ARDOT
ARKANSAS DEPARTMENT OF TRANSPORTATION

ARKANSAS STATE FREIGHT PLAN 2022

WE MOVE ARKANSAS FREIGHT

Arkansas Department of Transportation

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Arkansas State Freight Plan Outline and Crosswalk

The 2022 Arkansas State Freight Plan consists of 13 separate documents, including the Executive Summary, which provides a high-level overview of the key findings and recommendations of the planning process; nine chapters addressing each mode, required plan element, and other freight-related content in detail; Appendix A, which documents the financially-constrained Freight Investment Plan; Appendix B, which documents the Unconstrained List of Priority Freight Projects; and Appendix C, which includes the Freight Advisory Committee (FAC) meeting materials. The structure of the Plan is as follows:

- Executive Summary
- Chapter 1—Goals, Objectives, and Performance Measures
- Chapter 2—Highway Freight Modal Profile
- Chapter 3—Freight Rail Modal Profile
- Chapter 4—Air Cargo Modal Profile
- Chapter 5—Ports & Waterways Modal Profile
- Chapter 6—Commodity Flow Profile
- Chapter 7—Freight Economic Trends Profile
- Chapter 8—Multimodal Freight Needs Assessment
- Chapter 9—Strategies, Actions, and Freight Investment Plan
- Appendix A—Freight Investment Plan
- Appendix B—Unconstrained List of Priority Freight Projects
- Appendix C—Freight Advisory Committee Meeting Materials

These documents were developed on compliance with the State Freight Planning requirements set forth in 49 U.S.C. 70202, as amended by the Infrastructure Investment and Jobs Act (IIJA). Table 1 details the Plan’s compliance with those State Freight Planning requirements, providing a crosswalk between each requirement and where it is addressed in the Plan.

Table 1 Arkansas State Freight Plan Crosswalk with Required State Freight Plan Elements (49 U.S.C. 70202)

Requirement	State Freight Plan Reference(s)
Plan Contents—A State Freight Plan shall include, at a minimum:	
(1) An identification of significant freight system trends, needs, and issues with respect to the State	*Executive Summary* *Chapters 2, 3, 4, 5, 8*
(2) A description of the freight policies, strategies, and performance measures that will guide the freight-related transportation investment decisions of the State	*Executive Summary* *Chapters 1, 9*
(3) A listing of multimodal critical rural freight facilities and corridors designated within the State, and critical rural and urban freight corridors designated within the State	*N/A* *Chapter 2*
(4) A description of how the plan will improve the ability of the State to meet the national multimodal freight policy goals described in section 70101(b) of §70202 and the national highway freight program goals described in section 167 of title 23;	*Chapter 2*
(5) A description of how innovative technologies and operational strategies, including freight intelligent transportation systems, that improve the safety and efficiency of freight movement, were considered	*Executive Summary* *Chapter 2*
(6) In the case of roadways on which travel by heavy vehicles (including mining, agricultural, energy cargo or equipment, and timber vehicles) is projected to substantially deteriorate the condition of the roadways, a description of improvements that may be required to reduce or impede the deterioration	*Executive Summary* *Chapters 2, 8, 9*
(7) An inventory of facilities with freight mobility issues, such as bottlenecks, within the State, and for those facilities that are State owned or operated, a description of the strategies the State is employing to address the freight mobility issues	*Executive Summary* *Chapters 2, 3, 4, 5, 8, 9*
(8) Consideration of any significant congestion or delay caused by freight movements and any strategies to mitigate that congestion or delay	*Executive Summary* *Chapters 2, 3, 4, 5, 8, 9*
(9) A freight investment plan that includes a list of priority projects and describes how funds made available to carry out section 167 of title 23 would be invested and matched	*Chapter 9* *Appendix A*
(10) The most recent commercial motor vehicle parking facilities assessment conducted by the State	*Executive Summary* *Chapters 2, 8*
(11) The most recent supply chain cargo flows in the State, expressed by mode of transportation	*Executive Summary* *Chapter 7*
(12) An inventory of commercial ports in the State	*Executive Summary* *Chapters 3, 4, 5*
(13) If applicable, consideration of the findings or recommendations made by any multi-State freight compact to which the State is a party under Section 70204	*N/A*
(14) The impacts of e-commerce on freight infrastructure in the State	*Executive Summary* *Chapters 4, 7*

Requirement	State Freight Plan Reference(s)
Plan Contents—A State Freight Plan shall include, at a minimum:	
(15) Considerations of military freight	*Executive Summary* *Chapters 2, 3, 5*
(16) Strategies and goals to decrease a) the severity of impacts of extreme weather and natural disasters on freight mobility, b) the impacts of freight movement on local air pollution, c) the impacts of freight movement on flooding and stormwater runoff, and d) the impacts of freight movement on wildlife habitat loss	*Executive Summary* *Chapters 1, 9*
(17) Consultation with the State freight advisory committee	*Executive Summary* *Appendix C*

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ARKANSAS STATE FREIGHT PLAN

EXECUTIVE SUMMARY

2022

WE MOVE ARKANSAS FREIGHT

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Arkansas River facing Downtown Little Rock

Introduction

The movement of freight is critical to economic vitality and quality of life in Arkansas. The state's multimodal freight transportation network, comprised of highways, railroads, airports, ports and waterways, and pipelines provides Arkansans with access to essential goods and services, as well as job opportunities.

The Arkansas Department of Transportation (ARDOT) is updating its statewide freight plan at an unprecedented time. As the global, national, and state economies continue to recover from the COVID-19 pandemic, supply chain disruptions across the country and world have driven up prices and led to shortages of goods. These bottlenecks have caused shortages of products that Arkansas' residents and industries are accustomed to having readily available, from raw materials to household goods to automobiles.

This State Freight Plan is intended to guide multimodal freight transportation investments and promote strategies to help the state best position itself for the future. Across all modes, freight volumes in Arkansas are projected to grow by more than 50% by 2050, with the value of that freight expected to grow by 88%. The movement of those goods will be impacted by many emerging and unforeseen trends, including evolving technologies, changing population demographics, national and global politics, and international trade. Planning for those opportunities and challenges is an essential step toward delivering a safe, reliable, and competitive freight system for the future.

Goals and Objectives

The goals and objectives highlighted below provide a framework to improve the multimodal freight system, to compete for quality jobs, and to provide for the safe and efficient movement of goods in Arkansas. These goals and objectives were informed by stakeholder outreach and national best practices, and aligned with strategic aspects of other ArDOT plans, including the Long-Range Intermodal Transportation Plan (LRITP) and the Statewide Transportation Improvement Program (STIP). Together, they provide a strategic vision for the future of Arkansas' freight transportation system.

Safety and Resiliency

Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system.

» Improve the safety of highway freight.

» Reduce the risk of railroad grade crossing crashes/incidents.

» Support the development of safe and secure truck parking facilities.

» Reduce the vulnerability of the freight transportation system with an emphasis on critical infrastructure with an elevated risk of failure.

» Improve the resiliency of the freight transportation system to extreme weather events and natural disasters.

Economic Competitiveness

Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.

» Continue development of the four-lane grid system to connect communities and promote economic growth.

» Promote freight system performance – safety, condition, and efficiency – as essential for economic development, business expansion and attraction, job growth, and access to critical goods.

» Support the development of intermodal and multimodal facilities to increase connectivity between highway, railway, air, and waterway modes.

» Foster and strengthen partnerships with and between freight stakeholders.

» Promote adequate funding for operations, maintenance, safety, capital and capacity improvements, and other needs of all freight modes.

Infrastructure Condition

Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system.

- Rehabilitate or replace highway infrastructure that impedes freight movement, such as load-posted bridges and highways.
- Follow asset management principles to optimize return on freight infrastructure investments.
- Support and encourage the preservation and maintenance of roadways, railways, waterways, airports, and multimodal connections.

Congestion Reduction, Mobility, and System Reliability

Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.

- Reduce congestion with an emphasis on freight bottlenecks and first- and last- mile connectors.
- Support freight transportation alternatives (including multimodal or intermodal alternatives) that best match origin-destination patterns.
- Provide predictable, reliable travel times on key freight corridors.
- Optimize the performance of existing multimodal freight assets with an emphasis on technological solutions and operations management.

Environmental Sustainability

Enhance the performance of the transportation system while avoiding, minimizing, and/or mitigating impacts to natural and cultural resources.

- Identify and reduce barriers to minimize delay and improve the project delivery process.
- Minimize impacts to natural, historic, and cultural resources.
- Support initiatives and investments that reduce the impacts of freight movement on local air quality (including greenhouse gas emissions), flooding, stormwater runoff, and wildlife habitat loss.
- Utilize context-sensitive solutions in transportation system design, as appropriate.
- Improve equity across the multimodal freight system.

Stakeholder Outreach

This State Freight Plan Update was developed under the guidance of a diverse group of freight stakeholders known as the Freight Advisory Committee (FAC). The FAC advised ArDOT on freight-related priorities and funding needs, served as a forum for discussing issues affecting freight mobility, and provided a conduit for public participation in transportation planning.

The FAC was comprised of members from the public sector and private sector, including modal authorities, economic development agencies, representatives of major industries, freight carriers, planning organizations, advocacy groups, safety partners, and other freight stakeholders.

The FAC met virtually on three occasions to discuss progress on the freight plan, goals and objectives, critical freight needs and issues, and strategies for addressing current and future system needs. Future FAC activities are anticipated as the State Freight Plan is implemented.

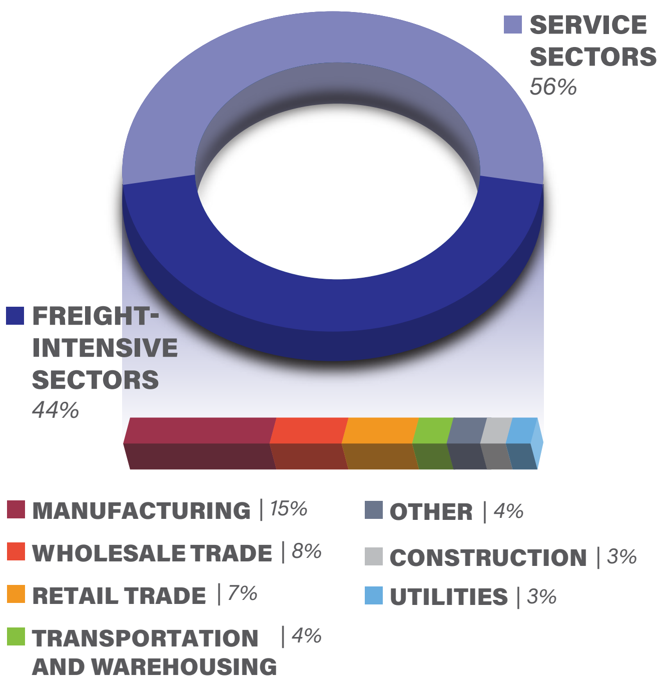
In addition to engagement with the FAC, other select critical freight stakeholders were interviewed both one-on-one and in group settings, including industry roundtables, to discuss recent changes and developments, key issues, and potential freight improvement projects and policy considerations.

Freight and the Economy

Demand for freight transportation is directly correlated to economic activity in both freight-intensive industries and the service sectors they support. In 2019, statewide economic output generated from freight-intensive activities was valued at $51 billion or 44% of total economic output. Manufacturing accounts for the largest share of freight-generating activity, followed by retail and wholesale trade. Arkansas' manufacturing sector grew more than any other freight-intensive industry over the last 5 years, largely driven by primary metals, petroleum and coal products, and the food and beverage sector. Employment in freight-intensive sectors accounts for approximately one-third of all jobs in Arkansas.

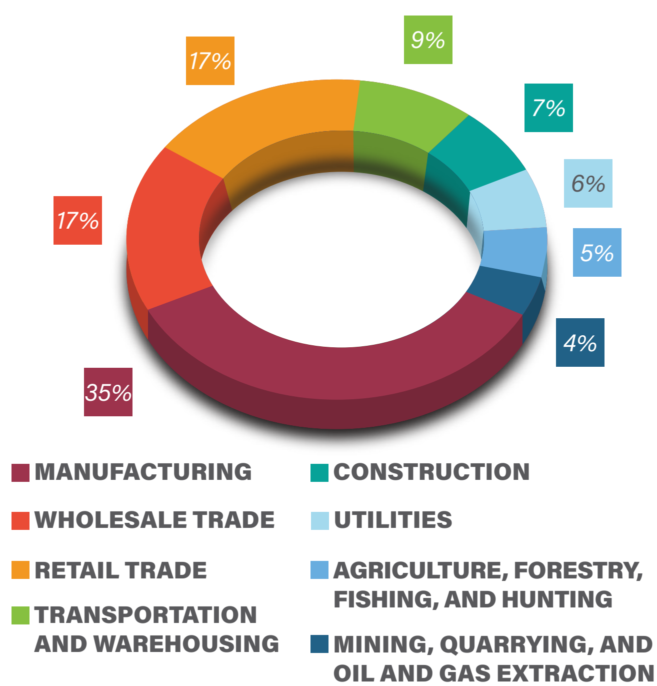
The Arkansas Economic Development Commission (AEDC) reports that between January 2015 and April 2020, there were 94 economic development projects proposed in the food and agribusiness manufacturing industry, totaling $2.3 billion and resulting in more than 5,000 new jobs. Relative to the nation, Arkansas continues to have a strong competitive advantage in multiple manufacturing sectors, including food and beverage, fabricated metal products, paper, and machinery.

Share of Economic Output for Freight-Intensive vs. Service Sectors in Arkansas, 2019



Source: Bureau of Economic Analysis.

Distribution of Economic Output for Freight-Intensive Industries, by Sector, 2019



Source: Bureau of Economic Analysis.

Arkansas' Freight Network Supports Key Industries

The multimodal freight transportation network supports key industries in Arkansas, including metals, agriculture, timber and forest, and retail/e-commerce, as well as the freight needs of military and defense industries. The multimodal network provides businesses with access to domestic and international supplies, facilities, and markets. Highlighted below are key facts about Arkansas' most critical freight-intensive industries (2019 reference year unless otherwise indicated).

Metals

» 22,300+ employed in the metals industry in Arkansas.

» Accounts for 13.6% of total manufacturing in the state.

» $683+ million worth of fabricated metal goods exported.

» Mississippi County in Northeast Arkansas has the second-largest capacity for steel production in the nation, and is expected to become the nation's top steel producer as new production capacity becomes operational through 2024.

Source: AEDC.

Agriculture

» #1 in the nation for rice production.

» #2 in the nation for broilers, processing more than 1 billion broilers in 2021.

» 21 million chickens processed per week.

» 3 million table eggs produced per day.

» #5 in the nation for turkey production, producing 27 million annually.

Source: AEDC, stakeholder interviews.

Timber and Forest

» 19 million total acres of forestland covering 56% of the state.

» Forestry contributes 5.1% of the state's economy.

» Arkansas is the 9th leading producer of timber in the U.S. (2018).

» 12.7% of the state's workforce is employed in timber and forest-related manufacturing, with 27,700+ skilled workers employed in timber and related industries.

Source: AEDC.

Retail/E-commerce

- 26% of jobs in Arkansas supported by the retail industry, with nearly 275,000 directly employed in the state (2018).
- U.S. e-commerce sales grew by 50% to $870 billion during the pandemic, leading to more warehouses and fulfillment centers, including multiple e-commerce fulfillment centers in Arkansas in the last five years.
- Walmart, one of the largest retailers in the world, is headquartered in Arkansas.

Source: National Retail Federation, Forbes.

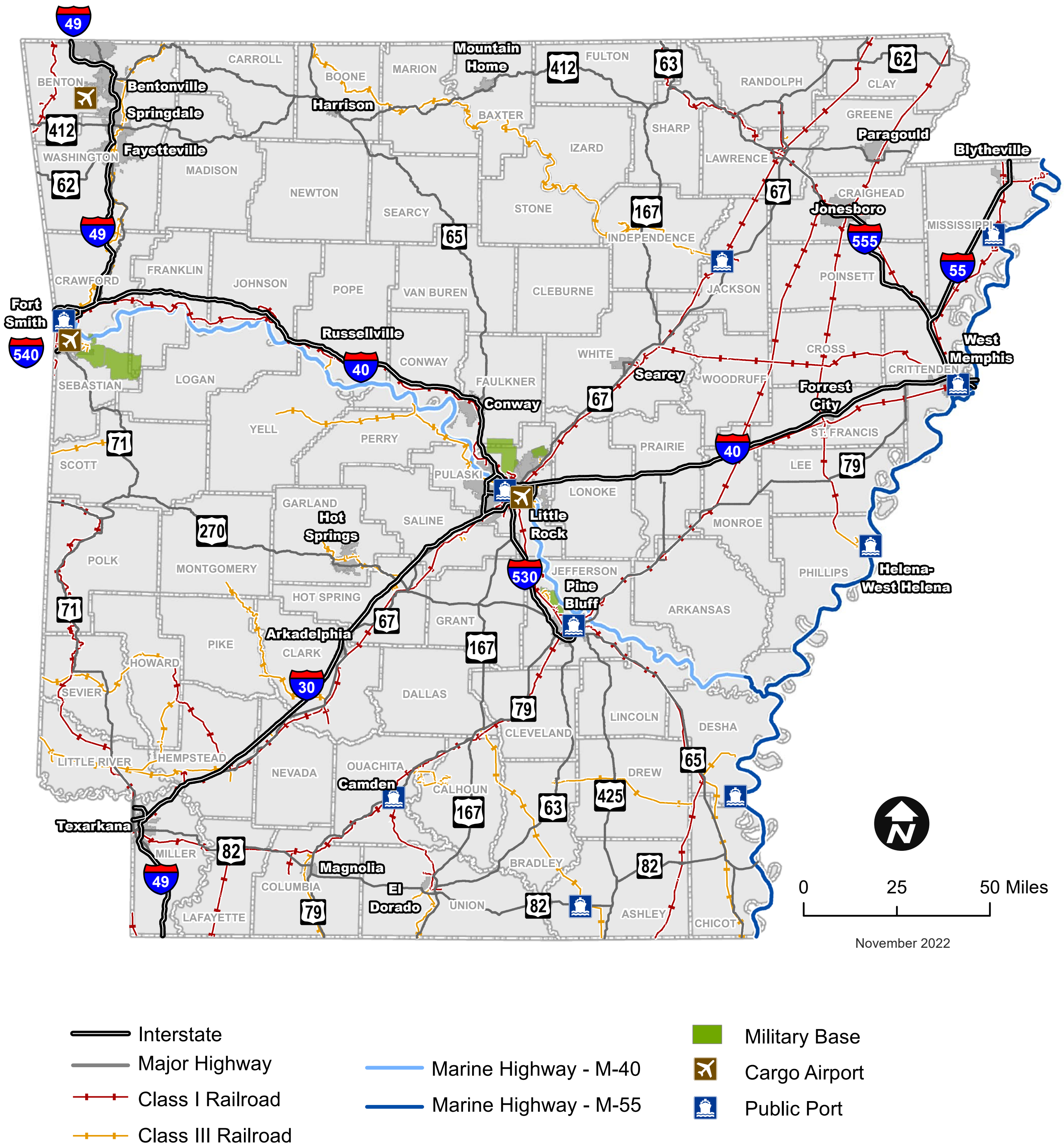
Military and Defense

- 62,400+ employed, generating $3 billion in labor income, $4.5 billion in Gross State Product, and nearly $330 million in state and local tax revenue (2015).
- Major facilities include Little Rock Air Force Base, Pine Bluff Arsenal, Camp Robinson in North Little Rock, and Ebbing Air National Guard Base and the Fort Chaffee Joint Maneuver Training Center, both in Fort Smith.

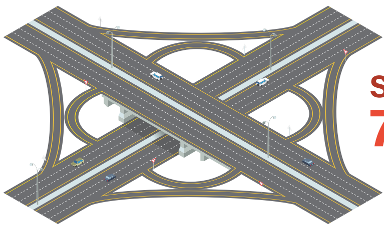
Source: AEDC.

Union Pacific Rail Yard (Newport)

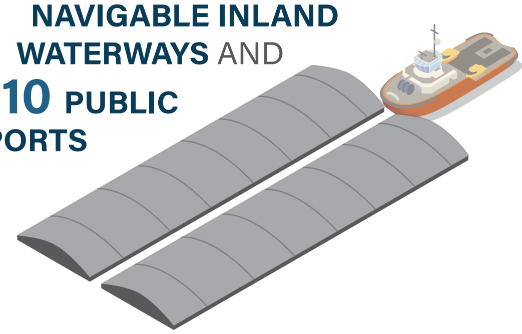
Arkansas' Multimodal Freight Network



OUT OF ROUGHLY
102,600 MILES
OF **PUBLIC ROADS**,
16,451 MILES ARE
ON THE **STATE HIGHWAY SYSTEM**, OF WHICH
768 MILES ARE
INTERSTATE HIGHWAYS

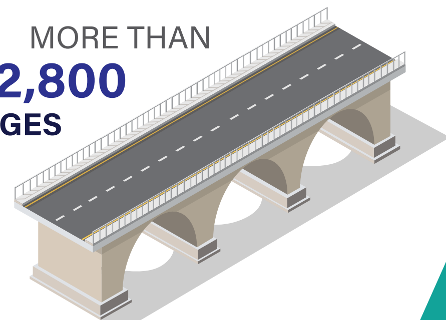


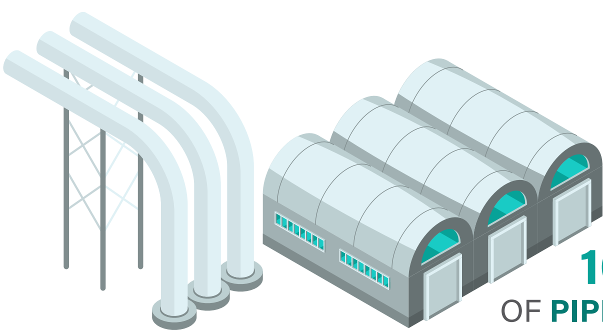
MORE THAN
600 MILES OF
NAVIGABLE INLAND WATERWAYS AND
10 PUBLIC PORTS



2,700+ MILES
OF **RAIL** OPERATED BY
3 CLASS I RAILROADS AND
23 CLASS III RAILROADS

MORE THAN
12,800
BRIDGES





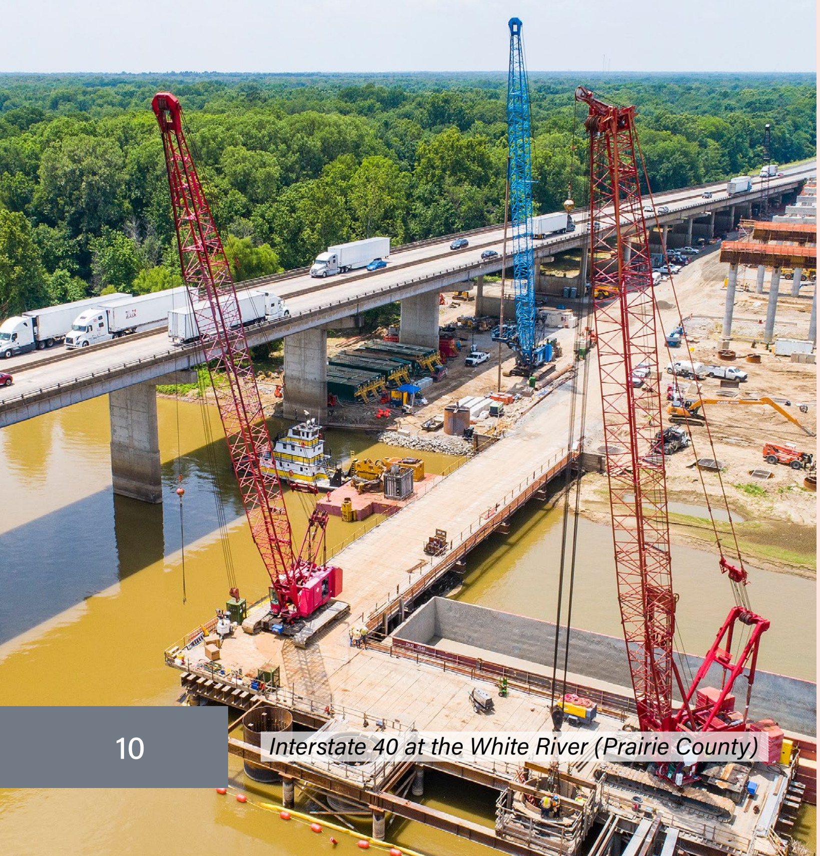
OVER
10,000 MILES
OF **PIPELINES**

LITTLE ROCK AIRPORT IS THE
PRIMARY AIR-CARGO HANDLING AIRPORT,
WITH
GROWTH OPPORTUNITIES
AT ALL AIR CARGO FACILITIES

Highways

Arkansas has an extensive roadway network consisting of 768 miles of Interstates, 15,683 miles of other State and U.S. highways, and over 86,100 miles of county roads and city streets. This network provides the backbone of the trucking industry and allows trucks to safely and efficiently move freight across all distances, from long hauls to local deliveries. The roadway freight network also includes key links at intermodal centers to the rail, port, air, and pipeline modes that keep multimodal/intermodal freight moving.

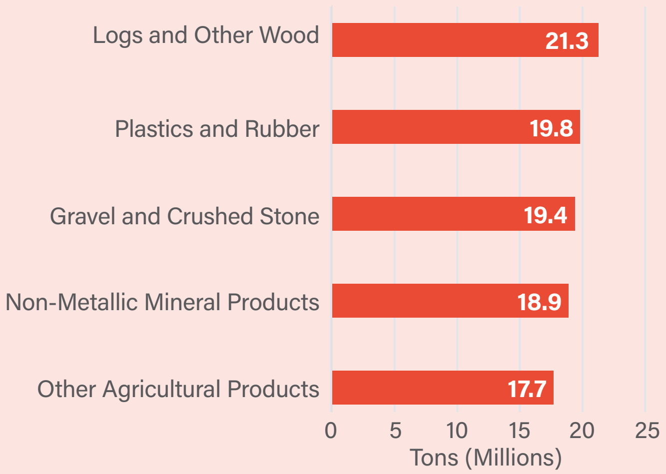
The Interstate System is the workhorse of Arkansas' State Highway System, accounting for approximately 40% of truck vehicle miles traveled. Increased congestion, truck tonnage, daily truck trips, and truck-miles traveled on Arkansas' Interstate System, coupled with population growth and other factors, represent challenges to the efficient movement of freight throughout the state. The highest volumes of truck traffic are seen near Texarkana, Little Rock, and West Memphis, primarily along the Interstate 30 (I-30), Interstate 40 (I-40), and Interstate 55 (I-55) corridors. In 2020, despite the impacts of the COVID-19 pandemic, I-40 from Little Rock to West Memphis continued to carry high truck volumes (generally exceeding 20,000 trucks per day), as did I-30 from Texarkana to Little Rock (generally exceeding 15,000 trucks per day).



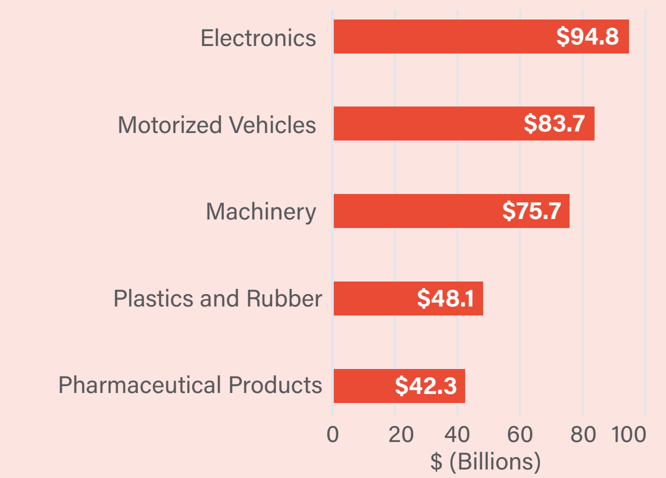
Interstate 40 at the White River (Prairie County)

IN **2019**, TRUCKS TRANSPORTED ALMOST **360 MILLION TONS** OF **FREIGHT** WORTH MORE THAN **$770 BILLION** ON ARKANSAS' ROADWAYS, WHICH IS EXPECTED TO GROW TO ALMOST **600 MILLION TONS** WORTH OVER **$1.5 TRILLION** BY **2050**.

Top Commodities by Tonnage (2019)

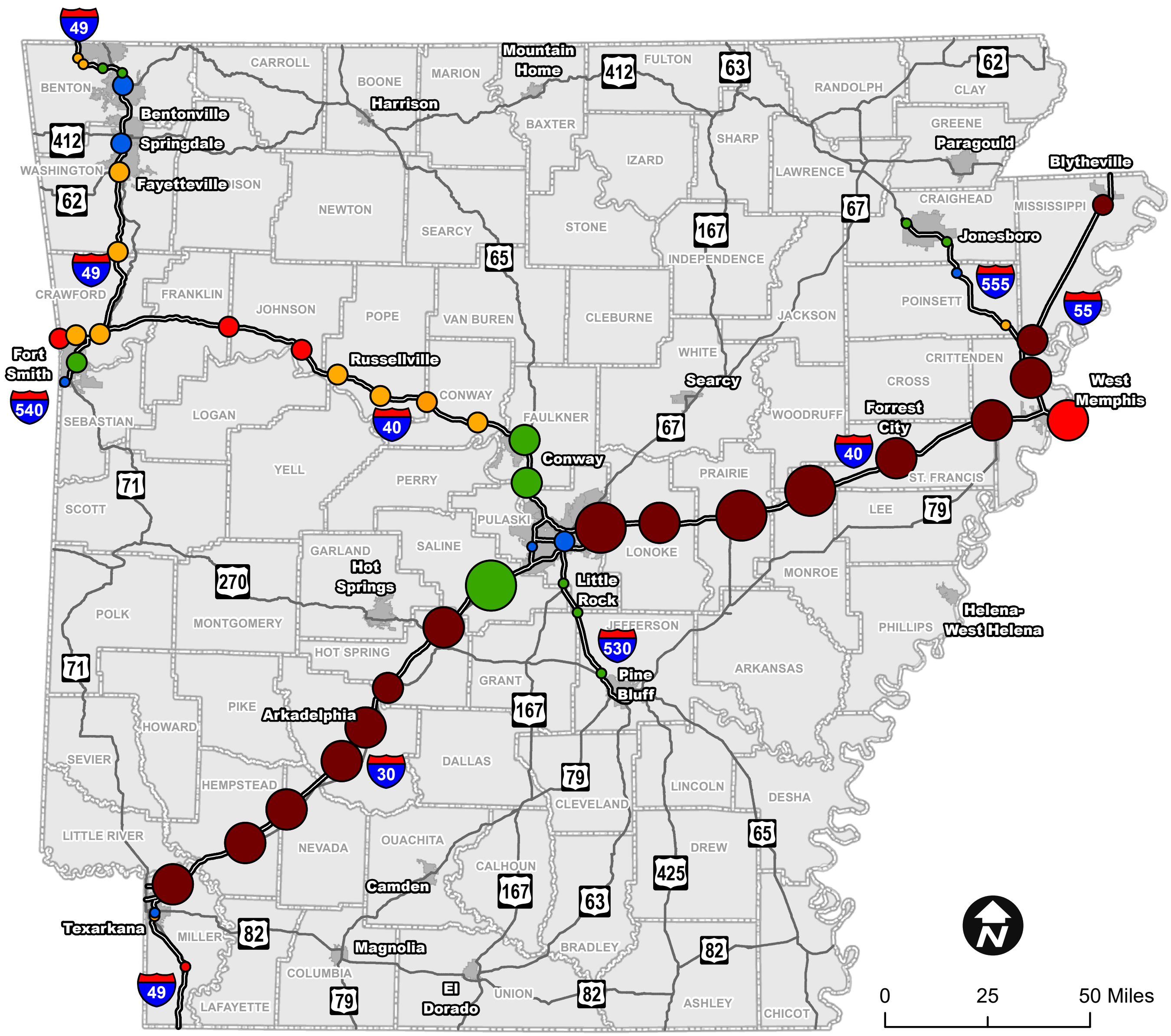


Top Commodities by Value (2019)



Source: Freight Analysis Framework, Version 5.

Daily Truck Volumes on Interstate Highways (2020)



Truck Volume at Count Location

- 5,000 or Less
- 5,001 to 10,000
- 10,001 to 15,000
- 15,001 to 20,000
- 20,001 or More

Truck Percent of DailyTraffic

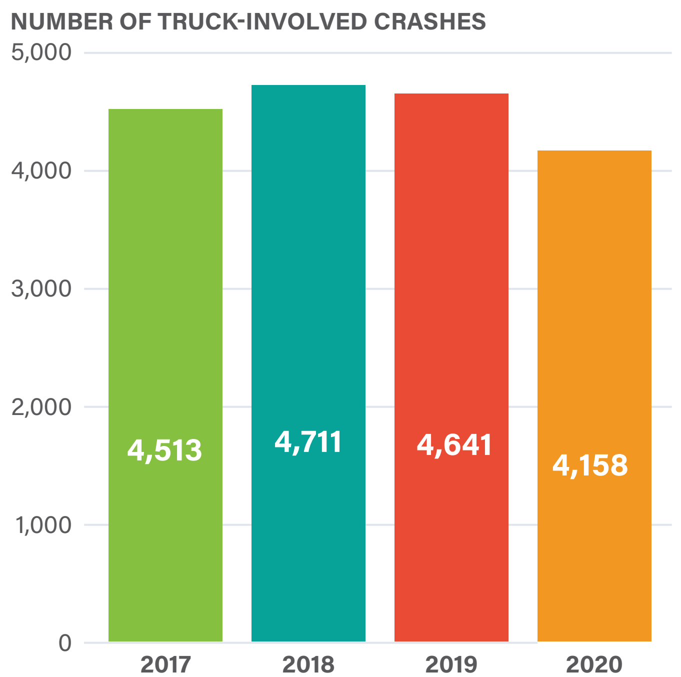
- 0 - 10% of DailyTraffic
- 10% to 20% of Daily Traffic
- 20% - 30% of Daily Traffic
- 30% - 40% of Daily Traffic
- Greater than 40% of Daily Traffic

Big Rock Interchange (Little Rock)

Safety is ARDOT's top priority in planning for and managing the State Highway System. Crashes involving trucks and passenger vehicles are more likely to be fatal due to the size differences between the two vehicle types. Given the projected increases in freight volumes over the next several decades, truck safety will continue to be a focus for ARDOT. From 2017 to 2020 there were 18,023 truck-involved crashes in Arkansas, which is just over 4,500 crashes per year on average. The sharp decrease of crashes in 2020 could be due to the fact that there were, on average, fewer vehicles on the road due to travel restrictions following the onset of the COVID-19 global pandemic.

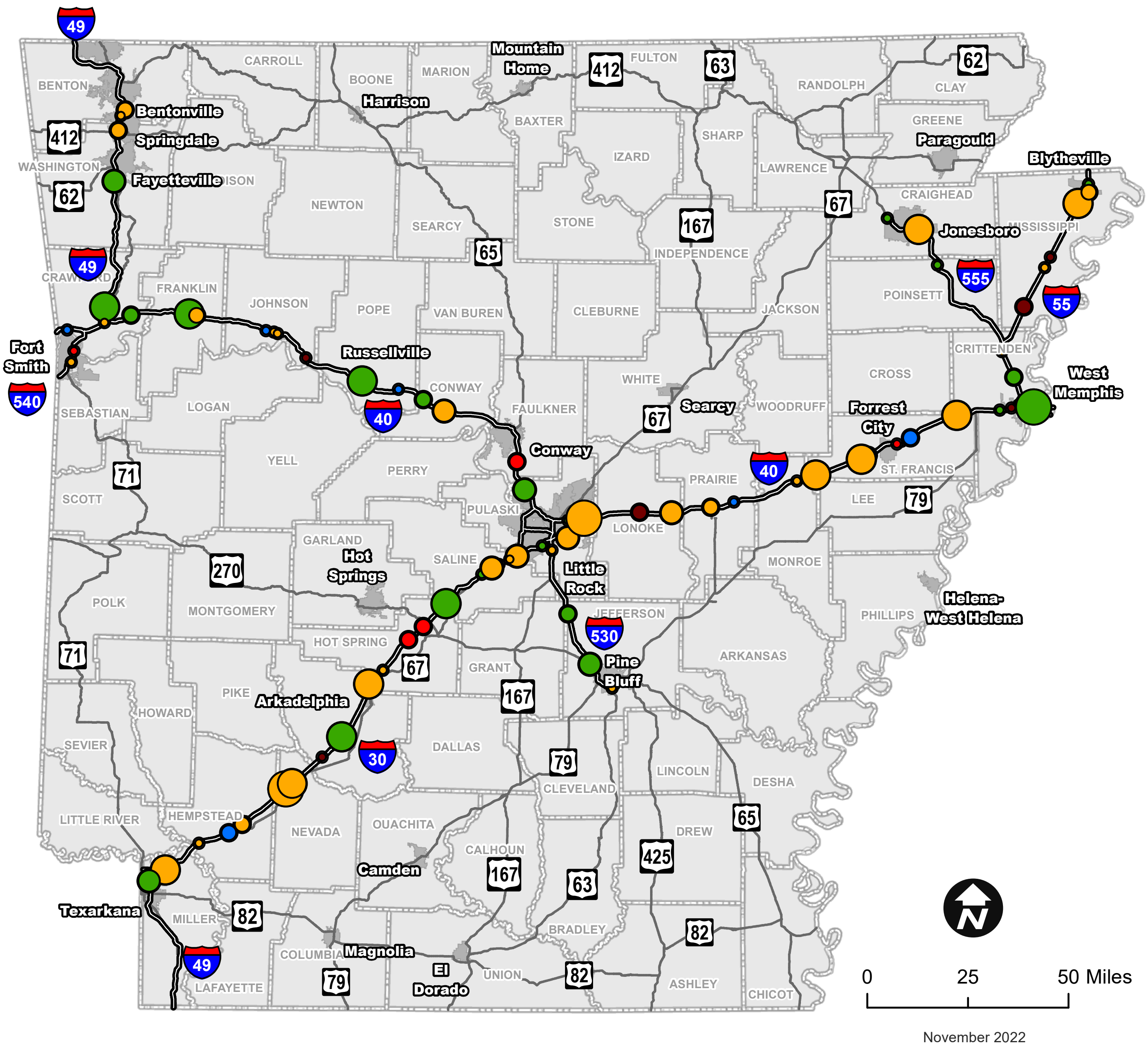
Trucking industry stakeholders are strong advocates for increased truck parking availability along major freight corridors, and adequate truck parking ensures that drivers can comply with federal hours of service (HOS) requirements. Sufficient truck parking also ensures that drivers have a safe location to stop, rather than parking along highway ramps or shoulders, which poses a safety risk for truck drivers, and the traveling public.

Truck-Involved Crashes in Arkansas per Year, 2017–2020



Source: ARDOT.

Truck Parking Utilization at Public and Private Facilities (2019)



Number of Spaces

- 5 - 25
- 26 - 50
- 51 - 100
- 101 - 300
- 301+

Utilization

- 0 - 50% of Capacity
- 50 - 100% of Capacity
- 100 - 150% of Capacity
- 150 - 200% of Capacity
- Over 200% of Capacity

Note: Mapped values reflect the total number of parking spaces (public and private) and parking demand at a given exit. Exits where no legal truck parking is provided are not mapped.

Railroads

Railroads are an essential component of Arkansas' multimodal freight transportation system. Located between the major freight centers of Dallas, Texas and Memphis, Tennessee, trackage in Arkansas plays a key role in the transport of freight from east to west coast markets. Railroads are ideal for cost-effectively transporting heavy, bulk goods and containers over long distances. Key industries utilizing these goods include many of Arkansas' largest economic sectors, including manufacturing, agriculture, construction, and mining. Arkansas' rail network is expansive, with 26 carriers operating over 2,700 miles of track.

Congestion and infrastructure constraints on the railroad network limit system capacity and economic development opportunities, particularly in the state's rural areas. One of the primary constraints involves portions of the network that are not capable of handling standard 286,000-pound rail cars. Most trackage with a weight capacity below this standard is concentrated in Southeast Arkansas and consists of Class III trackage. Track capacity upgrades in this region could bolster economic development as part of a larger freight investment strategy. Other bottlenecks require infrastructure upgrades, such as double tracking certain rail segments, extending trackage and siding, or improving weight or logistical restrictions along specific bridges and tunnels.

As of November 2022, pending regulatory approval, Kansas City Southern is set to be acquired by Canadian Pacific. If this acquisition goes through, the new Class I railroad would be the first to directly connect Canada, Mexico, and the United States, including track that directly traverses Arkansas.

IN **2019**, MORE THAN

160 MILLION TONS

OF **FREIGHT** WORTH MORE THAN

$300 BILLION MOVED ON

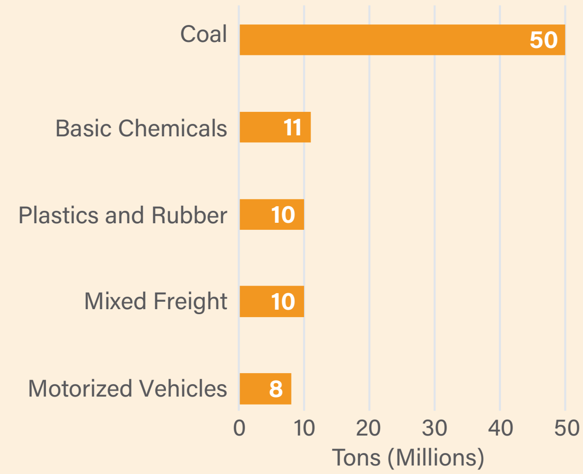
ARKANSAS' RAILROAD NETWORK,

WHICH IS EXPECTED TO GROW TO ALMOST

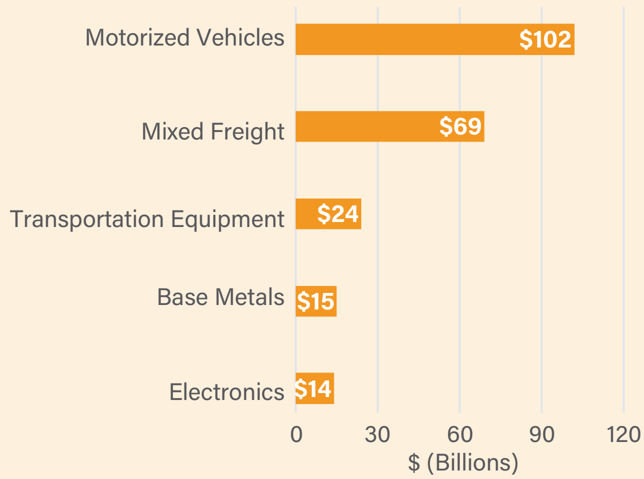
200 MILLION TONS WORTH

$500 BILLION BY **2050**.

Top Commodities by Tonnage (2019)

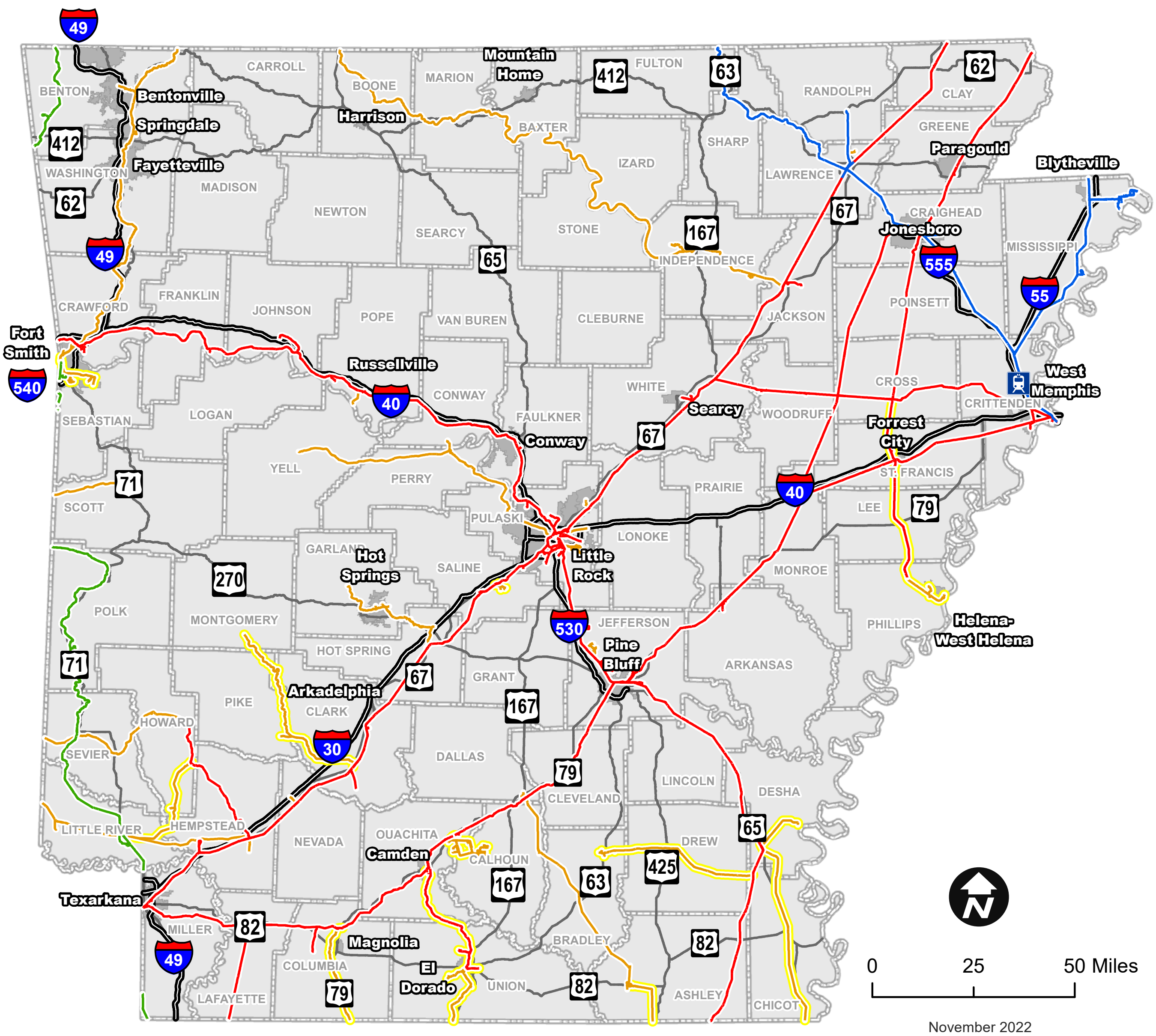


Top Commodities by Value (2019)



Source: Freight Analysis Framework, Version 5.

Track Ownership and Weight Restrictions



Class I Railroads
- Burlington Northern Santa Fe (BNSF)
- Kansas City Southern (KCS)
- Union Pacific (UP)

Class III Railroads
- Various Owners

Rail Intermodal Terminal

Less than 286,000 Pound Capacity Segment

Ports and Waterways

Arkansas' ports and waterways provide an efficient and economical shipping option for non-time sensitive bulk products from manufacturing, agriculture, and production and extraction industries. Barges are the primary freight transportation vehicle for inland waterways. Barges are also ideal for hauling oversized or overweight equipment. One barge can move the same tonnage as 16 train cars or 70 truck trailers. Inland ports often interface with roadway or rail networks, providing a competitive transportation solution that alleviates congestion on the nation's roadways and railways.

The U.S. inland waterways system links Arkansas to both domestic markets and coastal ports in the Gulf of Mexico. Arkansas is third in the nation for number of inland waterway miles and is currently served by five navigation systems: the Mississippi River, the McClellan-Kerr Arkansas River Navigation System (MKARNS), the Ouachita-Black Navigation System, the Red River, and the White River. The state borders 320 miles of the Lower Mississippi River and also borders or contains more than 600 miles of other commercially navigable waterways.

Challenges with waterways include dredging, funding for critical operations and maintenance projects, and port access. Aging lock and dam infrastructure – including portions outside the state – limit the usage and capacity of barge transportation services. Further complicating these issues is the difficulty in collecting accurate commodity flow data for the inland waterways system, which determines federal funding levels.

More so than any other mode of freight transportation, navigation along the nation's inland waterway system is highly susceptible to weather events that can cause delays and unsafe conditions. Since the last State Freight Plan, flooding and network resiliency has emerged as a top issue for inland ports and waterways. The most extreme recent example of such an event was the flooding of the Arkansas River in May 2019.

IN **2019**, ALMOST

8 MILLION TONS

OF **FREIGHT** WORTH NEARLY

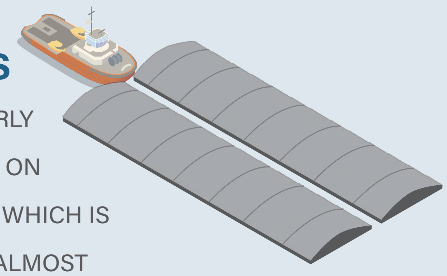
$3 BILLION MOVED ON

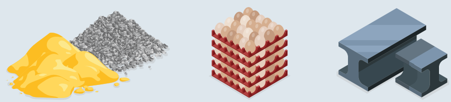
ARKANSAS' WATERWAYS, WHICH IS

EXPECTED TO GROW TO ALMOST

9 MILLION TONS

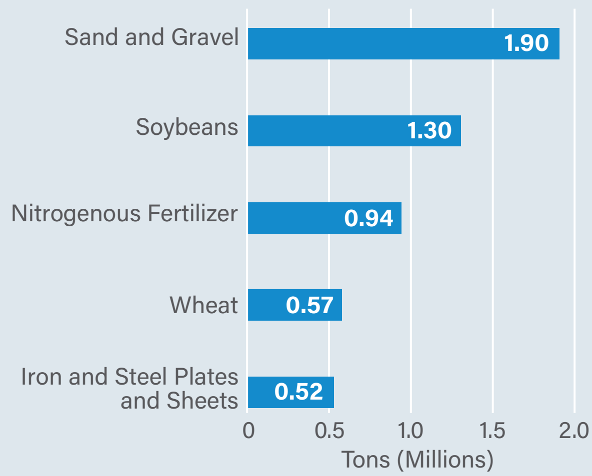
WORTH **$4 BILLION** BY **2050**.



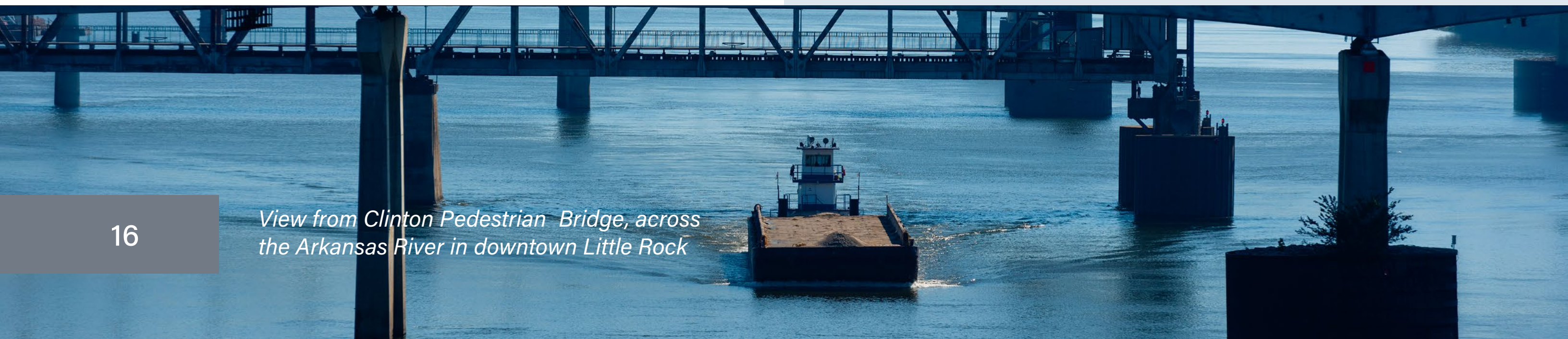


PORTS AND WATERWAYS ARE IDEAL FOR MOVING **HIGH VOLUMES OF BULK GOODS,** INCLUDING TOP COMMODITIES SUCH AS **SAND AND GRAVEL, AGRICULTURAL PRODUCTS**, AND **METALS.**

Top Commodities by Tonnage (2019)

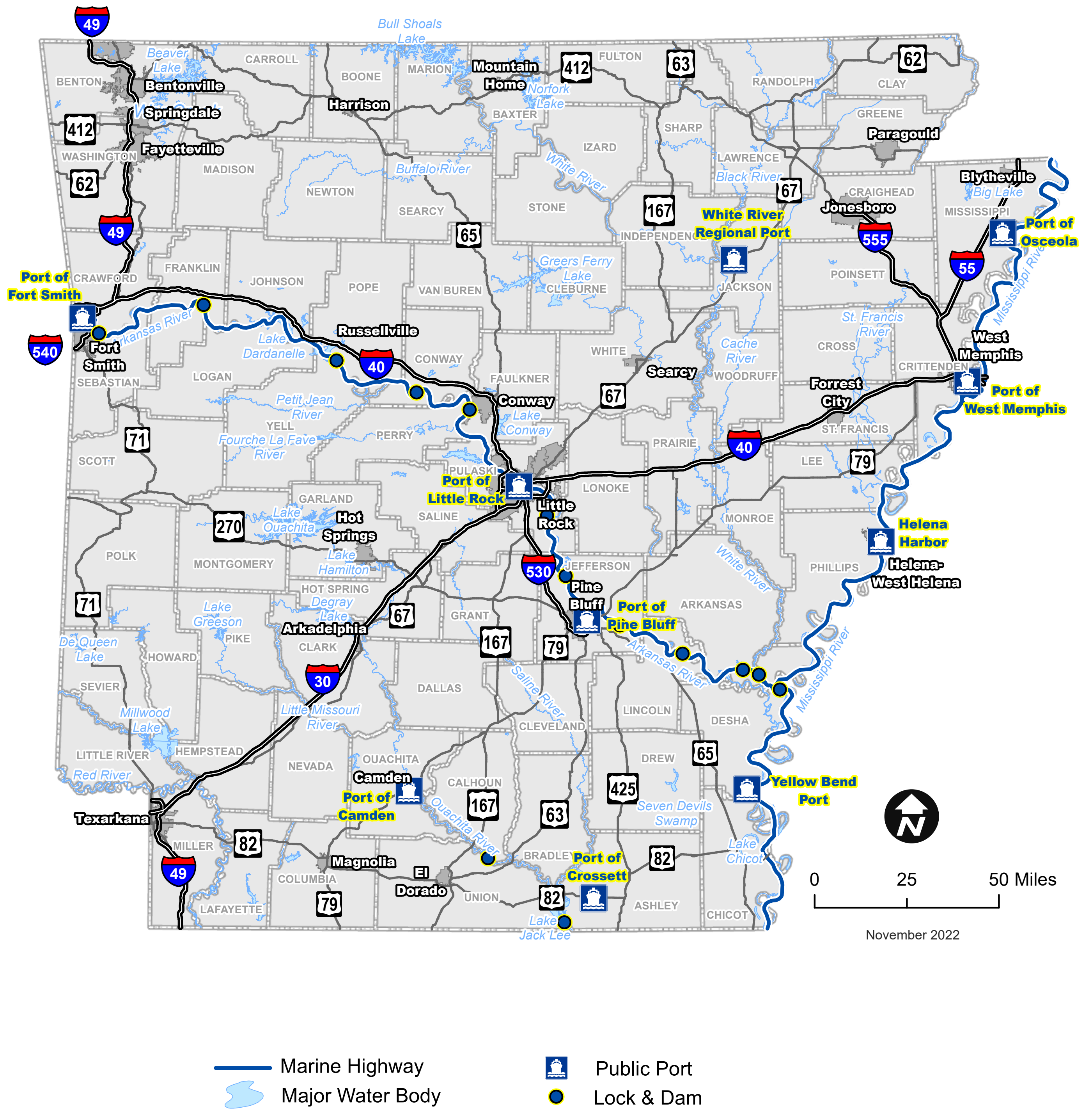


Source: U.S. Army Corps of Engineers.



View from Clinton Pedestrian Bridge, across the Arkansas River in downtown Little Rock

Ports and Waterways



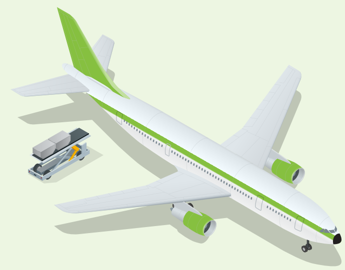
Airports

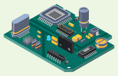
Arkansas' airports support the state's businesses and industries by transporting commodities and finished goods from suppliers to customers. Air cargo is an important element of Arkansas' freight network, allowing for low-weight, high-value freight to be moved quickly, and for the state to compete with other air-served freight markets. Arkansas has two major national airports and benefits from proximity to other major international airports in neighboring states. The largest air cargo facility in Arkansas is Bill and Hillary Clinton National Airport (LIT) in Little Rock, which transported nearly all air cargo tonnage in the state in 2019, while Northwest Arkansas National Airport (XNA) and Fort Smith Regional Airport (FSM) together handle the rest.

Arkansas' airports face significant competition due to the state's proximity to major airports in other states. Most notably, Memphis International Airport (MEM) is the largest airport in the U.S. for air cargo activity and is just 11 miles east of the Arkansas-Tennessee state border. Dallas/Fort Worth International Airport (DFW), another major airport hub, is about 320 miles from Little Rock, approximately 4.5 hours by car or truck. Most of Arkansas' air cargo-handling facilities have capacity to handle increased volumes if the market demands.

The COVID-19 pandemic was a catalyst that accelerated e-commerce growth in the U.S., resulting in a jump in the share of e-commerce in total retail sales. Although it is unclear whether the rapid adoption of e-commerce will be sustained in the long-term, some buyer preferences may permanently shift to certain online retailers or goods after a positive experience during the pandemic. This may lead to increased demand for expedited air cargo service. Retailers have also restructured their operations to better serve e-commerce, and these decisions and investments are likely to have a long-term impact on future business models.

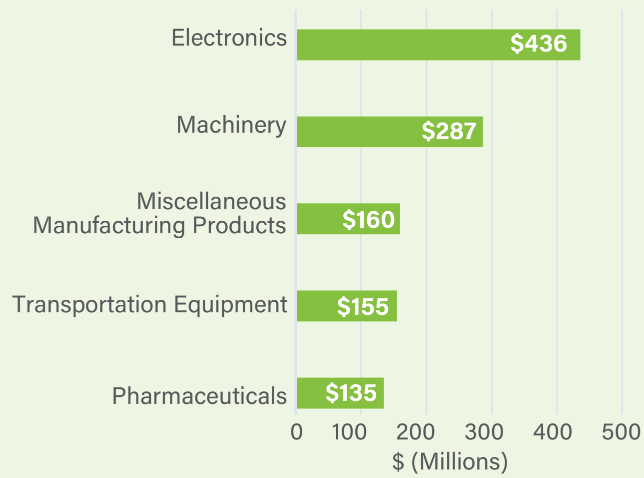
IN **2019**,
AIRPORTS IN ARKANSAS
MOVED MORE THAN
25,000 TONS
OF **FREIGHT** VALUED AT
$2 BILLION, WHICH IS
EXPECTED TO DOUBLE IN VOLUME TO
51,000 TONS VALUED AT
$4.7 BILLION BY **2050**.





AIR CARGO IS WELL SUITED TO HANDLE LOW-WEIGHT, HIGH-VALUE COMMODITIES, INCLUDING TOP GOODS SUCH AS **ELECTRONICS, PRECISION INSTRUMENTS, PHARMACEUTICALS, AND OTHER MANUFACTURED PRODUCTS**.

Top Commodities by Value (2019)

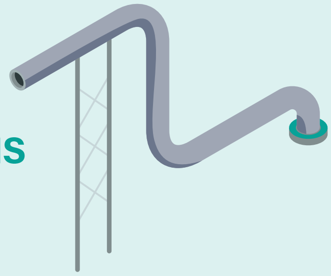


Source: Freight Analysis Framework, Version 5.

Pipelines

Pipelines are a specialized system. Arkansas has over 10,000 miles of pipelines moving gas, oil, and other products. Often, modal shifts – between pipeline, trucking, and rail – occur at pipeline terminals.

Louisiana, Oklahoma, and Mississippi accounted for more than 90% of inbound pipeline flows, while Mississippi, Louisiana, and Missouri accounted for more than 95% of outbound pipeline flows.



IN **2019**,

67 MILLION TONS

OF **FREIGHT** VALUED AT

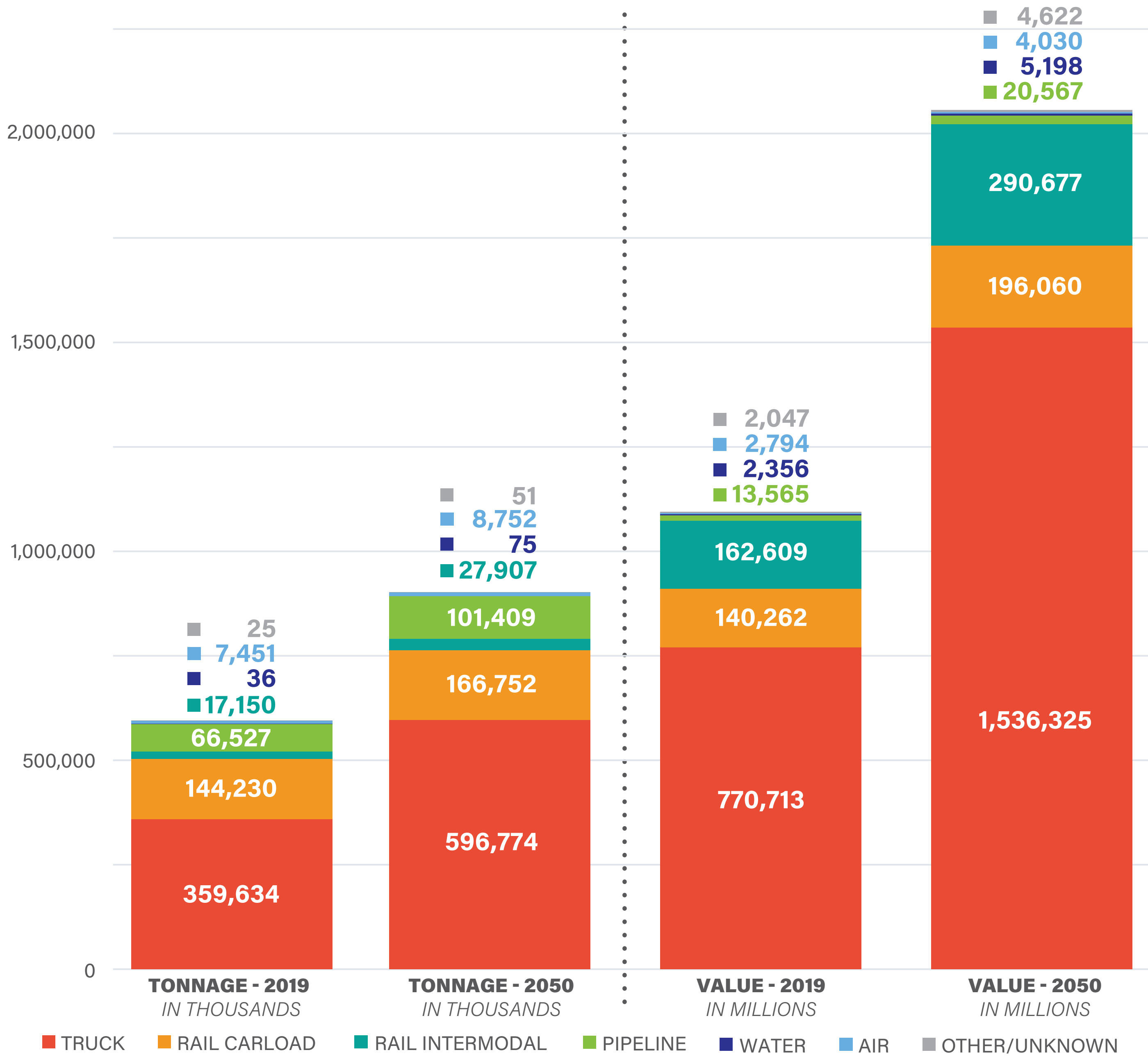
$14 BILLION WAS

MOVED THROUGH ARKANSAS' PIPELINES.

BY **2050**, PIPELINE VOLUMES ARE PROJECTED TO EXPAND TO **101 MILLION TONS** WORTH **$21 BILLION**.

Growing Arkansas, Growing Freight Demand

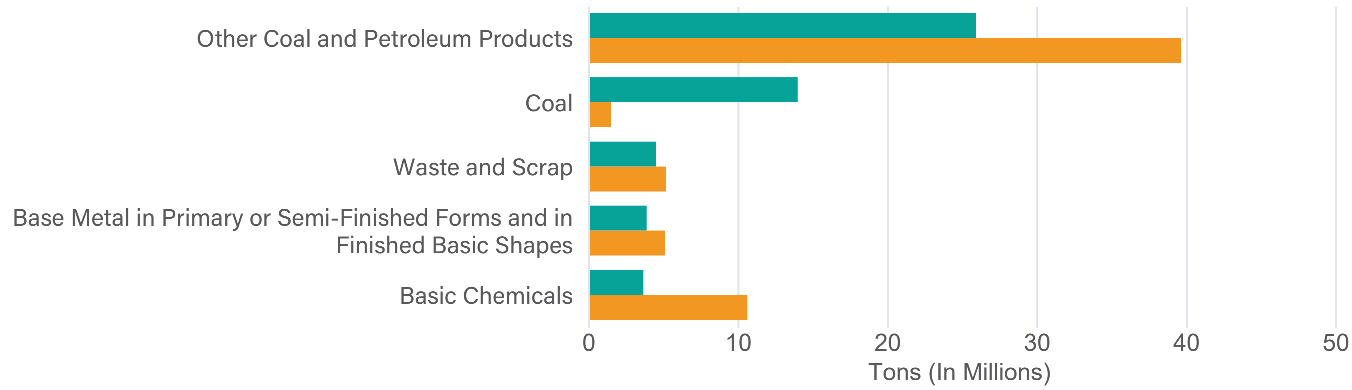
In 2019, approximately 595 million tons of freight moved over Arkansas' transportation system, valued at $1.1 trillion. This freight volume has been forecasted to increase by over 50% by 2050 to 902 million tons, worth over $2 trillion. More growth leads to more freight across all modes of transportation. Arkansas' central location offers access to extensive highway, rail, and pipeline networks, connecting the state to domestic and global markets from its ports, waterways, and airports. Arkansas also has an abundance of natural resources and is a top producer of key agricultural commodities, which are sold around the world.



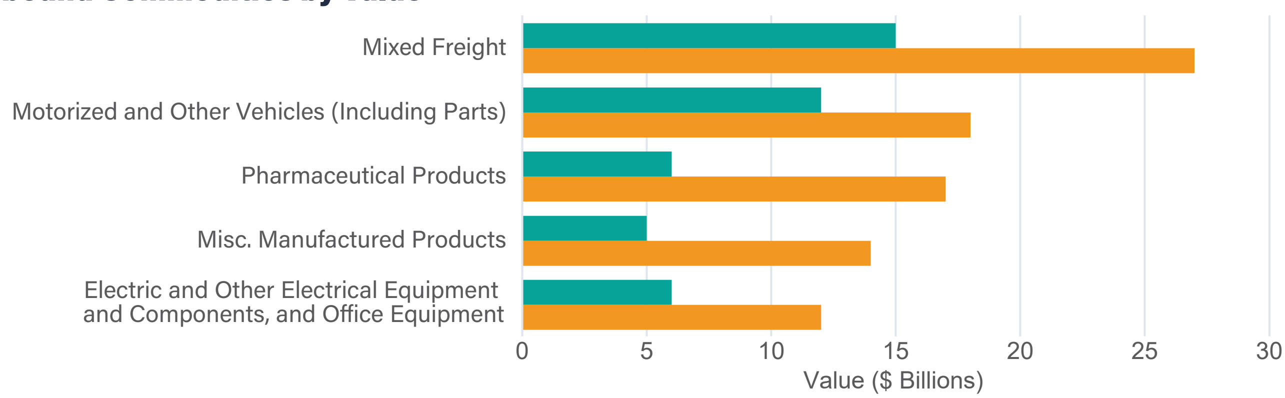
By 2050, trucks are expected to move a higher volume and proportion of freight flows in Arkansas, while railroad shares of freight volumes are projected to decline. Other modes are expected to grow modestly but retain a similar share of overall freight volume and value.

Top Commodities, All Modes, 2019-2050

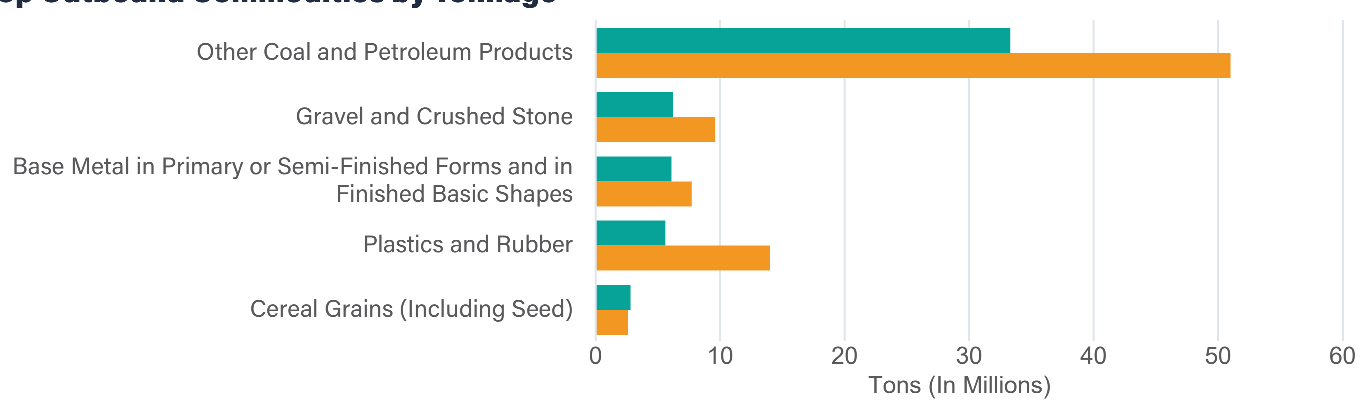
Top Inbound Commodities by Tonnage



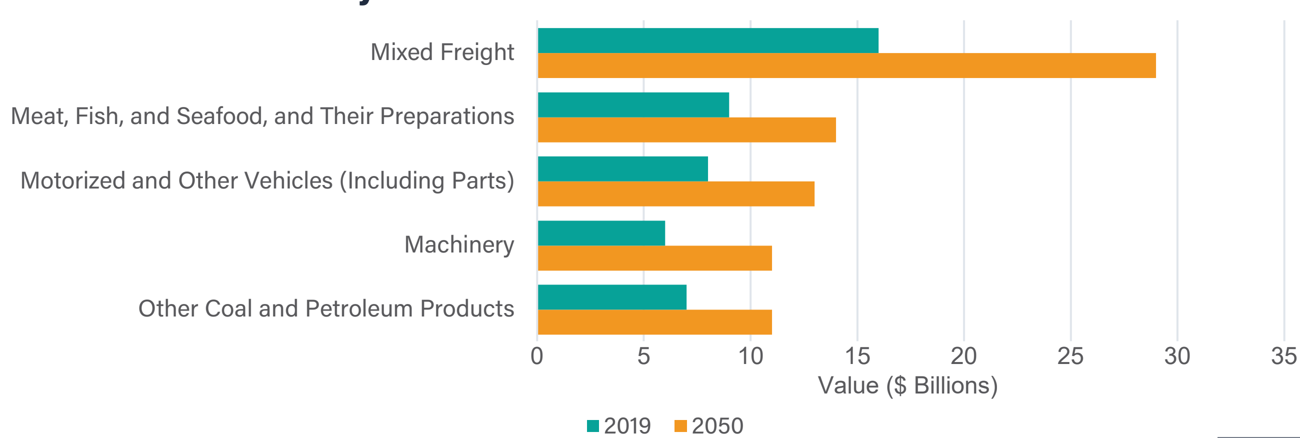
Top Inbound Commodities by Value



Top Outbound Commodities by Tonnage



Top Outbound Commodities by Value

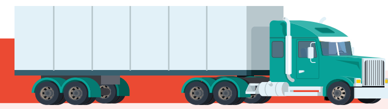


Source: Freight Analysis Framework, Version 5; STB Confidential Waybill Sample.

Arkansas' Multimodal Freight Needs

Access | Capacity | Aging Infrastructure and Deferred Maintenance | Resiliency | Funding

Highways

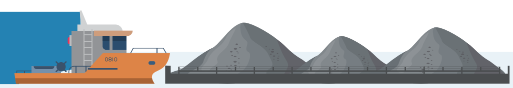


- **Asset Management –** maintain pavement and bridges in good condition, replace or rehabilitate load posted bridges.
- **Truck Safety –** reduce crashes through increased truck parking opportunities, educating the public, and increasing enforcement.
- **System Connectivity and Mobility –** completing the four-lane grid system and addressing key truck bottlenecks.
- **Truck Parking –** supports hours of service requirements and mitigates safety aspects of unauthorized parking.
- **Transportation Technology –** potential to invest in truck parking notification systems to improve utilization of existing truck parking facilities.

Railroads

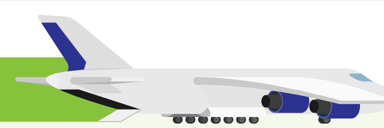
- **System Enhancement –** increase the versatility of the system by developing rail spurs, freight rail facilities, intermodal connections, and additional capacity.
- **Funding –** grant funding opportunities particularly challenging for shortline carriers to secure.
- **Track Quality and Weight Restrictions –** upgrading all track to handle 286,000-pound weight standard would increase competitiveness of freight rail and provide economic development opportunities.
- **Safety –** improving overall safety as well as at highway-rail at-grade crossings.
- **Service and Labor Challenges –** address and mitigate persistent labor and workforce challenges following the onset of COVID-19.

Ports and Waterways



- **Funding –** acquiring adequate levels of funding for priority projects, dredging, and maintenance needs.
- **Highway and Rail Access –** highway and rail access is a priority for current and potential port users.
- **Lock and Dam Infrastructure –** improving aging lock and dam infrastructure and tow haulage systems at all locks.
- **Dredging –** consistent, annual dredging is essential for reliable operations at inland ports.

Airports



- **Ground Access –** airport connector roads and connections to Interstate Highways to facilitate additional freight.
- **Capitalizing on Available Capacity –** marketing capacity and service opportunities as an alternative to busy neighboring hubs.

Strategies and Actions

This State Freight Plan identifies a number of challenges and needs across the state's multimodal freight transportation system, including aging infrastructure, congestion and bottlenecks, safety, rural and multimodal connectivity challenges, and funding. Meeting these challenges requires that freight and industry stakeholders throughout the state collectively take actions that are multimodal and comprehensive, with the goal of strengthening the state's transportation network and supporting evolving population and demographics, industry composition, freight and economic growth, and quality of life in Arkansas.

Highlighted below are strategies and actions for advancing the success of Arkansas' multimodal freight system within each goal area.

1

Safety and Resiliency: Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system.

» Continue to implement the railway-highway crossing improvement program.

» Implement Commercial Vehicle (truck) safety strategies from the Strategic Highway Safety Plan.

» Encourage development and expansion of truck parking areas.

» Evaluate emergency response protocols to better support the trucking industry.

» Support initiatives and investments that increase the resiliency of the multimodal freight network.

2

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

» Improve road and rail access to inland port facilities, air cargo facilities, transload terminals, and intermodal terminals.

» Improve last-mile access roads to Arkansas' rural industries, farms, and other freight-generating facilities.

» Support public and private investments in inland ports, transload terminals, and intermodal terminals.

» Continue working with the Freight Advisory Committee.

» Improve communication between modal authorities.

» Promote "Be Pro Be Proud" Initiative in Arkansas.

» Coordinate with the Arkansas Economic Development Commission (AEDC), Planning and Development Districts (PDD)/Economic Development Districts (EDD), Metropolitan Planning Organizations (MPO), and other economic development stakeholders.

» Promote the importance of all freight modes to local, state, and national economies.

3

Infrastructure Condition:
Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system.

- Evaluate, adjust, and enforce posted-speed, routing, weight, and size restrictions on roads and bridges.
- Continue implementation of the Transportation Asset Management Plan.
- Prioritize maintenance of existing assets over construction of new infrastructure.

4

Congestion Reduction, Mobility, and System Reliability:
Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.

- Continue to invest in Transportation Systems Management and Operations (TSMO) and Intelligent Transportation Systems (ITS).
- Deploy a truck parking availability system along Interstates.
- Update the statewide travel demand model, including freight module.
- Identify critical freight corridors.
- Support dredging of MKARNS to 12 feet.
- Coordinate with Class I/III railroads to identify opportunities for enhanced rail access and service.
- Integrate multimodal freight with regional planning activities.

5

Environmental Sustainability:
Enhance the performance of the transportation system while avoiding, minimizing, and/or mitigating impacts to natural and cultural resources.

- When developing system improvement alternatives or selecting operations/management strategies, consider approaches that minimize freight impacts on local air and noise pollution, flooding, stormwater runoff, and wildlife habitats.
- Promote equitable outcomes in the development of the freight system by considering the distribution of benefits and burdens on communities (including access, mobility, options, affordability, safety, employment opportunities, involvement, noise and other forms of pollution), with emphasis on historically marginalized or disadvantaged communities.

Highway 64 (Midland Bridge) facing Van Buren (circa 2019 Arkansas River Flood event)

Implementing the Plan

As the demand for the movement of freight into, out of, within and through Arkansas grows, it is increasingly important to invest in our freight system (including highways, railroads, ports and waterways, airports, and multimodal and intermodal assets) to ensure that the state's freight network can meet the needs of industry and consumers.

The Federal Highway Administration's National Highway Freight Program provides funding (approx. $18 million per year over the next five years) for freight projects. However, designated program funding for freight projects is limited relative to the many priority freight needs (across all modes) in Arkansas. Recognizing this challenge, the Infrastructure Investment and Jobs Act (IIJA) maintained and created numerous discretionary grant programs with eligibilities for multimodal freight projects:

» Rebuilding American Infrastructure with Sustainability and Equity (RAISE)
» Infrastructure for Rebuilding America (INFRA)
» Mega projects
» Promoting Resilient Operations for Transformative, Efficient, and Cost-Savings Transportation (PROTECT)
» Consolidated Rail Infrastructure and Safety Improvements Program (CRISI)
» Bridge Investment Program
» Port Infrastructure Development Program
» America's Marine Highways
» Airport Improvement Program
» Railroad Crossing Elimination Grant Program
» Rural Surface Transportation Grant Program

Arkansas has had past success with some of these programs, and ArDOT will continue to support future efforts and leverage its available resources when feasible.

Successful implementation of this State Freight Plan can only be achieved with the participation and collaboration of public- and private-sector users and owners of the transportation system, including freight industry stakeholders and federal, state, regional, and local agencies.

View from Clinton Pedestrian Bridge, across the Arkansas River in downtown Little Rock

State Freight Advisory Committee Participants

- Arkansas Department of Aeronautics
- Arkansas Department of Agriculture
- Arkansas Department of Energy and Environment, Division of Environmental Quality
- Arkansas Department of Transportation
- Arkansas Economic Development Commission
- Arkansas Farm Bureau
- Arkansas Forestry Association
- Arkansas Good Roads and Transportation Council
- Arkansas State Chamber of Commerce
- Arkansas Trucking Association
- Arkansas Waterways Commission
- Federal Motor Carrier Safety Administration – Arkansas Division
- Helena Harbor
- Monticello Economic Development Commission
- Northwest Arkansas Regional Planning Commission
- Nucor-Yamato Steel
- Port of Little Rock
- Riceland Foods
- Union Pacific Railroad
- Western Arkansas Planning and Development District

Ex-Officio

- Federal Highway Administration – Arkansas Division
- U.S. Army Corps of Engineers – Little Rock District

ARKANSAS STATE FREIGHT PLAN

Chapter 1

Goals, Objectives & Performance Measures

ARKANSAS DEPARTMENT OF TRANSPORTATION

WE MOVE ARKANSAS FREIGHT

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1.0 Introduction

The 2022 Arkansas State Freight Plan (SFP) was developed to meet the growing demand for the movement of goods in Arkansas and to promote the Arkansas Department of Transportation's (ARDOT) mission to provide safe and efficient transportation solutions to support Arkansas' economy and enhance quality of life for generations to come. To that end goals, objectives, and performance measures were established to provide a framework for freight system decision-making and performance evaluation. The selected goals, objectives, and performance measures were developed through engagement with the Freight Advisory Committee (FAC) and other stakeholders; informed by federal planning requirements and best practices; and aligned with other statewide plans to ensure consistency and continuity.

1.1 Report Organization

The remainder of this report is organized as follows:

- **Section 2.0—Goals and Objectives** discusses previously-established freight goals and objectives and national freight goal areas, and presents the 2022 SFP goals and objectives.
- **Section 3.0—Freight Performance Measures** describes best practices in establishing freight performance measures and presents the 2022 SFP freight performance measures.

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2.0 Goals and Objectives

While the development of the 2022 SFP was led by ARDOT, the goals and objectives of this SFP are multimodal in nature. They were developed to provide a framework for ARDOT, other modal authorities, and other freight stakeholders for planning, operating, and investing in the state's freight network. These goals and objectives build on the 2017 Arkansas State Freight Plan, refined through engagement with the Freight Advisory Committee (FAC) and other stakeholders, and reviewed for alignment with ARDOT agency goals, national freight goals, and existing plans and policies such as the Arkansas Long Range Intermodal Transportation Plan (LRITP), the Strategic Highway Safety Plan (SHSP), Statewide Transportation Improvement Program (STIP), and the Transportation Asset Management Plan (TAMP).

2.1 Review of Existing ARDOT and National Goals

The 2017 Arkansas State Freight Plan was developed concurrently with the 2017 Arkansas Long-Range Intermodal Transportation Plan. The LRITP is a performance-based long-range plan that examines all aspects of the state's multimodal transportation system and provides a policy framework to assist ARDOT with evaluating and prioritizing projects, implementing programs, and measuring performance. As the LRITP guides future investment decisions, it is critical for the goals of the SFP and the LRITP to remain aligned to ensure consistent transportation planning efforts across the state.

Table 2.1 Previously Established Goals

Arkansas State Freight Plan Goals (2017)	Arkansas Long Range Intermodal Transportation Plan Goals (2017)
• **Safety and Security:** Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system. • **Economic Competitiveness**: Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness. • **Infrastructure Condition:** Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system. • **Congestion Reduction, Mobility, and System Reliability:** Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.	• **Safety and Security:** Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system. • **Economic Competitiveness**: Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness. • **Infrastructure Condition:** Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system. • **Congestion Reduction, Mobility, and System Reliability:** Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods. • **Environmental Sustainability**: Enhance the performance of the transportation system while avoiding, minimizing, and/or mitigating impacts to natural and cultural resources. • **Multimodal Transportation System**: Partner with responsible modal agencies, local jurisdictions, and planning organizations working to improve safety, accessibility, and connectivity for the movement of people and goods.

In addition to aligning with the 2017 SFP and LRTIP, the 2022 SFP goals and objectives were developed to support national freight priorities defined in USDOT's National Freight Strategic Plan, as well as those established and continued in the Moving Ahead for Progress in the 21st Century Act (MAP-21) enacted in 2012, the Fixing America's Surface Transportation (FAST) Act enacted in 2015, and the Infrastructure Investment and Jobs Act (IIJA) enacted in 2021.

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

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

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

- Invest in infrastructure improvements and implement operational improvements on the highways of the United States that strengthen the contribution of the National Highway Freight Network to the economic competitiveness of the United States; reduce congestion and bottlenecks on the National Highway Freight Network; reduce the cost of freight transportation; improve the year-round reliability of freight transportation; and increase productivity, particularly for domestic industries and businesses that create high-value jobs;
- Improve the state of good repair of the National Highway Freight Network;
- Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Highway Freight Network;
- Improve the efficiency and productivity of the National Highway Freight Network;
- Improve the flexibility of States to support multi-State corridor planning and the creation of multi-State organizations to increase the ability of States to address highway freight connectivity; and

- Reduce the environmental impacts of freight movement on the National Highway Freight Network.

The IIJA builds upon both MAP-21 and the FAST Act. The IIJA creates additional requirements and recommendations for state freight plan contents, and adds new emphasis to existing goals areas. As defined in 49 U.S.C. 70202, resilience refers to the reliability or redundancy of freight transportation or the ability to rapidly restore access and reliability. To support this priority, state freight plans are required to establish strategies and goals to decrease the severity of impacts of extreme weather and natural disasters. In addition, the IIJA supports other national priorities such as reducing the impacts of freight on local air pollution, flooding and stormwater runoff, and wildlife habitat loss. The 2022 Arkansas SFP fulfills these requirements by refining an existing goal area, adding an additional goal area, and supporting objectives that focus on environmental sustainability.

2.2 Arkansas State Freight Plan Goals and Objectives

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

- **Safety and Resiliency**: Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system.
- **Economic Competitiveness:** Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.
- **Infrastructure Condition:** Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system.
- **Congestion Reduction, Mobility, and System Reliability:** Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.
- **Environmental Sustainability**: Enhance the performance of the transportation system while avoiding, minimizing, and/or mitigating impacts to natural and cultural resources.

The 2022 SFP also defines clear objectives to guide freight stakeholders through each goal area (Table 2.2). These objectives build upon previously established objectives and integrate new objectives related to connectivity and mobility, equity and the environment, resilience, and economic growth. Table 2.3 shows how the SFP goals compare to national multimodal freight policy goals.

Table 2.2 2022 Arkansas State Freight Plan Goals and Objective

Goal	Objective(s)
Safety and Resiliency: Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system.	• Improve the safety of highway freight. • Reduce the risk of grade crossing accidents/incidents. • Support the development of safe and secure truck parking facilities. • Reduce the vulnerability of the freight transportation system with an emphasis on critical infrastructure at elevated risk of failure. • Improve the resiliency of the freight transportation system to extreme weather events and natural disasters.
Economic Competitiveness: Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.	• Continue development of the four-lane grid system to connect communities and promote economic growth. • Promote freight system performance – safety, condition, and efficiency – as essential for economic development, business expansion and attraction, job growth, and access to critical goods. • Support the development of intermodal and multimodal facilities to increase connectivity between highway, railway, air, and waterway modes. • Foster and strengthen partnerships with and between freight stakeholders. • Promote adequate funding for operations, maintenance, safety, capital and capacity improvements, and other needs of all freight modes.
Infrastructure Condition: Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system.	• Rehabilitate or replace highway infrastructure that impedes freight movement, such as load-posted bridges and highways. • Follow asset management principles to optimize return on freight infrastructure investments. • Support and encourage the preservation and maintenance of roadways, railways, waterways, airports, and multimodal connections.
Congestion Reduction, Mobility, and System Reliability: Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.	• Reduce congestion with an emphasis on freight bottlenecks and first- and last-mile connectors. • Support freight transportation alternatives (including multimodal or intermodal alternatives) that best match origin-destination patterns. • Provide predictable, reliable travel times on key freight corridors. • Optimize the performance of existing multimodal freight assets with an emphasis on technological solutions and operations management.
Environmental Sustainability: Enhance the performance of the transportation system while avoiding, minimizing, and/or mitigating impacts to natural and cultural resources.	• Identify and reduce barriers to minimize delay and improve the project delivery process. • Minimize impacts to natural, historic, and cultural resources. • Support initiatives and investments that reduce the impacts of freight movement on local air quality (including greenhouse gas emissions), flooding, stormwater runoff, and wildlife habitat loss. • Utilize context-sensitive solutions in transportation system design, as appropriate. • Improve equity across the multimodal freight system.

Table 2.3 Alignment of National and ARDOT Freight Goals

2022 Arkansas State Freight Plan Goal	National Multimodal Freight Policy
• **Safety and Resiliency:** Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system.	• Improve the safety, security, efficiency and resiliency of multimodal freight transportation. • Use innovation and advanced technology to improve the safety, efficiency and reliability of the National Multimodal Freight Network.
• **Economic Competitiveness:** Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.	• Improve the economic efficiency and productivity of the NMFN. • Pursue the goals described above in a manner that is not burdensome to state and local governments. • Identify infrastructure improvements, policies and operational innovations that strengthen contribution of the National Multimodal Freight Network to the economic competitiveness of the U.S.; reduce congestion and eliminate bottlenecks on the National Multimodal Freight Network; and increase productivity, particularly for domestic industries/businesses that create high-value jobs. • Improve the flexibility of states to support multi-state corridor planning and the creation of multi-state organizations to address freight connectivity.
• **Infrastructure Condition:** Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system.	• Achieve and maintain a state of good repair on the National Multimodal Freight Network.
• **Congestion Reduction, Mobility, and System Reliability:** Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.	• Improve the short- and long-distance movement of goods that travel across rural areas between population centers; between rural areas and population centers; and from the nation's ports, airports, and gateways to the National Multimodal Freight Network. • Improve the reliability of freight transportation.
• **Environmental Sustainability**: Enhance the performance of the transportation system while avoiding, minimizing, and/or mitigating impacts to natural and cultural resources.	• Reduce the adverse environmental impacts of freight movement on the National Multimodal Freight Network.

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3.0 Freight Performance Measures

As identified in FHWA's Freight Performance Measure Primer, freight performance measures are tools to evaluate the level of accountability, efficiency, and effectiveness of the various freight modes and assist with the prioritization and selection of freight improvement projects and programs. These measures are used to monitor the performance of the transportation system using timely and reliable data, to ensure objectives and goals are met, and to identify potential freight bottlenecks.

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

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

3.1 Freight Performance Measures

MAP-21 requires all states to calculate freight travel time reliability on their Interstate Highways using the Truck Travel Time Reliability (TTTR) Index and report these findings to FHWA on a biennial basis, with two- and four-year performance targets. When the 2017 SFP was developed, freight travel time reliability was selected as the only metric to measure freight performance in Arkansas. However, it was noted that additional freight performance measures were under investigation based on available data and measurable impacts to the freight system. These measures included the number of truck-involved crashes and fatalities, average pavement condition rating of the Arkansas freight highway network, percent of freight highway network in poor condition, annual tonnage moved on waterways, annual truck volumes, pavement condition and truck speeds on designated NHS systems, and extending the TTR calculation to the remaining NHS segments.

Since the implementation of the 2017 SFP, ARDOT has continued to gather and evaluate the quality of datasets to identify additional freight performance measures to aid decision making. The 2022 SFP freight performance measures are outlined in Table 3.1 under their respective goal areas. Development of one or more environmental sustainability performance measures is anticipated for future SFP updates. A proposed rulemaking by the U.S. DOT would amend its regulations governing national performance management measures to require State DOTs and metropolitan planning organizations (MPOs) to establish declining carbon dioxide (CO_2) targets and to establish a method for the measurement and reporting of greenhouse gas (GHG) emissions associated with transportation under the Highways title of the United States Code (U.S.C.).[1] ARDOT will integrate any environmental performance metrics included in the final rulemaking in future SFP updates.

[1] https://www.federalregister.gov/documents/2022/07/15/2022-14679/national-performance-management-measures-assessing-performance-of-the-national-highway-system

Table 3.1 Freight Performance Measures

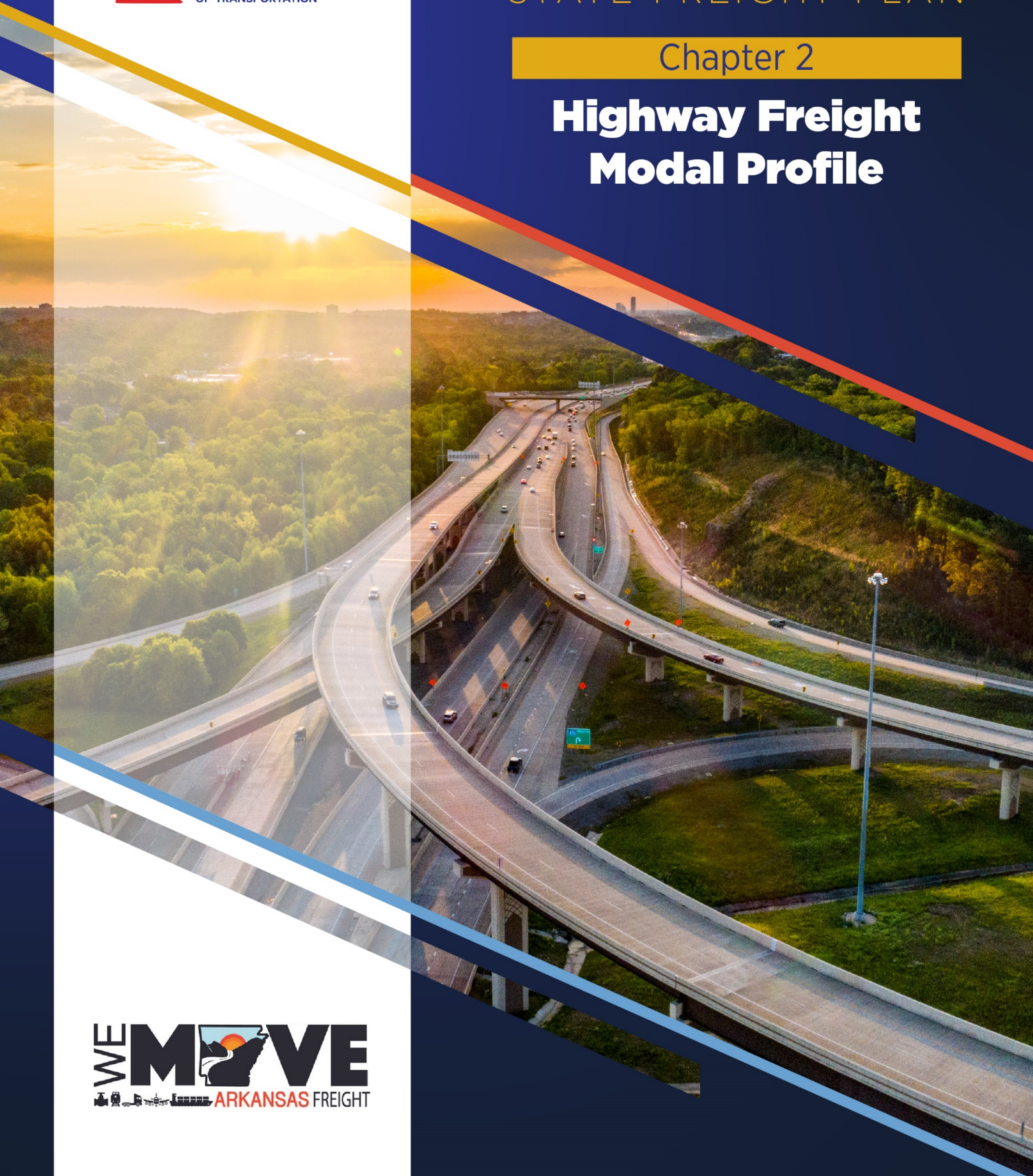
Performance Measure	Description	Source
Safety and Resiliency: Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system.		
Number of truck-involved crashes and truck-involved fatalities	Two indicators of the safety performance of the highway freight system; large commercial motor vehicles are an emphasis area of the SHSP	Various law enforcement agencies
Number of railroad grade crossing crashes	An indicator of multimodal (highways and railroads) safety performance of the freight system; the guiding performance measure for ARDOT's Railway Highway Crossings Program	Federal Railroad Administration
Number of truck parking spaces	A measure of the ability of the highway freight system to provide safe truck parking options in support of hour of service requirements; survey conducted annually by ARDOT	ARDOT
Economic Competitiveness: Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.		
Annual tonnage of freight by mode	A measure of system utilization, economic health, and changes in modal share	FAF
Value of freight by mode	A measure of system productivity, economic health, and changes in mode share	FAF
Infrastructure Condition: Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system.		
Percent of Interstate pavements in good condition	Required federal performance measure; a key indicator for the state of good repair of the freight highway system	ARDOT
Percent of Interstate pavements in poor condition	Required federal performance measure; a key indicator for the state of good repair of the freight highway system	ARDOT
Percent of non-Interstate National Highway System (NHS) pavements in good condition	Required federal performance measure; a key indicator for the state of good repair of the freight highway system	ARDOT
Percent of non-Interstate NHS pavements in poor condition	Required federal performance measure; a key indicator for the state of good repair of the freight highway system	ARDOT
Percent of NHS bridges by deck area classified as good condition	Required federal performance measure; a key indicator for the state of good repair of the freight highway system	ARDOT
Percent of NHS bridges by deck area classified as poor condition	Required federal performance measure; a key indicator for the state of good repair of the freight highway system	ARDOT
Number of load-posted bridges on the State Highway System	An indirect measure of mobility and economic competitiveness of the freight highway system (*e.g.*, barriers to highway freight mobility)	ARDOT
Congestion, Reduction, Mobility, and System Reliability: Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.		
Truck Travel Reliability Index (TTTR) on the Interstate System	Required federal performance measure; a key indicator of the performance freight highway system	National Performance Management Research Data Set

ARDOT
ARKANSAS DEPARTMENT OF TRANSPORTATION

ARKANSAS STATE FREIGHT PLAN

Chapter 2

Highway Freight Modal Profile



WE MOVE ARKANSAS FREIGHT

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1.0 Introduction

Arkansas has an extensive roadway freight transportation network that consists of 768 centerline miles of Interstates, 15,683 centerline miles of other U.S. and state highways, and over 86,100 centerline miles of county roads and city streets. This network provides the backbone of the trucking freight industry and allows trucks to safely and efficiently move freight across all distances, from long hauls to local deliveries. The roadway freight network also provides key links at intermodal centers to the rail, port, air, pipeline, and other freight transportation modes that keep the entire state's multimodal freight network going.

This profile updates, validates, and extends many of the analyses performed for the 2017 Arkansas State Freight Plan, including an overview of the freight roadway network inventory, demand, condition and performance, and safety.

1.1 Report Organization

This Highway Freight Modal Profile is organized as follows:

- **Section 2.0—Highway Freight Network Inventory** provides an inventory of roadway freight network assets, including the various roadway designations and supporting infrastructure.
- **Section 3.0—Highway Freight Transportation Demand** provides an overview of the usage of the roadway freight network, including truck volumes, the flow of commodities, and truck parking demand.
- **Section 4.0—Condition and Performance** provides an analysis of how well the roadway network performs, including measures of delay, pavement condition, and bridge condition.
- **Section 5.0—Safety** features an analysis of the safety of the roadway freight network, including general truck-involved crash trends and a truck-involved crash analysis.

1.2 Data Sources

The following data sources were considered in developing this profile:

- Arkansas Department of Transportation (ARDOT) data for weight-restricted roadways, oversize/overweight permits, weigh stations, truck volumes, truck parking, pavement conditions, bottlenecks, and crashes;
- Highway Performance Monitoring System for National Highway System roadway classifications;
- Federal Highway System for intermodal connectors;
- Freight Analysis Framework Version 5 for a commodity flow analysis;
- National Bridge Inventory for bridge condition data; and
- National Performance Management Research Data Set for truck speed and travel time reliability.

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2.0 Highway Freight Network Inventory

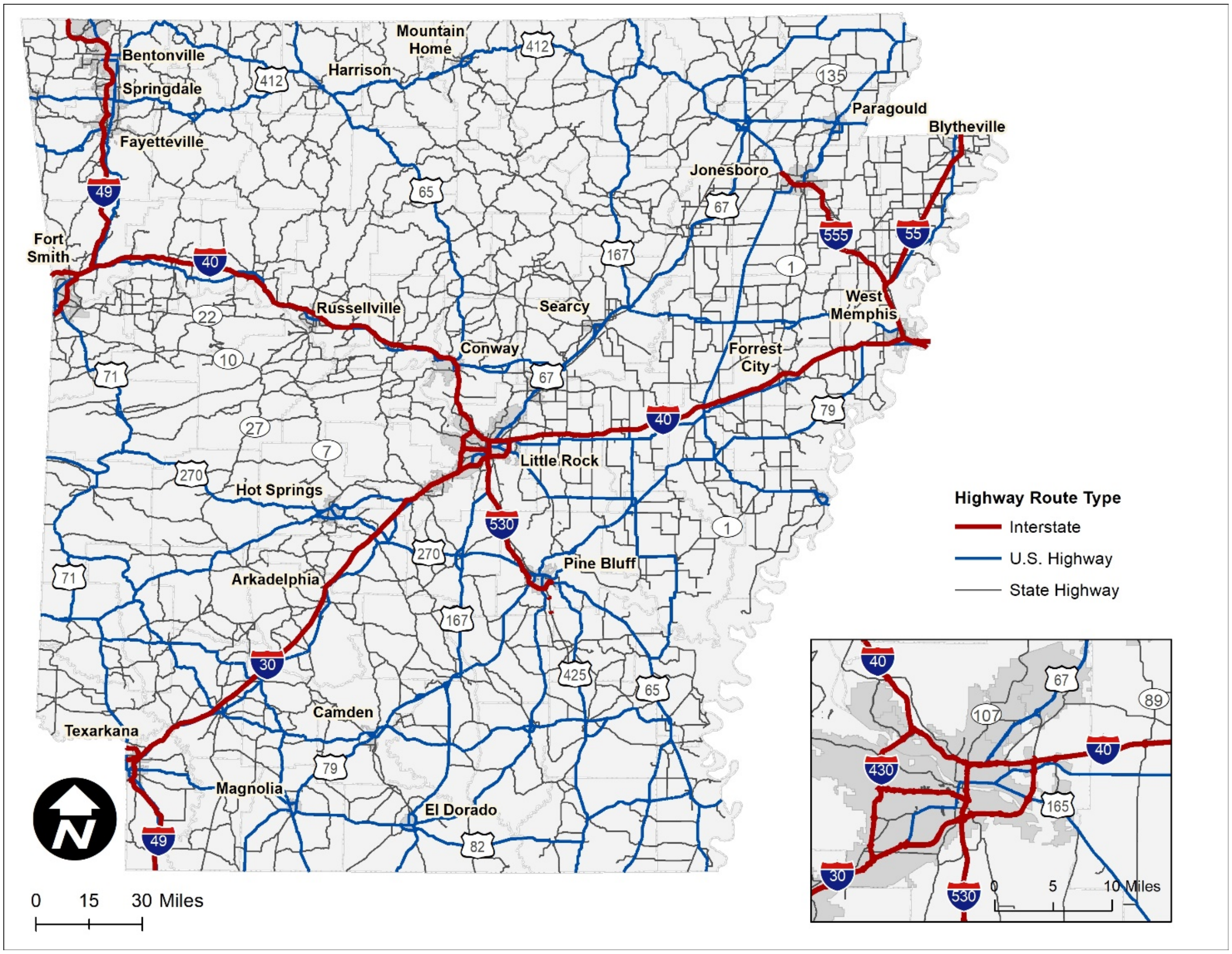
This section inventories the physical infrastructure that makes up the roadway freight network in Arkansas. This includes the various state and federal classification systems for roadways, oversize/overweight infrastructure and the related restrictions, and the growing intelligent transportation systems (ITS) infrastructure that helps ensure maximum efficiency through the network.

