satisfaction	Response Count	Percent Responded
Satisfied	4	66%

Unsatisfied	1	16%
Indifferent	1	16%

Trends and Opportunities

The final section asked respondents about potential regional and national trends affecting their business and expectations for the next few years. Lack of an available and skilled workforce was overwhelmingly the top concern of responding businesses followed by shifts in tariffs, trade, and the CPKC merger. Still, the majority of businesses in the region expect to expand in the coming years. Increased cooperation with local agencies could implement the suggestions made and improve collaboration across the region as it currently stands.

What policy/regulatory/logistics trends are affecting your ability to ship goods to/from/within the Bi-State Region? – 17 respondents

Trend	Response Count	Percent Responded
Available/skilled workforce	15	88%
Customs, tariffs, international trade changes	4	24%
CPKC merger	4	24%
Climate change, extreme weather, and environmental regulations	2	12%
State/local business incentives	2	12%
Freight-related land use zoning/regulations	1	6%
Truck parking availability/information dissemination	1	6%
Potential Chicago to Moline passenger rail project	1	6%

How do you anticipate your business in the region will change in the next 10-25 years? – 14 respondents

Change	Response Count	Percent Responded
Expansion	12	86%
Relocation within region	1	7%
Other (Expansion if able to ship via rail)	1	7%

What state/regional agencies do you coordinate with regarding freight transportation on a regular basis? – 17 respondents

Agency	Response Count	Percent Responded
None	12	71%
Illinois DOT	2	12%
Iowa DOT	2	12%
BSRC	1	6%

What can Bi-State Region public sector agencies do to support growth in freight and logistics industries (e.g. Data availability, non-transportation or economic policy, increased funding, etc.)?

Response
Work with ILDOT and USDA on agriculture transportation
Support three lanes on each side of I-80
Increased funding to rail capacity projects and applying pressure to area Class I railroads, including CPKC to improve their levels of service
Data availability and economic policy

Are there any other thoughts/comments that you would like to share?

Response
We are a transportation company in Davenport. Skilled workforce is a big challenge for us.
I really appreciate the level of engagement from The Bi-State Regional Commission. Transparency through communication is very vital to driving growth.

Appendix C. Performance Measures Selection

This appendix documents the performance measures selected under each goal area, detailing the level of data accessibility to perform the assessment at a regular interval and the level of analysis required to process the data and interpret the results.

Economy Goal

Two performance measures are selected under this goal area:

1) Total freight-dependent industry employment

Freight-dependent industries include farm employment, forestry, fishing, and related activities (NAICS code 11); mining, quarrying, oil and gas extraction (NAICS code 21); utilities (NAICS code 23); construction (NAICS code 23); manufacturing (NAICS code 31-33); wholesale trade (NAICS code 42); retail trade (NAICS code 44-45); and transportation and warehousing (NAICS code 48-49). Measuring the total employment of freight-dependent industries in the region helps to assess the size and condition of the freight workforce.

- **Data accessibility: High.** Total full-time and part-time employment by County by NAICS Industry code from the US Bureau of Economic Analysis, updated yearly.[87]
- **Level of analysis required: Low.** Freight-dependent industry employment size can be compared with the 2021 baseline to assess the overall trend in moving toward the Economy goal.

2) Total freight-dependent industry Gross Domestic Product (GDP)

Measuring the total GDP of freight-dependent industries in the region helps to gauge the productivity of the freight-dependent industries.

- **Data accessibility: High.** Total GDP by County by NAICS Industry code, US Bureau of Economic Analysis, updated yearly.[88]
- **Level of analysis required: Low.** Freight-dependent industry GDP size can be compared with the 2021 baseline to assess the overall trend in moving towards the Economy goal. Real GDP in chained dollars should be used.

Safety Goal

Performance measures selected under this goal area focus on highway and railway freight system safety indicators.

1) Truck-involved crashes

The number of truck-involved crashes in the region is an important indicator of highway freight safety.

- **Data accessibility: Moderate.** Crash, vehicle, and person level crash data can be requested and obtained from Iowa and Illinois DOTs, updated yearly.

[87] US Bureau of Economic Analysis. Employment by County, Metro, and Other Areas, https://www.bea.gov/data/employment/employment-county-metro-and-other-areas, accessed on September 22, 2023.
[88] US Bureau of Economic Analysis. GDP by County, Metro, and Other Areas, https://www.bea.gov/data/gdp/gdp-county-metro-and-other-areas, accessed on September 22, 2023.