There are various methods to classify roadways; the most familiar is to classify them by route type. Appropriate route types for a statewide plan include Interstates, U.S. highways, state highways, county roads, and city streets. The first three road types are used for the majority of transportation trips while local roads are normally low-volume and used at the start and end of journeys. County roads and city streets can be owned by jurisdictions such as counties, towns, or cities.

Throughout this highway freight profile, mileages are report in centerline mileage, which is the defined as the length of a road from start to end. Centerline mileage differs from lane mileage, in that lane mileage is the centerline mileage multiplied by the number of lanes on that segment. For example, a 10 mile-long stretch of roadway with four lanes will 10 centerline miles and 40 lane miles.

Figure 2.1 shows the Interstate, U.S. highways, and state highways throughout the state.

Figure 2.1 Arkansas Highways by Route Type



Source: ArDOT, 2020

2.1 Arkansas Roads by Functional Classification

A more technical classification of roadways is by using functional classification criteria. This divides roadways into the following categories[1]:

- **Interstates**, which are part of the Interstate highway system. Interstates are constructed with mobility and long-distance travel in mind, have on- and off- ramps throughout, and link major urban areas of the United States.
- **Other Freeways and Expressways**, which are main thoroughfares that are generally separated from cross-traffic and have on- and off-ramps throughout. Like Interstates, these roadways are designed to maximize long-distance mobility, and abutting land uses are not directly served by these roads.

[1] https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/section03.cfm

- **Other Principal Arterials**, which are main thoroughfares that limit cross-traffic and are often controlled by traffic signals. Principal Arterials still provide a high degree of mobility through both urban and rural areas, but adjacent land uses can be directly access from these roads through driveways.

- **Minor Arterials**, which interconnect and augment principal arterials. Minor arterials service trips of moderate length and serve geographic areas that are smaller than other arterials.

- **Major Collectors**, which serve to bring traffic from local roads to major and minor arterials. Generally, major collector routes are longer in length, have lower connecting driveway densities, higher speed limits, experience higher traffic volumes, and have more travel lanes than their minor counterparts.

- **Minor Collectors**, which augment major collectors and provide access to local roads. The difference between major and minor collectors is often difficult to distinguish, but minor collectors are often much shorter than major collectors, have fewer signalized intersections, and much lower speeds.

- **Local Roads**, which are generally those that serve individual houses and neighborhoods. Local roads account for the largest percentage of all roadways by mileage and are not intended for use in long-distance travel. Their function is often to provide a first- and last-mile connection to origins and destinations.

Principal arterials are often U.S. or state highways, but not all U.S. and state highways are arterials; some could serve other functions within the roadway network.

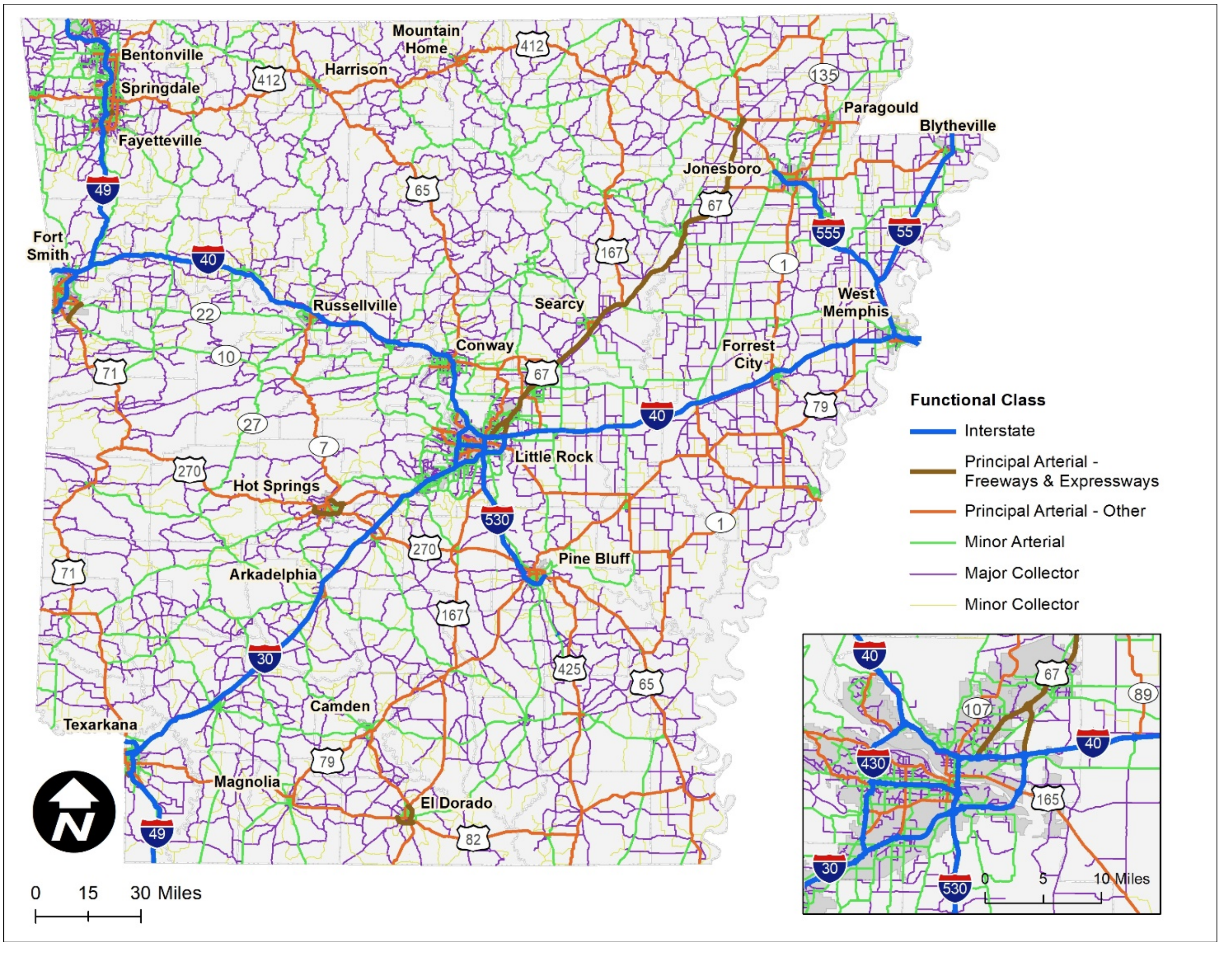
Table 2.1 shows the distribution of total mileage among these functional classifications in Arkansas. Interstates and other freeways and expressways make up just less than one percent of all mileage for a total of 937 miles across the state. Other arterials total 7,386 miles (just over seven percent of all mileage), and collectors total 21,158 miles (nearly 21 percent of all mileage). Local roads constitute the majority of roadway mileage with more than 73,122 miles (more than 71 percent of all mileages). Figure 2.2 shows a map of Arkansas roads by functional classification. Local roads are not displayed.

Table 2.1 Arkansas Roadway Mileage by Functional Classification

Route Type	Mileage	Percent of Total Mileage
Interstates	768	0.75%
Other Freeways & Expressways	169	0.16%
Other Principal Arterials	2,493	2.43%
Minor Arterials	4,893	4.77%
Major Collectors	14,020	13.66%
Minor Collectors	7,138	6.96%
Local Roads	73,122	71.27%
Total	**102,603**	**100.00%**

Source: Highway Performance Monitoring System, 2021

Figure 2.2 Arkansas Roadways by Functional Classification



Source: ArDOT, 2020

2.2 National Highway System

Another classification system for roadways is whether the road is part of the National Highway System (NHS), which is a federally-designated system of roads that is vital for the economic stability, national defense, and overall health of the U.S. The NHS is primarily composed of Interstates and other select principal arterials, as well as intermodal connectors. Intermodal connectors can be related to passenger movement or freight movement. Only the intermodal connectors designated for freight movement are discussed in this section.

Freight intermodal connectors are roads that lead to major intermodal facilities where large volumes of freight are exchanged and are considered key conduits for the timely and reliable delivery of goods. Criteria for being designated an intermodal connector are listed below in Table 2.2.

Table 2.2 Freight Intermodal Connector Criteria

Facility Type	Criteria
Commercial Aviation Airports	• Cargo – 100 trucks per day in each direction on the principal connecting route, or 100,000 tons per year arriving or departing by highway mode.
Ports	• Terminals that handle more than 50,000 TEUs (a volumetric measure of containerized cargo which stands for twenty-foot equivalent units) per year, or other units measured that would convert to more than 100 trucks per day in each direction. (Trucks are defined as large single-unit trucks or combination vehicles handling freight). • Bulk commodity terminals that handle more than 500,000 tons per year by highway or 100 trucks per day in each direction on the principal connecting route. (If no individual terminal handles this amount of freight, but a cluster of terminals in close proximity to each other does, then the cluster of terminals could be considered in meeting the criteria. In such cases, the connecting route might terminate at a point where the traffic to several terminals begins to separate).
Truck/Rail	• 50,000 TEUs/year, or 100 trucks per day, in each direction on the principal connecting route, or other units measured that would convert to more than 100 trucks per day in each direction. (Trucks are defined as large single-unit trucks or combination vehicles carrying freight).
Pipelines	• 100 trucks/day in each direction on the principal connecting route.

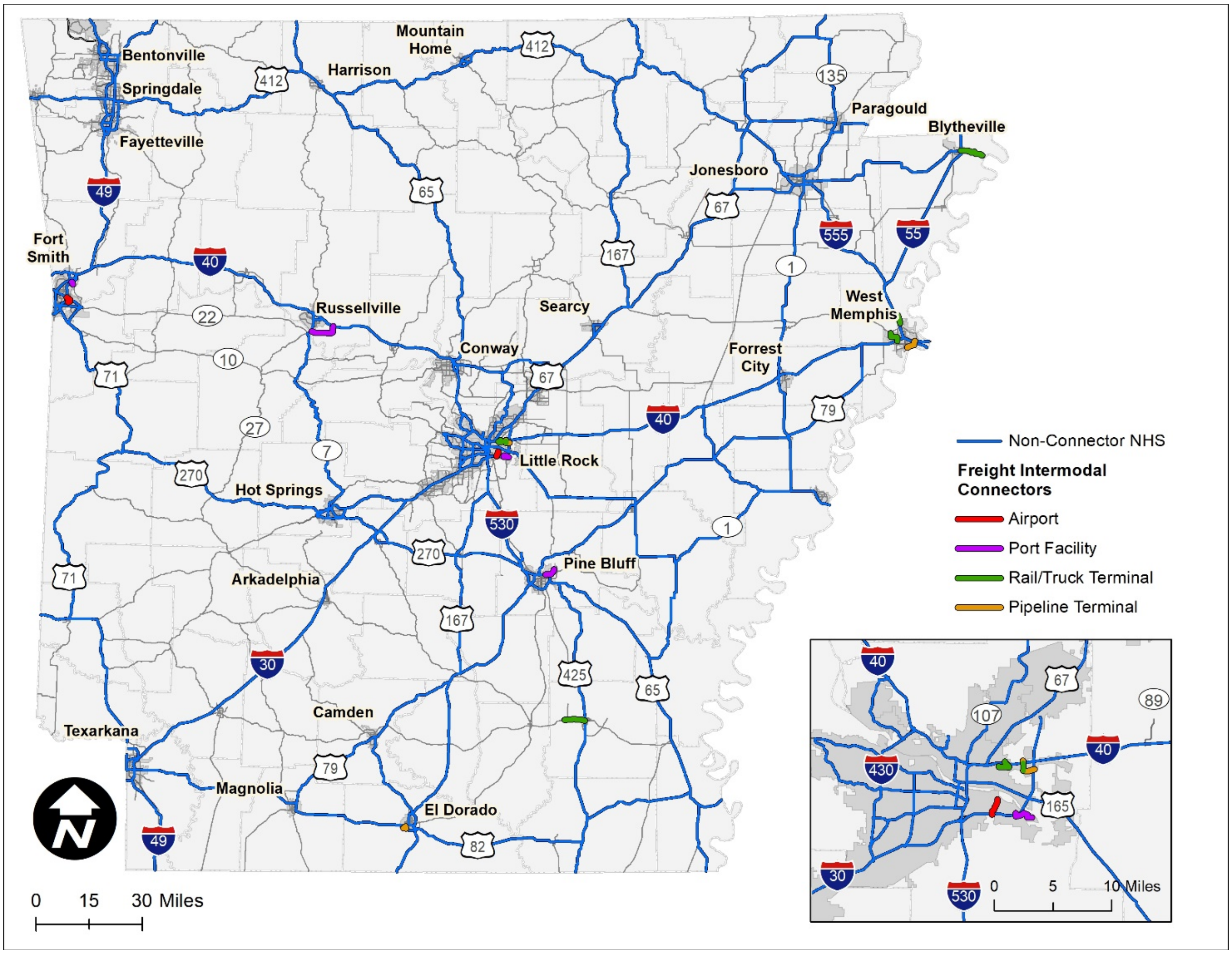
Source: Federal Highway Administration, NHS Intermodal Connector Selection Criteria, 2020

Additionally, there is a set of secondary criteria that can be used to justify the designation:

- Intermodal terminals that handle more than 20 percent of passenger or freight volumes by mode within a state.
- Intermodal terminals identified either in the Intermodal Management System or the state and metropolitan transportation plans as a major facility.
- Significant investment in, or expansion of, an intermodal terminal.
- Connecting routes targeted by the state, MPO, or others for investment to address an existing, or anticipated, deficiency as a result of increased traffic.

Figure 2.3 below shows the extent of the National Highway System in blue, with the freight intermodal connectors identified in red, purple, green, and orange depending on the facility they serve.

Figure 2.3 National Highway System



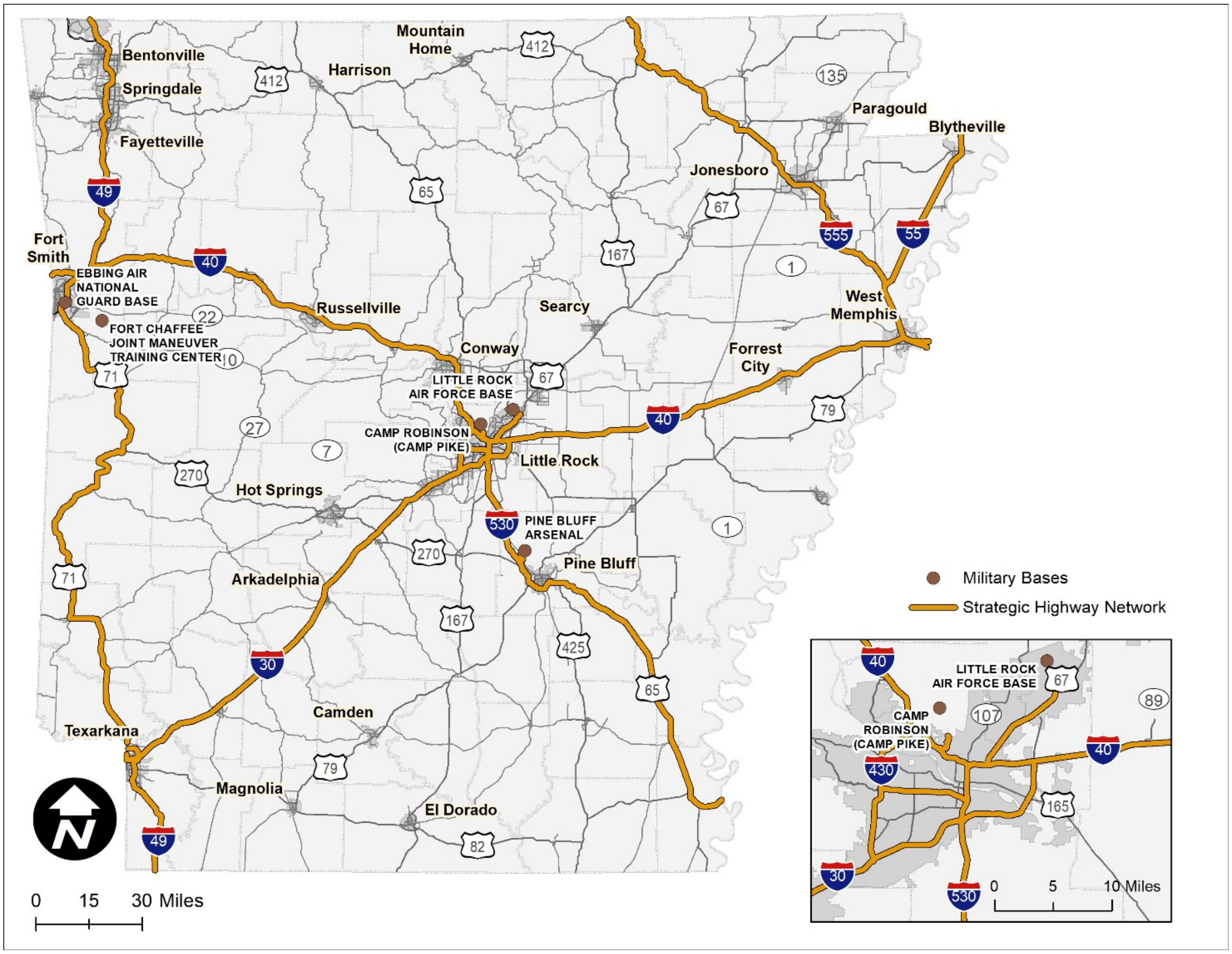
Source: Highway Performance Monitoring System

2.3 Strategic Highway Network

The U.S. Transportation Command developed the Strategic Highway Network (STRAHNET), which is a system of approximately 62,500 miles of roadways, including the Interstate System, which serves as the foundation of the U.S. Department of Defense's domestic on-the-ground operations. The STRAHNET defines the public highway network that is essential for supporting critical military and defense needs, including emergency mobilization and movement of goods including heavy armor, fuel, ammunition, repair parts, food, and other freight commodities that supports military operations. For Little Rock Air Force Base (AFB), U.S. Highway 67, U.S. Highway 167, Interstate 30 and Interstate 40 are the primary highways that support the movement of military equipment and aircraft spares from Little Rock AFB to Department of Defense destinations within the continental U.S. and military ports for overseas shipments. Little Rock AFB is the primary training location for all C-130 aircrew/maintenance training, and home to an operational C130 wing, Air National Guard and Air Force Reserve unit.[2]

The STRAHNET, combined with the Strategic Rail Corridor Network (STRACNET), strategic seaports, military airports, and other infrastructure facilities supports essential freight activity and goods movement for the U.S. military. Figure 2.4 shows the STRAHNET routes within Arkansas.

Figure 2.4 Strategic Highway Network



Source: Highway Performance Monitoring System

2 As part of the stakeholder outreach conducted as part of this State Freight Plan, ARDOT contacted personnel at the U.S. Transportation Command (USTRANSCOM), Pine Bluff Arsenal, and Little Rock Air Force Base (AFB) to discuss site-specific freight activity, challenges, and project/facility needs that would better facilitate essential goods movement at those two key sites in Arkansas. Little Rock AFB returned a written survey and provided information on freight activity, challenges, and capital improvement needs.

2.4 Freight System Designations

2.4.1 Federal – National Highway Freight Network

In the fall of 2015, Congress passed the Fixing America's Surface Transportation (FAST) Act, creating a new, long-term funding program for the nation's transportation system. One key element of the FAST Act is the creation of a National Highway Freight Network (NHFN), consisting of four subsystems of roadways:

- **Primary Highway Freight System (PHFS):** A network of roadways identified as the most critical highway portions of the U.S. highway freight transportation system determined by measurable and objective national data. Most of the PHFS consists of Interstates, but a portion are other high-trafficked roadways, and some are intermodal connectors (discussed above). Along with 23 miles of intermodal connectors, most of the Interstates in the state and part of U.S. Highway 67 make up the PHFS in Arkansas for a total of 604 miles of PHFS roadway.

- **Other Interstate Portions not on the PHFS:** The remaining Interstates that are not part of the PHFS make up this subsystem of roadways. I-430, I-530, I-540, I-555, and portions of I-49 are included in this category.

- **Critical Rural Freight Corridors (CRFCs):** These are designated public roads not in urbanized areas that provide access and connection to the PHFS and Interstate network for important ports, public transportation facilities, or other intermodal freight facilities. Arkansas has not yet designated any CRFCs.

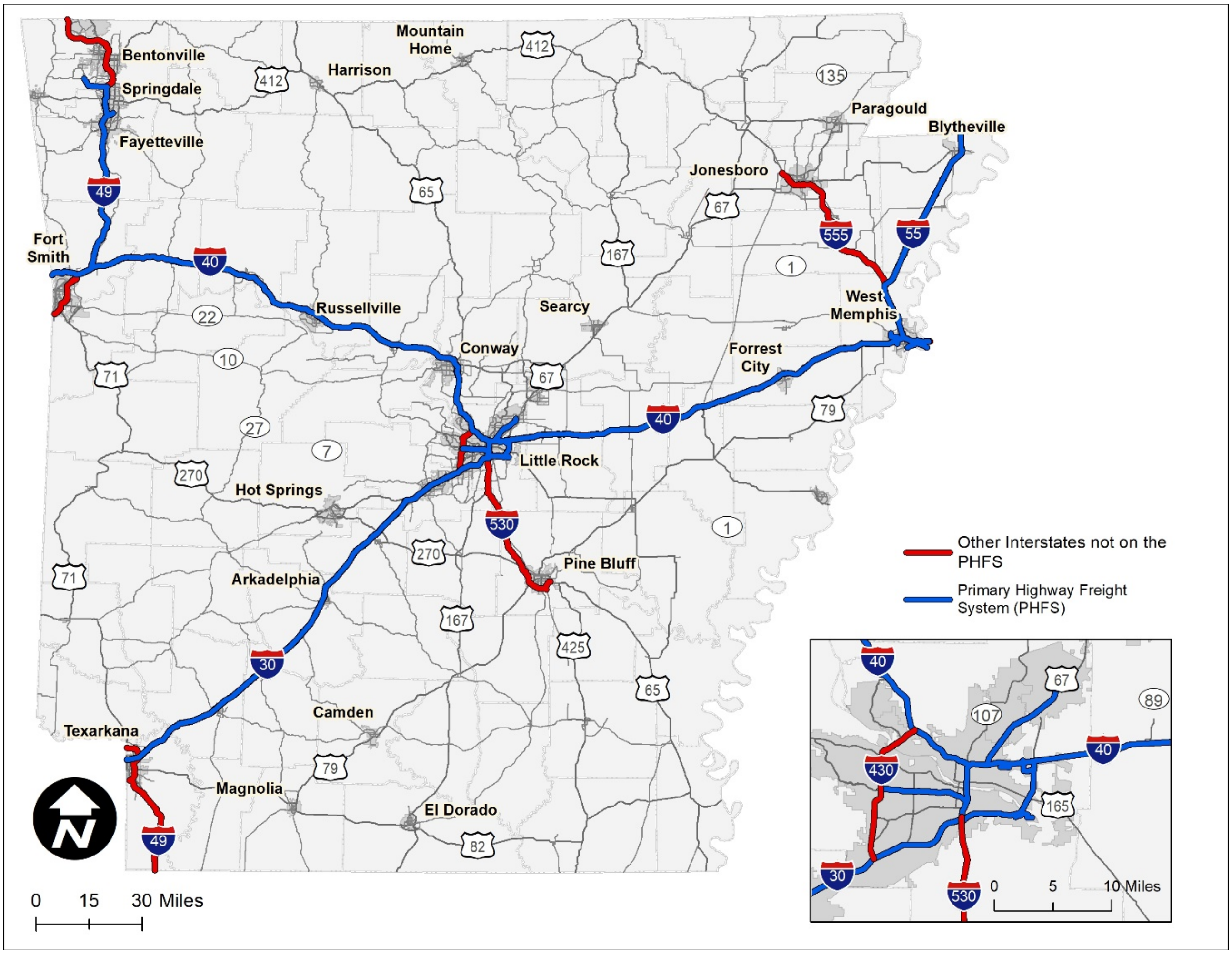
- **Critical Urban Freight Corridors (CUFCs):** These are the same as CRFCs, but are within urbanized areas. Arkansas has not yet designated any CUFCs.

With the passage of the Infrastructure Investment and Jobs Act (IIJA), the NHFN is able to be expanded beyond its current extent. Newly in the IIJA, a state with a population density lower than the national average (which applies to Arkansas), may designate either 600 miles or 25 percent of the amount of the PHFS (whichever is greater) as CRFCs. For Arkansas, this means the state can designate up to 600 miles of CRFCs. Additionally, the state is allowed to designate either 150 miles or 10 percent of PHFS mileage of roads (whichever is greater) as CUFCs. For Arkansas, this means the state can designate up to 150 miles of CUFCs.[3]

Figure 2.5 displays the Arkansas-portion of the National Highway Freight Network. The PHFS is in blue and other Interstates not on the PHFS are in red.

[3] https://www.fhwa.dot.gov/bipartisan-infrastructure-law/nhfp.cfm

Figure 2.5 Arkansas National Highway Freight Network



Source: Federal Highway Administration, 2021

2.5 Oversize and Overweight Vehicles and Weigh Stations

2.5.1 Size and Weight Restrictions

The maximum size and weight of vehicles is regulated by federal and state law. Vehicles over a certain size or weight must apply for Arkansas-specific oversize/overweight (OS/OW) permits. Oversized or overweight vehicles must be routed along corridors without impediments to their size or weight, such as low bridges, narrow roads, or roadways/bridges that cannot accommodate excess loads. Some of these permits carry additional restrictions, such as the restriction of OS/OW movements on certain Interstates during certain hours, the general restriction of these movements to clear-weather daylight hours only, requirement for escort vehicles, and speed limits on specific types of routes.

Maximum legal dimensions and weights are shown in Table 2.3. Any vehicle falling below these limits can operate without and OS/OW permit, but if a vehicle exceeds any of these limits, it would be necessary to obtain a permit. The complete list of rules and regulations can be found on ARDOT's website.[4]

Table 2.3 Legal Dimensions and Weight Limits for OS/OW Movements

Measure	Limit
Width	8 feet, 6 inches (8 feet for manufactured homes)
Height	14 feet
Length	Determined by trailer length
Trailer Length	53 feet, 6 inches
Weight	80,000 lbs gross weight of vehicle(s) and cargo on 5 or more axles. Additionally, must meet the Federal bridge formula for 80,000 lbs
Axle Weight	• Single Load-Carrying Axle: 20,000 lbs • Tandem Axle Group: 34,000 lbs • Tri-Axle Group: 50,000 lbs • Steer Axle: 12,000 to 20,000 lbs, axle must be rated by the manufacturer for weight • Tandem Steer/Front Axle: 24,000 lbs

Source: ARDOT Permit Rules, 2019

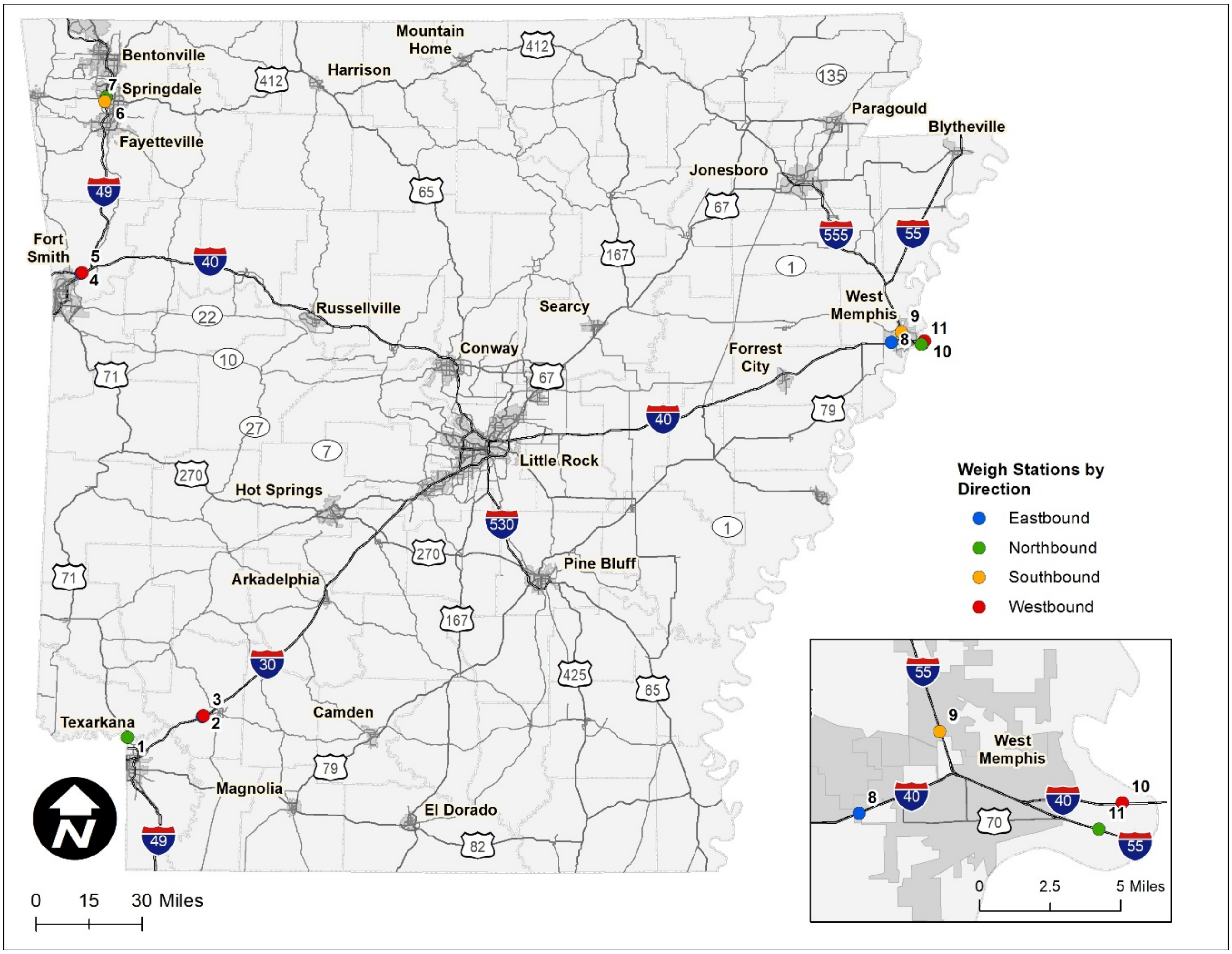
From March 2021 to March 2022, ARDOT issued and managed 173,094 permits, which translated to almost $17 million in permit fees.

2.5.2 Weigh Stations

One method to enforce the movement of OS/OW vehicles is to check truck weight at weigh stations. In Arkansas, there are 11 weigh stations statewide, all but one of which are on Interstates. A map of these weigh stations is shown in Figure 2.6 and a list of these stations is shown in Table 2.4. The one weigh station that is not on an Interstate is Weigh Station 1 in Little River County. In general, all of these weigh stations are near the borders of the state. This map and list do not include weigh-in-motion (WIM) sites.

[4] https://www.ardot.gov/wp-content/uploads/2020/10/2019-PERMIT-RULES.pdf

Figure 2.6 Arkansas Weigh Stations



Source: ArDOT, 2021

Table 2.4 List of Arkansas Weigh Stations

ID	Route	Direction	County	Location
1	U.S. Highway 71	Northbound	Little River	Ogden
2	I-30	Eastbound	Hempstead	Hope
3	I-30	Westbound	Hempstead	Hope
4	I-40	Eastbound	Crawford	Alma
5	I-40	Westbound	Crawford	Alma
6	I-49	Northbound	Washington	Springdale
7	I-49	Southbound	Washington	Springdale
8	I-40	Eastbound	Crittenden	Lehi
9	I-55	Southbound	Crittenden	Marion
10	I-40	Westbound	Crittenden	West Memphis
11	I-55	Northbound	Crittenden	West Memphis

Source: ARDOT, 2021

2.6 ITS Infrastructure

The Intelligent Transportation Systems (ITS) Section (in the Maintenance Division) at ARDOT is responsible for much of the roadway technology infrastructure used to operate roadways. An essential component of ARDOT's ITS portfolio is the transportation management center (TMC), which is a control room from which the state's roadways are monitored. Employees at the TMC monitor, detect, and report on incidents that affect the roadway network, such as crashes, and will assist with the clearing of these incidents and the return to normal of roadway operations. This is done primarily through traffic data feeds and strategically-placed cameras.[5]

TMC employees also assist with updates to ARDOT's dynamic message signs, which allow for the display of traffic information and other pertinent travel information to drivers, such as warnings about major incidents on the roadway and reminders to drive safely.[5]

Adjacent to the TMC is infrastructure for the operation of the land mobile radio (LMR) system. LMR is a communication system consisting of two-way radios that can be stationary, mobile, or handheld. This infrastructure supports effective ARDOT and police communication throughout the state and allows and combines with the TMC to ensure the continued operation of ARDOT roadways.[5]

In the future, ARDOT will continue to implement transportation technology to allow the roadway system to function at its highest level. In the near term, this will include ITS improvements along Interstate highways, including additional cameras, wrong-way detection systems, and dynamic signage to support alternate routing. ARDOT has also explored the installation of truck parking notification systems to allow truck drivers to know where spots are available, and the deployment of automated/connected vehicle infrastructure. In addition, ARDOT is currently developing the first statewide Transportation Systems Management and Operations (TSMO) Plan and anticipates updating the Statewide ITS Plan . These planning efforts represent an opportunity for ARDOT to identify and plan for the ITS needs of the roadway freight system.

[5] https://www.ardot.gov/divisions/maintenance/intelligent-transportation-systems/

3.0 Highway Freight Transportation Demand

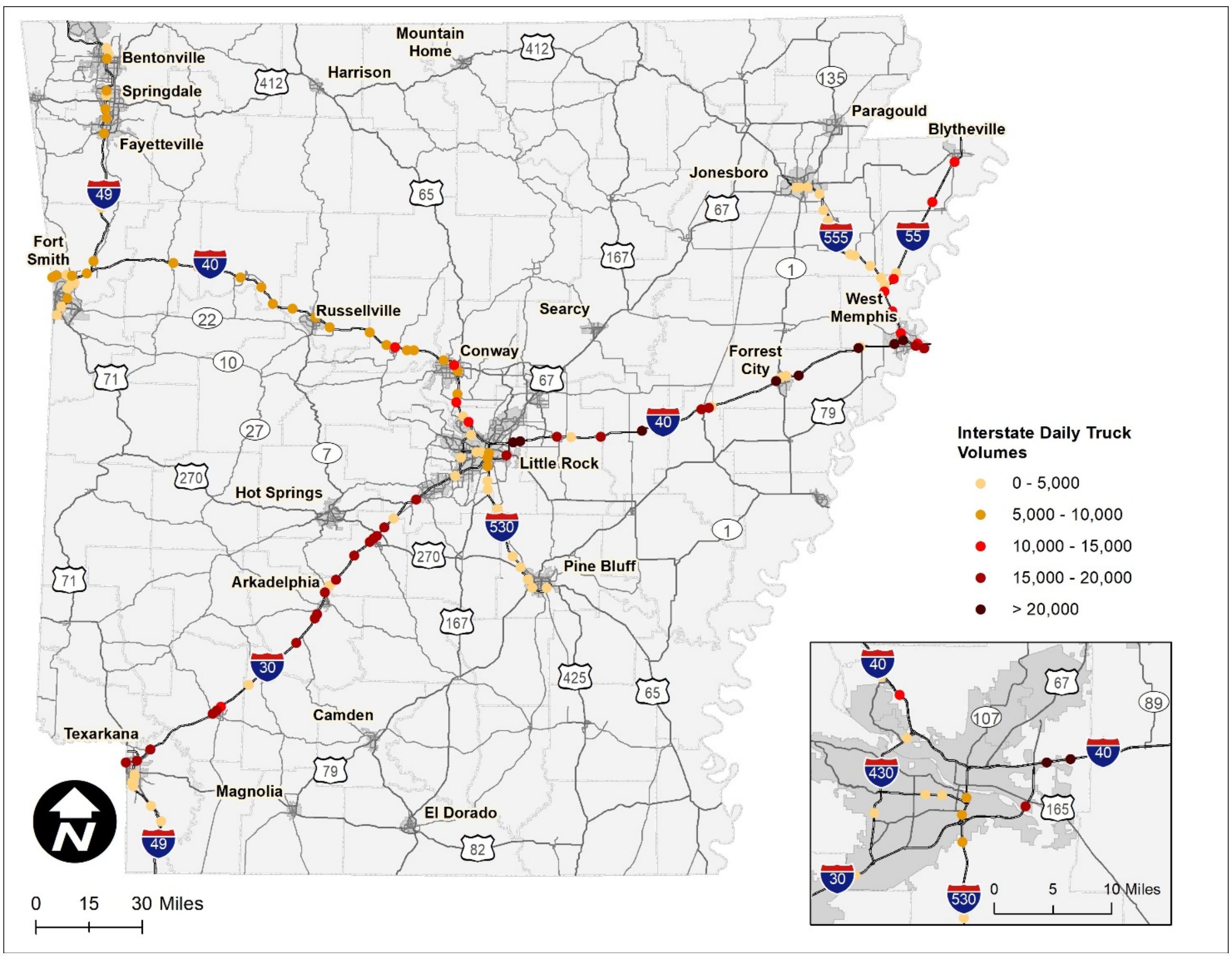
Highway freight transportation demand refers to how many trucks are using Arkansas' roadways, what they are carrying, and what markets are served. This section analyzes the demand for truck traffic throughout the state, the demand for goods and commodities carried by truck, and the demand for truck parking.

3.1 Truck Volumes

Figure 3.1 depicts truck volumes at point locations along Interstates in Arkansas. The highest truck volumes are experienced along the Interstate 30, Interstate 40, and Interstate 55 corridors. Between Little Rock and West Memphis, Interstate 40 experiences truck volumes of over 20,000 per day, and between Texarkana and Little Rock, Interstate 30 experiences over 15,000 trucks per day.

The most lightly-traveled Interstate segments for trucks are Interstate 49 south of Fayetteville, Interstate 530 south of Little Rock, and Interstate 49 south of Texarkana. These locations see, on average, under 5,000 trucks per day.

Figure 3.1 Interstate Daily Truck Volumes in Arkansas, 2020

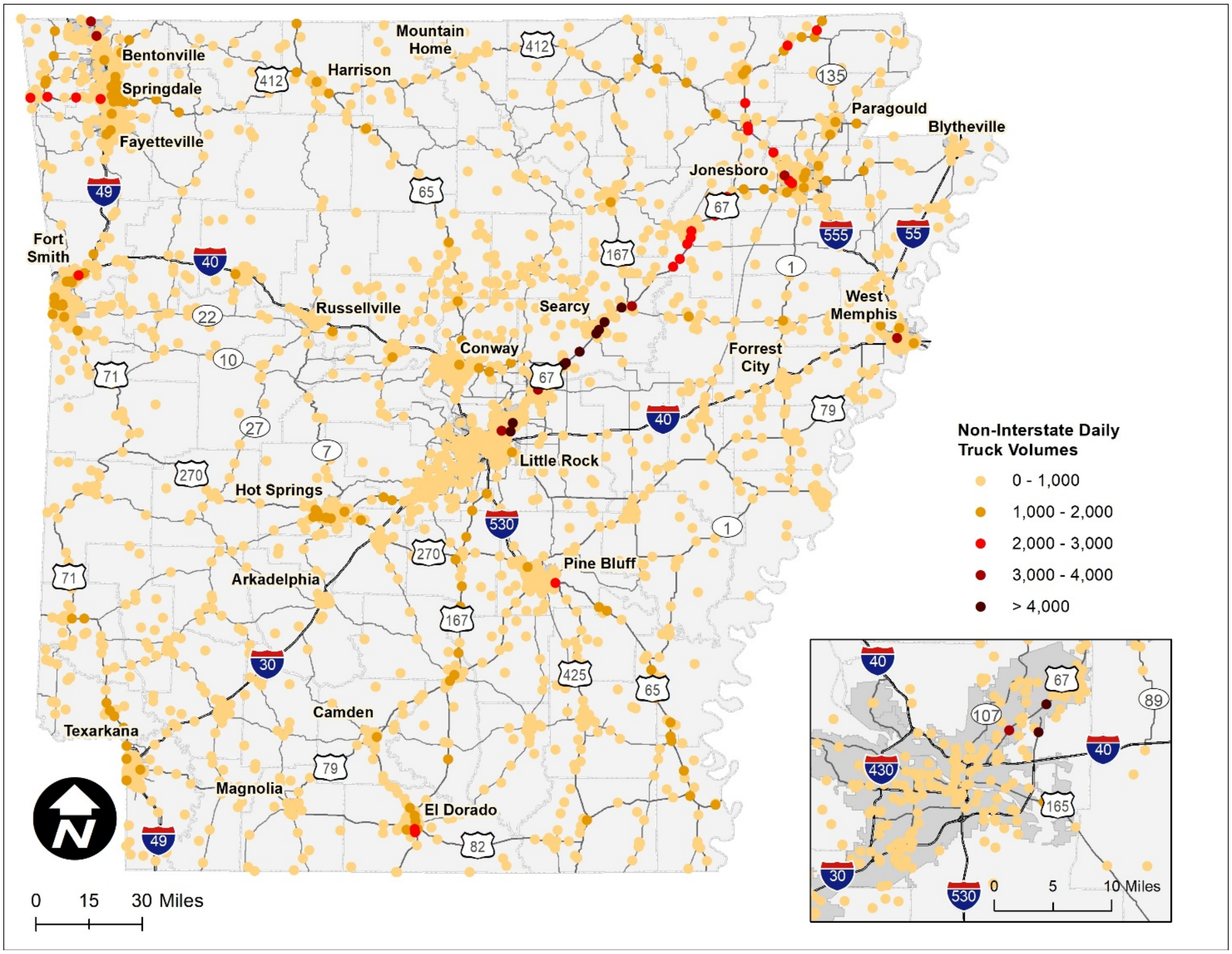


Source: ARDOT

Figure 3.2 depicts truck volumes along non-Interstate roadways in the state. These volumes are generally much lower than Interstate volumes. The non-Interstate truck volumes are experienced on U.S. Highway 67 as it goes northeast from Little Rock with over 4,000 trucks per day. While it is not an Interstate, this is one of the few non-Interstate roads in the state that is limited-access, and can therefore accommodate a larger amount of truck traffic.

Other areas of note are U.S. Highways 63 and 67 west of Jonesboro and U.S. Highways 71 and 412 near Bentonville and Springdale, which all experience in the range of 2,000 – 4,000 trucks per day.

Figure 3.2 Non-Interstate Daily Truck Volumes in Arkansas, 2020



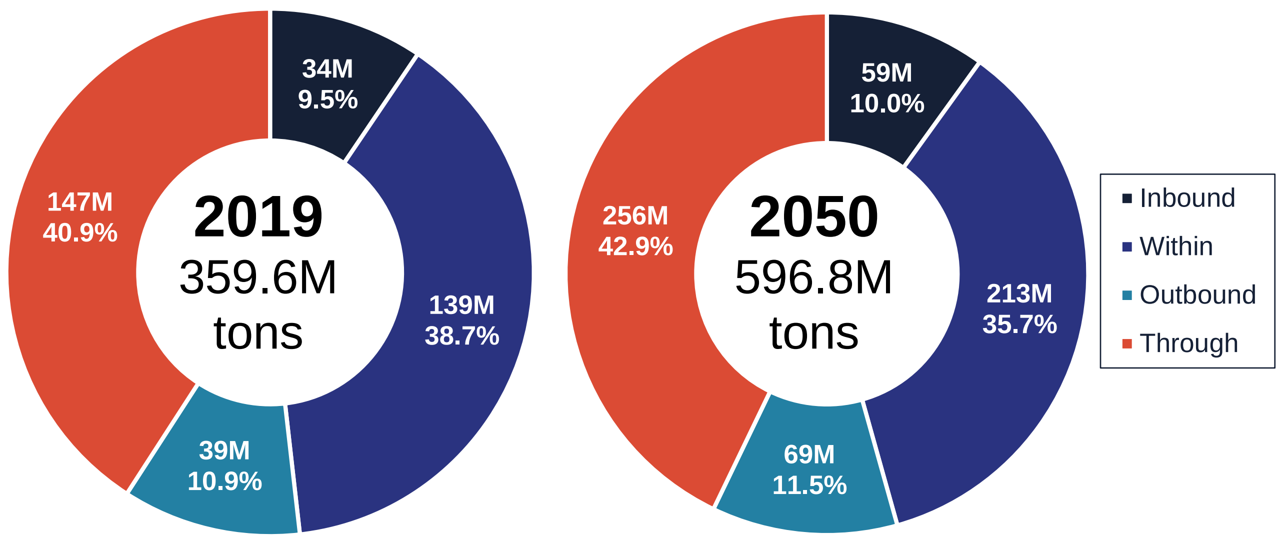
Source: ArDOT

3.2 Commodity Flow Analysis

This section details statewide commodity flows by truck. In 2019, trucks transported almost 360 million tons of freight worth more than $770 billion on Arkansas' roadways, which is expected to grow to almost 600 million tons worth over $1.5 trillion in 2050. Figure 3.3 (tonnage) and Figure 3.4 (value) show the breakdown of these shipments by the direction of movement. By tonnage, inbound and outbound shipments made up roughly 10 to 11 percent respectively in 2019, which is expected to remain true in 2050. In both periods, truck movement is dominated by through-state and intra-state movements. Through-state movements are truck shipments that start in a state other than Arkansas and end in a state other than Arkansas, but pass through the state during the journey. Intra-state movements are those that start and end in Arkansas.

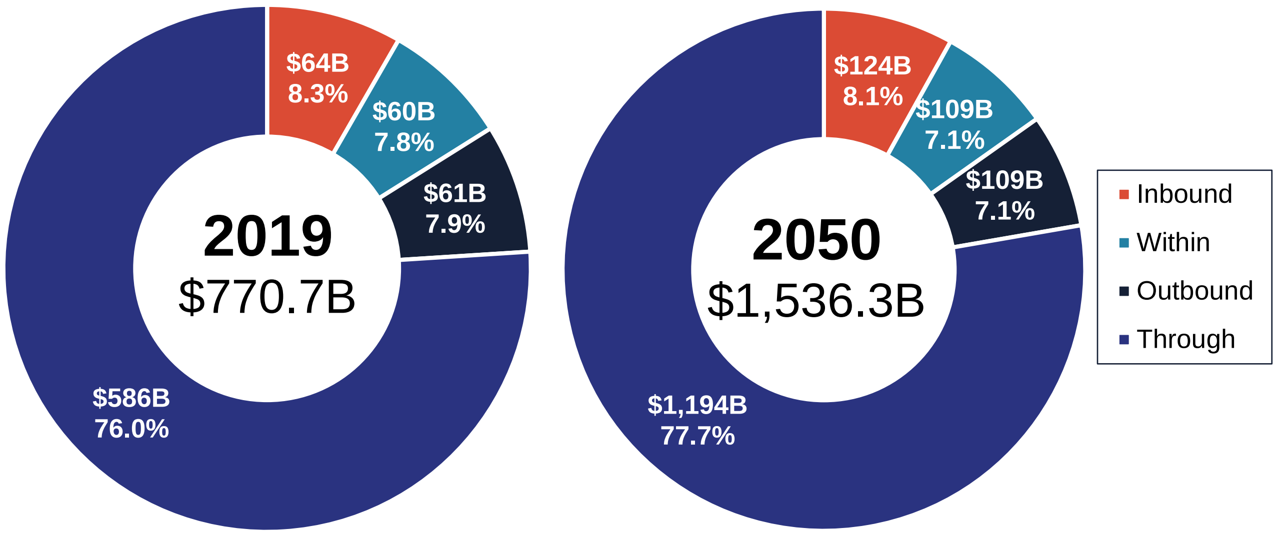
By value, the inbound, intra-state, and outbound directions each make up roughly seven to eight percent in both time periods, while through-state truck shipments made up the overwhelming majority with over 75 percent of the truck value shipped in 2019, which is expected to remain true in 2050.

Figure 3.3 Annual Arkansas Truck Tonnage, 2019 and 2050



Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

Figure 3.4 Annual Arkansas Truck Value, 2019 and 2050



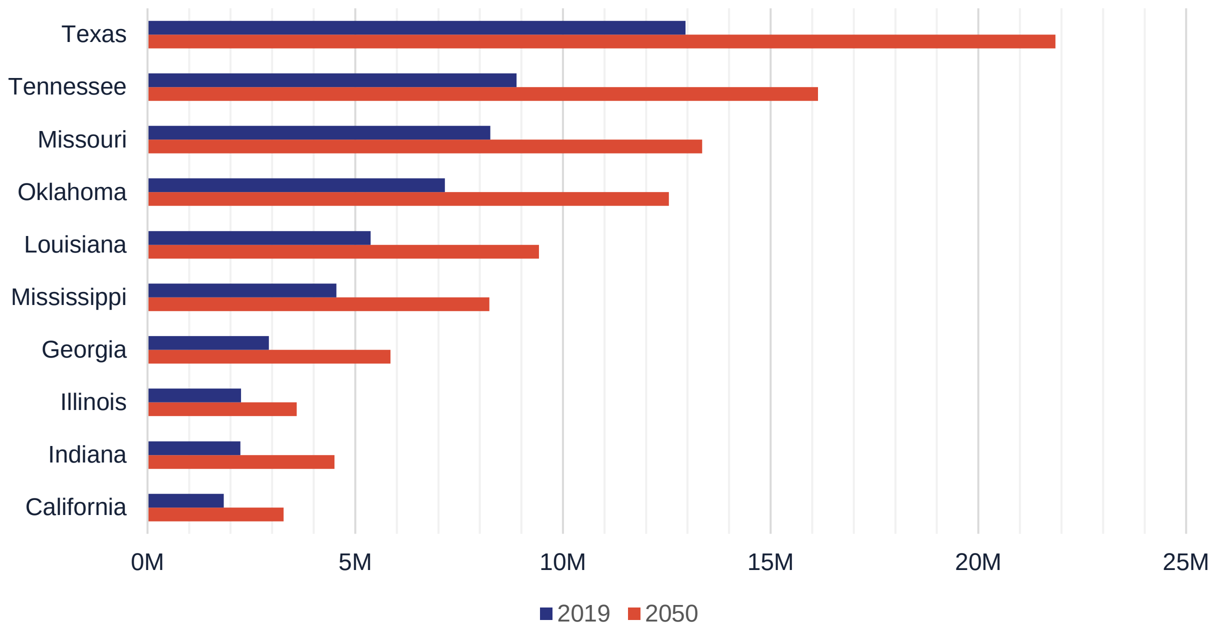
Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

3.2.1 Top Truck Trading Partners

Figure 3.5 and Figure 3.6 display the top domestic trading partners with Arkansas by truck tonnage and truck volume, respectively. Truck shipments are more competitive for shorter distances as compared to rail or air, and as such neighboring states make up the top six domestic truck trading partners. Texas trades the most with Arkansas with almost 13 million tons in 2019, which is projected to grow to almost 22 million in 2050. Outside of the neighboring states, the top states are Georgia, Illinois, Indiana, and California.

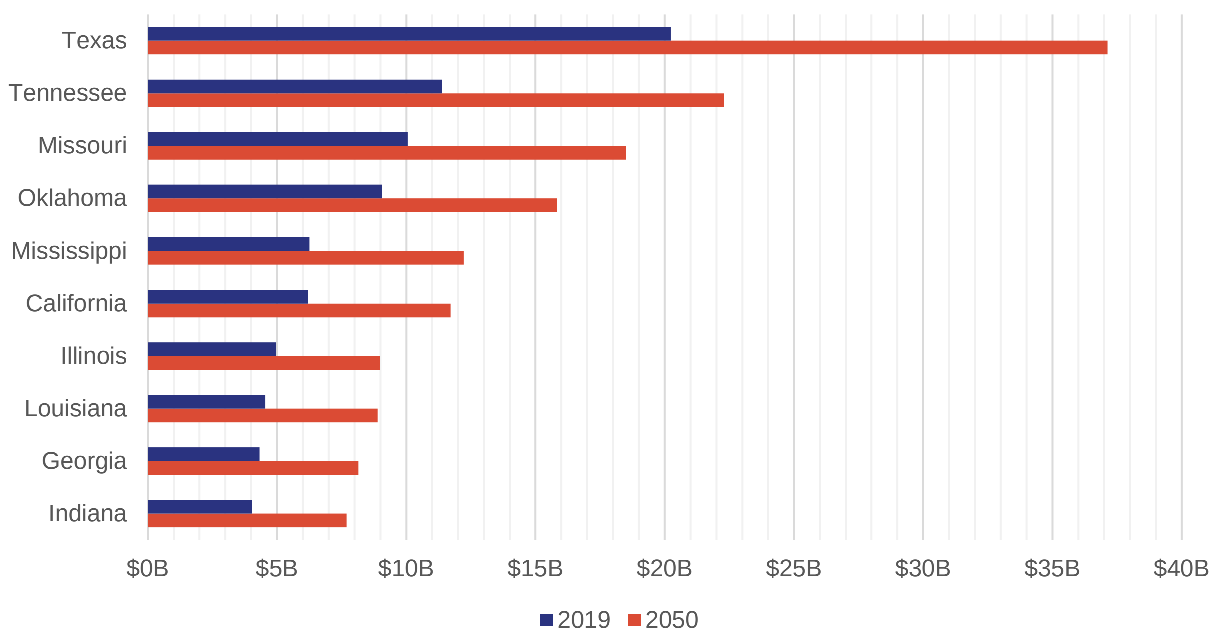
By value, the top five trading partners are also neighboring states, but California and Illinois are ranked six and seven respectively, with more trade than neighboring Louisiana. The top trading partner by value is Texas, with over $20 billion traded by truck in 2019, which is projected to grow to over $37 billion in 2050.

Figure 3.5 Top Domestic Truck Trading Partners by Tonnage, 2019 and 2050



Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

Figure 3.6 Top Domestic Truck Trading Partners by Value, 2019 and 2050

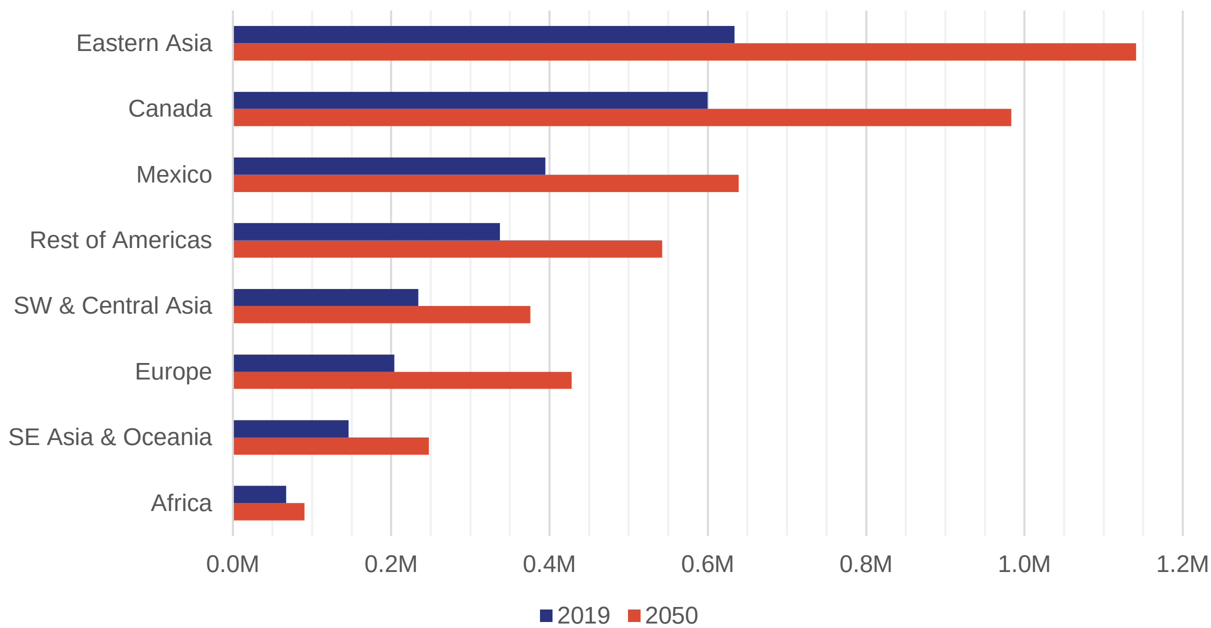


Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

Although Arkansas does not share any land borders with foreign countries, some truck movements in the state are generated because of international freight movements. Such international freight movements include shipments that arrive either by air at one of the state's airports or by water at an international water port close to the state. These shipments are moved to/from Arkansas by truck from/to the port of entry. Therefore, it is important to look at the Arkansas' international trading partners by truck while noting such movements are a combination of truck and air, or truck and water, etc.

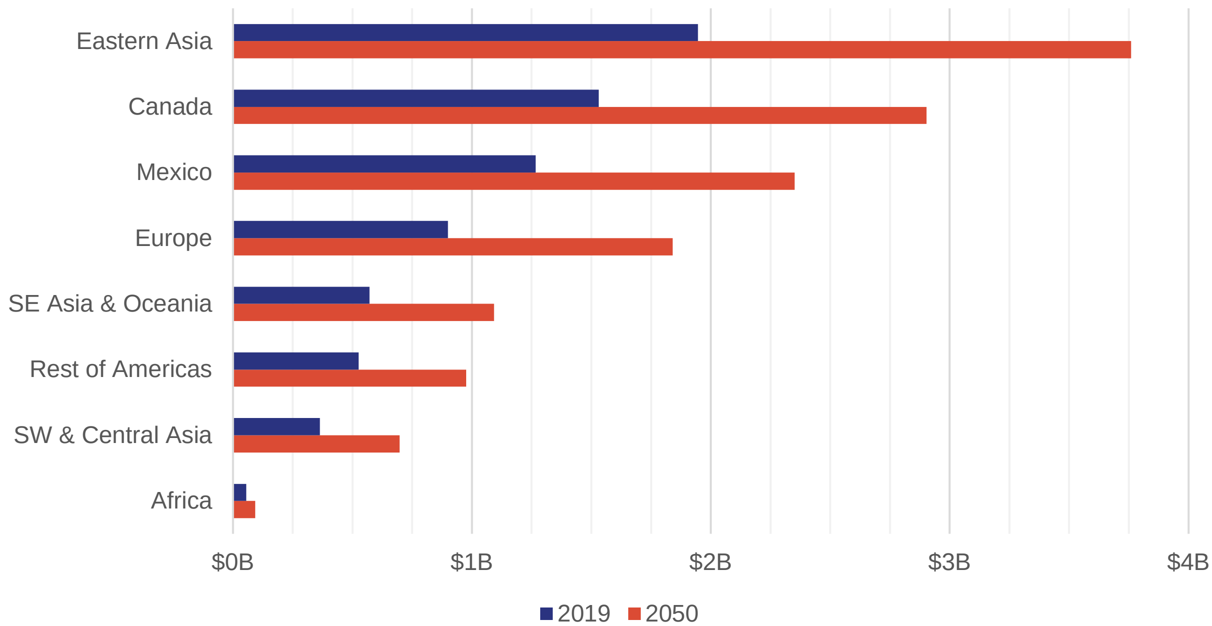
Figure 3.7 and Figure 3.8 display the top international trading partners with Arkansas by truck tonnage and truck value, respectively. In 2019, Eastern Asia was both the top trading partner in terms of tonnage (over 0.6 million tons) and value (almost $2 billion). That region is expected to maintain the top rank in 2050 when the tonnage increases to over 1.1 million and the value increases to over $3.75 billion. In each of the tonnage and value ranks, Canada and Mexico are the next two highest trading partners, in that order.

Figure 3.7 Top International Truck Trading Partners by Tonnage, 2019 and 2050



Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

Figure 3.8 Top International Truck Trading Partners by Value, 2019 and 2050



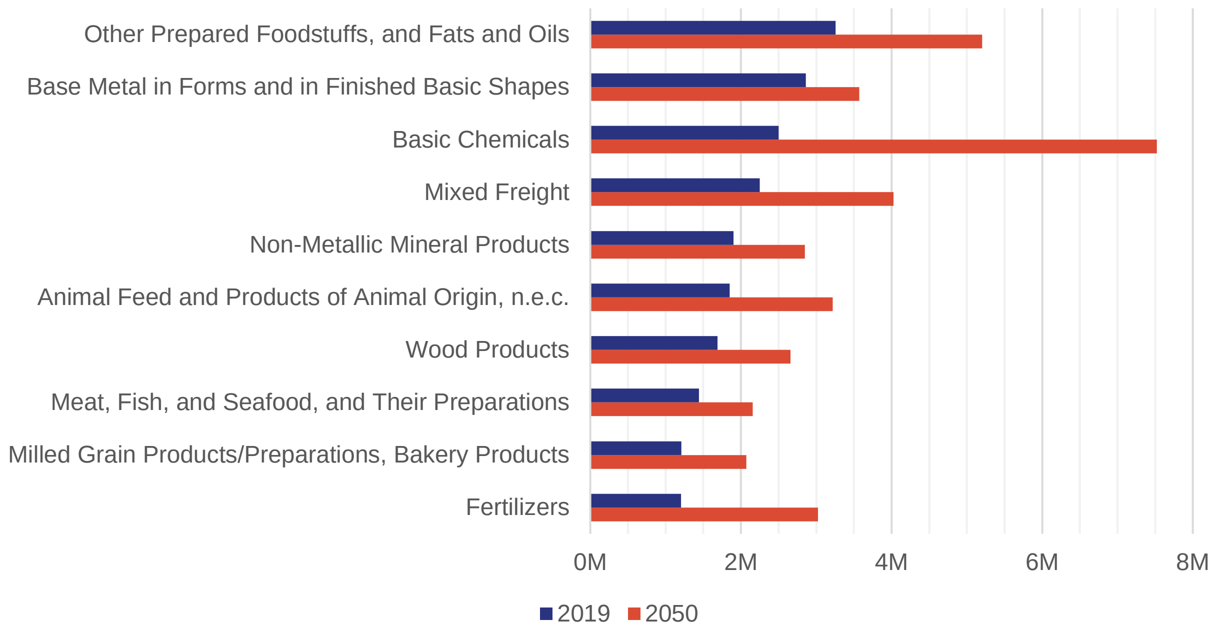
Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

3.2.2 Top Commodities Moved by Truck

Figure 3.9 and Figure 3.10 display the top inbound truck commodities by tonnage and value, respectively. These are commodities that come from other locations by truck and end in Arkansas. In 2019, the top commodity by weight was other prepared foodstuffs, which includes fats and oils, with over 3 million tons shipped by truck. This is expected to change in 2050 when the top commodity is projected to be basic chemicals, increasing by about 300 percent from 2.5 million tons in 2019 to 7.5 million tons in 2050.

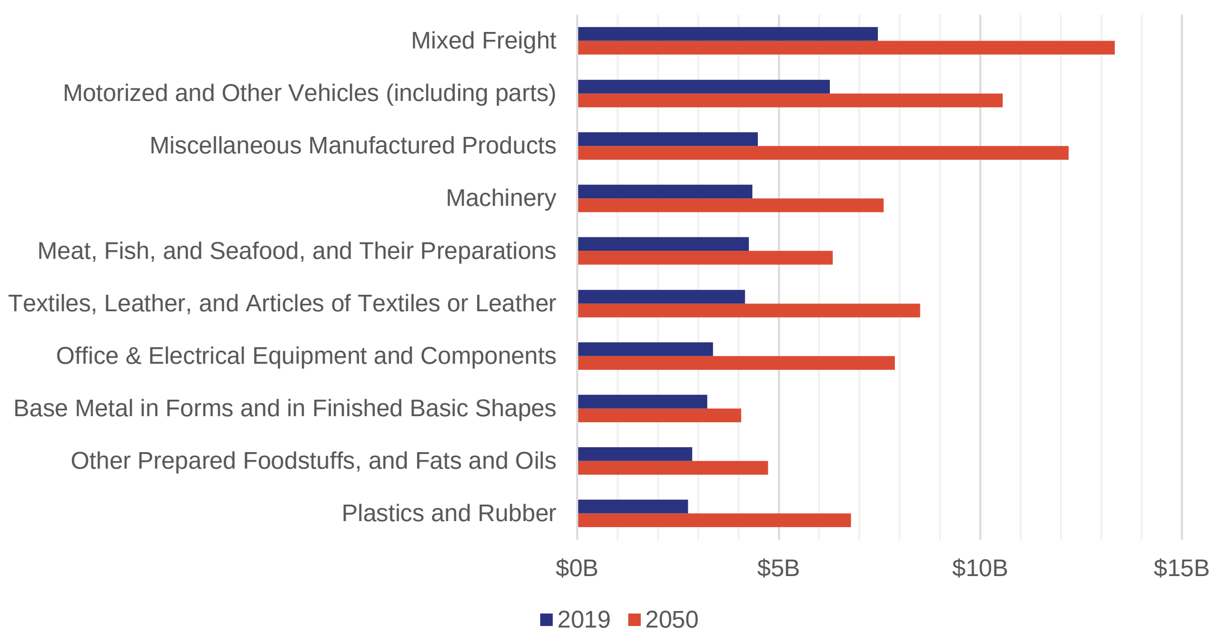
By value, mixed freight, also known as containerized freight, ranked highest in 2019 and is expected to rank highest in 2050, with about $7.5 billion and $13 billion shipped in those years, respectively. The other two top commodities by value in both years are motorized vehicles (including parts), and miscellaneous manufactured products.

Figure 3.9 Top Inbound Truck Commodities by Tonnage, 2019 and 2050



Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

Figure 3.10 Top Inbound Truck Commodities by Value, 2019 and 2050

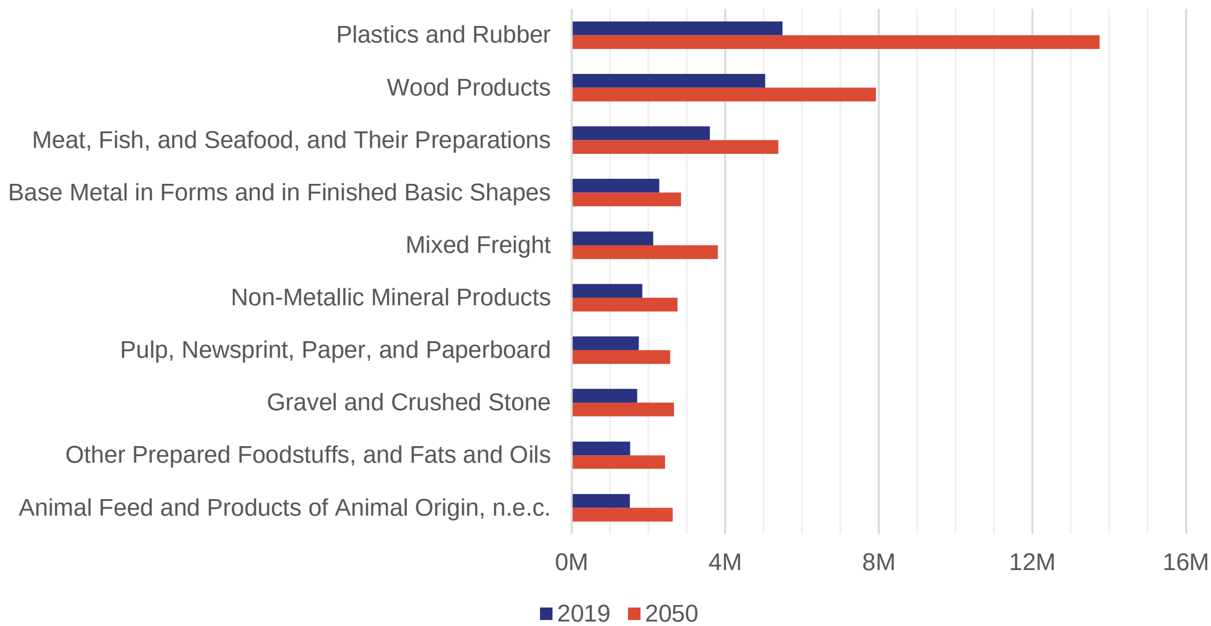


Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

Figure 3.11 and Figure 3.12 display outbound truck commodities by tonnage and value, respectively. These are commodities that start in Arkansas and end in another location. In 2019, the top three outbound commodities were plastics and rubber, wood products, and meat, fish, and seafood, and these are expected to remain the top commodities in 2050. While all of the top commodities are expected to grow sbetween 2019 and 2050, outbound Plastics and Rubber shipments are projected to increase the most, more than doubling from 5.5 million tons to almost 14 million tons.

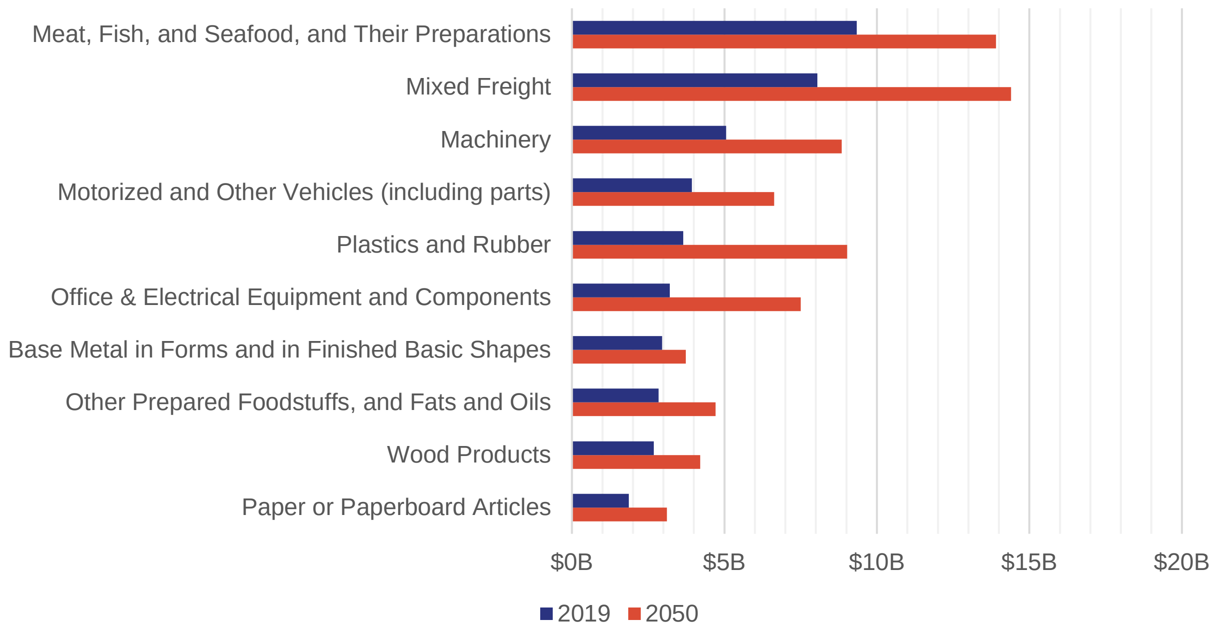
By value, the top commodity in 2019 was meat, fish, and sea food with almost $9.5 billion in outbound shipments. However, by 2050, the top commodity is projected to be mixed freight with over $14 billion, matching the current top inbound commodity by value.

Figure 3.11 Top Outbound Truck Commodities by Tonnage, 2019 and 2050



Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

Figure 3.12 Top Outbound Truck Commodities by Value, 2019 and 2050

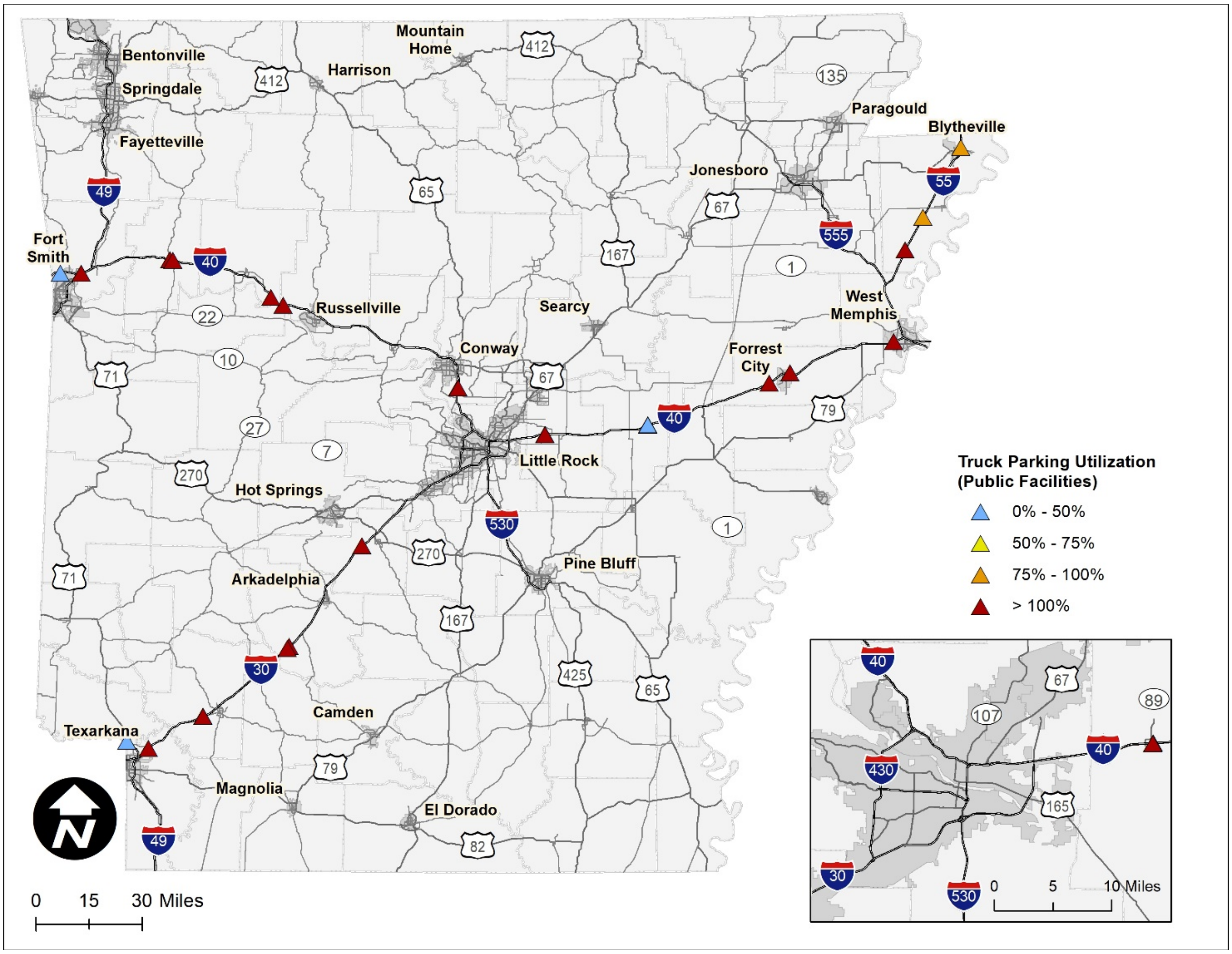


Source: Freight Analysis Framework Version 5, 2021; Analysis by Cambridge Systematics

3.3 Truck Parking

Figure 3.13 shows truck parking in public ARDOT facilities along Interstates, colored by their utilization. Utilization generally refers to the percentage of truck parking spaces that are used by trucks at a specific point in time, in this case a single overnight period in 2019. During that time, the total number of legal spaces was counted, and the total number of trucks parked at or near the facility were counted. When the number of trucks parked exceeds the number of legal spaces, the utilization ratio is over 100 percent (corresponding to a dark red color on the map). In some instances, trucks were illegally parked on ramps or shoulders near truck parking facilities that were over-capacity. For this truck parking survey, 20 out of the 26 public truck parking locations were over capacity.

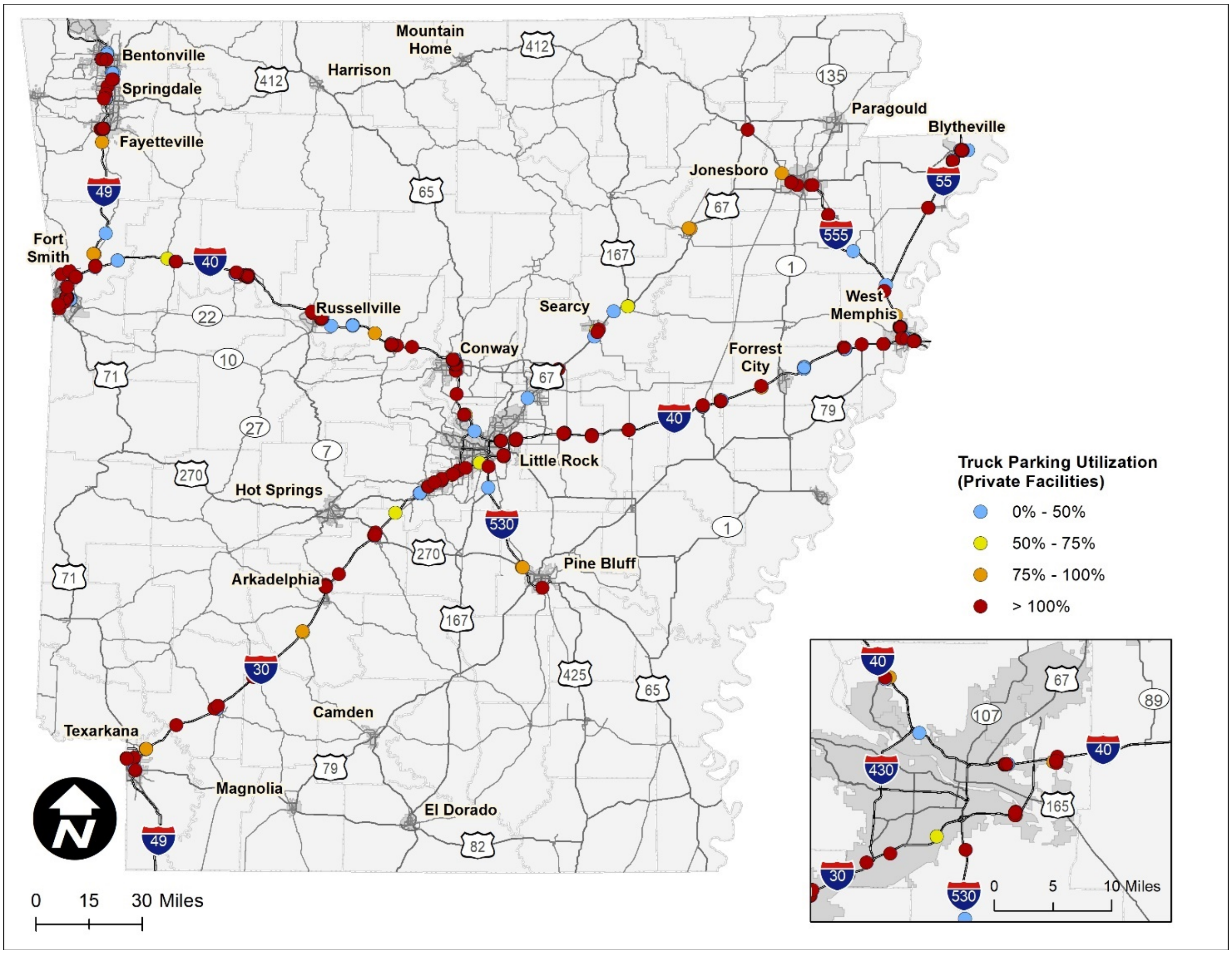
Figure 3.13 Truck Parking in Public ARDOT Facilities, 2019



Source: ARDOT

Figure 3.14 shows similar data, but for private truck parking facilities. In general, these are located right off of the Interstate and other limited-access road exits. Similarly to the public parking facilities, many of the private facilities were over-capacity. In total, 133 of the 283 surveyed private parking locations were over capacity. These locations are distributed fairly evenly across the state's roadways, without any obvious clusters of under- or over-utilization.

Figure 3.14 Truck Parking in Private Facilities, 2019



Source: ARDOT

One of the most pressing needs identified by stakeholders through outreach sessions and Freight Advisory Committee meetings was the need for more and expanded truck parking throughout the state, which echoes the findings by these analyses. The shortage of truck parking can be attributed to multiple factors, including:

- The high cost of constructing truck parking facilities, which limits the ability of public agencies to provide such facilities;
- Market conditions (such as the presence of competing facilities that provide accommodations for truck drivers), which drive private-sector decision-making; and
- Imposition of federal hour-of-service requirements and vehicle logging, which impacts the timing and selection of truck parking.

4.0 Condition and Performance

The condition of Arkansas' pavement and bridge infrastructure affects not only the speed and reliability of freight, but also the wear and tear on trucks using the network. Likewise, a higher-performing roadway freight network will ease the burden of freight travel across the state. Both the condition and performance of infrastructure impacts economic activity. This section analyzes pavement condition, bridge condition, and performance of Arkansas' roadway freight network.

4.1 Pavement Condition

Table 4.1 and Figure 4.1 show the pavement condition on Arkansas roadways. One metric that ARDOT uses to track pavement condition is the International Roughness Index (IRI), an industry-standard metric used to quantify road surface roughness. IRI is reported in inches-per-mile, and describes how much total vertical movement a standard passenger vehicle would experience if driven over a one-mile segment of pavement. A higher IRI value indicates a rougher surface.

It is standard to break IRI values into three categories, shown below:

- An IRI under 95 inches/mile is considered a "good" pavement condition.
- An IRI between 95 and 170 is considered a "fair" pavement condition.
- An IRI above 170 is considered a "poor" pavement condition.

It should be noted that available data does not cover all roadways in the state (only the Arkansas Primary Highway Network and systems of higher classification), but it does cover most of the Interstates, U.S. highways, and other state highways (along with some select local roads).

Table 4.1 shows that the worst overall pavement conditions are seen on principal arterials, with each category experiencing the lowest "good" pavement percentage (55-60 percent) and the highest "poor" pavement percentage (9-11 percent). Minor arterials and Interstates are in the middle with roughly 70-80 percent "good" pavement quality, and collectors and local roads have the best pavement quality with 90-99 percent "good" pavement quality. Generally, collectors and local roads experience lower traffic volumes, which may explain why these roads are in better condition. More traffic, especially truck traffic, increases the structural demand on roadways leading to pavement deterioration.

It should be noted of the Local roads in particular that the reported values represent a small (approximately 40 mile) sample, specifically those that are on the National Highway System. Hence, some results will not be representative of the larger system of roadways.

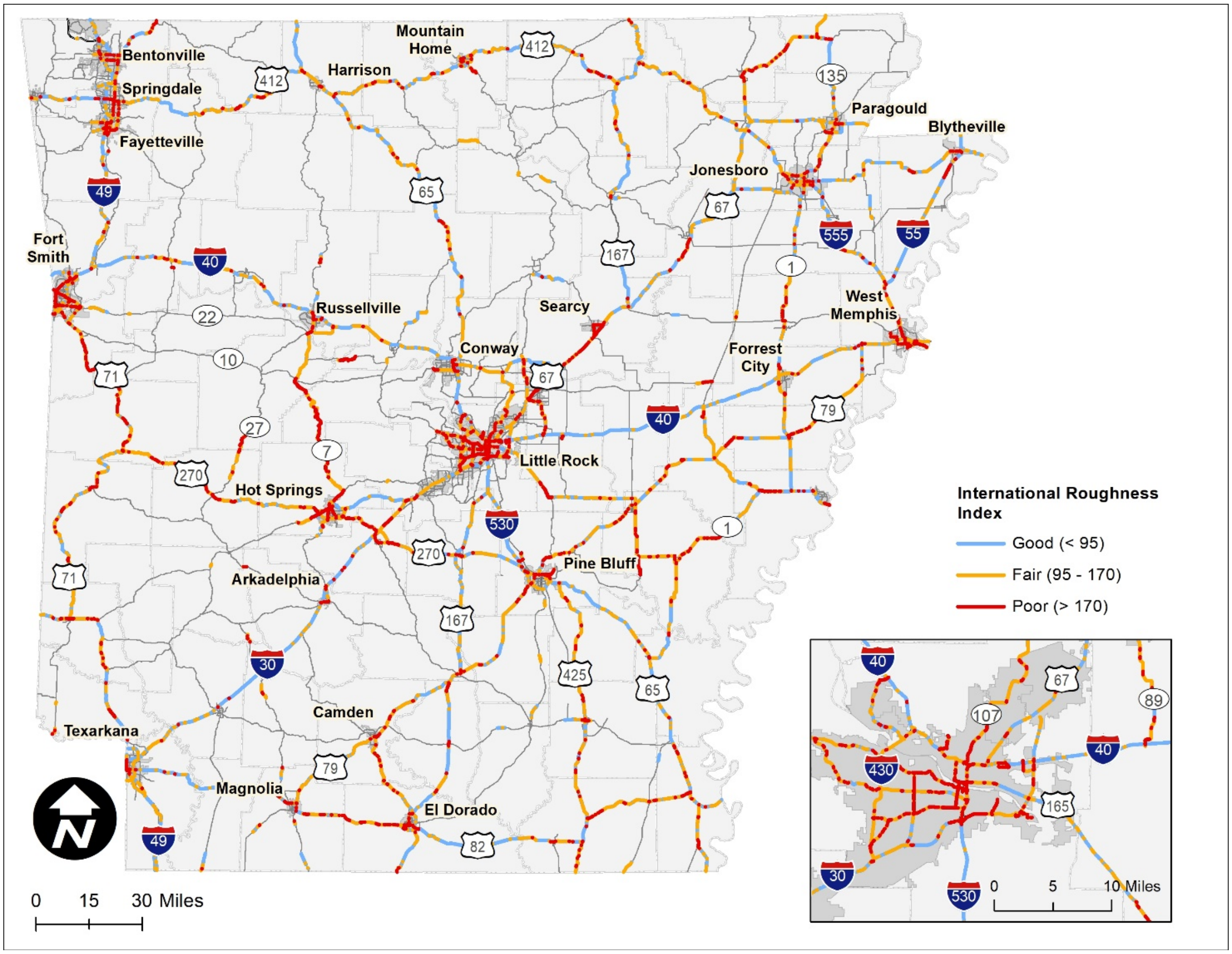
Table 4.1 Pavement Conditions by Route Type, 2020

Route Type	% Good by Mileage	% Fair by Mileage	% Poor by Mileage
Interstates	78.4%	17.9%	3.7%
Other Freeways & Expressways	59.5%	30.2%	10.3%
Other Principal Arterials	56.5%	34.5%	9.1%
Minor Arterials	74.6%	18.3%	7.1%
Major Collectors	93.6%	4.2%	2.2%
Minor Collectors	98.2%	0.8%	1.0%
Local Roads	91.3%	3.7%	5.0%

Source: ARDOT

Figure 4.1 shows a map of pavement conditions across the state. Generally, roads in rural areas are in better condition than those in rural areas. From a maintenance standpoint, it should be noted that it is generally more difficult to manage urban roadway conditions as urban roadways tend to operate closer to capacity, which makes it difficult to maintain satisfactory traffic operations in work zones, particularly when lane closures are required. In contrast, in rural areas, satisfactory traffic operations can generally be maintained with rolling single-lane closures.

Figure 4.1 Pavement Conditions in Arkansas, 2020



Source: ArDOT

4.2 Bridge Condition

Bridge condition is another important indicator of the overall condition of a highway freight network. Bridges with inadequate vertical clearances or weight restrictions negatively affect truck movement and force trucks to take detours to deliver their cargo. These detours can be significant, especially at bottlenecks, and can increase costs.

All bridge information in this section was taken from the National Bridge Inventory (NBI), which is a standardized nationwide source of bridge information from the FHWA. In total, there were 12,941 bridges in Arkansas in 2021, though this analysis primarily focuses on the bridges along the NHS. In 2021, there were 2,301 bridges along the NHS in the state.

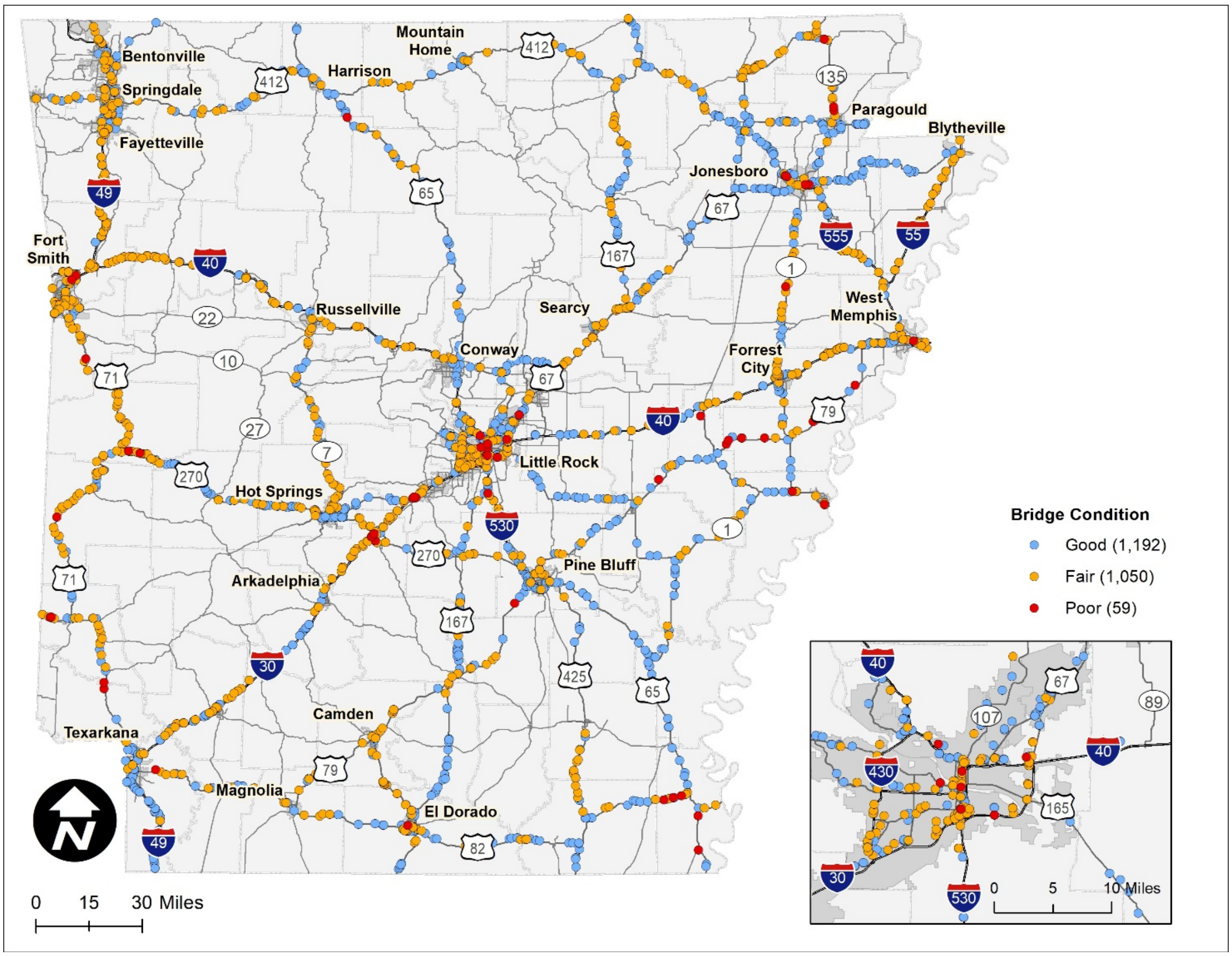
4.2.1 Condition

In the framework of the NBI, bridges are rated on a 1-9 scale for the following features: deck, superstructure, and substructure. A separate rating system is used for culverts.

Any score of 7 or higher indicates a “good” rating, and any rating of 4 or below indicates a “poor” rating. A score of 5 or 6 indicates a “fair” rating. For each bridge (excluding culverts), the minimum rating for these three items is used as the overall condition rating for a bridge. For example, if a bridge had a superstructure rating of 6, a substructure rating or 5, and a deck rating of 4, the overall rating for the bridge would be 4, indicating poor condition.

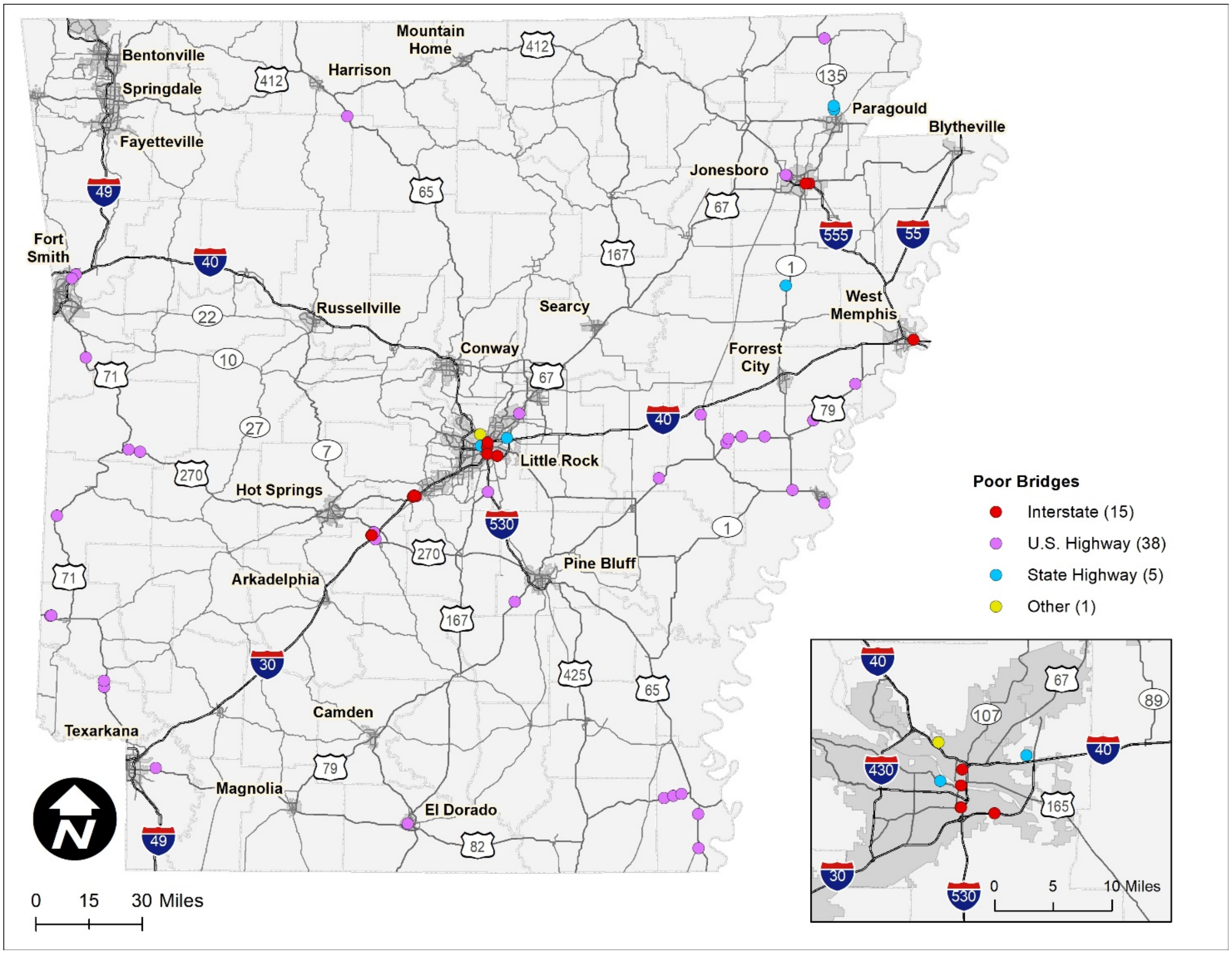
Figure 4.2 shows the rating of all 2,301 bridges (and culverts over 20 feet in length) along the NHS. Just under 52 percent of NHS bridges were in good condition, while another 45 percent were in fair condition. Along the NHS, there were 59 (just under 3 percent) bridges in poor condition. It is important to note that an open bridge classified as “poor” is not unsafe; rather, such bridges are in need of maintenance, repair, rehabilitation, or in some cases replacement. Unless these bridges are load posted, a rating of “poor” would not impact the movement of freight in the short term.

Figure 4.2 Bridge Condition Along the NHS in Arkansas, 2021



Source: National Bridge Inventory

Figure 4.3 Route Types and Poor Bridges in Arkansas, 2021



Source: National Bridge Inventory

4.2.2 Vertical Clearance

The vertical clearance of a bridge can be a significant obstacle to truck traffic. There must be adequate clearance underneath a bridge for a truck to pass safely. The ARDOT Bridge Policy Guidelines, which follow the latest AASHTO Roadside Design Guide, specify the following in terms of vertical clearance:

- Vertical clearance on Interstates and arterial roadways shall be at least 16 feet over the entire roadway width plus an allowance for future overlays of not less than 6 inches.

- Vertical clearance on collector and local roadways shall be at least 15 feet over the entire roadway width plus an allowance for future overlays of not less than 6 inches except for special circumstances.

Generally, bridges on the NHS, which overwhelmingly consists of Interstates and arterial roadways, need a minimum vertical clearance of 16 feet. Bridges with a vertical clearance between 16 and 16.5 feet (below the range for pavement overlays) would not be able to have overlays beneath the bridge.

For the purposes of this report, there are two ways to analyze a bridge's vertical clearance compliance. The bridge can either be carrying an NHS route (where the NHS route is "on top") or a bridge can go over an NHS route (where the NHS route is "below the bridge"). From a freight perspective, the primary concern is if a route passes under a structure lacking minimum clearance, which could potentially require a freight vehicle to detour.

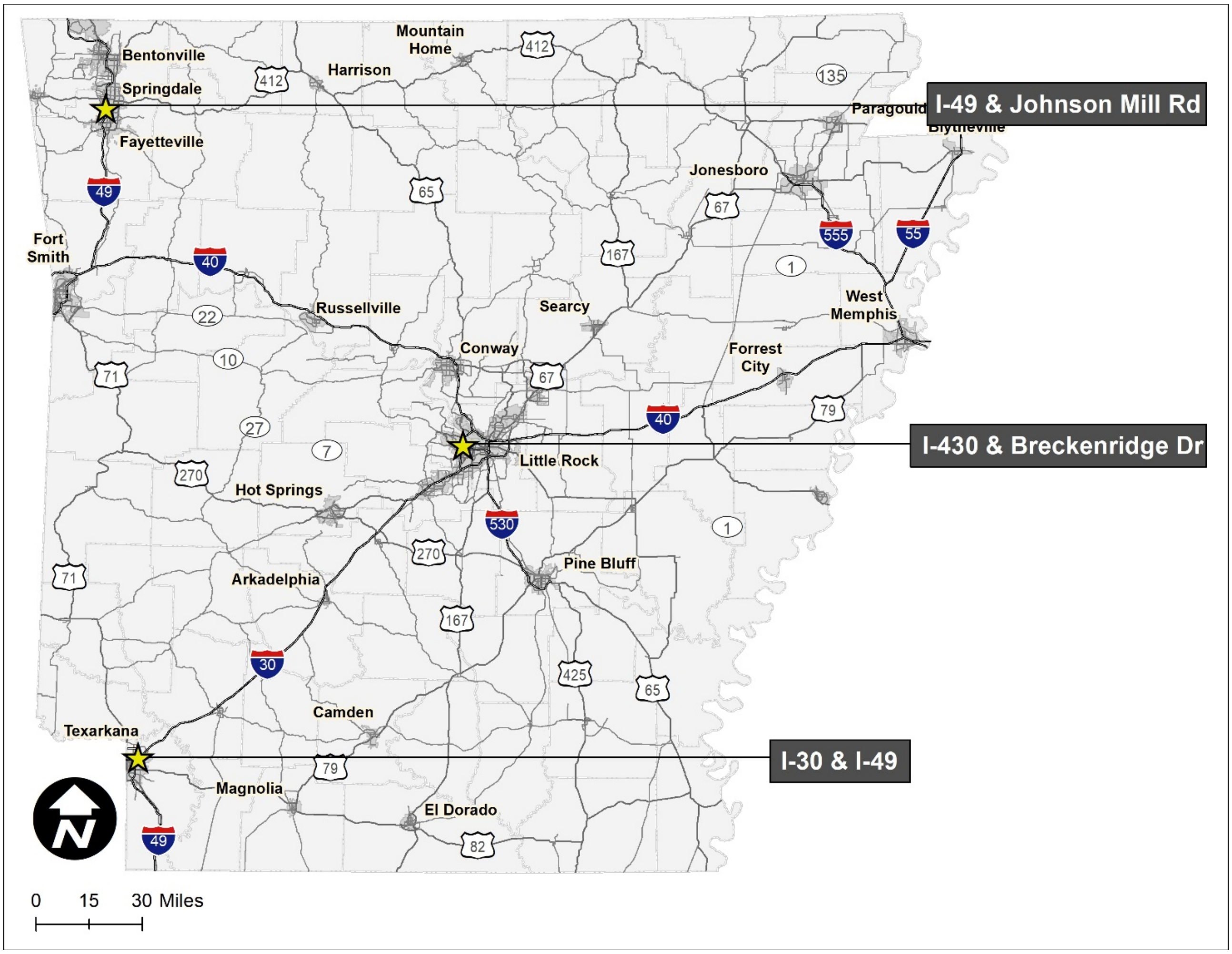
Table 4.2 shows three locations on/over the NHS system with less-than-standard vertical clearance. Figure 4.4 shows the location of these three bridges within Arkansas.

Table 4.2 Bridges on/over the NHS System with Less-than-Standard Vertical Clearance, 2021

Roads	Location	Vertical Clearance	Functional Class	Explanation
I-430 and Breckenridge Dr	South of Exit 8 on I-430, west of Little Rock	14.6'	Collector	Breckenridge Dr, which goes underneath I-430, does not meet the minimum vertical clearance of 15 feet for collector roads
I-30 and I-49	Interchange between I-30 and I-49, northeast of Texarkana	16.4'	Interstate	I-30, which goes underneath I-49, meets the minimum vertical clearance of 16 feet for Interstates, but does not have enough room for a full overlay (a minimum clearance of 16.5 feet).
I-49 and Johnson Mill Rd	Exit 69 on I-49, west of Lake Fayetteville	16.1'	Arterial	Johnson Mill Rd, which goes underneath I-49, meets the minimum vertical clearance of 16 feet for Interstates, but does not have enough room for a full overlay (a minimum clearance of 16.5 feet).

Source: National Bridge Inventory

Figure 4.4 Bridges on/over the NHS with Less-than-Standard Vertical Clearance, 2021



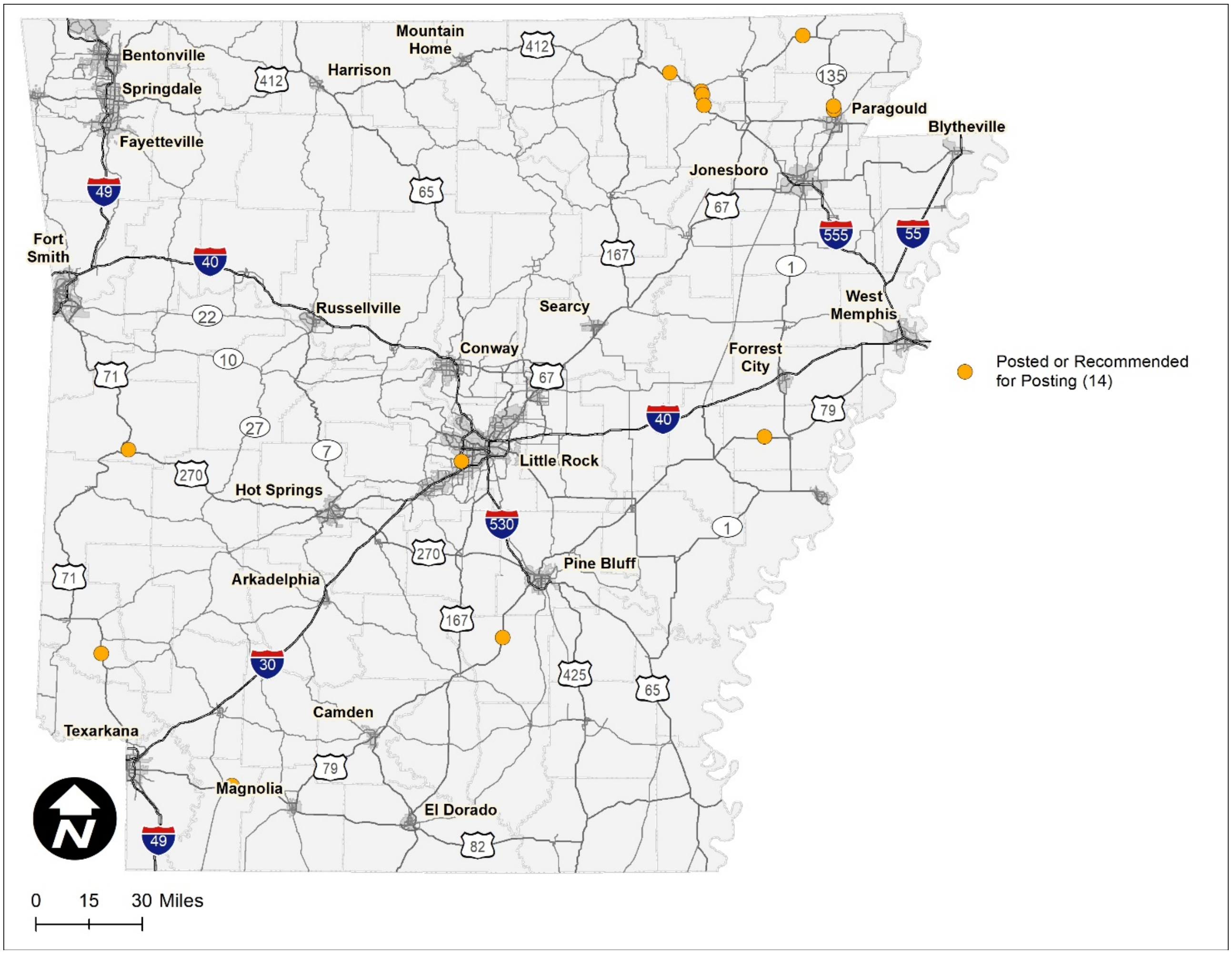
Source: National Bridge Inventory

4.2.3 Posted Bridges

One final hindrance that a bridge can pose for truck traffic is if a bridge is weight-restricted (or "load-posted"). A bridge can be load-posted if it was designed before new structural standards were adopted, if the bridge condition has deteriorated, or if non-design dead loads (such as overlays) have been added. Trucks that exceed the posted weight limits for these bridges are required to detour to an alternate route.

Out of the 2,301 bridges on the NHS in Arkansas in 2021, 14 were posted for a weight-restriction or were recommended for posting. Those bridges can be seen in Figure 4.5. Of these 14 bridges, 0 are on Interstates, 11 are on U.S. highways, and 3 are on state highways – all traverse small creeks or streams.

Figure 4.5 Posted Bridges on the NHS in Arkansas, 2021



Source: National Bridge Inventory

Out of the 12,941 bridges in Arkansas (as opposed to just bridges along the NHS) in 2021, 1,441 were posted for a weight-restriction or are recommended or posting, as shown in Table 4.3. The majority of these bridges (over 70%) are on county roadways, while state highways and other roadways total another 28% of posted bridges.

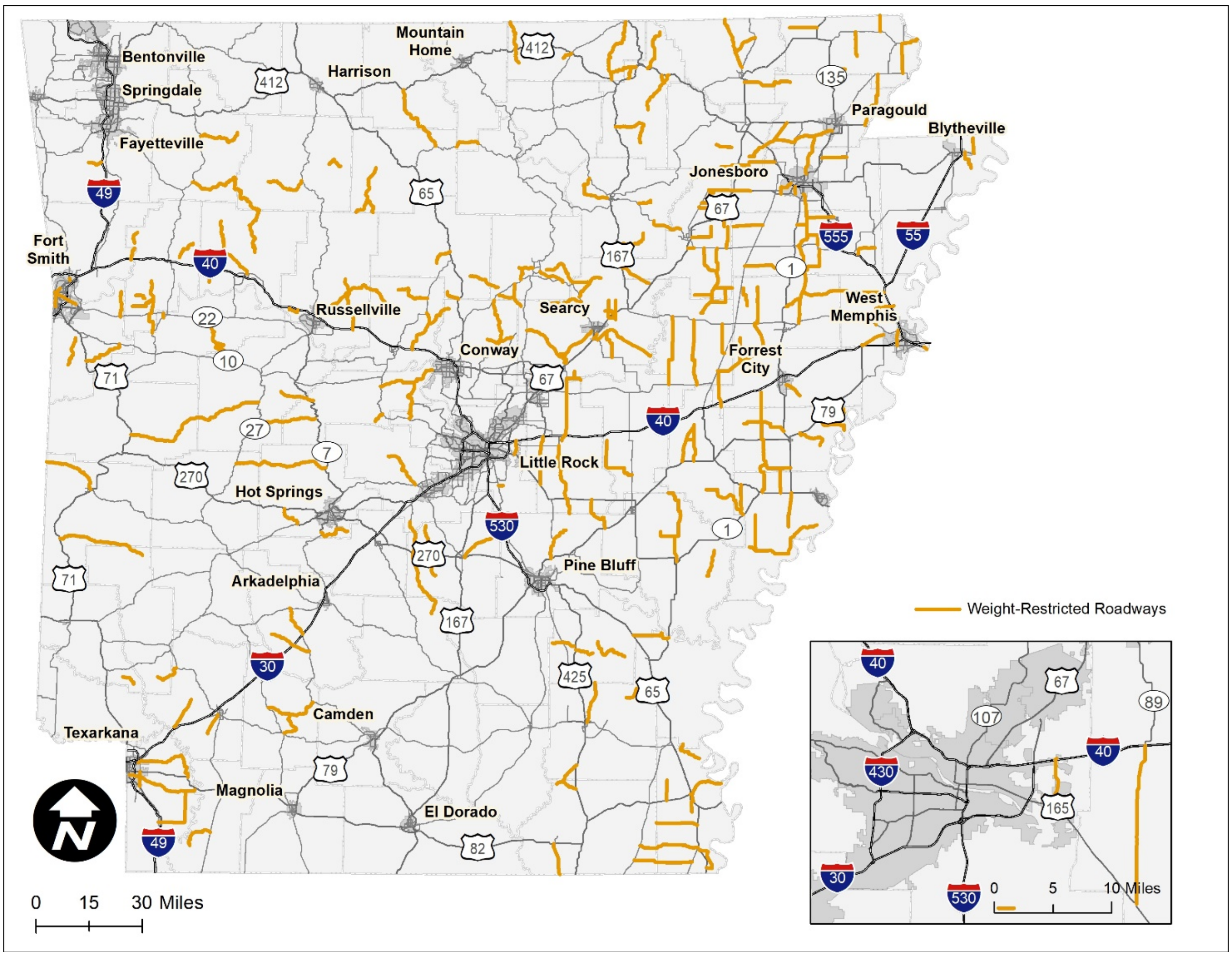
Table 4.3 All Posted Bridges in Arkansas, 2021

Route Type	# of Posted or Recommended for Posting Bridges	% of Total
Interstate	0	0.0%
U.S. Highway	21	1.5%
State Highway	263	18.3%
County Roadway	1,016	70.5%
Other	141	9.8%
Total	**1,441**	**100%**

Source: National Bridge Inventory

In addition to bridge load posting, the condition or structural capacity of roadways can also require weight restrictions. Weight-restricted roadways are shown in Figure 4.6.

Figure 4.6 Weight-Restricted Roadways in Arkansas



Source: ARDOT

4.3 System Performance

Various measures of the performance of Arkansas' roadway system can be estimated using data from the National Performance Management Research Set (NPMRDS). The NPMRDS is used by federal, state, and local agencies to understand travel-time-related metrics along roadways. Data is gathered from probe vehicles and measures speeds and travel times along predetermined roadway segments. This data can be used to calculate a variety of metrics related to travel speed, delay, and travel time reliability.

While analyzing the NPMRDS can be useful to observe general trends, it must be cautioned that, generally, NPMRDS data requires high truck volumes (high sample sizes) to be accurate. In areas with limited data, a few trucks traveling at low speeds could skew the data and not fully reflect the reality of roadway conditions.

The NPMRDS includes data on all NHS mileage in the state, which includes all Interstates and most other major and minor arterials. Probe data is available for other roadway systems, but the quality of the data generally declines as traffic volumes decline. Speeds and travel times are available for each segment in five-minute bins, separated by personal vehicles or trucks. In this analysis, truck-specific data from the entirety 2019 was used for the following time periods:

- **AM Peak:** 6:00am to 10:00am on weekdays
- **Mid-Day:** 10:00am to 4:00pm on weekdays
- **PM Peak:** 4:00pm to 8:00pm on weekdays
- **Nights:** 8:00pm to 6:00am on weekdays and weekends
- **Weekends:** 6:00am to 8:00pm on weekends

4.3.1 Truck Speed

One measure of freight roadway performance is truck speed. Measured truck speeds are compared to "free-flow" (FF) reference speeds, which are assumed to be the speed of trucks along a particular segment if there was no congestion and a minimal amount of other vehicles. The NPMRDS can be used to calculate free-flow speeds as percentiles of observed off-peak speeds on a particular segment across all time periods. The 85th percentile is normally close to the speed limit of a road, but could be slightly above or below depending on whether the speed limit is obeyed, the condition of the roadway, and other factors.

A segment can be assumed to be "congested" at a certain time of day if a typical truck's actual speed is significantly less than the free-flow speed. This reduction in speed could be due to a variety of factors, such as daily traffic, roadway construction closures, or back-ups due to accidents or temporary road closures.

Table 4.4 shows a matrix of the time periods specified above, broken out by the percentage of Interstate mileage falling within each speed category for each time period. Within each time period, the higher the percentages in the right part of the table (and conversely the lower the percentages in the left part of the table), the worse-performing that time period is in terms of average truck speeds.

For example, the worst time period in terms of average truck speeds is the PM Peak, with only 92.4 percent of Interstate mileage within 10 MPH of free-flow speeds. The PM Peak also has the highest percentages of Interstate mileage 10-20 MPH, 20-30 MPH, and over 30 MPH below free-flow speeds. The AM Peak has the second-worst average truck speeds, with similar distributions to the PM Peak. The Mid-Day, Night, and Weekend time periods are all better than the AM and PM Peak periods, which makes sense, as the peak periods typically experience the highest traffic volumes during the week.

Table 4.4 Summary of Average Truck Speeds for Interstates, 2019

Periods	% of Mileage < 10 MPH Below FF	% of Mileage 10-20 MPH Below FF	% of Mileage 20-30 MPH Below FF	% of Mileage > 30 MPH Below FF
AM Peak	93.6%	5.8%	0.5%	0.1%
Mid-Day	95.2%	4.4%	0.3%	0.0%
PM Peak	92.4%	6.7%	0.8%	0.1%
Nights	95.6%	4.1%	0.2%	0.0%
Weekends	95.9%	3.8%	0.3%	0.0%

Source: National Performance Management Research Data Set; analysis by Cambridge Systematics

Table 4.5 is similar to Table 4.4, except it shows average truck speed distributions for non-Interstate roads covered by the NPMRDS. In general, non-Interstate roads have lower average speeds than Interstate roads. Compared to well over 90 percent of Interstate mileage within 10 MPH of free-flow speeds, generally between 40 percent and 50 percent of non-Interstate mileage is within 10 MPH of free-flow speeds. The rest of the speed categories all contain significantly higher mileage percentages than Interstates. One of the reasons for this is that most of these roads are not designed for free-flow conditions; infrastructure such as traffic signals and driveways (especially in urban areas) introduce delay on these roads that Interstates do not experience.

Similar to Interstate average truck speeds, the PM Peak is the worst performing time period for non-Interstate NHS routes. Only 42.6 percent of mileage is within 10 MPH of free-flow speeds, and almost 10 percent is 20 MPH below free-flow speed. Unlike Interstate average truck speeds, the Mid-Day period (not the AM peak) is the second-worst performing time period.

Table 4.5 Summary of Average Truck Speeds for Non-Interstates, 2019

Periods	% of Mileage < 10 MPH Below FF	% of Mileage 10-20 MPH Below FF	% of Mileage 20-30 MPH Below FF	% of Mileage > 30 MPH Below FF
AM Peak	46.4%	46.1%	6.7%	0.8%
Mid-Day	45.6%	44.9%	8.4%	1.1%
PM Peak	42.6%	47.8%	8.5%	1.1%
Nights	48.7%	47.5%	3.2%	0.6%
Weekends	51.1%	42.9%	5.1%	0.9%

Source: National Performance Management Research Data Set; analysis by Cambridge Systematics

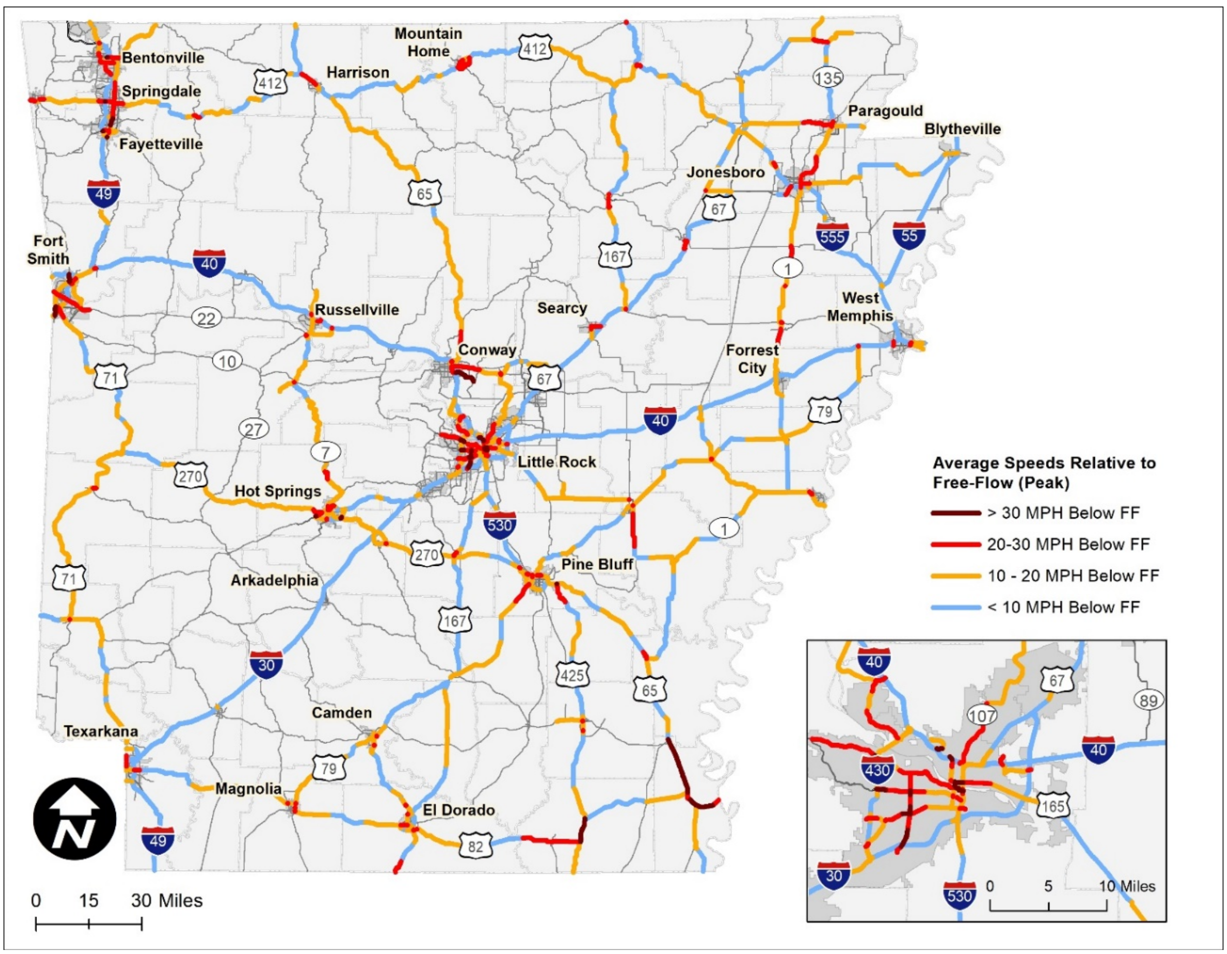
Figure 4.7 shows a map of average truck speeds relative to free-flow speeds on Arkansas NHS roadways for the AM and PM Peaks. Blue roads are the "best-performing" roads and operate closest to free-flow speeds, while redder roads are worse-performing and have average speeds further below free-flow.

The patterns observed in Table 4.4 and Table 4.5 can be visualized in Figure 4.7, with most of the Interstates within 10 MPH of free-flow (blue) and greater proportions of U.S. and state routes in darker colors (orange, red, and dark red). Additionally, urban areas generally have lower speeds than rural areas. This intuitively makes sense as urban areas generally have more traffic, especially during peak hours.

The Little Rock urban area generally sees the lowest average peak-hour truck speeds with most non-Interstate mileage within the urbanized area 20 MPH below free-flow speeds and a significant portion at least 30 MPH below free-flow. Fort Smith and the Fayetteville/Springdale/Bentonville area are other urban areas that experience lower average speeds.

In rural Arkansas, the most noteworthy location is U.S. Highway 65/U.S. Highway 278 in the southeast corner of the state. Over 20 miles of this roadway were reported to have an average speed of at least 30 MPH below free-flow speeds during 2019. This looks to be a result of the time period between approximately March 2019 and June 2019, where the NB section of the road in Chicot county experienced truck speeds over 50 MPH below free-flow. While this appeared in the analysis, observational evidence indicates that this is not a persistent condition, which further highlights the limitations of using the NPMRDS to analyze traffic conditions as roadway conditions cannot be attributed to specific causes and may be artefacts of the NPMRDS (such as long segments and limited data).

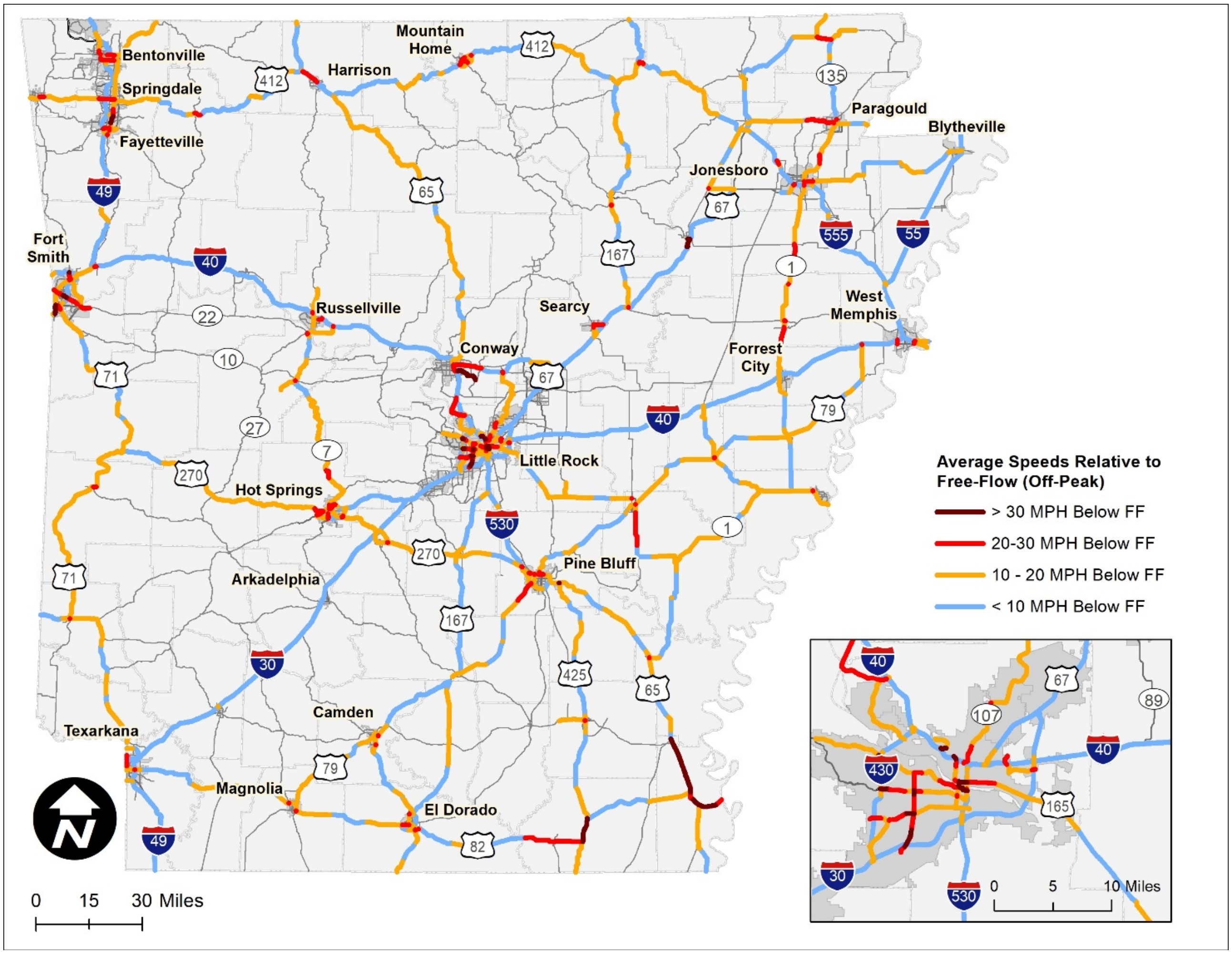
Figure 4.7 Average Truck Speeds During AM and PM Peak Hours in Arkansas, 2019



Source: National Performance Management Research Data Set; analysis by Cambridge Systematics

Figure 4.8 is similar to Figure 4.7, except it shows truck speeds relative to free-flow for the off-peak, non-weekend hours. In general, the segment speeds are not significantly different, on average, for each segment. Some segments have higher speeds, such as those in northwest Arkansas, but on average, the spatial distribution is similar to the peak periods.

Figure 4.8 Average Truck Speeds During Off-Peak Hours in Arkansas, 2019



Source: National Performance Management Research Data Set; analysis by Cambridge Systematics

4.3.2 Truck Travel Time Reliability

Another metric to measure roadway performance is Truck Travel Time Reliability (TTTR). TTTR measures the variability of travel over a specific time period. To measure TTTR, a metric called the Planning Time Index (PTI) is used. PTI is the ratio of the 95th-percentile truck travel time divided by the 50th-percentile (also known as median) truck travel time over a roadway segment. The greater the difference between the travel times, the higher the TTTR, and the less reliable that stretch of road is during a specific time period. For example, a TTTR of 2 means travel times could be twice as long as the median travel time.

TTTR is a measure of reliability (or consistency in travel times); thus, a road that is always congested will have a lower TTTR than a road that experience day-to-day variation between congestion and free-flow conditions.

For freight delivery, reliable travel times are important because consistent conditions mean travel time is predictable. On unpredictable roads, high variation in travel times must be built in as a "buffer" in a driver's schedule.

TTTR in 2019 was analyzed over the same roadway segments as the truck speed analysis and for the same time period breakdowns throughout the day. Table 4.6 shows a matrix of the percentage of miles that fall within each TTTR category for each time period throughout the day along Interstates. The Federal Highway Administration defines at TTTR greater than 1.5 as unreliable.

Although Truck Speed Analysis and TTTR Analysis measure different factors, similar results are seen between the two. As with average truck speeds, TTTR is the worst for Interstates during the PM Peak when almost five percent of Interstate miles have a TTTR over 1.50 and over three percent of Interstate miles have a TTTR over 2.00. Approximately 1.3 percent of Interstate miles have a TTTR over 3.00.

After the PM Peak, the Mid-Day and AM Peak time periods are the most unreliable for Arkansas Interstates. Each have about two percent of miles with a TTTR greater than 1.50 and just over one percent of miles with a TTTR greater than 2.00. The Nights and Weekends are by far the most reliable time periods, with about 99 percent of Interstate mileage with a TTTR less than 1.50.

Table 4.6 also reports the TTTR Index, which is the length-weighted average TTTR value for each time period. The PM Peak has the highest average value, which confirms that the PM Peak is the most unreliable time for Arkansas Interstates.

Table 4.6 Summary of Truck Travel Time Reliability for Interstates, 2019

Periods	TTTR Is < 1.25	TTTR Is 1.25-1.50	TTTR Is 1.50-2.00	TTTR Is 2.00-3.00	TTTR Is > 3.00	TTTR Index
AM Peak	95.7%	2.4%	0.8%	1.1%	0.1%	**1.07**
Mid-Day	94.7%	3.0%	1.0%	0.7%	0.6%	**1.08**
PM Peak	91.6%	3.6%	1.7%	1.8%	1.3%	**1.14**
Nights	98.3%	1.4%	0.3%	0.1%	0.0%	**1.07**
Weekends	97.7%	1.1%	0.5%	0.1%	0.6%	**1.07**

Source: National Performance Management Research Data Set; analysis by Cambridge Systematics

Table 4.7 shows a table of TTTR for non-Interstate roads. In contrast to TTTR on Interstates and average truck speeds on all roads, TTTR on non-Interstate roads is relatively consistent across all time periods. The distributions across all time periods show no time period as being the clear most or least reliable. The average TTTR Index for each time period is almost exactly the same as well; they are all between 1.35 and 1.36.

Table 4.7 Summary of Truck Travel Time Reliability for Non-Interstates, 2019

Periods	TTTR Is < 1.25	TTTR Is 1.25-1.50	TTTR Is 1.50-2.00	TTTR Is 2.00-3.00	TTTR Is > 3.00	TTTR Index
AM Peak	58.6%	20.6%	14.7%	4.9%	1.2%	**1.36**
Mid-Day	59.3%	22.0%	13.5%	3.8%	1.4%	**1.35**
PM Peak	57.0%	23.7%	13.5%	4.1%	1.7%	**1.36**
Nights	56.6%	27.4%	10.6%	4.1%	1.3%	**1.36**
Weekends	57.4%	24.4%	12.6%	4.2%	1.4%	**1.35**

Source: National Performance Management Research Data Set; analysis by Cambridge Systematics

Figure 4.9 shows a map of 2019 TTTR on Arkansas NPMRDS roadways for the AM and PM Peaks. Blue roads are the most reliable in terms of TTTR and are the most predictable, whereas redder roads are worse-performing and have the most unpredictable travel times. Roads in dark red have TTTRs of over 3.00.

As discussed in the previous tables, rural Interstates are generally more reliable than urban Interstates and non-Interstates, with the majority of rural Interstate mileage colored blue (the best TTTR). Similar to the average truck speeds, often the worst TTTRs are seen in and around urban areas such as Little Rock, Fort Smith, and Fayetteville/Springdale/Bentonville. Table 4.8, which shows the TTTR Index for urban and rural areas, confirms that for each time and for each type of road, the associated urban TTTR is higher than or the same as the corresponding rural TTTR.

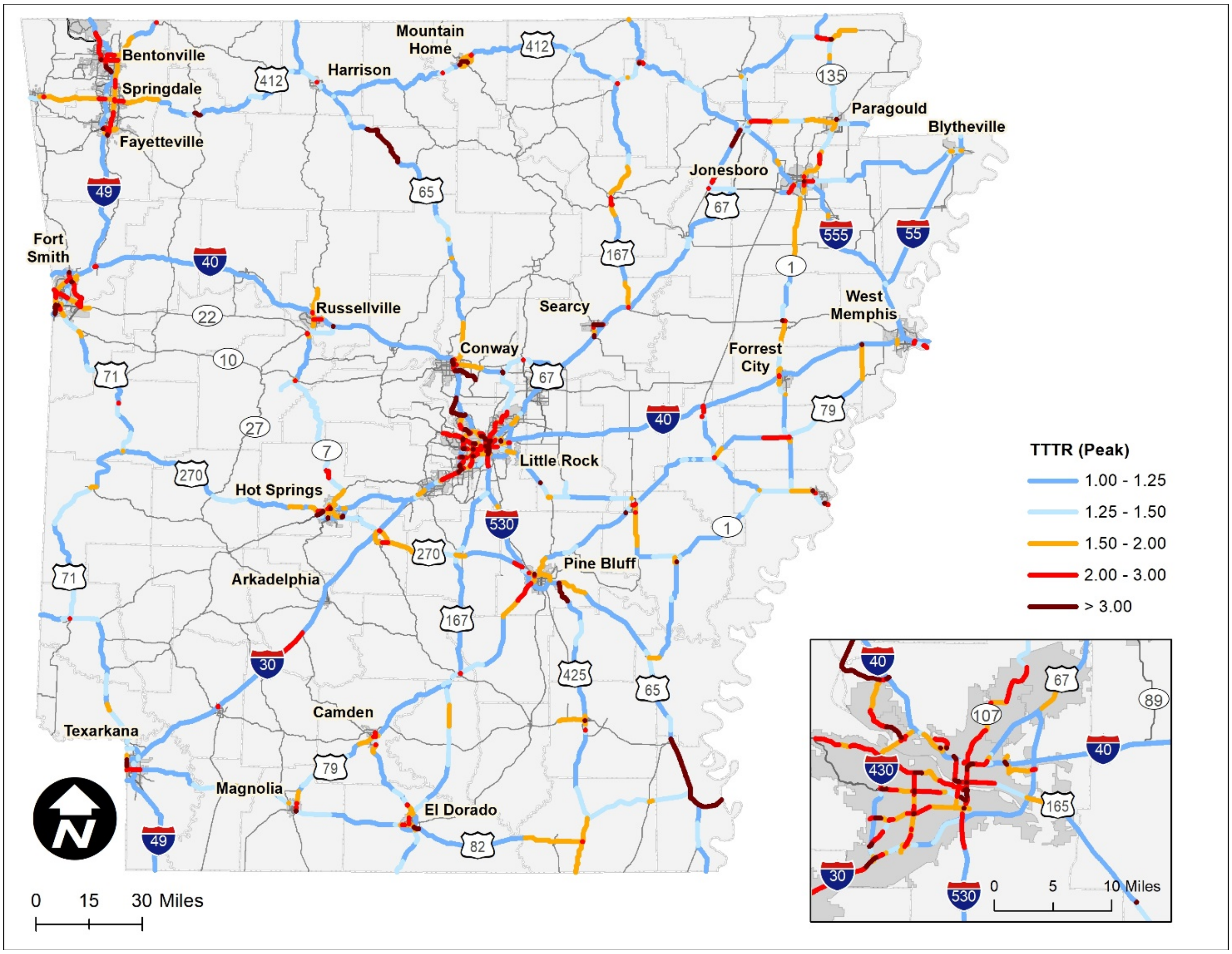
Table 4.8 TTTR Index for Urban vs. Rural

Periods	Interstate (Urban)	Interstate (Rural)	Non-Interstate (Urban)	Non-Interstate (Rural)
AM Peak	1.13	1.04	1.59	1.29
Mid-Day	1.08	1.08	1.56	1.29
PM Peak	1.19	1.10	1.61	1.29
Nights	1.09	1.05	1.54	1.31
Weekends	1.08	1.07	1.57	1.29

Source: National Performance Management Research Data Set, 2019; analysis by Cambridge Systematics, 2021

As was the case with average truck speeds, the road segment along U.S. Highway 65/U.S. Highway 278 in southeastern Arkansas stands out as a rural area with a poor performance metric. As discussed previously, this is likely due to low sample sizes or long segment length that caused the data to be skewed.

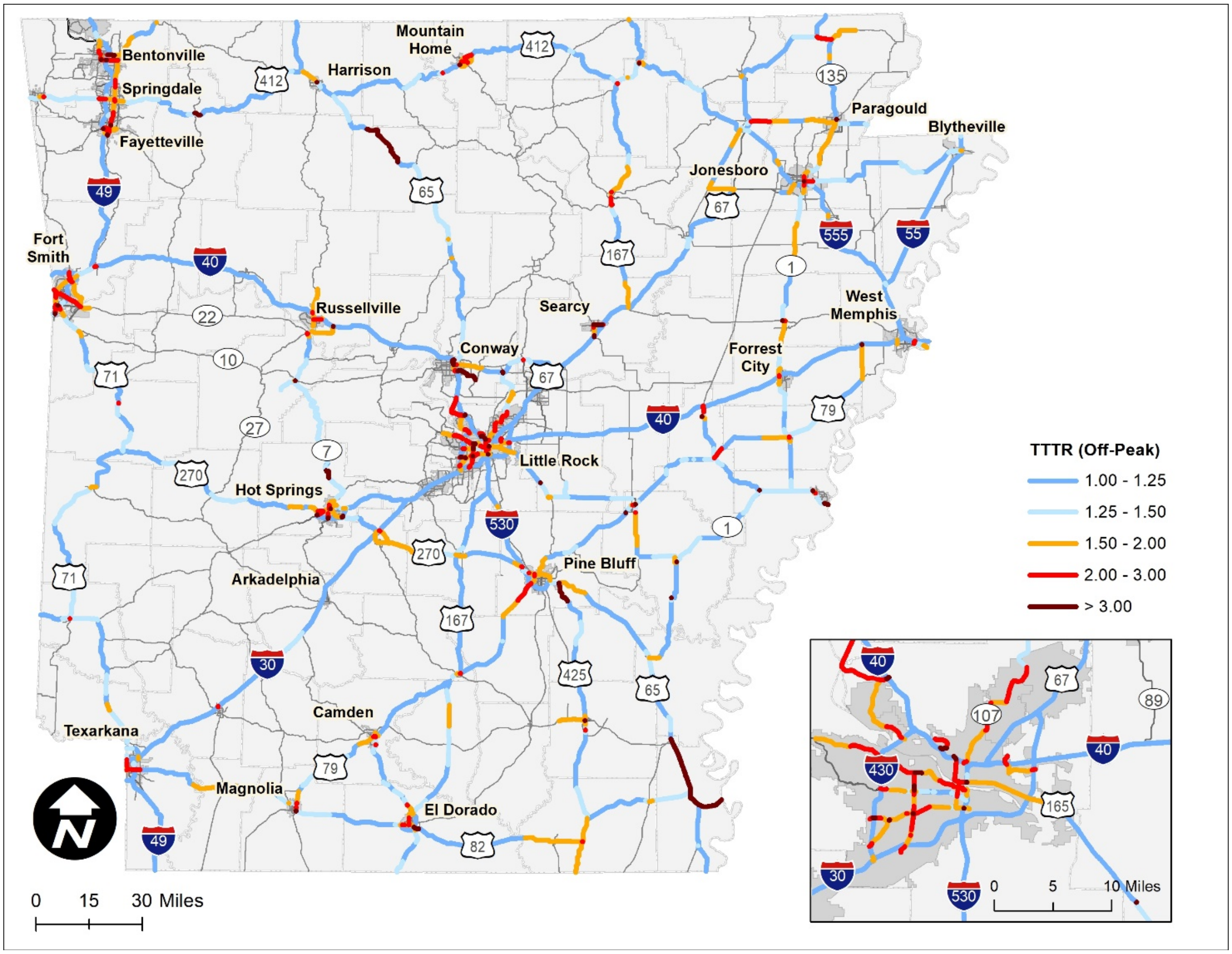
Figure 4.9 Truck Travel Time Reliability During AM and PM Peak Hours, 2019



Source: National Performance Management Research Data Set; analysis by Cambridge Systematics

Figure 4.10 shows a map of 2019 TTTR on Arkansas NPMRDS roadways for the off-peak, non-weekend hours. Given Table 4.6 and Table 4.7 show that there is not a significant difference between the peak periods and the off-peak periods for TTTR, it is not surprising that Figure 4.10 is not substantially different than Figure 4.9.

Figure 4.10 Truck Travel Time Reliability During Off-Peak Hours, 2019



Source: National Performance Management Research Data Set; analysis by Cambridge Systematics

4.3.3 Bottlenecks

In 2019, ARDOT identified the most important truck freight bottlenecks in the state using guidance from the "Truck Freight Bottleneck Reporting Guidebook" released by the FHWA in 2018 and "NCHRP Report 854, Guide for Identifying, Classifying, Evaluating, and Mitigating Truck Freight Bottlenecks" released in 2017. The FHWA Guidebook recommends a six-step process, supplemented with stakeholder feedback, as a method for identifying the most pressing truck freight bottlenecks. Those six steps are:

- Step 1: Select roadways for bottleneck analysis
- Step 2: Gather data for bottleneck identification and analysis
- Step 3: Screen for truck freight bottlenecks
- Step 4: Validate truck freight bottleneck list
- Step 5: Evaluate truck freight bottleneck causes

- Step 6: Prioritize truck freight bottlenecks

While going through these steps, ARDOT took the following into consideration when selecting the priority truck freight bottleneck areas:

- Road segments with high daily truck volumes
- Level of service (LOS) information for all roadway routes
- Areas of steep uphill or downhill vertical grades
- Segments with relatively high truck-involved crashes per mile
- Construction zones
- NPMRDS data to calculate daily total delay per mile of truck travel

After using this data to screen locations, ARDOT arrived at this list of eighteen truck freight bottleneck locations, seen in Table 4.9.

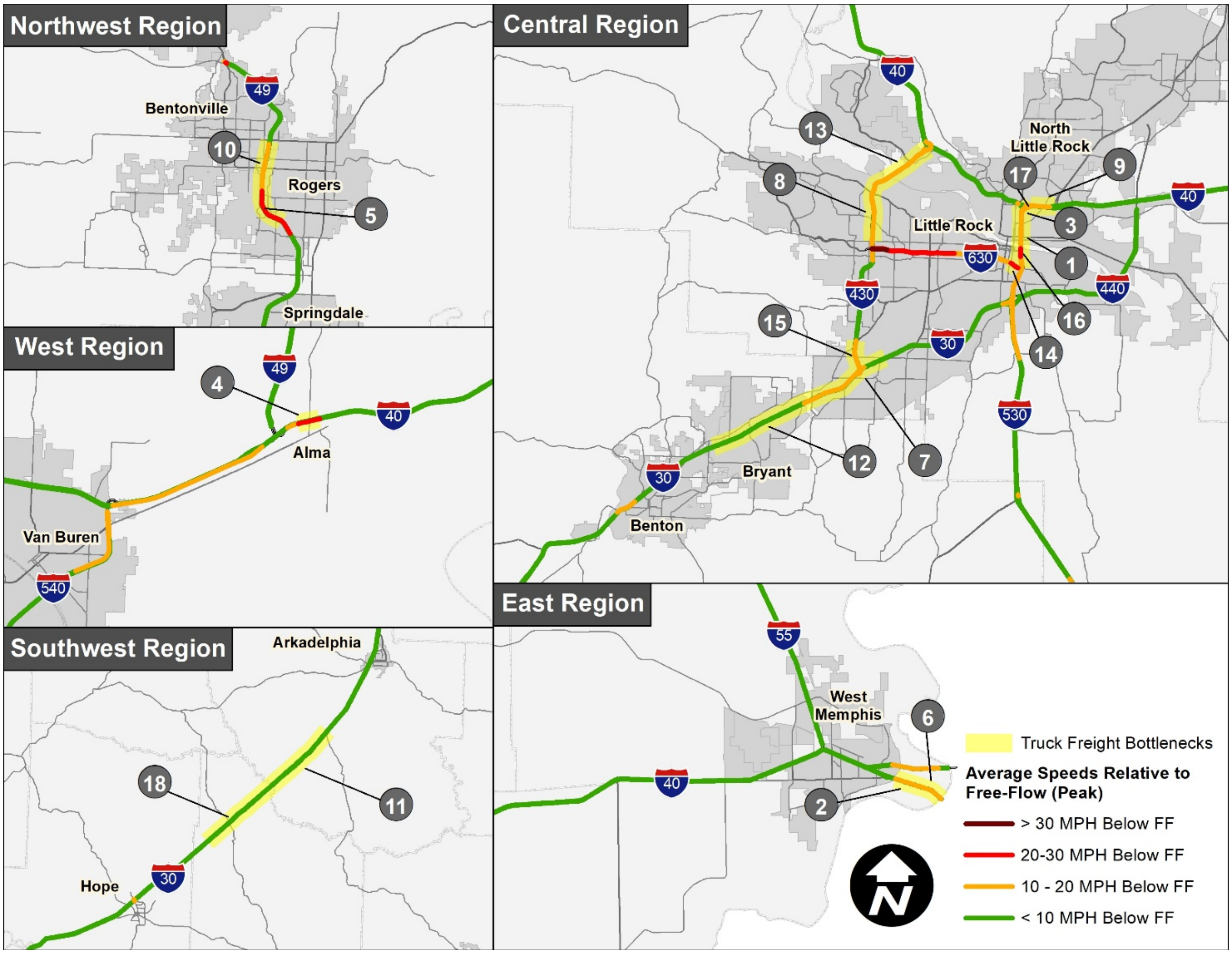
Table 4.9 Truck Freight Bottlenecks in Arkansas, 2019

ID	Segment	Description	Cause
1	I-30 EB	From I-30/I-630 Intersection to I-30/I-40 Intersection	Excess Demand
2	I-55 NB	Between Tennessee State Line and Exit 3A	Weigh Station
3	I-30 WB	From I-30/I-40 Intersection to I-30 downtown area	Excess Demand
4	I-40 West	Eastbound, nearing Alma, Highway 71 (Exit 13)	Weaving Area
5	I-49 NB	Near Rogers, from Exit 82 to Exit 85	Excess Demand
6	I-55 SB	Between Exit 1 and Tennessee State Line	Construction
7	I-30 WB	From I-30/I-430 Intersection (Exit 129) to Bryan (Exit 126)	Excess Demand
8	I-430 NB	Between I-430/I-630 Intersection (Exit 8) to I-40/I-430 Intersection (Exit 13)	Excess Demand
9	I-40 WB	Between U.S. Highway 67/I-40 Intersection (Exit 154) to I-30/I-40 Intersection (Exit 153)	Weaving Area
10	I-49 SB	Near Rogers, from Exit 85 to Exit 83	Excess Demand
11	I-30 WB	Near Gurdon, Exit 54	Construction
12	I-30 EB	From Bryant (Exit 123) to I-30/I-430 Intersection (Exit 128)	Excess Demand
13	I-430 SB	From I-40/I-430 Intersection (Exit 12) to Hwy 10/I-430 Intersection (Exit 9)	Excess Demand
14	I-630 EB	Near I-30/I-630 Intersection (Exit 1)	Weaving Area
15	I-430 NB	Near I-30/I-430 Intersection (Exit 1)	Weaving Area
16	I-630 WB	Near I-30/I-630 Intersection (Exit 1)	Weaving Area
17	I-40 EB	Between I-30/I-40 Intersection (Exit 153) to U.S. Highway 67/I-40 Intersection (Exit 154)	Weaving Area
18	I-30 EB	Near Gurdon, Exit 54	Construction

Source: ARDOT Mid-Year Report on Truck Freight Bottlenecks, 2020

Figure 4.11 displays the locations of these truck freight bottlenecks in yellow, overlaid with Interstate-only peak average truck speeds relative to free-flow (the same information from Figure 4.7). Generally, the identified bottlenecks reflected locations with lower average speeds (though some locations with lower average speeds were not classified as truck freight bottlenecks due to low truck volumes). The suspected cause of each bottleneck (such construction or excess demand), was also identified. In many cases, the cause of a bottleneck was a transient condition (such as a construction zone), not a permanent condition (such as excess demand).

Figure 4.11 Identified Truck Freight Bottlenecks in Arkansas, 2019



Source: ARDOT Mid-Year Report on Truck Freight Bottlenecks, 2020; National Performance Management Research Data Set; analysis by Cambridge Systematics

Outside of this process that ARDOT undertook, the American Transportation Research Institute (ATRI) releases a list of the Top 100 Truck Bottlenecks in America each year. For the past four iterations of this list, no locations have been identified in Arkansas or in cities near the border of Arkansas. The closest bottlenecks identified by ATRI are in Dallas, Texas; Richland, Mississippi; Nashville, Tennessee; and St. Louis, Missouri.[6]

6 https://truckingresearch.org/2021/02/23/2021-top-truck-bottlenecks/

ARDOT uses a multiple-objective decision analysis (MODA) tool for project selection. Project selection is driven by several factors that are relevant to highway freight mobility including travel time reliability (LOTTR), volume/capacity ratio (a measure of peak-hour recurring congestion), truck percent, and safety history (a source of travel time unreliability). Other measures that are included in the project selection process (including bridge and pavement condition) are also meaningful towards freight mobility and reliability.

ARDOT continues to make significant investments that are expected to relieve truck freight bottlenecks. Noteworthy examples include:

- Jobs CA0601 and CA0602 on Interstate 30 in Central Arkansas;
- Job 061630 on Interstate 430 in Central Arkansas; and
- Job CA0901, 090305, BB0903 and others on Interstate 49 in Northwest Arkansas.

In addition, while Interstate 40 from Little Rock to West Memphis does not generally experience reliability issues currently, it does experience the highest truck volumes of any highway in Arkansas, and does experience significant disruptions in freight movement due to crashes and other events. In response, ARDOT has two major ITS projects programmed (one on Interstate 40 and another on a parallel US highway) to improve reliability and resiliency of the corridor.

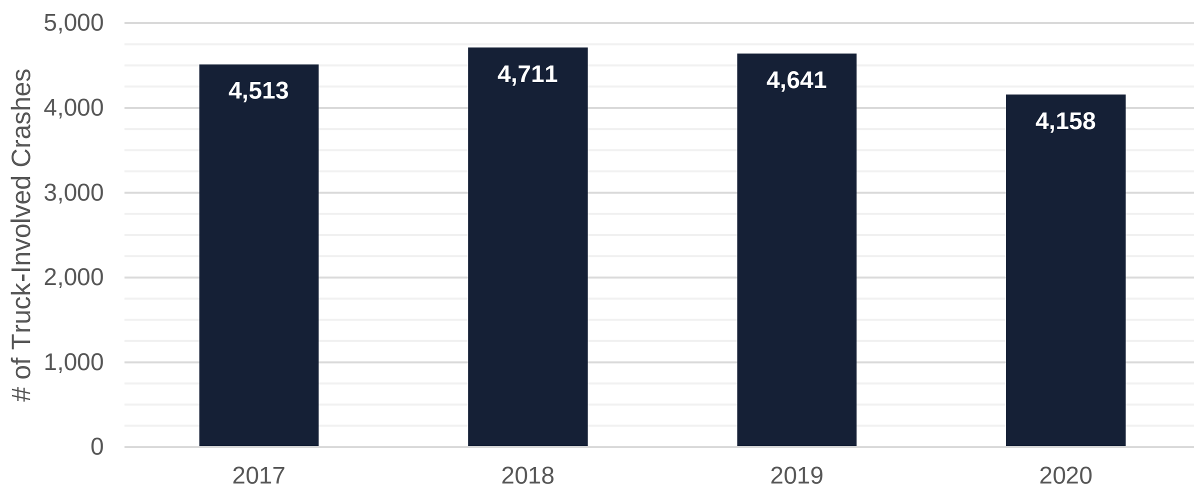
5.0 Safety

For this State Freight Plan, data on commercial-vehicle crashes was obtained for the period from 2017 to 2020. Available crash data includes information on the type of vehicles involved and type of crash, among other information collected by law enforcement. A truck-involved crash is any crash that involves at least one truck. The truck may not be the vehicle to initiate the crash; for example, a truck could be stopped at a traffic signal and have a passenger vehicle hit them from behind.

5.1 Truck-Involved Crashes

Between 2017 and 2020, there were 18,023 truck-involved crashes in Arkansas, which is just over 4,500 crashes per year on average. As Figure 5.1 shows, in 2017, there were 4,513 truck-involved crashes, which increased 4 percent to 4,711 in 2018, before falling 11 percent in the next two years to a 4-year low of 4,158 in 2020. The sharp decrease of crashes in 2020 could be due to the fact that there were, on average, fewer vehicles on the road during the COVID-19 pandemic.

Figure 5.1 Truck-Involved Crashes per Year, 2017 – 2020

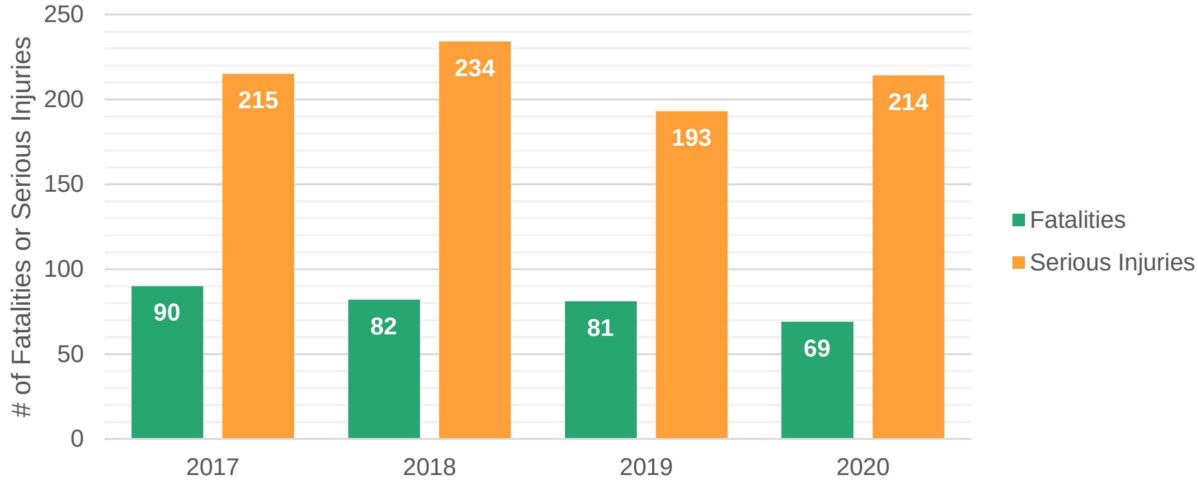


Source: ARDOT

Figure 5.2 below shows the total number of truck-involved crashes with fatalities (in green) and serious injuries (in orange) from 2017 to 2020. Recording a fatality or serious injury does not mean that the truck occupant was the one to sustain the injury or was the cause of the crash; it only means that a truck was involved in a crash that resulted in a fatality or serious injury.

Truck-involved fatalities decreased in each year of this time period from 90 in 2017 to 69 in 2020, a decrease of 23 percent. However, the number of serious injuries per year did not demonstrate any obvious trend, increasing from 2017 to 2018, before decreasing to 2019 and increasing to 2020.

Figure 5.2 Truck-Involved Crashes with Fatalities and Serious Injuries per Year, 2017 – 2020

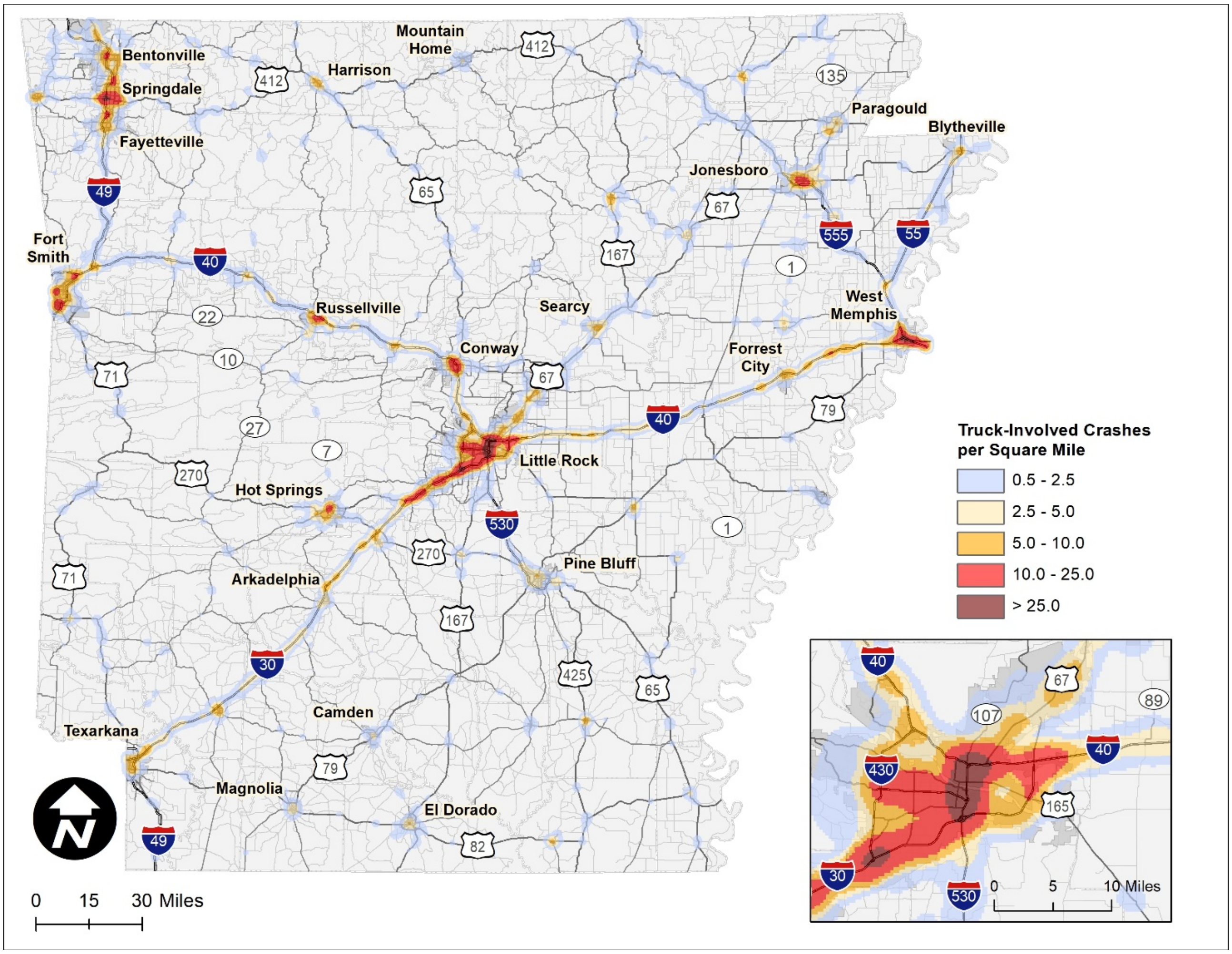


Source: ARDOT

Another way to view truck-involved crashes is by looking at the geographical location of the incidents to determine if there are patterns by geography or along specific roadways. Figure 5.3 shows a heat map of truck-involved crashes per square mile from 2017 to 2020. As expected, the most urbanized areas of the state (Little Rock, West Memphis, Bentonville/Springdale/Fayetteville, Fort Smith, and Jonesboro) show the highest concentration of crashes in the time period analyzed. In particular, the inset map shows Interstate 30 through downtown Little Rock and into North Little Rock as having the highest truck-involved crash density in the state, with over 25 truck-involved crashes per square mile along that corridor.

For the rest of the state, in general, the Interstates and other prominent arterials have the highest truck-involved crash densities, which is to be expected since these tend to have the highest truck volumes.

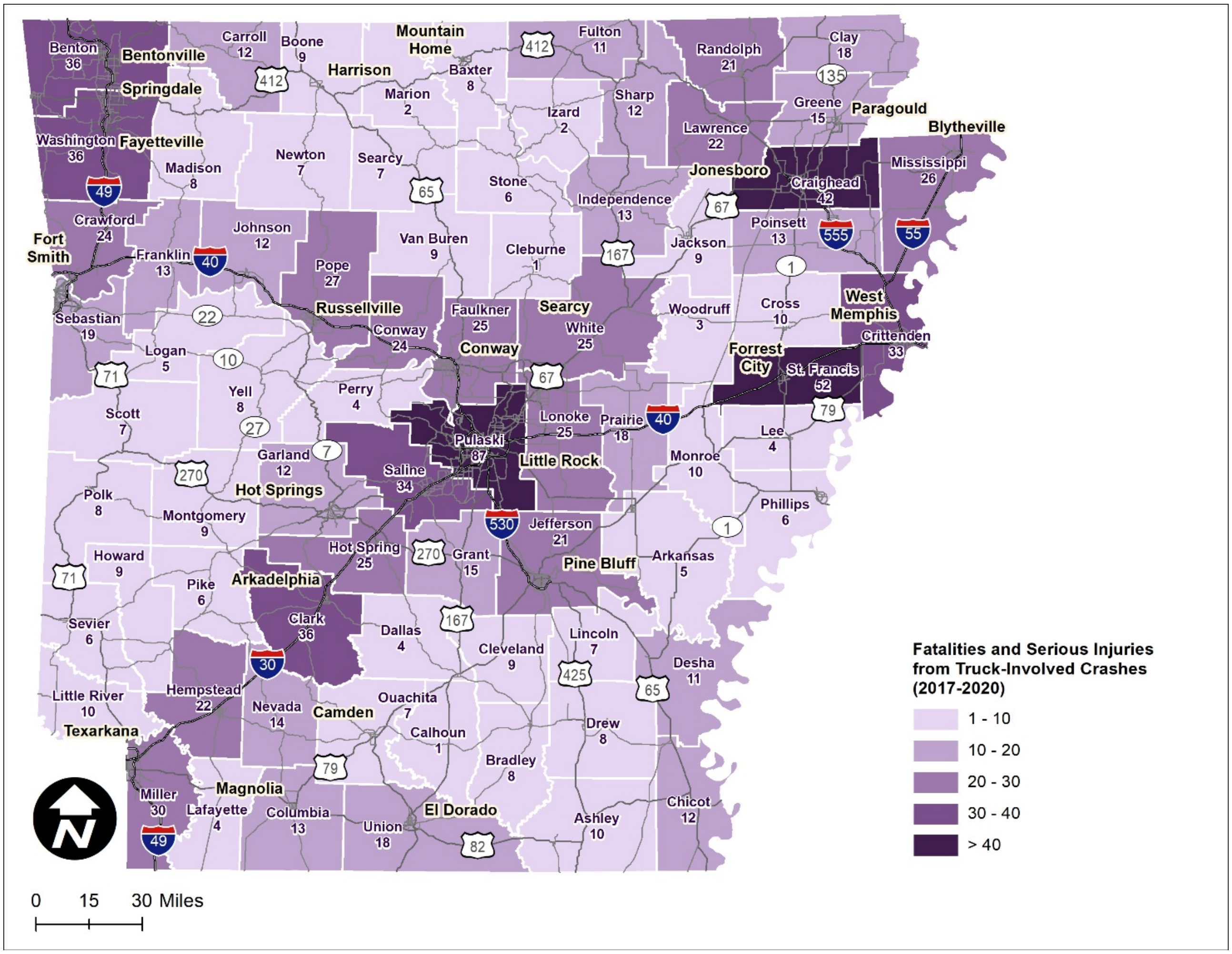
Figure 5.3 Truck-Involved Crashes per Square Mile in Arkansas, 2017 – 2020



Source: ARDOT

Figure 5.4 shows the county distribution of fatalities and serious injuries due to truck crashes. Fatalities and serious injuries may have a different spatial distribution compared to crashes of all types, which is why it is important to look at them separately. The three counties with the most fatalities and serious injuries are Pulaski, St. Francis, and Craighead (three counties with significant urban areas). Pulaski, the county in which Little Rock is located experienced 87 fatalities and serious injuries between 2017 and 2020.

Figure 5.4 Fatalities and Serious Injuries per County in Arkansas, 2017 – 2020



Source: ARDOT; analysis by Cambridge Systematics

Table 5.1 shows truck-involved crashes and resulting fatalities/serious injuries by route type, which demonstrates that the plurality (32.8 percent) of truck-involved crashes occur on Interstates, followed by U.S. highways and state highways with 20.8 percent and 17.5 percent, respectively. As seen before, this intuitively makes sense as these types of roadways generally see the highest amounts of truck traffic. With this in mind, it is important to note that just because a roadway system has more crashes does not make it less safe than a roadway system with fewer crashes.

Table 5.1 also shows that the split by number of fatalities and serious injuries does not follow the same pattern. Despite Interstates having the highest number of crashes by a wide margin, Interstates and U.S. highways have almost identical numbers of fatalities and serious injuries (377 and 376, respectively). State highways also have a larger proportion of fatalities and serious injuries compared to raw crashes as well.

City streets constitute over 10 percent of raw truck-involved crashes, but constitute less than half of that (4.7 percent) of the fatalities and serious injuries. This makes sense as city streets generally have trucks and other traffic traveling at lower speeds, which leads to less severe crashes.

Table 5.1 Truck-Involved Crash Statistics by Roadway Type, 2017 – 2020

Roadway Type	# of Truck-Involved Crashes	% of Truck-Involved Crashes	# of Fatalities and Serious Injuries	% of Fatalities and Serious Injuries
Interstate	5,904	32.8%	377	32.0%
U.S. Highway	3,748	20.8%	376	31.9%
State Highway	3,150	17.5%	263	22.3%
County Road	494	2.7%	22	1.9%
City Street	1,910	10.6%	55	4.7%
Frontage Road	7	0.0%	0	0.0%
Ramp	4	0.0%	0	0.0%
Unknown	2,806	15.6%	85	7.2%
Total	**18,023**	**100.0%**	**1,178**	**100.0%**

Source: ARDOT; analysis by Cambridge Systematics

Table 5.2 breaks truck-involved crashes down by collision type. The most prevalent type of truck-involved crash (26.5 percent of all truck-involved crashes over the four-year time period) is a sideswipe between two vehicles traveling in the same direction. This type of crash is most common on Interstates or other multi-lane roads where vehicles try to pass each other in adjacent lanes. Front-to-rear (also known as “rear end” crashes) are the second-most prevalent, followed by single vehicle crashes and angled crashes.

For Interstates, sideswipe in the same direction is the most common type with over 43 percent of crashes. For other major roads (U.S. highways, state highways, and county roads), single vehicle and angled crashes constitute the plurality of truck-involved crashes (each above 20 percent of all crashes).

Table 5.2 also records the fatalities and serious injuries experienced as a result of these truck-involved crashes. While sideswipes in the same direction were the most common type of crash, front to rear (27.5 percent), angled (22.4 percent), single vehicle crashes (19.1 percent), and front to front or head-on crashes (13.9 percent) all caused more fatalities and serious injuries. These types of crashes, especially front to front (or head-on) crashes, are the most dangerous types of crashes for all vehicles, not just trucks.

Table 5.2 Truck-Involved Crashes by Collision Type, 2017 – 2020

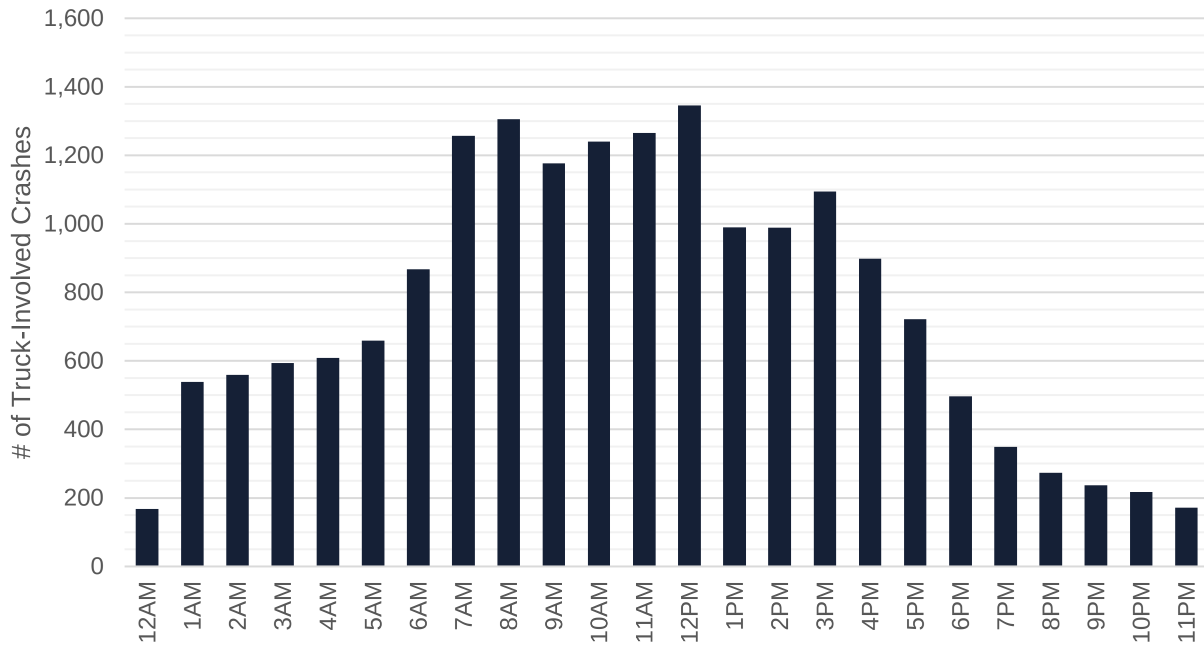
Collision Type	# of Truck-Involved Crashes	% of Truck-Involved Crashes	# of Fatalities and Serious Injuries	% of Fatalities and Serious Injuries
Sideswipe, Same Direction	4,774	26.5%	83	7.0%
Front to Rear	4,258	23.6%	324	27.5%
Single Vehicle Crash	3,767	20.9%	225	19.1%
Angle	3,032	16.8%	264	22.4%
Sideswipe, Opposite Direction	955	5.3%	80	6.8%
Other	561	3.1%	35	3.0%
Front to Front	430	2.4%	164	13.9%
Rear to Side	170	0.9%	1	0.1%
Rear to Rear	76	0.4%	2	0.2%
Total	**18,023**	**100.0%**	**1,178**	**100.0%**

Source: ARDOT; analysis by Cambridge Systematics

Figure 5.5 shows the distribution of truck-involved crashes per hour of the day from 2017 to 2020. Typically, graphs of personal vehicle crash statistics increase steadily as the day goes on, with the highest rates in the PM peak and just after (when traffic volumes are high and it is more likely to be dark outside)[7]. However, truck-involved crashes are overwhelming favored to happen in the middle of the day, rather than the evening like personal vehicles. Noon is the hour with the most truck-involved crashes with 1,346 between 2017 and 2020, and the hours between 7AM and noon all have similar counts. From 1:00am to 6:00am, crash counts per hour were between 500 and 900 crashes, which is higher than the traditionally-busy evening hours, such as 6:00pm to 8:00pm (between 300 and 500 crashes).

[7] https://www-fars.nhtsa.dot.gov/Crashes/CrashesTime.aspx

Figure 5.5 Truck-Involved Crashes by Hour of Day, 2017 – 2020

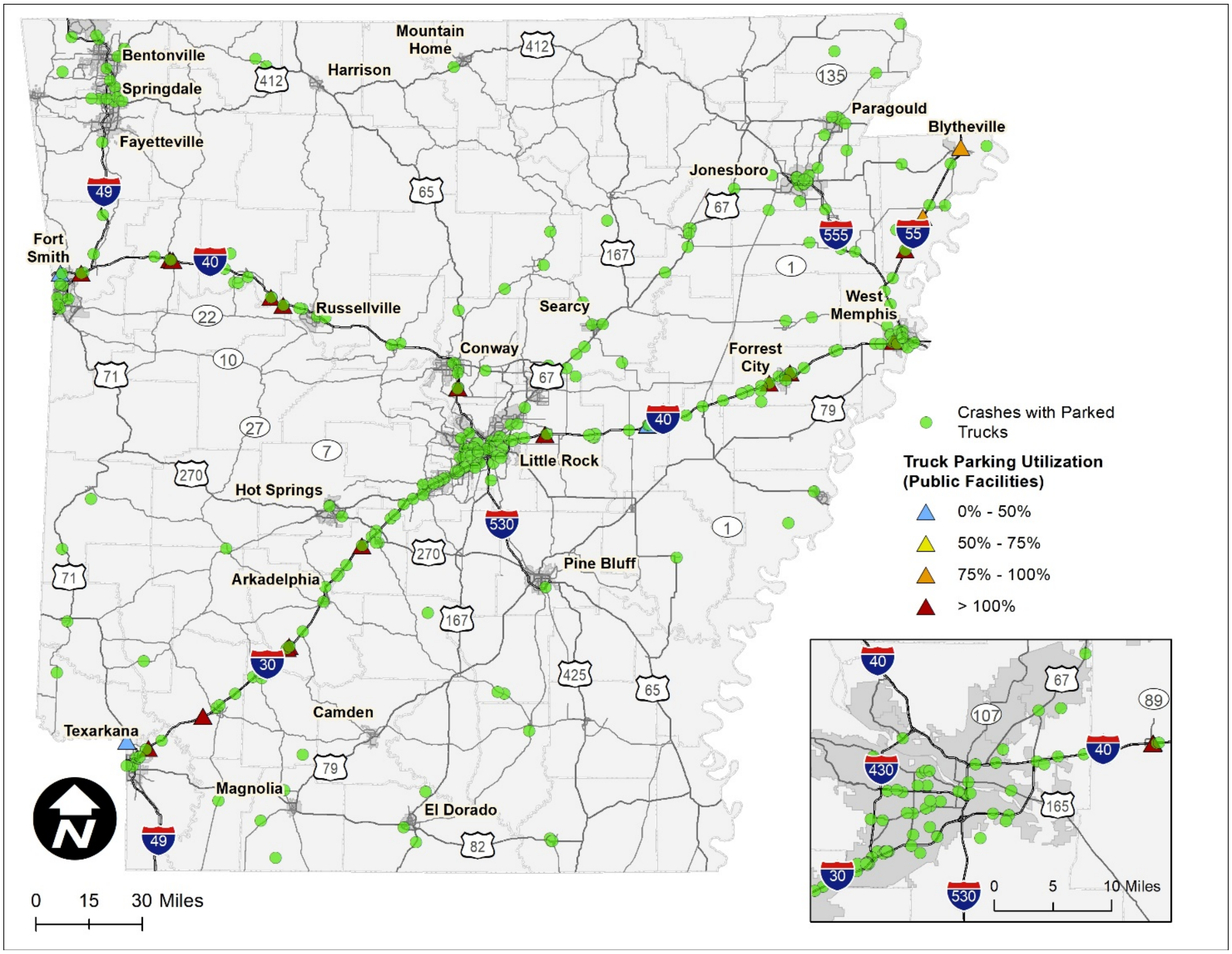


Source: ARDOT; analysis by Cambridge Systematics

5.2 Parked Trucks

Given the high utilization of truck parking sites in Arkansas, it is important to analyze the safety impacts related to the over-utilization of truck parking sites. Figure 5.6 shows crashes with parked trucks between 2017 and 2020 in green overlaid on ARDOT truck parking facilities in the colored triangles. Near truck parking facilities that have a utilization over 100 percent (which means there are more trucks looking for parking than there are spots), one might expect there to be more crashes involving parked trucks as drivers who cannot find a legal/marked spot may pull off to the side of the road, park on an exit ramp, or park in some other location that is unsafe or undesirable. While no general correlation between crashes with parked trucks and lack of truck parking, some clumping is observed in the vicinity of select locations (such as Forrest City and West Memphis), though more detailed analyses would need to be performed to validate those relationships.

Figure 5.6 Truck-Involved Crashes Involving Parked Trucks in Arkansas, 2017 – 2020



Source: ARDOT; analysis by Cambridge Systematics

ARDOT
ARKANSAS DEPARTMENT OF TRANSPORTATION

ARKANSAS STATE FREIGHT PLAN

Chapter 3

Freight Rail Modal Profile

WE MOVE ARKANSAS FREIGHT

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1.0 Introduction

This Freight Rail Modal Profile provides an overview of the railroads comprising the statewide system, key freight rail facilities, demand and performance metrics, and safety indicators. Freight rail is an essential component of the Arkansas multimodal freight transportation system. One strength of freight rail lies in its ability to transport heavy, bulk goods and containers over long distances cost-effectively. This broadly includes goods such as metals, chemicals, aggregates, agricultural products, petroleum, and various consumer products. In terms of significance, these products form the building blocks of the multi-scale economy. Key industries utilizing these goods include many of Arkansas' largest economic sectors, including manufacturing, agriculture, construction, and mining.

Arkansas' rail network is expansive. Union Pacific Railroad (UP) corridors broadly run from the southwest through the northeast, roughly paralleling Interstates 30 and 40. Kansas City Southern (KCS) trackage can be found in the western portion of the state, while Burlington Northern Santa Fe Railway (BNSF) trackage is found in eastern Arkansas. Class III short line trackage is found throughout Arkansas, especially in the southern portion of the state. Switching and terminal railroads, shorter in nature, are also found across the state in both urban and rural industrial and intermodal centers.

At the national scale, Arkansas' rail network plays an important role in multi-direction freight rail flows. Located between the major freight centers of Dallas and Memphis, Arkansas trackage plays a key role in the transport of freight from east to west coast markets. Correspondingly, Arkansas is home to three Class I railroads. This includes BNSF and UP, the two largest freight railroads in the U.S. in terms of network mileage. Pending regulatory approval, KCS, the smallest national Class I railroad, is set to be acquired by Canadian Pacific (CP). If this acquisition goes through, the new Class I railroad would be the first to directly connect Canada, Mexico, and the United States, including track that directly traverses Arkansas.

1.1 Data Sources

To develop this Modal Profile, multiple data sources were utilized:

- Freight railroad websites: Reviewed as a means of gathering the most up-to-date information regarding rail operations.
- Freight railroad surveys: Conducted as a means of gathering direct insight from the freight railroads regarding their respective networks and related needs.
- The 2015 Arkansas State Rail Plan and 2017 Arkansas State Freight Plan: Both plans were used to supplement information gathered on each freight railroad where needed.
- Surface Transportation Board (STB): Used to gather information on any proposed abandonment proceedings.
- Federal Railroad Administration (FRA) Office of Safety Analysis dashboard: Used to collect and assess safety data.
- Freight Analysis Framework (FAF5) and STB Confidential Waybill Sample: Used to quantify and project statewide freight flows.

- Rail Industry Publication Sources: Used to identify and assess key rail industry trends and the implications for Arkansas.

1.2 Report Organization

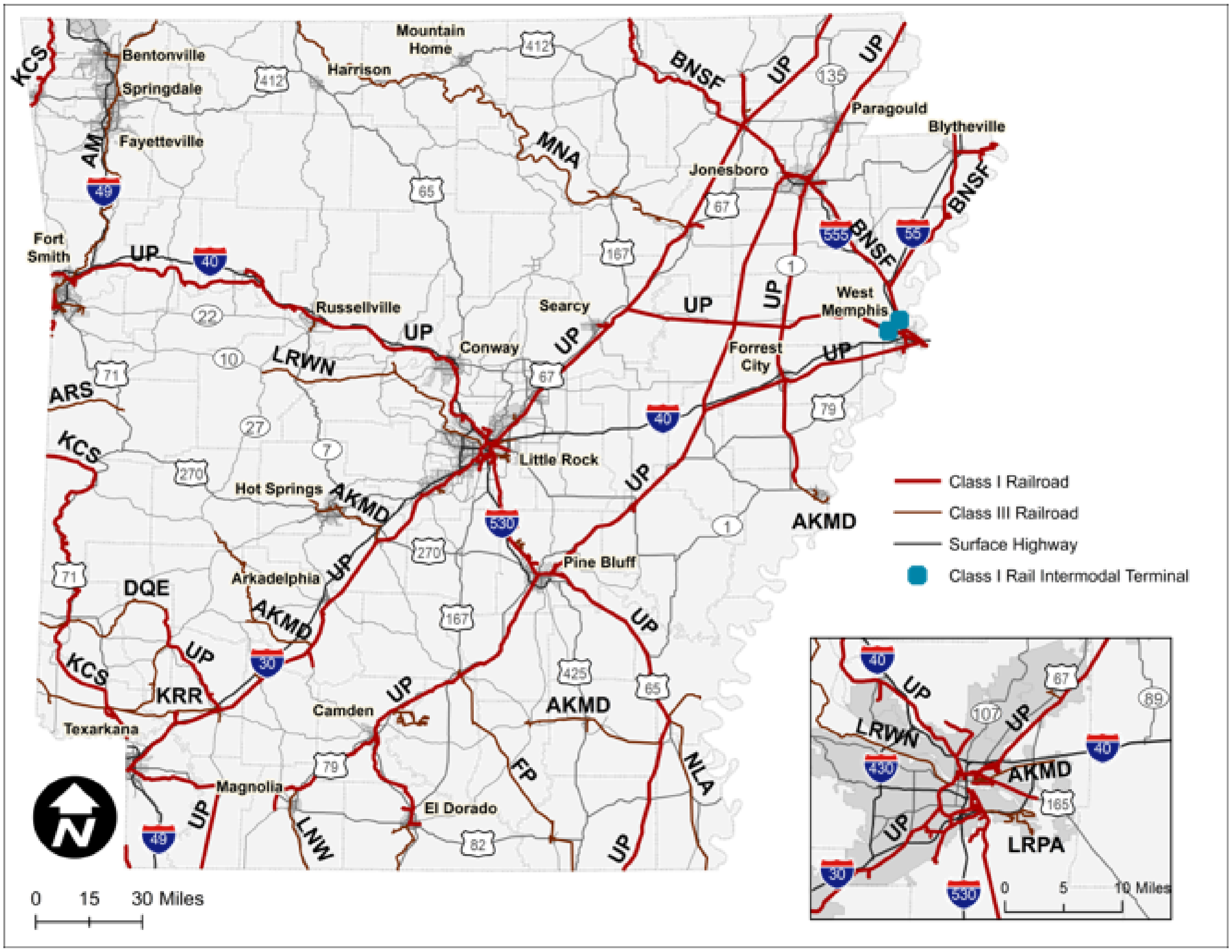
The remainder of this report is organized as follows:

- **Section 2.0—Freight Railroad Infrastructure and Facilities** identifies statewide freight railroads and related infrastructure and intermodal facilities.
- **Section 3.0—Freight Rail Demand** provides a commodity flow analysis to assess current and projected statewide freight rail demand.
- **Section 4.0—Rail Condition and Performance** assesses the condition of the statewide rail network from a system performance and safety perspective.
- **Section 5.0—Rail Industry Trends** provides an overview of key rail industry trends expected to influence statewide freight rail operations.

2.0 Freight Rail Infrastructure and Facilities

This section introduces Arkansas' freight railroads and intermodal facilities that comprise the Arkansas freight railroad system. Arkansas' freight rail network is comprised of 26 freight railroads. This includes three Class I railroads and 23 Class III railroads.[1] The Class III railroads are further broken out into 16 local railroads and six switching and terminal railroads. These railroads are visualized in Figure 2.1, and summarized in Table 2.1, Table 2.2, and Table 2.3. In total, the Arkansas freight rail network consists of 2,738 miles.

Figure 2.1 Arkansas Freight Rail Network



Source: FRA North American Rail Network supplemented with information from freight railroad websites and surveys.

[1] U.S. freight railroad class standards are set forth by the Surface Transportation Board, based on annual revenue and adjusted for inflation. The current revenue thresholds were set forth in 2019. Class I railroads are defined as those railroads with an annual operating revenue of at least $504,803,294. Class II railroads are defined as those railroads with an annual operating revenue of between $40,384,284 and $504,803,293. Class III railroads are defined as those railroads with an annual operating revenue of $40,384,283 or less. The specificity of these figures can be attributed to these original standards being set forth in 1992 using 1991 dollar figures, and subsequent inflation adjustment factors.

Table 2.1 Arkansas Class I Freight Railroads

Class I Railroad	Alpha Code	Mileage	% of Total
BNSF Railway	BNSF	198	12%
Kansas City Southern Railway	KCS	158	9%
Union Pacific	UP	1,324	79%
	Total Class I Mileage	**1,680**	**100%**

Source: Freight railroad websites; surveys of Arkansas freight rail carriers; 2015 Arkansas State Rail Plan.

Table 2.2 Arkansas Class III Local Freight Railroads

Class III Local Railroad	Alpha Code	Mileage	% of Total
Arkansas & Missouri Railroad	AM	108	11%
Arkansas, Louisiana & Mississippi Railroad	ALM	12	1%
Arkansas Midland Railroad	AKMD	249	26%
Arkansas Southern Railroad	ARS	53	6%
Bauxite & Northern Railroad	BXN	6	1%
Dardanelle & Russellville Railroad	DR	5	1%
DeQueen & Eastern Railroad	DQE	45	5%
El Dorado & Wesson Railway	EDW	6	1%
Fordyce & Princeton Railroad	FP	55	6%
Kiamichi Railroad	KRR	66	7%
Little Rock & Western Railway	LRWN	79	8%
Louisiana & Northwest Railroad	LNW	25	3%
Missouri & Northern Arkansas Railroad	MNA	177	19%
Northern Louisiana & Arkansas Railroad	NLA	46	5%
Ouachita Railroad	OUCH	13	1%
Prescott & Northwestern Railroad	PNW	7	1%
Warren & Saline River Railroad	WSR	3	< 1%
	Total Class III Local Mileage	**955**	**100%**

Source: Freight railroad websites; surveys of Arkansas freight rail carriers; 2015 Arkansas State Rail Plan.

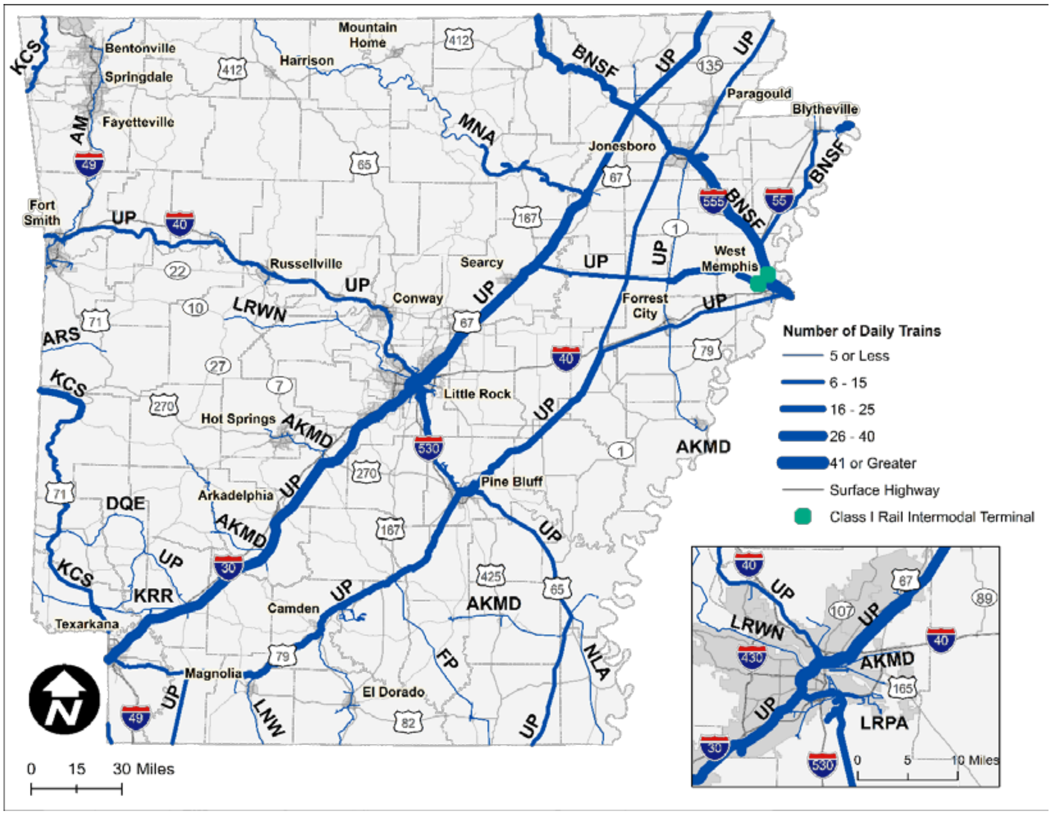
Table 2.3 Arkansas Class III Switching & Terminal Freight Railroads

Class III Local Railroad	Alpha Code	Mileage	% of Total
Camden & Southern Railroad	CSR	3	3%
Delta Valley & Southern Railway	DVS	2	2%
East Camden & Highland Railroad	EACH	54	52%
Fort Smith Railroad	FSR	24	23%
Little Rock Port Authority Railroad	LRPA	17	17%
West Memphis Base Railroad	WMBR	3	3%
Total Class III Switching & Terminal Mileage		**103**	**100%**

Source: Freight railroad websites; surveys of Arkansas freight rail carriers; 2015 Arkansas State Rail Plan.

Based on rail traffic counts at statewide highway-rail grade crossings, rail traffic across Arkansas' freight rail network is shown in Figure 2.2. Daily train traffic is most highest across Union Pacific's larger Hoxie and Little Rock Subdivisions, which form a heavily trafficked corridor between Dallas and Chicago. Along this corridor, rail traffic typically consists of upwards of 40 daily trains. The River Subdivision of BNSF between Memphis and Springfield, Missouri carries up to approximately 30 daily trains. Additional rail segments that carry sizable daily traffic include many of Union Pacific's other subdivisions, as well as the Kansas City Southern rail network, which weaves into and out western Arkansas. Comparatively, Arkansas' Class III railroads tend to carry less daily traffic than the Class I networks.

Figure 2.2 Arkansas Freight Rail Network Traffic



Source: FRA Highway-Rail Grade Crossing Database data applied to the Arkansas Rail Network

2.1 Class I Railroads

Freight railroads with a Class I designation have an operating revenue of greater than $250 million. In the United States, there are seven Class I railroads that cover expansive geographic areas of the United States, and specialize in the hauling of regional and long-distance cargo. Three Class I railroads currently operate within Arkansas: BNSF, KCS, and UP.

2.1.1 BNSF Railway

With a rail network spanning 32,500 miles, BNSF Railway (BNSF) is the largest railroad in the U.S. The BNSF network covers 28 states, primarily in the western United States. BNSF commenced operations in 1996, following the merger of the Atchison Topeka and Santa Fe Railway and the Burlington Northern Railroad. The railroad is currently owned by Berkshire Hathaway.

Within Arkansas, BNSF operates approximately 198 miles of track across two corridors in northeast Arkansas:

- **River Subdivision:** Operates between Turrell (north of West Memphis) and St. Louis, Missouri.
- **Thayer South Subdivision:** Operates between Thayer, Missouri and Memphis, Tennessee, through northeast Arkansas.

The entire BNSF network within Arkansas has a weight standard of 286,000 pounds. As a key indicator of track quality, 286,000 pounds is the North American standard for maximum allowable gross rail weight of railcars. In addition to the two subdivisions, BNSF has trackage rights across much of the UP Arkansas network. These trackage rights include the Hoxie, Little Rock and Jonesboro subdivisions, as well as the Brinkley, Memphis, and Shreveport subdivisions. Lastly, BNSF has trackage rights along the Pine Bluff Subdivision between Pine Bluff and the start of the Shreveport Subdivision in Lewisville. The top commodities moved by BNSF in Arkansas include metals, farm products, chemicals, forestry products, non-metallic minerals, food, and coal. Top inbound commodities to Arkansas include coal, industrial products, and agricultural products. Top outbound commodities from Arkansas include industrial products and agricultural products.

Table 2.4 BNSF Railway Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
1,030	190	Unavailable	840	Unavailable

Source: BNSF Railway

2.1.2 Kansas City Southern

Kansas City Southern (KCS) is the smallest of the national Class I operators, with a network spanning 3,400 miles across ten U.S. states. The KCS network also includes an additional approximately 3,300 miles of track across 15 states in Mexico, owned and operated by Kansas City Southern de México which is fully owned by KCS.

In September 2021, Canadian Pacific (CP) won the bid to acquire KCS and announced a merger agreement subject to regulatory approval. As of December 2022, the Surface Transportation Board's (STB) approval of this merger is pending.[2]

Within Arkansas, KCS primarily serves the far western portion of the state, spanning 158 miles. The railroad's primary north-south corridor between Shreveport and Kansas City weaves into and out of Arkansas from Louisiana, Texas, Oklahoma, and Missouri. The network also includes a branch connecting Fort Smith to the primary north-south corridor in Poteau, Oklahoma. With the exception of the Fort Smith Branch, the KCS network within Arkansas has a weight standard of 286,000 pounds. KCS also has trackage rights along the Kiamichi Railroad within Arkansas, and the Nashville Subdivision of the Arkansas Southern Railroad. The top commodities for KCS in Arkansas include stone, pulp board, scrap paper, iron, metals, wood pulp, coal, chemicals, and crops.

Table 2.5 Kansas City Southern Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
158	158	59	12	Unavailable

Source: Kansas City Southern and 2015 Arkansas State Rail Plan

2.1.3 Union Pacific Railroad

Union Pacific Railroad (UP) is the second-largest railroad in the U.S., with a network of 32,000 miles serving 23 states in the western two-thirds of the country. It is the largest railroad in Arkansas with an expansive network of 1,324 miles. The railroad was originally incorporated in 1862 through the Pacific Railway Act. The modern day network of UP was formed through various mergers including the Missouri Pacific, Chicago and Northwestern, Western Pacific, Missouri-Kansas-Texas, and Southern Pacific rail networks.

Within Arkansas, the UP rail network serves a broad corridor stretching from the southwest to the northeast portions of the state, as well as connectivity to the Fort Smith area. The network consists of the following major subdivisions:

- **Hoxie Subdivision:** The busiest subdivision of UP, which operates between Little Rock and points northeast, including St. Louis and Chicago. Access is also available to UP's Memphis subdivision.
- **Little Rock Subdivision:** The second busiest UP subdivision in Arkansas operates between Little Rock and points southwest to Texarkana, and ultimately Dallas.
- **Jonesboro Subdivision:** Operates between Jonesboro and Pine Bluff, along a corridor parallel to the Hoxie Subdivision.

Additional subdivisions include the following:

- **Brinkley Subdivision:** Operates between Brinkley and West Memphis/Memphis,

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2 https://www.cpr.ca/en/media/surface-transportation-board-accepts-cp-kcs-merger-application-as-complete-sets-procedural-schedule

- **El Dorado Subdivision:** Operates between Camden and El Dorado.
- **Helena Subdivision:** Operates between Helena and Wynne.
- **McGehee Subdivision:** Operates between Pine Bluff and McGehee and points south.
- **Memphis Subdivision:** Operates between Searcy and West Memphis/Memphis.
- **Nashville Subdivision:** Operates between Hope, along the Little Rock Subdivision, and Nashville.
- **Pine Bluff Subdivision:** Operates between Pine Bluff and Texarkana.
- **Shreveport Subdivision:** Operates between Lewisville and Shreveport, Louisiana.
- **White Bluff Subdivision:** Operates between Little Rock and White Hall/Pine Bluff.
- **Wynne Subdivision:** Operates between Wynne and Jonesboro.
- **Van Buren Subdivision:** Operates between Little Rock and Fort Smith.

With the exception of the Helena Subdivision and scattered railroad spurs, the entire UP network in Arkansas has weight standard of 286,000 pounds. The top commodities for UP in Arkansas include auto parts, intermodal wholesale, grain, food, sugar, steel, aggregates, coal, chemicals, and oils.

Table 2.6 Union Pacific Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
1,324	1,324	286	191	Unavailable

Source: Union Pacific and 2015 Arkansas State Rail Plan

2.2 Local Railroads

Local Class III railroads, also known as short lines, are those railroads with an annual operating revenue of less than $39.2 million. Local railroads typically provide line haul services, and provide connections to the larger Class I network as well as “last-mile” connectivity to freight generating facilities, particularly in rural areas. In Arkansas, there are currently 17 local railroads, which are profiled in the following subsections.

2.2.1 Arkansas & Missouri Railroad

The Arkansas & Missouri Railroad (AM) is a 286,000-pound standard, double-stack cleared Class III railroad operating 150 miles of track between Fort Smith and Monett, Missouri. Of the total mileage, 111 miles are operated within Arkansas. The railroad, founded in 1986, also provides rail-to-water intermodal services at Fort Smith and Van Buren along the Arkansas River, in addition to transloading services across its geography. Key commodities transferred include grain and feed supplements, paper products, sand, plastic, food products, scrap steel, lumber, aluminum, and bauxite. The AM interchanges with BNSF at Monett; and KCS, UP, and Fort Smith Railroad (FSR) at Fort Smith/Van Buren.

Table 2.7 Arkansas & Missouri Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
108	103	5	0	Class 1: 5 Class 3: 103

Source: 2015 Arkansas State Rail Plan

2.2.2 Arkansas, Louisiana & Mississippi Railroad

The Arkansas, Louisiana & Mississippi Railroad (ALM) is a 286,000-pound standard Class III railroad operating 71 miles between Crossett in southeast Arkansas, and Monroe, Louisiana. Of the total mileage, 16 miles are operated in Arkansas, while the remaining 55 miles are operated in Louisiana. Founded in 1908, the railroad had multiple corporate owners in the timber industry until its acquisition by Genesee & Wyoming in 2004. Key commodities transported include lumber, paper, forest products, and chemicals. The ALM interchanges with UP at Monroe and Fordyce and Princeton Railroad (FP) at Crossett.

Table 2.8 Arkansas, Louisiana & Mississippi Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
12	12	0	0	Class 1: 2 Class 2: 10

Source: Genesee & Wyoming

2.2.3 Arkansas Midland Railroad

The Arkansas Midland Railroad (AKMD) is a Class III railroad operating approximately 148 miles. The railroad consists of seven branches across Arkansas:

- **Cypress Bend Branch:** Operates 19.5 miles along UP-owned tracks between the UP McGehee Yard and Cypress Bend.
- **Gurdon Branch:** Operates 2.9 miles in Gurdon with connections to UP.
- **Helena Branch:** Operates 16 miles between the Lexa and Helena Harbor, with connections to UP.
- **Hot Springs Branch:** Operates 43 miles between Malvern and Mountain Pine, with connections to UP. The branch has a weight standard of 286,000 pounds.
- **Jacksonville Branch:** Operates 4.2 miles in Jacksonville with connections to UP.
- **North Little Rock/Carlisle Branch:** Operates 19 miles, in two sections, between North Little Rock and Galloway, and North Little Rock and the Carlisle Industrial Lead. Connections are available to UP and BNSF, as well as the Little Rock & Western Railway (LRWN).

- **Warren Branch:** Operates 44 miles between Dermott and Warren with connections to UP and the North Louisiana and Arkansas Railroad (NLA).

This railroad was originally established in 1992 by the Pinsly Railroad Company, and was subsequently sold to Genesee & Wyoming in 2015. Key commodities transported include forestry products, grain products, aggregates, building materials, cottonseeds, and chemicals.

Table 2.9 Arkansas Midland Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
249	72.4	76.6	0	Class 1: 31.7 Class 2: 31.2 Expected: 67.1 Unidentified: 19

Source: Genesee & Wyoming

2.2.4 Arkansas Southern Railroad

The Arkansas Southern Railroad (ARS) is a Class III railroad operating a total of 63 miles. The railroad consists of two branches:

- **Nashville Subdivision:** Operates 32 miles between Nashville and Ashdown with connections to KCS and the Kiamichi Railroad (KKR). This subdivision has a 286,000-pound standard track capacity.

- **Waldron Subdivision:** Operates 29 miles between Waldron and Heavener, Oklahoma with connections to KCS and UP.

This railroad began operations in 2005 when KCS leased the two branch lines to Watco Transportation Services. Key commodities transported include animal feed and chemicals.

Table 2.10 Arkansas Southern Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
53	0	53	0	Class 1: 32 Expected: 21

Source: 2015 Arkansas State Rail Plan

2.2.5 Bauxite & Northern Railroad

The Bauxite & Northern Railroad (BXN) is a Class III railroad operating 3 miles of mainline track, with an additional 3.5 miles of sidings and spurs in Bauxite. The railroad began operations in 1906 as a subsidiary of the Aluminum Company of America (Alcoa). The railroad was purchased by RailAmerica in 2005, which was acquired by Genesee & Wyoming in 2012. Key commodities transferred include alumina, bauxite, clay, and cement. Railcar storage is available for up to 44 cars. The BXN interchanges with UP.

Table 2.11 Bauxite & Northern Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
6.5	6.5	0	0	Class 1: 6.0 Expected: 0.5

Source: Genesee & Wyoming

2.2.6 Dardanelle & Russellville Railroad

The Dardanelle & Russellville Railroad (DR) is a Class III railroad operating 5.2 miles in Russellville, up to the Arkansas River across from Russellville. The railroad commenced operations in 1883 and is currently owned by Arkansas Shortline Railroads, Inc. Key commodities transported include forest products, plastic, petroleum and drilling commodities. The DR interchanges with UP.

Table 2.12 Dardanelle & Russellville Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
5.2	5.2	0	0	Expected: 5.2

Source: 2015 Arkansas State Rail Plan

2.2.7 DeQueen & Eastern Railroad

The DeQueen & Eastern Railroad (DQE) is a 286,000-pound standard Class III railroad operating 91 miles between Perkins and Valliant, Oklahoma. Of the total mileage, 45 miles are operated in Arkansas, with the remaining 46 miles operated in Oklahoma. Through Oklahoma, the railroad also operates as the Texas, Oklahoma, & Eastern Railroad (TOE), an affiliated railroad that operates in conjunction with the DQE.

The DQE was incorporated in 1900 as a subsidiary of Weyerhaeuser Company, a timber producer and wood manufacturer. In 2010, Weyerhaeuser Company sold all of its railroads, including the DQE and TOE, to Patriot Rail Corporation. Key commodities transported include pulpboard, plywood chips, corn, stone, paper, soybeans and chemicals. The DQE interchanges with UP at Perkins, KCS and TOE at DeQueen, and the Kiamichi Railroad (KRR) at Valliant, Oklahoma. Railcar storage is available for up to 150 cars.