- **Level of analysis required: Moderate.** Crash data should be linked with vehicle details data to extract truck-involved crashes only. Fatal or serious injury crashes and truck-involved crashes with pedestrians and cyclists can be separated/highlighted. The five-year rolling average of a total number of truck-involved crashes can be compared with the 2018-2022 five-year rolling average baseline to assess the overall trend in moving toward the Safety goal.

2) Rail crossing incidents

The number of rail crossing incidents, including highway-rail crossing incidents, trespassing accidents, and other/equipment incidents, on the region's rail network is an important indicator of rail system safety performance.

- **Data accessibility: High.** Data can be obtained from the FRA free of charge.[89] FRA's rail crossing incident reports are available at the crossing level.
- **Level of analysis required: Moderate.** Data can be filtered by county and aggregated for the region. Both the number of incidents and severity level can be measured. The five-year rolling average of the total number of rail crossing incidents can be compared with the 2018-2022 five-year rolling average baseline to assess the overall trend in moving towards the Safety goal.

Mobility Goal

Performance measures selected under this goal area cover highway, railway, and maritime freight system mobility indicators.

1) Truck Travel Time Reliability (TTTR)

The TTTR is defined as the 95th percentile truck travel time divided by the 50th percentile truck travel time. The TTTR is calculated for five time periods of each interstate segment known as a Traffic Message Channel (TMC). The maximum TTTR for each TMC is multiplied by the length of the TMC. Then the sum of all length-weighted segments divided by the total length of Interstate will generate the TTTR Index.

- A TTTR Index close to 1 suggests that travel times are generally reliable and predictable, with minimal variance between typical (50th percentile) and less frequent, longer (95th percentile) travel times.
- A TTTR Index much greater than 1 suggests that travel times can be very unpredictable. Trucks are more likely to experience significant delays, and the difference between a "typical" day and a "bad" day can be substantial.

This is the only federally required freight performance measure and is a useful indicator to illustrate the level of reliability of truck travel in the most heavily traveled parts of the region.

- **Data accessibility: High.** Data can be obtained from FHWA's National Performance Management Research Data (NPMRDS) platform, made available to BSRC through the DOTs. BSRC regularly monitors the TTTR index for the interstates in the region.
- **Level of analysis required: Low.** Data can be downloaded and compared with established targets to assess the overall trend in moving toward the region's freight Mobility goal.

2) Regional top bottlenecks

Truck bottlenecks are areas or segments on the roadway network on which the trucks experience a significant breakdown in traffic flow. According to the FHWA, a bottleneck may cause congestion, but

[89] Federal Railroad Administration, Equipment Accident/Incident Source Data, https://data.transportation.gov/dataset/Railroad-Equipment-Accident-Incident-Source-Data-F/agxq-n5hy, accessed on September 22, 2023.

congestion is not always the result of a bottleneck. Identifying and measuring the severity of the bottleneck level can be an effective mobility measure.

- **Data accessibility: Moderate.** The RITIS Probe Data Analytics Suite[90], available to BSRC via the DOTs, provides a Bottleneck Ranking Tool that identifies and ranks bottlenecks in the region based on a weighted total delay matrix. By default, this tool ranks regional highway bottlenecks for all vehicular traffic, truck traffic volume, as well as time of day distribution pattern of truck traffic, which can be incorporated into the evaluation matrix to develop a more freight-centric bottleneck ranking.
- **Level of analysis required: High.** Data on region truck traffic volume needs to be incorporated into the bottleneck evaluation matrix to identify top bottlenecks for freight traffic. This also requires considering truck traffic's time-of-day travel patterns to highlight bottlenecks that will be most impactful for trucks. Detailed instructions for deriving at the bottleneck level can be provided in subsequent project deliverables, to assist BSRC staff in continuous monitoring and assessment of the bottlenecks.

3) Average monthly delay at locks (tows)

The lock delay is the waiting time between the arrival of a vessel/tow at a lock and the start of the lockage process. Lock delays not only impact the efficiency of goods movements on the region's river systems but also increase the transportation cost for shippers.

- **Data accessibility: High.** Data can be obtained from the United States Army Corps of Engineers (USACE) website[91] by lock and dam, updated yearly.
- **Level of analysis required: Low.** Average monthly delay at Lock 14-17 along the Mississippi River can be analyzed for each year and compared with the 2019 baseline to assess the overall trend in moving toward the Mobility Goal.

4) Percent of vessels delayed at locks (all)

The percentage of vessels delayed is another indicator to assess maritime freight system mobility.

- **Data accessibility: High.** Data can be obtained from the USACE website[92] by lock and dam, updated yearly.
- **Level of analysis required: Low.** The percentage of vessels delayed at Lock 14-17 along the Mississippi River can be analyzed for each year and compared with the 2019 baseline to assess the overall trend in moving toward the Mobility Goal.

System Preservation Goal

5) Federal PM2 in the Quad Cities MPA and the Bi-State Region

MAP-21 requires the establishment of measures to assess the performance of pavement conditions of the Interstate and non-Interstate National Highway System (NHS) and bridge conditions of the NHS. DOTs and MPOs with applicable roadways within their metropolitan planning areas, set targets or the following performance measures, known as "PM2."

- Percentage of pavements of the Interstate System in Good condition

[90] Probe Data Analytics Suite. https://pda.ritis.org/suite/. Accessed on September 22, 2023.

[91] USACE. Public Lock Usage Report files. https://publibrary.planusace.us/#/document/e82f2fcc-0ef1-4201-813b-28503b41da8e. Accessed on September 22, 2023.

[92] USACE. Public Lock Usage Report files https://publibrary.planusace.us/#/document/e82f2fcc-0ef1-4201-813b-28503b41da8e. Accessed on September 22, 2023.

- Percentage of pavements of the Interstate System in Poor condition
- Percentage of pavements of the non-Interstate NHS in Good condition
- Percentage of pavements of the non-Interstate NHS in Poor condition
- Percentage of NHS bridges classified as in Good condition
- Percentage of NHS bridges classified as in Poor condition

2.4.1.2 Pavement Condition

The Federal Highway Administration (FHWA) classifies pavement conditions as good, fair, or poor based on three criteria: the International Roughness Index (IRI) of the pavement section, the cracking condition of the pavement, and the rutting rating for concrete or faulting rating for asphalt. According to the FHWA's definitions[93]:

- If two out of the three ratings are "poor," the pavement section is classified as "poor."
- If all three ratings are "good," then the pavement section is classified as "good."
- Otherwise, it's classified as "fair."

To determine the "good" and "poor" measures, the total lane-miles of the respective highway segments are summed up and then divided by the total lane-miles of all segments in the relevant system.

State DOTs report data either from their biennial performance report to FHWA or from their HPMS data submission. Targets apply to all roadways in a state or MPO system, no matter the ownership. They're set based on 0.1-mile sections of the mainline highways.

2.4.1.3 Bridge Condition

Bridge condition is determined by the lowest rating of National Bridge Inventory (NBI) condition ratings, for Item 58 (Deck), Item 59 (Superstructure), Item 60 (Substructure), or Item 62 (Culvert). If the lowest rating is greater than or equal to 7, the bridge is classified as Good; if it is less than or equal to 4, the classification is Poor. Bridges rated 5 or 6 are classified as Fair.[94]

2.4.1.4 Target Setting

Target setting occurs during 4-year periods, with the first targets established in 2018 for the performance period of calendar year (CY) 2018-2021. Iowa[95] and Illinois[96] have set 2- and 4-year targets for the second reporting period of CY 2022-2025. The Bi-State MPO has supported each state's respective pavement and bridge conditions for the metropolitan planning area (MPA).

For the remaining part of the five-county region outside the MPO's MPA, evaluating the condition of the NHS system gives a broader perspective on the region's primary freight corridor conditions.

- **Data accessibility: Moderate.** Pavement condition data for the NHS provided by state DOTs to MPOs is the most up-to-date data.[97] Illinois publishes the data on the DOT's website and allows

[93] Pavement that is part of a bridge deck is excluded from metric calculations. Missing, invalid, or unresolved data is also excluded from the calculations and is not to exceed five percent of the system's mileage.

[94] Iowa makes the latest bridge condition data available but doesn't provide on the other

[95] Iowa DO. Pavement and Bridge Performance Measures. https://iowadot.gov/systems_planning/fpmam/2022-2025-Pavement-Bridge-Targets.pdf. Accessed on September 22, 2023.