Table 2.13 DeQueen & Eastern Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
45	45	0	0	Class 3: 45

Source: 2015 Arkansas State Rail Plan

2.2.8 El Dorado & Wesson Railway

The El Dorado & Wesson Railway (EDW) is a Class III railroad operating 5.5 miles between El Dorado and Newell. The railroad also includes yard trackage and additional leased trackage for total operations spanning over 17 miles. The EDW was founded in 1905 to serve an area lumber mill. Key commodities transported include petroleum products, chemicals and medium density fiberboard. The EDW interchanges with UP and the Ouachita Railroad Company (OUCH). Railcar storage is available for up to 100 cars.

Table 2.14 El Dorado & Wesson Railway Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
6	6	6	0	Class 3: 6

Source: 2015 Arkansas State Rail Plan

2.2.9 Fordyce & Princeton Railroad

The Fordyce & Princeton Railroad (FP) is a 286,000-pound standard Class III railroad operating 57 miles between Fordyce and Crossett in southern Arkansas. The railroad was founded in 1890, and was owned by Georgia Pacific, a forestry products company between 1963 and 2004, before being sold to Genesee & Wyoming. Forest products are the primary commodities transported along the railroad. The FP interchanges with UP at Fordyce and the Arkansas, Louisiana & Mississippi Railroad (ALM). Railcar storage is available for up to 833 cars.

Table 2.15 Fordyce & Princeton Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
55	55	0	0	Class 1: 55

Source: Genesee & Wyoming

2.2.10 Kiamichi Railroad

The Kiamichi Railroad (KRR) is a Class III railroad operating 264 miles between Hope in southwest Arkansas and Madill, Oklahoma. Of the total mileage, 36 miles are operated in Arkansas, with the remaining mileage operated in Oklahoma, as well as along a branch between Antlers, Oklahoma; Hugo, Oklahoma; and Paris, Texas. Besides the Paris Branch between Oklahoma and Texas, the railroad has a 286,000-pound standard track capacity. The railroad, formerly a main line of the former St. Louis – San Francisco Railway, began independent operations in 1987. It was purchased by RailAmerica in 2002, which was acquired by Genesee & Wyoming in 2012. Key commodities transported include scrap metal, non-metallic minerals, animal feed, coal, lumber, paper, glass, cement, pulpwood, stone and food products. The KRR interchanges with UP at Hope and Durant, Oklahoma, KCS at Ashdown, and BNSF at Madill, Oklahoma. Railcar storage is available for up to 980 cars.

Table 2.16 Kiamichi Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
65.5	65.5	0	6.5	Class 1: 31 Expected: 34.5

Source: Genesee & Wyoming

2.2.11 Little Rock & Western Railway

The Little Rock & Western Railway (LRWN) is a 286,000-pound standard Class III railroad operating 87 miles between Little Rock and Danville to the west. The railroad was founded in 1900 by the Choctaw, Oklahoma and Gulf Railroad, which became part of the Chicago, Rock Island and Pacific Railroad main line between Memphis and Tucumcari, New Mexico. When the railroad ceased operations, Green Bay Packaging acquired the railroad in 1980 and subsequently sold it to Rail Management Corporation in 1983. Genesee & Wyoming, the current owner, acquired Rail Management Corporation in 2015. Key commodities transported include wood and paper products, grain, limestone slurry, cornstarch, salt, liquified petroleum gas, and pulp mill liquid. The LRWN interchanges with BNSF and UP in North Little Rock. Additionally, the LRWN acts as an intermediate switcher between BNSF and UP in North Little Rock since there is no direct connect between the two Class I railroads at this location. Railcar storage is available for up to 300 cars.

Table 2.17 Little Rock & Western Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
79	44	35	5	Unavailable

Source: Genesee & Wyoming

2.2.12 Louisiana & Northwest Railroad

The Louisiana & Northwest Railroad (LNW) is a 286,000-pound standard Class III railroad operating 68 miles between McNeil in southwest Arkansas and Gibsland, Louisiana. Of the total mileage, 25 miles are operated in Arkansas, with the remaining mileage operated through Louisiana. The railroad was incorporated in 1889, and purchased by Patriot Rail in 2008. Key commodities transported include chemicals, steel, and plastics. The LNW interchanges with UP in McNeil, and KCS in Gibsland. Railcar storage is available for up to 60 cars.

Table 2.18 Louisiana & Northwest Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
25	19	6	0	Class 1: 25

Source: 2015 Arkansas State Rail Plan

2.2.13 Missouri & Northern Arkansas Railroad

The Missouri & Northern Arkansas Railroad (MNA) is a 286,000-pound standard Class III railroad operating 490 miles between Diaz in northern Arkansas and Kansas City, Missouri. Of the total mileage, 126 are operated in Arkansas, with the remaining mileage operated through Missouri. The railroad is part of the former Missouri Pacific. As a separate railroad, the MNA commenced operations in 1992 and was acquired by Genesee & Wyoming in 2012. Key commodities transferred include coal, grain, frozen foods, minerals, steel, chemicals, asphalt, and forest products. The MNA interchanges with UP in Newport, as well as in Kansas City, Missouri. In Missouri, the MNA also interchanges with BNSF and KCS. Railcar storage is available for up to 2,000 cars.

Table 2.19 Missouri & Northwest Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
177	175	2	34	Class 2 or Above

Source: Genesee & Wyoming

2.2.14 Northern Louisiana & Arkansas Railroad

The Northern Louisiana & Arkansas Railroad (NLA) is a Class III railroad operating 62 miles between McGehee in southeast Arkansas and Lake Providence, Louisiana. The railroad was formed in 2011 following abandonment filings by its previous owners and subsequent acquisitions of several segments via Offers of Financial Assistance from the Surface Transportation Board. Key commodities transferred include agricultural and industrial commodities. The NLA interchanges with UP through the Arkansas Midland Railway.

Table 2.20 Northern Louisiana & Arkansas Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
46	24	22	0	Expected: 46

Source: 2015 Arkansas State Rail Plan

2.2.15 Ouachita Railroad

The Ouachita Railroad (OUCH) is a Class III railroad operating 26.2 miles in and around El Dorado. The railroad, currently owned by Arkansas Short Line Railroad since 1990, was previously owned by the East Camden & Highland Railroad. Key commodities transported include chemicals and forest products. Connections are available to UP.

Table 2.21 Ouachita Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
13	13	0	0	Expected: 13

Source: 2015 Arkansas State Rail Plan

2.2.16 Prescott & Northwestern Railroad

The Prescott & Northwestern Railroad (PNW) is a 286,000-pound standard Class III railroad operating 9 miles in and around Prescott in southwest Arkansas. The railroad was previously owned by Potlach Corporation, a forestry products company, until 2010 when it was acquired by the Pinsly Railroad Company. Subsequently, Genesee & Wyoming acquired the railroad in 2015. Roofing products are the primary commodities transported along the railroad. The PNW interchanges with UP.

Table 2.22 Prescott & Northwestern Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
7.7	11.2	0	0	Expected: 7.7

Source: Genesee & Wyoming

2.2.17 Warren & Saline River Railroad

The Warren & Saline River Railroad (WSR) is a Class III railroad operating 3 miles in Warren in south-central Arkansas. The railroad has a similar history to the Prescott & Northwestern Railroad (PNW), involving acquisition by Genesee & Wyoming from the Potlach Corporation in 2015. Key commodities transferred include outbound lumber and forest products. The WSR interchanges with the Arkansas Midland Railroad (AKMD).

Table 2.23 Warren & Saline Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
3	3	0	0	Expected: 3

Source: Genesee & Wyoming

2.3 Switching & Terminal Railroads

Switching & terminal Class III railroads are generally defined as those railroads performing switching and terminal services for larger railroads. Unlike local Class III railroads, switching & terminal railroads do not provide freight services between two distinct geographic locations. Instead these railroads primarily support shunting operations such as combining railcars to form a consist, breaking down train consists, and railcar storage. These railroads, often previously abandoned by the larger railroads over time, perform an important role in serving businesses and customers not directly located along the larger railroads. In Arkansas, there are currently six switching & terminal railroads, which are profiled in the following subsections.

2.3.1 Camden & Southern Railroad

The Camden & Southern Railroad (CSR) is a Class III railroad operating 3.2 miles in Camden in south-central Arkansas. The railroad, which commenced operations in 2011, is currently leased and operated by Arkansas Short Line Railroads Inc. from the Camden Area Industrial Development Corporation (CAIDC). Prior to 2011, the CAIDC acquired trackage from multiple private facilities that had shuttered before 2005. Today, the railroad primarily serves customers at the new industrial park developed by the CAIDC. Key commodities transported include forest products, plastic, petroleum, and drilling components. The CSR interchanges with UP.

Table 2.24 Camden & Southern Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
3.2	0	3.2	0	Expected: 3.2

Source: 2015 Arkansas State Rail Plan

2.3.2 Delta Valley & Southern Railway

The Delta Valley and Southern Railway (DVS) is a Class III railroad operating two miles in Wilson in northeast Arkansas. The railroad was formerly part of a larger section of track along the San Francisco – St. Louis Railway, although all but the current two miles of track were abandoned in 1947. Outbound cottonseed is the primary commodity transferred along the railroad. The DVS interchanges with BNSF.

Table 2.25 Delta Valley & Southern Railway Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
2	2	0	0	Expected: 2

Source: 2015 Arkansas State Rail Plan

2.3.3 East Camden & Highland Railroad

The East Camden & Highland Railroad (EACH) is a Class III railroad operating 54 miles between East Camden and Eagle Mills in south-central Arkansas. The railroad primarily consists of a loop in and around the Highland Industrial Park. The railroad primarily provides storage services, with a capacity for up to 3,000 cars, although switching services are also available. EACH interchanges with UP.

Table 2.26 East Camden & Highland Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
54	54	0	0	Class 1: 54

Source: 2015 Arkansas State Rail Plan

2.3.4 Fort Smith Railroad

The Fort Smith Railroad (FSR) is a 286,000-pound standard Class III railroad operating 23.5 miles in and around Fort Smith. The railroad was constructed in the 1890s by the Arkansas Central Railroad and later became part of the Missouri Pacific Railroad, which merged with Union Pacific in 1982. Key commodities transported include grain (rice), food products, industrial and agricultural chemicals, electoral products, fabricated metal, machinery, plastics and rubbers. The FSR interchanges with KCS and UP. FSR (and other Pioneer Railroad subsidiaries) was acquired by Patriot Rail in 2022.

Table 2.27 Fort Smith Railroad Mileages

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
23.5	0	23.5	0	Class 1: 23 Expected: 0.5

Source: Pioneer Lines

2.3.5 Little Rock Port Authority Railroad

The Little Rock Port Authority Railroad (LRPA) is a Class III railroad operating 17 miles within the Little Rock Port Industrial Park in Little Rock. The railroad is owned and operated by the Little Rock Port Authority. Key commodities transported include steel, peanuts, plastic pellets, gas piping, as well as any commodities shipped through customers located within the industrial park, or with access to on-site docks along the Arkansas River. The LRPA interchanges with UP and BNSF within the port.

Table 2.28 Little Rock Port Authority Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
19	19	0	0	Class 1: 19

Source: Little Rock Port Authority

2.3.6 West Memphis Base Railroad

The West Memphis Base Railroad (WMBR) is a Class III railroad operating 2.2 miles in West Memphis. The railroad, originally built from abandoned UP spur segments, was previously owned by the City of West Memphis until 2018 when it was leased and eventually purchased by West Memphis Base Railroad, L.L.C. The railroad primarily serves the Port of West Memphis and also provides trackage rights to UP. Key commodities transported include steel, propane, and chemicals. The WMBR interchanges with UP.

Table 2.29 West Memphis Base Railroad Mileage in Arkansas

Miles Operated	Miles Owned	Miles Leased	Trackage Rights Mileage	Mileage by FRA Track Class
3	3	0	0	Class 1: 3

Source: West Memphis Base Railroad

2.4 Abandonments

The process for railroad to abandon trackage is documented by the Surface Transportation Board.[3] Since the previous State Rail Plan was published in 2015, no sections of track have been proposed for abandonment.

3 https://www.stb.gov/proceedings-actions/search-stb-records/

2.5 Intermodal Facilities

Intermodal facilities are designed for the loading and unloading of containerized freight and trailers to and from flatcars, as well as to and from trucks. These facilities allow for transferring intermodal freight between different modes, as well as between different rail lines and subdivisions. In the United States, major intermodal terminals are operated by each of the Class I railroads. Typically, these facilities are located within close proximity to major urban and freight centers. In Arkansas, this includes two facilities within close proximity to Memphis in the city of Marion. Overall, publicly available information on detailed operations of each intermodal terminal, including total throughput and capacities, is limited. However, information on facility layouts, capabilities, compatibility with user interface technology, and schedules is provided through the websites of each Class I railroad.

2.5.1 Marion Intermodal Terminal

The Marion Intermodal Terminal is the primary intermodal facility for Union Pacific serving the Memphis region. The facility supports rail-to-rail and rail-to-truck operations, as well both trailer on flat car (TOFC) and container on flat car (COFC) capabilities. TOFC refers to the placement of wheeled trailers on railcars. COFC, a more efficient means of rail transport, refers to the placement of containers directly on railcars, without wheels or trailers. This allows for double-stacking capabilities, which saves space and allows for greater efficiency in operations.

2.5.2 Harvard Intermodal Facility

The Harvard Intermodal Terminal is the second hub for BNSF serving the Memphis region. After suspending intermodal service in 2009[4] the facility continued to function as a rail yard, until August 2021 when BNSF restarted intermodal operations at the facility in response to strong demand for intermodal shipping during the COVID-19 pandemic. [5] The Harvard Intermodal Facility handled all Memphis-bound freight originating from the Port of Long Beach's Pier T Terminal through November of 2021, when intermodal service was once again suspended.

2.6 National Multimodal Freight Network

The development of a National Multimodal Freight Network[6] was required under the Fixing America's Surface Transportation (FAST) Act in 2015. The purpose of this designation is to assist states in directing resources and prioritizing investments related to National Multimodal Freight Policy goals within the FAST Act. Through this legislation, the U.S. Department of Transportation is tasked with designating and redesignating key multi-modal links, nodes, and corridors based on a number factors. These factors include the following:

- Origins and destinations of freight movements across the United States.
- Volumes, tonnages, and value of freight moved.

[4] https://www.adeq.state.ar.us/downloads/webdatabases/permitsonline/npdes/permitinformation/arr00c026_notice%20of%20termination_20091201.pdf

[5] https://www.bnsf.com/news-media/customer-notifications/notification.page?notId=bnsf-responds-to-growing-intermodal-demand-in-memphis-region

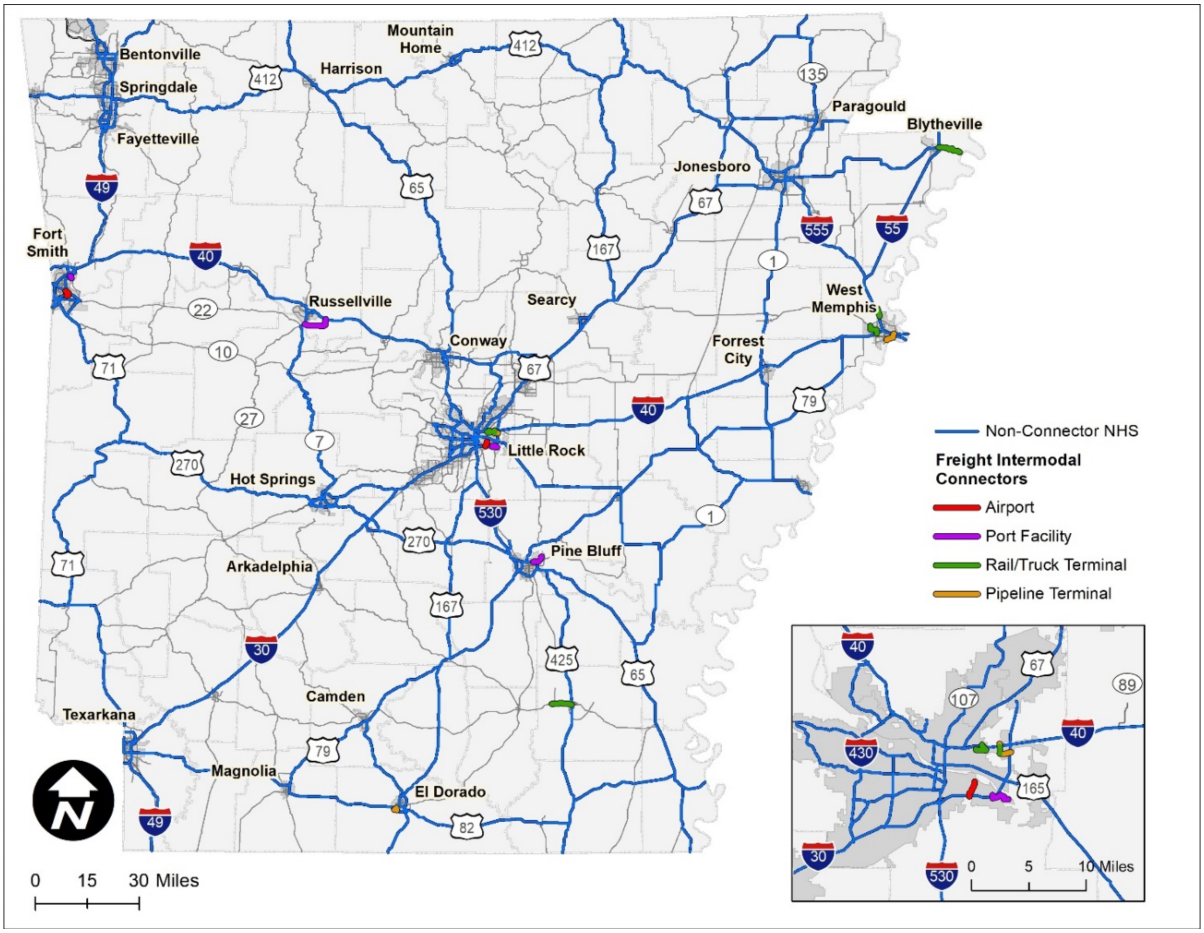
[6] https://www.transportation.gov/sites/dot.gov/files/2020-09/NFSP_fullplan_508_0.pdf

- Access to ports of entry, airports, seaports, and other related facilities.
- Economic factors.
- Access to major manufacturing, agricultural, natural resources, and other production hubs.
- Access to energy exploration, development, installation, and production areas.
- Key intermodal links and connections.
- Freight choke points and other impediments contributing to significant measurable congestion, delay in freight movement, or inefficient modal connections.
- Impacts on all freight transportation modes.
- Major distribution centers, inland intermodal facilities, and first- and last-mile facilities.
- Considerations for domestic and global supply chains.

Designation and redesignation of the National Multimodal Freight Network occurs on a basis of at least every five years. As part of these processes, states are given the opportunity to provide feedback on the network, including with input from local metropolitan planning organizations (MPOs), state freight advisory councils, owners of port, rail, pipeline, and airport facilities, as well as insight from state transportation improvement programs or freight plans. This process is particularly useful and beneficial when applying for and securing federal funding for key transportation projects. Within Arkansas, the current National Multimodal Freight Network includes the following transportation infrastructure components:

- **Class I Freight Rail Network:** Comprised of UP, BNSF, and KCS railroad networks. Class III railroads are not included.
- **National Highway Freight Network:** Including all Interstate Highways in Arkansas, as well as select Intermodal Connectors as illustrated in Figure 2.3. These connectors consist of key highways and roads that lead to major intermodal facilities (airport, seaport, rail/truck terminals, and pipeline terminals) where large volumes of freight are exchanged. Statewide intermodal connectors are displayed in Figure 2.3. Additional information on National Highway Freight Network designation, including designation of intermodal connectors, can be found in the Highway Freight Modal Profile.
- **Marine Waterways:** Comprised of the Arkansas and Mississippi River Marine Highways, and the Ouachita White River Inland Waterways.
- **Public Ports:** Designated public ports with total domestic and foreign trade short tonnage of over 2 million. In Arkansas, this includes the Port of Helena along the Mississippi River.

Figure 2.3 Arkansas National Highway Freight Network Intermodal Connectors



2.7 Strategic Rail Corridor Network

The U.S. Transportation Command developed the Strategic Rail Corridor Network (STRACNET), which is a system of commercial railroads that serves U.S. Department of Defense's domestic operations, connecting bases, military installations, and maritime ports when rail service is needed. In Arkansas, this includes Little Rock Air Force Base (which currently does not utilize freight rail for essential goods movement), Camp Robinson, Ebbing Air National Guard Base, Fort Chaffee Joint Maneuver Training Center, and the Pine Bluff Arsenal. STRACNET is designated along with the Strategic Highway Network (STRAHNET), strategic seaports, military airports, and other infrastructure facilities that support essential freight activity and goods movement for the U.S. military. Figure 2.4 shows the STRACNET routes within Arkansas. This includes the entire KCS network through western Arkansas, BNSF's Thayer South Subdivision, and UP's Hoxie and Memphis Subdivisions.

Figure 2.4 Arkansas STRACNET Corridors

Source: U.S. Bureau of Transportation Statistics; U.S Transportation Command.

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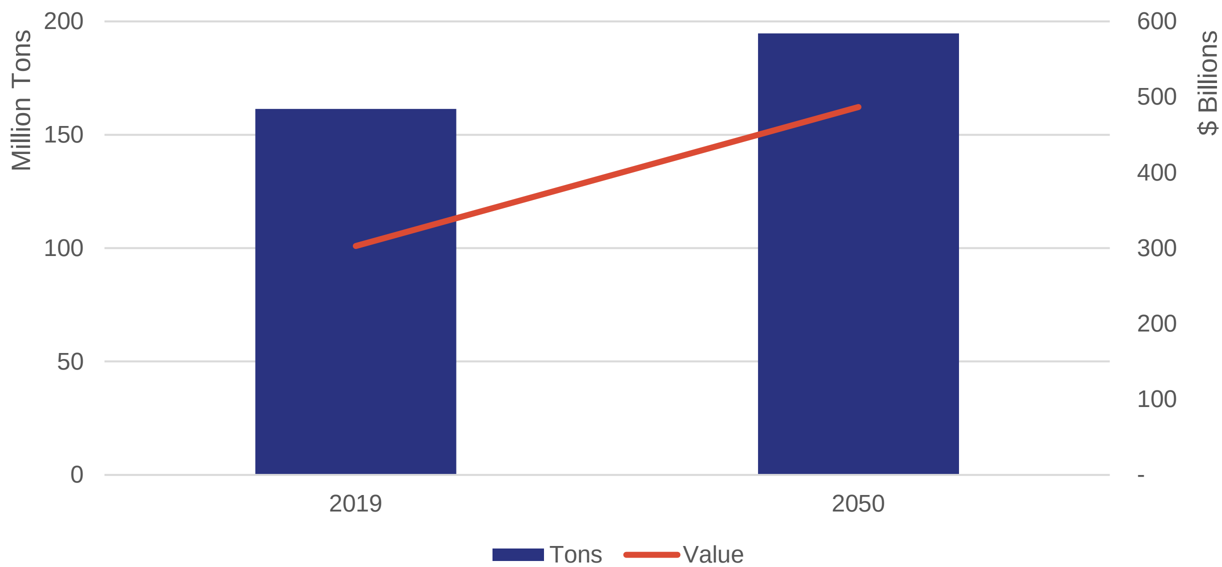
3.0 Freight Rail Demand

This section examines freight rail demand across the Arkansas rail network. Using disaggregated FAF Version 5.2 data and the confidential STB Carload Waybill Sample, freight rail tonnage and value were analyzed for a base year of 2019, with projections through 2050. The analysis of freight demand includes an assessment of total tonnage and value, directional breakdown, top commodities, top state trade partners, supplemented by an assessment of intermodal and carload service types.

3.1 Statewide Freight Rail Activity

In 2019, more than 160 million tons of freight valued at more than $300 billion moved throughout the Arkansas freight rail network (Figure 3.1). By 2050, tonnage is expected to grow by 20 percent to nearly 200 million tons by 2050 valued at nearly $500 billion.

Figure 3.1 Total Freight Rail Tons and Value in Arkansas, 2019 and 2050

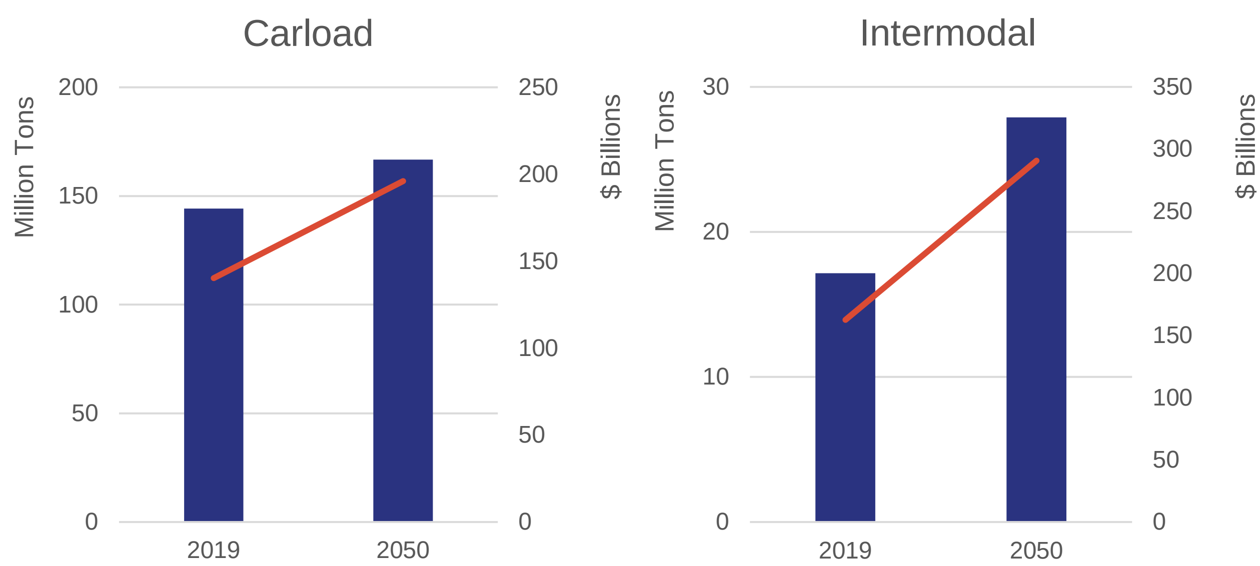


Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

Freight rail tonnage and value are further broken out by carload and intermodal totals in Figure 3.2. The distinguishing of carload and intermodal traffic refers to the type of railcar and corresponding commodities transported. Carload traffic refers to various types of railcars used to primarily, but not exclusively, transport bulk commodities such as aggregates, grain, or coal. This includes hopper cars, tank cars, flat cars, box cars, and gondolas. Intermodal traffic refers to containerized units able to be double-stacked for rail transport, and directly transferred to other modes, including truck and vessel. Intermodal traffic consists of a wide range of commodities, primarily in finished or intermediate stages of production, including automobile parts, equipment, packaged food, toys, and various household and everyday items.

As shown in Figure 3.2, carload tonnage is expected to increase by 15 percent through 2050 to approximately 167 million tons. During this time, total carload value is expected to increase by 40 percent to approximately $196 billion. Intermodal tonnage is expected to increase from 17 million to 28 million by 2050. Total intermodal value is expected rise significantly from $163 billion to $291 billion. Based on these figures, carload represents the majority of transported tonnage, although intermodal tonnage is expected to increase at a faster rate through 2050. On the other hand, the smaller amount of intermodal tonnage is much more valuable. Furthermore, intermodal value is also expected to increase at a much higher rate through 2050. These differences in carload and intermodal patterns are expected given the composition of commodities transported.

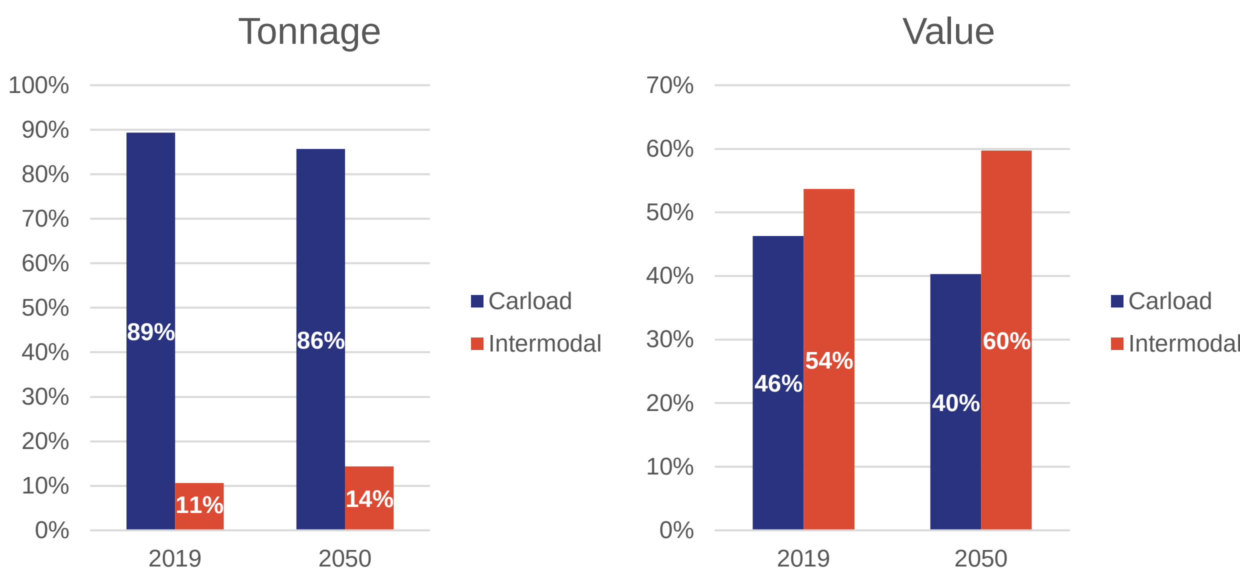
Figure 3.2 Freight Rail Tons and Value by Service Type, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

The breakdown of carload and intermodal figures is further illustrated in Figure 3.3. Total tonnage is comprised primarily of carload traffic, a trend that is largely expected to remain in place through 2050, despite a small increase in intermodal percentage. Despite the small proportion of total tonnage, intermodal traffic comprised over half of total 2019 freight rail traffic value. Through 2050, intermodal traffic is expected to comprise 60 percent of freight rail traffic value, despite smaller increases in tonnage percentage. This indicates that intermodal traffic will be increasingly comprised of higher value and finished products, in comparison to carload bulk commodities.

Figure 3.3 Proportion of Carload vs. Intermodal Traffic in Arkansas, 2019 and 2050



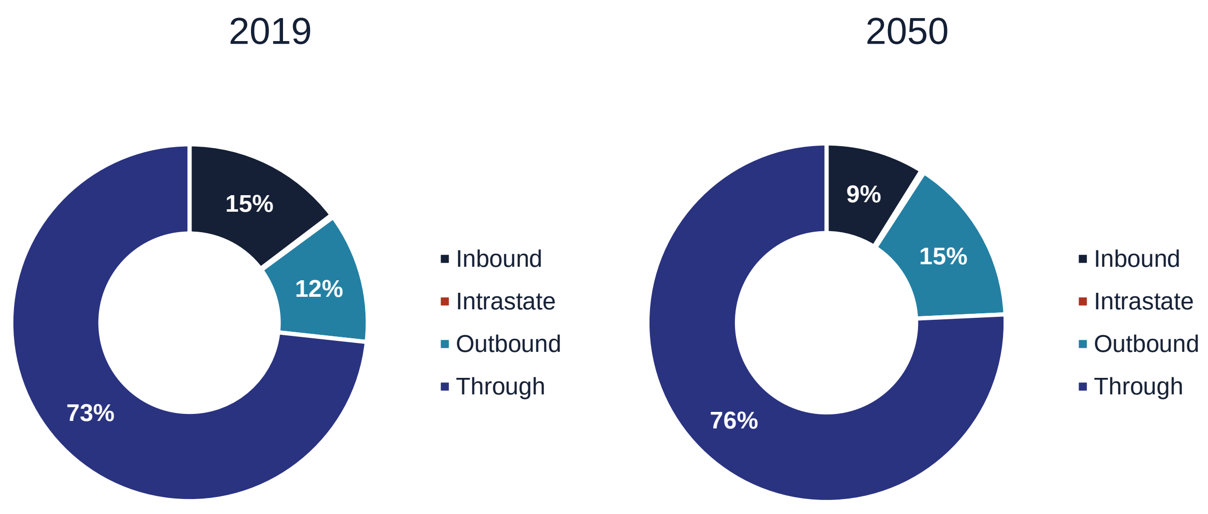
Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

3.2 Directional Split

The directional breakdown of Arkansas freight rail traffic is shown in Figure 3.4 for tonnage and in Figure 3.5 for value. The vast majority of traffic, both in terms of tonnage and value, is comprised of through traffic. This can be attributed to multiple factors, including the state's geography, position within the national freight rail network, and proximity to major industrial markets. Arkansas, located in a constrained position, ranks in the bottom half of states in both physical area and population. At the same time, a large portion of the state's freight rail network is comprised of Class I trackage along major corridors and within close or immediate proximity to national freight generators and hubs such as Dallas, Kansas City, St. Louis, Chicago, and Memphis. As a result, a significant amount of traffic into and out of these freight hubs passes through Arkansas on the way to intermediate and final destinations.

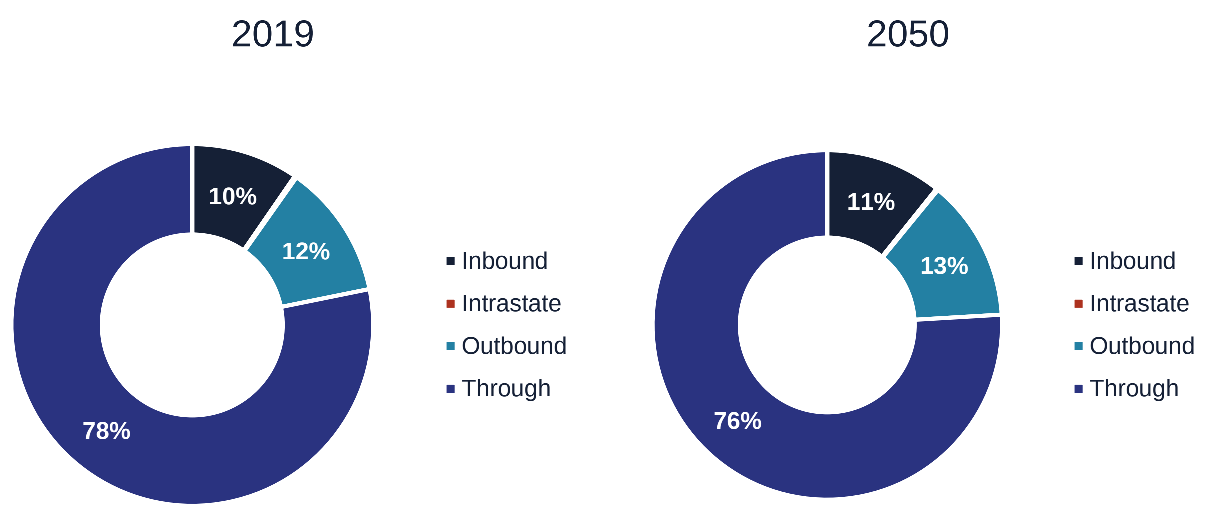
Similarly, intrastate traffic comprises only a negligible amount of both totals, given the relatively small size of the state. These trends are expected through 2050. In terms of tonnage, inbound tonnage comprised a slightly higher proportion in comparison to outbound. Through 2050, outbound tonnage is expected to comprise a higher proportion, given a proportion of 15 percent outbound tonnage and just 9 percent inbound tonnage. In terms of value, both inbound and outbound proportions are expected to rise slightly. This is as a result of a slight decrease in the total share of through traffic in 2050.

Figure 3.4 Rail Direction Split by Tonnage, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

Figure 3.5 Rail Direction Split by Value, 2019 and 2050



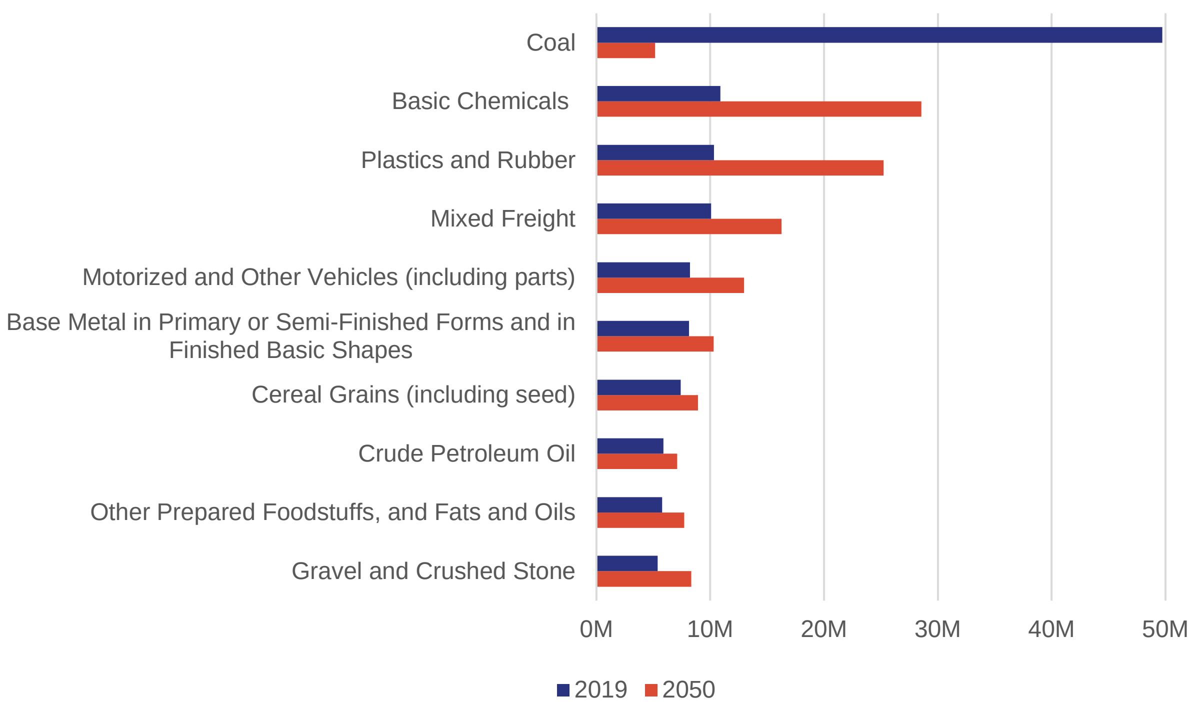
Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

3.3 Top Commodities

Top commodities by tonnage across both carload and intermodal traffic are shown in Figure 3.6. In 2019, coal was by far the most dominant commodity by tonnage at nearly 50 million tons. The dominance of coal can be attributed to its broad and widespread use as a source for electricity production. Given its physical characteristics as a bulk commodity, coal has primarily been transported by rail. In 2020, 67 percent of all coal shipments reached their final destination by rail. However, due to the rise of other cost competitive fuels (such as natural gas), and environmental concerns, the use of coal for power generation has declined significantly from its peak in 2008. Correspondingly, between 2008 and 2020, originated coal carloads across the U.S. dropped by 61 percent. The decline of coal is expected to continue, given the cost effectiveness and availability of natural gas.[7] Through 2050, coal is expected to decline by 90 percent to just 5 million tons, placing it well outside of the top ten statewide commodities.

Beyond the decline in coal tonnage through 2050, significant increases in other commodities such as basic chemicals and plastic/rubber are expected. Both commodities are broad in definition and include key components in a wide range of everyday, commercial, and industrial products, ranging from sealants and paints, to resin sheets.[8] Additional top commodities with sizable increases include vehicles and vehicle parts, metal, and aggregates (gravel and crushed stone), which further support a wide range of industries from manufacturing and construction to pharmaceuticals. As a result, increases in the top rail commodities, across all directions, are largely expected to offset coal declines through 2050, as indicated by projected increases in total tonnage (Figure 3.1).

Figure 3.6 Top 10 Rail Commodities by Tonnage, All Directions, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

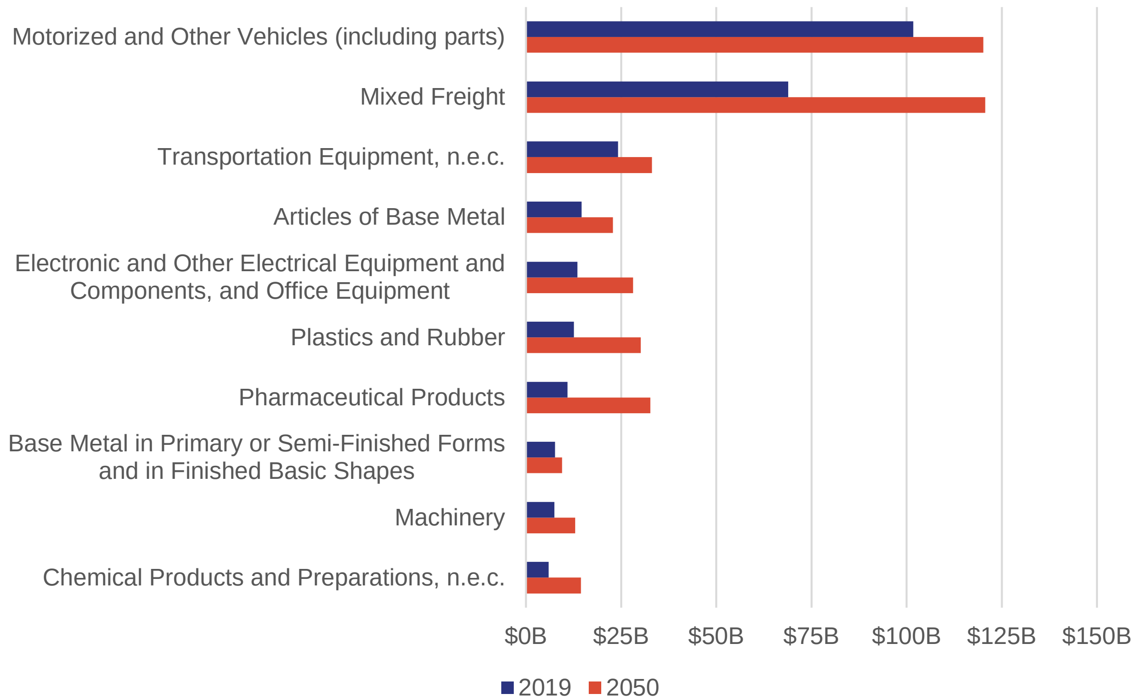
As shown in Figure 3.7, the composition of top commodities by value largely differs from those based on tonnage. This is the case despite the significant amount of coal tonnage transported by rail in 2019. The difference in composition of commodities is attributed to the characteristics of the commodities themselves. Bulk commodities such as coal and aggregates that are typically quite heavy in nature tend to have a much

[7] Association of American Railroads 'What Railroads Haul: Coal' Available at https://www.aar.org/wp-content/uploads/2020/07/AAR-Coal-Fact-Sheet.pdf

[8] Association of American Railroads 'What Railroads Haul: Chemicals' Available at https://www.aar.org/wp-content/uploads/2020/07/AAR-Chemicals-Fact-Sheet.pdf

lower value on a per-unit basis. This is in comparison to commodities such as pharmaceuticals and electronics, which have a value largely derived from their versatility as finished, accessible consumer products. Through 2050, vehicles and mixed freight are expected to remain the top commodities. This includes a particularly significant increase in mixed freight value from just under $70 billion to $120 billion. As the term suggests, mixed freight refers to a wide range of commodities, goods, and finished products transported together. Additional increases in total value are expected for pharmaceuticals, plastic/rubber, and electronics.

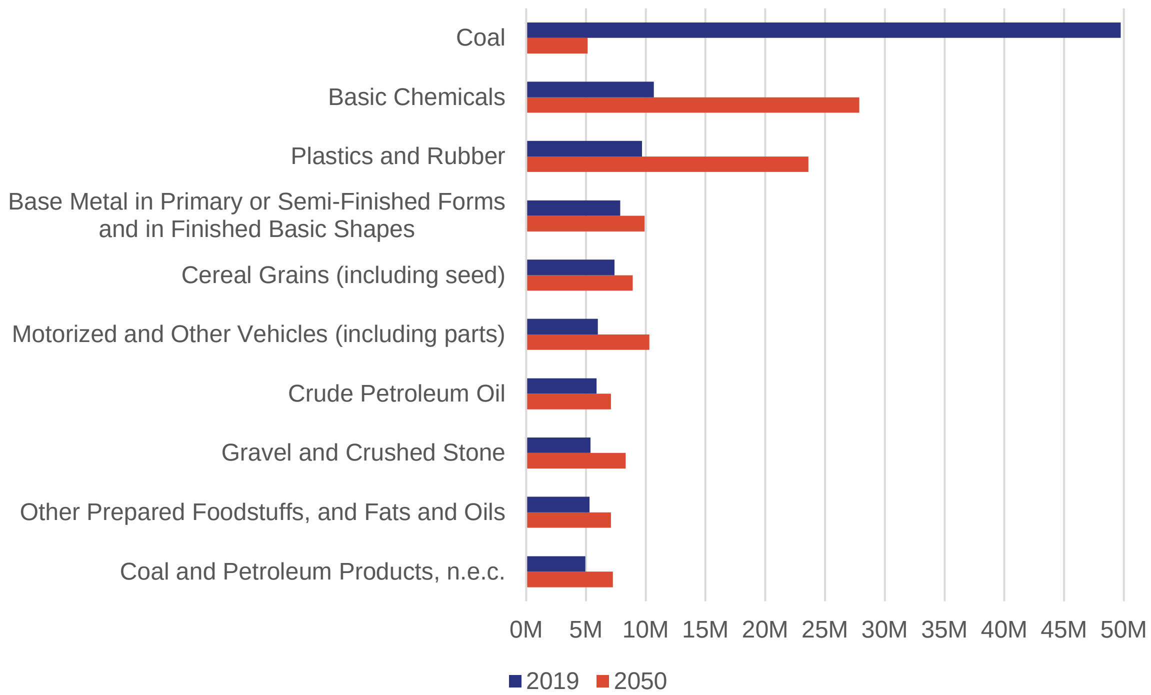
Figure 3.7 Top 10 Rail Commodities by Value, All Directions, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

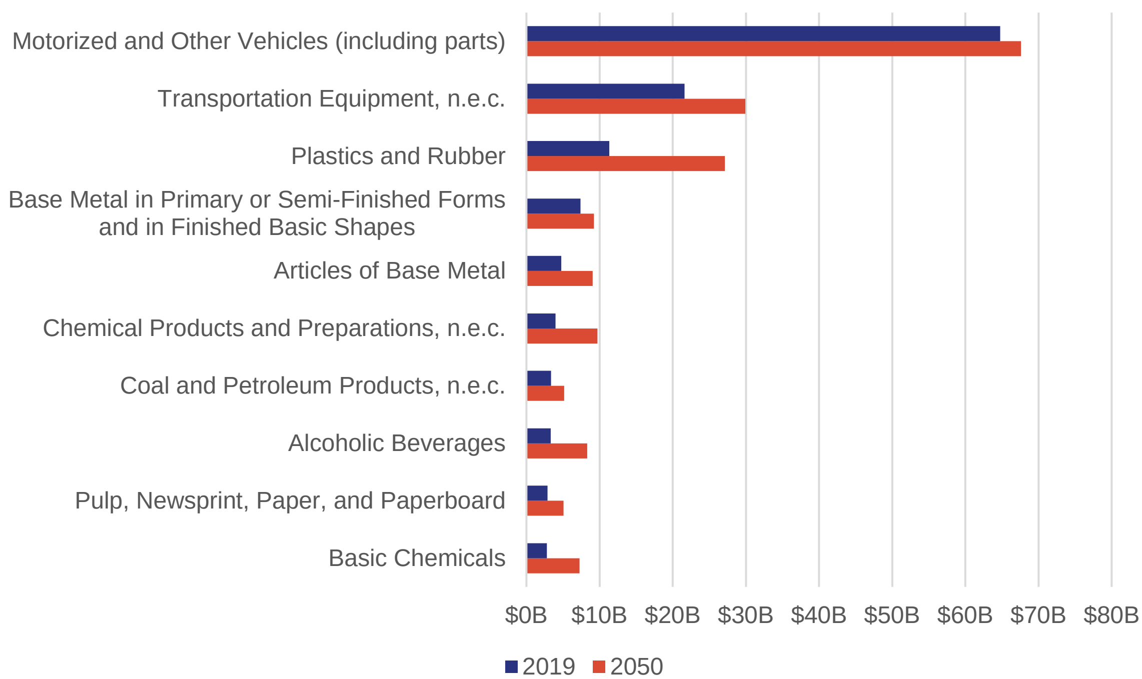
Top commodity tonnage and value are further broken out by carload and intermodal traffic in the following figures. Carload tonnage top commodities largely mirror total tonnage across both types of traffic (Figure 3.8). This includes the top commodities of coal, plastics/rubber, and basic chemicals, which are almost exclusively transported by carload. By value, top commodities include vehicles, transportation equipment, and plastic/rubber (Figure 3.9). These are expected to remain the top carload commodities by value through 2050.

Figure 3.8 Top 10 Carload Rail Commodities by Tonnage, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

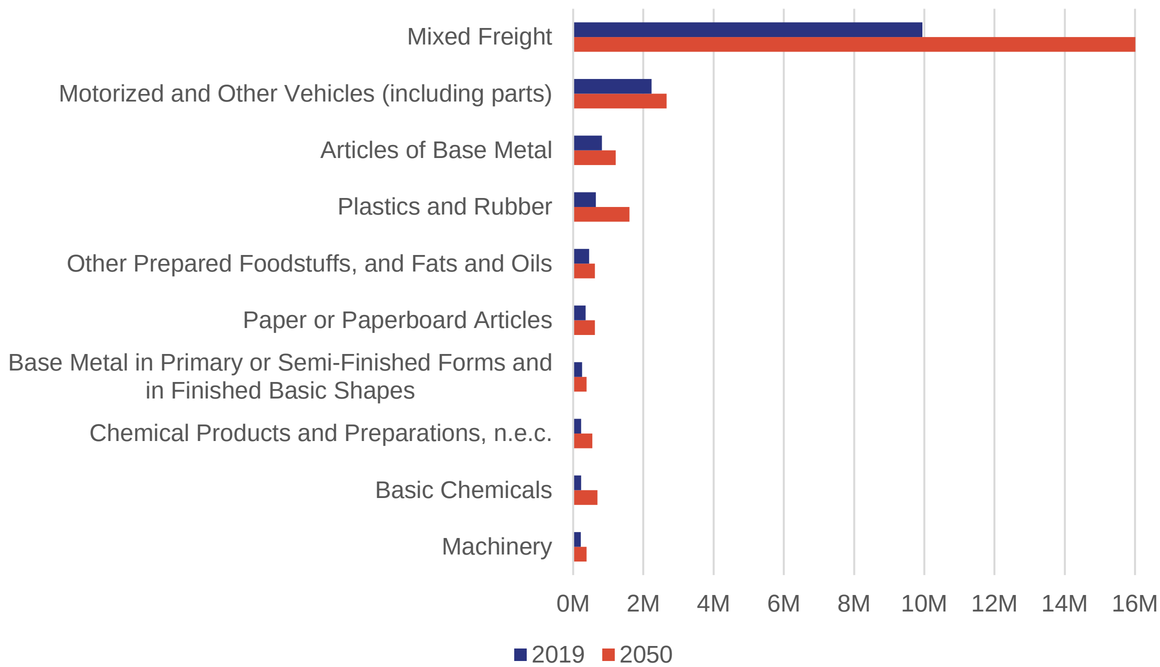
Figure 3.9 Top 10 Carload Rail Commodities by Value, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

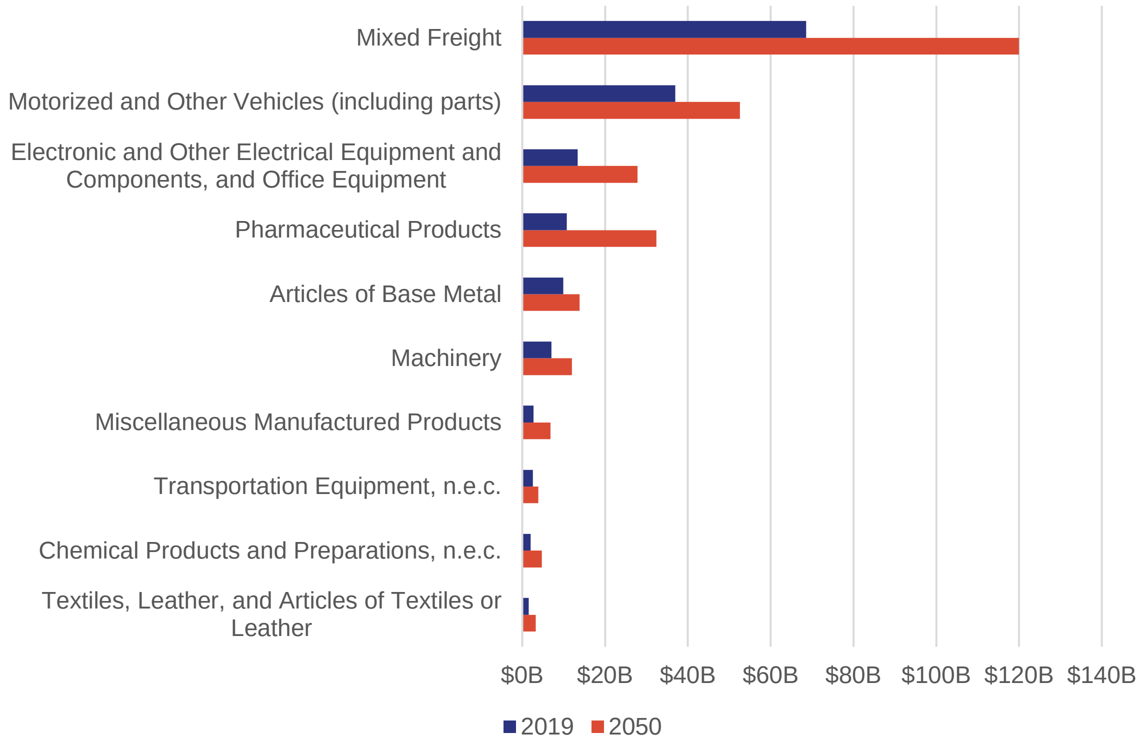
Top intermodal commodities by tonnage are shown in Figure 3.10 and by value in Figure 3.11. By tonnage, intermodal traffic is largely comprised of mixed freight. With a large increase from 10 to 16 million tons expected through 2050, this trend is expected to remain in place. By value, mixed freight is also the top commodity, followed by vehicles. Through 2050, large increases in value are also expected for electronics and pharmaceuticals as well.

Figure 3.10 Top 10 Intermodal Rail Commodities by Tonnage, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

Figure 3.11 Top 10 Intermodal Rail Commodities by Value, 2019 and 2050



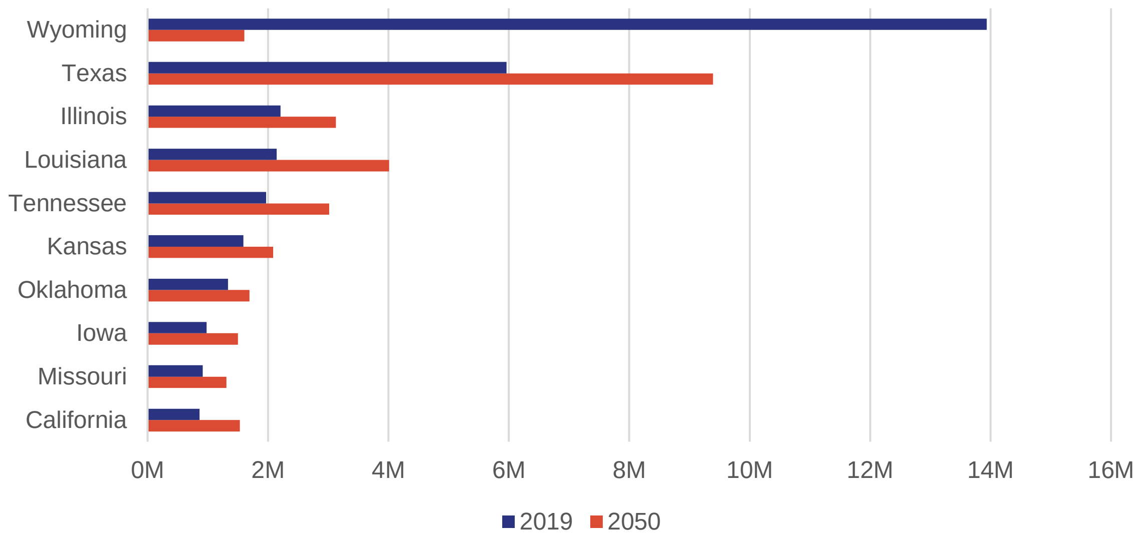
Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

3.4 Top Trading Partners

Top geographic trading partners by carload and intermodal haulage are provided in the following figures, beginning with carload tonnage (Figure 3.12). In 2019, carload tonnage was largely dominated by inbound traffic in the form of coal from Wyoming. Correspondingly, Wyoming inbound tonnage is expected to drop significantly through 2050. Outside of Wyoming, most carload tonnage, including through 2050, is expected from nearby states, with the most sizable increases expected from those states directly bordering Arkansas, including Texas, Louisiana, and Tennessee.

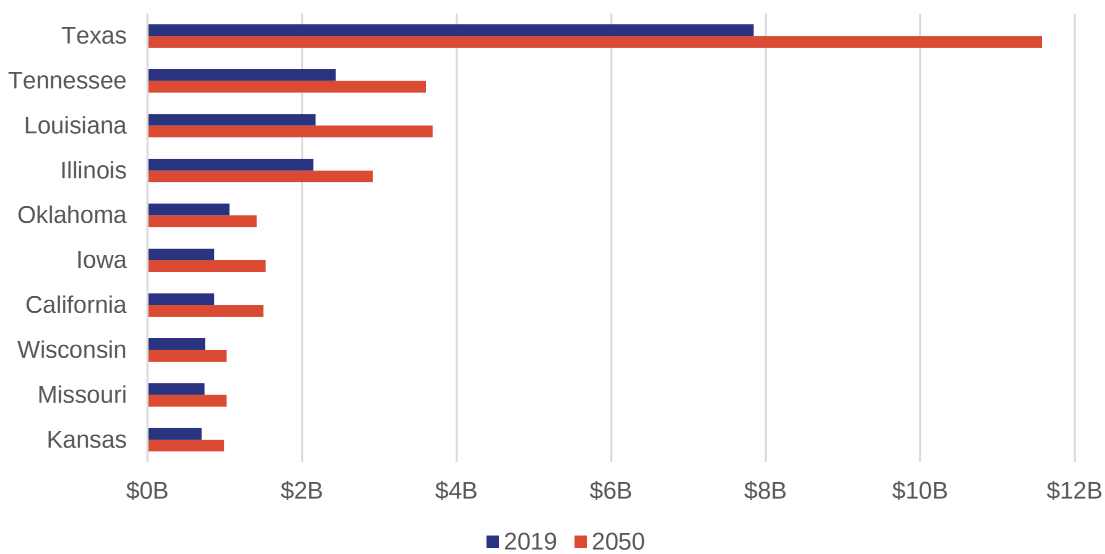
As shown in Figure 3.13, top trading partners by carload value largely mirror those by carload tonnage. The exception to this is Wyoming, and its corresponding coal tonnage. This is expected given the characteristics of coal as a heavy, but lower value commodity. As a result, the majority of top trading partner value stems from trade with neighboring and nearby states, including Texas, Tennessee, and Louisiana. Through 2050, sizable increases in total value are expected for each of the top trading partners.

Figure 3.12 Top 10 Carload Trading Partners by Tonnage, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

Figure 3.13 Top 10 Carload Trading Partners by Value, 2019 and 2050

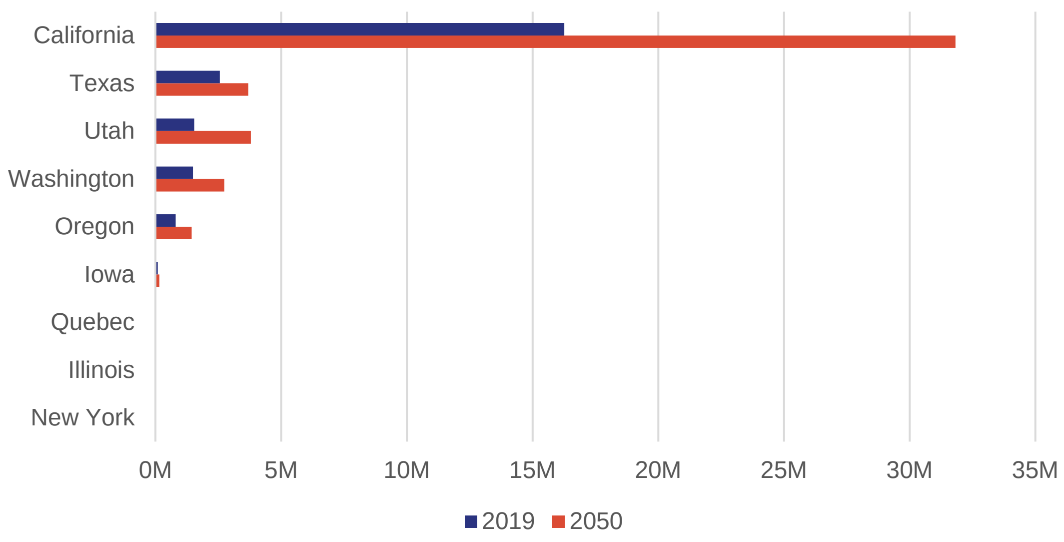


Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

The geographic composition of intermodal trading partners by tonnage (Figure 3.14) differs noticeably from carload. For intermodal tonnage, outbound tonnage to California comprised the large majority of traffic in 2019 at just over 15 million tons. Such traffic is expected to increase significantly to over 30 million tons through 2050. Given the presence of the other West Coast states within the limited range of intermodal trading partners, the majority of this tonnage is likely bound for West Coast ports such as Long Beach and Seattle. Traffic into and out of Texas, the second largest intermodal tonnage trading partner, may be a mix of domestic and port-bound (Houston, Brownsville, and land border crossings with Mexico) freight.

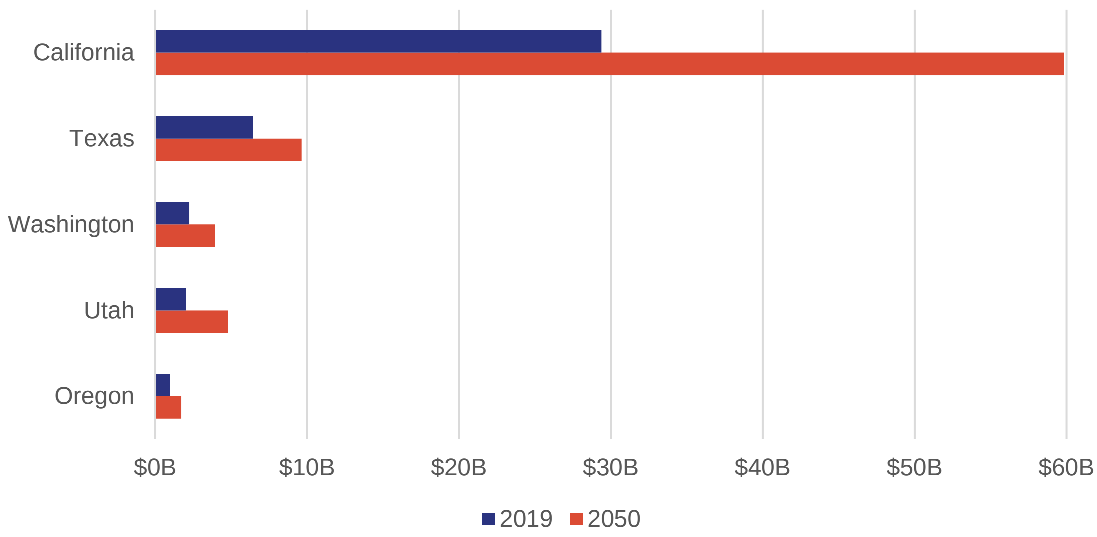
Similarly, the top intermodal trading partners by value (Figure 3.15) mirror those by tonnage, a limited group of states overall. The composition of these partners includes California, followed by Texas, Washington, Oregon, and Utah, with sizable increases expected for each of these locations through 2050.

Figure 3.14 Top 10 Intermodal Trading Partners by Tonnage, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

Figure 3.15 Top Intermodal Trading Partners by Value, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

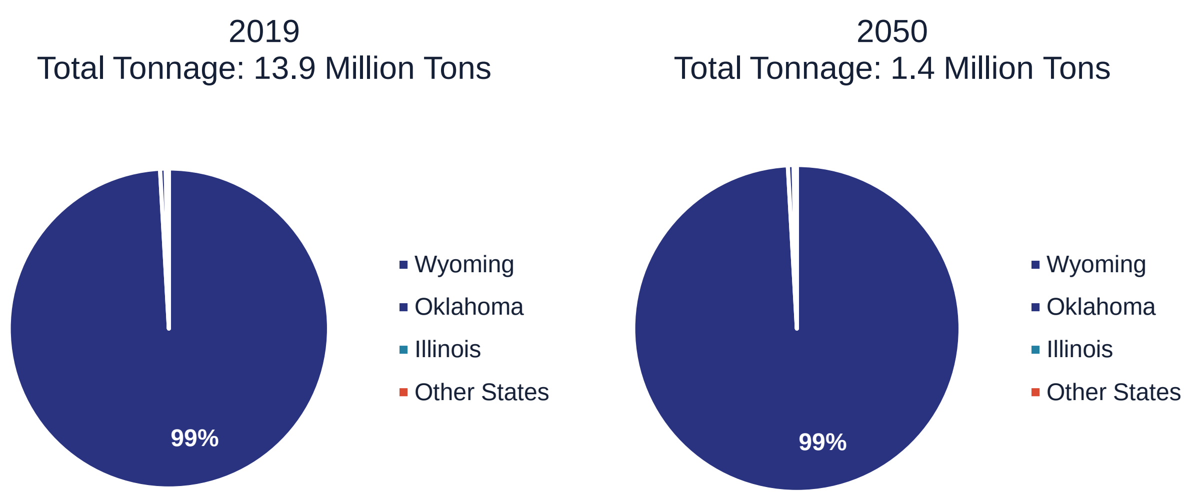
Next, top trading partners are broken out for the top inbound and outbound commodities into and out of Arkansas. Both the top commodities and corresponding tonnage and value differ from those figures described in Section 3.3 above. This is because Section 3.3 considers commodity flow figures across all directional splits, including through traffic, which comprises approximately 75 percent of all tonnage and value. Although inbound and outbound traffic comprise only a quarter of total commodity flow, this information is useful in discerning which commodities are particularly important within the realm of the Arkansas economy, along with the origins and destinations of those commodities.

By tonnage, in 2019, the top inbound/outbound commodities included the following:

- Coal – 13.9 million tons[9]
- Gravel and Crushed Stone – 4.5 million tons
- Base Metal in Primary or Semi-Finished Forms and in Finished Basic Shapes – 4.2 million tons

Together, these three commodities comprised approximately 67 percent of all inbound and outbound tonnage. For each of these three commodities, the three top trading partners are shown in Figure 3.16, Figure 3.17, and Figure 3.18 below. With the exception of coal commodity flows, top trading partners in 2019 were primarily neighboring states. For gravel and crushed stone, such trade comprised 94 percent of inbound/outbound tonnage. Trade of base metals with the neighboring states of Texas, Oklahoma, and Tennessee comprised 65 percent of inbound/outbound tonnage. With the exception of coal tonnage, which is expected to decline significantly, both gravel and crushed stone, as well as base metal tonnages are expected to increase through 2050. The flow of these commodities across top trading partners is expected to remain the same through 2050.

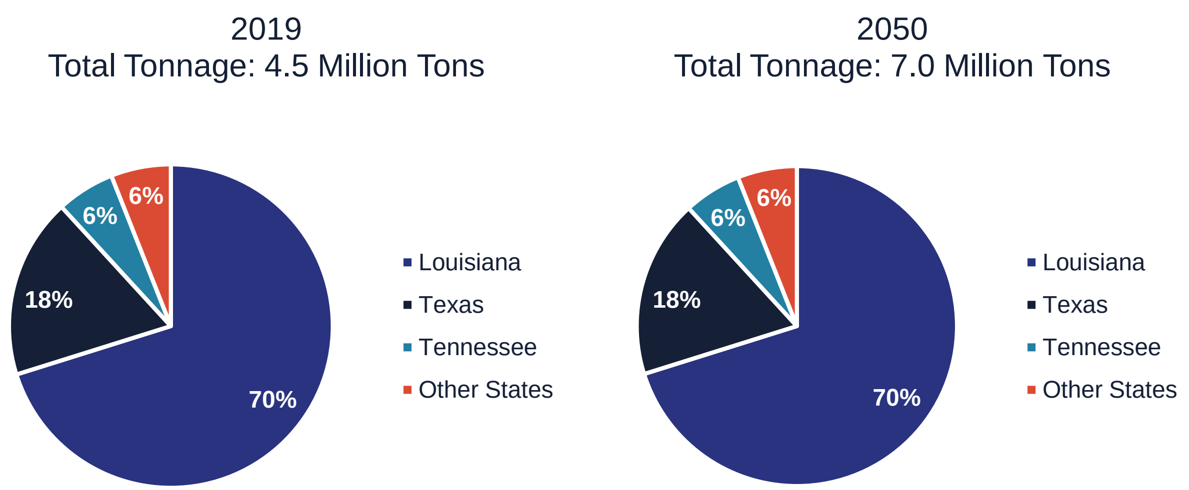
Figure 3.16 Top Trading Partners by Tonnage: Coal, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

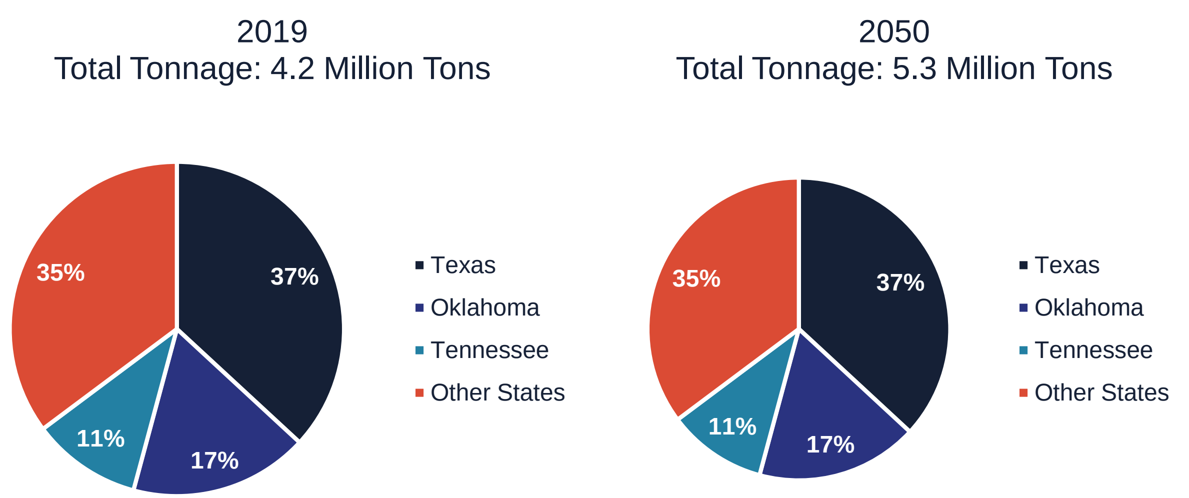
[9] Coal tonnage is comprised entirely of inbound tonnage, nearly exclusively from Wyoming. Reflecting national trends, coal tonnage is expected to decline significantly through 2050. Refer to Section 3.3 for additional information on coal commodity trends.

Figure 3.17 Top Trading Partners by Tonnage: Gravel and Crushed Stone, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

Figure 3.18 Top Trading Partners by Tonnage: Base Metal in Primary or Semi-Finished Forms and in Finished Basic Shapes, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

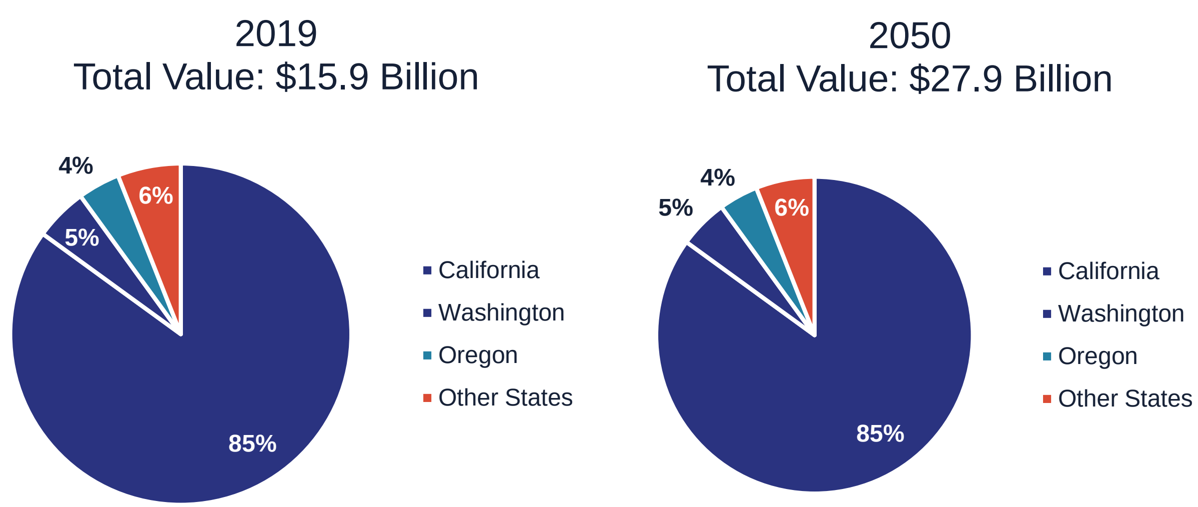
By value, in 2019, the top inbound/outbound commodities included the following:

- Mixed Freight - $15.9 billion
- Transportation Equipment – $10.2 billion

- Motorized and Other Vehicles – $9.5 billion

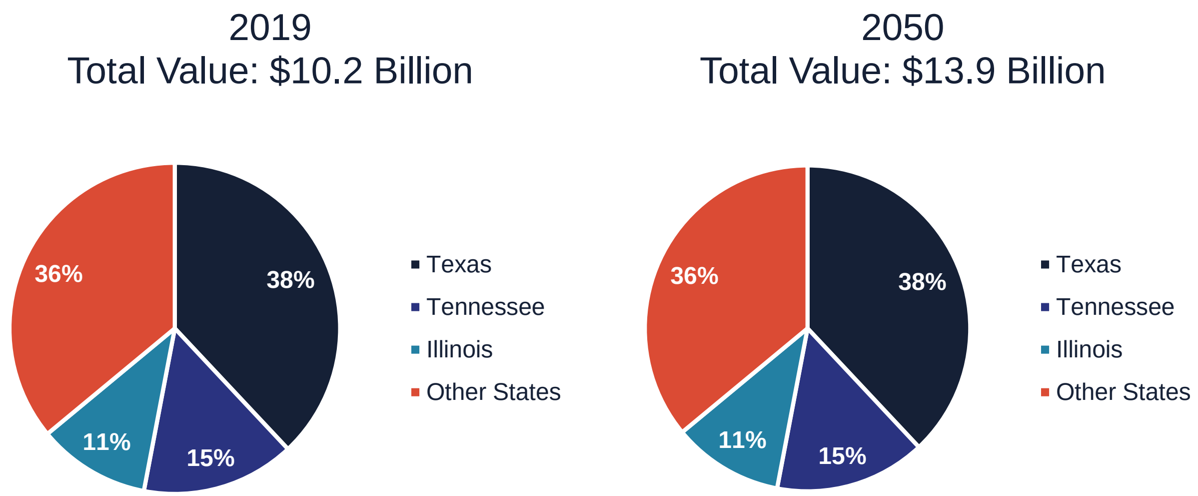
Together, these three commodities comprised approximately 67 percent of all inbound and outbound value. For each of these three commodities, the three top trading partners are shown in Figure 3.19, Figure 3.20, and Figure 3.21 below. In comparison to those top commodities by tonnage, there was somewhat more variation in the geographic distribution of top trading partners by value. For example, for mixed freight, the three west coast states of California, Washington, and Oregon comprised 94 percent of inbound/outbound value. For motorized vehicle parts, trade with California comprised 38 percent of inbound/outbound value. On the other hand, for both transportation equipment and motorized vehicle parts, Texas was the largest trading partner. Through 2050, all three top commodities are expected are expected to see growth in total value. The flow of these commodities across top trading partners is expected to remain the same through 2050.

Figure 3.19 Top Trading Partners by Value: Mixed Freight, 2019 and 2050



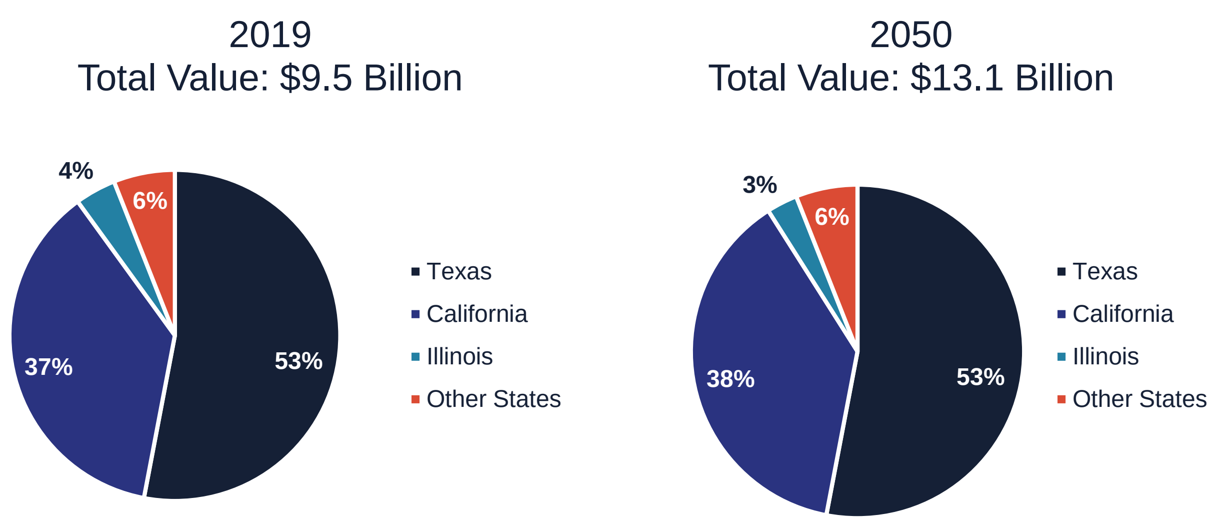
Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

Figure 3.20 Top Trading Partners by Value: Transportation Equipment, 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

Figure 3.21 Top Trading Partners by Value: Motorized and Other Vehicles (Including Parts), 2019 and 2050



Source: Disaggregated FAF5.2 and confidential STB Carload Waybill Sample

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4.0 Rail Condition and Performance

This section examines the condition and performance of the Arkansas rail network. This includes an assessment of existing infrastructure, including bottlenecks and constraints, as well as safety metrics. Analyzed safety metrics include overall incidents, as well as a brief focus on highway-rail grade crossing incidents.

4.1 Condition & Performance

The assessment of condition and performance examines multiple aspects of the statewide rail infrastructure network. Key bottlenecks within the statewide network are provided based on feedback from the surveying of freight railroads in Arkansas. Key constraints, including weight and height restrictions were assessed based on insight from surveys, additional available information for each freight railroad, and supplemented, where needed, with information from the 2015 Arkansas State Rail Plan.

4.1.1 Bottlenecks

Bottlenecks can form from multiple shortcomings of the multimodal infrastructure system. This can result in the need for upgrades, such as double tracking certain rail segments, extending trackage and siding to reach new locations, or improving weight or logistical restrictions along certain bridges. The need to address bottlenecks is important to prevent backlogs and traffic jams along not just freight railroads, but also the entire multimodal freight network. Based on insight from the surveying of freight railroads, the following bottlenecks are identified across the Arkansas freight rail network:

- BNSF indicated that extending siding in Sedgwick would help alleviate some rail congestion in the corridor, located between Hoxie and Jonesboro.

- No bottlenecks were reported along Genesee & Wyoming owned or operated trackage.

- Pioneer Lines (now owned by Patriot Rail) indicated that FSR trains must traverse a bridge controlled by another short line (Arkansas & Missouri Railroad) to access the interchange with UP. According to Pioneer Lines, this requires significant coordination of schedules, which can be impacted by various factors, including weather.

  Pioneer Lines also noted that the railroad is experiencing an annual growth rate of 5 percent. As such, the FSR will soon reach full capacity and will require the construction of additional trackage.

- The Little Rock Port Authority indicated a bottleneck related to an at-grade crossing. This bottleneck is related to the at-grade crossing with Fourche Dam Pike in Little Rock. When unit trains traverse this crossing, resulting highway congestion can spill over to the adjacent Interstate 440 interchange.

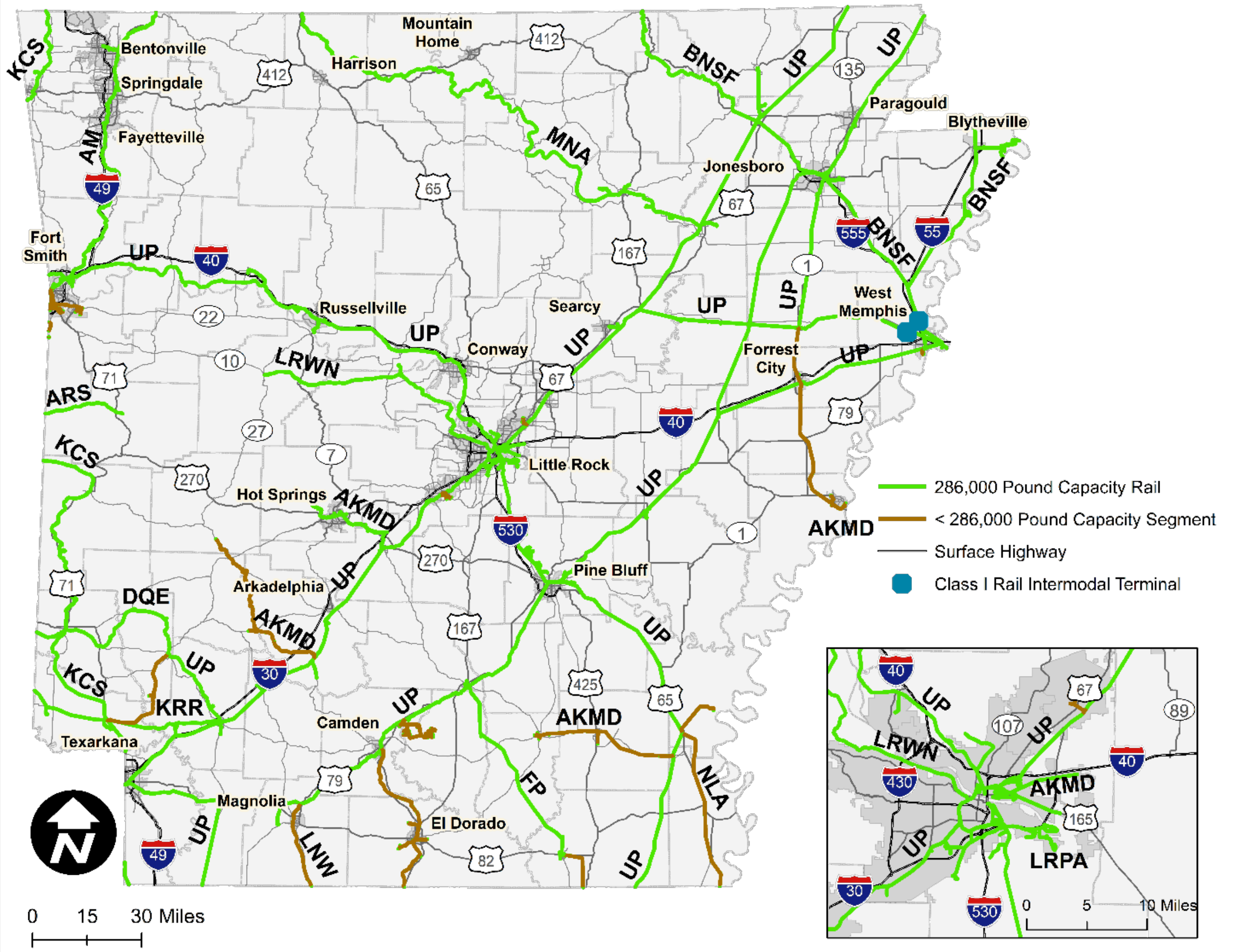
- WMBR indicated the need for additional trackage at the Port of West Memphis to accommodate increased carloads. According to WMBR, there are plans to build this additional trackage.

A related issue is the impact of blocked crossings on highway mobility, an issue that FRA recognized with the creation of the Public Blocked Crossing Incident Reporter (fra.dot.gov/blockedcrossings/).

4.1.2 Constraints

There are a number of infrastructure constraints that have the potential to affect the performance of the statewide rail system. This includes 286,000-pound rail weight standard – a function of overall track quality, and height restrictions. As discussed above, 286,000 pounds is the general standard for railcar maximum gross weight across the North American rail network. For those railroads or segments with weight restrictions below 286,000, such restrictions can limit competitiveness and the ability to attract new businesses and customers. As shown in Figure 4.1, the majority of Arkansas rail trackage has a weight capacity of at least 286,000. This includes the majority of Class I trackage. Most trackage with a weight capacity below the 286,000-pound standard is concentrated in the southeast part of the state and consists of Class III trackage. Track capacity upgrades in this the Southeast Arkansas region in particular could bolster economic development, as part of a larger freight investment strategy.

Figure 4.1 Arkansas Rail Network Weight Restrictions



Source: Freight railroad websites, surveys, and 2015 Arkansas State Rail Plan

An additional weight restriction was identified from outreach to the freight railroads:

- The Little Rock Port Authority indicated issues with weight restrictions along the trestle bridge over the Fourche Creek, which is the entry point to the Port of Little Rock.

Height restrictions primarily refer to overpass bridge deck clearances. When most of the national rail network was built, 15 feet was the standard height restriction for overpasses. However, newer rail cars such as high cube boxcars have a height of 17 feet. In addition, intermodal double-stack rail cars can have a height of up to 22 feet. As part of the 2015 State Rail Plan, outreach was conducted to the Class I and Class III railroads regarding network height restrictions. No additional height restrictions were identified during the freight railroad surveying process.

As indicated in the 2015 State Rail Plan, there are a few height restrictions along the statewide rail network:

- BNSF did not report any height restrictions along its network.
- Kansas City Southern double stack intermodal cars cannot operate on the Fort Smith Branch. Kansas City Southern also identified a problematic overpass in Texarkana that is frequently struck by tractor trailers.
- Union Pacific reported that a tunnel along the Van Buren Subdivision near Conway is the primary height constraint.
- Each of the short lines interviewed reported being able to accommodate 17 foot railcars such as high cube boxcars. Because intermodal double-stacked railcars primarily travel along the Class I rail network, the Class III railroads were not asked about their ability to accommodate 22-foot railcars.

4.2 Safety

In this section, rail safety data for the Arkansas rail system is analyzed for the 2015-2019 time period. Grade crossing incidents are also analyzed with select data also expanding to include the 2010-2019 time period. Safety is a particularly important indicator of freight rail system performance. Although rail accidents are much less prevalent than road-based accidents, key characteristics of the rail system such as vehicle weight, vehicle size, and a lack of protective barriers along railroad tracks increase overall safety risks. These risks are further exacerbated at grade crossings between railroad tracks and roads where direct interactions between the two modes take place.

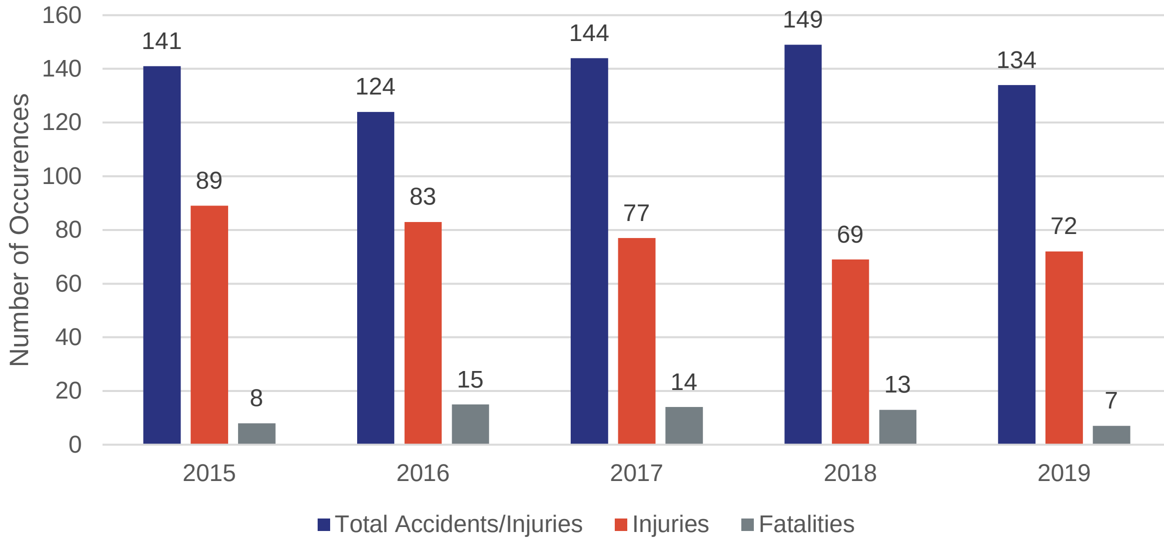
4.2.1 Rail Incidents

Figure 4.2 illustrates total rail accidents/incidents[10] between 2015-2019. Total accidents and incidents fluctuated somewhat within a range of 124 and 149 occurrences. In total, there were 692 accidents/incidents across the five year period. Given these fluctuations across the relatively short time period, there does not appear a to be a trend in either direction regarding occurrences of accidents/incidents. Injuries peaked in 2015 at 89 occurrences, and dropped to a low 69 in 2018 before rising slightly to 72 in 2019. This indicates a

[10] The FRA does not differentiate between an “accident” and an “incident.” Rather, the FRA explains, “‘Accident/Incident’ is the term used to describe the entire list of reportable events. These include collisions, derailments, and other events involving the operation of on-track equipment and causing reportable damage above an established threshold; impacts between railroad on-track equipment and highway users at crossings; and all other incidents or exposures that cause a fatality or injury to any person, or an occupational illness to a railroad employee.” It is noted that the standard practice in the highway safety industry is to use the term “crash.”

downward trend in injuries across the five-year period. Fatalities were elevated from 2016 through 2018, but were lower in 2015 and 2019.

Figure 4.2 Arkansas Rail Accidents/Incidents & Safety Metrics, 2015 – 2019

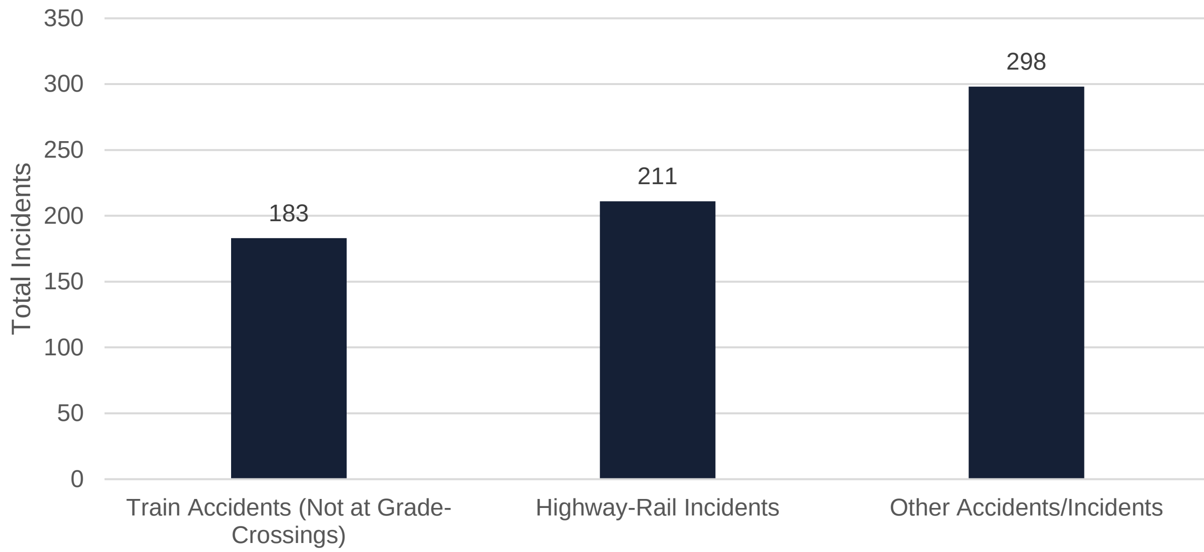


Source: FRA 2021 Accident/Incident Overview Dashboard

Further detail on the 692 accidents/incidents is shown in Figure 4.3. Outside of other "Other Accidents and Incidents"[11], a larger proportion (approximately 54 percent) of accidents occurred in highway-rail incidents, in comparison to train accidents. These type of accidents/incidents accounted for 211 of the 692 total, or 30 percent.

[11] The FRA defines "Other Accidents/Incidents" as any death, injury, or occupational illness of a railroad employee that is not the result of a "train accident" or "highway-rail incident."

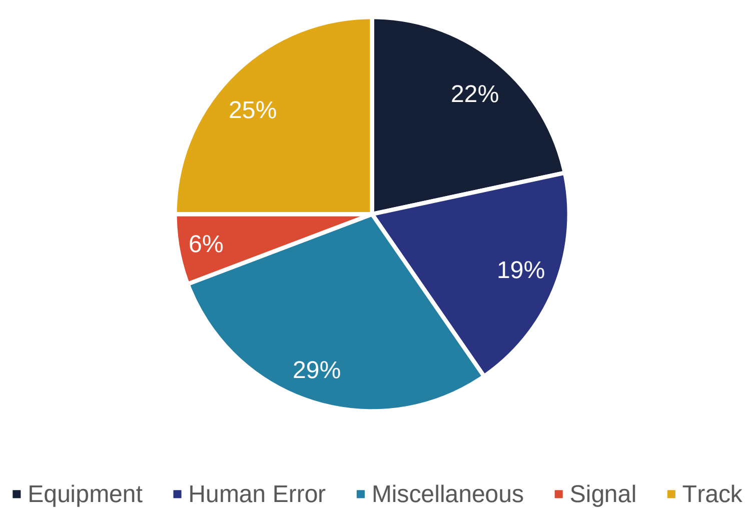
Figure 4.3 Type of Rail Accident/Incident in Arkansas, 2015 – 2019



Source: FRA 2021 Accident/Incident Overview Dashboard

Train accidents occurring between 2015 and 2019 are broken out by cause in Figure 4.4. While miscellaneous causes were the most common at 29 percent, a sizable portion of train accidents were attributed to track issues, equipment malfunction, or human error. Each of these causes accounted for over 19 percent of all train accidents. Signal issues comprised the lowest proportion of train accidents at six percent.

Figure 4.4 Train Accident By Cause, 2015 – 2019

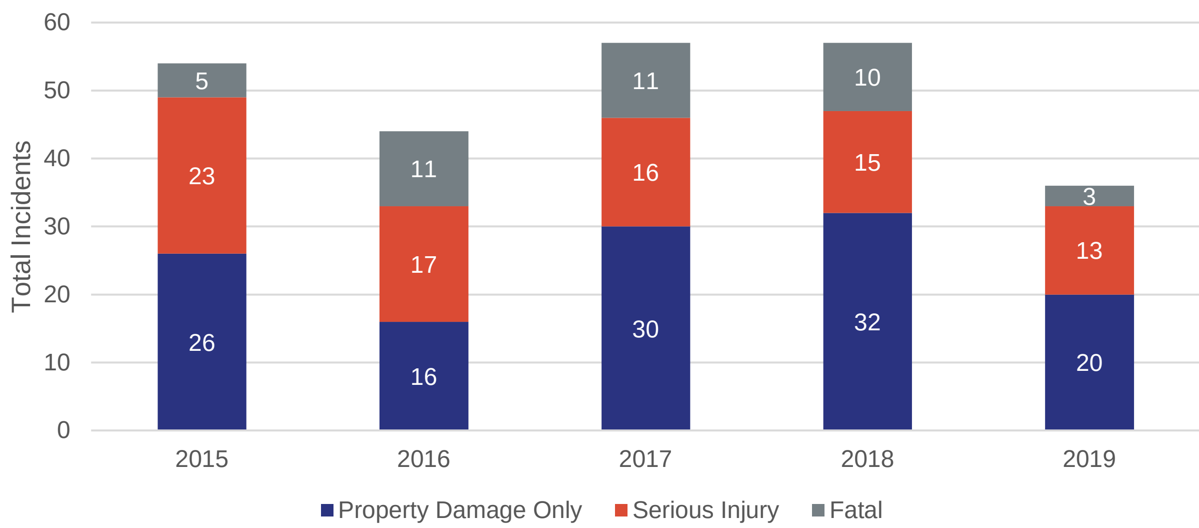


Source: FRA 2021 Accident/Incident Overview Dashboard

4.2.2 Grade Crossing Incidents

According to FRA data, there were a total of 210 crossing crashes in Arkansas between 2015 and 2019. Incident severity metrics are shown in Figure 4.5.

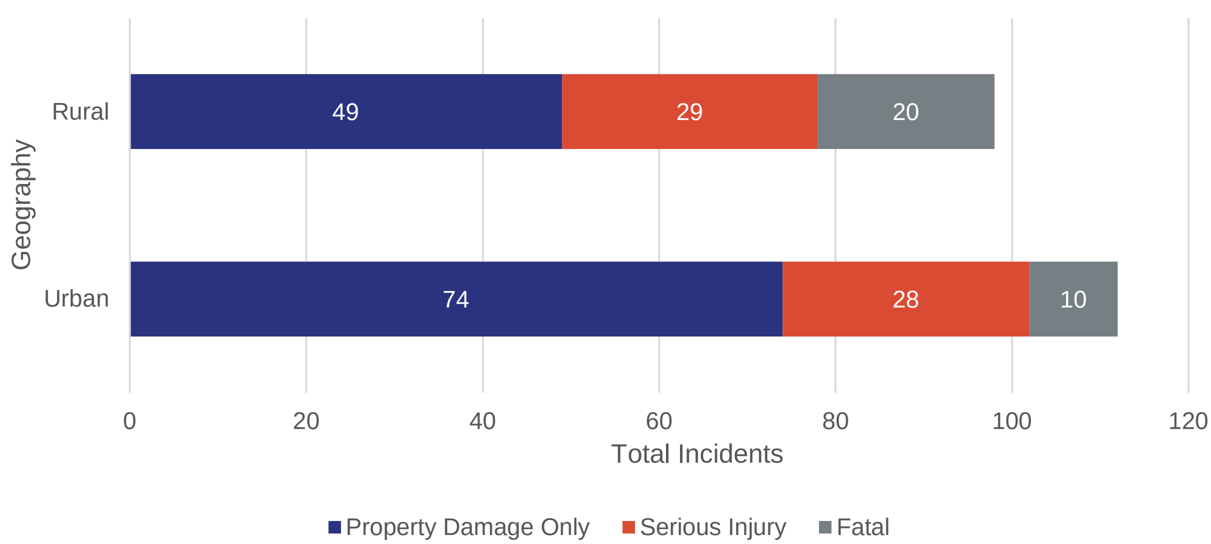
Figure 4.5 Arkansas Crossing Crash Severity Metrics by Year, 2015 – 2019



Source: FRA 2021 Rail Grade Crossing Incident Dashboard

A comparison of crossing crashes in urban versus rural areas is shown in Figure 4.6. Although urban crossings accounted for approximately 53 percent of crossing crashes, rural crossings comprised two-thirds of fatalities.

Figure 4.6 Total Incidents in Urban vs. Rural Areas, 2015 – 2019



Source: FRA 2021 Rail Grade Crossing Incident Dashboard

Most crashes occurred at individual, unique crossings, indicating that at least some of these may be isolated incidents, and not necessarily due to a particular shortcoming of the crossing design. A total of 23 crossings saw two or more crashes during the five year period. Of these crossings, 20 crossings saw 2 crashes, while 3 crossings saw three crashes.

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5.0 Rail Industry Trends

This section provides insight into multiple rail industry trends expected to impact statewide and national railroad operations to some degree, including Positive Train Control, precision scheduled railroading, and relevant mergers and acquisitions.

5.1 Positive Train Control

Positive Train Control (PTC) systems are designed to prevent train-to-train collisions, over-speed derailments, incursions into established work zones, and movements of trains through switches left in the wrong position. PTC consists of a system of communication between operating locomotives and rail track operations center. This system is able to identify any operational issues within the track network or locomotive, including speeding. If needed, the PTC system can remotely stop the locomotive from moving. The term *positive* refers to the requirement that the track operations center provides positive movement allowance in order for a locomotive to proceed on PTC-implemented trackage.