[96]Illinois DOT. IDOT Measures and Targets - State of Acceptable Condition. https://idot.illinois.gov/transportation-system/transportation-management/planning/transportation-asset-management-plan/performance.html#:~:text=The%20CRS%20(Condition%20Rating%20Survey,treatments%20at%20the%20right%20time. Accessed on September 22, 2023.

[97] The HPMS database has a 1-2 year time lag.

for querying for roadways in and outside of the MPA in the region. Iowa sends the data to MPOs directly. The NBI database provides the latest and most complete bridge condition rating.

- **Level of analysis required: Moderate.** Additional querying is required if reporting for the MPA and the remainder of the five-county region.

While the core of performance measures for the System Preservation Goal focuses on the NHS system, it's essential to clarify that this doesn't mean we overlook or undervalue the importance of non-NHS roadways. The broader network's pavement condition isn't proposed as a performance measure primarily due to complexities in data gathering and the challenge of aligning the state-of-good repair priorities across various governmental levels under a unified standard. Pavement conditions for non-NHS roadway, particularly for critical last-mile connections will be thoroughly reviewed and featured within the highway system modal profile development, contingent upon available data.

6) Percent of bridges with an 80 or lower sufficiency rating

Bridge sufficiency ratings indicate the adequacy of a bridge for continued use and provide a more comprehensive view of the state of good repair of bridges than the NBI condition rating. This rating is based 55 percent on structural evaluation, 30 percent on the obsolescence of the bridge design, and 15 percent on the importance of the bridge to the public. A score of 80 or less is required for Federal repair funding, while a score of 50 or less is required to use Federal funding for replacement of the bridge. Iowa and Illinois have additional requirements for bridges to be eligible for state bridge improvement programs.

- **Data accessibility: Moderate.** Data can be obtained from the Iowa[98] and Illinois DOTs, respectively.
- **Level of analysis required: Moderate.** The percentage of bridges in the region with an 80 or lower sufficiency rating can be compared with the 2021 baseline to assess the overall trend in moving towards the System Preservation Goal.

Sustainability and Resiliency

1) Unscheduled Closures at Rock Island District locks

While scheduled maintenance along the Mississippi River is done regularly and typically not during peak navigation season, unscheduled closures can occur due to water levels, mechanical issues, or other safety hazards. With few locks located in the region and no alternative routing, unscheduled closures and unexpected unavailability for longer than the average delay time can significantly disrupt shipping schedules and freight flow in the region. Monitoring the frequency of unscheduled closures each year can give insight into lock maintenance needs and efficiency of waterborne commodity flow.

- **Data accessibility: High.** Data is available publicly through USACE's lock performance management system and public lock usage and unavailability data file[99] published each year. The most recent data with unscheduled closures published is from 2020.
- **Level of analysis required: Low.** This data can be downloaded in a single file covering unscheduled closures from 1993 onward. Can be compared with the most recent year available to determine if maintenance and unpredicted delays have improved in the last year.

[98] NBI does not report sufficiency rating results directly on the publicly available database. Iowa uses the Bridge Condition Index, which is a similar measure with the FHWA sufficiency rating created by FHWA but is more sensitive to changes in condition rating for the different bridge components. Illinois reports the bridge sufficiency rating in the bridge inventory data directly.

[99] USACE, Public Lock Unavailability Report Files, https://publibrary.planusace.us/#/document/06abcdaa-6224-4f23-a151-7be1a42106b3. Accessed on September 18, 2023.

2) Hazardous material spills incidents

The number of hazardous material spill incidents in the region that are on the region's freight infrastructure network can be an effective measure and help the region devise ways to minimize their potential impact.