Through the Rail Safety Act of 2008, PTC implementation was mandated for the Class I rail network for any track sections with 5 million or more gross tons of annual rail traffic, trackage where certain hazardous materials are transported, and on any main lines over which intercity or commuter rail passenger service is regularly provided. In Arkansas, this includes BNSF and KCS trackage, as well as most UP trackage. On December 29, 2020, the FRA announced that PTC had been successfully implemented across all 57,536 miles of United States trackage where it was required.

5.2 Precision Scheduled Railroading

A relatively recent development, precision scheduled railroading (PSR) refers to the streamlining of freight railroad operations for the purposes of increasing efficiency and overall profitability. The overarching goal of PSR is to transport the same or an incremental amount of freight, with fewer railcars and locomotives using a more simplified, direct line of transport. Key strategies associated with PSR include eliminating variability in workloads and work schedules, optimizing utilization of locomotives and train cars, and streamlining overall operations. Currently, PSR is in use by the following Class I railroads: Canadian National (adoption of PSR in 1998), Canadian Pacific (adoption of PSR in 2012), CSX (adoption of PSR in 2017), Kansas City Southern (adoption of PSR in 2018), Norfolk Southern (adoption of PSR in 2018) and Union Pacific (adoption of PSR in 2018).[12]

The alternative to PSR involves the traditional operating structure of freight railroad systems. This structure consists of a hub-and-spoke model in which shipments are typically hauled along set routes and schedules to larger rail yards and terminals, also known as hump yards. At these locations, railcars are reshuffled, as needed, onto different trains bound for intermediate and final destinations. Currently, BNSF is the sole Class I railroad utilizing the traditional hub-and-spoke model.[13]

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[12] SJSU ScholarWorks 'Examining the Effects of Precision Scheduled Railroading on Examining the Effects of Precision Scheduled Railroading on Intercity Passenger and High-Speed Rail Service Intercity Passenger and High-Speed Rail Service' March 2022. Available at https://scholarworks.sjsu.edu/cgi/viewcontent.cgi?article=1389&context=mti_publications

[13] Breakthrough 'What is Precision Scheduled Railroading?' August 6, 2020. Available at https://www.breakthroughfuel.com/blog/precision-scheduled-railroading/

5.3 Railroad Mergers & Acquisitions

The proposed merger between Canadian Pacific (CP) and Kansas City Southern (to be known as CPKC) has garnered a significant amount of attention in recent months. As described in Section 2.0, CP won the bid to acquire KCS. The transaction has an enterprise value of approximately $31 billion, with KCS shareholders set to receive an equivalent number of CP shares and cash as part of the buyout. Should the merger proceed, it would form the first single-line railroad linking Canada, the United States, and Mexico.

As of December 2022, the Surface Transportation Board (STB) is reviewing the acquisition. Upon STB approval, the merger is expected to be completed over a three-year period. As part of these plans, CP and KCS have laid out a number of anticipated benefits[14]:

- According to CP and KCS, CPKC will be able to capture an additional $716 million in annual revenue. CPKC's growth will stem from traffic gained from other railroads, and traffic gained from trucks as a result of tapping into new markets. This ability to tap into new markets is the result of increased efficiency not previously possible.
- The resulting intermodal service is expected to take 64,000 trucks annually off the North American highway system, reducing greenhouse gases by approximately 377,000 per year.
- Increased rail traffic is expected in the transport of a range of commodities, including grain, chemicals, forest products, appliances, auto parts, finished vehicles, and intermodal.
- As a result of projected increases in traffic, CPKC expects to add at least 1,000 union jobs, of which approximately 800 will be located in the United States.

In addition to these anticipated benefits, CPKC documentation lays out expected impacts to rail traffic along the rail network, proposed capacity improvements and projects, details on expanded intermodal service, and operational changes. This documentation also includes support letters from 960 rail shippers, short line and regional railroads, ports, industry suppliers, public officials, business groups, and some labor unions. Because the merger is still in the review stage, it is difficult to fully assess the direct impacts to the Arkansas rail network and local rail shippers and customers. However, CP and KCS estimate an increase in total daily trains from 13.5 to 28.5 along the Pittsburgh Sub between Kansas City and Shreveport, which includes the primary Kansas City Southern trackage through Arkansas.

Some Class I railroads, including BNSF and UP, have expressed reservations about this merger. BNSF has expressed concerns about potential harm to United States shippers in their ability to compete with Mexican shippers in Mexico cross-border shipments.[15] UP has asked the Surface Transportation Board to reject the merger, on the basis of being incomplete. In particular, UP argues that CP and KCS have not fully accounted for 360,000 carloads, roughly a third of total divertible traffic, leading to a flawed national network operating

[14] Trains Magazine 'CP – KCS Merger Plans for Growth' Vol. 22 Issue 1

[15] Trains Magazine 'BNSF and CN raise issues over CP-KCS merger' November 12, 2021. Available at https://www.trains.com/trn/news-reviews/news-wire/bnsf-and-cn-raise-issues-over-cp-kcs-merger/

plans.[16] It remains to be seen if this merger will affect BNSF and UP traffic, including through Arkansas. Such impacts however, will be considered by the STB in rendering a final decision on the merger.

[16] Trains Magazine 'Union Pacific and Canadian Pacific spar over KCS merger' November 22, 2021. Available at https://www.trains.com/trn/news-reviews/news-wire/union-pacific-and-canadian-pacific-spar-over-kcs-merger/

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ARKANSAS DEPARTMENT OF TRANSPORTATION

ARKANSAS STATE FREIGHT PLAN

Chapter 4

Air Cargo Modal Profile

WE MOVE ARKANSAS FREIGHT

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1.0 Introduction

Arkansas airports support the state's businesses and industries by transporting commodities and finished goods from suppliers to customers. Air cargo is an important element of Arkansas' freight network, allowing for freight to be moved over long distances in a short amount of time, and for the state to compete with other air-served freight markets. Arkansas has two major national airports and benefits from proximity to other major international airports in neighboring states. The largest air cargo facility in Arkansas is Bill and Hillary Clinton National Airport (LIT) in Little Rock, which transported nearly all air cargo tonnage in the state in 2019.

This profile of Arkansas' air cargo system describes current assets, cargo types, air freight demand, and air cargo system performance and trends statewide. The information in this profile is a critical element of the Arkansas State Freight Plan, particularly in light of strong and consistent growth of e-commerce activity over the past decade, which intensified during the COVID-19 pandemic. This analysis not only helps inform where these goods enter the state and where they are destined, but also how companies are distributing air cargo and where these major air cargo facilities are located.

Air cargo can be moved through dedicated freight service or in passenger planes as belly cargo. Dedicated movement includes expedited, integrated service from companies like FedEx, United Parcel Service (UPS), and Amazon, which handle door-to-door cargo movement. Smaller regional air freight services also support these major carriers by connecting to smaller markets and more rural areas. Belly cargo, the freight moved under passenger planes, allows more efficient utilization of flight resources and allows airports with shorter runways to receive cargo.

Air cargo commodities are typically highly valuable and generate a significant amount of economic activity to the state. The Arkansas Department of Transportation's (ARDOT) Long-Range Intermodal Transportation Plan (2017) found that over 39,700 jobs are traced to aviation, generating $1.3 billion in payroll and benefits and $3.1 billion in economic activity statewide. The aviation industry is an economic generator that supports local access to global markets and increases the community tax base.

1.1 Data Sources

This profile describes the state's air cargo facilities, demand, performance, and trends. The information presented was obtained from various sources, including the previous Arkansas State Freight Plan (2017), Bureau of Transportation Statistics TranStats Database T-100, airport websites, and the Airport Council International (ACI). These sources informed air cargo origin/destination flows, annual tonnage, carriers servicing Arkansas via freight and mail, and other annual air cargo statistics.

1.2 Report Organization

The remainder of this report is organized as follows:

- **Section 2.0—Air Cargo Infrastructure and Facilities** provides a background on the aviation system, facilities, and major carriers operating at Arkansas' air cargo-handling airports.
- **Section 3.0—Air Cargo Demand** details the demand for air cargo in Arkansas, including volumes, value, commodities, trade partners, origins, and destinations.

- **Section 4.0—Air Cargo Performance and Trends** describes trends impacting air cargo in Arkansas and provides information on aviation safety.

2.0 Air Cargo Infrastructure and Facilities

The Arkansas aviation system includes 99 public airports and 210 private airports.[1] Of these, three airports reported air cargo activity in 2019, which includes tonnage for both freight and mail shipments. Clinton National Airport handles nearly all (more than 99 percent) of total air cargo activity in the state. Northwest Arkansas National Airport (XNA) and Fort Smith Regional Airport (FSM) together handle the remaining air cargo. Clinton National Airport is located in the state capital, Little Rock. Table 2.1 shows air cargo tonnage distributed through three major airports in Arkansas in 2019 and 2020. Even with the onset of the COVID-19 pandemic in March 2020 and the resulting surge in demand for e-commerce, there was little change in the cargo volumes from 2019 to 2020 at Arkansas' airports.

Little Rock Air Force Base (AFB) is located near Jacksonville in central Arkansas. It opened in 1955 with 6,000 acres of land, one runway, training pilots, navigators, and flight engineers. Today, Little Rock AFB hosts the largest C-130 fleet in the world, with responsibilities ranging from supplying humanitarian airlift relief to disaster victims to airdropping supplies and troops into hostile areas.[2] Although military-related freight activity in Arkansas is not fully captured in commodity flow databases for confidentiality purposes, there is a sufficient amount of freight activity moving in and out of Little Rock AFP via truck supporting military activities and supply needs.[3]

Figure 2.1 shows the location of major cargo facility airports in Arkansas in relation to the state's highway and rail network.

Table 2.1 Airports with Air Cargo Activity in Arkansas

Airport	City	2019 Tonnage	% of Total	2020 Tonnage	% of Total
Clinton National Airport (LIT)	Little Rock	18,813	99.7%	19,370	99.7%
Northwest Arkansas National Airport (XNA)	Fayetteville	26	0.1%	25	<1%
Fort Smith Regional Airport (FSM)	Fort Smith	25	0.1%	26	<1%
Total		**18,864**	**100%**	**19,421**	**100%**

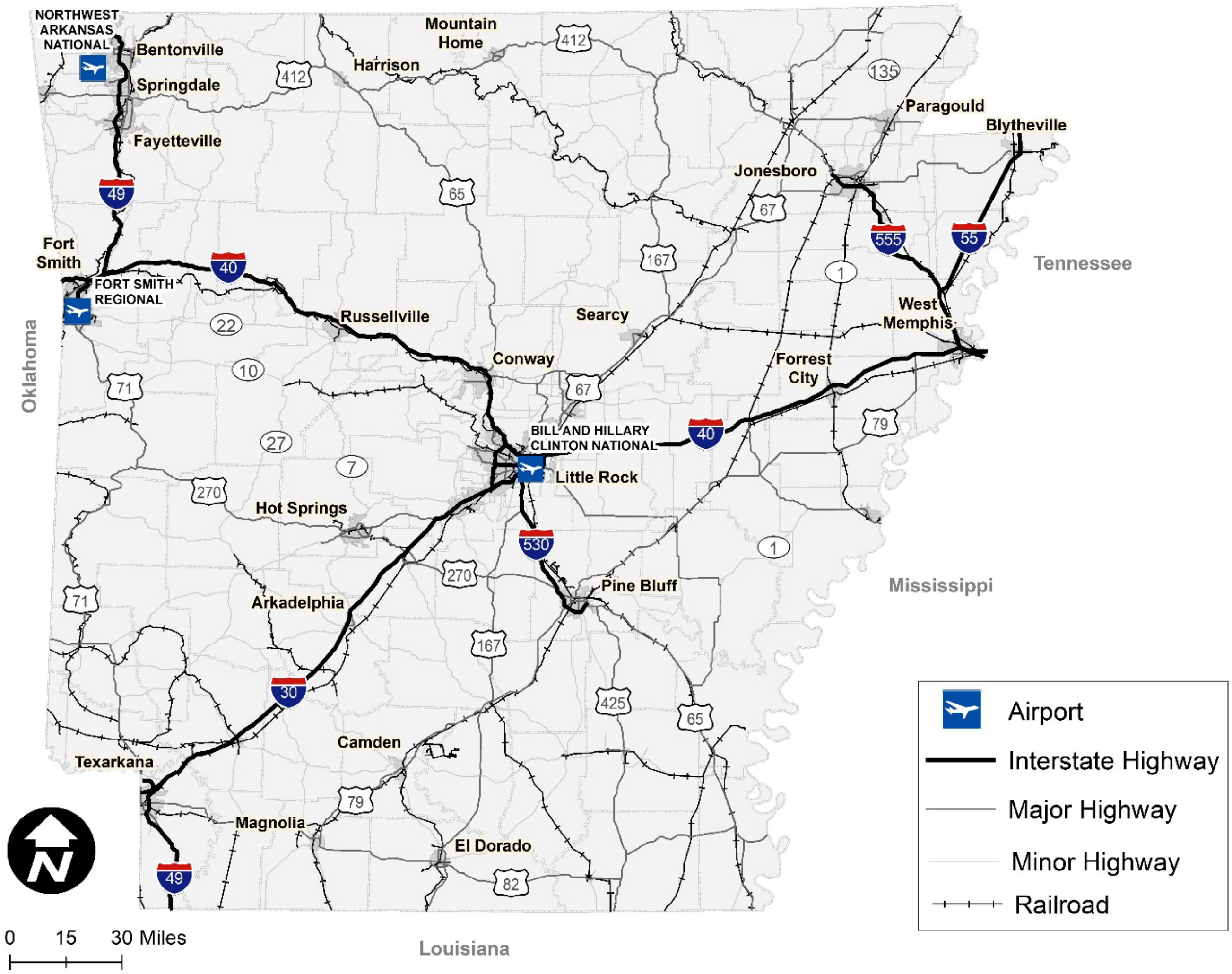
Source: BTS T-100 Market, 2019.

[1] FAA Airport Statistics.

[2] https://installations.militaryonesource.mil/in-depth-overview/little-rock-afb.

[3] As part of the stakeholder outreach conducted as part of this State Freight Plan Update, ARDOT contacted personnel at the U.S. Transportation Command (USTRANSCOM), Pine Bluff Arsenal, and Little Rock Air Force Base (AFB) to discuss site-specific freight activity, challenges, and project/facility needs that would better facilitate essential goods movement at those two key sites in Arkansas. Little Rock AFB returned a written survey and provided information on freight activity, challenges, and capital improvement needs.

Figure 2.1 Airports Servicing Air Cargo in Arkansas



Source: Arkansas Department of Transportation.

2.1 Air Cargo Facilities

This section details current and potential future infrastructure at Clinton National Airport as well as other notable air cargo-handling facilities within and adjacent to Arkansas.

2.1.1 Bill and Hillary Clinton National Airport (LIT)

Clinton National Airport is the 79th largest commercial airport in the United States,[4] handling about 2.2 million passengers annually.[5] The airport is owned by the City of Little Rock and operated by the Little Rock Municipal Airport Commission. Clinton National Airport hosts six airlines with dozens of daily departures and nonstop

[4] Little Rock Airport. Accessed on October 5, 2021. Available from: https://www.littlerock.com/little-rock-destinations/bill-and-hillary-clinton-national-airport-lit-:~:text=Bill%20and%20Hillary%20Clinton%20National%20Airport%2C%20the%2079th,attracts%20passengers%20from%20a%20number%20of%20surrounding%20states.

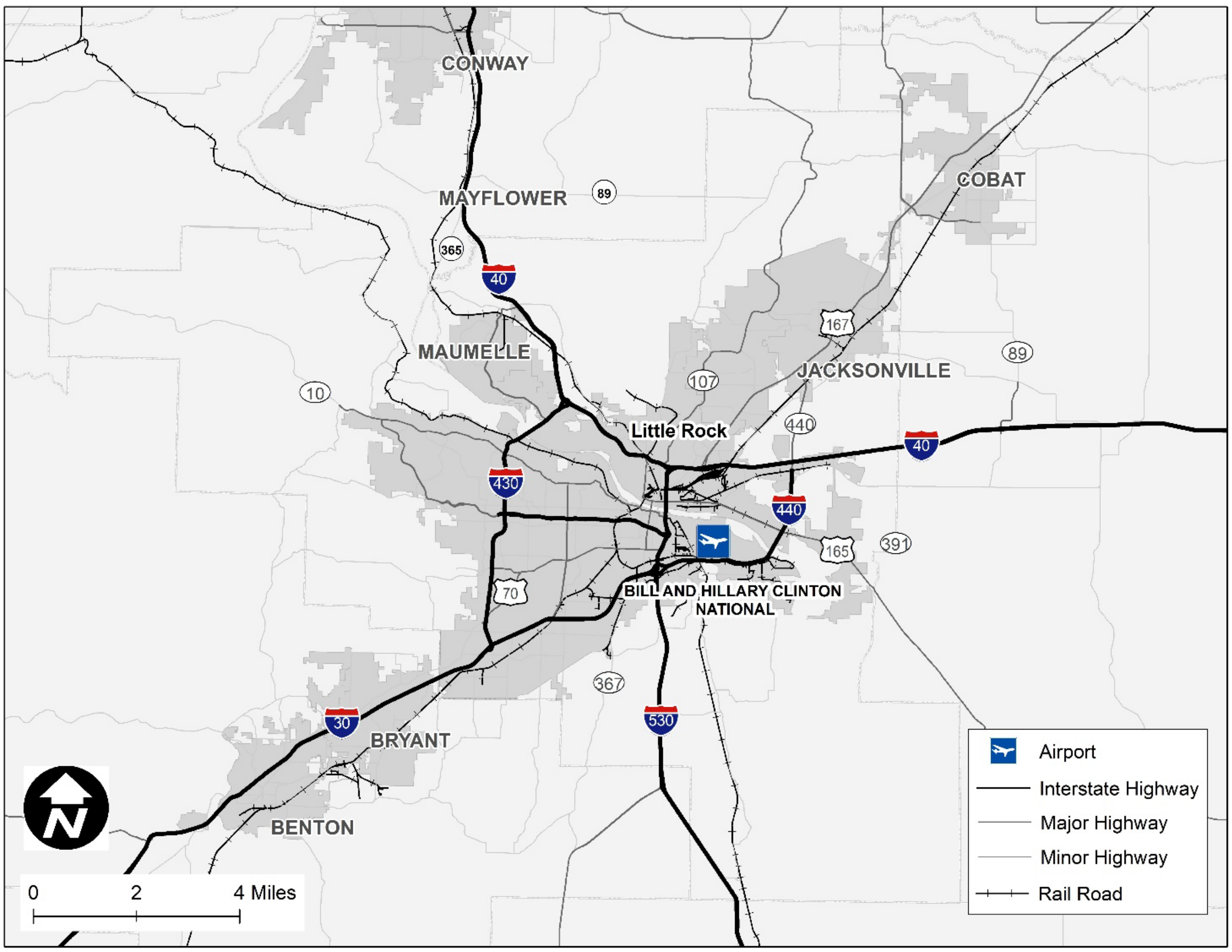
[5] Arkansas Long Range Intermodal Transportation Plan, 2017.

service to 14 cities. The airport has three runways: two parallel runways measuring 8,273 and 7,200 feet in length and a 5,124 feet crosswind runway. The parallel runways are equipped with precision instrument landing system (ILS) approaches. Non-precision approaches are available for all runways. Clinton National Airport recently completed a $20 million terminal renovation.

Figure 2.2 shows Clinton National Airport in relation to surrounding multimodal transportation infrastructure. The airport is located near the focal point of converging highways and railroads, providing good connectivity to markets in many directions.

Clinton National Airport is the busiest airport in Arkansas in terms of air cargo volumes, handling more than 99 percent of total volume in the state. Facilities and runways are primarily designed for passengers; however many airlines are capable of transporting cargo to various places. The airport provides passenger flights to 14 nonstop destinations.[6]

Figure 2.2 Clinton National Airport Surrounding Transportation Infrastructure



Source: Arkansas Department of Transportation.

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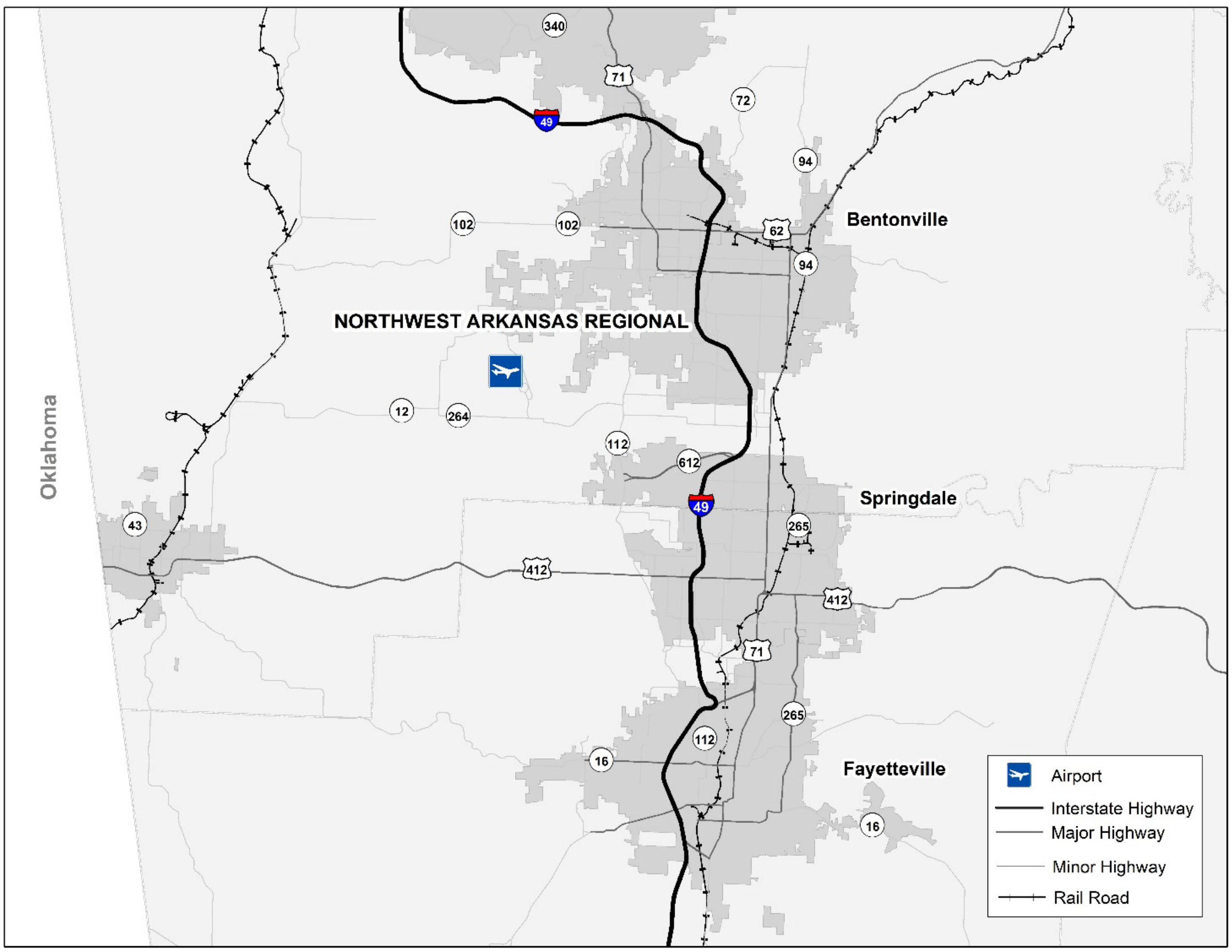
[6] Bill and Hillary Clinton National Airport website. Accessed on October 5, 2021. Available from: https://www.clintonairport.com/airport-services/air-cargo/

2.1.2 Other Arkansas Air Cargo Facilities

Northwest Arkansas National Airport (XNA) is located in Northwest Arkansas and operated by Northwest Arkansas Regional Airport Authority. Northwest Arkansas National is the second-largest airport in Arkansas by passenger volumes, providing 50 scheduled flights per day to 23 destinations across the U.S. The airport currently does not have dedicated cargo flights but handles some belly cargo. In 2019, the airport handled 26 tons of cargo. Northwest Arkansas National has an 8,800-foot runway with both ILS precision and a non-precision instrument approach.[7] Northwest Arkansas National Airport is planning to develop an integrated sustainability management plan to identify facility needs as well as social, economic, and environmental goals. Figure 2.3 presents the surrounding multimodal transportation infrastructure at Northwest Arkansas National. The airport is located within 10 miles of the I-49 corridor and its parallel railroad infrastructure.

Figure 2.3 Northwest Arkansas National Airport Surrounding Transportation Infrastructure

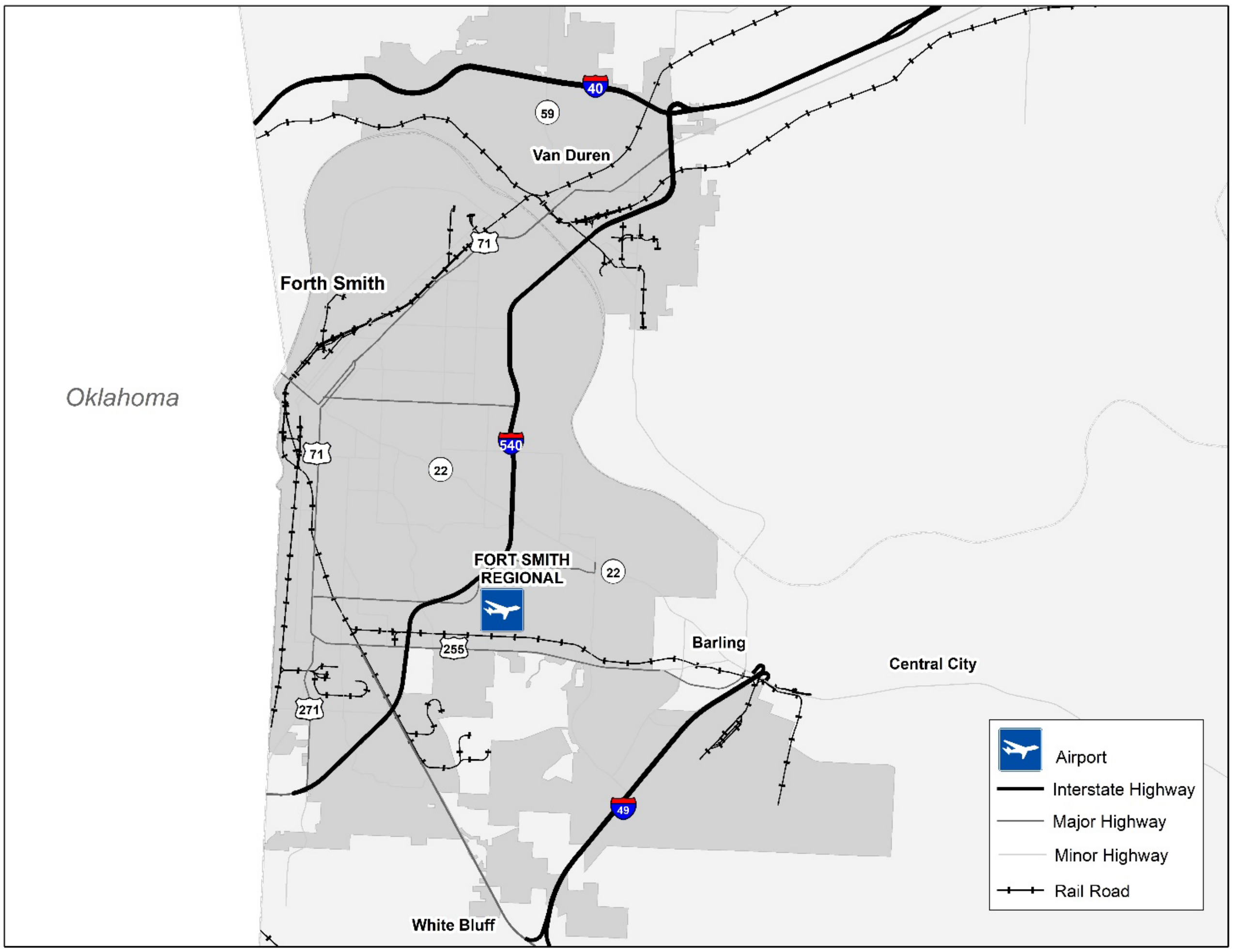


Source: Arkansas Department of Transportation

7 Arkansas Long Range Intermodal Transportation Plan, 2017.

Fort Smith Regional Airport (FSM) is the regional airport for western Arkansas. In 2019, the airport handled over 180,000 passengers and 21,000 aircraft operations.[8] In addition to airline service, Fort Smith Regional is home to the Arkansas Air National Guard with over 300 employees. The airport has air cargo service to Dallas-Fort Worth International Airport and Memphis International Airport, FedEx's global hub. Fort Smith Regional has an 8,000-foot runway and a complementary 5,002-foot crosswind runway. An ILS precision approach is available for the primary runway, and a combination precision and non-precision approach is available on the crosswind runway. Figure 2.4 presents the surrounding multimodal transportation infrastructure at Fort Smith Regional. The airport is located adjacent to I-540 less than 10 miles south of I-40.

Figure 2.4 Fort Smith Regional Airport Surrounding Transportation Infrastructure



Source: Arkansas Department of Transportation.

2.1.3 Nearby Airports

Arkansas airports face significant competition due to the state's proximity to major airports in other states. Most notably, Memphis International Airport (MEM) is the largest airport in the U.S. for air cargo activity and is just 11 miles east of the Arkansas-Tennessee state border. Dallas/Fort Worth International Airport (DFW), another

[8] Airport passenger and cargo activity report, 2019. Available from: https://flyfsm.com/airport-reports/.

major airport hub, is about 320 miles from Little Rock, approximately 4.5 hours by car or truck. Third-party logistics companies often negotiate a bulk rate with carriers at specific airports to ship goods, securing the best deals with carriers that cover several cities and transport large volumes of cargo. As a result, it is often more economical for shippers to transport their goods by truck from major airports outside of Arkansas rather than utilizing smaller airports within the state.

According to the Federal Aviation Administration (FAA), Memphis International Airport handled 12.2 million tons of air cargo in 2019, and Dallas/Fort Worth International Airport handled 2.4 million tons that year. The state's proximity to major air cargo airports with significant infrastructure and capacity impacts Arkansas' potential to grow volumes handled at Clinton National Airport and others throughout the state. Table 2.2 shows the top 10 air cargo airports in the U.S. by landed weight as well as the rankings of airports close to the Arkansas state line. The ranking and tonnage information was collected from FAA all-cargo data.

Table 2.2 Landed Weight of Top Ten U.S. Air Cargo Airports Plus Other Nearby Regional Airports, 2019

U.S. Rank	Airport	City, State	Landed Weight, thousands of tons, 2019	Distance to Arkansas State Line (Miles)
1	Memphis International (MEM)	Memphis, TN	12,172	11
2	Ted Stevens Anchorage International (ANC)	Anchorage, AK	9,153	-
3	Louisville Muhammad Ali International (SDF)	Louisville, KY	7,800	320
4	Miami International (MIA)	Miami, FL	4,618	970
5	Los Angeles International (LAX)	Los Angeles, CA	3,730	-
6	Cincinnati/Northern Kentucky International (CVG)	Hebron, KY	3,619	430
7	Chicago O'Hare International (ORD)	Chicago, IL	3,272	450
8	Indianapolis International (IND)	Indianapolis, IN	2,651	380
9	Dallas-Fort Worth International (DFW)	Dallas/Fort Worth, TX	2,370	200
10	Ontario International (ONT)	Ontario, CA	2,246	-
71	Lambert-St. Louis International (STL)	Saint Louis, MO	202	170
73	Louis Armstrong New Orleans (MSY)	New Orleans, LA	196	257
90	Will Rogers World (OCK)	Oklahoma City, OK	132	188
112	Springfield-Branson National (SGF)	Springfield, MO	69	62

Source: U.S. DOT, Federal Aviation Administration.

Note: Landed weight at ANC is high due to international air cargo flights to/from Asia refueling in Anchorage.

2.2 Air Cargo Service Providers

According to the Bureau of Transportation Statistics (BTS), four types of air cargo services are used in Arkansas, as shown in Table 2.3. The majority (96 percent) of all tonnage is scheduled all cargo services (Class G). The remaining tonnage is split among the remaining three service classes.

Table 2.3 Air Cargo Service in Arkansas, in tons, 2019

Service	Total Tons	% of Total
Scheduled Passenger/ Cargo Service (F)	464	2%
Scheduled All Cargo Service (G)	19,556	96%
Non-Scheduled Civilian All Cargo Service (P)	313	<2%
Non-Scheduled Civilian Passenger/ Cargo Service (L)	74	<1%
Total	**20,406**	**100%**

Source: BTS T-100 Market, 2019.

There are three primary types of air cargo carriers:

- **Integrated express service carriers** move their shipment door-to-door and provide shipment pick-up, transport via air or truck, and delivery. These operators include FedEx, UPS, and USPS. Integrated express service operates on a hub-and-spoke system similar to the airline system where the hub is the main operating center. This service focuses on small and high-volume shippers moving their products to multiple locations, and the market includes individual, private, and business-to-customer.

- **Freight forwarding companies** act as indirect carriers between the shipper and the carrier. The forwarder supports diverse types and sizes of freight from small packages to container loads. They use third party service providers to move the freight.

- **Airport-to-airport service carriers** are limited to airports where the shipper or shipper's forwarder drops the shipment at an origin airport and the customer or customer's forwarder picks it up at the destination airport. This service includes all-cargo, commercial passenger carriers, and ad-hoc charter.

Expedited shipping provides speed and security to time-sensitive freight shipments at a relatively higher cost compared to other modes. Expedited carriers are an important linkage for transporting goods to rural areas, connecting Arkansas' businesses and consumers to national and global markets. Table 2.4 summarizes the market share of top air cargo carriers in Arkansas. UPS is the top air cargo carrier in the state for both imports and exports, comprising 87 percent of total tonnage. FedEx handled nine percent of total tonnage, the second-highest carrier in the state. The remaining eight airlines collectively comprise less than five percent of total volumes.

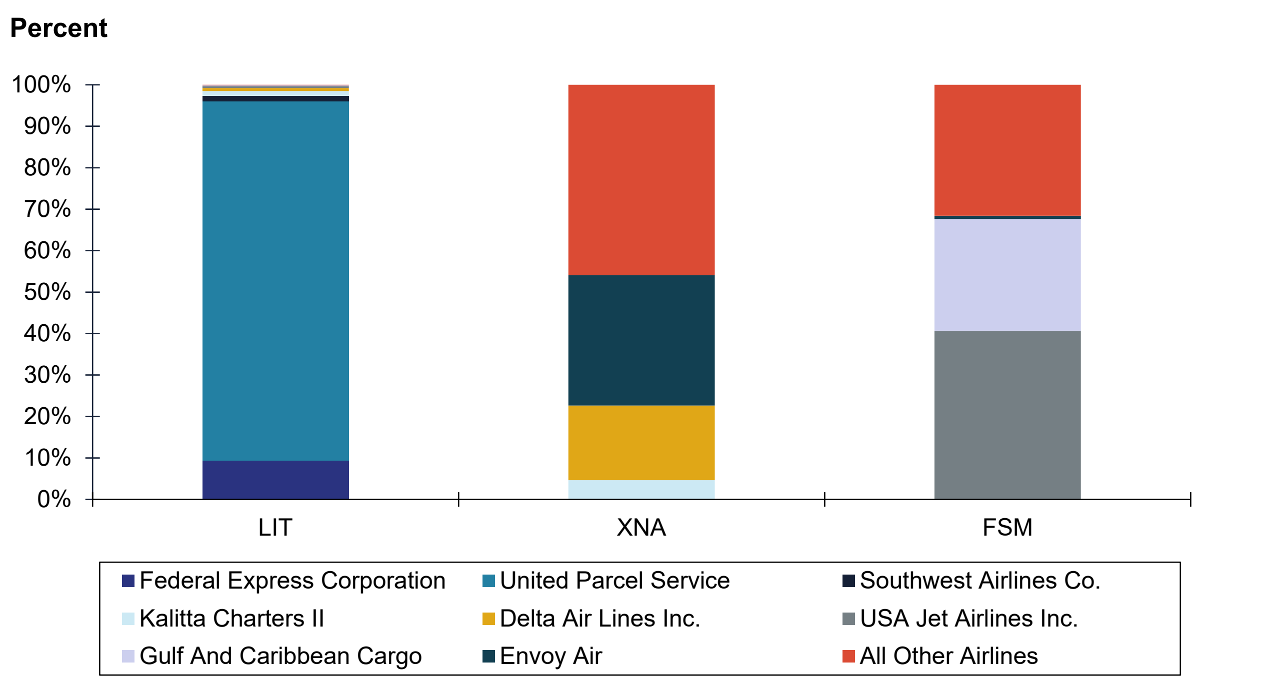
Table 2.4 Top Air Cargo Carriers at Arkansas Airports, 2019

Carrier Name	Total Tonnage	Percent of Total	Operating at LIT	Operating at XNA	Operating at FSM
United Parcel Service	16,335	87%	■		
Federal Express Corporation	1,772	9%	■		
Southwest Airlines Co.	244	1%	■		
Kalitta Charters II	221	1%	■		
Delta Air Lines Inc.	142	< 1%	■	■	■
USA Jet Airlines Inc.	58	< 1%	■		■
Gulf And Caribbean Cargo	36	< 1%	■		■
Envoy Air	18	< 1%	■	■	■
Ameristar Air Cargo	15	< 1%	■	■	■
Tatonduk Outfitters Limited	11	< 1%	■		
American Airlines Inc.	11	< 1%	■	■	

Source: BTS T-100 Market, 2019.

Figure 2.5 shows the distribution of tonnage carried by each carrier at Arkansas' top three air cargo-handling airports. The major carriers, UPS and FedEx, only operate at Clinton National Airport, while the other airports are served by a mix of airlines.

Figure 2.5 Air Cargo Carriers at Arkansas Airports by Tonnage, 2019



Source: BTS T-100 Market, 2019.

3.0 Air Cargo Demand

This section discusses statewide demand for air cargo in Arkansas and highlights air cargo activity at the state's three cargo-handling airports. Data used to analyze demand includes air cargo trade partners, tonnage, value, and top commodities.

3.1 Arkansas Air Cargo Activity

The COVID-19 pandemic devastated passenger air travel and airline revenues across the globe, but demand for air cargo remained strong. Arkansas' air cargo volumes did not change notably between 2019 and 2020. By contrast, Memphis International Airport—a top competitor to Clinton National Airport—experienced an increase of nearly seven percent from 2019 to 2020.[9] Table 3.1 shows how Arkansas airports are ranked by the Airport Council International relative to global airports.

Table 3.1 Arkansas Airport Air Cargo World Rankings, 2020

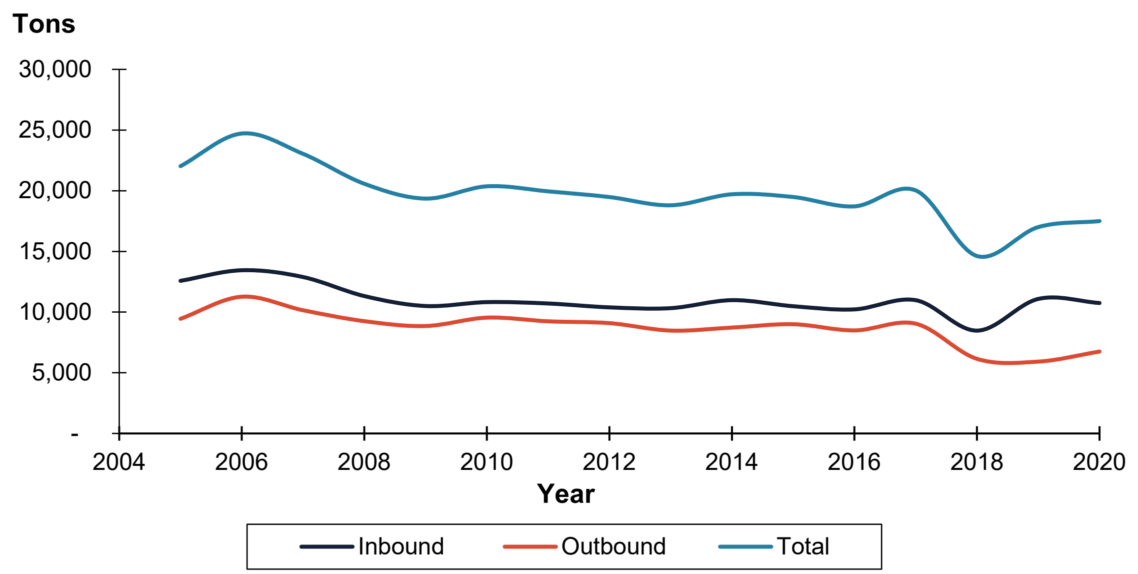
Airport Name	Airport Code	World Ranking 2020
Clinton National Airport	LIT	368
Northwest Arkansas National Airport	XNA	1,567
Fort Smith Regional Airport	FSM	1,697

Source: Airport Council International, 2020.

Figure 3.1 and Figure 3.2 present historical air cargo tonnage trends for the Arkansas and the Nation as a whole over the last 15 years. The inbound and outbound trends for Arkansas followed a similar pattern as the U.S. with inbound being slightly higher than outbound. Air cargo tonnage has declined overall in Arkansas in recent years, though it has not been significantly impacted by major macroeconomic events, such as the Great Recession of 2008, relative to national trends. Overall tonnage experienced a notable drop in 2018 and has since been struggling to rebound. One contributing factor to this decline could be competition from other freight modes and airports, such as trucking to and from larger cargo airports in the region. Economies of scale at these airports may result in a more efficient total cost of transportation.

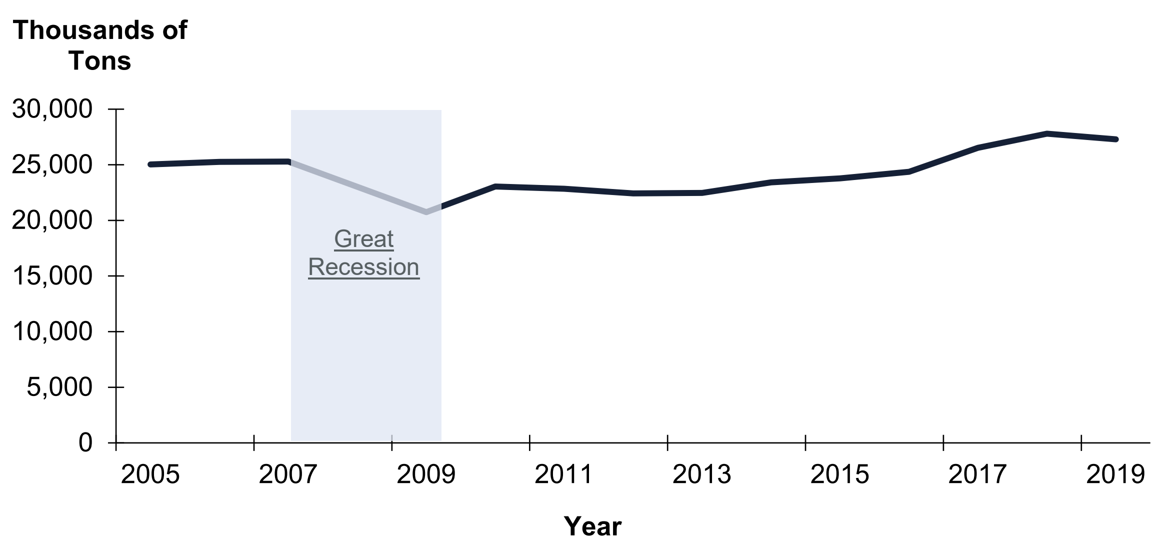
[9] ACI, COVID-19 Report, 2021.

Figure 3.1 Arkansas Air Cargo Tonnage, 2005–2020



Source: BTS T-100 Market Data.

Figure 3.2 U.S. Air Cargo Revenue Tons Enplaned, 2005–2019



Source: BTS T-100 Market Data.

Table 3.2 and Table 3.3 show the top air cargo origin and destination cities for Arkansas airports in 2019. Arkansas' top air cargo origins and destinations include Louisville, Dallas-Fort Worth, El Paso, Memphis, and Los Angeles. All have UPS or FedEx hubs on-site that drive the demand for air cargo.

Table 3.2 Top 10 Destinations from Arkansas Airports, 2019

Airport Name	Destination City	Total Tonnage	% of Total
Louisville Muhammad Ali International (SDF)	Louisville, KY	3,650	58%
El Paso International (ELP)	El Paso, TX	1,331	21%
Memphis International (MEM)	Memphis, TN	1,016	16%
Tulsa International (TUL)	Tulsa, OK	80	1%
Dallas-Fort Worth International (DFW)	Dallas/Fort Worth, TX	64	1%
Hartsfield—Jackson Atlanta International (ATL)	Atlanta, GA	47	<1%
Ontario International (ONT)	Ontario, CA	42	<1%
Blue Grass (LEX)	Lexington, KY	41	<1%
Lafayette Regional/Paul Fournet Field (LFT)	Lafayette, LA	33	<1%
Niagara Falls International (IAG)	Niagara Falls, NY	31	<1%

Source: BTS T-100 Market.

Table 3.3 Top 10 Origins to Arkansas Airports, 2019

Airport Name	Origin City	Total Tonnage	% of Total
Louisville Muhammad Ali International (SDF)	Louisville, KY	6,861	57%
Dallas-Fort Worth International (DFW)	Dallas/Fort Worth, TX	1,881	16%
Los Angeles International (LAX)	Los Angeles, CA	1,217	10%
Laredo International (LRD)	Laredo, TX	1,011	8%
McAllen International (MFE)	McAllen, TX	615	5%
Louis Armstrong New Orleans International (MSY)	New Orleans, LA	135	1%
Shreveport Regional (SHV)	Shreveport, LA	123	1%
Hartsfield—Jackson Atlanta International (ATL)	Atlanta, GA	96	<1%
Ontario International (ONT)	Ontario, CA	65	<1%
Dallas Love (DAL)	Dallas, TX	55	<1%

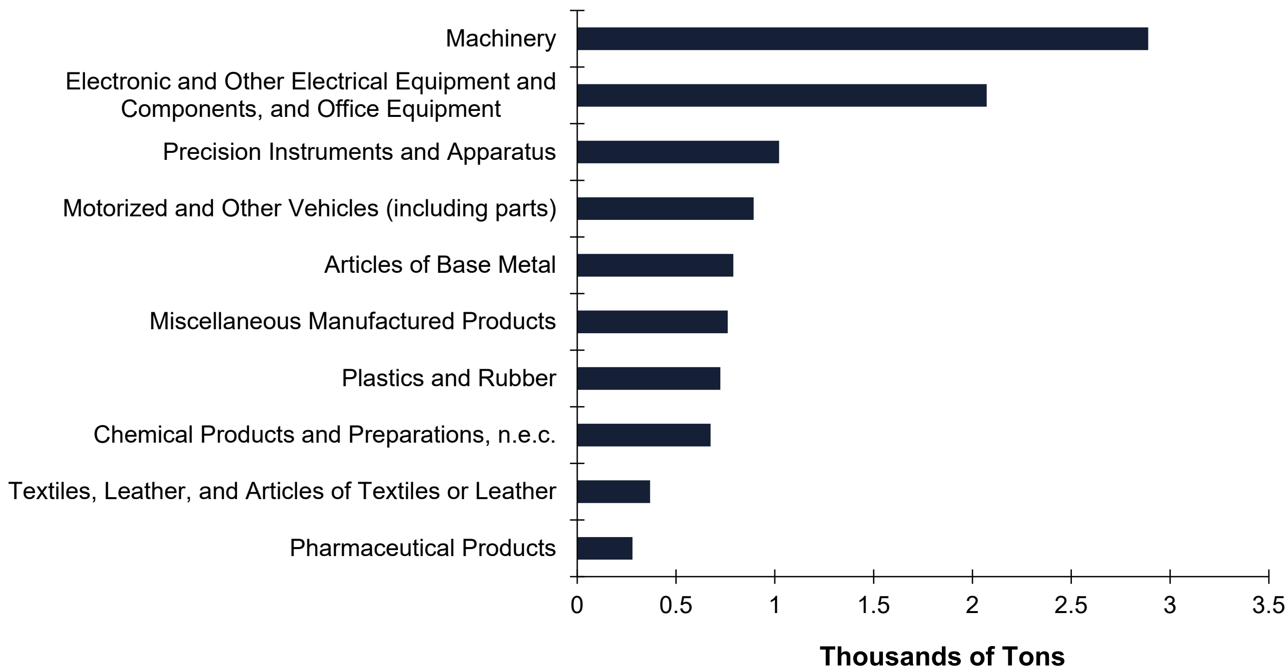
Source: BTS T-100 Market.

The Freight Analysis Framework (FAF5) reports commodity flows by volume (thousands of tons) and value (millions of dollars) for 2017, which was projected to 2019 for the purposes of this analysis. The FAF5 includes air cargo movements under one of two modes: air or multiple modes/mail. Multiple modes/mail moves could involve air cargo, or could involve other modes. This section, and each use of FAF5 data in this report, only includes moves classified as air only. As a result, mail and packages are likely underestimated.

The top inbound air cargo commodities by volume in Arkansas in 2019 were machinery, electronics, precision instruments, motorized vehicles, and articles of base metal. Together, these five commodity groups accounted for nearly three-quarters of air cargo volume. Figure 3.3 displays the top inbound air cargo commodities by volume.

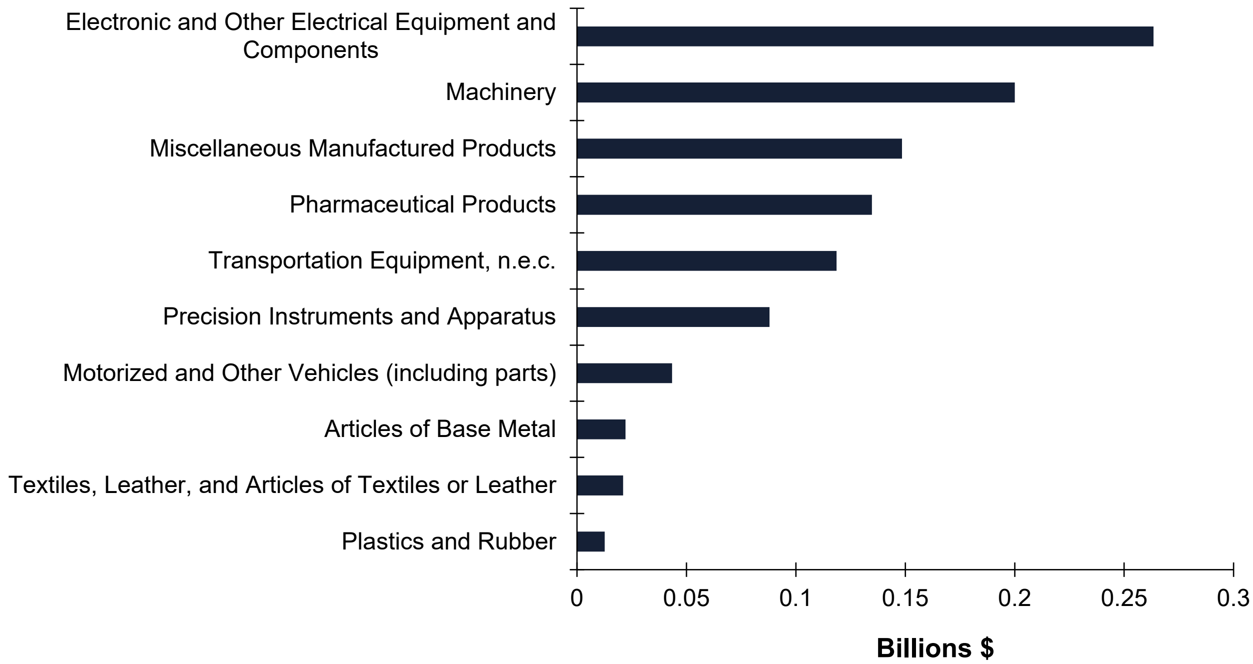
By value, the top inbound commodities were electronics, machinery, miscellaneous manufactured products, pharmaceuticals, and transportation equipment (Figure 3.4). Pharmaceuticals are an example of an extremely high value commodity with a low weight. These types of goods are often time-sensitive and depend on reliable, efficient air transportation.

Figure 3.3 Top Inbound Air Cargo Commodities by Tonnage



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

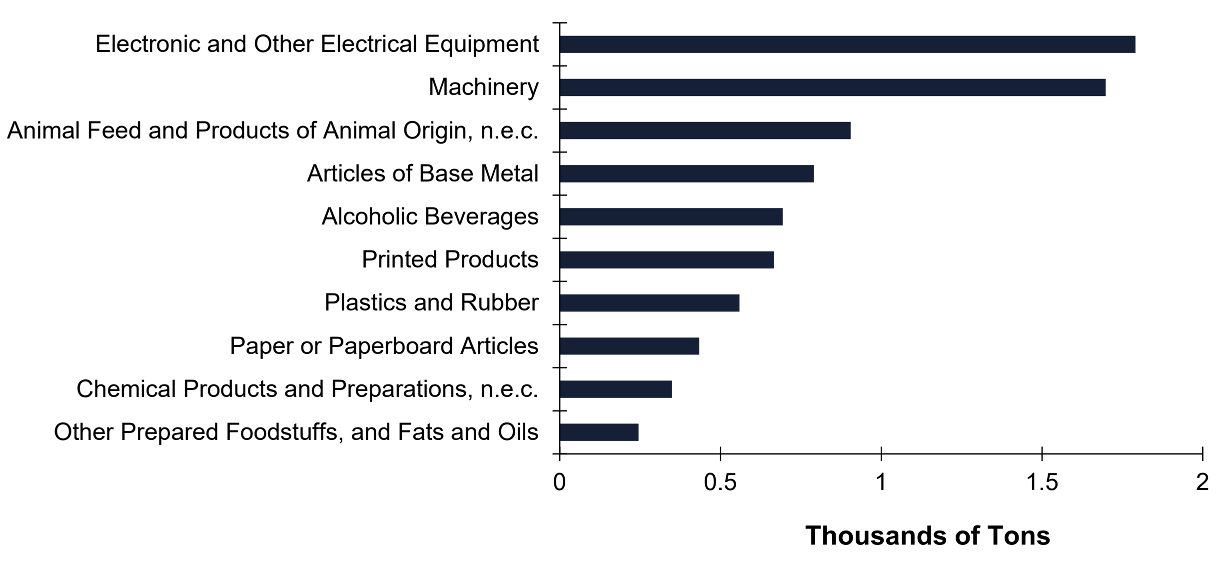
Figure 3.4 Top Inbound Air Cargo Commodities by Value



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

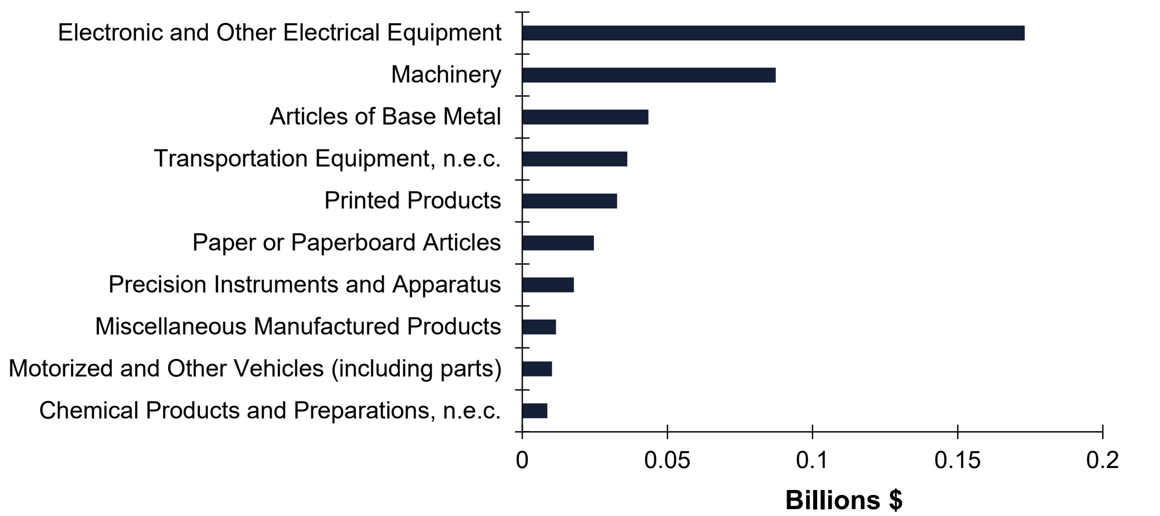
The top outbound air cargo commodities by volume in Arkansas in 2019 were electronics, machinery, animal feed, base metals, and alcoholic beverages (Figure 3.5). Together, these five commodity groups accounted for 72 percent of air cargo volume. By value, the top outbound commodities were electronics, machinery, articles of base metal, transportation equipment, and printed products (Figure 3.6).

Figure 3.5 Top Outbound Air Cargo Commodities by Tonnage



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

Figure 3.6 Top Outbound Air Cargo Commodities by Value



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

3.2 Demand by Airport

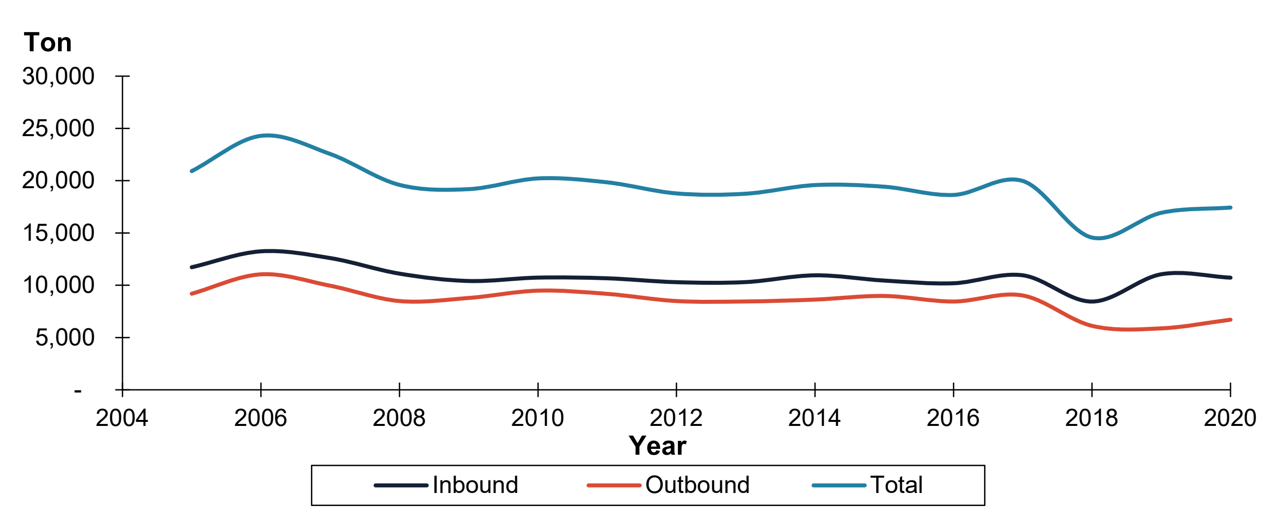
This section focuses on discussion of air cargo demand at Clinton National Airport, but also summarizes findings of demand at other notable air cargo-handling facilities in Arkansas.

3.2.1 Clinton National Airport

Clinton National Airport is the largest and most significant air cargo-handling airport in the state, and handled nearly all air cargo demand in the state in 2019. Clinton National Airport experienced peak cargo volumes in 2006 (24,293 tons), which declined to 14,562 tons by 2018. Overall, air cargo has declined over the past 10 years, rising slightly to over 17,400 tons by 2020, as shown in Figure 3.7.

Figure 3.7 Clinton National Airport Air Cargo Volumes

2005–2020



Source: BTS T-100 Market.

Table 3.4 and Table 3.5 show top air cargo origin and destination cities for Clinton National Airport in 2019. These findings are closely aligned with the statewide air cargo activity discussed in Section 3.1. Louisville and El Paso comprised 78 percent of export volumes and Louisville and Dallas-Fort Worth comprised 72 percent of import volumes to/from Clinton National Airport.

Table 3.4 Top 10 Destination Airports from Clinton National Airport, 2019

Airport Name	Destination City	Total Tonnage	% of Total
Louisville Muhammad Ali International (SDF)	Louisville, KY	3,650	58%
El Paso International (ELP)	El Paso, TX	1,331	21%
Memphis International (MEM)	Memphis, TN	1,016	16%
Tulsa International (TUL)	Tulsa, OK	80	1%
Dallas-Fort Worth International (DFW)	Dallas, TX	64	1%
Hartsfield—Jackson Atlanta International (ATL)	Atlanta, GA	46	<1%
Ontario International (ONT)	Ontario, CA	42	<1%
Blue Grass (LEX)	Lexington, KY	41	<1%
Lafayette Regional/Paul Fournet Field (LFT)	Lafayette, LA	33	<1%
McCarran International (LAS)	Las Vegas, NV	29	<1%

Source: BTS T-100 Market.

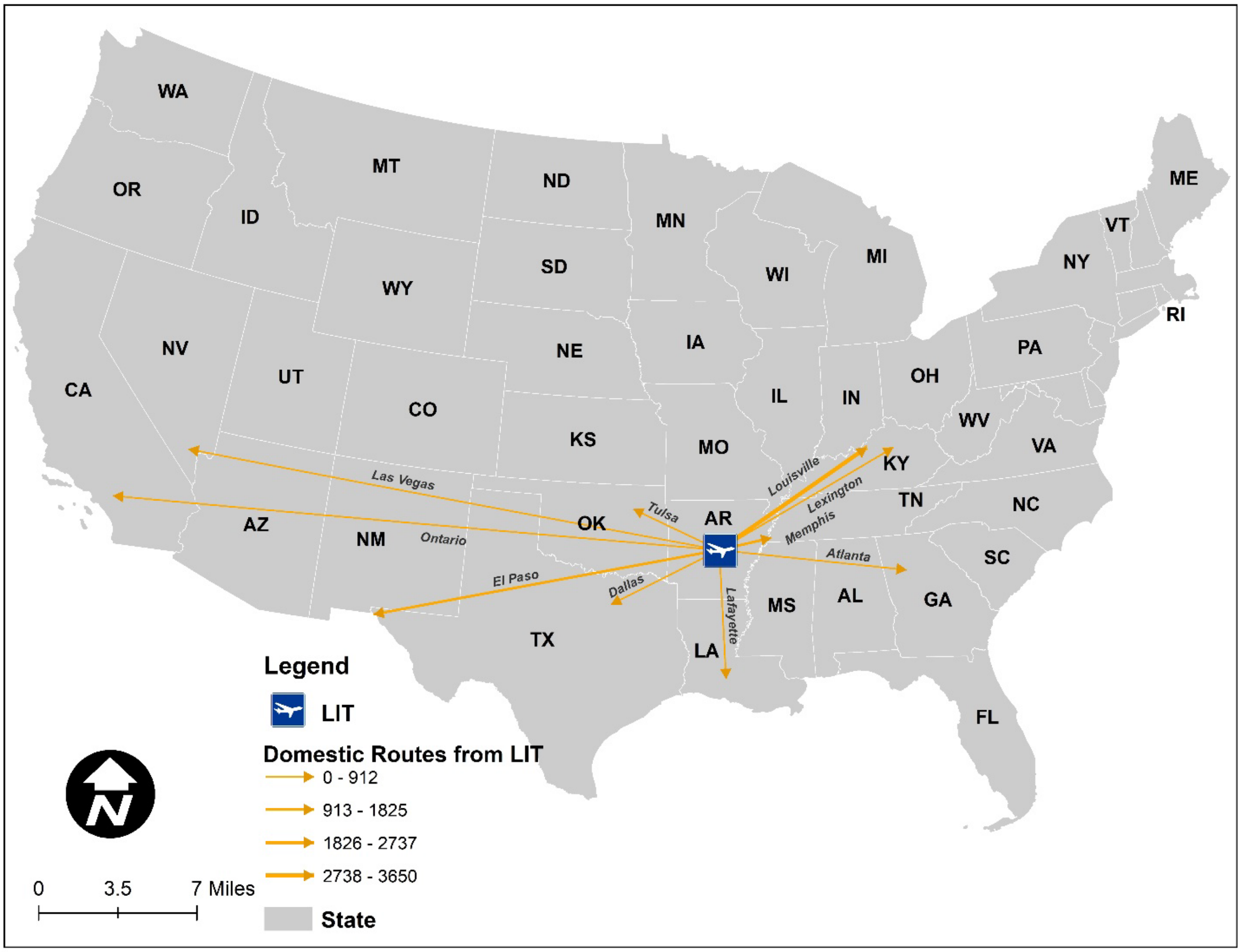
Table 3.5 Top 10 Origin Airports to Clinton National Airport, 2019

Airport Name	Origin City	Total Tonnage	% of Total
Louisville Muhammad Ali International (SDF)	Louisville, KY	6,861	57%
Dallas-Fort Worth International (DFW)	Dallas/Fort Worth, TX	1,864	16%
Los Angeles International (LAX)	Los Angeles, CA	1,217	10%
Laredo International (LRD)	Laredo, TX	1,011	8%
McAllen International (MFE)	McAllen, TX	615	5%
Louis Armstrong New Orleans International (MSY)	New Orleans, LA	135	1%
Shreveport Regional (SHV)	Shreveport, LA	123	1%
Hartsfield—Jackson Atlanta International (ATL)	Atlanta, GA	92	<1%
Ontario International (ONT)	Ontario, CA	65	<1%
Dallas Love (DAL)	Dallas, TX	55	<1%

Source: BTS T-100 Market.

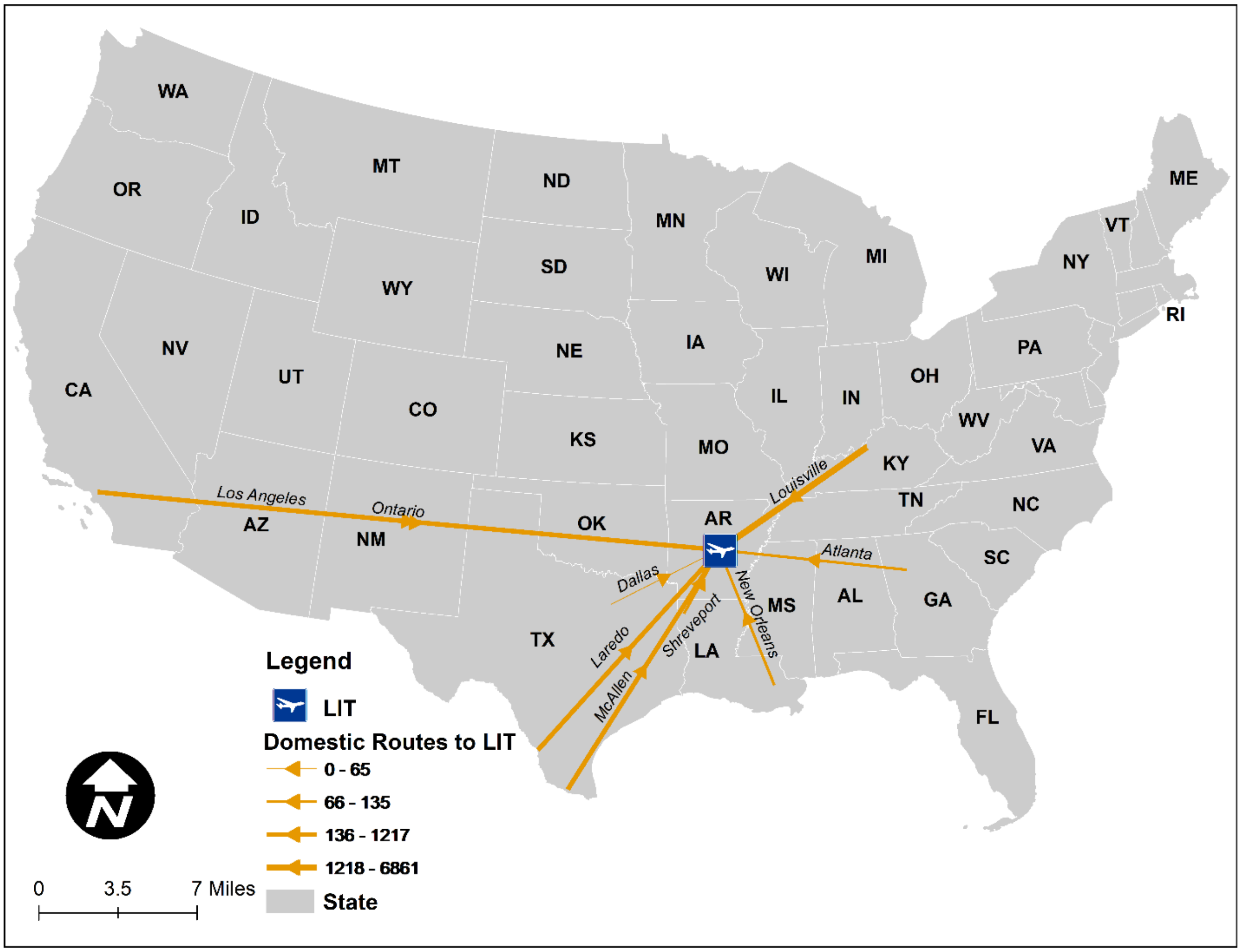
Figure 3.8 and Figure 3.9 show the location of Clinton National Airport relative to its top origin and destinations for air cargo. Air cargo is distributed from airports to major hubs and major hubs to cities for final distribution.

Figure 3.8 Top 10 Cargo Destination Airports from Clinton National Airport, 2019



Source: BTS T-100 Market, 2019.

Figure 3.9 Top 10 Cargo Origin Airports to Clinton National Airport, 2019

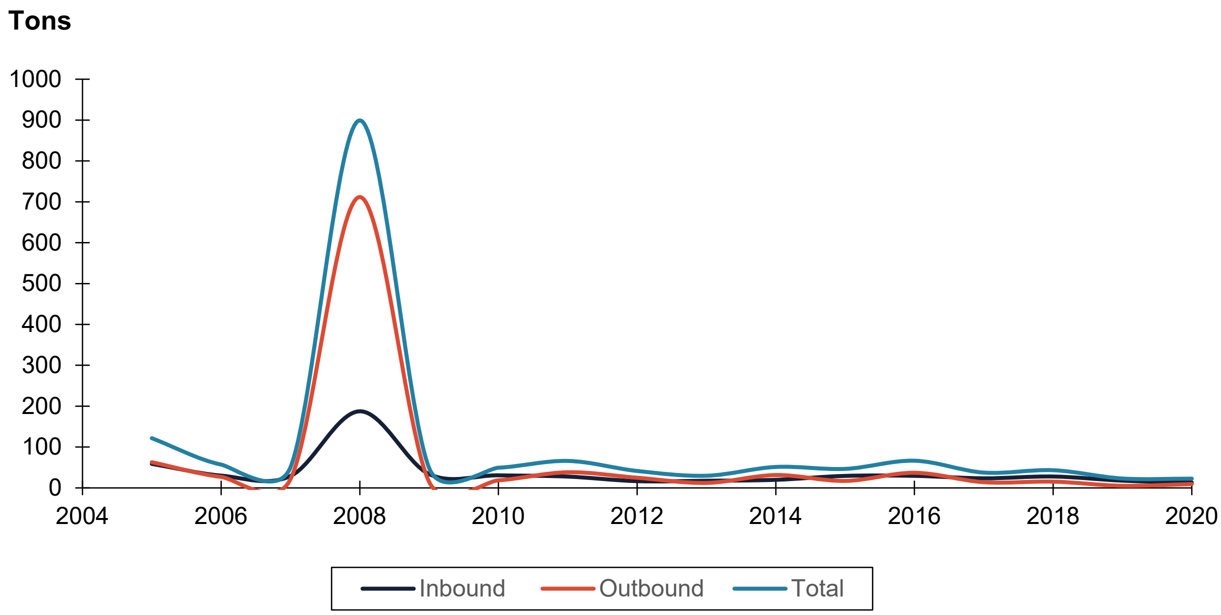


Source: BTS T-100 Market, 2019.

3.2.2 Other Airport Facilities

Air cargo tonnage at Northwest Arkansas National Airport (XNA) spiked to 900 tons in 2008, but has generally been less than 100 tons per year over the past 15 years, as shown in Figure 3.10. Table 3.6 and Table 3.7 show the top origin and destinations cities for Northwest Arkansas National Airport in 2019. Dallas comprised 60 percent of total imports and exports for Northwest Arkansas National Airport.

Figure 3.10 Northwest Arkansas National Airport Cargo Volumes, 2005 – 2020



Source: BTS T-100 Market data.

Table 3.6 Top Destination Airports from Northwest Arkansas National, 2019

Airport Name	Destination City	Total Tonnage	Percent
Dallas-Fort Worth International (DFW)	Dallas/Fort Worth, TX	1.8	32%
Hartsfield—Jackson Atlanta International (ATL)	Atlanta, GA	1.5	26%
Chicago O'Hare International (ORD)	Chicago, IL	1.4	25%
Charlotte/Douglas International (CLT)	Charlotte, NC	1.0	17%

Source: BTS T-100 Market data

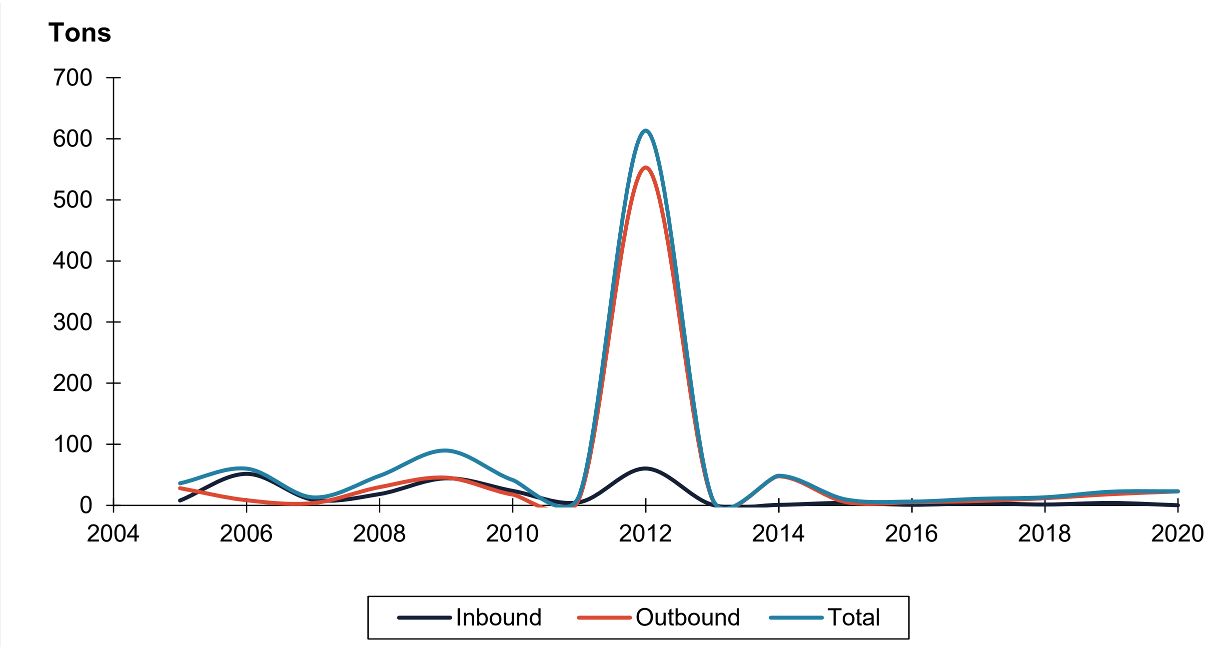
Table 3.7 Top Origin Airports to Northwest Arkansas National, 2019

Airport Name	Origin City	Total Tonnage	Percent
Dallas-Fort Worth International (DFW)	Dallas/Fort Worth, TX	12	68%
Hartsfield—Jackson Atlanta International (ATL)	Atlanta, GA	3	16%
Chicago O'Hare International (ORD)	Chicago, IL	2	9%
Brownsville/South Padre Island International (BRO)	Brownsville, TX	1	6%

Source: BTS T-100 Market data.

Air cargo tonnage at Fort Smith Regional Airport (FSM) has generally been less than 100 tons annually, but experienced a spike in 2012 to 613 tons, as shown in Figure 3.11. Table 3.8 shows the top air cargo destinations for Fort Smith Regional Airport. Dallas-Fort Worth International Airport and South Bend International Airport, IN are the only origin airports recorded in 2019 for Fort Smith Regional.

Figure 3.11 Fort Smith Regional Airport Cargo Volumes, 2005 – 2019



Source: BTS T-100 Market data

Table 3.8 Top Destination Airports from Fort Smith Regional, 2019

Airport Name	City	Total Tonnage	Percent
Cleveland-Hopkins International (CLE)	Cleveland, OH	17	83%
Niagara Falls International (IAG)	Niagara Falls, NY	2.8	14%
Greenville Spartanburg International (GSP)	Greenville, SC	0.5	3%
Dallas-Fort Worth International (DFW)	Dallas/Fort Worth, TX	0.2	1%

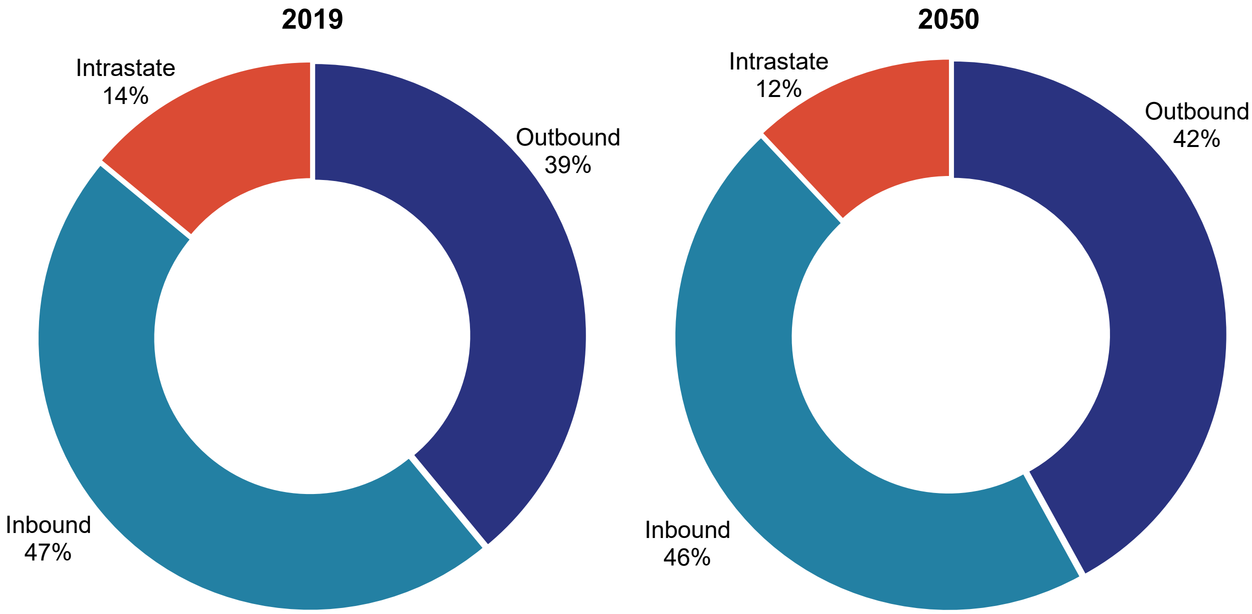
Source: BTS T-100 Market, 2019.

3.3 Future Statewide Air Cargo Activity

Projections of air cargo activity through 2050 are available via the Freight Analysis Framework (FAF) database, which is produced through a partnership between Bureau of Transportation Statistics (BTS) and Federal Highway Administration (FHWA). A comprehensive analysis of FAF data for 2019 and 2050 flows is available in the Commodity Flow Profile produced as part of this State Freight Plan update.

By 2050, air freight in Arkansas is expected to double in volume to more than 51,000 tons and estimated at $4.7 billion in value. In terms of directional flows, inbound air shipments are expected to comprise less than half of the total. Outbound flows are the second largest and are expected to rise marginally to 42 percent by 2050. Figure 3.12 provides the volume of directional flows shipped by Arkansas airways for 2019 and 2050.

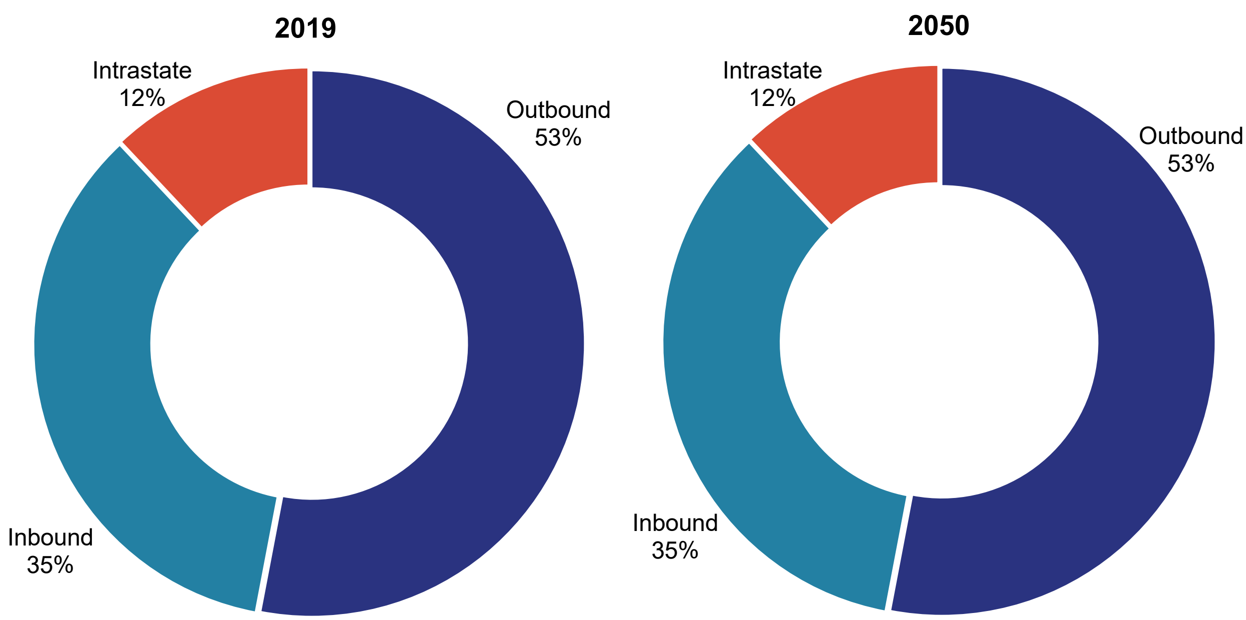
Figure 3.12 Annual Arkansas Air Cargo Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Inbound flows are expected to account for over 50 percent of the total value by 2050, and the value of intrastate shipments is expected to exceed that of outbound goods. Figure 3.13 shows the value of Arkansas air cargo shipments for 2019 and 2050.

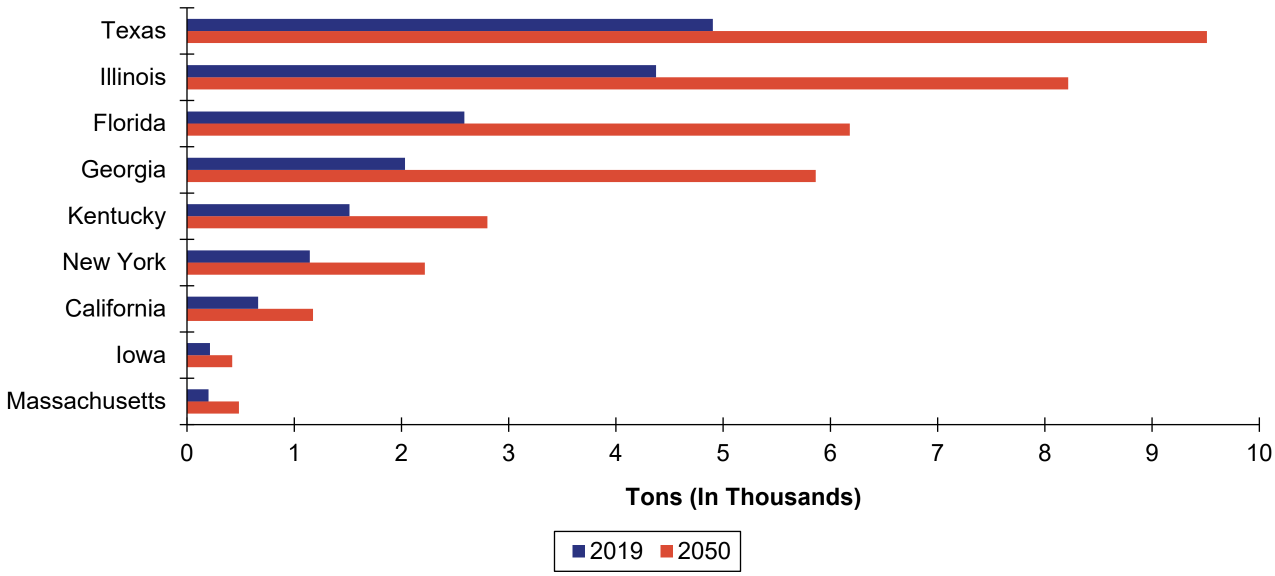
Figure 3.13 Annual Arkansas Air Cargo Value, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 3.14 shows Arkansas top trading partners for air cargo shipments by tonnage. Of the top trading partners, Texas accounted for 20 percent of air cargo volumes. Other significant trade partners include Illinois, Florida, and Georgia. When combined these states contribute to 56 percent of overall air shipments. By 2050, Arkansas top trading partners will remain the same, with Texas accounting for 19 percent of total tonnage.

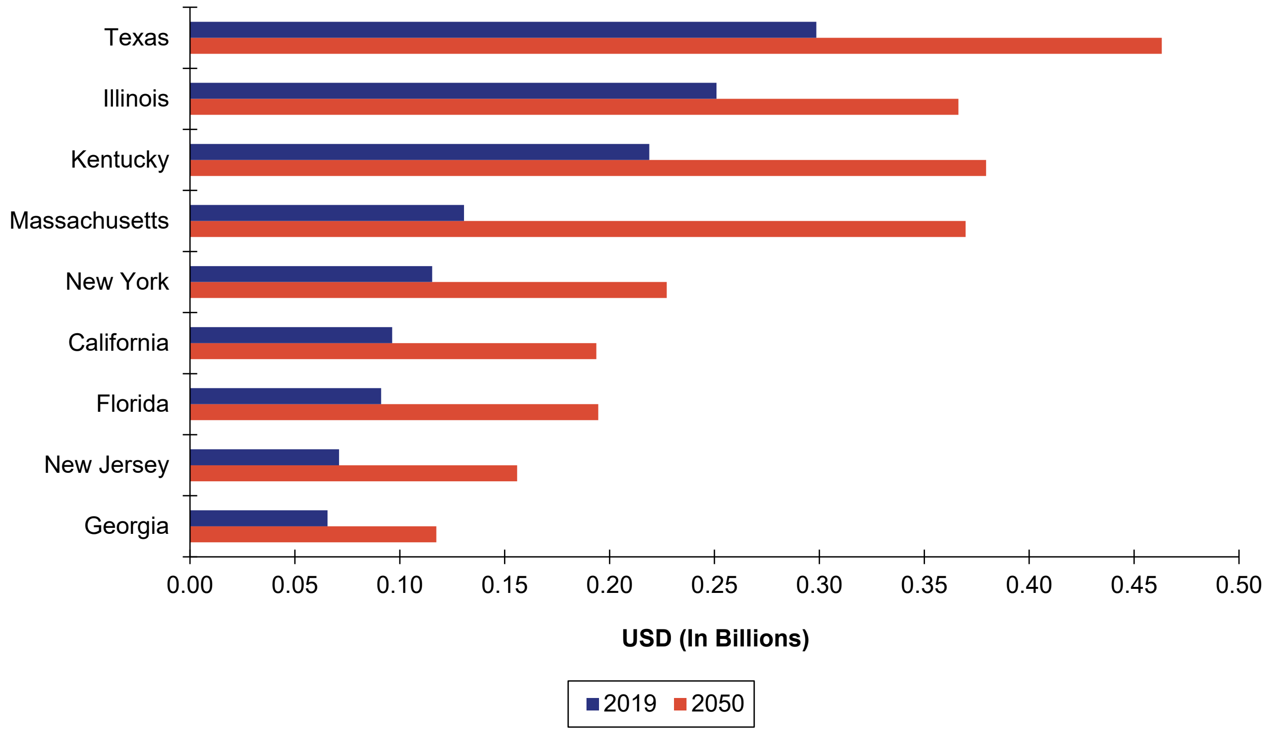
Figure 3.14 Top Domestic Air Cargo Trading Partners by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

For both 2019 and 2050, the value of shipments moved by air with Texas and Illinois were ranked the highest, mostly due to high shipment volumes. Other states with far lower volumes, such as Kentucky, Massachusetts, and New York, were also ranked among the top trading partners reflecting preferences for shipping high valued items via air. The share of the air shipment values for the top five trading partners is projected to decline from 50 percent in 2019 to 39 percent by 2050. The most significant increases are expected to originate from Massachusetts, Texas, and Kentucky.

Figure 3.15 Top Domestic Air Cargo Trading Partners by Value, 2019 and 2050

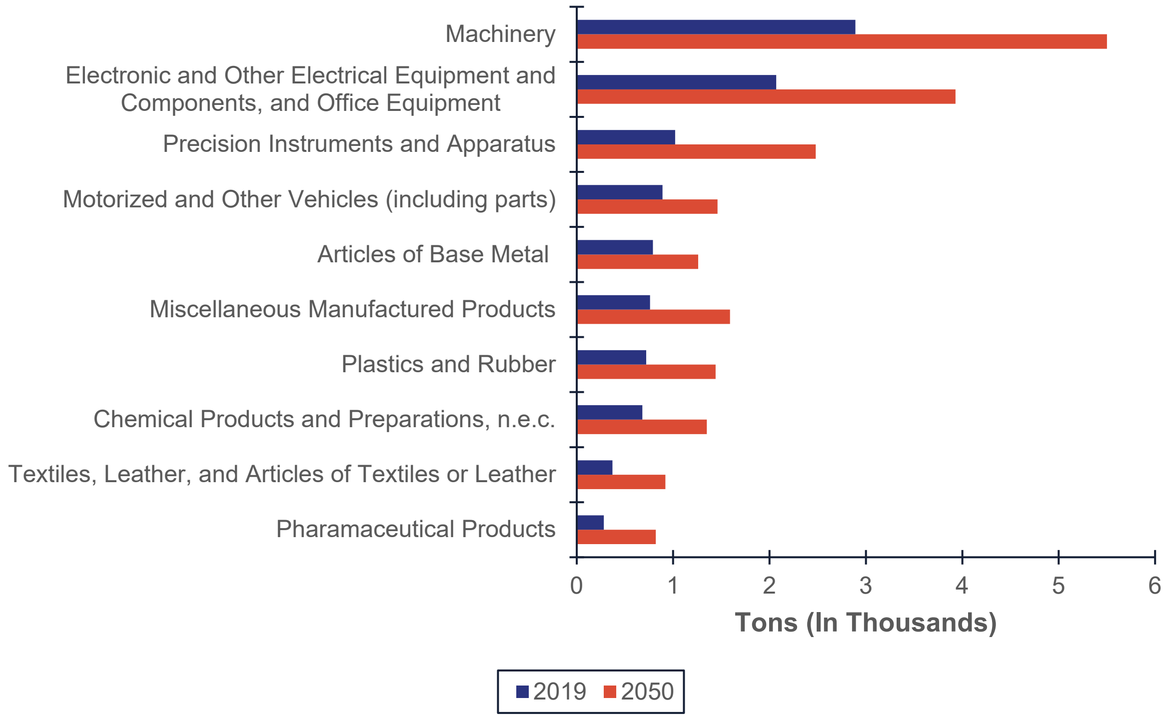


Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Between 2019 and 2050, machinery, electronic and other electrical equipment, and precision instruments and apparatus are expected to remain the most significant imports shipped via air into Arkansas. Together, they accounted for 6 thousand tons or almost 25 percent of air cargo inbound flows (Figure 3.16).

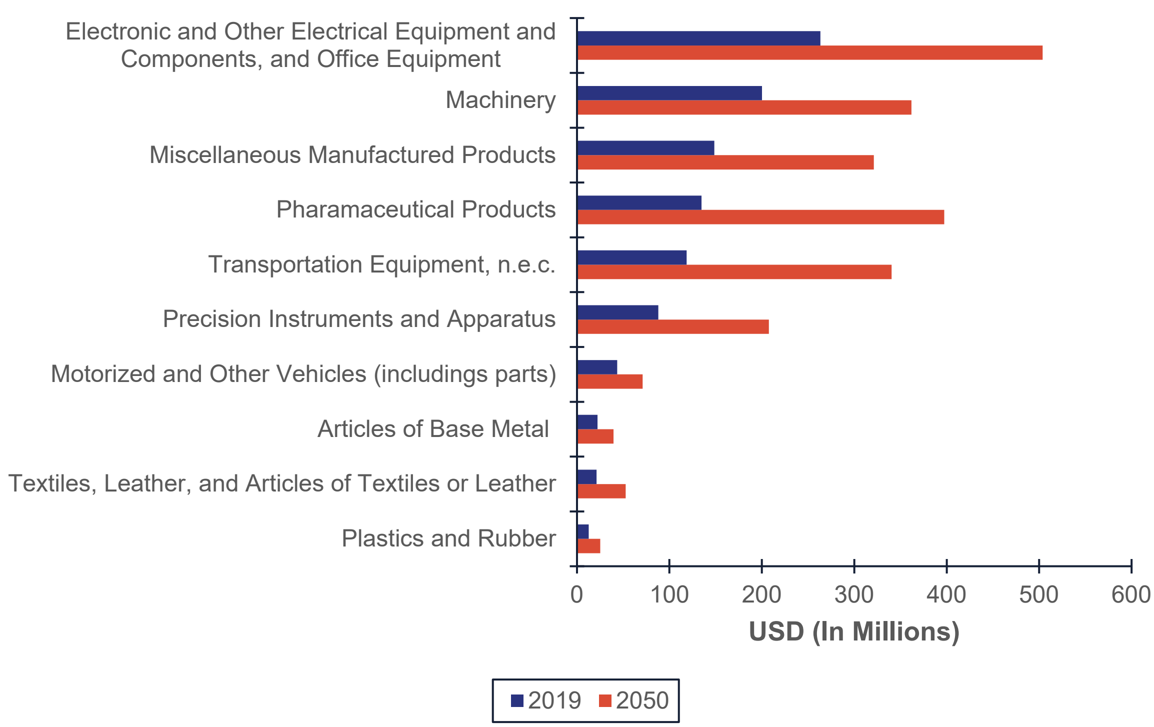
Electronic and other electrical equipment was identified as the commodity with the highest value of shipments totaling $263 million for 2019 (Figure 3.17). By 2050, this commodity group is expected to maintain its position and projected to grow to $504 million. Machinery and manufactured goods and miscellaneous manufactured products rank second and third, respectively, for both 2019 and 2050.

Figure 3.16 Top Inbound Air Cargo Commodities by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 3.17 Top Inbound Air Cargo Commodities by Value, 2019 and 2050

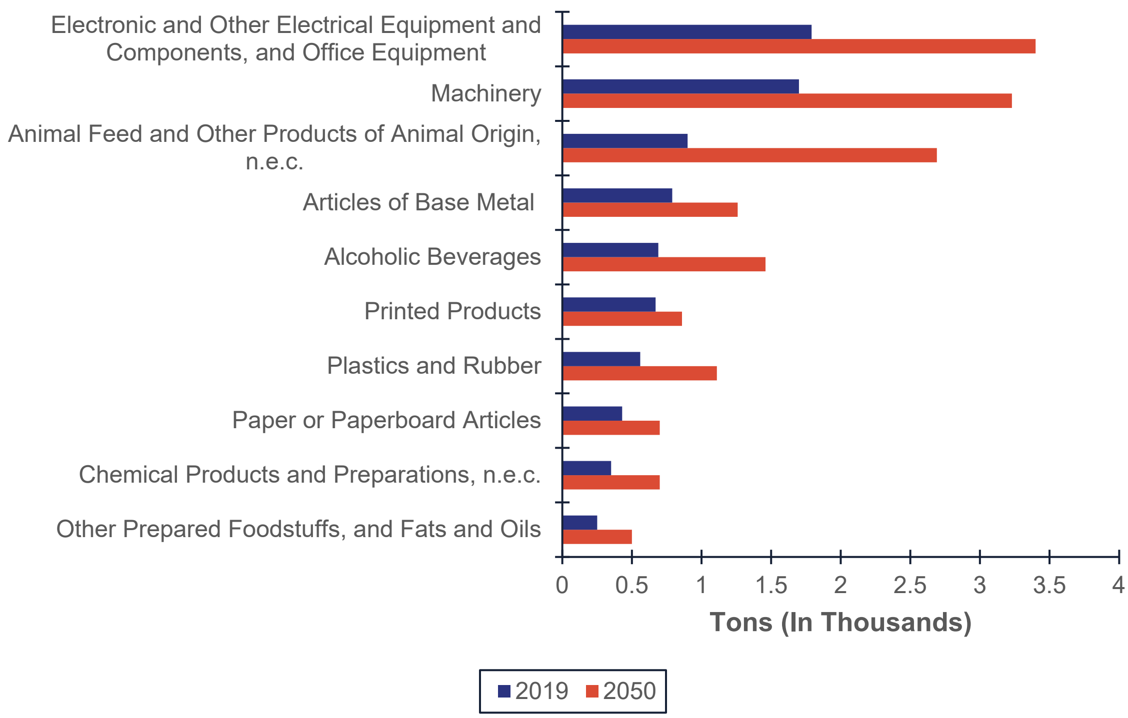


Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 3.18 displays the top outbound air cargo commodities by tonnage for 2019 and 2050. The top three outbound commodities are electronic and other electrical equipment and components, machinery, and animal feed and products of animal origin. Growth is projected for all three, with combined tonnage increasing from 4 billion tons in 2019 to 9 billion tons by 2050.

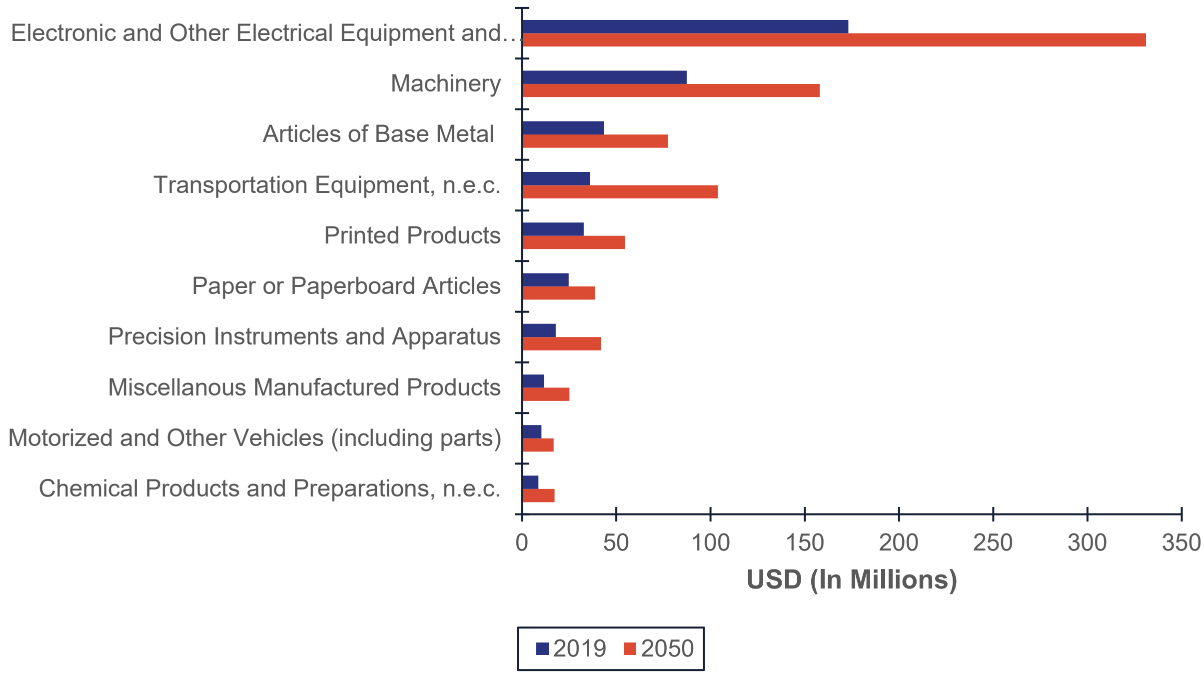
Electronic and other electrical equipment and components and machinery are the most significant commodities in terms of value. Together, they accounted for $260 million in 2019 and are projected to account for $489 million in 2050, comprising over half of outbound total value. Figure 3.19 shows the top outbound air cargo commodities by value for 2019 and 2050.

Figure 3.18 Top Outbound Air Cargo Commodities by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 3.19 Top Outbound Air Cargo Commodities by Value, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021

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4.0 Air Cargo Performance and Trends

Air cargo performance and trends in the state of Arkansas are based on quantitative and qualitative data. Findings from research and stakeholder outreach specific to freight operations combined with commodity flow forecasts inform how the conditions and needs of air cargo operations will continue to evolve in the future.

4.1 Statewide Aviation Safety

The National Transportation Safety Board (NTSB) publishes information about aviation accidents and incidents. Accidents are defined as adverse occurrences after any person has boarded an aircraft with intention of flight and before the last person disembarks. Injury or substantial property damage must occur to result in an accident. Incidents encompass all other occurrences that could or do affect safety. Only some incidents are included in the Aviation Accident Database, and the remainder of this section describes accidents involving an airplane in the state of Arkansas. Helicopters and other vehicle types are not included.

Between 2015 and 2020, a total of five aviation accidents occurred in Arkansas, including one fatal accident and one serious injury accident. The causes of these fatal and serious accidents were determined to be loss of engine power (partial and total), abnormal runway contact, and other miscellaneous factors.

4.2 Trends

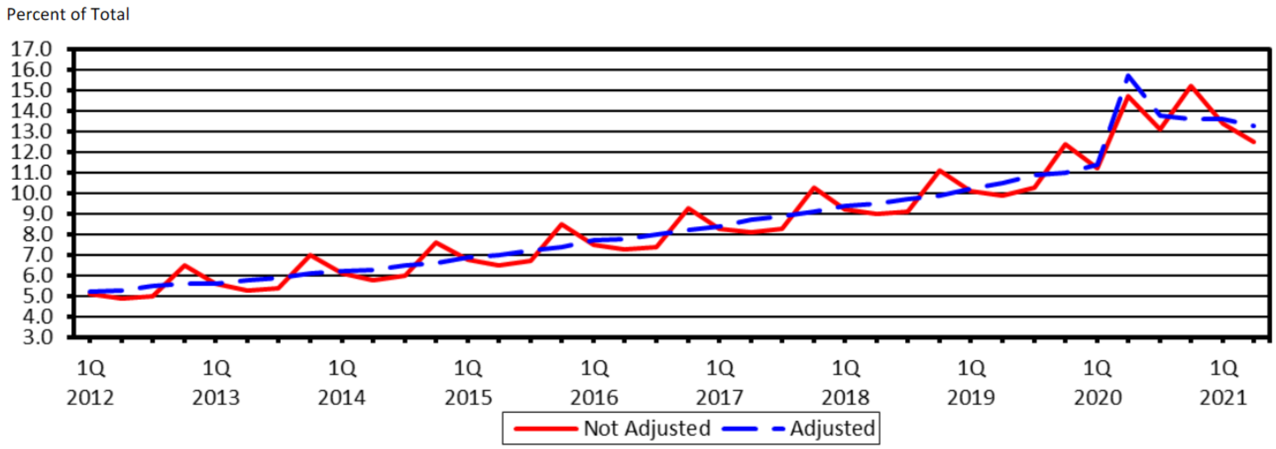
Air cargo trends were identified through a review of industry practices, technological advances, and other published data on trends related to the air cargo industry.

4.2.1 E-commerce Growth

Historically, air cargo has been primarily used for low-weight, high-value goods (e.g., electronics) and perishables (e.g., flowers and food items) given its relatively high shipment cost relative to trucks. Over the past decade, the promise of fast delivery for nearly every consumer product imaginable has led the rise in air cargo demand nationally, and has transformed how people in the U.S. purchase many types of goods. E-commerce allows consumers to shop at any time of day from the comfort of their home. Although air cargo providers face steep competition from lower-cost shipping modes such as trucks, container shipping, and rail, retailers are increasingly using air cargo to fulfill overnight and same-day delivery options.

COVID-19 was a catalyst that accelerated e-commerce growth in the U.S., resulting in a jump in the share of e-commerce in total retail sales, as shown in Figure 4.1. During the initial months of the pandemic, lockdowns, store closures, and fear of illness led even more people to opt to shop for essential and non-essential goods online. Americans spent $791.7 billion on e-commerce sales during 2020, an increase of 32.4 percent from 2019 spending, translating to e-commerce accounting for 14 percent of total retail sales in 2020 as compared to 11 percent in 2019. Commodities such as groceries, recreational goods (such as sporting goods, musical instruments, and books), and home improvement gear drove the increase in sales. Although it is unclear whether the rapid adoption of e-commerce will be sustained in the long-term as COVID-19 restrictions are lifted, some shopper buying preferences may permanently shift to certain online retailers or goods after a positive experience with e-commerce during the pandemic. Retailers have also restructured their operations to better serve e-commerce, and these decisions and investments are likely to have a long-term impact on future business models.

Figure 4.1 Estimated Quarterly U.S. Retail E-commerce Sales as a Percent of Total Quarterly Retail Sales, 2012 – 2021



Source: U.S. Census, https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf.

4.2.2 Aging Infrastructure

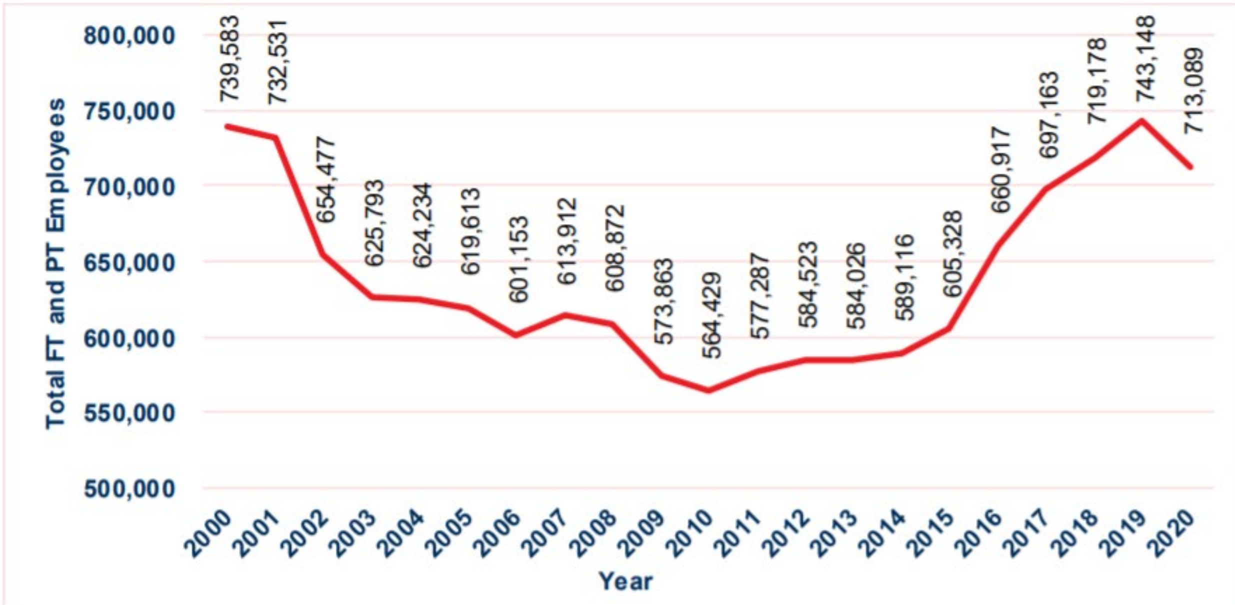
There is a continuous need to maintain, rehabilitate, and modernize aviation facilities throughout the state and Nation to meet the growing demand for air cargo and passenger services. A survey by Airports Council International in 2019 estimated that airports in the U.S. require more than $128 billion in infrastructure upgrades by 2023.[10] Inadequate airport infrastructure makes air cargo transportation less efficient, reliable, and competitive relative to other freight transportation modes, and can limit or restrict economic growth opportunities in the state. New investments can help local communities attract new air carriers, increasing competition and leading to lower shipping costs. Capital improvement funding for airports in the U.S. is administered on an annual basis by the Federal Aviation Administration (FAA) via the Airport Improvement Program (AIP).

4.2.3 Aviation Workforce Shortage

Workforce shortages have come to the forefront of transportation issues during the COVID-19 pandemic, resulting in layoffs, furloughs, and voluntary exits between 2019 and 2020. Aviation professionals such as pilots and mechanics require specialized training. The industry has historically relied on a labor pipeline from former military personnel, which is itself a declining labor pool. Candidates may complete other specialized education and training to enter the field. After several years of a growth in the aviation workforce, revenue losses and labor conditions during the COVID-19 pandemic resulted in furloughs, layoffs, and voluntary exits from the industry between 2019 and 2020 (Figure 4.2). Low wages, labor conditions, and revenue loss during the pandemic pushed many qualified candidates from pursuing an aviation career.

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

Figure 4.2 Total U.S. Full- and Part-time Domestic Airline Employees, 2000 – 2020

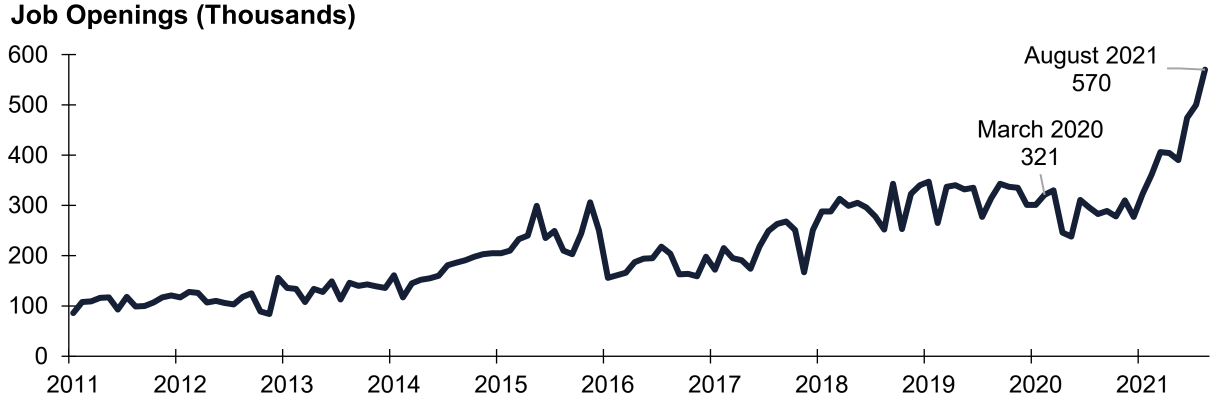


Source: Illinois Aviation Systems Plan, based on BTS Schedule P-1(a), 2021. Excludes December 2020.

Air cargo operations also depend on landside warehousing and distribution. Warehousing and fulfillment establishments have recently struggled to recruit and retain staff in a physically demanding environment with low wages. Trucking and distribution companies have similarly suffered from extreme demands during the pandemic, compounding the chronic driver shortage. The Bureau of Labor Statistics reported rapidly climbing job openings in the transportation, warehousing, and utilities industry during 2021; in August 2021, openings were at a record 570,000 compared to an average of approximately 305,000 during 2019 and 2020 (Figure 4.3). Arkansas is served by the St. Louis District of the Federal Reserve, which cited business difficulty in finding and retaining workers of all skill levels in the Beige Book report on economic conditions, despite efforts to increase pay and improve worker morale.[11]

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

Figure 4.3 U.S. Job Openings in Transportation, Warehousing, and Utilities, 2011 – 2021



Source: U.S. Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (seasonally adjusted). 2021.

4.2.4 COVID-19

The COVID-19 pandemic devastated passenger air travel and airline revenues, but demand for air cargo remained strong. Consumers turned increasingly to e-commerce, and national distribution of vaccines and medical supplies became paramount to the COVID-19 response. Aviation provides the fastest, most reliable service of any freight mode and is the mode of choice for high-value, low-volume commodities such as pharmaceuticals and electronics. During the height of the pandemic, belly cargo capacity was lost as passenger travel came to a halt. However, dedicated freight service increased and airlines converted passenger planes to freighters to meet demand. Combined, these adjustments resulted in a reduction of total cargo mitigated by explosive growth in dedicated freight service.

4.2.5 Unmanned Aerial Systems

Deployment of unmanned aerial systems (UAS) and unmanned aerial vehicles (UAV) has expanded beyond research and military applications, and UAS are in operation by states, infrastructure providers, businesses, and the public for infrastructure inspections, firefighting, surveillance, photography, and more. UAS also have potential applications in first and last mile deliveries currently completed on the roadway network.

The FAA conducted a series of pilot programs with nine implementation partners throughout the Nation from 2017 to 2020 in its Integration Pilot Program (IPP). This program transitioned to the BEYOND program in October 2020, and eight of the nine IPP participants are continuing to explore UAS challenges. The BEYOND program focuses on Beyond Visual Line of Site (BVLOS) operations, leveraging industry operations, and focusing on community engagement. Additionally, the program will not seek waivers and will operate under current standards. Several participants in the pilot program have explored package delivery in rural, suburban, and urban settings. Two participating agencies, the Kansas DOT and Memphis-Shelby County Airport Authority, are located near Arkansas and can serve as resources for Arkansas to relate best practices and lessons learned[12]:

[12] BEYOND Lead Participants. FAA. Accessed February 16, 2022. https://www.faa.gov/uas/programs_partnerships/beyond/lead_participants/

- Kansas Department of Transportation—focused on Beyond Visual Line of Sight operations at the outset of the IPP, conducting power line inspections in rural areas of the state. Working with a team of industry partners, including Iris Automation and Kansas State University-Polytechnic, KDOT flew several long routes to demonstrate ground-based and onboard surveillance capabilities, as well as operational procedures. KDOT will continue to focus on the state's rural communities as it transitions into BEYOND. Kansas' priorities during BEYOND include: public safety operations, including those dealing with pandemic and disaster relief, proper infrastructure and certification support, and the production of new and innovative communication architectures with the objective of moving UAS data in real time to establish meaningful connectivity as a statewide resource.

- Memphis-Shelby County Airport Authority—teamed up with FedEx, 901 Drones, Asylon and other partners to cover several focus areas during the IPP: enhancing airport security surveillance systems, reducing aircraft general visual inspection times, enhancing personnel safety, enhancing runway/taxiway FOD detection, and removal and reducing aircraft parts delivery time to ramp gates. As the team transitions from IPP to BEYOND, its goal is to develop public policies, guidance and procedures for FAA approval of regular, routine on-airport UAS flight operations supporting aircraft inspections, security surveillance, FOD detection, and aircraft parts delivery that can be duplicated at other FedEx hub operations beyond Memphis, with an end state supporting 24/7, BVLOS and Operations Over People.

This research will continue to advance the state of technology and policy to enable future logistics applications of UAS.

In Arkansas, drones and UAS are allowed for recreational and commercial use, subject to FAA regulations and flight controls put in place by local authorities. However, drone operators are not permitted to knowingly record a person or persons using a UAS to conduct surveillance or collect information on critical infrastructure without formal written consent from the structure’s owner. Critical infrastructure in Arkansas is defined as follows:

- Petroleum refineries or petroleum/chemical storage facilities;

- Electrical power generation or delivery systems;

- Rubber and chemical manufacturing facilities;

- Railroad operating facilities;

- Communication towers or communications facilities;

- Electrical power generation or delivery systems;

- Food processing or manufacturing facilities; and

- Correctional or detention facilities.

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ARKANSAS STATE FREIGHT PLAN

Chapter 5

Ports & Waterways Modal Profile

WE MOVE ARKANSAS FREIGHT

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1.0 Introduction

Ports and waterways are essential elements of Arkansas' multimodal freight system. Waterborne transport provides an efficient and economical shipping option for non-time sensitive bulk products such as manufactured goods, agricultural products, and natural resources. Inland ports often interface with roadway or rail networks, providing a competitive transportation solution that concurrently alleviates congestion on the nation's roadways.

The United States Inland Waterways System (IWWS) is made up of nearly 12,000 miles of Federally-maintained inland navigable waterways on rivers, lakes, and coastal bays, touching 38 of the 48 contiguous states and handling shipments to/from those 38 states. The IWWS is part of a larger system designated as America's Marine Highways. Inland waterways are a critical part of the nation's multimodal freight network, responsible for transporting nearly 830 million tons of cargo annually.

Barges are the primary freight transportation vehicle for inland waterways. They are well-suited for the movement of large quantities of bulk commodities, such as coal; petroleum products, including crude oil, gasoline, diesel fuel, jet fuel, heavy fuel oils, and asphalt; iron and steel; grain; chemicals, including fertilizers; aggregates such as sand, gravel, and rock for the construction industry; and intermodal containers. Barges are also ideal for hauling oversized or overweight equipment. One barge can move as many tons as 70 tractor trailers or 16 train cars.[1]

This profile includes an overview of existing facilities, the demand and use of these facilities, and ongoing challenges of the inland waterway network, particularly as it relates to funding and aging infrastructure.

1.1 Report Organization

The remainder of this report is organized as follows:

- **Section 2.0—Ports and Waterways Infrastructure and Facilities** describes the marine highways and rivers within Arkansas and the locks and dams located on these rivers as well as the users who operate on them through either public or private facilities.
- **Section 3.0—Ports and Waterways Demand** describes recent trends in waterway tonnages in Arkansas, with a breakdown by commodities.
- **Section 4.0—Condition and Performance** highlights capital improvement needs as well as other critical issues related to aging infrastructure and flooding concerns along the waterway system.

1.2 Data Sources

This profile was developed as an update to the 2017 Arkansas State Freight Plan and, as such, utilizes many of the same data sources as that plan. For inland waterways, the most up-to-date and detailed information is provided by the U.S. Army Corps of Engineers, but the sources considered for this update include the following:

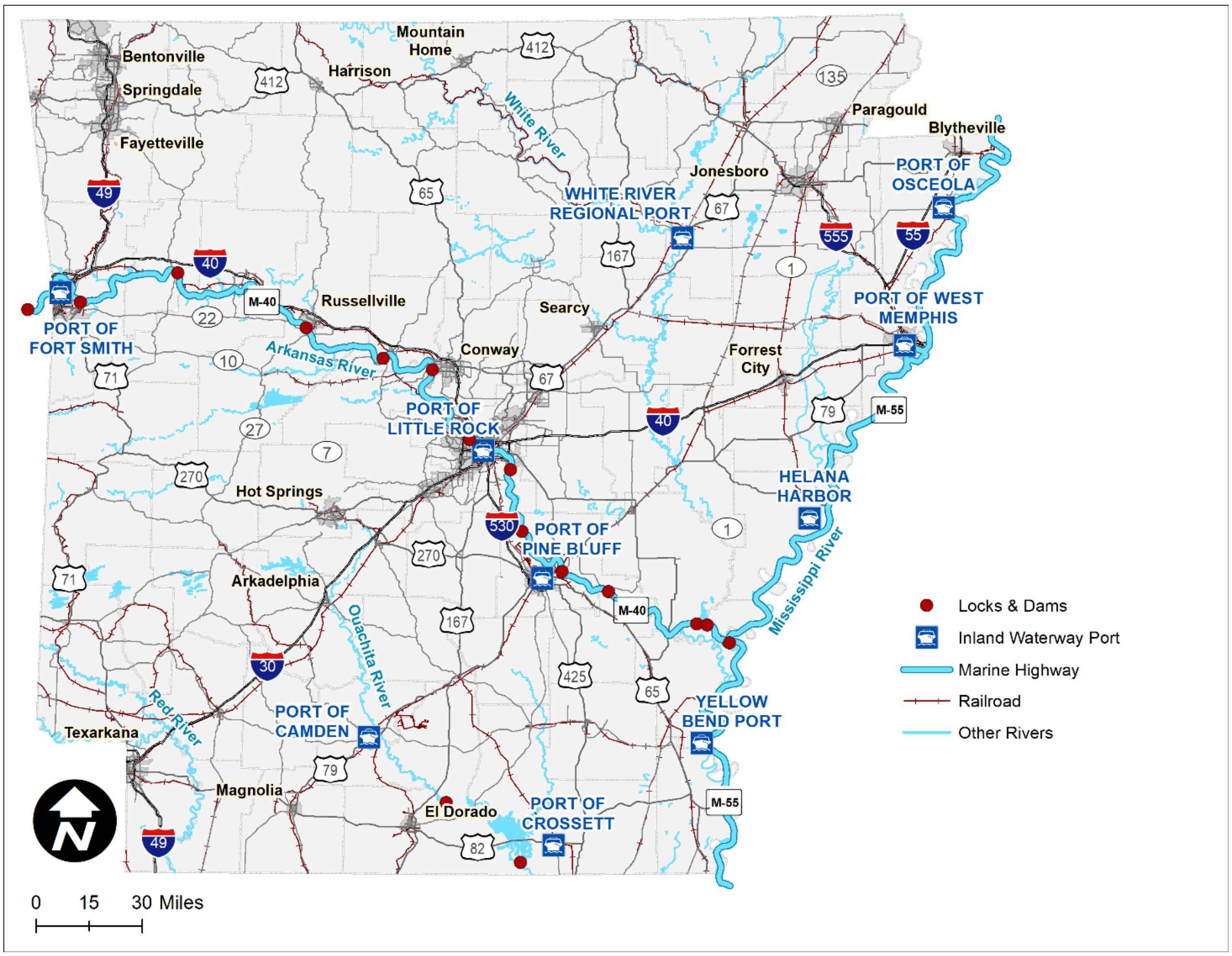
[1] 2021 Report Card for America's Infrastructure. Inlands Waterways Report Card.

- U.S. Army Corps of Engineers – Lock & dam data (e.g., delay, barge volumes), commodity movements (e.g., tonnage, types of commodities).
- Arkansas Waterways Commission – Public and private port information.
- Private port and terminal websites – Supplemental data provided by port/terminal owners.
- Local and national news sources – Recent conditions and changes to the inland waterway system.

2.0 Ports and Waterways Infrastructure and Facilities

The U.S. inland waterways system links Arkansas to coastal ports in the Gulf of Mexico, including Mobile, Alabama; New Orleans, Louisiana; Morgan City, Louisiana; Houston, Texas; and Brownsville, Texas. The waterways also link Arkansas to domestic markets such as Minneapolis, Minnesota; Chicago, Illinois; Pittsburgh, Pennsylvania; Chattanooga, Tennessee; and Tulsa, Oklahoma. Figure 2.1 shows the Arkansas inland waterway system. Arkansas is third in the nation for number of inland waterway miles and is currently served by five navigation systems: the Mississippi River, the McClellan-Kerr Arkansas River Navigation System (MKARNS), the Ouachita-Black Navigation System, the Red River, and the White River. The state borders 320 miles of the Lower Mississippi River and also borders or contains more than 600 miles of other commercially navigable waterways. Fifteen locks and dams in Arkansas make navigation possible. Thirteen of the locks and dams are on the MKARNS, and two are on the Ouachita River. There are no locks and dams on the Mississippi River portion of the Arkansas inland waterway network.

Figure 2.1 Arkansas Waterway System



Source: U.S. Army Corps of Engineers.

Arkansas' five navigation systems provide direct waterway access to 35 of the state's 75 counties. Additionally, every county in the state is within 65 miles of a navigable waterway. The rivers provide access to the inland waterways system, coastal ports, and national and international trade.

The busiest component of Arkansas' inland waterway freight system is the Arkansas River. The **Arkansas River** (McClellan-Kerr Arkansas River Navigation System, known as MKARNS) provides navigation through Arkansas from its connection to the Mississippi River south of Helena to Catoosa, Oklahoma. In 2015, the MKARNS was designed as Marine Highway 40 (M-40) through the U.S. Department of Transportation's (USDOT) Maritime Administration (MARAD) America's Highway Program. About 308 miles of the 445-mile long channel are located in Arkansas. The channel is divided into four segments:

The significant flooding event of May 2019 had a profound impact on the use of Arkansas' inland waterway system. The resulting flood-related damage required emergency maintenance and repairs to critical components of the system. Full navigation was not resumed for over four months after the initial event. Those who rely on this network had to find alternative modes of transportation during that time, most likely at an increased cost, thereby reducing their competitive opportunities both nationally and abroad.

Section 4.0 provides greater detail on the condition and performance of inland waterways, but an initial understanding of this event in particular is critical to much of the information in Sections 2.0 and 3.0.

- White River Entrance Channel. The navigation channel begins in Arkansas at Mississippi River Mile 599 at the confluence of the White and Mississippi Rivers and proceeds one-half mile upstream on the White River to the Montgomery Point Lock and Dam. From there, the channel proceeds nine miles upstream on the White River.
- Arkansas Post Canal. The next nine miles of the waterway are manmade and connect the White River to the Arkansas River.
- Arkansas River. For the next 377 miles, through Arkansas and into Oklahoma, the MKARNS follows the Arkansas River.
- Verdigris River. In Oklahoma the waterway leaves the Arkansas River once again at Muskogee and follows the Verdigris River north for the last 50 miles to the head of navigation at Tulsa's Port of Catoosa.

The USACE maintains a minimum 9-foot channel depth on the MKARNS. Congress authorized a 12-foot draft in 2005, but funds have not been appropriated. The current total of 1,500 short tons of capacity per barge could be increased by 200 tons for each additional foot of draft available, resulting in a barge capacity of 2,100 tons with a 12-foot draft. Significant, prolonged flooding along portions of this river system in 2019 hampered navigation and required emergency dredging to facilitate tow access. The MKARNS has an elevation differential of 420 feet from its beginning at Mile 600 on the Mississippi River, to the head of navigation near Tulsa, Oklahoma. There are 18 locks and dams on the MKARNS: 13 in Arkansas and 5 in Oklahoma. Each lock chamber is 110 feet wide and 600 feet long, can handle an 8-barge tow, and can accommodate 15-barge tows using double lockage.

Public ports located along the MKARNS are at Pine Bluff, Little Rock, and Fort Smith/Van Buren. In addition, there are three designated Foreign-Trade Zones[2] on the MKARNS at the ports of Little Rock, Muskogee,

[2] Known internationally as free-trade zones, Foreign-Trade Zones are secure areas under U.S. Customs and Border Protection (CBP) supervision that are generally considered outside CBP territory upon activation. Foreign and domestic merchandise can be moved into such zones for operations such as storage, exhibition, assembly, and manufacturing.

Oklahoma and Tulsa, Oklahoma. About 42 countries have engaged in commerce with the Arkansas River Basin Region via the MKARNS.

The nation's largest commercial river, the **Mississippi River,** forms the eastern border (320 miles) of the state. Designated as M-55, the river is authorized to support 12-foot navigation, but is maintained for a 9-foot draft. The river supports 12-foot navigation 97 percent of the time enabling the movement of approximately 200 million tons past the state each year. Other major tributaries of the Mississippi River, in addition to the Arkansas River, include the Red, Atchafalaya, Tennessee, Ohio, Missouri, and Illinois Rivers. With the exception of the Red River, these other rivers do not pass through Arkansas. However, they provide important connections to other states through their shared connection to the Mississippi.

Compounding flooding events, including the flooding of the Arkansas River in May 2019, resulted in flooding along the Mississippi River and billions of dollars in economic loses. In particular, portions of the Lower Mississippi River, which includes Arkansas, exceeded records set by the Great Mississippi Flood of 1927, a major driver of levee construction for flood control in the 1920s. Based on data from the National Centers for Environmental Information, overall economic loses for Arkansas in 2019 due to flooding events are estimated at between $1 and $2 billion.

Public ports on the Mississippi River in Arkansas are located at Osceola, West Memphis, Helena, and Arkansas City (Yellow Bend). On the Lower Mississippi River, service providers such as barge-towing companies are numerous, commercial traffic is unconstrained by locks, and transportation costs are low.

The characteristics of the remaining three river systems in Arkansas are as follows:

- The **Ouachita River** (Ouachita/Black Navigation System) flows from south central Arkansas to its confluence with the Tensas River near Jonesville, Louisiana, where it becomes the Black River and enters the Mississippi River north of Baton Rouge via the Old River Lock. The Ouachita is authorized for a 9-foot-deep channel from the Louisiana state line to Camden, Arkansas, a distance of 117 miles. Two lock structures are located on this river within Arkansas, the Felsenthal Lock and Dam and the H.K. Thatcher Lock and Dam (near Calion). A third, the Columbia Lock and Dam, is located in Louisiana. The towns of Camden and Crossett both have public ports. The river was recently dredged only to Crossett.

- The **White River**, of which the final 10 miles are part of the MKARNS, is navigable on a seasonal basis. It is authorized to support at least a 9-foot-deep channel to Newport, about 255 miles from the Mississippi River. The White River Regional Port Authority was recently established due to an increased interest in transportation along this river. Funding from the Newport Economic Development Commission and the Arkansas Waterways Commission has supported this site development.[3] A single lock is located on the White River, the Montgomery Point Lock and Dam, at the entrance to the Mississippi River.

- The **Red River** is currently navigable from the Mississippi River north of Baton Rouge to Shreveport, Louisiana. The U.S. Army Corps of Engineers (USACE) conducted a study to allow navigation into Arkansas to Index Bridge between Texarkana and Ashdown. Variations of the study call for navigation to Garland City and Fulton. While initial feasibility studies did not yield a favorable cost/benefit ratio for channel improvements, a more recent study funded by the State of Arkansas found that shippers could

Formal entry procedures and payments of duties are not required for such merchandise until it enters CBP territory for domestic consumption. This allows for an importer to pay duties on either the original materials or the foreign product, which can result in savings on duties paid.

[3] Arkansas Waterways Commission.

save $75 million annually by extending this river's navigation. As such, the USACE will resume evaluating this project.

Summary characteristics of the rivers in Arkansas are shown in Table 2.1.

Table 2.1 Arkansas Waterway Characteristics

River	Total Miles	Total Navigable Miles in Arkansas	River Channel Depth	Operational Period
Arkansas River (MKARNS)	445	308	Currently navigable with a 9' draft; authorized for 12' navigation, but not appropriated	Year-round
Lower Mississippi	953	320	Authorized for 12' navigation; maintained for 9' draft; river supports 12' 97% of the time	Year-round
Ouachita	548	117	Authorized for 9' navigation to Camden; currently maintaining to Crossett	Year-round
White	722	255	Authorized for 9' navigation to Newport; currently not dredged, resulting in no navigation at present	N/A
Red	1,360	0	Authorized for 9' navigation to Shreveport, Louisiana. Currently not navigable.	N/A

Source: U.S. Army Corps of Engineers.

2.1 Marine Highways and Strategic and Alternate Seaports

MARAD recognizes three types of marine highways: corridors, connectors, and crossings. Corridors are multistate routes that parallel major national highways. Connectors are routes that serve as feeders to the larger corridors, and crossings are short routes that transect harbors or waterways and offer alternatives to much longer or less convenient land routes between points. In August 2010, MARAD designated the MKARNS (the Arkansas River) as a Marine Highway Connector that connected to the Mississippi River (M-55).

In February 2015, the USACE upgraded MKARNS from a moderate-use to a high-use system. The USACE upgrades a waterway to high-use when it carries more than 10 million tons and more than 3 billion ton-miles of commodities in a year. The Waterborne Statistics Center showed the five-year average to be 10.6 million tons, although flooding in 2019 caused a significant decrease in traffic in that year.

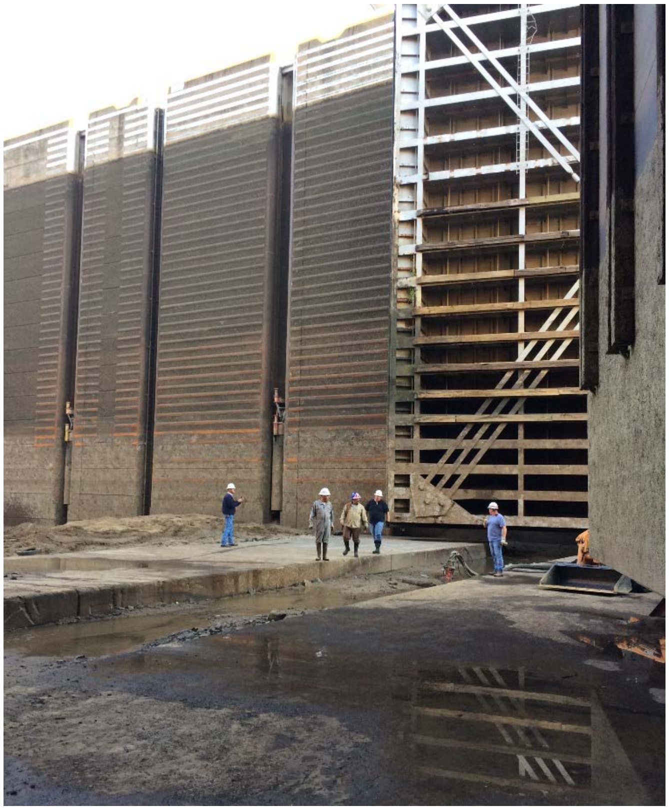
In May 2015, the MKARNS had its status upgraded from connector to corridor by MARAD. It is known as Marine Highway 40 because it parallels Interstate 40. The upgrade makes the system more prominent when viewed by industries and international markets and opens the system to future funding opportunities by the federal government.

Arkansas does not have any Strategic and Alternate Seaports, as defined and identified by the U.S Transportation Command, which support essential U.S. military activities. Little Rock Air Force Base reported limited utilization of ports and waterways (8 commercial water shipments in the last 10 years).[4]

[4] As part of the stakeholder outreach conducted as part of this State Freight Plan, ARDOT contacted personnel at the U.S. Transportation Command (USTRANSCOM), Pine Bluff Arsenal, and Little Rock Air Force Base (AFB) to discuss site-

2.2 Lock and Dam Infrastructure

Dewatering the Dardanelle Lock & Dam (L&D No. 10) in Russellville, Arkansas



Source: ARDOT

The Arkansas River was once unpredictable with a wide floodplain in many areas. At times, people could practically walk across some parts of the river on sandbars, and at other times river flooding caused extensive damage to property and crops. In 1946, Congress authorized the USACE to begin constructing a series of locks and dams on the Arkansas River from its mouth into Oklahoma. Through this system of locks and dams, barge navigation is enabled and improved in areas where a river flows across a steep slope. Dams are used to create pools of water that have a constant depth, and locks serve as stairs, moving vessels from one pool to the next.

In Arkansas, thirteen locks and dams are located on the MKARNS. Traffic volumes generally increase as the MKARNS approaches the confluence of the Arkansas and Mississippi Rivers. Downbound traffic is dominated by grains destined for Louisiana, and upbound traffic is dominated by chemical fertilizer originating at Gulf Coast terminals and destined for Oklahoma. Table 2.2 shows the 13 locks and dams, river mile, loaded and empty barge traffic, commercial vessels, and total traffic. Relatively speaking there is little recreational traffic along this waterway that could conflict with barge movements. The most significant conflict points exist at the Murray and Dardanelle locks, where 20 percent of traffic is recreational. For overall commercial traffic, over 1,000 vessels pass through each lock on an annual basis. Empty barges represent 20 percent of the overall barge movement, although total movements of this type are down an average of 31 percent since 2015. This decrease may represent a better utilization of empty backhaul movements as the volume of loaded barges has remained relatively consistent over the same time period. The volumes of the southernmost lock and dam on the Mississippi River, Chain of Rocks, is also included here to illustrate the differences between the two river systems. Chain of Rocks is located near St. Louis, Missouri, and there are no locks and dams on the Lower Mississippi River. This facility processes nearly double the number of barges as the busiest lock on the MKARNS. In addition, the Mississippi River also has significantly more recreational traffic resulting in commercial traffic only accounting for 31 percent of all vessels.

specific freight activity, challenges, and project/facility needs that would better facilitate essential goods movement at those two key sites in Arkansas. Little Rock AFB returned a written survey and provided information on freight activity, challenges, and capital improvement needs.

Table 2.2 Arkansas Waterway Vessel Movements, 2020

Lock	River Mile	Empty Barges	Loaded Barges	Total Barges	Commercial Vessels	Total Vessels	Percent Commercial
Montgomery Point	.05	1,123	4,627	5,750	954	988	97%
Norrell	10.3	1,210	5,032	6,242	1,137	1,244	91%
Wilbur D Mills AR 2	13.3	1,210	5,025	6,235	1,264	1,383	91%
Joe Hardin	50.2	1,162	4,831	5,993	1,232	1,322	93%
Emmett Sanders	66.0	1,149	4,859	6,008	1,233	1,314	94%
Col. Charles D Maynard	86.3	1,209	4,816	6,025	1,232	1,421	87%
David D Terry	108.1	1,198	4,705	5,903	1,203	1,364	88%
Murray	125.4	954	4,037	4,991	1,022	1,280	80%
Toad Suck Ferry	155.9	996	4,090	5,086	1,044	1,143	91%
Arthur V Ormand	176.9	960	4,061	5,021	1,014	1,120	91%
Dardanelle	205.5	990	4,058	5,048	1,001	1,248	80%
Ozark-Jeta Taylor	256.8	721	3,676	4,397	936	1,074	87%
Chain of Rocks	185.5	2,384	9,076	11,460	1,434	4,673	31%

Source: U.S. Army Corps of Engineers.

2.3 Public Port Authorities

There are 10 public port authorities in Arkansas, as shown in Figure 2-1. On the Mississippi River, there are four public ports:

- Port of Osceola – The Port of Osceola is a 500-acre port with 200 acres available for development. Located on the Mississippi River, the port has immediate connections to Class I rail service through BNSF and highway connections to Interstate 55, as well as US Highway 6 (not pictured in Figure 2.1). The port predominately handles bulk products in the form of wheat, rice, soybeans, and sand.[5]

- Port of West Memphis – The West Memphis-Crittenden County Port Authority owns a general purpose river terminal and a special purpose grain terminal with nearby rail service, and has nearby access to Interstates 40 and 55. The port is currently conducting a three-phase project to improve travel to and from the port.[6]

- Helena Harbor – The Phillips County Port Authority in Helena, Arkansas has developed a 2.3-mile long slack water harbor with a nine-foot deep channel and industrial park complex. The adjoining Helena Harbor Industrial Park has Class III rail service, natural gas, electrical power, and water utilities to serve new industries, and the site has nearby access to US Highway 49 (not shown in Figure 2.1). The harbor channel

[5] Inland Rivers, Ports, and Terminals. https://www.irpt.net/map-location/osceola-port-authority/?mpfy_map=628&mpfy-pin=8511

[6] Arkansas Waterways Commission. https://www.waterways.arkansas.gov/ports-terminals/mississippi-river/

is 300 feet wide with an additional 50 feet of berthing space.[7] Approximately 4,000 acres is available for industrial development. The Arkansas Waterways Commission recently awarded a $287,800 grant to the port through its Port, Intermodal, and Waterway Development Grant Program to prepare for container on barge operations by 2023.[8]

- Yellow Bend Port – The Yellow Bend Port is located directly on the Mississippi River in a slack water harbor that is accessible through a 250-foot wide entrance. The Port is situated near US Highways 65 and 165. The Port has land available for industrial use.[9]

There are three public ports along the MKARNS. The following provides details about their operations:

- Port of Pine Bluff – The Port of Pine Bluff is the oldest port on the MKARNS and encompasses 372 acres. Seven industries are located in the Harbor Industrial District, in addition to a USACE marine terminal and a U.S. Coast Guard station. A 20-acre public terminal, owned by the port authority and operated by Watco Transloading, LLC, offers barge transloading, warehousing, and bulk storage. Rail service is provided by Union Pacific (UP), with reciprocal switching by BNSF[10], and highway access is provide by nearby Interstate 530 and US Highways 65 and 79. Facilities include a 98,000 square foot in-transit warehouse and 44,000 square feet of dry bulk storage.[11]

- Port of Little Rock – The Port of Little Rock encompasses 2,640 acres of industrial property and has two barge docking facilities, one on a slack water harbor and one on the main navigation channel. The port owns and maintains its own railroad that handles over 10,000 cars/year. The port supports over 50 industrial firms employing over 3,500 people. The Little Rock area has access to five interstate highways: Interstates 30 and 40 are major commercial routes serving both coasts, and Interstates 430 and 630 are loops that link the major routes. Interstate 440 directly connects the two main interstates and serves the airport and the Little Rock Port Authority.[12] The river terminal is currently leased on a long-term basis by Logistic Services, Inc, a professional stevedoring company specializing in the handling of bulk, steel, and general cargoes.[13]

- Port of Fort Smith – The Fort Smith Port Authority was established as an instrumentality of the City of Fort Smith and has all general powers necessary to promote, develop, construct, equip, maintain and operate ports, harbors, river-rail or barge terminals for the City of Fort Smith.[14] The port is situated on 28 acres and

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[7] Helena Harbor. http://helenaharbor.com/

[8] Seark Today. *Port of Yellow Bend, Crossett Port awarded grant funds for improvements.* https://searktoday.com/port-of-yellow-bend-crossett-port-awarded-grant-funds-for-improvements/

[9] Arkansas Waterways Commission. https://www.waterways.arkansas.gov/ports-terminals/mississippi-river/

[10] Arkansas Waterways Commission. https://www.waterways.arkansas.gov/ports-terminals/arkansas-river/

[11] Jefferson County Alliance. https://jeffersoncountyalliance.com/

[12] Arkansas Waterways Commission. https://www.waterways.arkansas.gov/ports-terminals/arkansas-river/

[13] Port of Little Rock. https://www.portoflittlerock.com/

[14] City of Fort Smith. https://www.fortsmithar.gov/index.php/port-authority

predominately handles steel in the form of coiled plate, coiled wire rod, and bars.[15] The port enjoys close proximity to Class I and Class III rail, as well as Interstate 540 and US Highway 71.

There are two public ports located along the Ouachita River in Arkansas:

- Port of Crossett – The Port of Crossett is located on the eastern bank of the Ouachita River at mile marker 237. The port has a nine-foot navigation channel, a docking peer, turning basin, and a four barge towing system. There is also a 15,000 square foot warehouse on site available for lease and an 850,000 gallon storage tank currently leased by Tetra Technologies. Ten acres of outside storage is available with an additional 72 acres available for future development.[16] The Port takes direct access to US Highway 82.

- Port of Camden – The City of Camden Port Authority owns a warehouse and river terminal on approximately eight acres near downtown Camden. The river terminal remains available for further development and usage.[17] Highway access is provided by US Highway 79, and a rail spur provides access to Union Pacific trackage.

One public port has been recently formed along the White River:

- White River Regional Port – The White River Regional Port Authority was recently established as a collaborative project between the City of Newport and Jackson County in response to an increased interest in transportation up the White River to Newport. The authority is developing basic infrastructure to create a loading facility in Newport to increase opportunities primarily in the agriculture and mining sectors for northeast Arkansas. They are currently seeking a partner to assist in the development and operation of the port.[18] Newport is situated near US Highway 67 and Union Pacific track runs in close proximity to the White River.

2.4 Intermodal Authorities

Intermodal shipping utilizes multiple transportation modes in order to capitalize on the advantages of highway, rail, and water movements. To support and encourage these intermodal movements, several cities and counties within Arkansas have formed intermodal authorities (pursuant to Act 690 of 1997) working to develop intermodal facilities, some of which are located along the state's waterway system. The following provides highlights about active intermodal authorities:

- Central Arkansas Intermodal Authority (CAIA) – Formed by Conway and Perry Counties, CAIA aims to develop a port on the Arkansas River to encourage economic development in the two counties. The Authority has previously worked with ARDOT and the USACE on studying this development, owns property abutting the Arkansas River, and is developing a master plan for the.[19]

[15] Inland Rivers, Ports, and Terminals. https://www.irpt.net/map-location/port-fort-smithfive-rivers-distribution/?mpfy-pin=2311

[16] City of Crossett. http://www.cityofcrossett.net/transportation.html

[17] Arkansas Waterways Commission. https://www.waterways.arkansas.gov/ports-terminals/ouachita-river/

[18] Arkansas Waterways Commission. https://www.waterways.arkansas.gov/ports-terminals/white-river/

[19] Central Arkansas Intermodal Authority. http://www.centralarintermodalauthority.com/

- Little River County Intermodal Authority (LRCIA) – LRCIA was formed in 2015 by agreement of the Little River County and the City of Ashdown. In 2019, LRCIA received a $500,000 grant from the Arkansas Economic Development Commission for planning and development of an intermodal facility. To that end, LRCIA has conducted environmental studies and acquired and cleared a site for further development and marketing.

- Northeast Arkansas Regional Intermodal Facilities Authority (NARIFA) – NARIFA was created in 2009 with the purpose of creating and promoting intermodal and multimodal assets in the region. This Authority includes the counties of Randolph and Lawrence as well as the cities of Corning, Pocahontas, and Walnut Ridge.[20]

- River Valley Regional Intermodal Facilities Authority (RVRIFA) – Formed as a collaboration between Pope County and the City of Russellville, the RVRIFA intends to develop an intermodal transportation and industrial facility on the MKARNS. Proposed improvements include a slack water harbor, service by a shortline railroad with access to UP, and a four-lane truck bypass connecting with I-40.[21] Highlighting the challenges of developing waterway facilities, the RVRIFA recently abandoned planned efforts to construct a slackwater harbor because the project had become cost prohibitive.[22]

- Southeast Arkansas Regional Intermodal Facilities Authority (SEARIA) – SEARIA was formed in 1999 by agreement of Bradley and Drew Counties and the Cities of Monticello and Warren following a series of studies and surveys to establish the need for and feasibility of intermodal operations in the region. Using a federal earmark and other funding, the SEARIA is actively developing a 354-acre regional intermodal facility west of Monticello taking direct access to US Highway 278 (and the alignment of Future Interstates 530 and 69) and served by a Class III (Arkansas Midland) railroad.

- Southwest Arkansas Regional Intermodal Authority (SWARIA) – SWARIA is a coalition of counties (Clark, Dallas, Hot Spring, Montgomery, Nevada, and Pike) and Cities (Arkadelphia, Amity, Antoine, Caddo Valley, Delight, Glenwood, Gurdon, Malvern, and Murfreesboro) formed with the goal of encouraging, supporting, and aiding economic growth and development for the southwest Arkansas region by improving the area's transportation systems. In 2017, SWARIA received a $1.3 million grant from the US Economic Development Administration to fund the construction of public transload facility with crossdock.[23]

- Western Arkansas Intermodal Authority (WAIA) – As part of the Western Arkansas Planning & Development District (WAPDD), WAIA's role is to plan and develop initiatives for transportation improvements that benefit the entire Western Arkansas region. Development partners for this Authority include WAPDD, Van Buren and Fort Smith chambers of commerce, Fort Chaffee Public Trust, Northwest Arkansas Council, and Arkansas Economic Development Commission. WAIA recently completed a conceptual study for an intermodal facility near Van Buren to include marine, transload, and railroad facilities serving commercial and industrial properties.[24]

[20] Northeast Arkansas Regional Intermodal Authority. http://neaintermodal.com/

[21] Russellville Area Chamber of Commerce. https://www.russellvillechamber.com/alliance/transportation/

[22] https://www.kvom.com/news-sports-headlines/proposed-slackwater-harbor-project-scrapped

[23] Southwest Arkansas Regional Intermodal Authority. https://swaria.org/

[24] Western Arkansas Planning & Development District. https://www.wapdd.org/western-arkansas-intermodal-authority/

Other intermodal authorities have been formed in Arkansas but are currently inactive, while still others are in various stages of exploration or formation.

2.5 Commercial Port Facilities

Table 2.3 provides an inventory of commercial port facilities (public and private), including marine terminals, airports, and other major freight generators across the state.

Table 2.3 Inventory of Commercial Ports in Arkansas

Facility Name	Facility Type	Location	Owner (Operator)	Commodities Handled
Poinsett Rice & Grain	Dock	Mississippi River at Osceola	Poinsett Rice & Grain, Inc	Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others)
Consolidated Grain & Barge Co	Dock	Mississippi River at Osceola	-	Grain Products
WATCO	Dock	Mississippi River at West Memphis	West Memphis - Crittenden County Port Authority (Global Materials Services, LLC)	Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Food and Farm Products | Unknown or Not Elsewhere Classified
Consolildated Grain and Barge Co.	Dock	Mississippi River at West Memphis	Consolidated Grain & Barge Co	Grain Products
Kinder Morgan Bulk Terminals	Dock	Mississippi River at Helena	-	Fertilizers | Forest Products, Lumber, Logs, Woodchips | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Sulphur (Dry), Clay & Salt | Other Non-Metal. Min. | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Other Agricultural Products; Food and Kindred Products | Unknown or Not Elsewhere Classified
Consolildated Grain and Barge Co.	Dock	Mississippi River at Helena	Global Materials Services, LLC	Forest Products, Lumber, Logs, Woodchips | Food and Farm Products | Other Agricultural Products; Food and Kindred Products | Unknown or Not Elsewhere Classified
Entergy Arkansas, Robert E. Ritchie Steam Electric Station Dock	Dock	Mississippi River at Helena	Entergy Arkansas, Inc	Fertilizers | Other Chemicals and Related Products
Planters Service	Dock	Mississippi River at Helena	Pat Burks (Planters Service, Inc)	Chemicals and Related Products | Fertilizers | Other Chemicals and Related Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others)
Texas Eastern Products Pipeline Co.	Dock	Mississippi River at Helena	Texas Easterils; Inc, Inc	Petroleum and Petroleum Products | Gasoline, Jet Fuel, Kerosene | Distillate,Residual & Other Fuel Oils; Lube Oil & Greases

Facility Name	Facility Type	Location	Owner (Operator)	Commodities Handled
Bunge Corp.	Dock	Mississippi River at Helena	Bunge Corp	Fertilizers | Sulphur (Dry), Clay & Salt | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Other Agricultural Products; Food and Kindred Products
Helena Marine Service Dock	Dock	Mississippi River at Helena	Helana Marine Service, Inc	Fertilizers | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Sulphur (Dry), Clay & Salt | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Vegetable Products | Animal Feed, Grain Mill Products, Flour, Processed Grains | Other Agricultural Products; Food and Kindred Products
Helena Bridge Terminal Docks	Dock	Mississippi River at Helena	Helena Bridge Terminal, Inc	Fertilizers | Forest Products, Lumber, Logs, Woodchips | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Sulphur (Dry), Clay & Salt | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains | Other Agricultural Products; Food and Kindred Products
Archer Daniels Midland Co.	Dock	Mississippi River at Helena	Archer Daniels Midland Co	Fertilizers | Sulphur (Dry), Clay & Salt | Other Non-Metal. Min. | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains
McAlister Grain	Dock	Mississippi River at Helena	McAllister Grain, Inc. Phone	Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Unknown or Not Elsewhere Classified
Helena-West Helena Phillips County Port Authority	Dock	Mississippi River at Helena	Helena-West Helena Phillips County Port Authority	Coal,Lignite & Coal Coke | Fertilizers | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Food and Farm Products | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Unknown or Not Elsewhere Classified
Mississippi Limestone Corp.	Dock	Mississippi River at Helena	Mississippi Limestone Corp	Fertilizers | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Barley, Rye, Oats, Rice and Sorghum Grains
Helm Fertilizer	Dock	Mississippi River at Helena	Helm Fertilizer, Inc.	Gasoline, Jet Fuel, Kerosene | Fertilizers | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others)
Pendleton Marina	Dock	Arkansas River at Dumas	(Pendleton Warehouse, Inc)	Fertilizers | Barley, Rye, Oats, Rice and Sorghum Grains
Cities Service LP Gas	Dock	Mississippi River at Eudora	-	-

Facility Name	Facility Type	Location	Owner (Operator)	Commodities Handled
Mississippi Limestone Corp.	Dock	Mississippi River at Lake Village	-	Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material
Oakley Port of Pendleton	Dock	Arkansas River at Gillett	-	Coal,Lignite & Coal Coke | Fertilizers | Other Chemicals and Related Products | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Paper & Allied Products | Building Cement & Concrete; Lime; Glass | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others)
Taylor Farms & Trucking Dock	Dock	Arkansas River at Dumas	(Taylor Farms & Trucking, Inc)	Fertilizers
Farmers Grain Terminal	Dock	Mississippi River at Yellow Bend	(Farmers Grain Terminal, Inc)	Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | All Manufactured Equipment, Machinery and Products
Transmontaigne Product Services	Dock	Mississippi River at Arkansas City	Transmontaigne Product Services, Inc	Petroleum and Petroleum Products | Gasoline, Jet Fuel, Kerosene | Distillate,Residual & Other Fuel Oils; Lube Oil & Greases | Petroleum Pitches, Coke, Asphalt, Naptha and Solvents | Chemicals and Related Products | Fertilizers | Other Chemicals and Related Products | Barley, Rye, Oats, Rice and Sorghum Grains
Bunge North America Desoto Landing	Dock	Mississippi River at DeSoto Landing	Bunge North America., Inc	Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others)
Farmers Grain Terminal	Dock	Mississippi River at Lake Village	Farmers Grain Terminal, Inc	Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others)
Pioneer Foods Inc	Dock	Mississippi River at Lake Village	-	-
Yellow Bend River Port	Dock	Mississippi River at Arkansas City	Chicot-Desha Metropolitan Port Authority (Oakley Port of Yellow Bend)	Forest Products, Lumber, Logs, Woodchips | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Slag | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains | Unknown or Not Elsewhere Classified
Island Harbor Marina	Dock	Arkansas River at Sherrill	-	-
Tyson Foods Pine Bluff Feed Mill Dock	Dock	Arkansas River at Pine Bluff	-	Fertilizers | Food and Farm Products | Wheat | Corn | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains

Facility Name	Facility Type	Location	Owner (Operator)	Commodities Handled
Tyson Foods Pine Bluff Feed Mill Dock	Dock	Arkansas River at Pine Bluff	-	Food and Farm Products
Global Materials Services	Dock	Arkansas River at Pine Bluff	Global Materials Services, LLC	Fertilizers | Forest Products, Lumber, Logs, Woodchips | Paper & Allied Products | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Unknown or Not Elsewhere Classified
Tyson Foods, Milling And Warehouse	Dock	Arkansas River at Pine Bluff	Tyson Foods Inc.	-
Bunge Corp Linwood Grain Elevator	Dock	Arkansas River at Linwood	Bunge Corp.	Food and Farm Products | Wheat | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others)
International Paper Co Victoria Bend	Dock	Arkansas River at Pine Bluff	International Paper Co. (Pickett-Davison Fuel Service)	Distillate,Residual & Other Fuel Oils; Lube Oil & Greases | Other Chemicals and Related Products | Wheat
Century Tube Corp	Dock	Arkansas River at Pine Bluff	Century Tube Corp.	Iron Ore and Iron & Steel Waste & Scrap | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.)
Petroleum Fuel And Terminal Co	Dock	Arkansas River at Pine Bluff	Petroleum Fuel and Terminal Co., a subsidiary of Apex Oil Co.	Petroleum and Petroleum Products | Distillate,Residual & Other Fuel Oils; Lube Oil & Greases | Fertilizers | Other Chemicals and Related Products | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others)
U S Coast Guard Depot	Dock	Arkansas River at Pine Bluff	U.S. Government (U.S. Coast Guard)	Mooring U.S. Coast Guard vessels; and handling navigation aids.
Pine Bluff Marine Terminal	Dock	Arkansas River at Pine Bluff	U.S. Government (U.S. Army Corps of Engineers	Paper & Allied Products
Turner Marine Service Dock	Dock	Arkansas River at Pine Bluff	Turner Marince Service, Inc	Fertilizers | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains
Pine Bluff Sand & Gravel Pine Bluff Sand Plant Dock	Dock	Arkansas River at Pine Bluff	Pine Bluff Sand & Gravel Co.	Fertilizers | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.)
Ramusson Group	Dock	Arkansas River at Pine Bluff	The Rasmusson Group Inc.	Paper & Allied Products

Facility Name	Facility Type	Location	Owner (Operator)	Commodities Handled
73 River Terminal	Dock	Arkansas River at Pine Bluff	T.W. Pelton & Co. Phone	Petroleum Pitches, Coke, Asphalt, Naptha and Solvents | Fertilizers | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Paper & Allied Products | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | All Manufactured Equipment, Machinery and Products
Bunge Corp	Dock	Arkansas River at Pine Bluff	Bunge Corp.	Petroleum Pitches, Coke, Asphalt, Naptha and Solvents | Fertilizers | Other Non-Metal. Min. | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains
Little Rock Port Authority Dock	Dock	Arkansas River at Little Rock	Little Rock Port Authority (Logistic Services, Inc)	Coal,Lignite & Coal Coke | Fertilizers | Other Chemicals and Related Products | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Iron Ore and Iron & Steel Waste & Scrap | Non-Ferrous Ores and Scrap | Sulphur (Dry), Clay & Salt | Paper & Allied Products | Building Cement & Concrete; Lime; Glass | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Primary Non-Ferrous Metal Products;Fabricated Metal Prods. | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains | All Manufactured Equipment, Machinery and Products | Unknown or Not Elsewhere Classified
Little Rock Port Authority Oil Pier	Dock	Arkansas River at Little Rock	Little Rock Port Authority (Safety-Kleen Corp and River Cement Co)	Distillate,Residual & Other Fuel Oils; Lube Oil & Greases | Petroleum Products NEC | Building Cement & Concrete; Lime; Glass
West Slackwater HarborDock, Little	Dock	Arkansas River at Little Rock	Port of Little Rock	-
East Slackwater HarborDock, Little	Dock	Arkansas River at Little Rock	Port of Little Rock	-
Latture Park & Marina	Dock	Arkansas River at Fort Smith	-	-
Arkhola Sand & Gravel Co	Dock	Arkansas River at Fort Smith	Arkhola Sand & Gravel	Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material

Facility Name	Facility Type	Location	Owner (Operator)	Commodities Handled
Fort Smith Port Authority Dock	Dock	Arkansas River at Fort Smith	City of Fort Smith (Global Materials Services, LLC)	Petroleum Pitches, Coke, Asphalt, Naptha and Solvents | Fertilizers | Iron Ore and Iron & Steel Waste & Scrap | Non-Ferrous Ores and Scrap | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Primary Non-Ferrous Metal Products;Fabricated Metal Prods. | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains | Unknown or Not Elsewhere Classified
Consolidated Grain & Barge Co	Dock	Arkansas River at Van Buren	(Consolidated Grain & Barge Co)	Coal,Lignite & Coal Coke | Fertilizers | Forest Products, Lumber, Logs, Woodchips | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Iron Ore and Iron & Steel Waste & Scrap | Non-Ferrous Ores and Scrap | Sulphur (Dry), Clay & Salt | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Primary Non-Ferrous Metal Products;Fabricated Metal Prods. | Food and Farm Products | Fish | Wheat | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains
Five Rivers Distribution, LLC	Dock	Arkansas River at Van Buren	-	Coal,Lignite & Coal Coke | Fertilizers | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Iron Ore and Iron & Steel Waste & Scrap | Non-Ferrous Ores and Scrap | Sulphur (Dry), Clay & Salt | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Primary Non-Ferrous Metal Products;Fabricated Metal Prods. | Wheat | Corn | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains | All Manufactured Equipment, Machinery and Products
Bruce Oakley	Dock	Arkansas River at North Little Rock	Bruce Oakley, Inc.	Coal,Lignite & Coal Coke | Distillate,Residual & Other Fuel Oils; Lube Oil & Greases | Petroleum Pitches, Coke, Asphalt, Naptha and Solvents | Petroleum Products NEC | Fertilizers | Other Chemicals and Related Products | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Iron Ore and Iron & Steel Waste & Scrap | Non-Ferrous Ores and Scrap | Sulphur (Dry), Clay & Salt | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Primary Non-Ferrous Metal Products;Fabricated Metal Prods. | Food and Farm Products | Wheat | Corn | Barley, Rye, Oats, Rice and Sorghum Grains | Oilseeds (Soybean, Flaxseed and Others) | Animal Feed, Grain Mill Products, Flour, Processed Grains | Unknown or Not Elsewhere Classified
Jeffery Sand Co	Dock	Arkansas River at North Little Rock	Jeffrey Sand Co., Inc	Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Iron Ore and Iron & Steel Waste & Scrap | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | All Manufactured Equipment, Machinery and Products | Unknown or Not Elsewhere Classified

Facility Name	Facility Type	Location	Owner (Operator)	Commodities Handled
Jeffery Sand Co	Dock	Arkansas River at Conway	-	Forest Products, Lumber, Logs, Woodchips | Sand, Gravel, Stone, Rock, Limestone, Soil, Dredged Material | Unknown or Not Elsewhere Classified
Terra Industries	Dock	Arkansas River at Blytheville	Terra Industries, Inc. Phone	Coal,Lignite & Coal Coke | Fertilizers | Other Chemicals and Related Products | Iron Ore and Iron & Steel Waste & Scrap | Non-Ferrous Ores and Scrap | Slag | Other Non-Metal. Min. | Primary Iron and Steel Products (Ingots,Bars,Rods,etc.) | Oilseeds (Soybean, Flaxseed and Others)
Port of Crossett	Dock	Ouachita River at Crossett	-	Other Chemicals and Related Products | Unknown or Not Elsewhere Classified
Cross Oil Refining & Marketing Co	Dock	Ouachita River at Luann	-	Petroleum and Petroleum Products | Crude Petroleum
Clinton National Airport (LIT)	Airport	Little Rock	City of Little Rock (Little Rock Municipal Airport Commission)	Electronic and Other Electrical Equipment and Components, and Office Equipment | Machinery ' Animal feed and Products of Animal Origin | Articles of Base Metal | Alcoholic Beverages | Printed Products | Plastics and Rubber | Paper or Paperboard Articles |
Northwest Arkansas National Airport (XNA)	Airport	Highfill	Northwest Arkansas National Airport Authority	Miscellaneous Belly Cargo
Fort Smith Regional Airport (FSM)	Airport	Fort Smith	City of Fort Smith (Fort Smith Airport Commission)	Miscellaneous Belly Cargo
Marion Intermodal Terminal	Rail-Truck Intermodal Terminal	Marion	Union Pacific	Truck on Flat Car, Container on Flat Car
Harvard Intermodal Facility	Rail-Truck Intermodal Terminal	Marion	BNSF Railway	Container on Flat Car (Note: Intermodal service was suspended at this location in 2009, though it continued to function as a rail yard. Intermodal service was restarted in August 2021 to meet increased intermodal demand in the greater Memphis area, before being suspended again in November 2021.)

Facility Name	Facility Type	Location	Owner (Operator)	Commodities Handled
Various	Distribution/ Fulfillment Centers	Various locations, including Bentonville, Searcy, Maumelle, Little Rock, North Little Rock, and others	Various owners, including Walmart, Dillard's, Amazon, Fedex, Lowe's (planned), Tractor Supply Co. (planned), Dollar General (planned), and others	Various Retail Goods
Various	Industrial Parks and E-Commerce Parks	Various, including concentrated industrial activity in all large urban areas and diffuse industrial clusters in virtually all counties	Various cities, counties, economic development authorities, and others	Various Raw Materials and Manufactured Goods

Source: https://www.irpt.net/arkansas-white-red-ouachita/; https://www.arcgis.com/apps/mapviewer/index.html?layers=349ce90ebfcd47f49401ac4d817b0d58; https://geospatial-usace.opendata.arcgis.com/maps/349ce90ebfcd47f49401ac4d817b0d58/about; https://publibrary.planusace.us/#/document/c44f4907-734d-4d78-8aad-4a78216a51a9; https://www.waterways.arkansas.gov/ports-terminals/

3.0 Ports and Waterways Demand

This section focuses on the existing demand for freight movement on the inland waterway system, primarily driven by low-cost, non-time sensitive bulk products. In particular, Arkansas' farmers rely upon this network to move agricultural products. Energy products, building materials, and industrial chemicals are also major commodities moved by waterways in Arkansas. This is evident based on the numerous public and private operations along the waterway as detailed in Section 2.0. The analysis in this section provides more detail on the commodities moved by the river system. This analysis primarily utilizes data from the USACE and provides information by river, commodity, and direction. The most recent year of available data is 2019. However, due to flooding along the Arkansas River, the 2019 data represents atypical conditions. For context, the analysis includes an assessment of volumes from previous years as points of comparison.

Additional commodity information and forecasts are available from the Freight Analysis Framework (FAF) version 5.2. Developed in partnership between the Bureau of Transportation Statistics (BTS) and the Federal Highway Administration (FHWA), this database allows for a more direct comparison with other modes.

3.1 USACE Commodity Flow Analysis

The USACE monitors and reports the movement of commodities on the nation's river system, which allows for a detailed analysis of the movement of goods over waterways in Arkansas. This section highlights the commodities moved along each river system. Note that some reports may include commodity movements along the same waterway but in another state.

As the largest river system in the state, the MKARNS transported nearly 8 million short tons with the top 10 commodities accounting for 80 percent of this tonnage. Most commodities saw a drastic decrease in movement in 2019 due to extensive, prolonged flooding along the inland river system which limited navigation for over four months and resulted in a 30 percent decrease in tonnage from 2018. However, exclusive of 2019, annual growth from 2015 to 2018 was 3.1 percent.

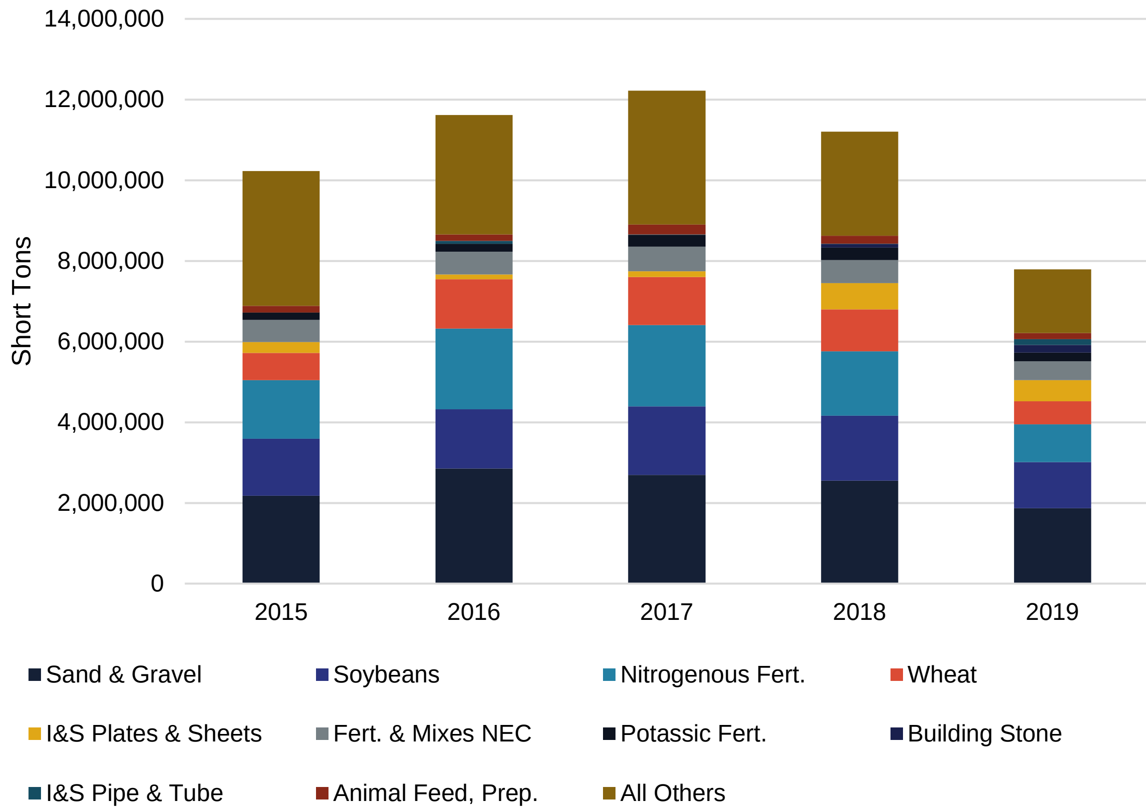
As shown in Table 3.1, the most significant commodities moved on the Arkansas River were sand & gravel, soybeans, and nitrogenous fertilizer. Of the top 10 commodities, all experienced tonnage growth between 2015 and 2018, but most dropped below 2015 volumes in 2019. Commodities that experienced notable growth over this time frame despite flood conditions include iron and steel pipe and tube and building stone, both of which also saw increases in 2019. Figure 3.1 illustrates commodity flow trends on the MKARNS over this timeframe.

Table 3.1 MKARNS Commodity Movements, 2015 – 2019, in short tons

Commodity	2015	2016	2017	2018	2019	2015 – 2018 CAGR	2015 – 2019 CAGR
Sand & Gravel	2,177,967	2,853,546	2,697,298	2,547,825	1,869,603	5.4%	-3.7%
Soybeans	1,410,740	1,465,965	1,696,709	1,614,291	1,140,004	4.6%	-5.2%
Nitrogenous Fert.	1,451,825	2,006,384	2,016,757	1,592,910	936,049	3.1%	-10.4%
Wheat	674,500	1,220,755	1,189,443	1,040,473	571,559	15.5%	-4.1%
I&S Plates & Sheets	272,876	119,611	139,209	653,969	523,129	33.8%	17.7%
Fert. & Mixes NEC	548,651	557,354	614,454	574,018	470,181	1.5%	-3.8%
Potassic Fert.	184,615	206,032	294,491	306,983	214,281	18.5%	3.8%
Building Stone	0	0	0	84,044	189,734		
I&S Pipe & Tube	774	67,779	10,978	10,253	146,730	136.6%	271.1%
Animal Feed, Prep.	160,780	155,044	242,567	199,915	146,016	7.5%	-2.4%
All Others	3,342,314	2,964,111	3,316,762	2,578,575	1,583,995	-8.3%	-17.0%
Total	10,225,042	11,616,581	12,218,668	11,203,256	7,791,281	3.1%	-6.6%

Source: U.S. Army Corps of Engineers. Note: Includes the main stem of navigation system, including lower 10 miles of White River; Arkansas Post Canal; Arkansas River between Arkansas Post Canal and Muskogee, OK; and Verdigris River between Muskogee, OK and Catoosa, OK; (445 miles). Tributaries include the lower five miles of Lake Langhofer, lower two miles of Poteau River and the lower 10 miles of Sans Bois Creek (17 miles).

Figure 3.1 MKARNS Commodity Movements, 2015 – 2019, in short tons



Source: U.S. Army Corps of Engineers.

Commodities moved along the Ouachita and Black Rivers (Table 3.2) are significantly less diverse than those moved along the MKARNS. Volumes average around 500,000 short tons per year but reached a peak of 820,221 short tons in 2017. Overall volumes trended downward 11.9 percent annually between 2015 and 2019. On this portion of the inland waterway system, the top five commodities accounted for 97 percent of movements along the river in 2019. Primary commodities are focused on fuels (distillate fuel oil and gasoline) and agricultural products (soybeans and corn). Of these, soybeans account for the largest shipments out of the state, representing 80 percent of all shipments. Figure 3.2 illustrates commodity flow trends on the Ouachita River over this timeframe.

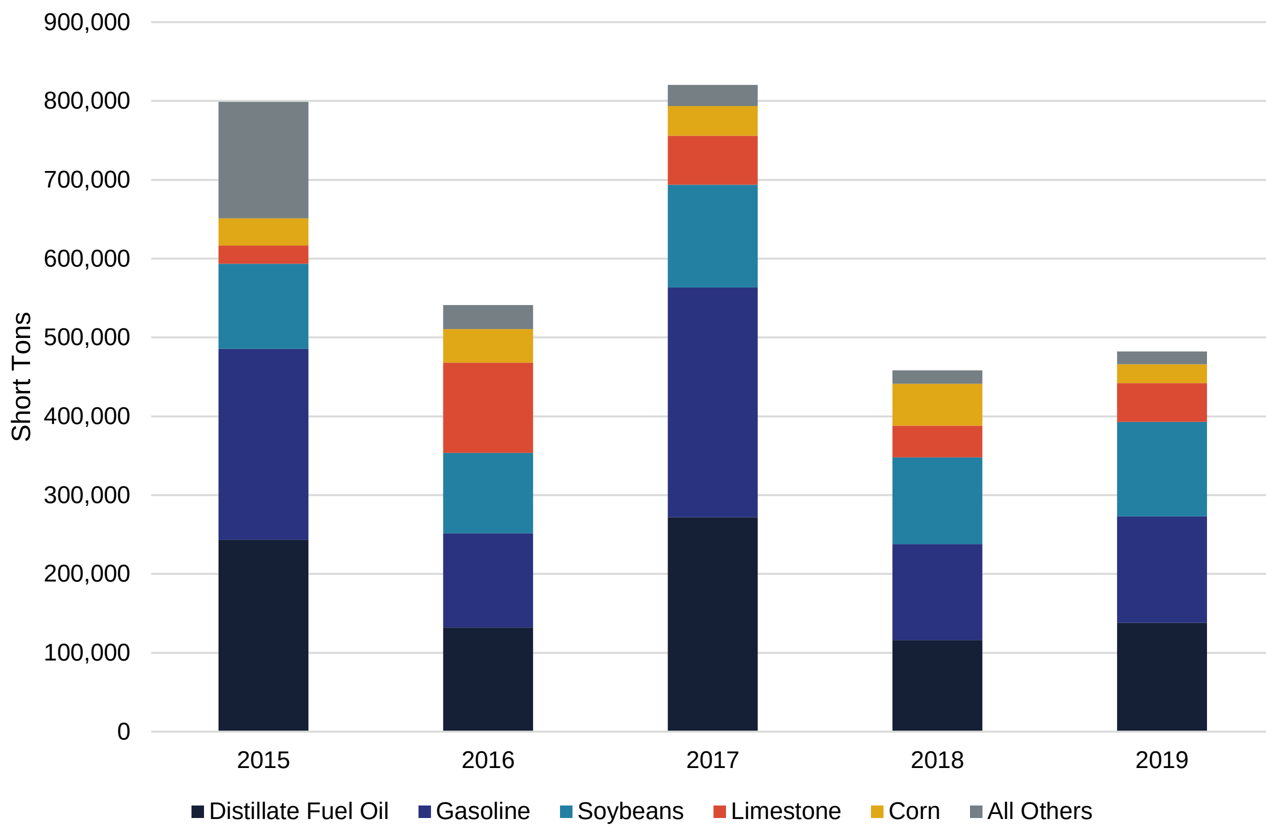
The Ouachita and Black Rivers are also subject to flooding which has led to catastrophic failures and impacted commodity flows. In March 2018, the Ouachita River reached a flood crest of 85.4 feet at the Felsenthal Lock and Dam, over 20 feet higher than normal water levels. Rising waters impacted Arkansas' cities along the Ouachita, including the flooding of Mount Ida's sewers and water treatment facility, flooding of residences, and road closures.

Table 3.2 Ouachita and Black Rivers Commodity Movements, 2015 – 2019, in short tons

Commodity	2015	2016	2017	2018	2019	2015 – 2018 CAGR	2015 – 2019 - CAGR
Distillate Fuel Oil	243,228	131,811	271,807	116,235	138,131	-21.8%	-13.2%
Gasoline	242,146	119,813	291,746	121,515	134,994	-20.5%	-13.6%
Soybeans	108,046	102,151	130,324	109,964	119,840	0.6%	2.6%
Limestone	23,372	114,421	61,778	40,442	49,229	20.1%	20.5%
Corn	34,478	42,596	37,910	53,083	23,928	15.5%	-8.7%
All Others	147,477	30,214	26,656	17,252	16,157	-51.1%	-42.5%
Total	798,747	541,006	820,221	458,491	482,279	-16.9%	-11.9%

Source: U.S. Army Corps of Engineers. Note: This section includes from the mouth of the Black River to Camden, AR (336 miles).

Figure 3.2 Ouachita and Black Rivers Commodity Movements, 2015 – 2019, in short tons



Source: U.S. Army Corps of Engineers. Note: This section includes from the mouth of the Black River to Camden, AR (336 miles).

The USACE does not report cargo movements on the Red River and only minimal amounts of sand and gravel move on the White River above Batesville each year. Significant volumes are also moved along the Mississippi River, which borders Arkansas, although volumes for the Arkansas portion alone are not reported. While the volumes of commodities moved solely on the Mississippi River to Arkansas are not available, state-to-state commodity movements are reported on an annual basis by the USACE which does capture this traffic.

Table 3.3 shows the top originating states for goods destined for Arkansas via the inland waterways system, inclusive of all rivers. Generally speaking, the origin of goods bound for Arkansas will always be states that are connected to Arkansas by the same river systems. Louisiana accounts for more than half of the goods bound for the state, primarily driven by primary metal products which represent the second-highest volume good moving to the state by river in 2019 with over 2.2 million short tons. Large volumes of iron ore, iron, and steel waste and scrap from multiple states result in it being the highest state import with over 2.3 million short tons in 2019. Unlike other landlocked states, such as Kentucky or Missouri, Louisiana serves as an import/export location for international goods. Maintaining navigational routes along the inland waterway system is important for Arkansas producers and consumers to compete on the international stage.

Table 3.3 Top Originating States for Goods Inbound to Arkansas on the Waterway System, 2019

State	2019 Short Tons	% of Total	Primary Commodities
Louisiana	3,851,664	54%	Primary Metal Products; Iron Ore, Iron, and Steel Waste and Scrap; Chemical Fertilizers
Texas	1,001,104	14%	Iron Ore, Iron, and Steel Waste and Scrap
Kentucky	607,896	8%	Sand, Gravel, Shells, Clay, Salt, and Slag
Missouri	396,529	6%	Sand, Gravel, Shells, Clay, Salt, and Slag; Iron Ore, Iron, and Steel Waste and Scrap
Illinois	348,016	5%	Iron Ore, Iron, and Steel Waste and Scrap
All Others	974,180	14%	
Total	7,179,389	100%	Primary Metal Products; Iron Ore, Iron, and Steel Waste and Scrap; Sand, Gravel, Shells, Clay, Salt, and Slag

Source: U.S. Army Corps of Engineers.

Table 3.4 shows the goods that are moving out of the state via the waterway system. Again, movements with Louisiana represent the greatest portion of traffic. This is due to the movement of nearly 4 million short tons of food and food products to the state, most likely for export. Other major commodities include nearly 1 million short tons of primary metal products which are predominately destined for Illinois and Texas as well as nearly 1 million short tons of petroleum products destined for Kentucky and Tennessee.

Table 3.4 Top Destination States for Goods Outbound from Arkansas on the Waterway System, 2019

State	2019 Short Tons	% of Total	Primary Commodities
Louisiana	4,339,043	68%	Food and Food Products; Primary Metal Products; Petroleum Products
Kentucky	484,557	8%	Petroleum Products
Illinois	373,072	6%	Primary Metal Products
Texas	359,836	6%	Primary Metal Products
Tennessee	192,154	3%	Petroleum Products
All Others	631,480	10%	
Total	6,380,142	100%	Food and Food Products; Primary Metal Products; Petroleum Products

Source: U.S. Army Corps of Engineers.

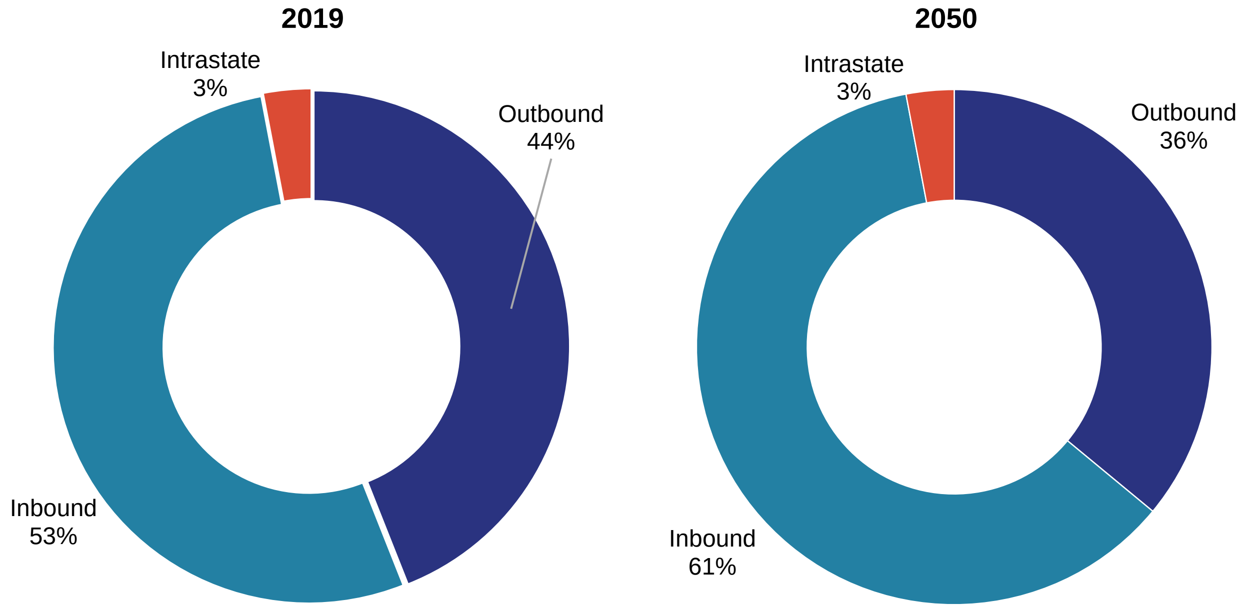
In addition to these large volumes moving in and out of the state, nearly 2 million short tons of sand, gravel, shells, clay, salt, and slag also moved within the state in 2019. Other commodities which remained in the state include petroleum products; iron ore, iron, and steel waste and scrap; and primary metal products.

3.2 FAF Commodity Flow Analysis

For the FAF commodity flow, data years of 2019 and 2050 were utilized to be consistent with other modal profiles developed as part of the *Arkansas State Freight Plan.* These values may differ from those published by the USACE due to differing methodologies. The data presented here represents a portion of the analysis that can be found in the *Commodity Flow Profile.*

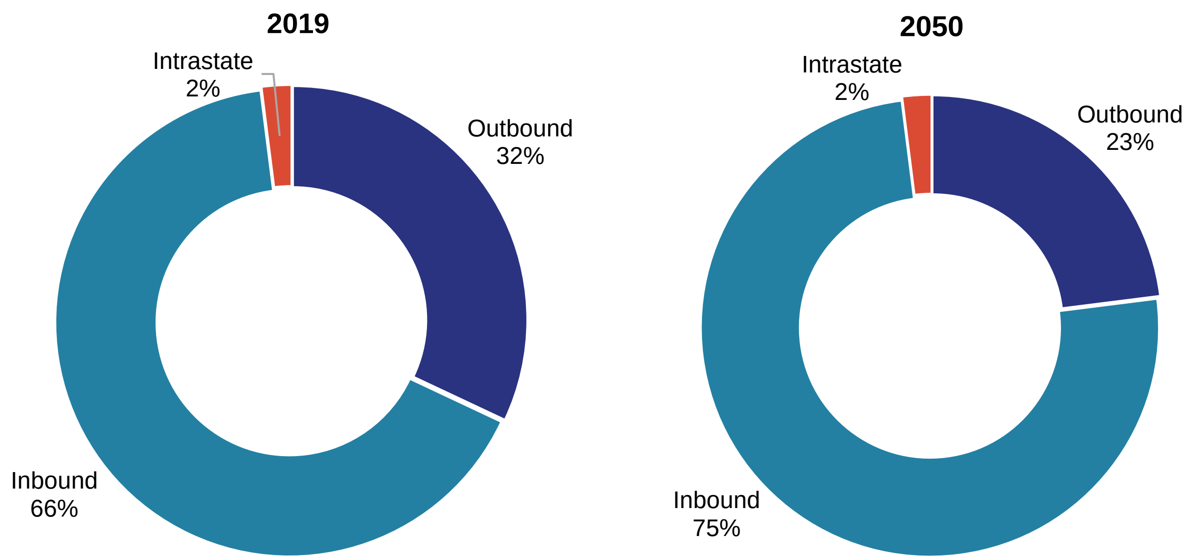
In 2019, almost 8 million tons of freight were shipped via Arkansas waterways, valued at nearly $3 billion. By 2050, waterway tonnage is expected to increase to 9 million tons of freight worth a little over $4 billion, as shown in Figure 3.3 and Figure 3.4. For both 2019 and 2050, over 95 percent of freight shipped via water was comprised of inbound and outbound movements. Intrastate movements, which reflect freight movements that start and end in Arkansas, account for only three percent freight shipped by water. Similarly, by value, intrastate movements accounted for only two percent of waterway freight value, while the remainder was comprised of inbound (32 percent) and outbound flows (66 percent) in 2019. By 2050, the share of inbound flows is projected to increase to 75 percent, while outbound flows will contract to 23 percent.

Figure 3.3 Annual Arkansas Waterway Tonnage, 2019 and 2050



Source: FAF5.2; Analysis by Cambridge Systematics.

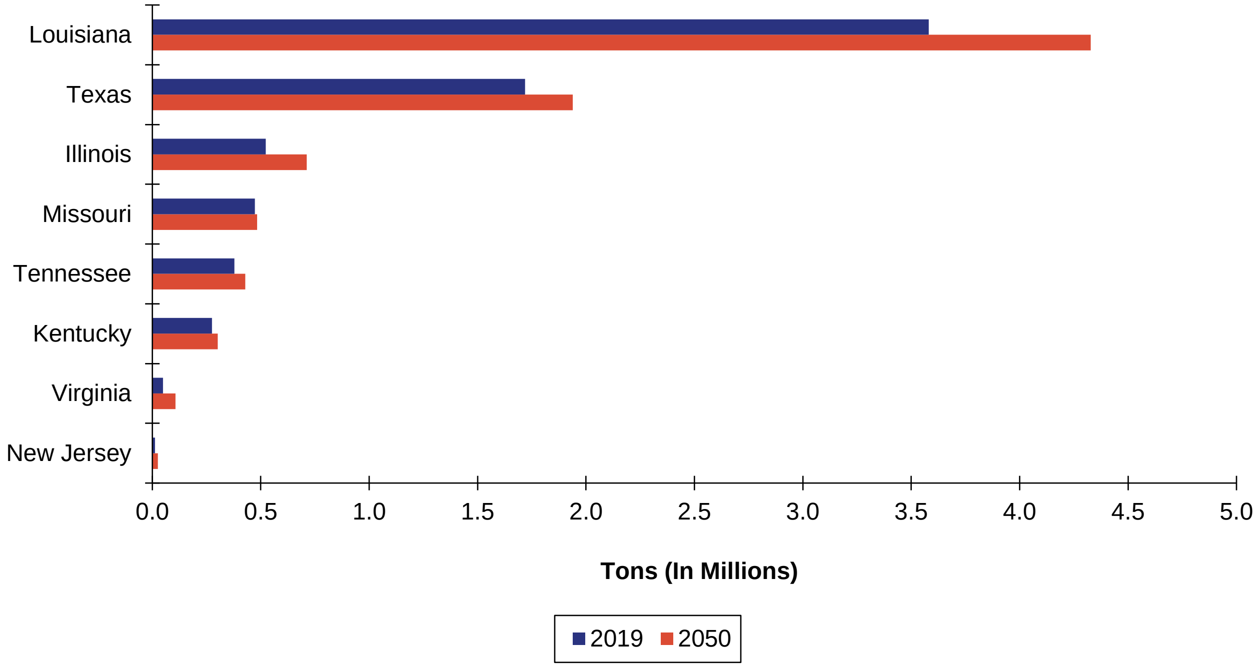
Figure 3.4 Annual Arkansas Waterway Value, 2019 and 2050



Source: FAF5.2; Analysis by Cambridge Systematics.

Consistent with the USACE data, FAF 5.2 reports Louisiana, Texas, and Illinois as the top three domestic trading partners by tonnage and value, respectively. Arkansas' trade with Louisiana features prominently—contributing almost 3.6 million tons in 2019 and projected to exceed 4 million tons by 2050 as shown in Figure 3.5. Louisiana is a dominant trade partner as it serves as an import/export location for international goods. Texas and Illinois rank second and third in terms of waterway shipping volumes. Together, these three states account for more than three-quarters of Arkansas' freight moved via water. Shipping values for waterway freight was the highest for Louisiana ($900 million), followed by Illinois and Texas. When combined, 77 percent of the value of freight shipped by water occurred with these top trading partners. By 2050, shipment from Illinois valued at $1.3 billion is projected to exceed Louisiana ($1.1 billion). Despite this change, Arkansas top three trading partners for shipments by water will remain the same for 2050.

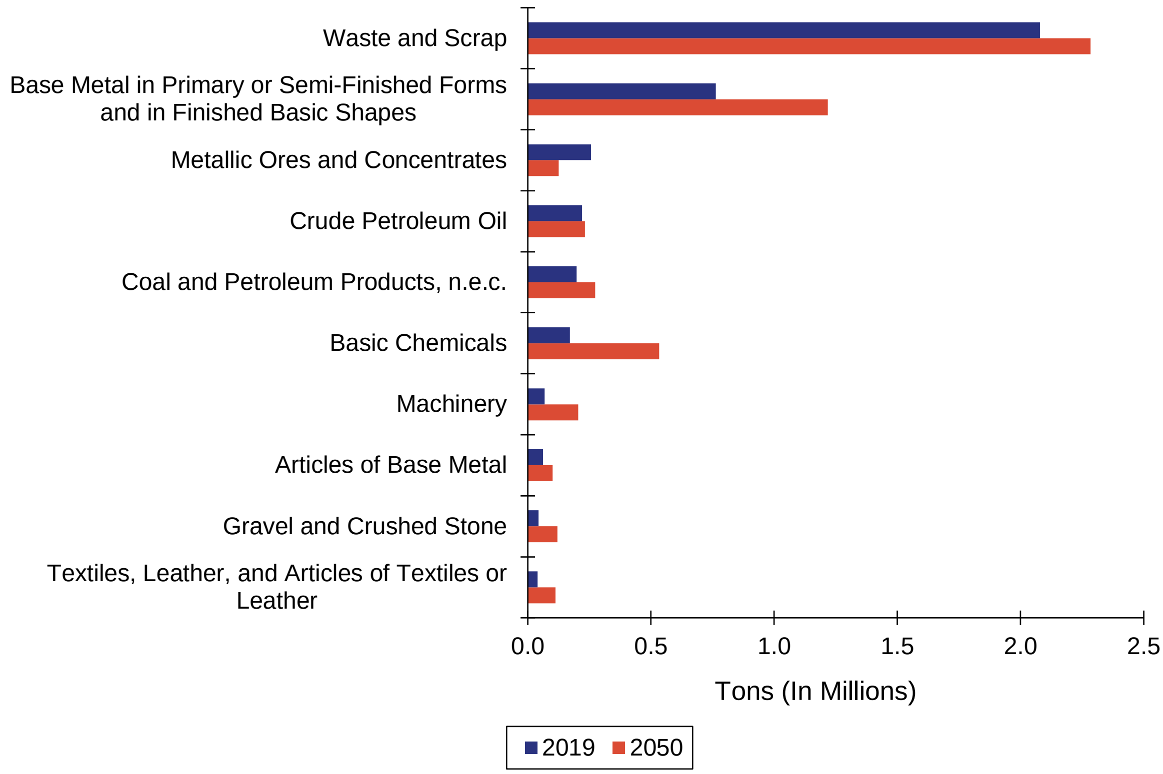
Figure 3.5 Top Domestic Waterway Trading Partners by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

The top inbound waterway commodities by tonnage are predominately waste and scrap and base metals in primary or semi-finished form which account for over 70 percent of total inbound shipments moved by water during 2019. Their combined volumes are projected to increase from 2.8 million tons to 3.5 million by 2050 as shown in Figure 3.6. In terms of shipment values, waste and scrap ranked highest in 2019 valued at $0.5 billion and will increase to $0.6 billion by 2050. The value of textiles, leather and articles of textiles and leather was the second highest in 2019. By 2050, this item will triple in value to $0.8 billion to become the highest value commodity shipped by water.

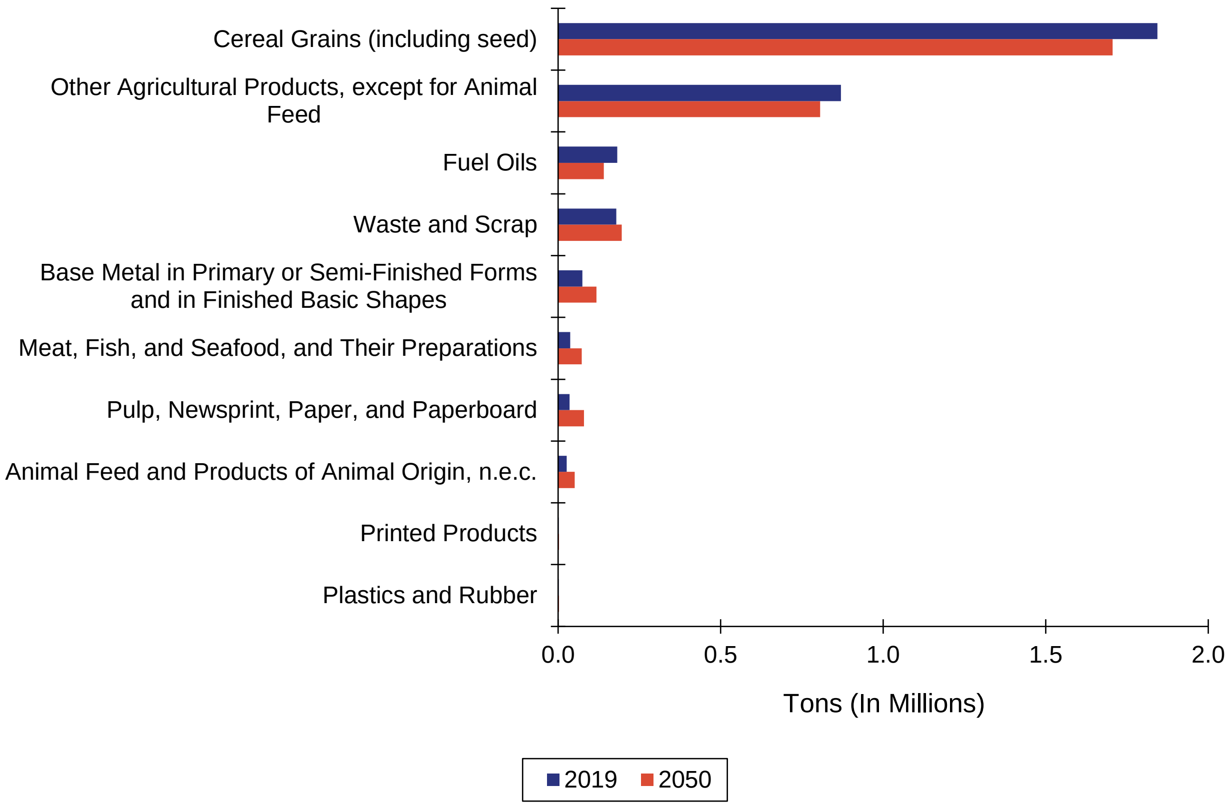
Figure 3.6 Top Inbound Waterway Commodities by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

For outbound waterway commodities, cereal and grains, other agricultural products and fuel oils accounted for almost 90 percent of outbound flows in 2019. By 2050, contractions in tonnage are projected for these items, while waste and scrap displaces fuel oils for third place among the top exports as shown in Figure 3.7. By value, cereal and grains, other agricultural products and fuel oils also ranked as the top three commodities, with combined shipments valued at $0.7 billion in 2019. Reductions in other agricultural products and fuel oils will occur by 2050. In addition, higher shipping values for base metal in primary and semi-finished form will result in an upward movement to third highest commodity value, while fuel oils will rank fourth.

Figure 3.7 Top Outbound Waterway Commodities by Volume, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

In 2019, waste and scrap was the main commodity transported via intrastate waterway, accounting for 97 percent of intrastate flows. By 2050, intrastate tonnage shipped by waterway is expected to increase by 10 percent, with waste and scrap maintaining its share throughout this period. By value, waste and scrap also accounted for 97 percent of total intrastate shipments by waterway, worth $59 million in 2019. By 2050, shipments values are projected to grow proportionally to volume growth by 10 percent.

4.0 Condition and Performance

This section focuses on the existing conditions and performance of the network, particularly as it relates to the age of infrastructure along the inland waterway system as well as recurring events, such as flooding, which impedes navigation. Increased damage from flooding events makes investing in facility resiliency a top priority, albeit hampered by limited funding availability.

4.1 Flooding and Aging Infrastructure

More so than any other mode of freight transportation, navigation along the nation's inland waterway system is highly susceptible to weather events that can cause delays and unsafe conditions. Since the last State Freight Plan, flooding and network resiliency has emerged as a top issue for inland ports and waterways. The most extreme recent example of such an event was the flooding of the Arkansas River in May 2019. An initial series of thunderstorms occurring between May 19 and May 21 caused initial flooding, which was compounded by continued rainfall in the weeks following. The impacts of this storm on commodity movements and volumes have already been detailed in the prior section with a noticeable drop in tonnages moved in 2019. Total damages were estimated at $3.2 billion along with the loss of five lives.[25]

Fort Smith, home to the Fort Smith Port Authority, was heavily impacted by this event. The Arkansas River crested there at 40.79 feet, breaking a record previously set in 1945, submerging the Port of Fort Smith and suspending operations. Depth and volume of water moving along the river, mixing with debris, can already be a cause of navigational concern, but the speed of the current further prevented waterway operations. A typical speed along this section of river is 30,000 cubic feet per second (cfs) with a small craft advisory issued at 70,000 cfs. When the Arkansas River crested, water was flowing at 570,000 cfs with normal flows not resuming until July 2019.[26]

A backlog of maintenance at the locks and dams along the river system was also a cause for concern during this period. On May 23, 2019 two barges broke from their moorings and traveled down the MKARNS before slamming into the Webbers Falls Lock & Dam (Lock and Dam 16). Upon striking the dam, the barges sank to the base of the structure, impeding the river's flow and blocking the operation of four gates. Tulsa District locks 14, 17, and 18 were also inundated and under water. One characteristic of this infrastructure is that it is primarily used for navigation and not flood risk management. However, even with minimal damage to Webbers Falls, the salvage of these barges was a significant effort. The last barge was not removed until September 2, 2019 with limited navigation of the entirety of the MKARNS resuming on September 30, over four months after the initial event.[27]

Overall maintenance, repair and replacement of critical lock and dam components and channel bank stabilization along the MKARNS are vital to marine operations in Arkansas. As evidenced from the 2019 flood, the safe, efficient movement of goods along the MKARNS is critical to the economy of Arkansas and to the efficiency of other transportation modes as they must handle a greater capacity when the river system cannot.

[25] National Oceanic and Atmospheric Administration. Billion-Dollar Weather and Climate Disasters. https://www.ncdc.noaa.gov/billions/events/US/2019

[26] *The Great Flood of 2019.* Arkansas Living. June 30, 2019.

[27] *Barge Wreckage recovered from Webbers Falls L&D 16*. U.S. Army. October 22, 2019.

In recent years, Arkansas has been successful in obtaining federal funds towards inland waterways projects. In addition, the Infrastructure Investment and Jobs Act (IIJA) allocated funds towards several critical operations and maintenance projects, including[28]:

- $109.1 million to complete construction of the Three Rivers project, which would result in structures built to prevent the White and Arkansas Rivers from merging together.
- $72.3 million towards various operations and maintenance projects on the MKARNS Arkansas Segment, including constructing channel training structures, purchase of stoplogs, and repair of stoplogs and gates at several locks.
- $1.6 billion for construction activities, including $92.6 million to initiate construction of the deepening of the MKARNS.
- $273.5 million for channel improvements along the Mississippi River and its tributaries in Arkansas and other states.
- $10 million in operations and maintenance projects at Helena Harbor, Osceola Harbor, White River, Yellow Bend Port, and Ouachita and Black Rivers.

Deepening the channel has been a decades-long effort that will improve river flows and increase barge capacity by up to 40 percent, which may, in turn, relieve congestion of other modes, improve air quality, reduce carbon emissions, reduce transportation costs, and boost shipping industry competitiveness.[29]

In addition, the Arkansas Waterways Commission continues to advocate for a return of full-time operation to all locks along the Ouachita-Black River Navigation System. The lack of navigation reliability on the Ouachita River has resulted in lost business and investment opportunities in Arkansas. Improving reliability would benefit local industries, but without consistent lock operations, dredging, or maintenance of the navigation channel north of the Louisiana border, industries cannot access these services. The restoration of service at the locks and maintenance of the channel is imperative to allow unimpeded commercial barge traffic and to facilitate economic development opportunities.

4.2 Port Capital Improvement Needs

To determine port capital improvement needs, a survey was conducted for Arkansas' public inland waterway ports. Ports were asked to provide information on how their operations have changed since the development of the precious State Freight Plan, discuss industry issues, and identify needs and recently completed projects at their individual port facilities. The following summarizes these discussions at a high level with further detail provided in the Multimodal Freight Needs Assessment and Unconstrained List of Priority Freight Projects.

The needs of Arkansas' inland ports vary greatly based on which river they are located, most notably due to the stability of the lock and dam infrastructure. Ports like Helena Harbor and Yellow Bend are located on the Mississippi River which does not have locks below St. Louis. Due to this, their operations are relatively unimpacted by maintenance or congestion issues at this type of infrastructure. For other ports, working locks are a more critical need for the continued operations as a port and waterway facility. In comparison to those

[28] Arkansas Waterways Commission, June 2022.

[29] Arkansas Waterways Commission, Testimony to Mississippi River Commission, April 5, 2022.

on the Mississippi River, the Port of Crossett is the furthest north on the Ouachita River that the USACE will dredge and is dependent upon working locks. Prolonged closure at the Columbia Lock & Dam due to seepage issues, among others, caused the port to lose a tenant who would ship a few barge loads a month. At this point, the Port of Crossett has not had any river shipments for the last four or five years.