- **Data accessibility: Moderate.** This data can be retrieved from Iowa's Department of Natural Resources[100] and Illinois's Emergency Management Agency.[101]

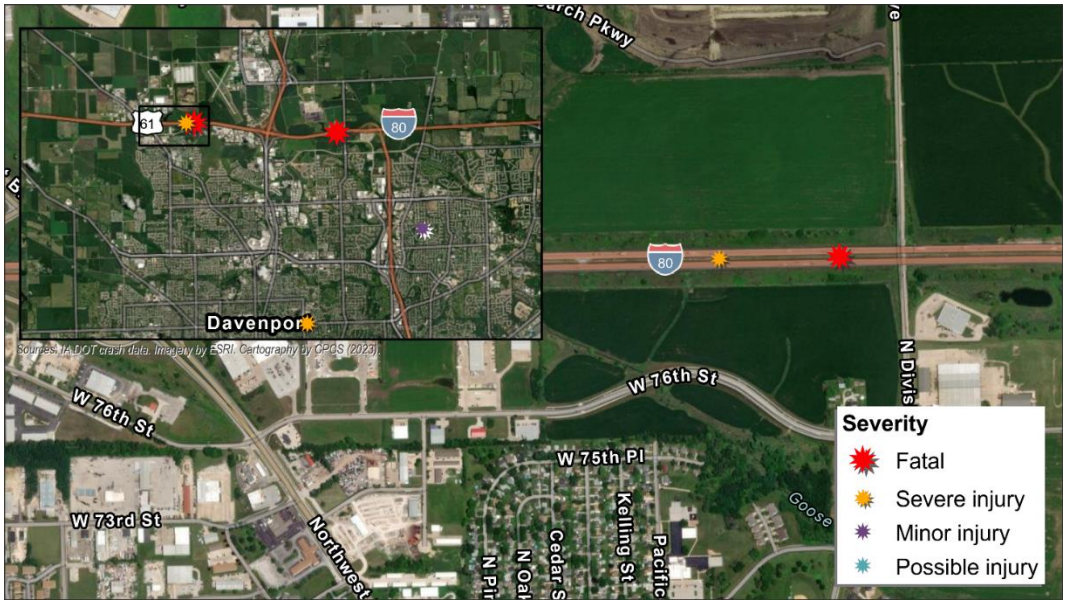
- **Level of analysis required: Low.** The number of hazardous material spills on the freight network can be queried and compared with the baseline.

[100] Iowa Department of Natural Resources Hazardous Material Release Database. https://programs.iowadnr.gov/hazardousspills/introductory.aspx. Accessed on September 18, 2023.
[102] Illinois Emergency Management Agency. Hazardous Material Incident Reports. https://public.iema.state.il.us/FOIAHazmatSearch/. Accessed on September 18, 2023.

Appendix D. Truck and Non-Motorist Fatal Crashes

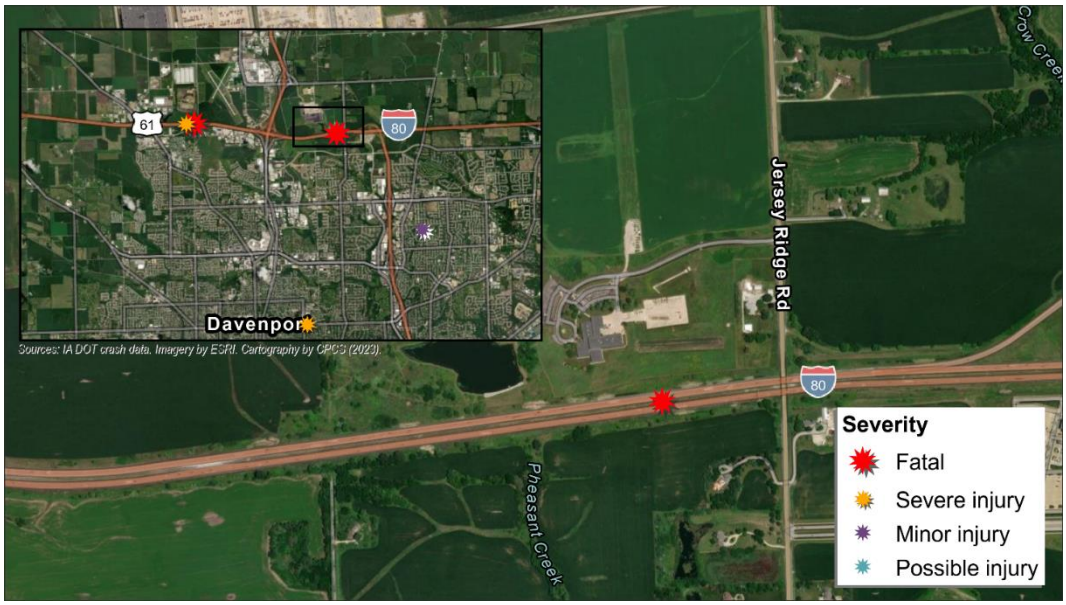
This Appendix reviews the truck and non-motorist fatal crashes on the freight network during 2018 and 2022. Figure 183 and Figure 184 show the fatal crashes between a truck and non-motorists on I-80. Figure 183 shows the fatal crash that occurred in 2019 less than 800 feet away from a severe injury crash that occurred the previous year. The fatal crash occurred at 2:58 AM on May 2, 2019, and included one motor vehicle with the cause of the crash listed as “Other: no improper action.” The severe crash that occurred in September of the prior year at the same location was due to evasive swerving action which resulted in one severe injury.

Figure 183: Fatal Truck-Involved Crash on I-80 (1)



Source: CPCS analysis of crash data from IA DOT, imagery from ESRI

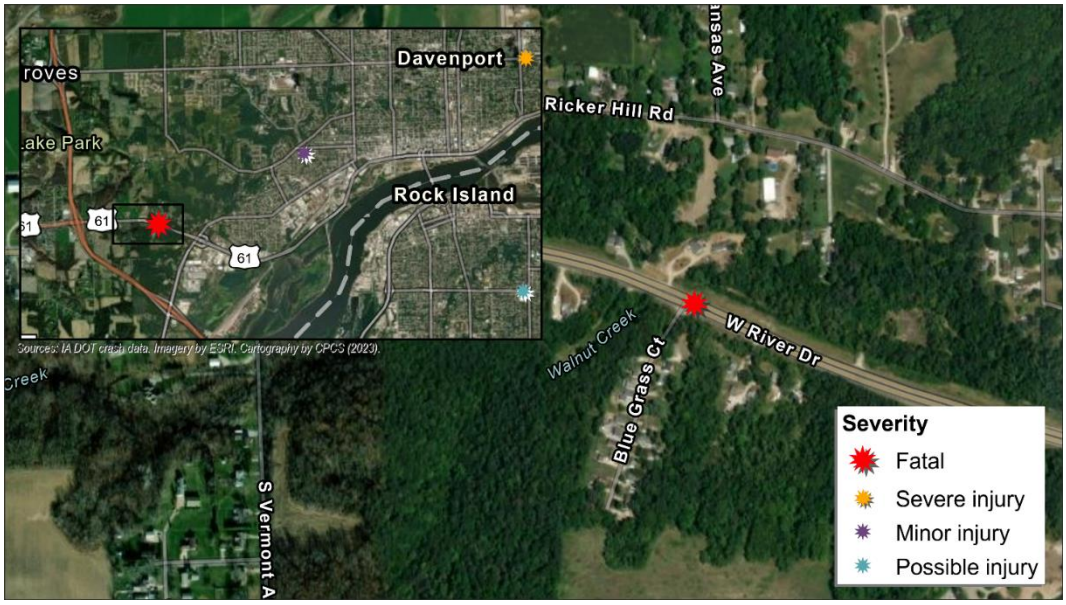
Figure 184: Fatal Truck-Involved Crash on I-80 (2)



Source: CPCS analysis of crash data from IA DOT, imagery from ESRI

A fatal truck crash occurred on Iowa 461/W River Dr as shown in Figure 185 on April 2021, at 3:34 AM involving one motor vehicle which was not a result of improper action by the driver according to the crash report (Figure 185). Non-motorist action was reported as a contributing factor to the crash.

Figure 185: Fatal Truck-Involved Crash on IA-461



Source: CPCS analysis of crash data from IA DOT, imagery from ESRI

Figure 186: Fatal Truck-Involved Crash on US-61 South of Muscatine

Source: CPCS analysis of crash data from IA DOT, imagery from ESRI

Figure 187: Fatal Truck-Involved Crash on US-61 North of Muscatine

Source: CPCS analysis of crash data from IA DOT, imagery from ESRI

Two fatal non-motorist-involved truck crashes occurred on US 61 near Muscatine, Iowa. The crash shown in Figure 186 occurred on August 12, 2019, at 4:51 AM due to following too closely, with visual obstruction cited as a contributing factor. The crash that occurred approximately 10 miles north on US-61 shown in Figure 187 took place the prior year on May 17, 2018, at 2:50 AM with the cause listed as “Other: no improper action.

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