In addition to physical infrastructure needs, severe weather events have also made consistent port operations difficult. The flooding that occurred in 2019, had a significant impact on volumes, but that other disruptions due to severe weather or natural disasters are not uncommon. Low water events in 2012 impacted volumes along the Mississippi River and Hurricane Ida in 2021 destroyed much of the barge fleets on the Mississippi River, causing significant shortages and hurting the ability of barge operators to maintain their business. These extreme weather events can exasperate dredging issues which remain underfunded. Several ports identified the need for consistent, annual dredging and the importance of adequate water depth. While most channels are maintained to nine feet, dredging to 12 feet would significantly increase the productivity and efficiency of using inland ports.

Funding for additional dredging has been hard to come by. As such, intermodal connections are increasingly important for Arkansas' inland ports. While most ports report having adequate landside access to their facilities, additional modal options (including rail and highway) were identified that would strengthen their competitive position. In the case of the Little Rock Port Authority, rail operations generate over 75 percent of their revenue, and they are looking to expand the use of their existing rail infrastructure. Likewise, the Port of Little Rock is actively studying new roadway connections to improve access and mobility for trucks. As noted above, more detailed information about these and other multimodal port infrastructure needs is provided in the Multimodal Freight Needs Assessment chapter and Unconstrained List of Priority Freight Projects (Appendix B).

As the ports look towards improving their facilities, supply chain constraints, the rising cost of goods and services, and funding match requirements for competitive federal grant programs make expansion difficult. In spite of this, several of the ports have completed projects identified in the prior Freight Plan and have identified new projects. Details on these projects are included in the Multimodal Freight Needs Assessment chapter.

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ARKANSAS
STATE FREIGHT PLAN

Chapter 6

Commodity Flow Profile

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1.0 Introduction

Assessing the needs of Arkansas' freight system requires an understanding of future freight demand and the factors that shape the current environment. This Commodity Flow Profile presents existing and projected future demand for freight in the state. The forecast presented in this report provides a baseline scenario against which future alternative scenarios can be developed to explore changing external conditions. The report examines the direction of the flow of goods, various modes of transportation, major trading partners, and top commodities moved through the freight system.

In 2019, 595 million tons of freight moved over Arkansas' transportation system, valued at $1.1 trillion. This freight volume has been forecasted to increase by 51 percent by 2050 to 902 million tons, worth over $2 trillion. Arkansas is a landlocked state, and its central location has led to a high volume of through flows—goods that pass through the state without stopping. In 2019, the largest share of freight moved on the state's transportation system consisted of through flows, which represented 45 percent of the total tonnage and 75 percent of total freight values. Trucking is the predominant mode of freight transportation, accounting for more than half of total volumes in 2019. When combined with rail, these two modes move almost 90 percent of shipments. Trends in directional split and modal split are expected to remain consistent through 2050.

One major shift over the next thirty years is expected to be the composition of top commodities moved on the freight system. In 2019, coal was the second largest commodity by tonnage, contributing to almost 10 percent of total shipments. By 2050, a significant contraction in coal is forecast to be offset by an increase in coal and petroleum products, plastics and rubber, and base chemicals. This shift will affect the state's top trading partners as of today. Wyoming is among Arkansas' top five trading partners in 2019, but is not expected to be in the top five trading partners by 2050. Nonetheless, Arkansas' other significant trading partners – Louisiana, Texas, Mississippi, and Oklahoma – are expected retain their position through 2050.

1.1 Data & Methodology

Several data sources were used in the commodity flow analysis, details as follows:

- **Freight Analysis Framework version 5.2 Database.** The Freight Analysis Framework (FAF), produced through a partnership between Bureau of Transportation Statistics (BTS) and Federal Highway Administration (FHWA), integrates data from a variety of sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation. Starting with data from the 2017 Commodity Flow Survey (CFS) and international trade data from the Census Bureau, FAF incorporates data from agriculture, extraction, utility, construction, service, and other sectors. FAF version 5.2 provides estimates for tonnage and value by regions (multi-county or state FAF zones) of origin and destination, a 2-digit Standard Classification of Transported Goods (SCTG) commodity type, and mode. Data is available for the base year of 2017 and forecasts from 2020 through 2050 in 5-year intervals. FAF 2017-2050 data was disaggregated to obtain truck, water, air, pipeline, and other flows at the county level for the state of Arkansas. Growth factors for 2017–2050 were used to estimate 2019 disaggregated FAF flows. Additionally, growth factors estimated from FAF for rail (carload equivalent) mode and multiple modes and mail mode (which includes rail intermodal) were applied to 2019 Carload Waybill Sample data to forecast the future year (2050) freight rail traffic.

- **2019 Carload Waybill Sample for Arkansas.** The Association of American Railroads (AAR) collects a stratified sample of carload waybills annually for the Surface Transportation Board (STB) from railroads that terminated at least 4,500 carloads each year for each of the previous three years, or which move five percent or more of any state's total rail traffic. The Arkansas Department of Transportation (ARDOT) obtained the confidential version of the Waybill Sample, which includes detailed shipment data including origin county, destination county, 7-digit level Standard Transportation Commodity Code (STCC) commodity type, equipment type, and tonnage. This data formed the basis for the base year freight rail traffic. In this analysis, the rail traffic flows in the 2019 Carload Waybill Sample data were converted to a 2-digit Standard Classification of Transported Goods (SCTC) equivalent commodity flows database using a lookup table.

1.2 Report Organization

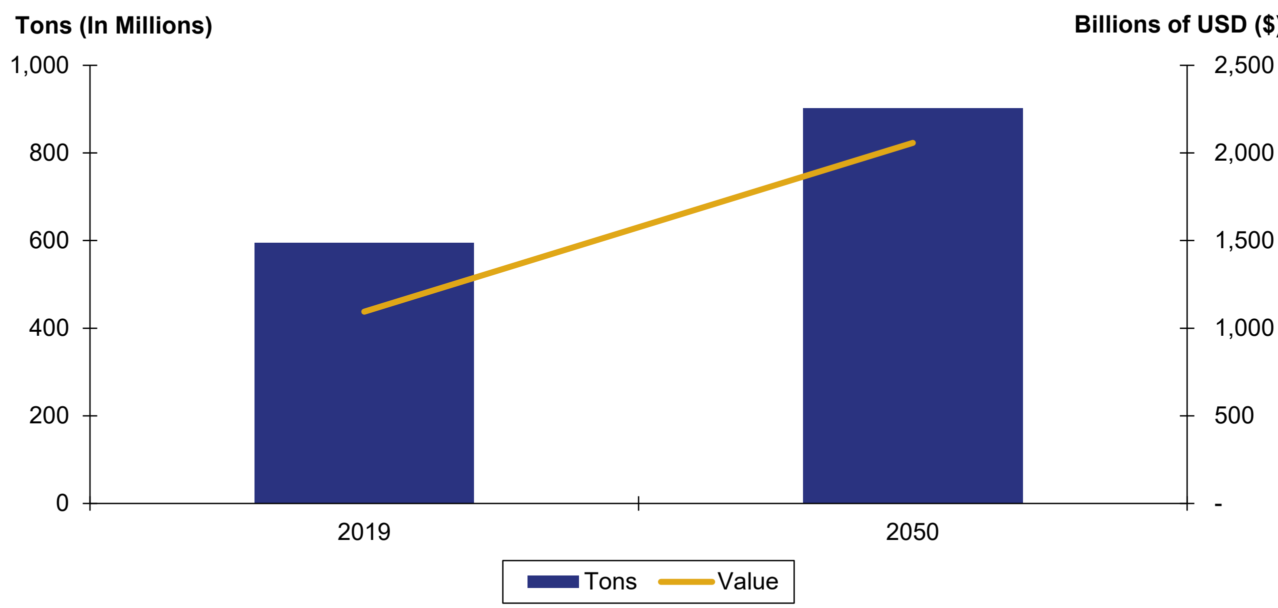
The remainder of this report is organized as follows:

- **Section 2.1—Modal Split** examines the distribution of commodity flows by various modes of transportation—truck, rail, waterways, air, and pipeline. This includes an analysis of freight volumes and values for the base year 2019 and forecast year 2050.
- **Section 2.2—Directional Split** provides an overview of the movement of freight flows classified by inbound, outbound, intrastate and through flow shipments. This includes an analysis of freight volumes and values for the base year 2019 and forecast year 2050.
- **Section 2.3—Top Commodities** highlights Arkansas' top performing commodities in terms of tonnage and value for the base year 2019 and the forecast year 2050.
- **Section 2.4—Top Trading Partners** identifies those states that account for the largest share of Arkansas' inbound and outbound trade flows for the base year 2019 and the forecast year 2050.

2.0 Statewide Freight Demand

In 2019, 595 million tons of freight valued at $1.1 trillion moved through Arkansas' freight transportation system (Figure 2.1). By 2050, freight tonnage is projected to increase by 51 percent to 902 million tons, with a more than proportionate growth in value of 88 percent to $2.1 trillion.

Figure 2.1 Projected Freight Tonnage and Value, 2019 and 2050



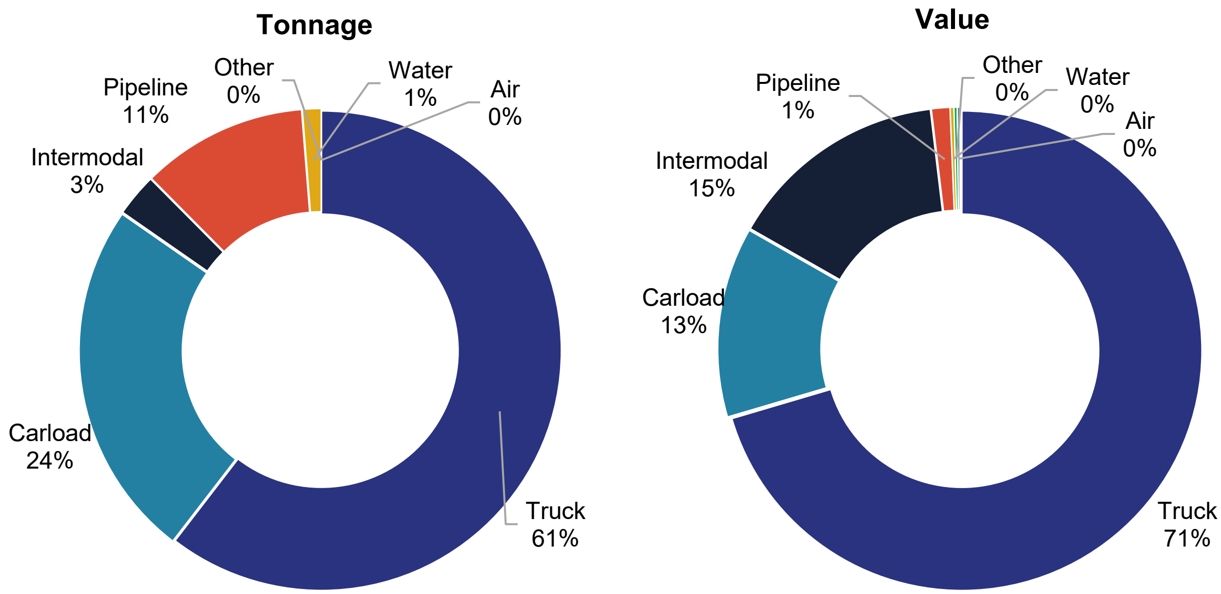
Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

2.1 Modal Split

In Arkansas, trucking accounts for the bulk of freight movements, responsible for 61 percent of total volume and 71 percent of total value in 2019. Rail held the second largest share, contributing to 27 percent of freight tonnage and 28 percent of value. When further broken down, rail is made up of carload and intermodal services. While 24 percent of total volume belonged to carload, its share of value was much lower at 13 percent. By contrast, the intermodal share of total volume and value stood at 3 percent and 15 percent, respectively. Freight transported by pipeline accounted for 11 percent of total volumes, but only 1 percent of the total value. The remaining modes—water, air, and other—comprised of less than 1 percent for both freight volume and value. Figure 2.2 and Figure 2.3 shows Arkansas freight by mode for tonnage and value for 2019 and 2050.

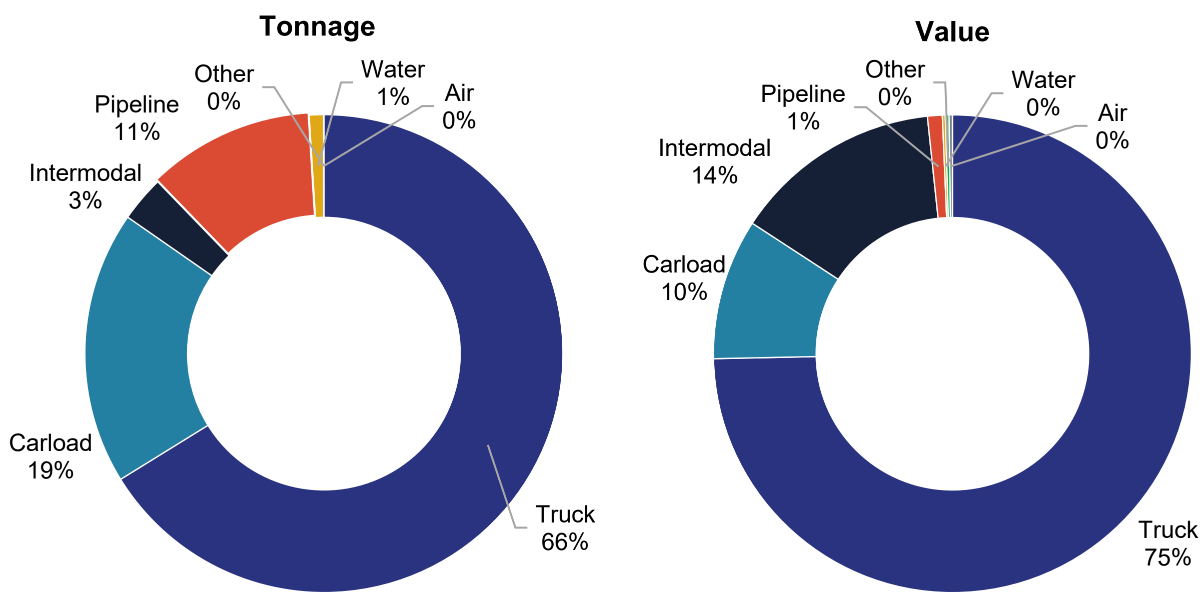
Over the next 30 years, the volume of freight moved through Arkansas' transportation system is projected to grow by 51 percent. By 2050, the volume of truck freight is expected to rise by 66 percent, while its value is expected to double. In contrast, rail freight volumes are expected to increase by 20 percent, with a 61 percent increase in value. Carload volumes are expected to account for almost one-fifth of total tonnage, but only a 10 percent share of value. Intermodal freight is expected to amount to 3 percent of volume and 14 percent of value. Growth in pipeline freight is projected to rise in volume and value of 52 percent and 51 percent, respectively.

Figure 2.2 Arkansas Freight Tonnage and Value by Mode, 2019



Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

Figure 2.3 Arkansas Freight Tonnage and Value by Mode, 2050



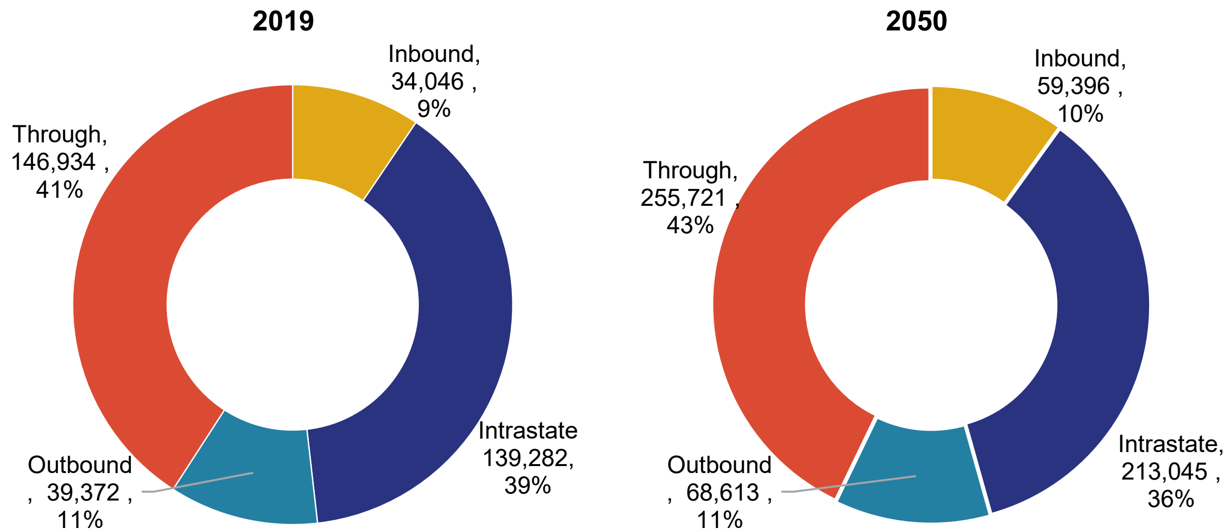
Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

2.1.1 Truck Freight Demand

In 2019, trucks transported almost 360 million tons of freight worth more than $770 billion on Arkansas' highways, which is expected to grow to almost 600 million tons worth over $1.5 trillion in 2050. Figure 2.4 (tonnage) and Figure 2.5 (value) show the breakdown of these shipments by the direction of movement. Throughflow movements are truck shipments that start in a state other than Arkansas and end in a state other than Arkansas, but pass through the state during the journey. Intrastate movements are those that start and end in Arkansas.

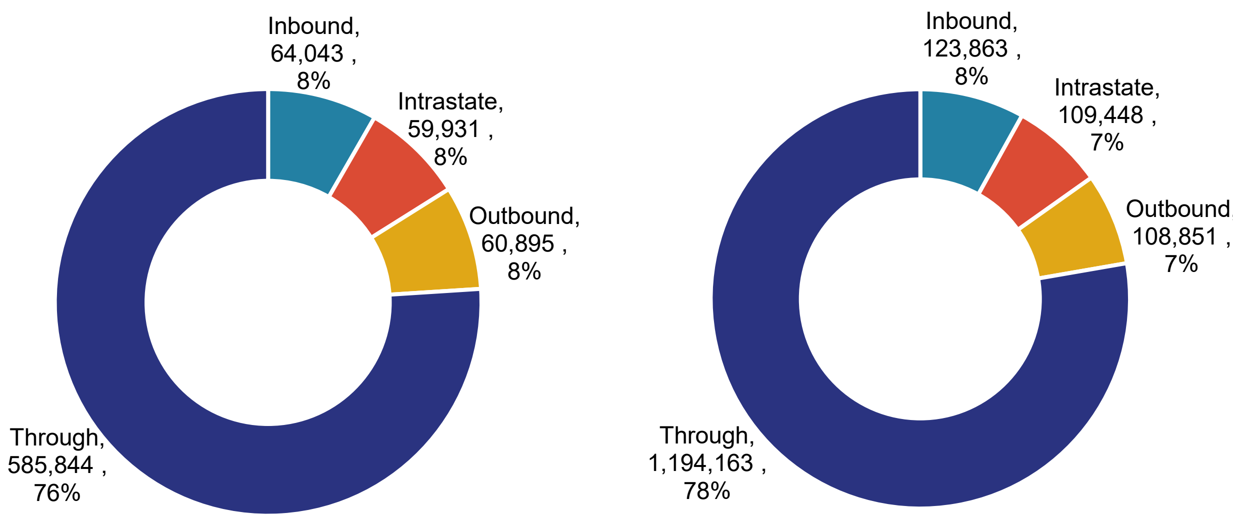
By tonnage, inbound and outbound shipments each make up 9 to 12 percent in both 2019 and 2050. Truck movement is dominated by throughflow and intrastate directions. By value, the inbound, intrastate, and outbound directions each comprise between 8-9 percent, and through truck shipments make up the overwhelming majority with over 75 percent of truck value shipped in 2019 and 2050.

Figure 2.4 Annual Arkansas Truck Tonnage (thousand tons), 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.5 Annual Arkansas Truck Value, (thousand tons), 2019 and 2050



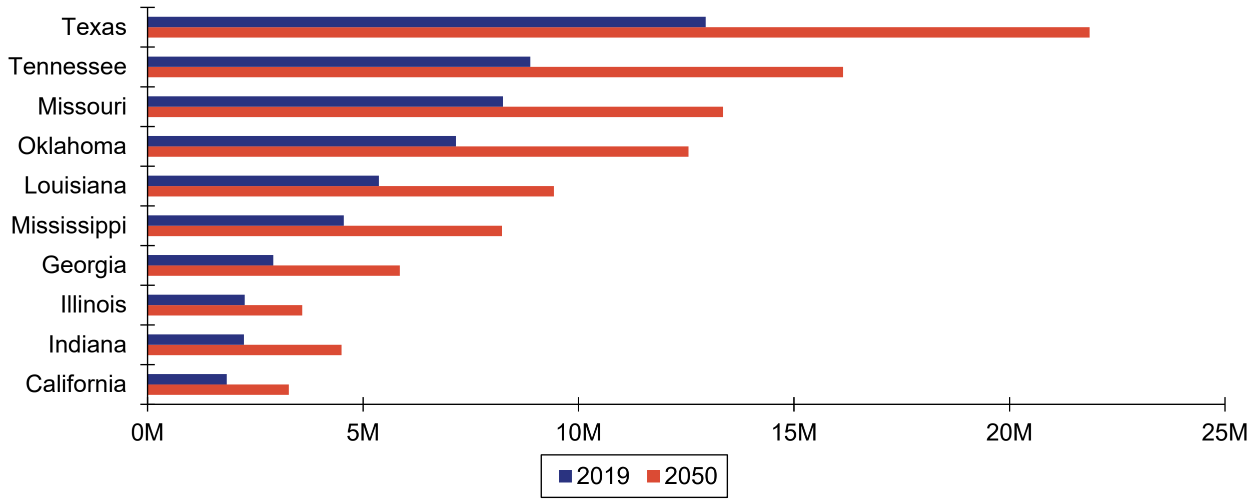
Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Top Truck Trading Partners

Figure 2.6 and Figure 2.7 display the top domestic trading partners for Arkansas by tonnage and volume, respectively. Truck shipments are more competitive for shorter distances as compared to rail or air. As such, neighboring states make up the top six domestic truck trading partners. Texas trades the most with Arkansas with almost 13 million tons in 2019, which is projected to grow to almost 22 million in 2050. Outside of the neighboring states, the top states are Georgia, Illinois, Indiana, and California.

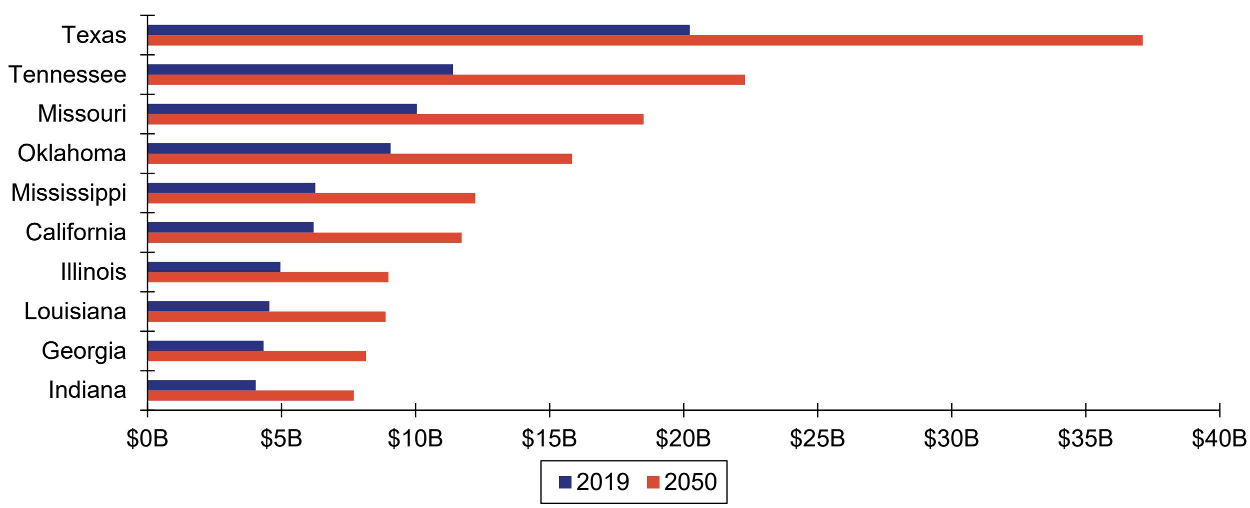
By value, the top five trading partners are also neighboring states, but California and Illinois are ranked sixth and seventh respectively, with more trade than neighboring Louisiana. The top trading partner by value is Texas with over $20 billion traded by truck in 2019, which is projected to grow to over $37 billion in 2050.

Figure 2.6 Top Domestic Truck Trading Partners by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.7 Top Domestic Truck Trading Partners by Value, 2019 and 2050

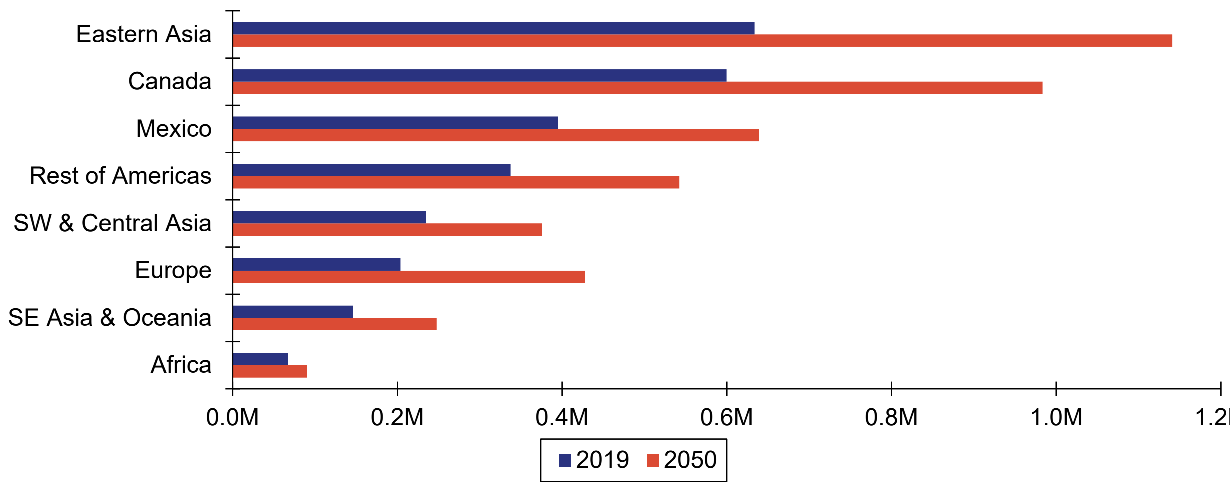


Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Although Arkansas does not share any land borders with foreign countries, some truck movements in the state are generated because of international freight movements. Such international freight movements include shipments that arrive either by air at one of the state's airports or by water at an international water port close to the state. These shipments are moved to/from Arkansas by truck from/to the port of entry. Therefore, it is important to look at the Arkansas' international trading partners by truck while noting such movements are a combination of truck and other modes.

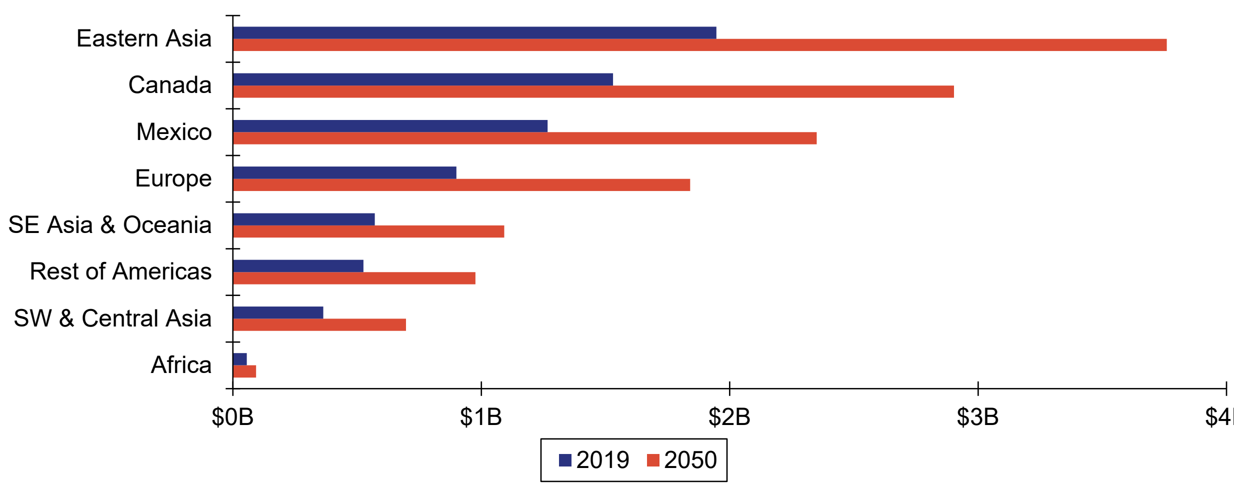
Figure 2.8 and Figure 2.9 display the top international trading partners with Arkansas by truck tonnage and truck value, respectively. In 2019, Eastern Asia is both the top trading partner in terms of tonnage (over 0.6 million tons) and value (almost $2 billion). That region is expected to maintain the top rank in 2050 when the tonnage increases to over 1.1 million tons and the value increases to over $3.75 billion. In each of the tonnage and value ranks, Canada and Mexico are the next two highest trading partners, in that order.

Figure 2.8 Top International Truck Trading Partners by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.9 Top International Truck Trading Partners by Value, 2019 and 2050



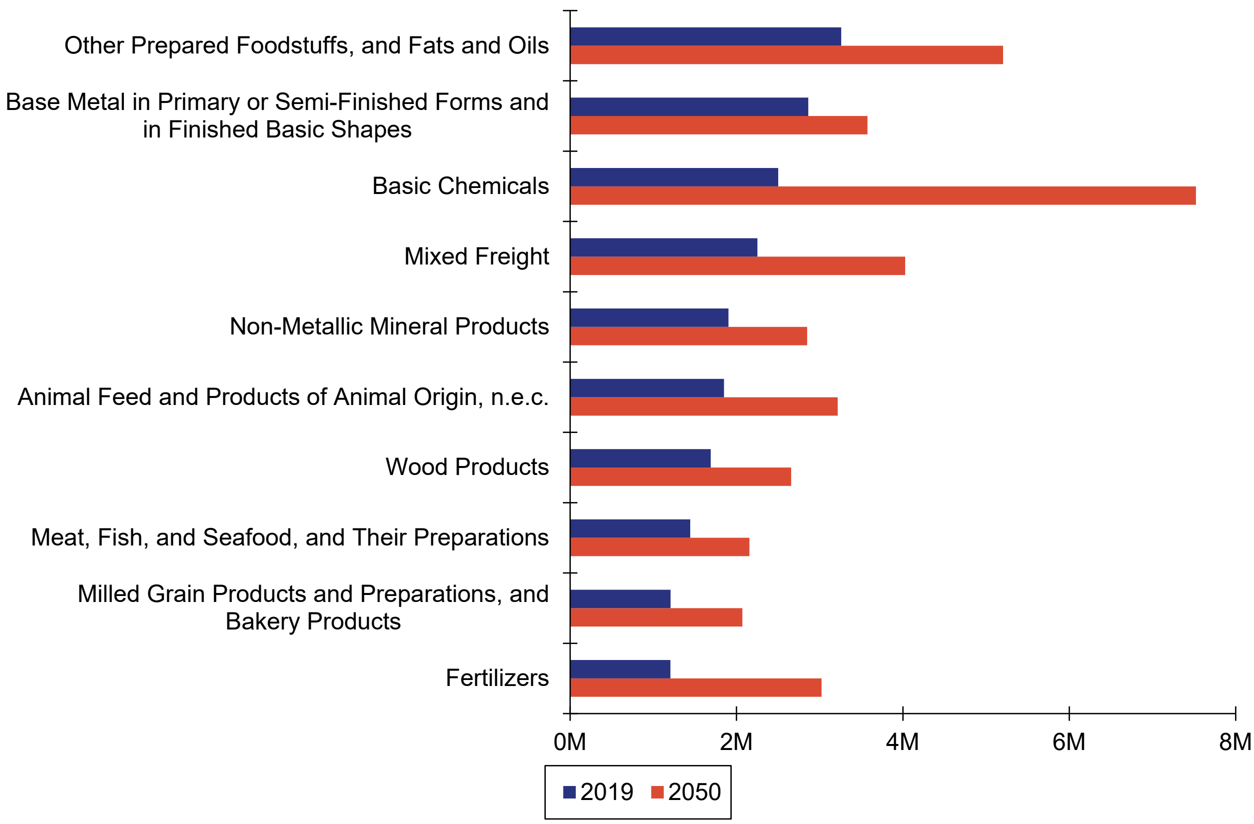
Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Top Commodities Moved by Truck

Figure 2.10 and Figure 2.11 display the top inbound truck commodities by tonnage and value, respectively. These are commodities that come from other locations by truck and end in Arkansas. In 2019, the top commodity by weight was other prepared foodstuffs, which includes fats and oils, with over 3 million tons shipped by truck. This is expected to change by 2050 when the top commodity is expected to become basic chemicals, increasing by about 300 percent from 2.5 million tons in 2019 to 7.5 million tons in 2050.

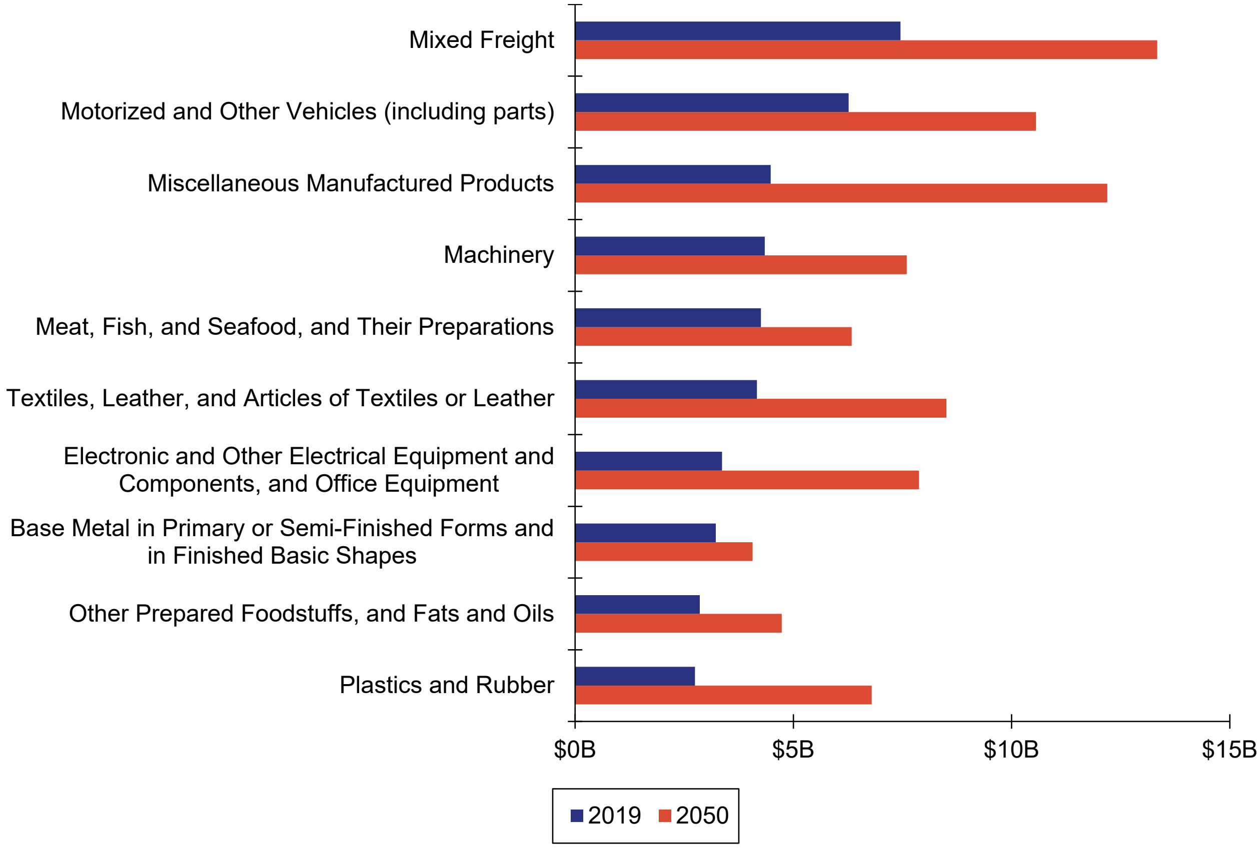
By value, mixed freight, also known as containerized freight, ranked highest in 2019 and is expected to rank highest in 2050, with about $7.5 billion and $13 billion shipped in those years, respectively. The other two top commodities by value in both years are motorized vehicles (including parts), and miscellaneous manufactured products. A complete list of commodity codes, definitions and descriptions are available in Section 2.5.

Figure 2.10 Top Inbound Truck Commodities by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.11 Top Inbound Truck Commodities by Value, 2019 and 2050

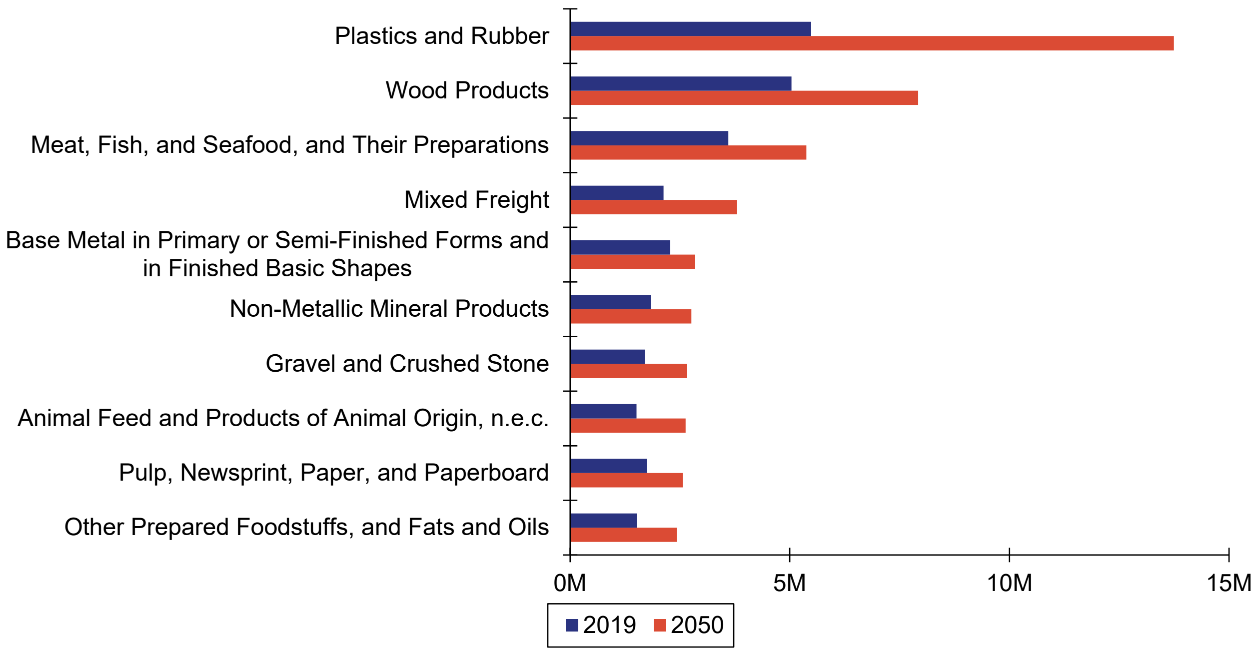


Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.12 and Figure 2.13 display the outbound truck commodities by tonnage and value, respectively. These are commodities that start in Arkansas and end in another location. In both 2019 and 2050, the top three outbound commodities are plastics and rubber; wood products; and meat, fish, and seafood. All are expected to grow steadily from between 3 million and 5 million tons to their 2050 totals, but outbound plastics and rubber shipments are projected to increase the most, more than doubling from 5.5 million tons to almost 14 million tons.

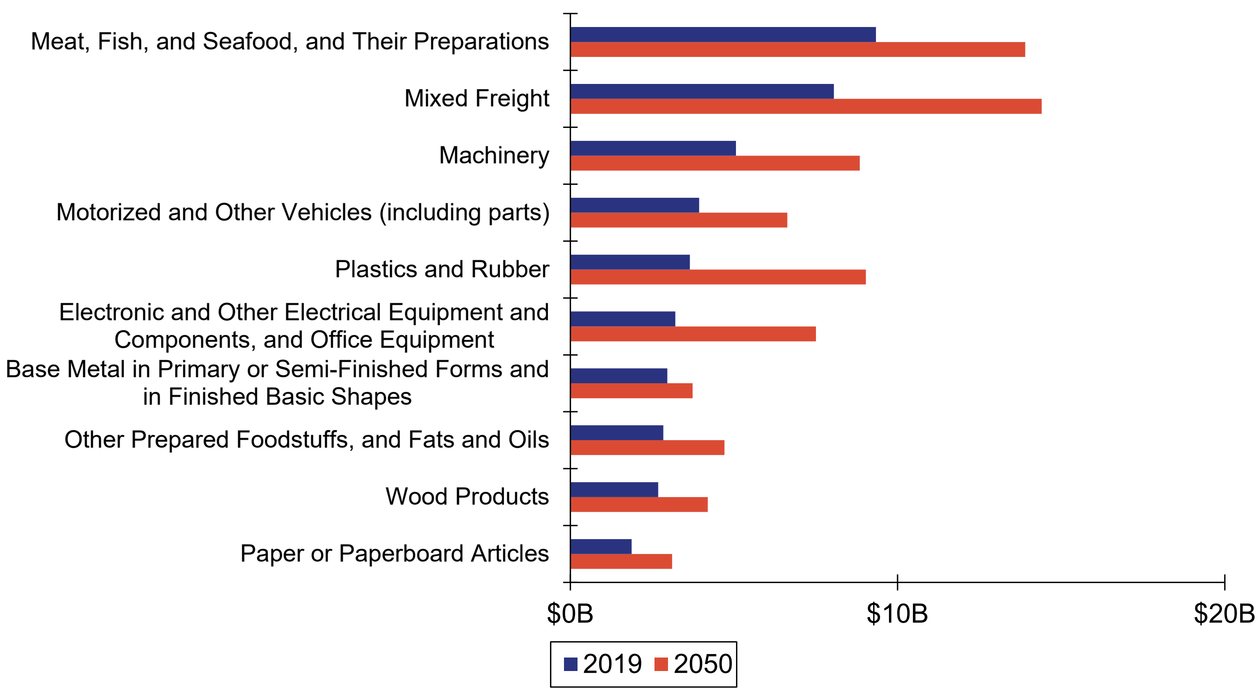
By value, the top commodity in 2019 is meat, fish, and sea food with almost $9.5 billion in outbound shipments, but the top commodity is projected to change in 2050 to mixed freight with over $14 billion, mirroring the top inbound commodity by value.

Figure 2.12 Top Outbound Truck Commodities by Tonnage, 2019 and 2050



Source: FAF5.2, Analysis by Cambridge Systematics, 2021.

Figure 2.13 Top Outbound Truck Commodities by Value, 2019 and 2050



Source: FAF5.2, Analysis by Cambridge Systematics, 2021.

For intrastate volumes, the top three commodities include logs and other wood in the rough, gravel and crushed stone, and natural sands. When combined, they account for around half of top ten products in 2019. This trend is expected to continue to 2050, with the largest volume growth attributed to logs and other wood in the rough from 21 million tons to 32 million tons.

By value, mixed freight and live animals and fish ranked as the top two commodities in 2019 accounting for $13 billion in intrastate shipments. By 2050, the value of live animals and fish shipments is expected to increase to $19 billion, surpassing projections for mixed freight valued at $12 billion.

In 2019, top commodities for through-state shipments includes plastics and rubber, other prepared foodstuffs and fats and oils, and base metal in primary and semi-finished forms. Their combined weight totals 32 million tons or 38 percent of overall through volumes. By 2050, the top three commodities are expected to shift, with plastics and rubber, base chemicals, and chemical products and preparation (not elsewhere classified [n.e.c.]) projected to comprise the top three commodities.

In terms of value, the top three through-state shipments in 2019, consisting of electronic and other electrical equipment and components, motorized and other vehicles, and machinery, accounted for $221 billion. By 2050, the value of electronic and other electrical equipment and components is expected to still rank the highest at $202 billion, followed by pharmaceutical products and motorized and other vehicles.

2.1.2 Rail Freight Demand

This section examines freight flows moved across the state by intermodal and carload services[1]. Through shipments account for the bulk of Arkansas' rail flows for both tonnage and value. In 2019, total through flows reached 147 million tons representing three-quarters of total rail shipments. The majority of rail shipments were carload, while the share of intermodal volumes accounted for only 12 percent. The share of outbound and inbound volumes accounted for a respective 12 percent and 15 percent, primarily comprising of carload volumes. Intrastate rail shipments were negligible amounting for less than 1 percent of the total.

By 2050, rail shipment volumes are projected to grow for all directions, with the exception of inbound carload freight. Through carload volumes are expected to experience the highest growth, with a projected increase of 21 million tons, followed by outbound carload flows (9 million tons) and through intermodal flows (8 million tons). Figure 2.14 provides the breakdown of rail volumes by carload and intermodal for 2019 and 2050.

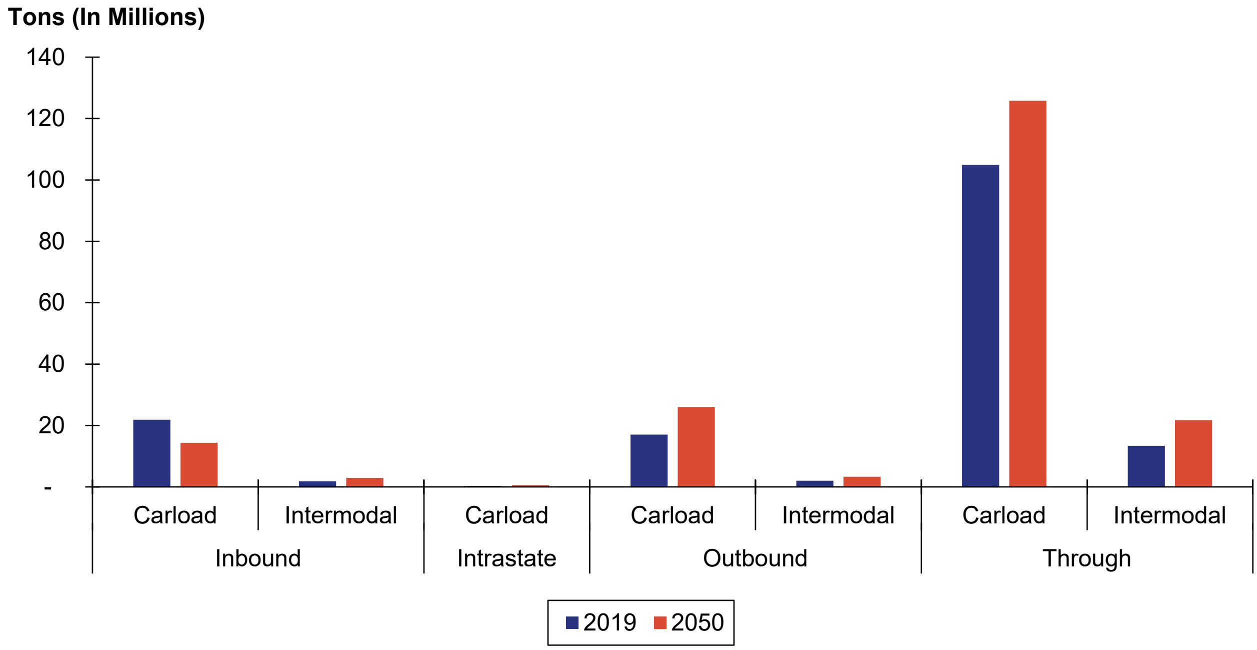
Through flows accounted for 76 percent of the total value of rail shipments in 2019. Intermodal flows were valued higher than carload freight, despite much lower intermodal volumes. The value of through intermodal and carload flows totaled $121 million and $115 million, respectively. Similarly, total outbound flows were valued at $36 million, of which intermodal flows contributed $21 million. Total values of inbound rail flows were $29 million, of which intermodal and carload accounted for $20 million and $9 million, respectively.

By 2050, the value of rail freight is projected to increase by 61 percent. The highest growth in value is expected for intermodal movements at $89 million. Other notable increases include through carloads ($44 million),

[1] Carload traffic refers to various types of railcars used to primarily, but not exclusively, transport bulk commodities such as aggregates, grain, or coal. This includes hopper cars, tank cars, flat cars, box cars, and gondolas. Intermodal traffic refers to containerized units able to be double-stacked for rail transport, and directly transferred to other modes, including truck and vessel. Intermodal traffic consists of a wide range of commodities, primarily in finished or intermediate stages of production, including automobile parts, equipment, packaged food, toys, and various household and everyday items.

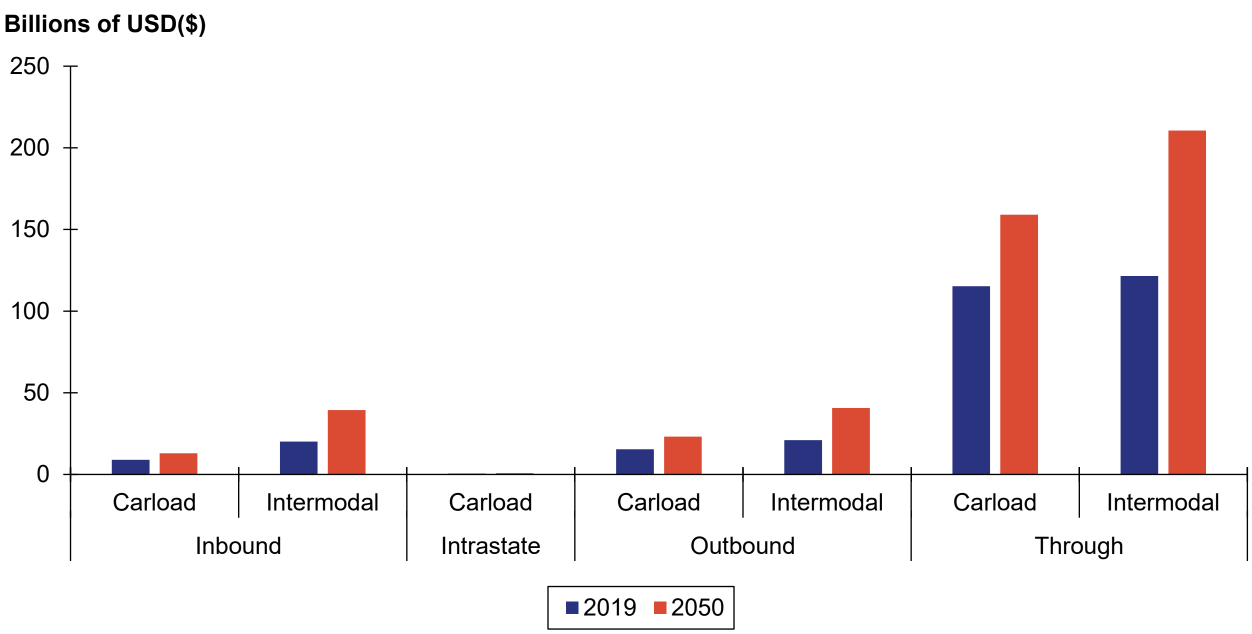
outbound intermodal ($20 million), and inbound intermodal ($19 million). Figure 2.15 shows the breakdown of rail value by carload and intermodal for 2019 and 2050.

Figure 2.14 Freight Direction for Rail by Tonnage, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill, Analysis by Cambridge Systematics, 2021.

Figure 2.15 Freight Direction for Rail by Value, 2019 and 2050



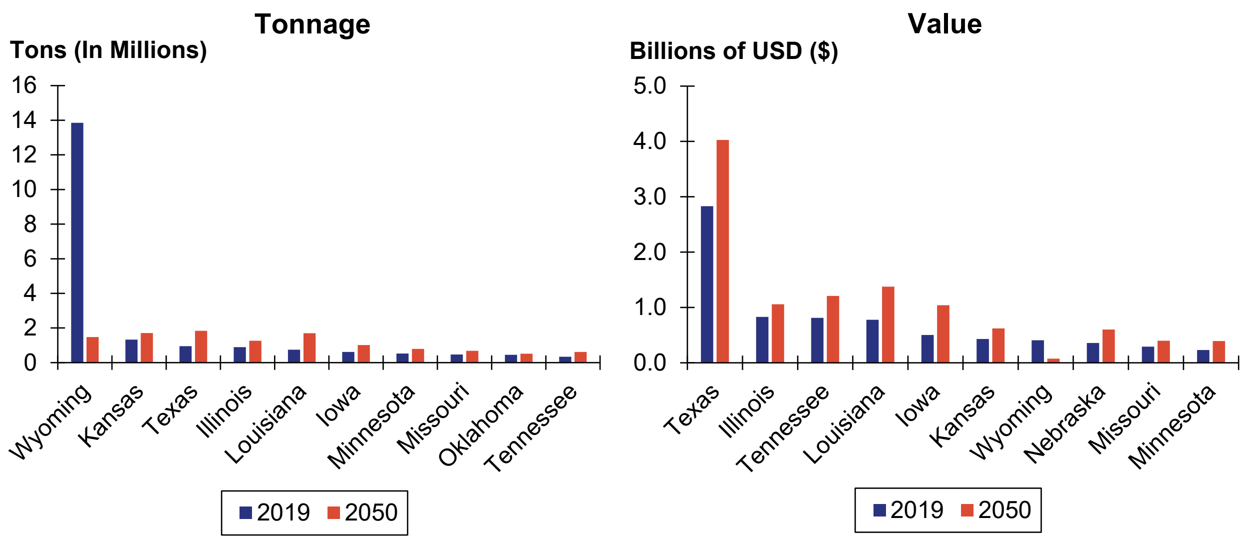
Source: FAF5.2 and 2019 Carload Waybill, Analysis by Cambridge Systematics, 2021.

Top Carload Trading Partners

Wyoming was ranked as the top trading partner for inbound carload volumes, accounting for 68 percent of total inbound movements in 2019. Shipments from neighboring states amounted to 26 percent of inbound carload volumes, of which Kansas and Texas accounted for almost half. At the same time, Texas was the top partner in terms of trade value, contributing to 38 percent of the total value of inbound shipments. Illinois and Tennessee ranked second and third, each accounting for 11 percent of the inbound movements. In comparison, Wyoming's inbound carload contributed to only 5 percent of the total value, ranking seventh among top trading partners by value.

By 2050, inbound carload tonnage is projected to decline by 42 percent mainly due to a decrease in shipments from Wyoming. Subsequently, Texas, Kansas and Louisiana are expected to rank as top three inbound trading partners accounting for 45 percent of total volumes. Despite the projected decrease in tonnage, the value of inbound carload is projected to increase over the next 30 years. Texas is expected to continue to account for the highest share of value, while Louisiana is expected to rank second followed closely by Tennessee. Figure 2.16 shows the top trading partners for inbound carload shipments by tonnage and value for 2019 and 2050.

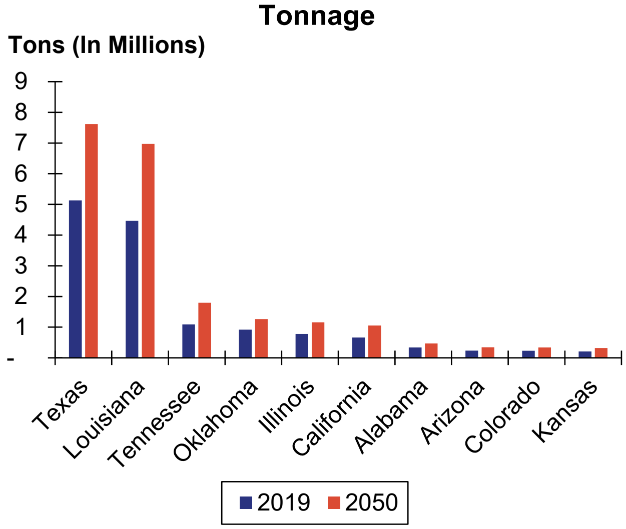
Figure 2.16 Top Trading Partners by Tonnage and Value for Inbound Carload, 2019 and 2050

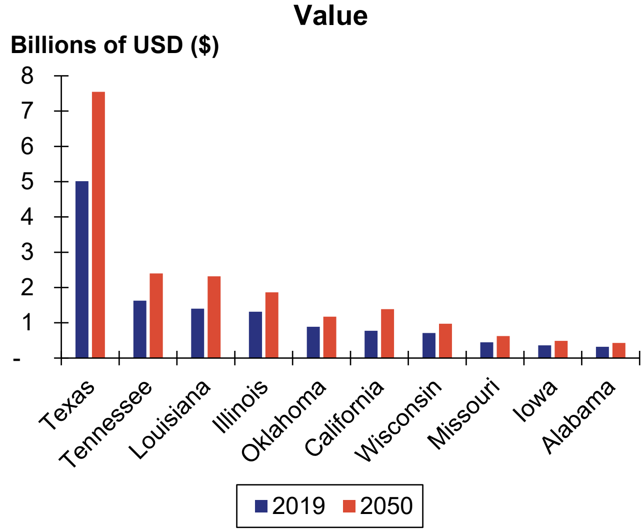


Source: FAF5.2 and 2019 Carload Waybill, Analysis by Cambridge Systematics, 2021.

Texas and Louisiana received the largest volumes of Arkansas' outbound carload movements. In 2019, Texas accounted for 37 percent of the overall share, while Louisiana's share was 32 percent. By 2050, outbound flows to these states are projected to grow, but their combined share will remain the same. In terms of value, Texas ranks as the top outbound partner. Tennessee is ranked second, contributing 13 percent of the total value of outbound flows, followed by Louisiana with 11 percent. Over the next 30 years, the largest growth in value for outbound carload flows will originate from Texas. Figure 2.17 shows the top trading partners for outbound carload shipments by tonnage and value for 2019 and 2050.

Figure 2.17 Top Trading Partners by Tonnage and Value for Outbound Carload, 2019 and 2050



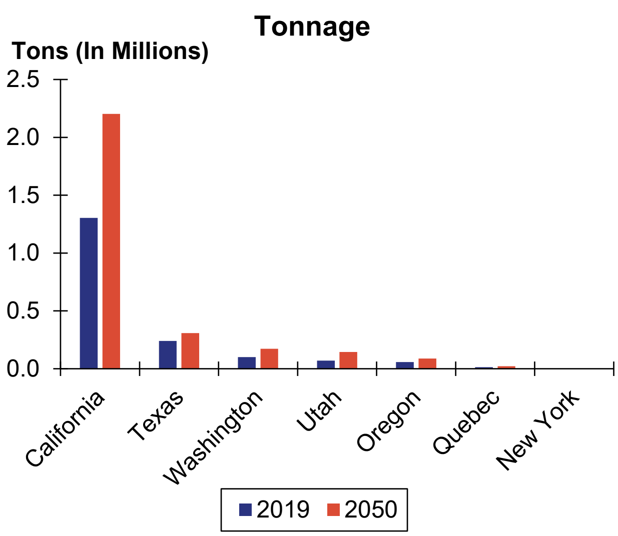


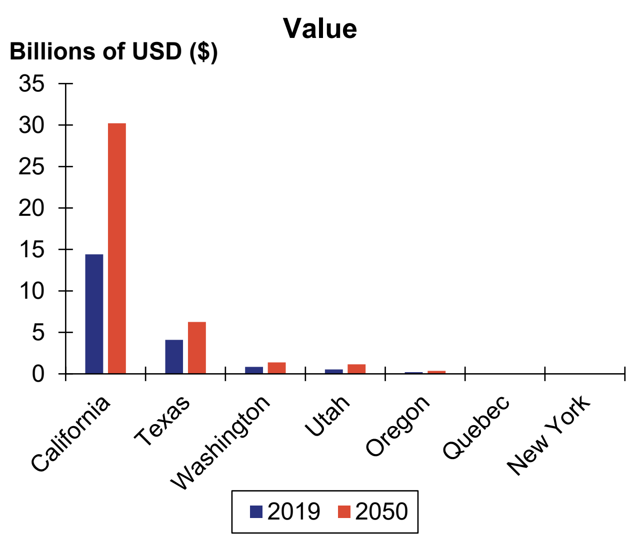
Source: FAF5.2 and 2019 Carload Waybill, Analysis by Cambridge Systematics, 2021.

Top Intermodal Trading Partners

For inbound intermodal trade, California was the top trading partner, contributing 73 percent of total volume and 72 percent of total value in 2019. Ranking second was Texas, with 13 percent of total volume and 20 percent of total value. The remaining states accounted for less than one-fifth of the share of tonnage and value. By 2050, inbound intermodal freight is expected to increase from all origin states with 78 percent growth in volume and 82 percent growth in value originating from California. Figure 2.18 shows the top trading partners for inbound intermodal shipments by tonnage and value for 2019 and 2050.

Figure 2.18 Top Trading Partners by Tonnage and Value (Inbound Intermodal), 2019 and 2050

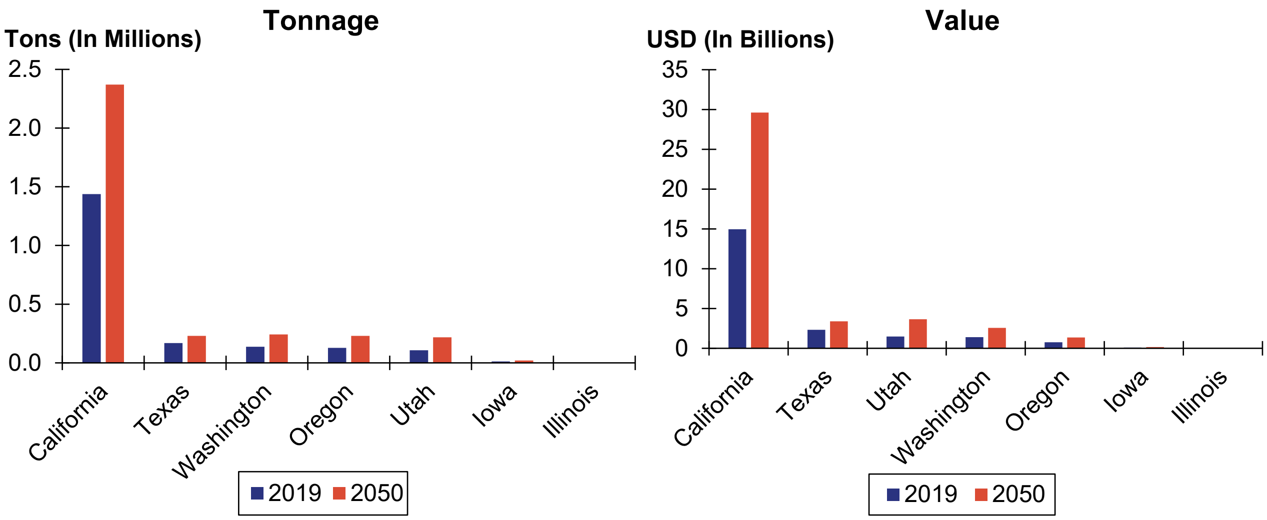




Source: FAF5.2 and 2019 Carload Waybill, Analysis by Cambridge Systematics, 2021.

California was the top trading partner for outbound intermodal shipments, accounting for almost three-quarters of the total volume and value in 2019. Texas ranked second for both value and volume accounting for 8 percent and 11 percent, respectively. By 2050, similar trends are expected to continue as shipments to California will dominate outbound intermodal freight. The rest of outbound flow volumes will be evenly distributed between Texas, Washington, Oregon, and Utah. Utah and Texas are expected to rank second and third in terms of value accounting for 9 percent and 8 percent of the total, respectively. Figure 2.19 shows the top trading partners for outbound intermodal shipments by tonnage and value for 2019 and 2050.

Figure 2.19 Top Trading Partners by Tonnage and Value for Outbound Intermodal, 2019 and 2050



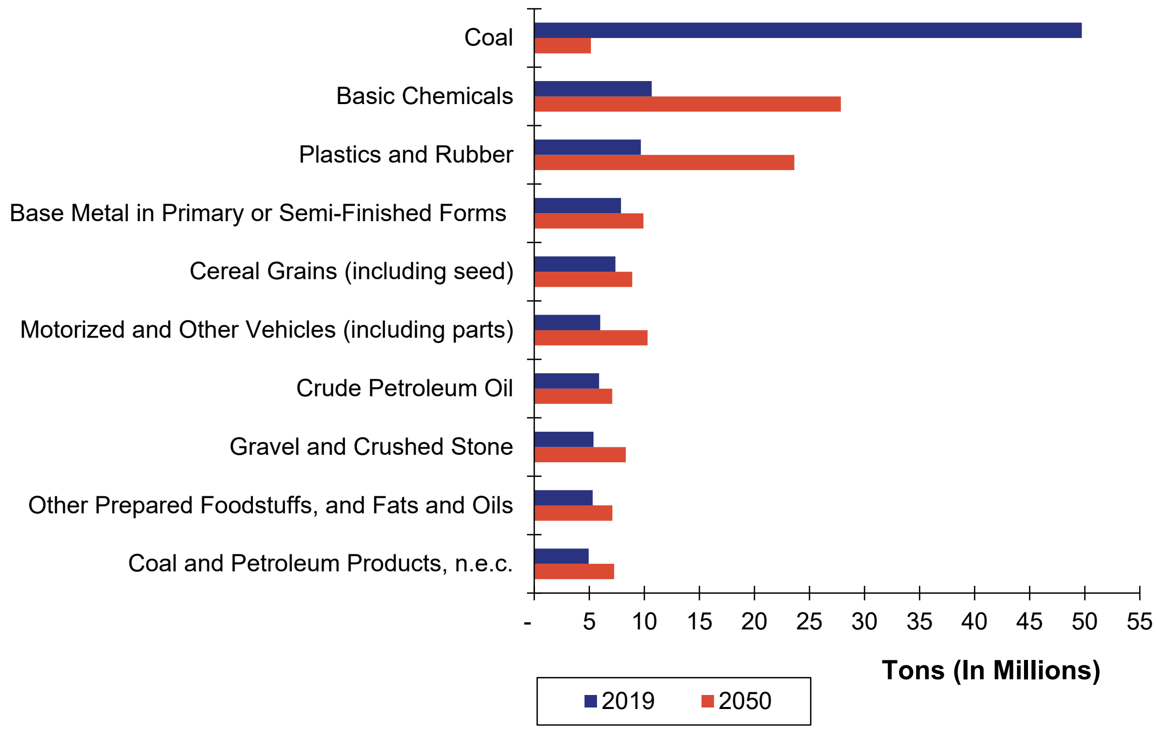
Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

Top Commodities Moved by Rail

Coal, basic chemicals, and plastic and rubber were the top three products shipped via carload on Arkansas' rail. These three commodities comprised of almost half of the total volume in 2019. For inbound shipments, the volume of top ranking commodities—coal, cereal and grains, and waste and scrap—amounted to 16.7 million tons. While top three outbound shipments totaled 9.4 million tons and comprised of gravel and crushed stone, base metal in primary and semi-finished forms, and pulp, newsprint and paper and paperboard. The most significant throughflow shipments were coal, basic chemicals, and plastic and rubber, with a combined volume of 54.3 million tons.

By 2050, significant contractions in coal are projected to result in a decreased share from 34 percent to 3 percent of the total carload volumes. Subsequently, basic chemicals (27.8 million tons), plastic and rubber (23.6 million tons), and motorized and other vehicles (10.3 million) are projected to be the top commodities. Figure 2.20 provides the top rail commodities by volume for carload services for 2019 and 2050.

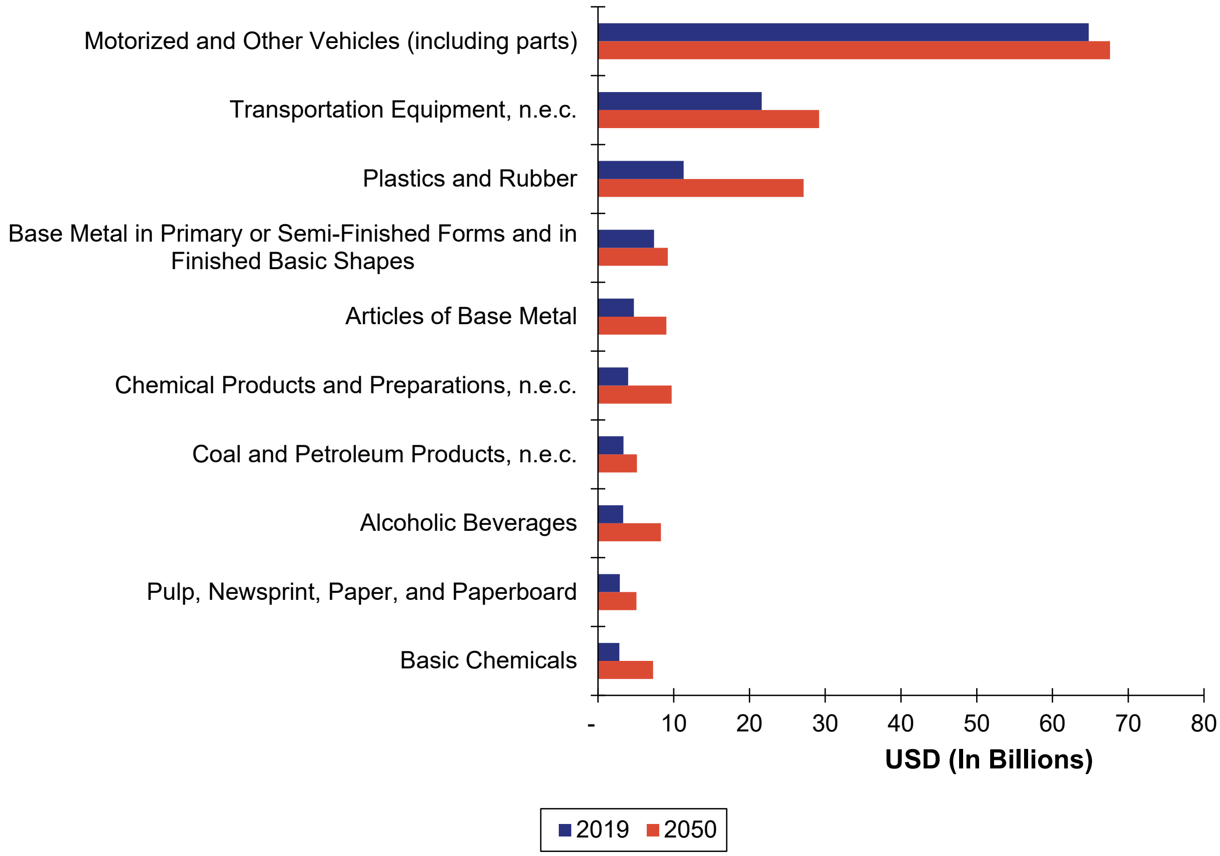
Figure 2.20 Top Rail Commodities by Tonnage (Carload), All Directions, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

In terms of carload shipment values in 2019, the top three commodities were valued at a total of $98 million. Motorized and other vehicles accounted for almost half of overall value, followed by transportation equipment n.e.c. (15 percent) and plastic and rubber (8 percent). By 2050, the total value of carload shipments is projected to rise by 40 percent, with sizeable increases in plastics and rubber shipments ($16 million), transportation equipment n.e.c. ($8 million), and chemical products and preparations ($6 million). Nonetheless, the top three commodities in 2019 will continue to dominate through 2050, being projected to increase in value to $124 million. Figure 2.21 provides the top rail commodities by value for carload services for 2019 and 2050.

Figure 2.21 Top Rail Commodities by Value (Carload), All Directions, 2019 and 2050

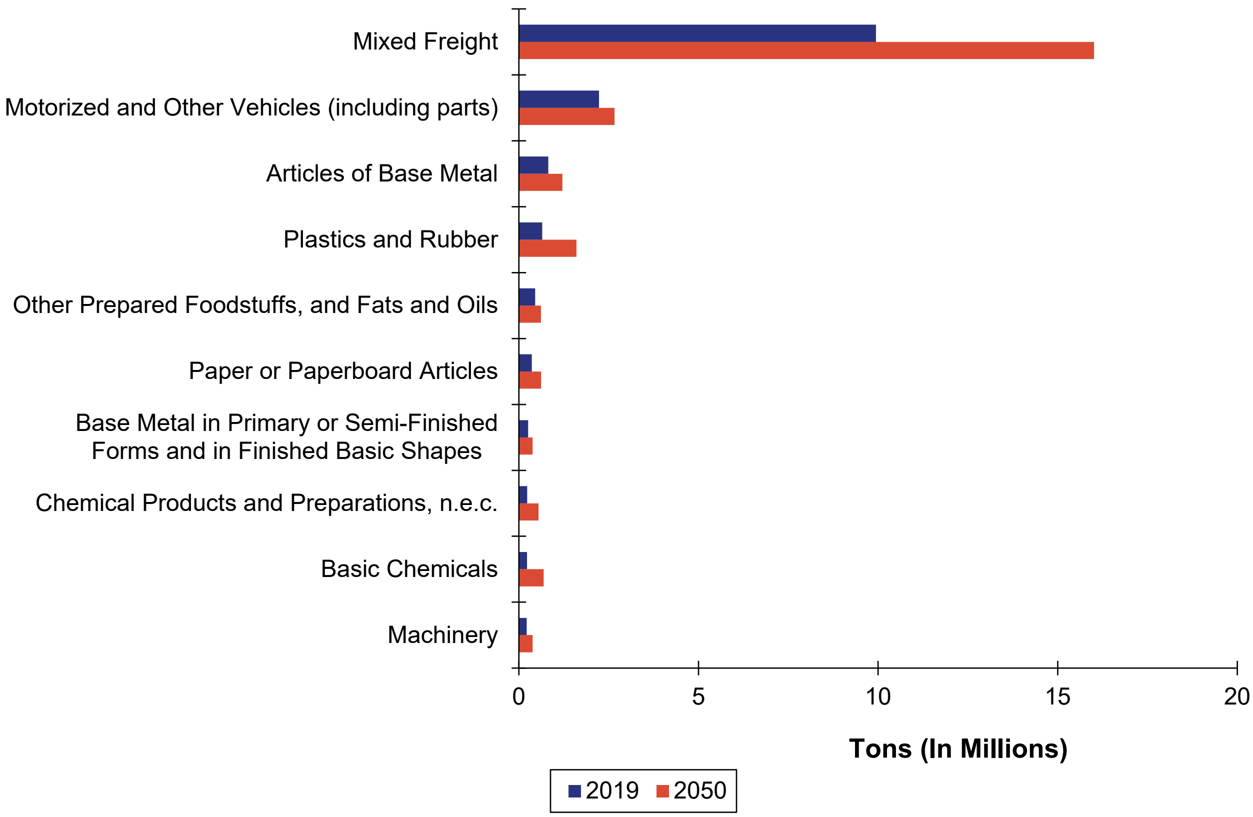


Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

Mixed freight and motorized and other vehicles were the top commodities shipped via intermodal services in 2019, amounting to 19 million tons valued at $106 million. In 2019, mixed freight accounted for 58 percent of volume and 42 percent of the value of intermodal shipments. Motorized and other vehicles represented only 13 percent of intermodal volumes and 22 percent of intermodal value. These two commodities also ranked first and second at the disaggregated level for inbound, outbound, and through movements.

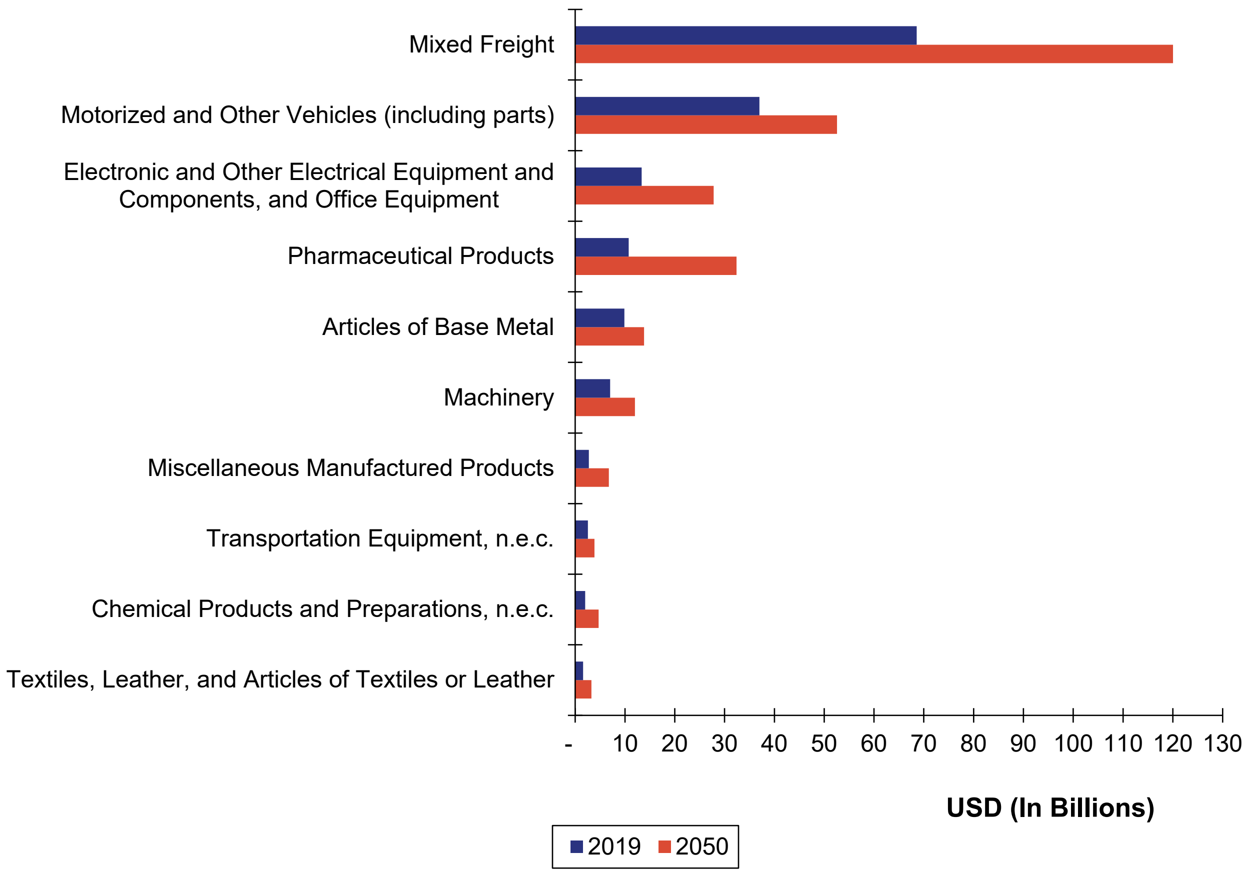
Growth projections indicate that the top performing commodities will remain the same through 2050, with volumes of 12 million tons worth $173 million. Figure 2.22 and Figure 2.23 provide the top rail commodities by tonnage and value for intermodal services for 2019 and 2050.

Figure 2.22 Top Rail Commodities by Tonnage (Intermodal), All Directions, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

Figure 2.23 Top Rail Commodities by Value (Intermodal), All Directions, 2019 and 2050



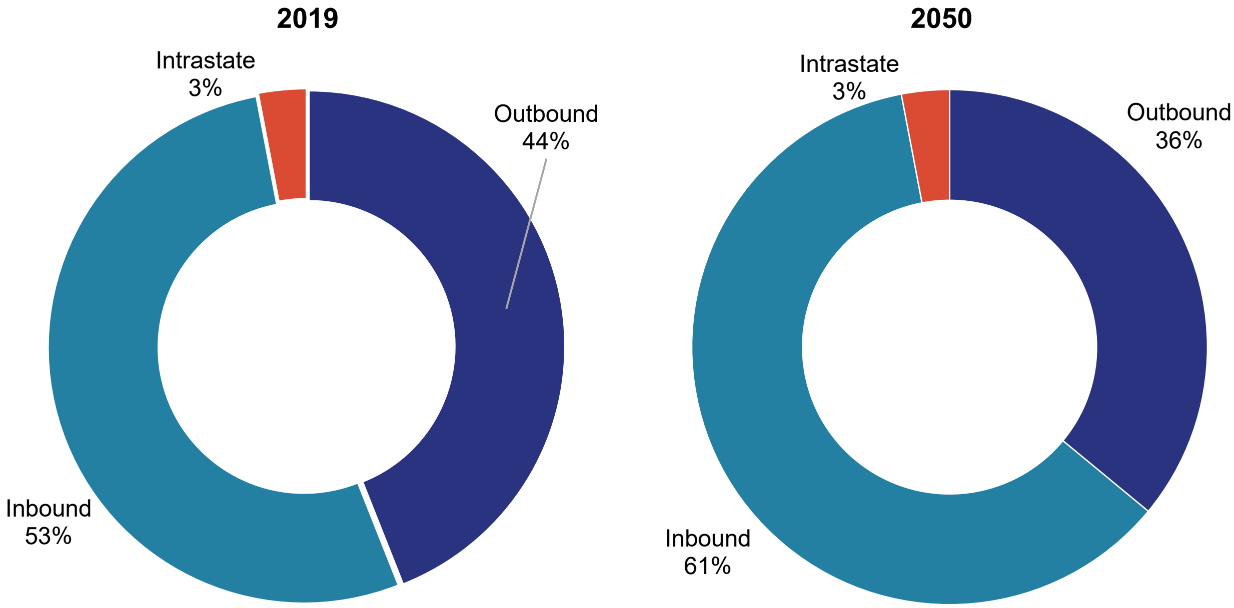
Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

2.1.3 Waterway Freight Demand

This section examines Arkansas' freight flows moved on its waterway systems. As noted in elsewhere in this State Freight Plan, there are known challenges in collecting commodity flow data on waterways, so the data reported here should be understood as the best publicly available information and that actual volumes and values may differ from reported volumes and values.

In 2019, an estimated 8 million tons of freight were shipped via Arkansas waterways, valued at nearly $3 billion. By 2050, waterway tonnage is expected to increase to 9 million tons of freight worth a little over $4 billion. Figure 2.24 shows the direction of movement by tonnage. For both 2019 and 2050, over 95 percent of freight shipped via water is comprised of inbound and outbound movements. Intrastate movements, which reflect freight shipping that start and end in Arkansas, accounted for only 3 percent freight shipped by water.

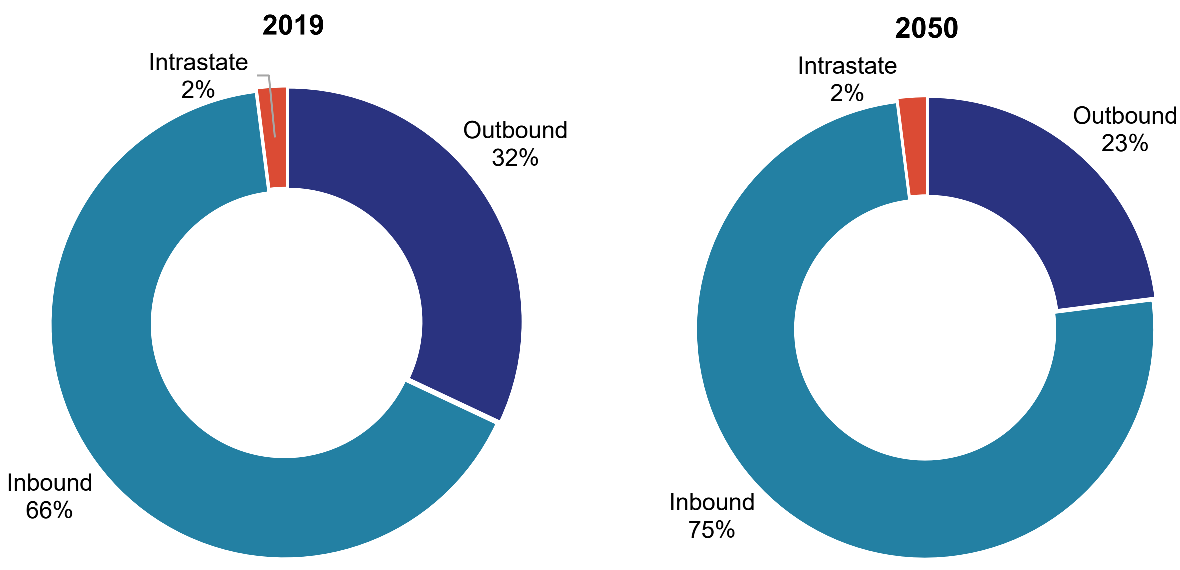
Figure 2.24 Annual Arkansas Waterway Tonnage, 2019 and 2050



Source: FAF5.2; Analysis by Cambridge Systematics, 2021.

With intrastate accounting for only 2 percent of waterway freight value, the remainder comprised of inbound (32 percent) and outbound flows (66 percent) in 2019. By 2050, the share of inbound flows is projected to increase to 75 percent, while outbound flows will contract to 23 percent. Figure 2.25 shows the value of Arkansas waterway flows by direction for 2019 and 2050.

Figure 2.25 Annual Arkansas Waterway Value, 2019 and 2050



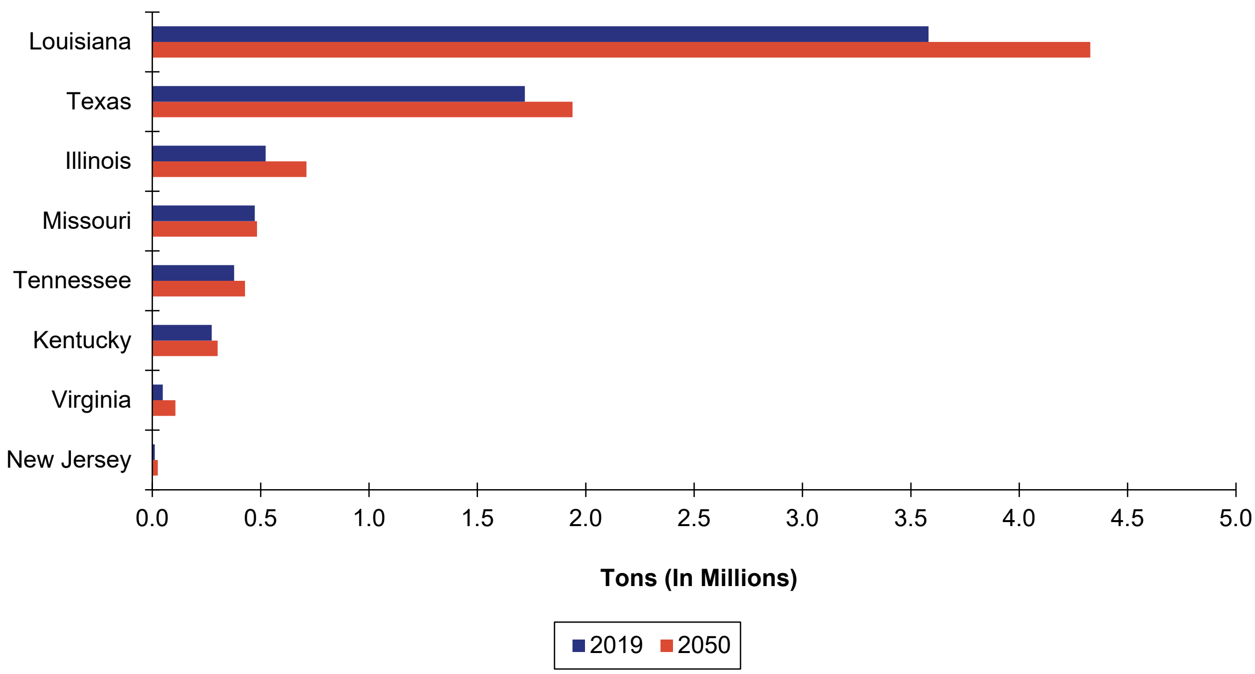
Source: FAF5.2; Analysis by Cambridge Systematics, 2021.

Top Waterway Trading Partners

Figure 2.26 and Figure 2.27 display Arkansas' top domestic waterway trading partners by tonnage and value, respectively. Arkansas' trade with Louisiana features prominently—contributing almost 3.6 million tons in 2019 and projected to exceed 4 million tons by 2050. Louisiana is a dominant trade partner as it serves as an import/export location for international goods. Texas and Illinois rank second and third in terms of waterway shipping volumes. Together, these three states account for more than three-quarters of Arkansas' freight shipped via water.

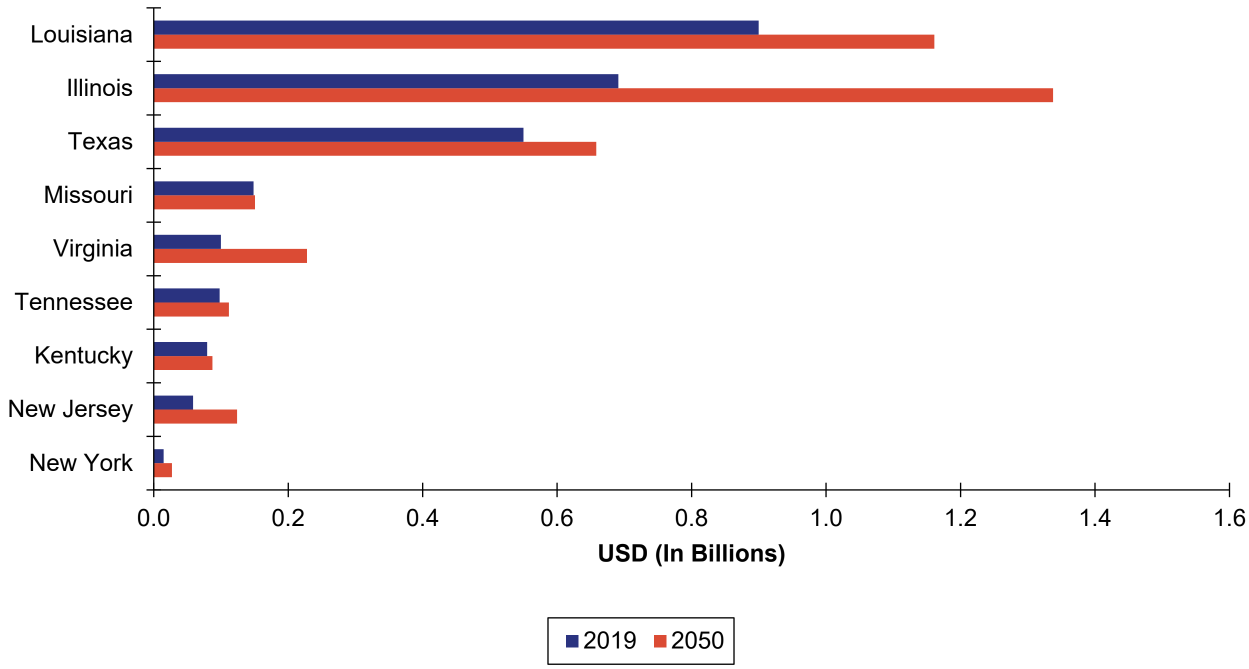
In 2019, value for waterway freight was the highest for Louisiana ($900 million), followed by Illinois and Texas. When combined, 77 percent of the value of freight shipped by water occurred with these top trading partners. By 2050, shipment from Illinois ($1.3 billion) is projected to exceed Louisiana ($1.1 billion). Despite this change, Arkansas top three trading partners for shipments by water are expected to remain the same in 2050.

Figure 2.26 Top Domestic Waterway Trading Partners by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.27 Top Domestic Waterway Trading Partners by Value, 2019 and 2050



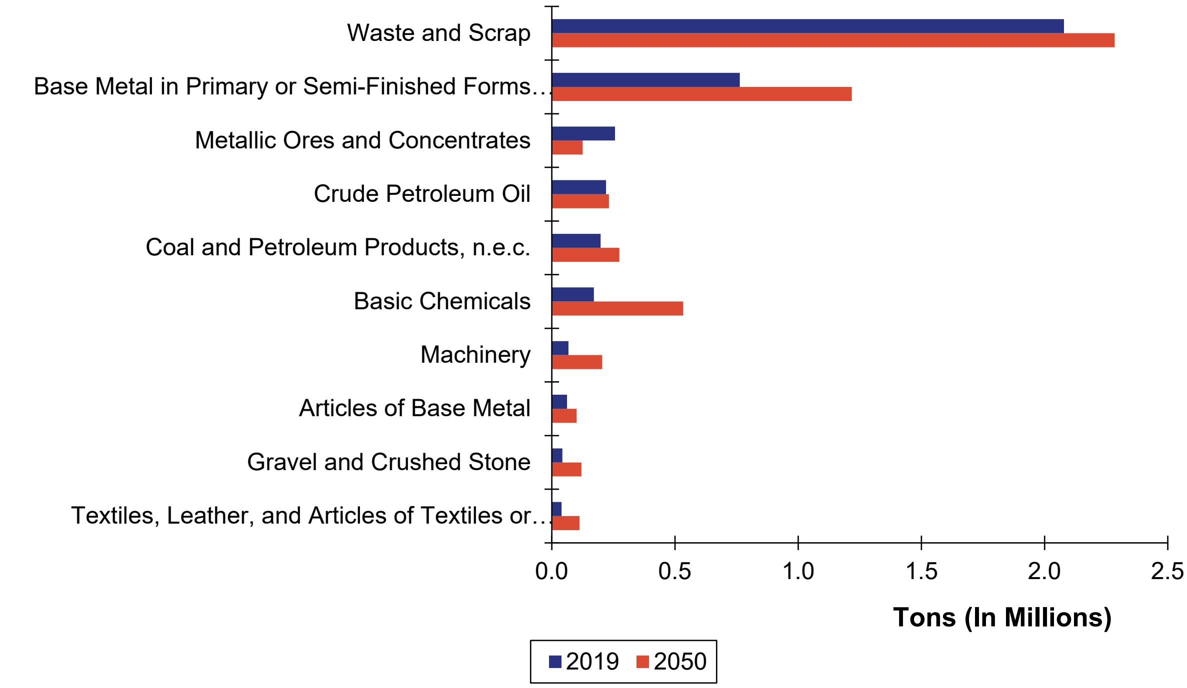
Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Top Commodities Moved by Water

Figure 2.36 and Figure 2.29 show the top inbound waterway commodities for tonnage and value, respectively. Two commodities, waste and scrap and base metals in primary or semi-finished form, account for over 70 percent of total inbound shipments moved by water during 2019. Their combined volumes are projected to increase from 2.8 million tons to 3.5 million by 2050.

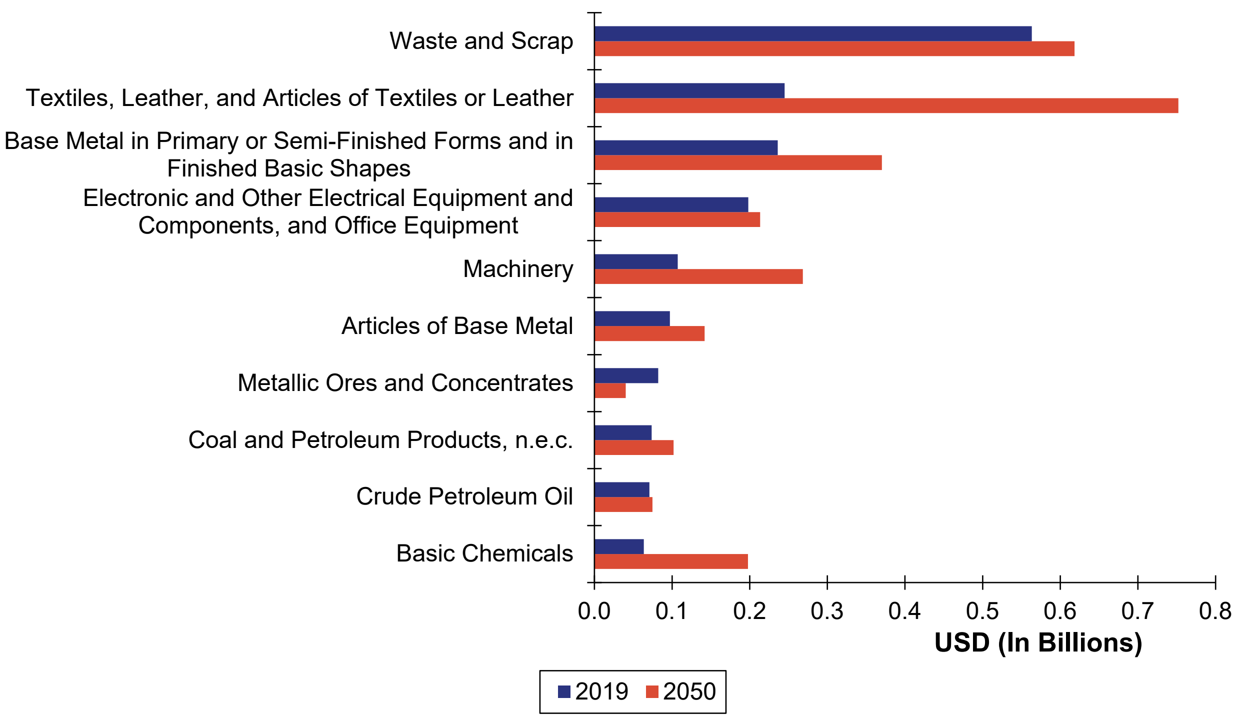
In terms of shipment values, waste and scrap ranked highest in 2019, valued at $0.5 billion, and expected to increase to $0.6 billion by 2050. The value of textiles, leather and articles of textiles and leather was the second highest in 2019. By 2050, this commodity group is projected to triple in value to $0.8 billion, to become the highest value commodity shipped by water.

Figure 2.28 Top Inbound Waterway Commodities by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.29 Top Inbound Waterway Commodities by Value, 2019 and 2050

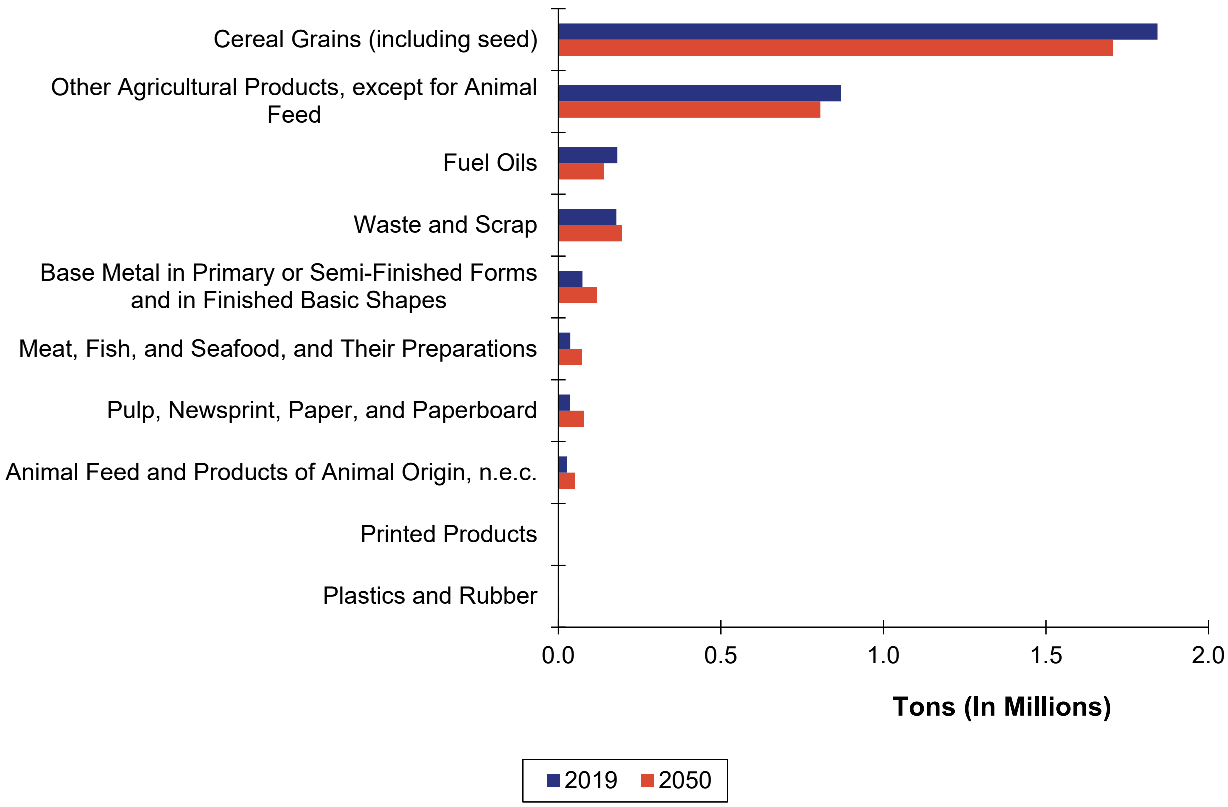


Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.30 and Figure 2.31 display the outbound waterway commodities by tonnage and value, respectively. In 2019, cereal and grains, other agricultural products and fuel oils accounted for almost 90 percent of outbound flows. By 2050, contractions in tonnage are projected for these items, while waste and scrap displaces fuel oils for third place among the top exports.

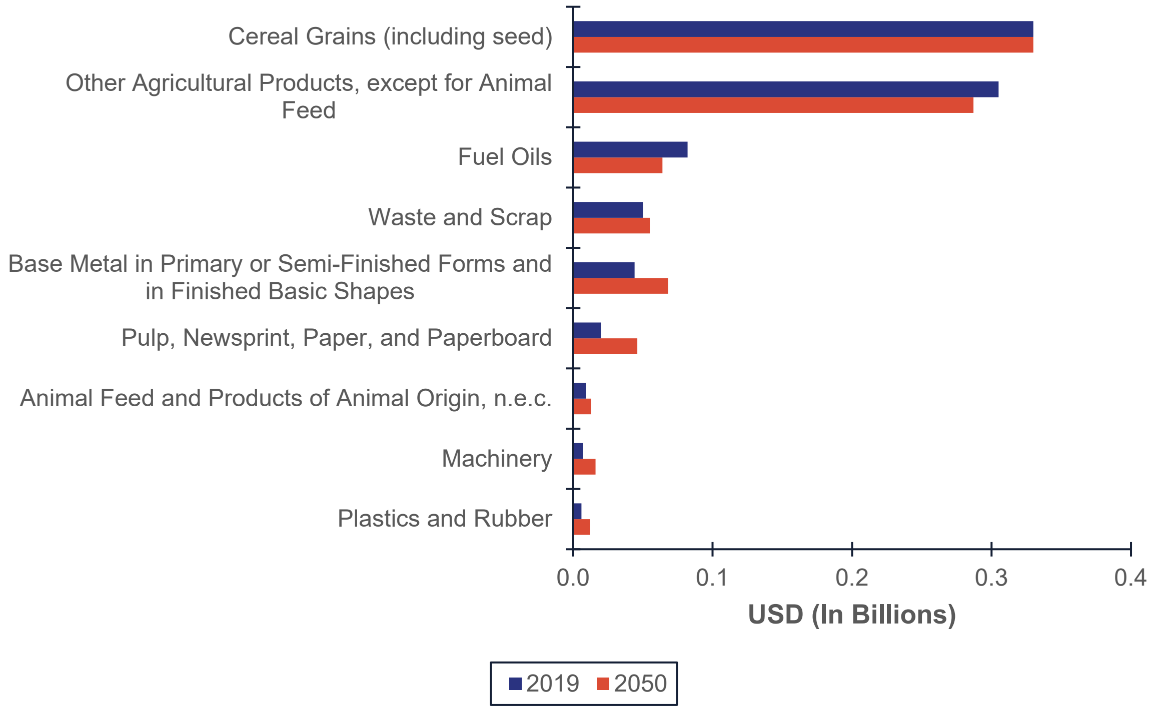
By value, cereal and grains, other agricultural products and fuel oils also ranked as the top three commodities, with combined shipments valued at $0.7 billion in 2019. Reductions in other agricultural products and fuel oils are expected to occur by 2050. In addition, higher shipping values for base metal in primary and semi-finished form are expected to result in an upward movement to the third highest commodity value, while fuel oils will rank fourth.

Figure 2.30 Top Outbound Waterway Commodities by Volume, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.31 Top Outbound Waterway Commodities by Value, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

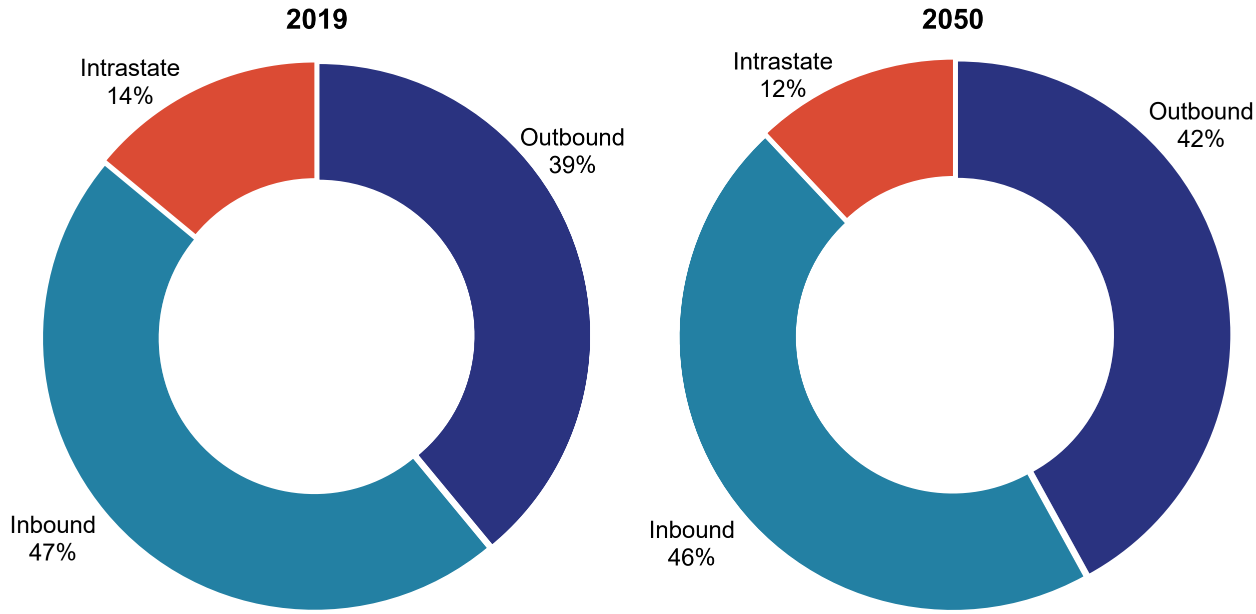
In 2019, waste and scrap was the main commodity transported via intrastate waterway, accounting for 97 percent of intrastate flows. By 2050, intrastate tonnage shipped by waterways is expected to increase by 10 percent, with waste and scrap maintaining its share throughout this period.

By value, waste and scrap also accounted for 97 percent of total intrastate shipments by waterway, worth $59 million in 2019. By 2050, shipments values are projected to grow proportionally to volume growth (10 percent).

2.1.4 Air Cargo Freight Demand

This section on Air Cargo Freight Demand provides an overview of Arkansas' freight flows moved by air. In 2019, approximately 25,000 tons of freight, valued at $2 billion, was shipped by air. By 2050, air freight is expected to double in volume to 51,000 tons and estimated at $4.7 billion in value. In terms of directional flows, inbound air shipments make up a little less than half of the total for 2019 and this is projected to continue in 2050. Outbound flows are the second largest accounting for 39 percent in 2019 and are projected to rise marginally to 42 percent by 2050. The remainder comprises of intrastate movements with 14 percent in 2019 and a projected 12 percent by 2050. Figure 2.32 provides the percent share of directional flows shipped by Arkansas air cargo carriers for 2019 and 2050.

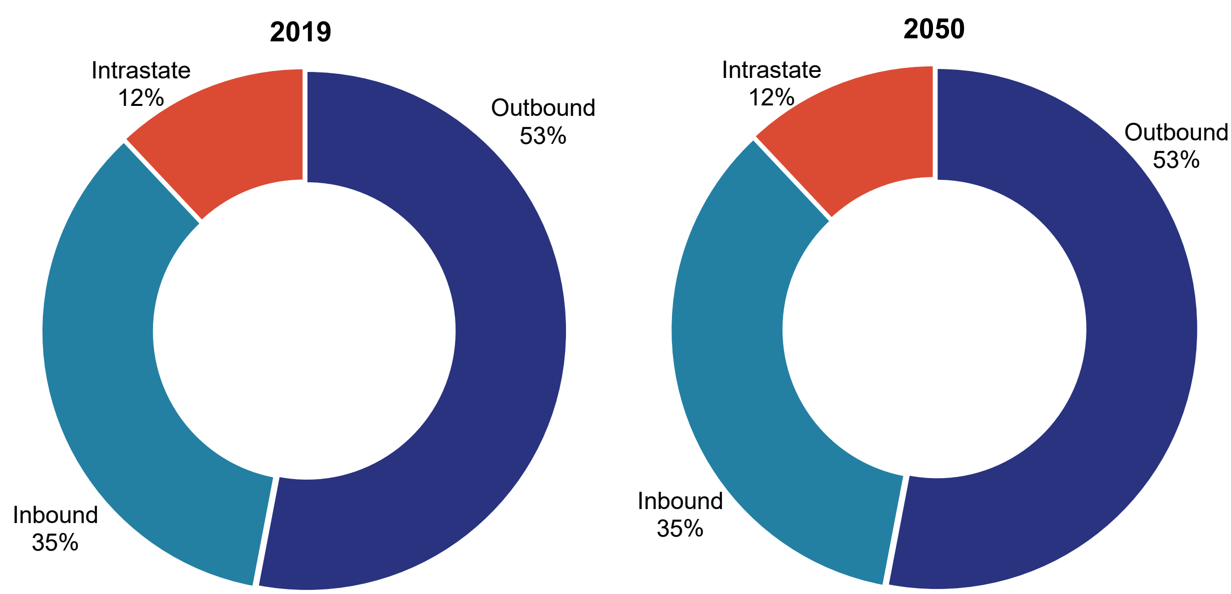
Figure 2.32 Annual Arkansas Air Cargo Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Inbound flows account for over 50 percent of the total value in 2019, and this is expected to continue in 2050. In 2019, the remainder was almost evenly split between outbound (24 percent) and intrastate (23 percent) flows. By 2050, the value of intrastate shipments is expected to exceed that of outbound goods. Figure 2.33 shows the value of Arkansas air cargo shipments for 2019 and 2050.

Figure 2.33 Annual Arkansas Air Cargo Value, 2019 and 2050

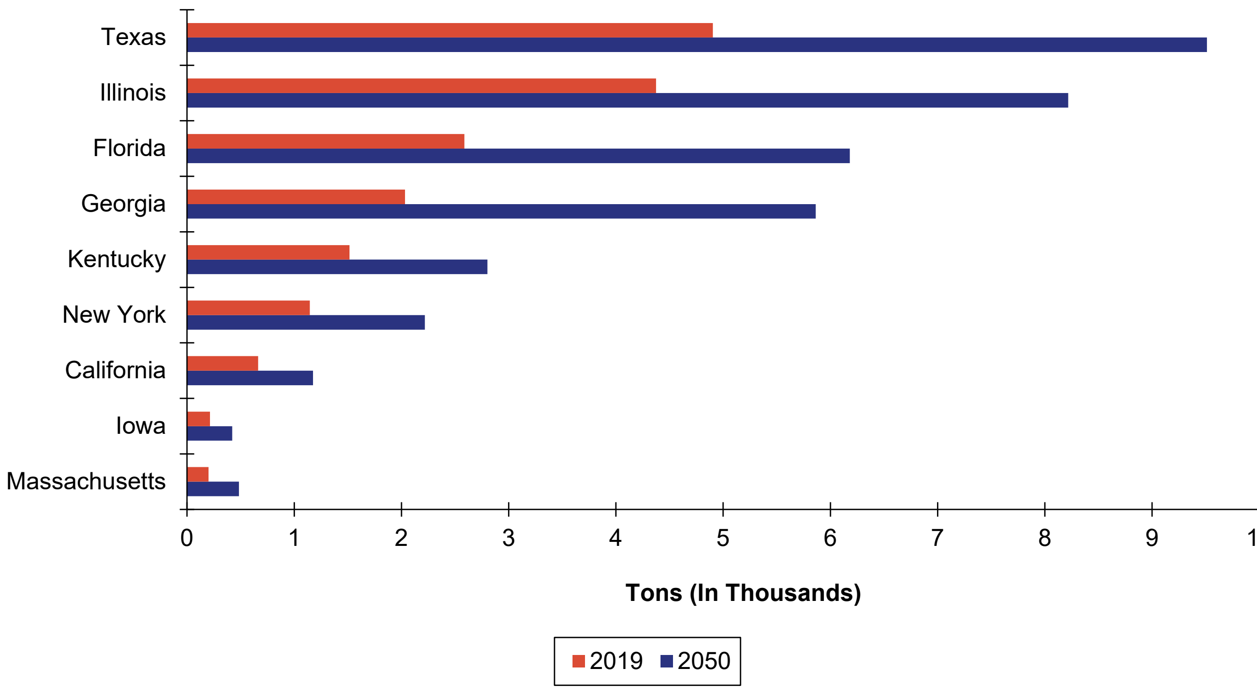


Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Top Air Cargo Trading Partners

Figure 2.34 shows Arkansas' top trading partners for air cargo shipments by tonnage. Of the top trading partners, Texas accounted for 20 percent of air cargo volumes. Other significant trade partners include Illinois, Florida, and Georgia. When combined, these states contribute to 56 percent of overall air shipments. By 2050, Arkansas' top trading partners are projected to remain the same, with Texas accounting for 19 percent of total tonnage.

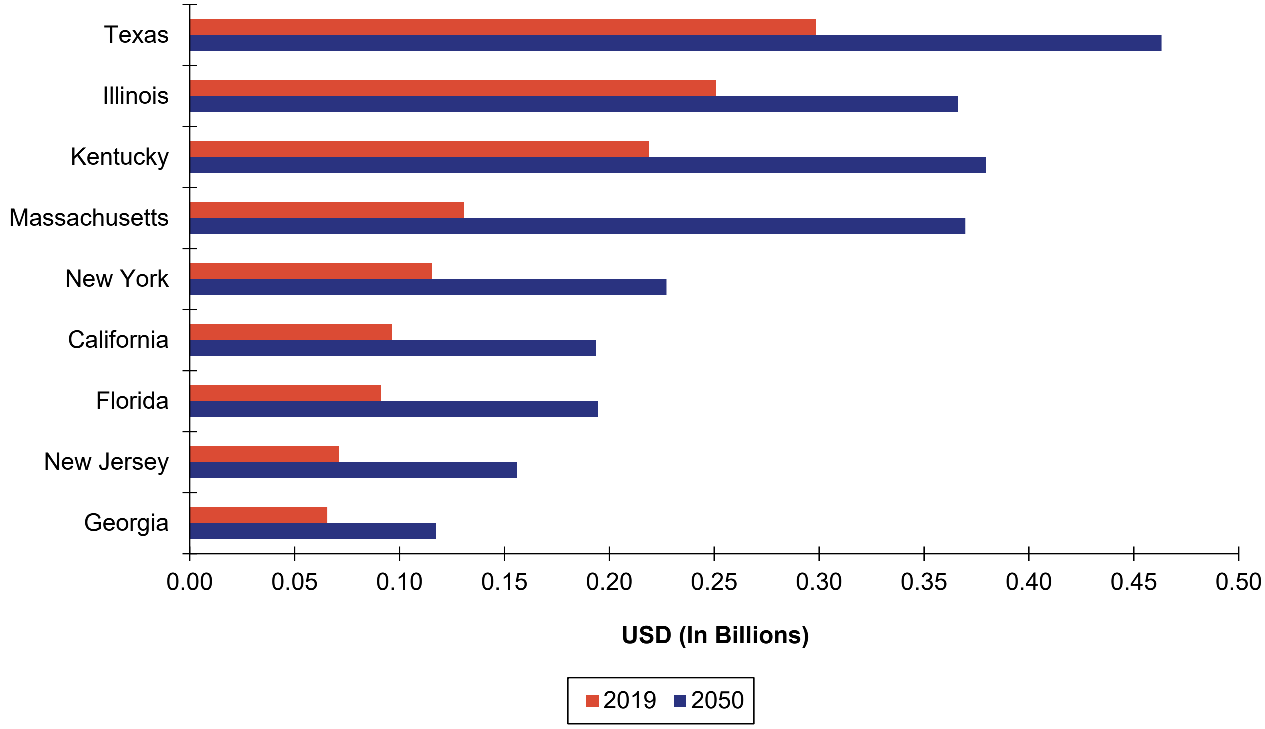
Figure 2.34 Top Domestic Air Cargo Trading Partners by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

For both 2019 and 2050, the value of shipments moved by air with Texas and Illinois were ranked the highest, mostly due to high shipment volumes. Other states with far lower volumes, such as Kentucky, Massachusetts, and New York, were also ranked among the top trading partners reflecting preferences to shipping high valued items via air. The shares of the air shipment values for these top five trading partners are projected to decline from 50 percent in 2019 to 39 percent by 2050. The most significant increases are expected to originate from Massachusetts, Texas, and Kentucky.

Figure 2.35 Top Domestic Air Cargo Trading Partners by Value, 2019 and 2050



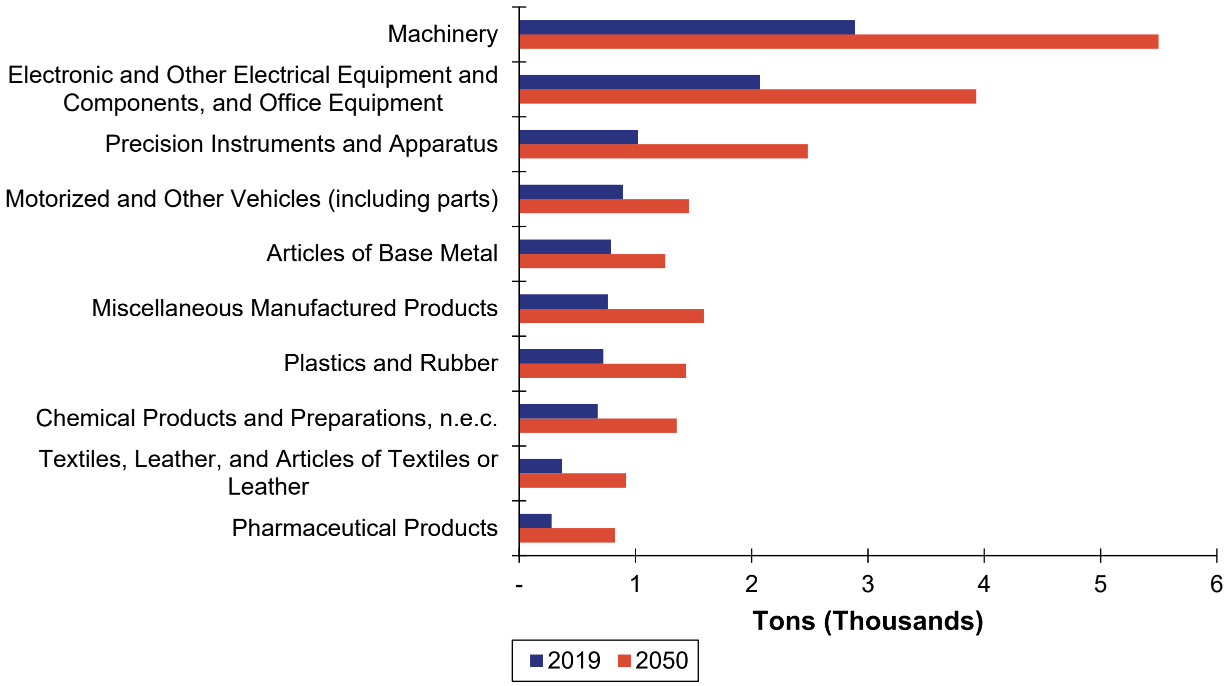
Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Top Commodities Moved by Air

For 2019, machinery, electronic and other electrical equipment, and precision instruments and apparatus were the most significant imports shipped via air into Arkansas. Together, they accounted for 6,000 tons or almost 25 percent of air cargo inbound flows. By 2050, these commodities are projected to remain the top three commodities shipped by air (by tonnage), as their volumes are expected double to 12,000 tons. Figure 2.36 shows Arkansas' top inbound air cargo commodities by tonnage for 2019 and 2050.

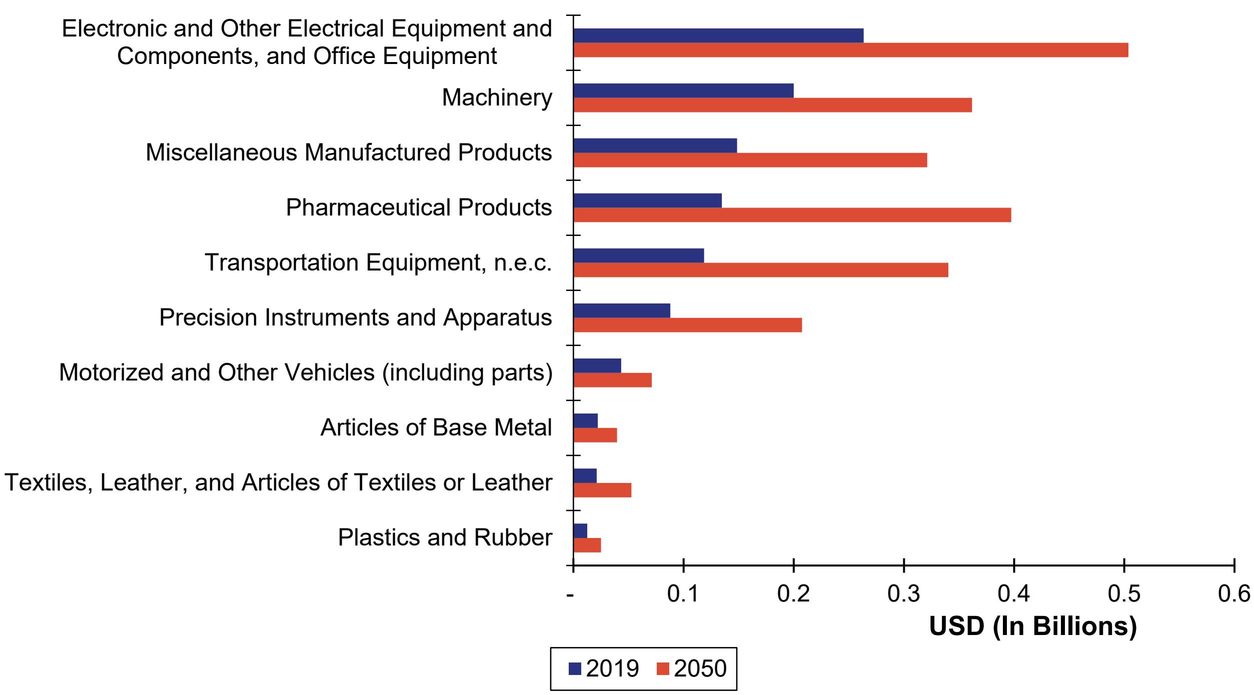
Electronic and other electrical equipment was identified as the commodity with the highest value of shipments totaling $263 million for 2019. By 2050, this commodity group is expected to maintain its position with growth projected at $504 million. Machinery and manufactured goods and miscellaneous manufactured products rank second and third, respectively, for both 2019 and 2050. Figure 2.37 provides Arkansas' top inbound air cargo commodities

Figure 2.36 Top Inbound Air Cargo Commodities by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.37 Top Inbound Air Cargo Commodities by Value, 2019 and 2050

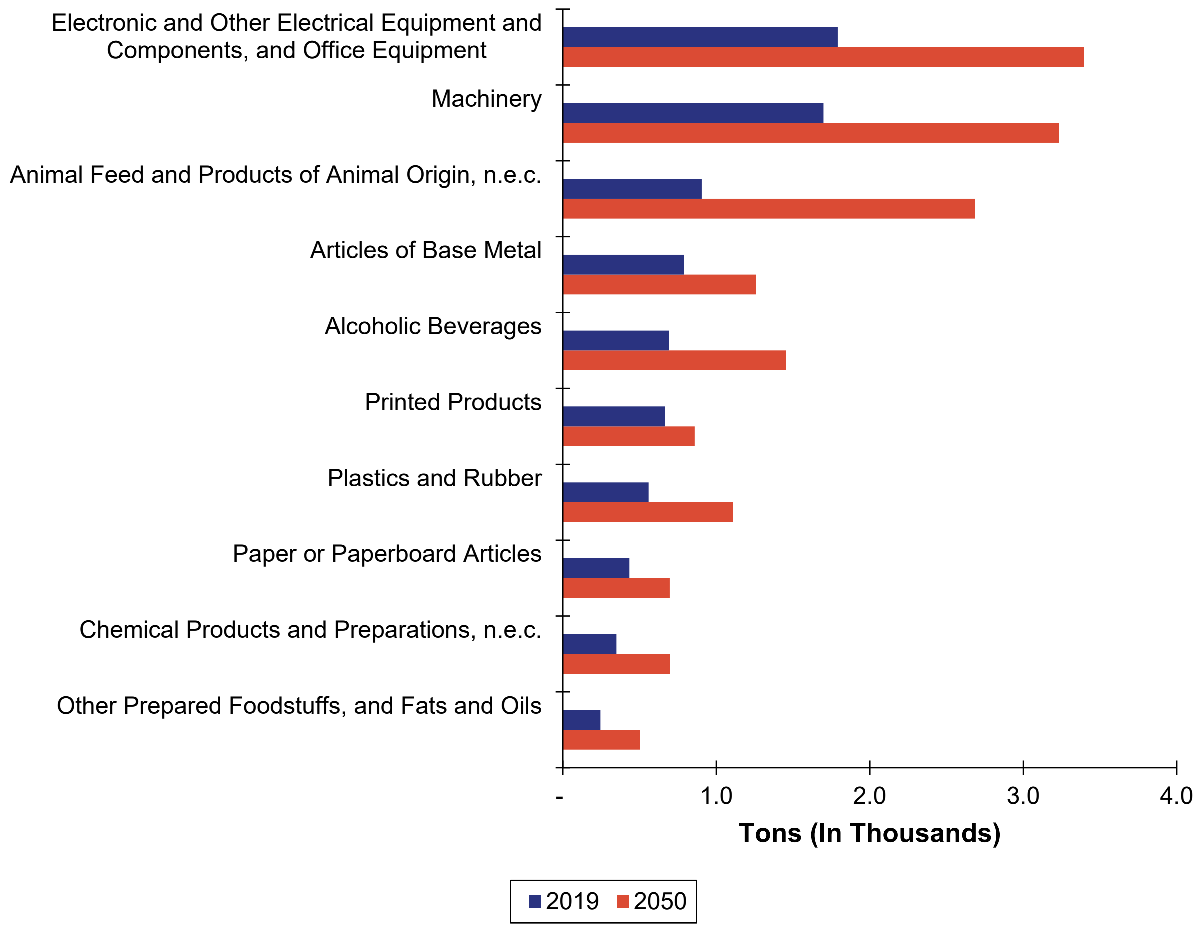


Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.38 displays the top outbound air cargo commodities by tonnage for 2019 and 2050. For both years, the top three outbound commodities are electronic and other electrical equipment and components, machinery and animal feed and products of animal origin. Growth is projected for all three, with combined tonnage increasing from more than 4,000 tons in 2019 to more than 9,000 tons by 2050.

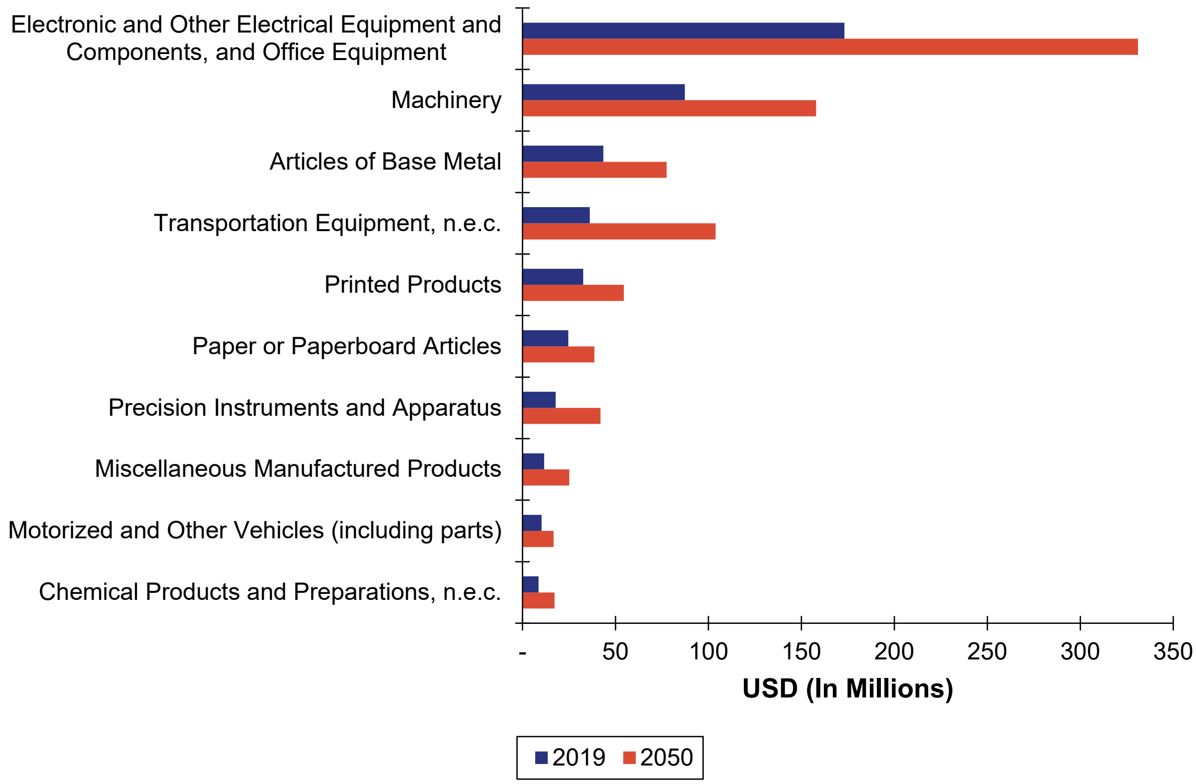
Electronic and other electrical equipment and components and machinery air cargo were the most significant commodities in terms of value. Together, they accounted for $260 million in 2019 and $489 million in 2050, comprising over half of outbound total value. Figure 2.39 shows the top outbound air cargo commodities by value for 2019 and 2050.

Figure 2.38 Top Outbound Air Cargo Commodities by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.39 Top Outbound Air Cargo Commodities by Value, 2019 and 2050



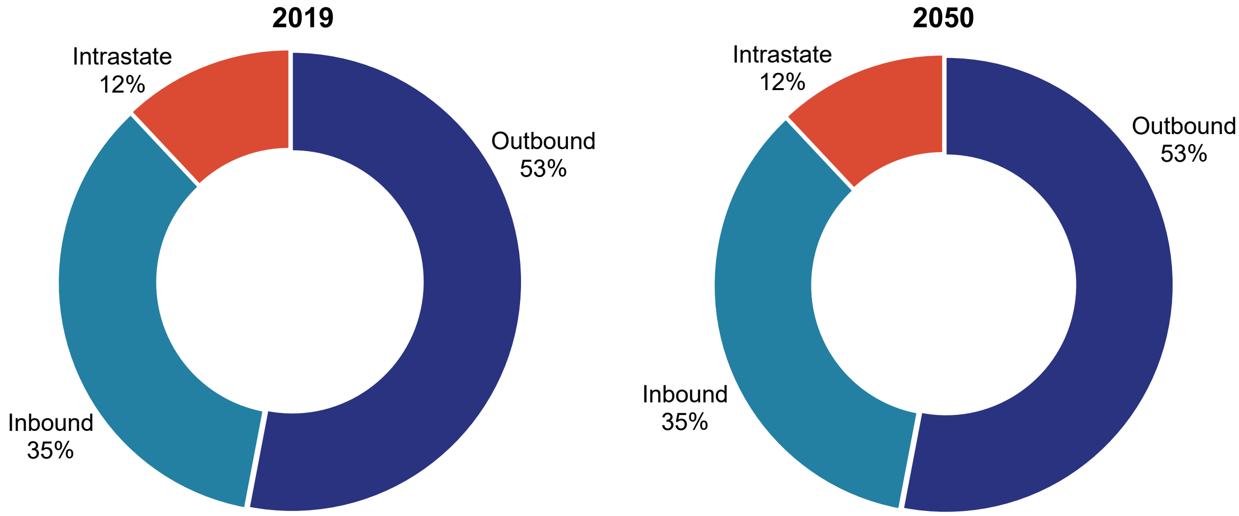
Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

2.1.5 Pipeline Freight Demand

This section provides an overview of Arkansas' freight flows moved via pipeline. In 2019, some 67 million tons of freight valued at $14 billion was moved through Arkansas' pipelines. By 2050, pipeline volumes are projected to expand to 101 million tons worth $21 billion. For directional flow, the distribution of tonnage is constant for 2019 and 2050 as outbound flows account for half of total shipments. Figure 2.40 provides Arkansas' pipeline tonnage by direction for 2019 and 2050.

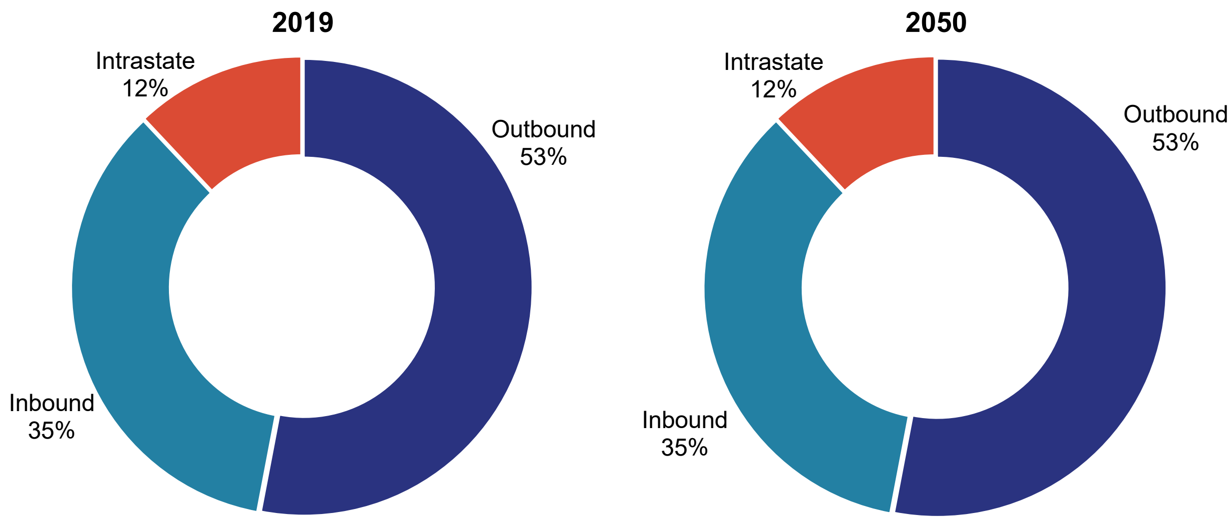
By value, the share of pipeline shipments by direction is projected to be the same for 2019 and 2050. Outbound flows represent over half of the total value of pipeline flows, while inbound and intrastate contribute 35 percent and 12 percent, respectively. Figure 2.41 shows the percent share of Arkansas pipeline value by direction for 2019 and 2050.

Figure 2.40 Direction of Pipeline Flows by Tonnage, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.41 Direction of Pipeline Flows by Value, 2019 and 2050



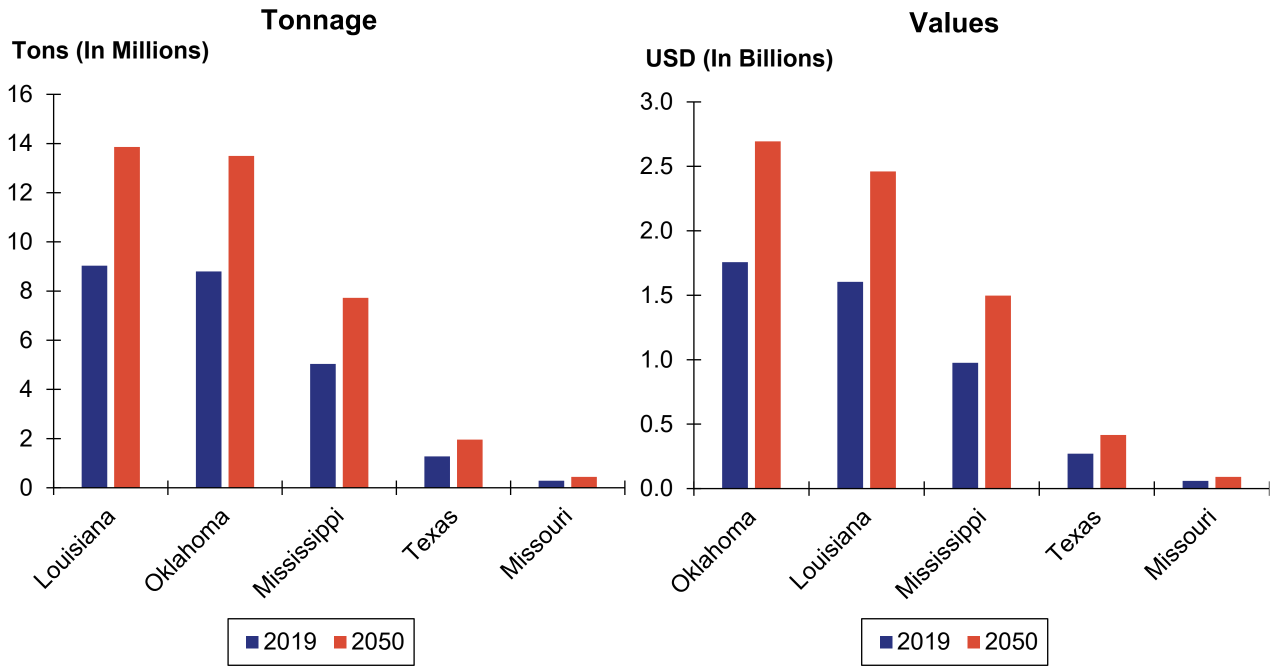
Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Top Pipeline Trading Partners

Figure 2.42 shows Arkansas' top trading partners for inbound pipeline flow by tonnage and value. In 2019, Louisiana, Oklahoma and Mississippi accounted for more than 90 percent of inbound pipeline flows by both tonnage and value. Louisiana was identified as the top trading partner with a volume of 9 million tons, which is expected to grow to 14 million tons by 2050. Inbound shipments from Oklahoma and Mississippi totaled 14 million tons in 2019 and are expected to increase to approximately 21 million tons by 2050.

In 2019, the value of inbound pipeline flows from Oklahoma was the highest ($1.8 billion), followed by Louisiana ($1.6 billion) and Mississippi ($1 billion). The aggregate value of these flows is expected to rise by 63 percent to $6.7 billion by 2050.

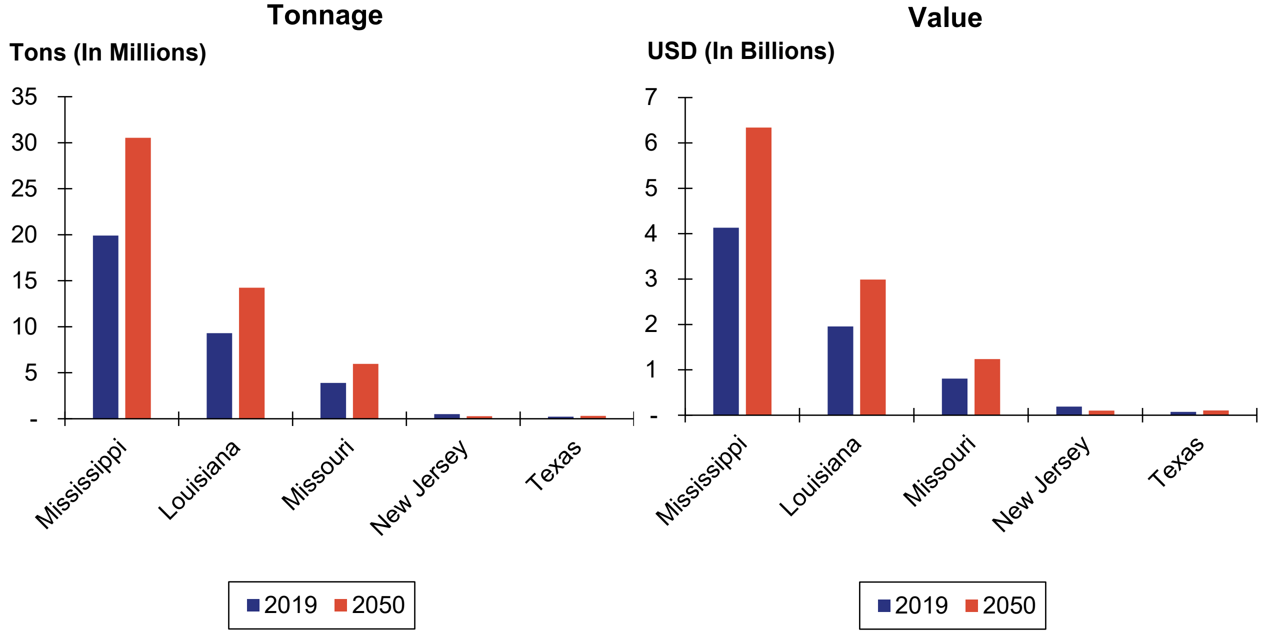
Figure 2.42 Top Trading Partners for Inbound Pipeline Flows by Tonnage and Value, 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.43 shows Arkansas' main trading partners for outbound pipeline flows in tonnage and value. For both 2019 and 2050, Mississippi, Louisiana, and Missouri accounted for more than 95 percent of outbound pipeline flows. Outbound volume to Mississippi of 20 million tons in 2019 is projected to rise to 31 million tons by 2050. Volume growth for Louisiana and Missouri has been estimated at a total of 7 million tons, bringing their total shipments from 13 million in 2019 to an estimated 20 million by 2050. In 2019, shipments from these top three trading partners were valued at $7 billion. By 2050, the total value of outbound pipeline freight expected to rise to $11 billion, with the most significant growth from Mississippi ($2 billion) and Louisiana ($1 billion).

Figure 2.43 Top Trading Partners for Outbound Pipeline Flows by Tonnage and Value, 2019 and 2050



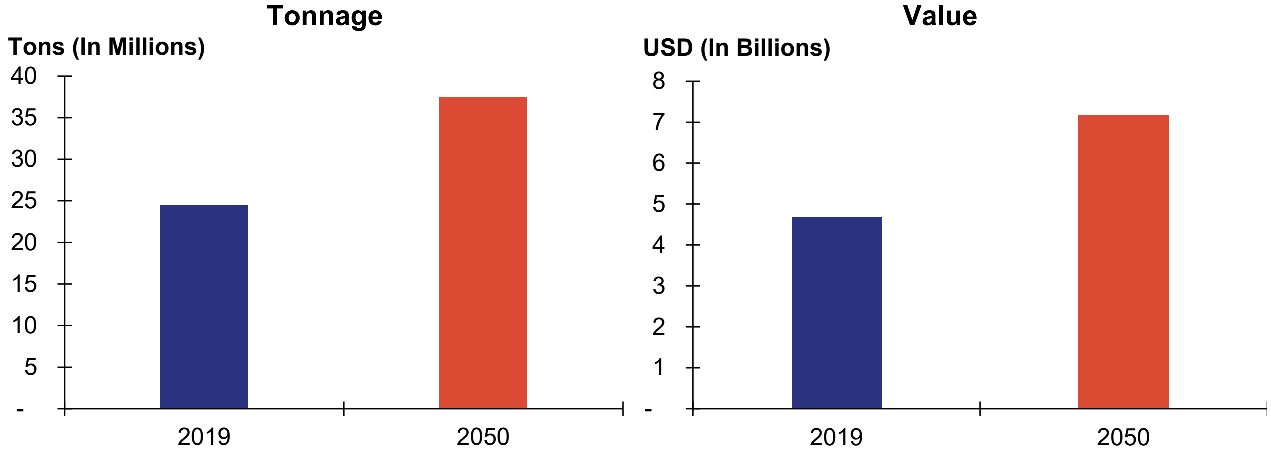
Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Top Commodities Moved by Pipeline

For Arkansas, only one product is shipped via inbound pipeline—coal and petroleum products. For pipelines, which handle liquid commodities, this includes petroleum, refined products, and miscellaneous petroleum products. In 2019, 24 million tons of coal and petroleum products were shipped into Arkansas via pipeline. By 2050, volumes are expected to grow by 53 percent to 37 million tons. A proportionate 53 percent increase in shipment value is also projected, from $5 billion in 2019 to $7 billion in 2050. Figure 2.44 shows the tonnage and value for Arkansas' only inbound pipeline commodity for 2019 and 2050.

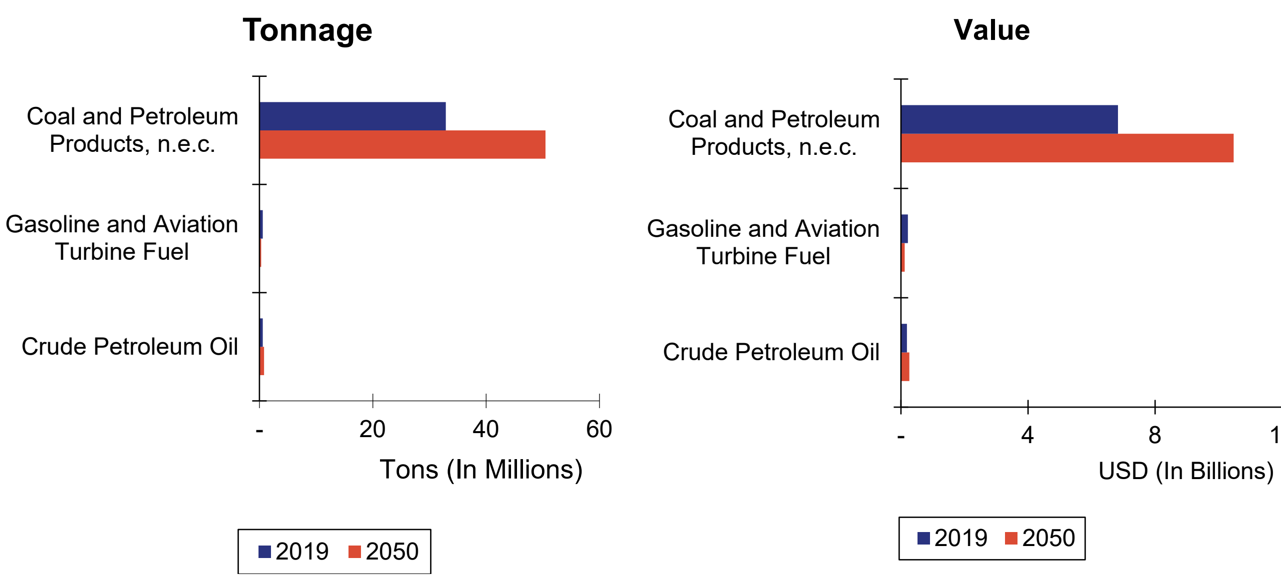
Around 97 percent of Arkansas' outbound pipeline shipments consists of coal and petroleum products. In 2019, 32 million tons of coal and petroleum products valued at $7 billion was shipped out via pipeline. By 2050, outbound shipments of this commodity are expected to expand to 50 million tons worth $10 billion.

Figure 2.44 Top Inbound Pipeline Commodity (Coal and Petroleum Products n.e.c.), 2019 and 2050



Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

Figure 2.45 Top Outbound Pipeline Commodities by Tonnage and Value, 2019 and 2050

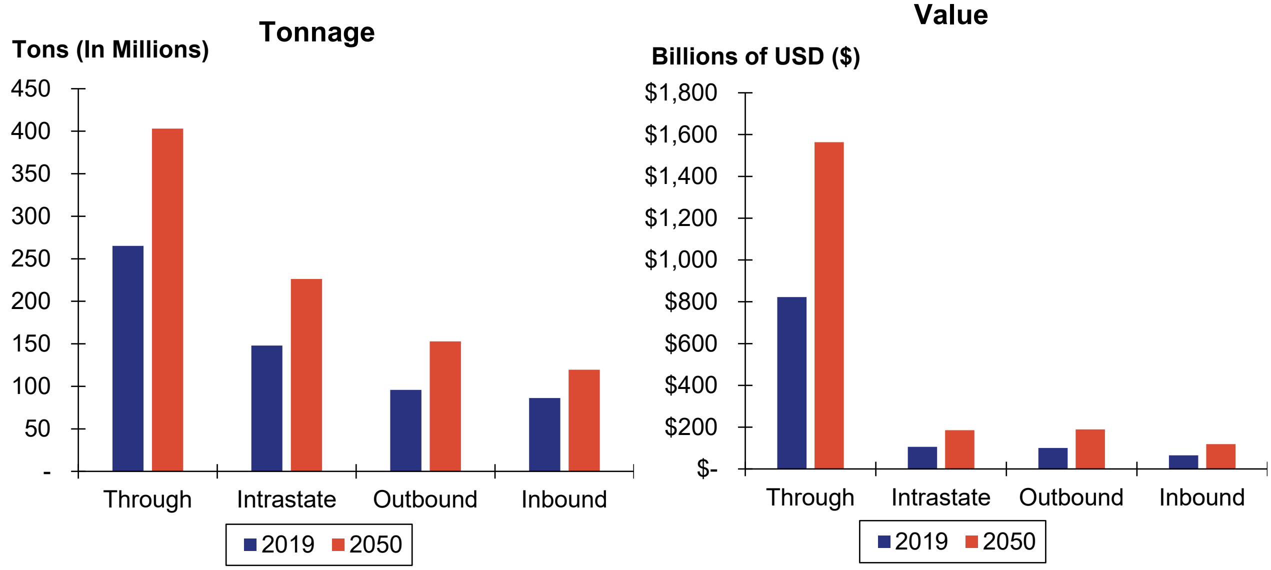


Source: FAF 5.2; Analysis by Cambridge Systematics, 2021.

2.2 Directional Split

Arkansas' largest volume of shipments (including all modes) comprise of those that pass through the state without stopping (known as "through" movements). In 2019, through flows accounted for 45 percent of the total freight volume or 265 million tons. Intrastate shipments contributed to one-quarter of total tonnage, followed by outbound and inbound flows. Similarly, through flow values accounted for 75 percent of the total freight value, while intrastate shipments made up 10 percent. The remainder comprised of outbound and inbound flows accounting for 9 percent and 6 percent, respectively. Figure 2.46 summarizes the directional split by weight and value for goods moved in Arkansas in 2019 and projected weight and value for 2050.

Figure 2.46 Freight Direction by Tonnage and Value, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

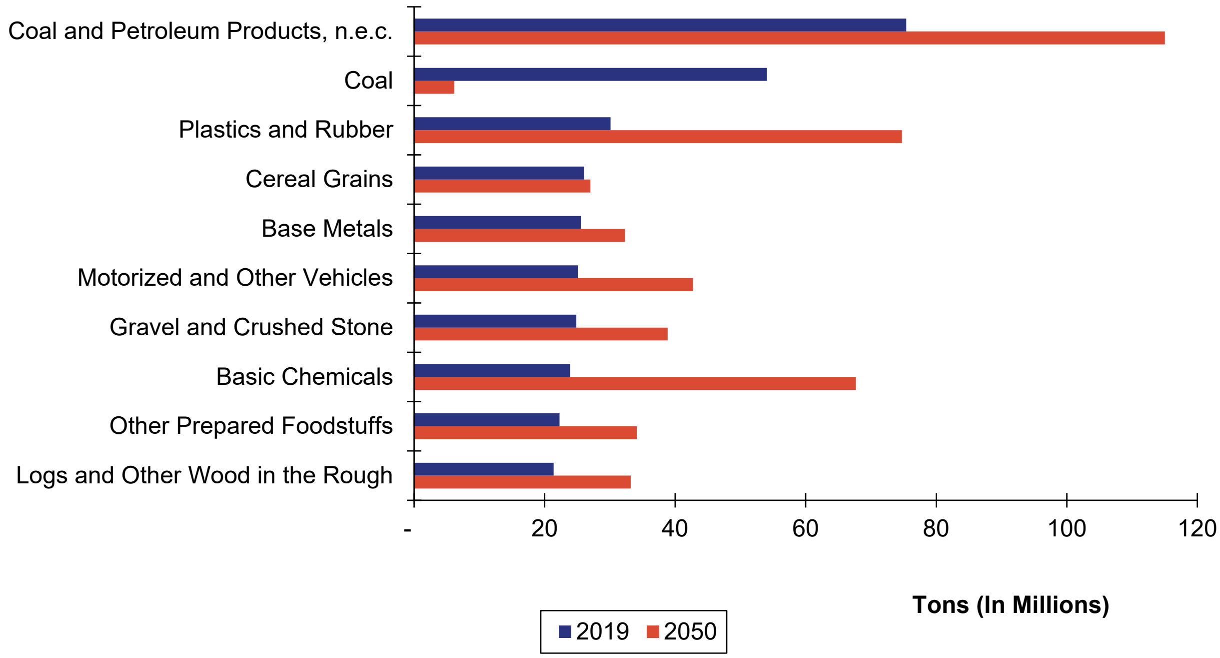
The directional split is projected to remain mostly consistent with current shares through 2050. Freight tonnage moved through the state and intrastate is expected to account for 45 percent and 25 percent of volumes, respectively. The directional shares of freight tonnage and value are expected change minimally over the next thirty years.

2.3 Top Commodities

Of the top ten commodities moved on Arkansas freight transportation system (all directions, including through movements), coal and petroleum products n.e.c., coal, and plastics and rubber accounted for almost half of the total tonnage in 2019. Other notable commodities include cereal and grains, base metal in primary or semi-finished form, and motorized and other vehicles. By 2050, the composition of top commodities is projected to change significantly, as an 89 percent decline in coal shipments is expected to be offset by sizeable growth in the volume of coal and petroleum products n.e.c., plastics and rubber, and base chemicals. Consequently, these commodities will rank among the top three by 2050, followed by gravel and crushed stone, and motorized and other vehicles. Figure 2.47 shows the top commodities by tonnage for 2019 and their 2050 projections.

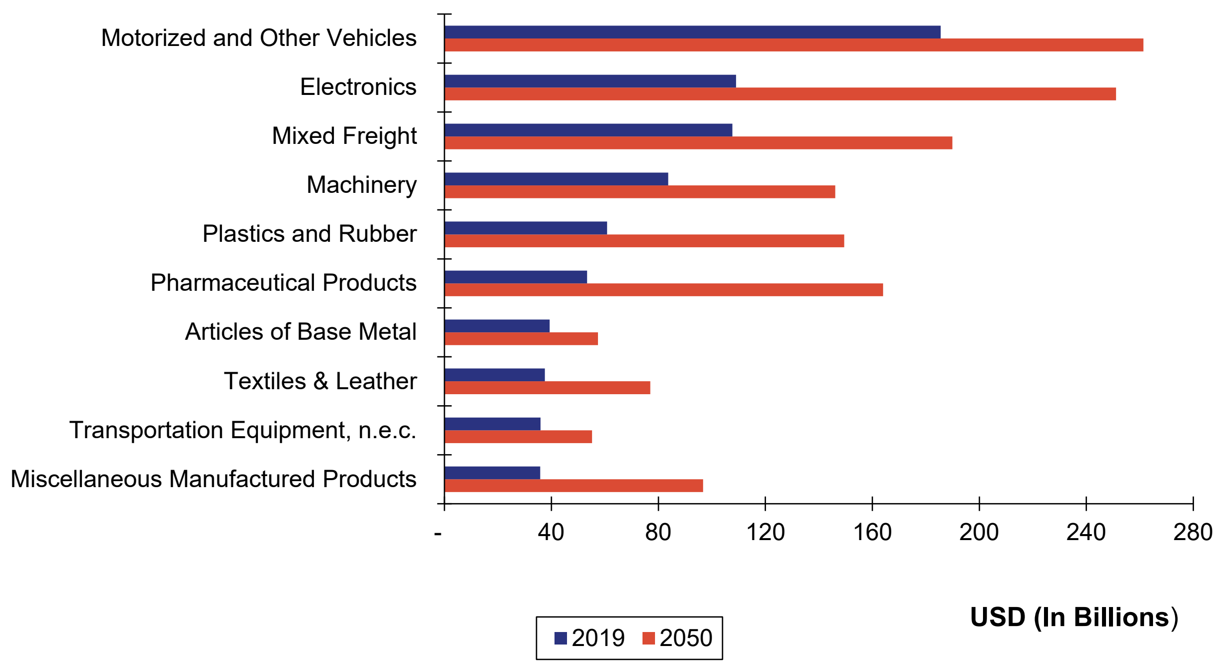
In terms of commodity value, motorized and other vehicles comprised of one-quarter of the total value of the top commodities, but made up only 8 percent of tonnage. Other commodities that account for a sizeable share of value include electronics and other significant electronical equipment (15 percent) and mixed freight (14 percent). These top three commodities will continue to maintain their significance, with the share of value declining from 53 percent of total value of commodities moved in 2019 to 48 percent by 2050. Figure 2.48 shows the top commodities by value for 2019 through 2050.

Figure 2.47 Arkansas Top Commodities by Tonnage, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

Figure 2.48 Arkansas' Top Commodities by Value, 2019 and 2050



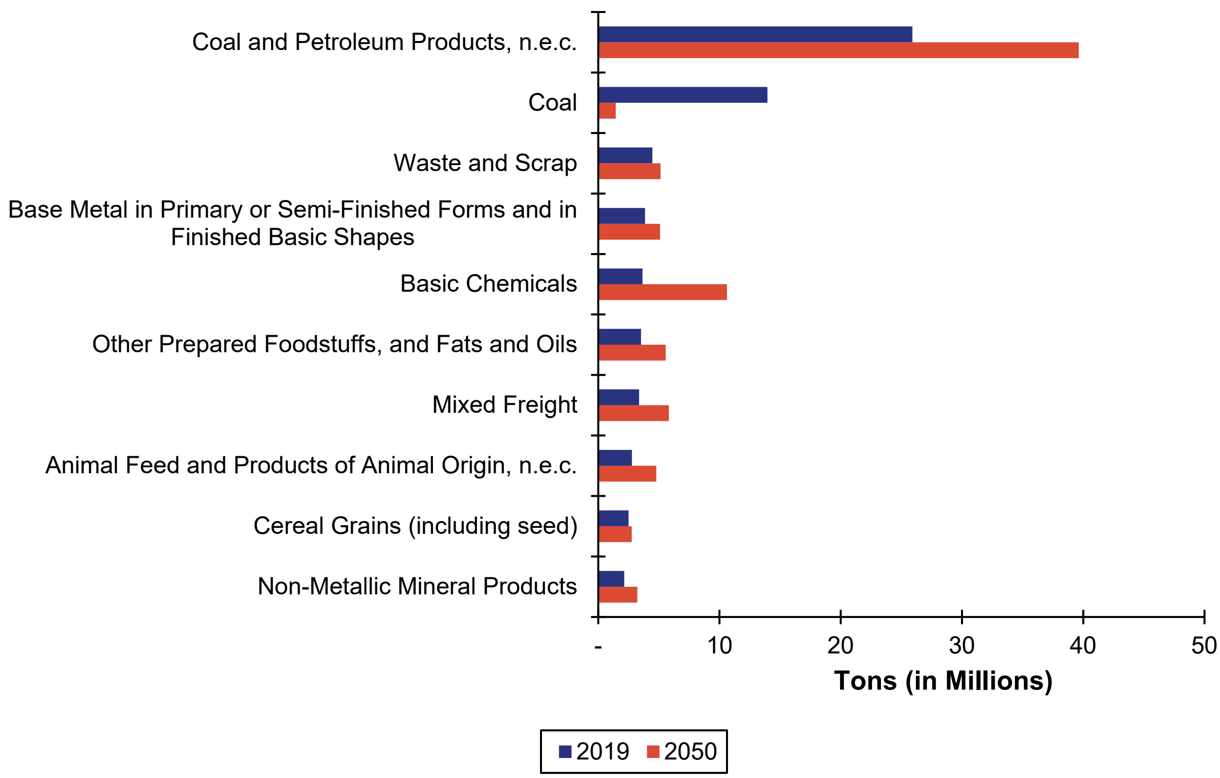
Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

2.3.1 Top Inbound Commodities

Figure 2.49 and Figure 2.50 show the top inbound commodities for tonnage and value, respectively. In 2019, coal and petroleum products n.e.c. and coal were ranked as Arkansas' top two inbound commodities, accounting for respective 30 percent and 16 percent of Arkansas' inbound flows. However, the share of coal is projected to contract to 1 percent by 2050. In 2019, other commodities that ranked among the top five inbound flows included waste and scrap (5 percent), base metals in primary and semi-finished form (5 percent) and base chemicals (4 percent). By 2050, the ranking of inbound commodities shift as base chemicals displaces coal as the second largest inbound commodity.

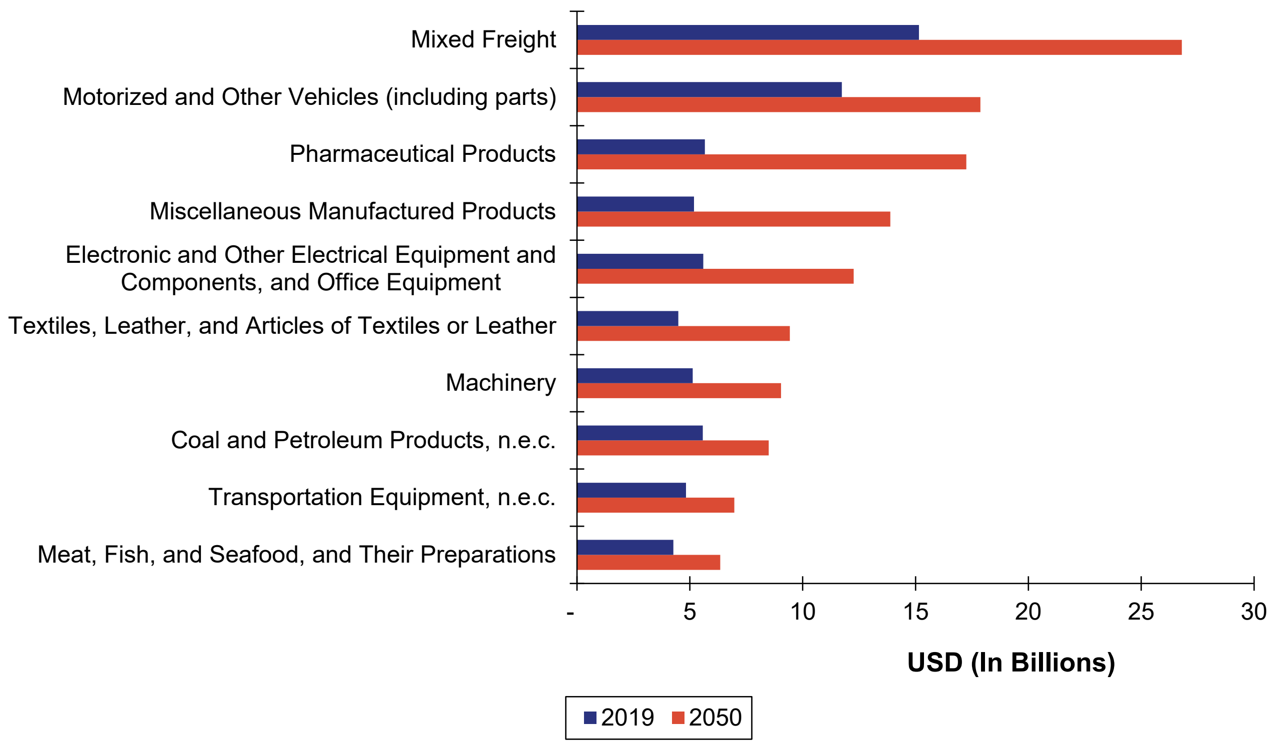
By value, three commodities—mixed freight, motorized and other vehicles and pharmaceutical products represented around half of value of top ten goods. In 2019, mixed freight shipments, valued at $15 million, was ranked the top commodity, followed by motorized and other vehicles ($12 million) and pharmaceutical products ($6 million). By 2050, the value of top ten commodities is projected to almost double from $64 million in 2019 to $126 million, while the top three commodities are expected to remain the same.

Figure 2.49 Arkansas Top Inbound Commodities by Tonnage, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

Figure 2.50 Arkansas Top Inbound Commodities, by Value, 2019 and 2050

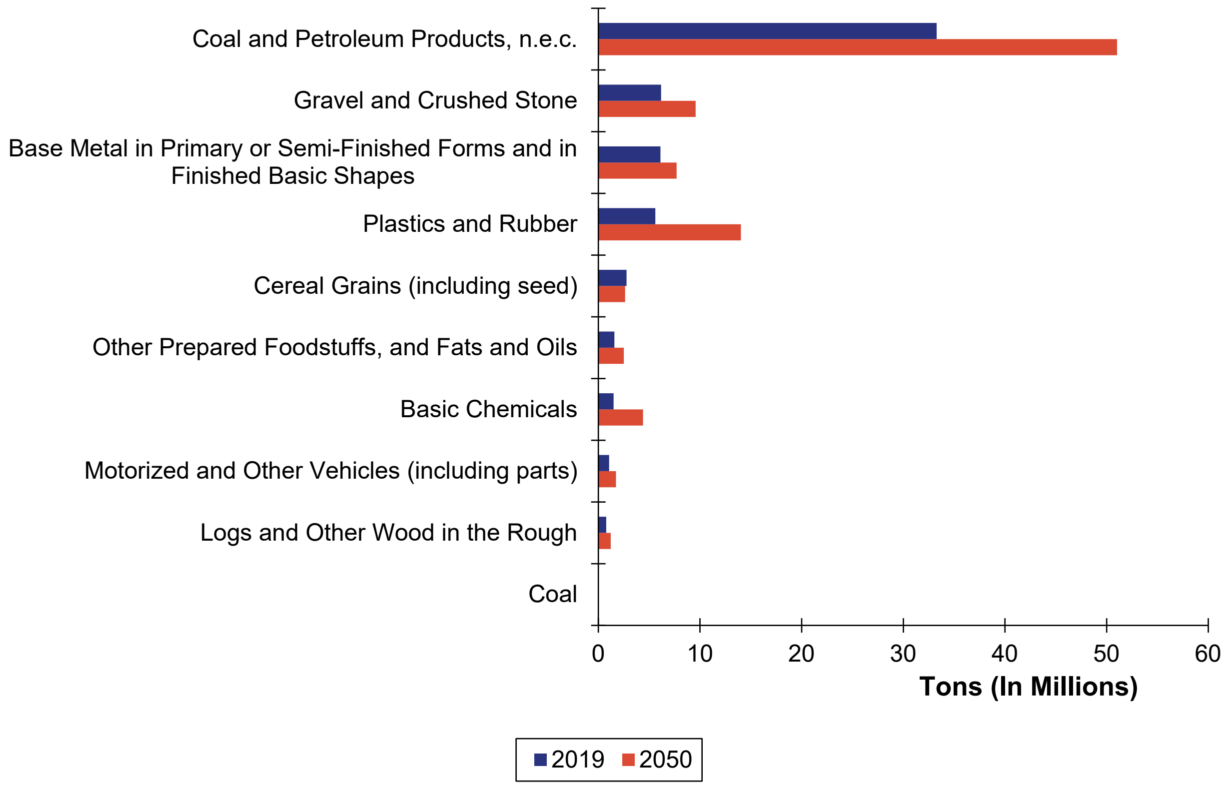


Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

2.3.2 Top Outbound Commodities

Among the top ten outbound commodities, coal and petroleum products was the most significant with 33 million tons representing almost 60 percent of volume. Other significant commodities include base metal in primary or semi-finished forms, gravel and crushed stones, and plastics and rubber which account for around 30 percent of shipments. By 2050, these products are expected to continue to be the top performers with the largest volume increases coming from coal and petroleum products (17 million tons) and plastics and rubber (8 million tons). Figure 2.51 shows Arkansas' top ten outbound commodities by volume for 2019 and 2050.

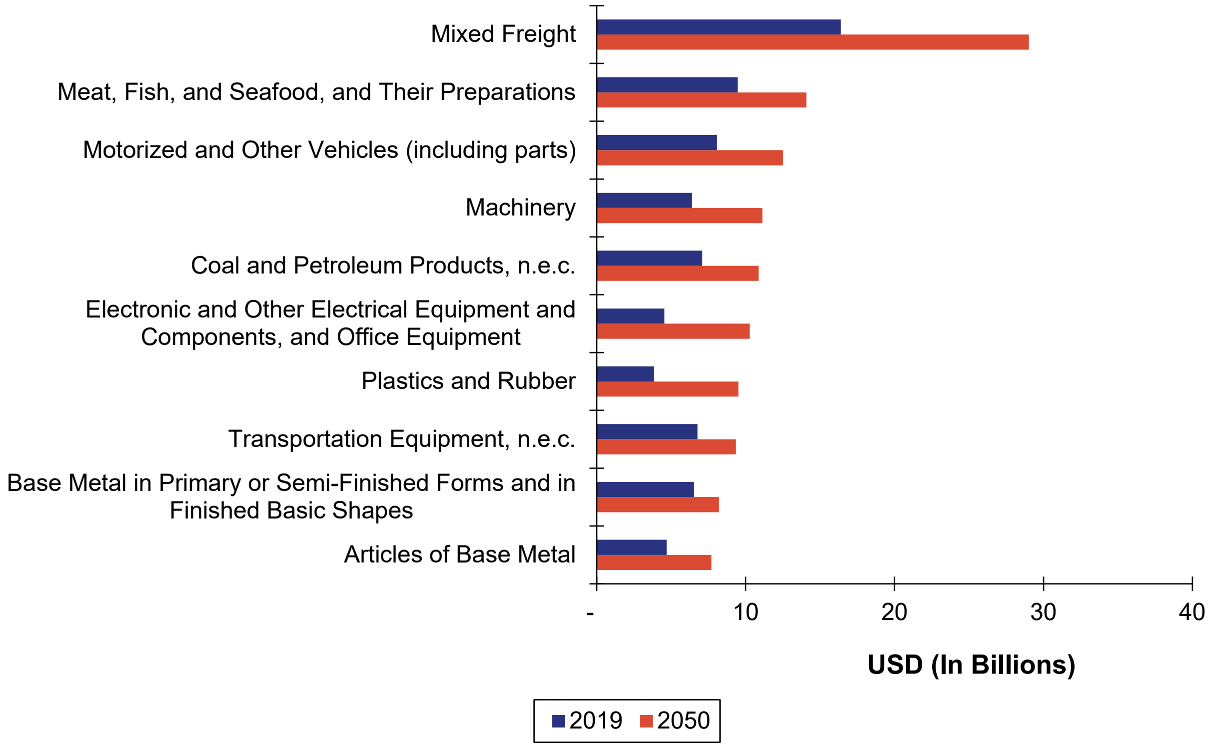
Figure 2.51 Top Outbound Commodities by Volume, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

Mixed freight held the highest value among the top outbound commodities, amounting to $16 billion in 2019. Other high-value commodities consisted of meat fish and sea food and their preparations ($9 billion) and motorized and other vehicle parts ($8 billion). Together these commodities account for 46 percent of the value of the top ten commodities. Over the next thirty years, these top performers are expected to be the most significant with their combined value increasing to $56 million. Figure 2.52 shows Arkansas' top ten outbound commodities by value for 2019 and 2050.

Figure 2.52 Top Outbound Commodities by Value, 2019 and 2050



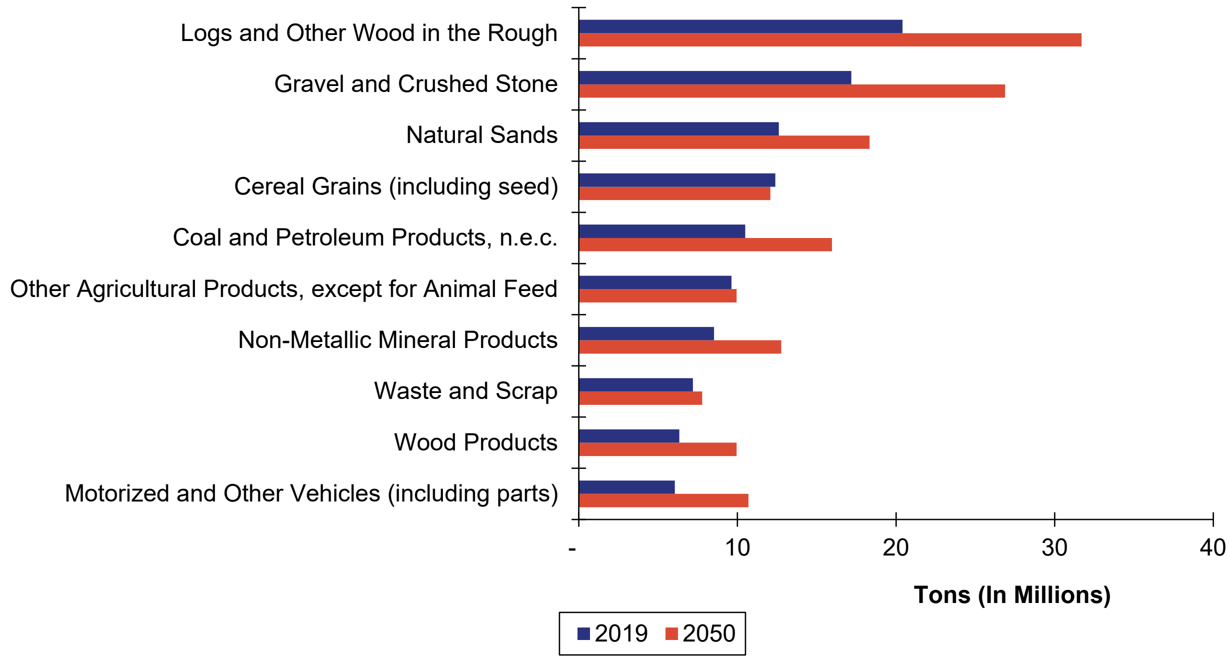
Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

2.3.3 Top Intrastate Commodities

Figure 2.53 and Figure 2.54 show the top intrastate commodities for tonnage and value, respectively. In 2019, the top three commodities shipped within the state comprised of logs and other woods in the rough, gravel and crushed stone, and natural sands. Together, they accounted for 50 million tons and almost 45 percent of top intrastate commodities. By 2050, shipment volumes of these commodities are estimated to rise to a total of 77 million tons.

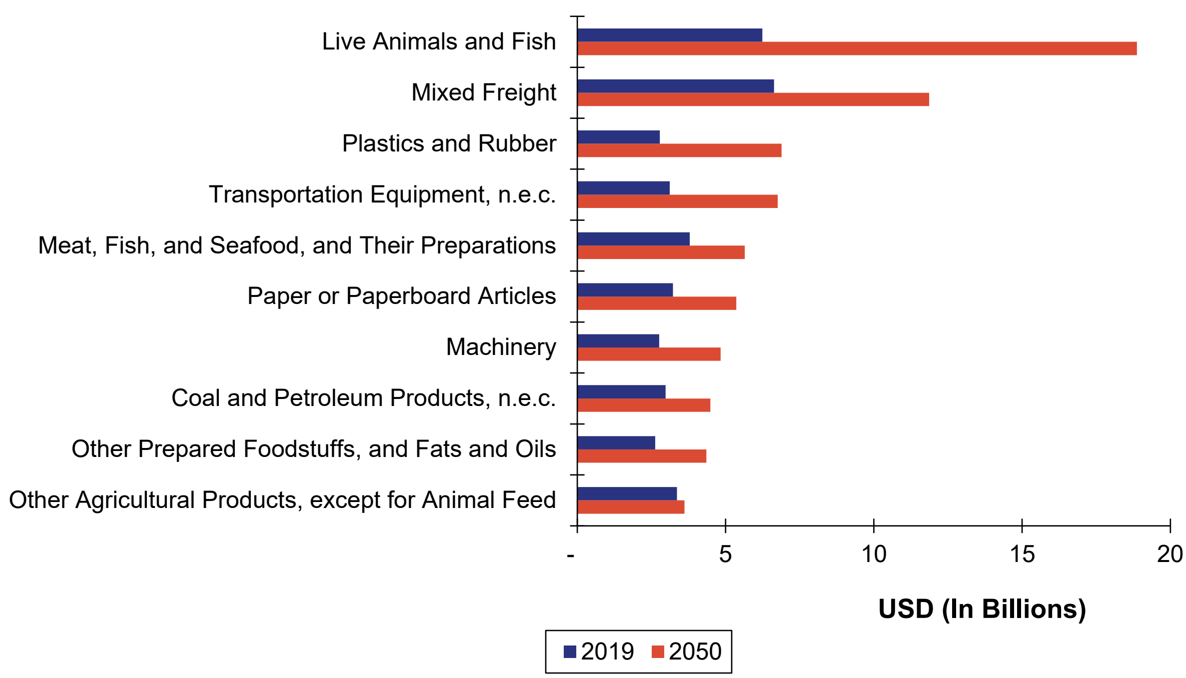
In terms of value, live animals and fish and mixed freight were the top commodities—worth $13 billion in 2019. Over the next thirty years, the value of live animals and fish is projected to more than double, while mixed freight is expected to increase by 79 percent. Combined, their total value will increase to $31 billion.

Figure 2.53 Top Intrastate Commodities by Volume, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

Figure 2.54 Top Intrastate Commodities by Value, 2019 and 2050



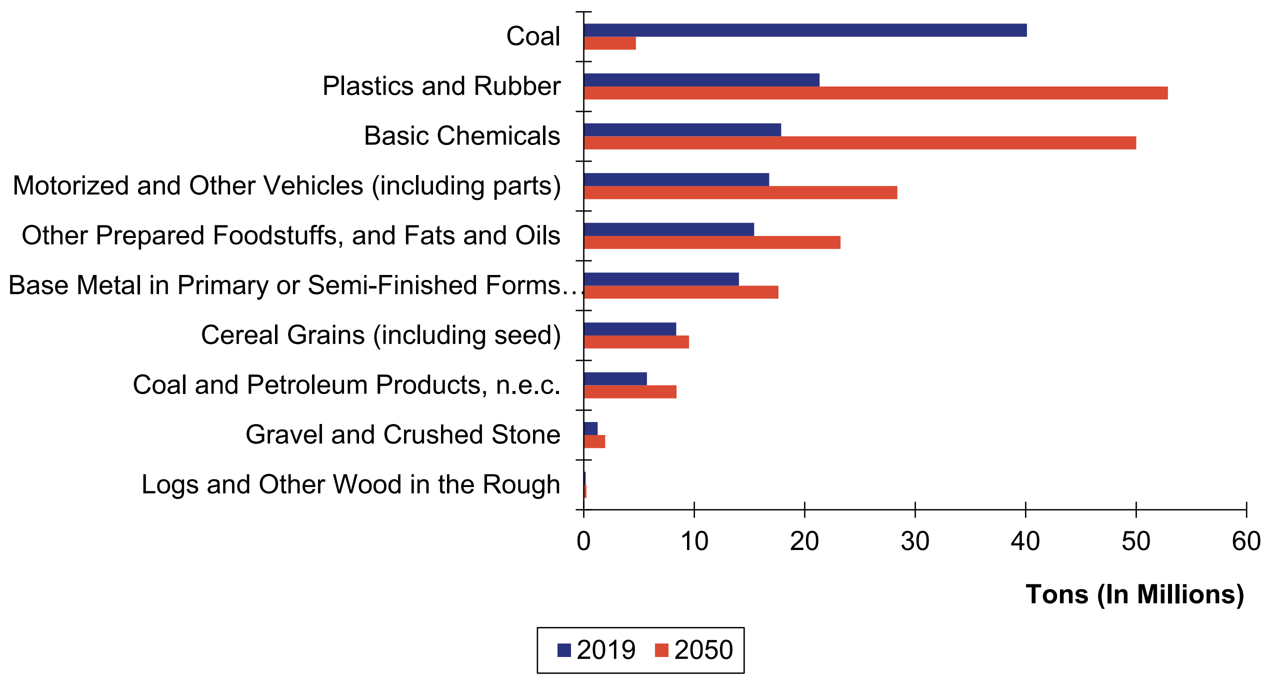
Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

2.3.4 Top Throughflow Commodities

Figure 2.55 displays the top through commodities by tonnage for 2019 and 2050. In 2019, coal was the top through commodity, followed by plastics and rubber and basic chemicals. By 2050, the volume of coal shipments are projected to contract significantly, resulting in plastics and rubber and basic chemicals being ranked as the top commodities.

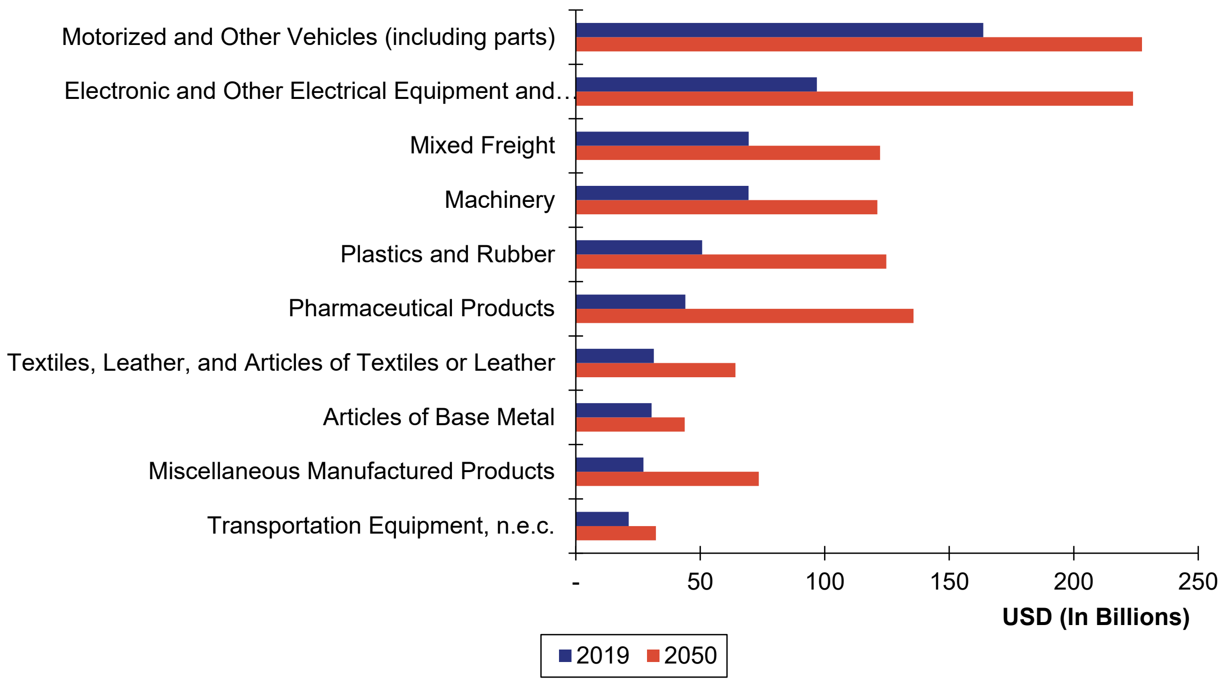
In 2019, motorized and other vehicles and electronic and other electrical equipment were the most significant through commodities in terms of value. In that year, they accounted for $260 million and 42 percent of through values. By 2050, their combined value is projected rise to $451 billion, but their share will decline to 37 percent. Figure 2.56 shows the top through commodities by value for 2019 and 2050.

Figure 2.55 Top Throughflow Commodities by Volume, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

Figure 2.56 Top Throughflow Commodities by Volume, 2019 and 2050



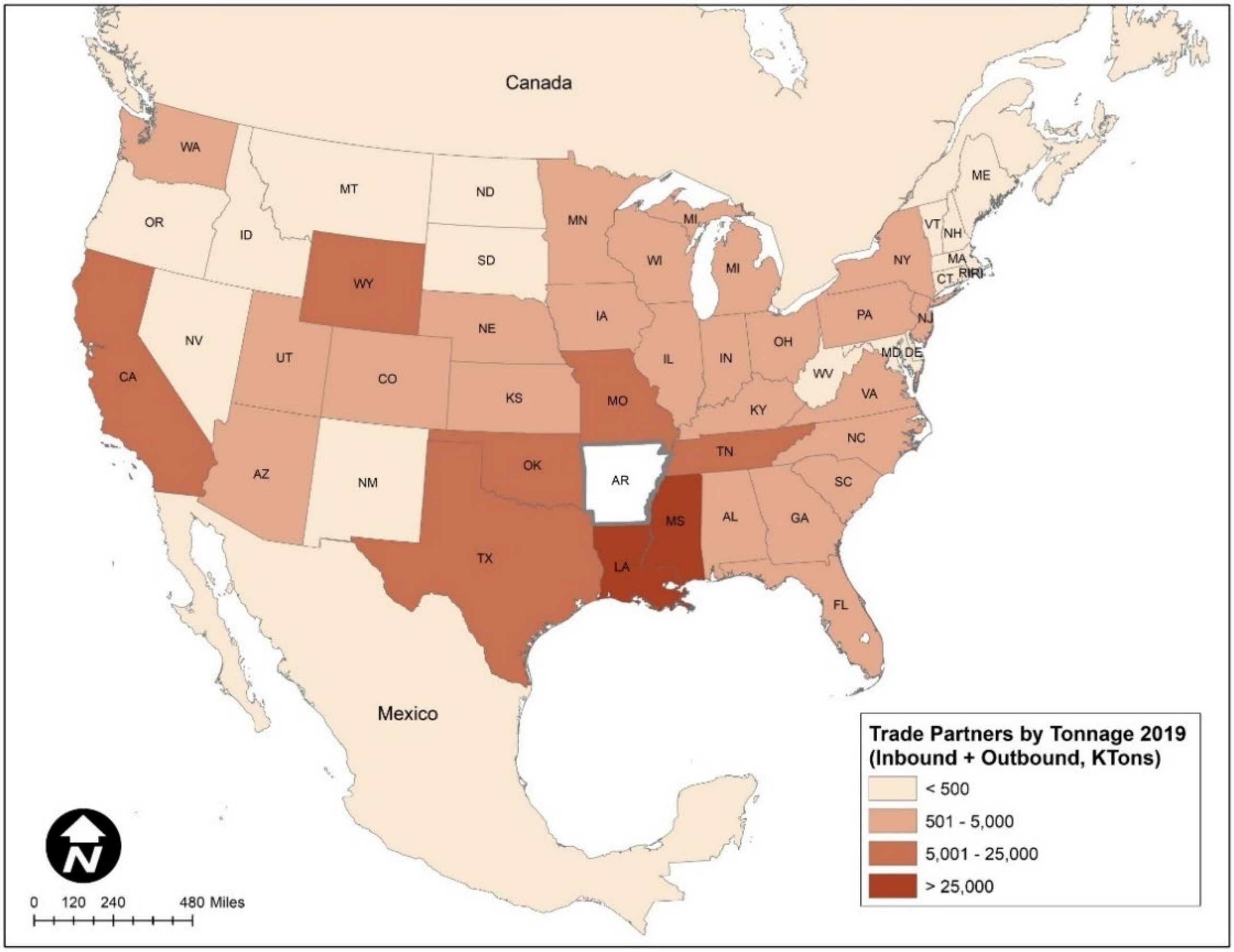
Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

2.4 Arkansas Trading Partners

Figure 2.57 provides a map of Arkansas' trading partners based on highest combined inbound and outbound tonnage in 2019. Louisiana ranked first among Arkansas' top trading partners, with 33 million tons of combined inbound and outbound flows amounting to 18 percent of total tonnage. Mississippi followed closely behind accounting for 16 percent (or 30 million tons) of total tonnage. Texas was the third largest trading partner with trade volumes of 23 million tons amounting to 12 percent of trade flows. Pipeline flows account for 56% of inbound and outbound trade volumes with Louisiana and 83 percent of inbound and outbound trade volumes with Mississippi.

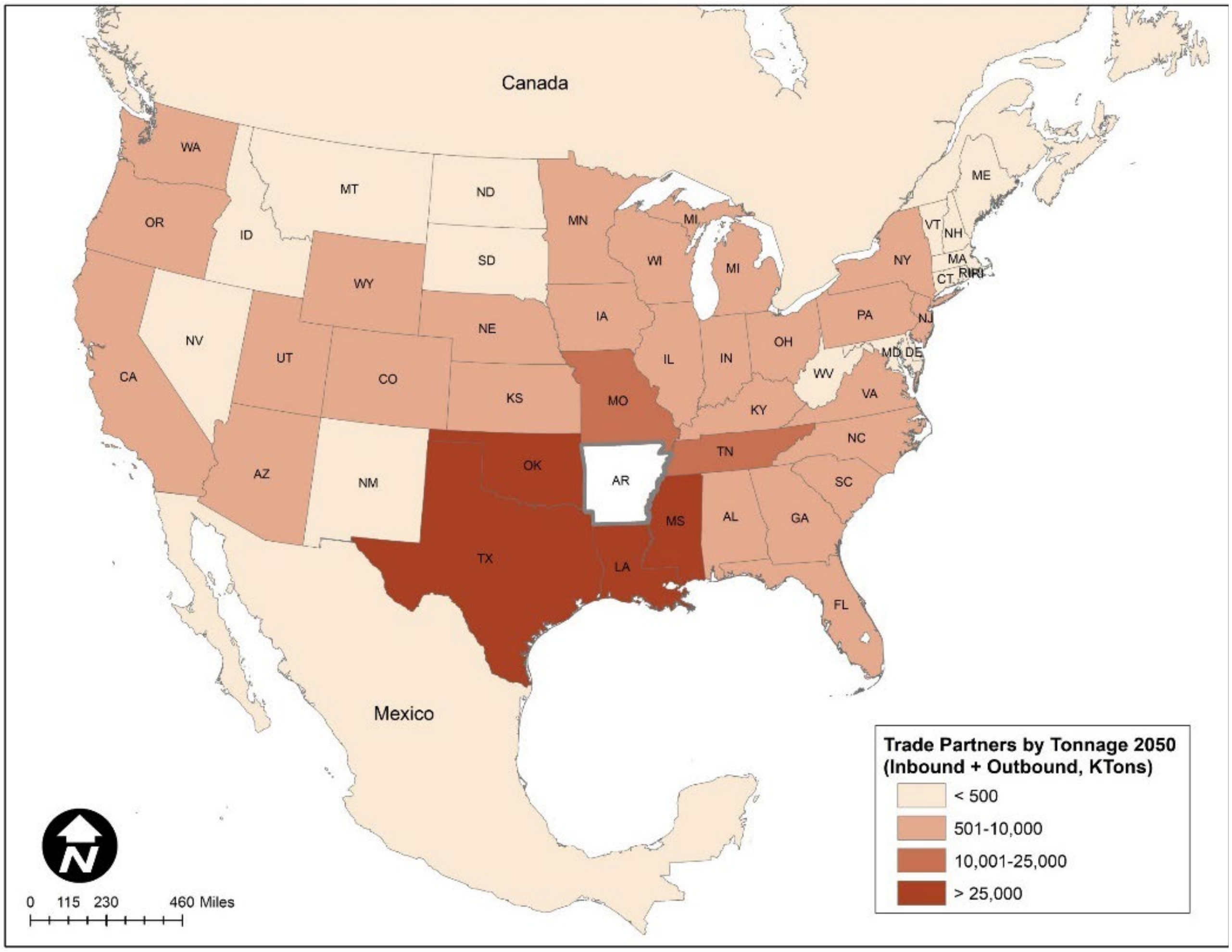
Figure 2.58 shows Arkansas' projected trading partners by volume in 2050. With freight flows from Louisiana, Mississippi and Texas comprising of almost half of Arkansas' external trade in 2050, these states are expected to remain its top three trading partners. Trade with Louisiana is expected to increase by 55 percent to 51 million tons, contributing 19 percent to total flows. Similarly, Arkansas' trade volumes with Mississippi and Texas are projected to grow 57 percent and 59 percent, respectively, resulting in their ranking as second and third most significant trading partners in 2050.

Figure 2.57 Map of Arkansas' Trading Partners by Tonnage, 2019



Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

Figure 2.58 Map of Arkansas' Trading Partners by Tonnage, 2050

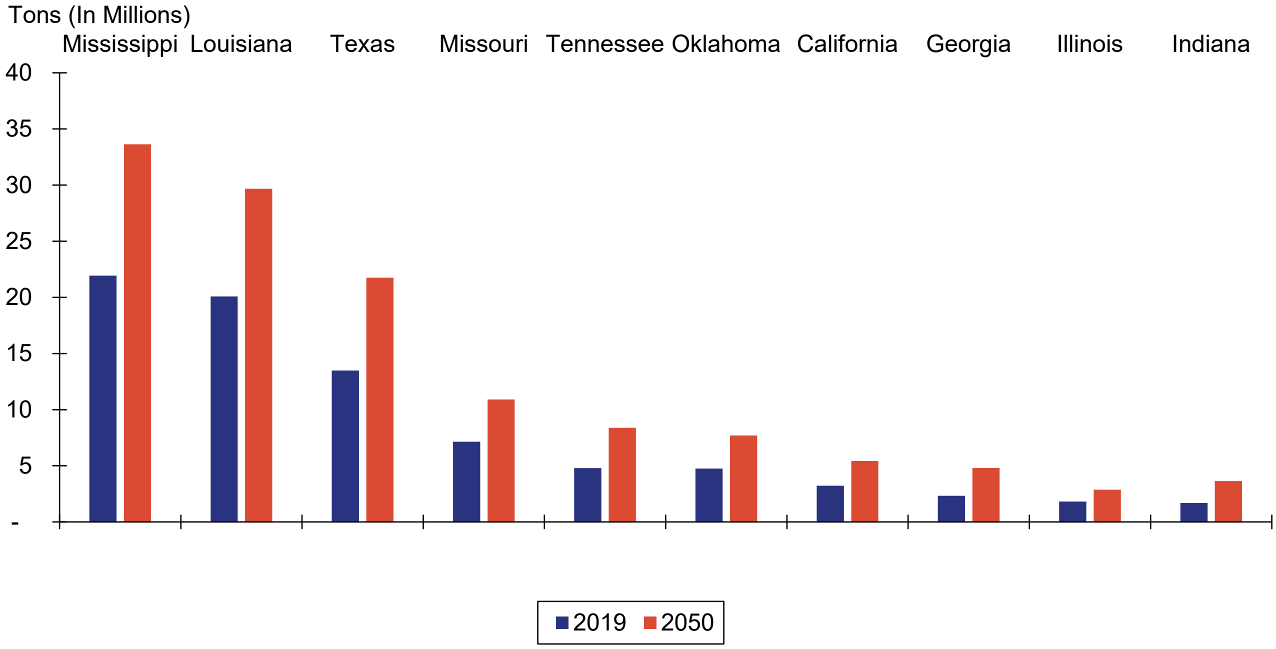


Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

2.4.1 Outbound Goods

Of the total outbound volumes, 75 percent is shipped to neighboring states. Figure 2.59 shows the top trading partners for the state's outbound goods. In 2019, Mississippi was Arkansas' top destination, with 22 million tons, accounting for 23 percent of total outbound freight. Louisiana was second, accounting for 21 percent of outbound shipments, followed by Texas with 14 percent. Goods sent to Canada and Mexico amounted to less than one percent of outbound flows. By 2050, outbound volumes are expected to increase for all major destinations, with the largest volume increases belonging to the top three—Mississippi, Louisiana, and Texas.

Figure 2.59 Arkansas' Top Outbound Partners by Tonnage, 2019 and 2050



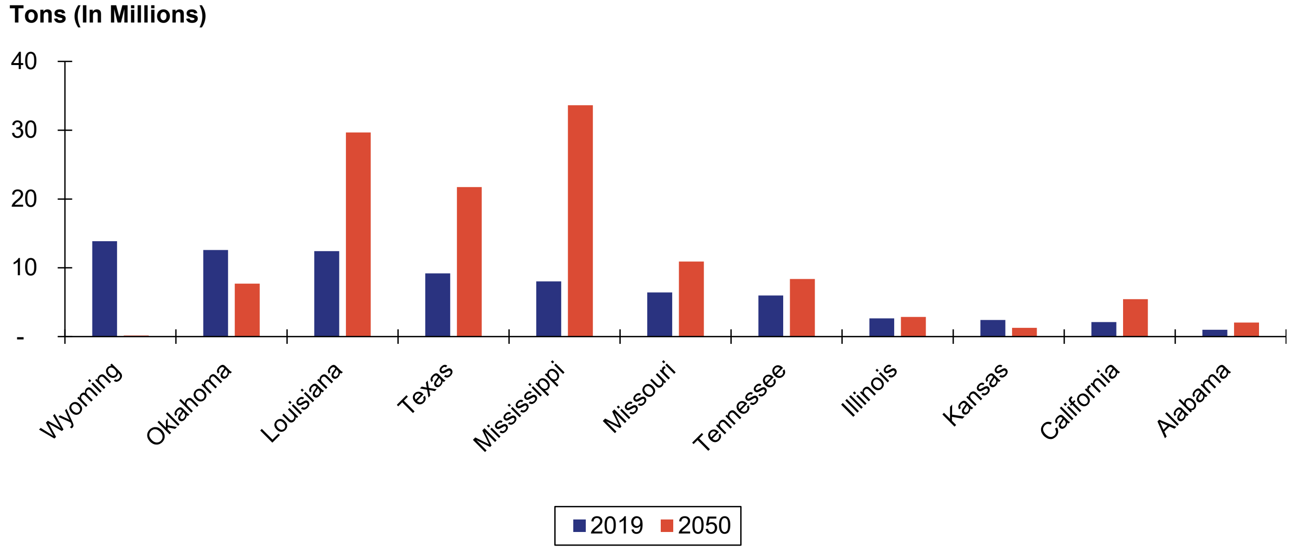
Source: FAF5.2 and 2019 Carload Waybill; Analysis by Cambridge Systematics, 2021.

In 2019, over one-third of Arkansas' outbound freight volumes consisted of coal and petroleum products, n.e.c. amounting to 33 million tons. By 2050, outbound volumes of this commodity are expected to increase by 53 percent to 51 million tons. Gravel and crushed stone, base metals in primary and semi-furnished form, and wood products each accounted for approximately 6 percent of total tonnage. By 2050, the share of these goods is expected to dip slightly, while the share of plastics and rubber is expected to rise to become the second largest in terms of outbound volumes. Figure 2.59 provides a breakdown of Arkansas' top outbound commodities for 2019 and their 2050 projections.

2.4.2 Inbound Goods

In 2019, Arkansas' inbound volumes amounted to 86 million tons, of which almost two-thirds originated from neighboring states. Commodities shipped from Wyoming accounted for 16 percent of total inbound volumes by tonnage, making it Arkansas' top inbound partner. Other top inbound trading partners include Oklahoma and Louisiana which contributed 15 percent and 14 percent, respectively. By 2050, inbound volumes from Wyoming will reduce by 85 percent, driven almost entirely by the projected decline in coal. By contrast, commodity volumes from Louisiana, Texas, and Mississippi are projected to rise by 89 percent, 82 percent, and 72 percent, respectively, due to projected increases in inbound shipments of chemicals, mixed freight, and processed food products (including animal feed and products of animal origin and other prepared foodstuffs, fats, and oils).

Figure 2.60 Arkansas' Top Inbound Trading Partners by Tonnage, 2019 and 2050



Source: FAF5.2 and 2019 Carload Waybill Data; Analysis by Cambridge Systematics, 2021.

2.5 STCC Code Classification

Table 2.1 presents the Standard Transportation Commodity Code (STCC) classifications and descriptions, as referenced throughout the commodity flow analysis detailed in Section 2.0.

Table 2.1 Standard Transportation Commodity Code Classifications and Descriptions

2-Digit Code	Commodity	Description
01	Farm Product	All types of fruits, vegetables, livestock, animal products, cotton, grain, and other farm products.
08	Forest Products	Includes barks, gum, and other forest products.
09	Fresh Fish or Marine Products	Fresh fish and marine products.
10	Metallic Ores	Includes iron, copper, nickel, aluminum, lead, zinc, and other ores.
11	Coal	Includes all coal products.
13	Crude Petroleum or Natural Gas	Crude petroleum, natural gas, and natural gasoline products.
14	Nonmetallic Minerals	This category includes a variety of construction and building products, such as stone blocks or crushed rock materials.
19	Ordnance or Accessories	Guns, ammunition, military equipment and other ordnance or accessories.
20	Food or Kindred Products	This category includes animal products, produce and other processed foods and beverages.
21	Tobacco Products	Cigarettes, cigars, chewing tobacco and other processed tobacco.
22	Textile Mill Products	Woven fabrics, knit fabrics, yarn, silk, carpets, and other textile goods.
23	Apparel or Related Products	All types of apparel and accessories.
24	Lumber or Wood Products	Lumber, forest materials and other manufactured wood products.
25	Furniture or Fixtures	All types of furniture and fixtures.
26	Pulp, Paper, or Allied Products	Paper, pulp, wallpaper, envelops, boxes and other paper products.
27	Printed Matter	Newspaper, periodicals, greeting cards and other printed matter.
28	Chemicals or Allied Products	Industrial chemicals, pharmaceutical drugs, cosmetics, soap and detergents, paint, and other chemical products.
29	Petroleum or Coal Products	Petroleum, refined products, asphalt and miscellaneous coal and petroleum products.
30	Rubber or Misc. Plastics	Includes tires, inner tubes, rubber or plastic footwear and other products.
31	Leather or Leather Products	Finished and industrial leather, leather footwear, luggage, and other leather goods.
32	Clay, Concrete, Glass, or Stone	All types of clay, glass and glassware, concrete/cement, and stone.
33	Primary Metal Products	Includes steel, iron, lead, copper, and other primary metal products.
34	Fabricated Metal Products	Includes cans, cutlery, tools, hardware, bolts/nuts and other fabricated metal products.

2-Digit Code	Commodity	Description
35	Machinery	Engines, farm machinery/equipment, elevators, special tools, construction machinery and other types of machinery.
36	Electrical Equipment	Electrical equipment, switchboards, household appliances, electric lamps, and other electrical equipment.
37	Transportation Equipment	Includes motor vehicles, truck trailers, aircraft, ships, boards, and others.
38	Instrum. Photo Equip, Optical Eq	Scientific equipment, medical devices and equipment, watches/clocks, and others.
39	Misc. Manufacturing Products	Jewelry, toys, games, sporting goods, office supplies and other miscellaneous manufactured goods.
40	Waste or Scrap Materials	Ashes, scrap, chemical waste, and other miscellaneous waste.
41	Misc. Freight Shipments	Miscellaneous freight shipments and special commodities.
42	Shipping Containers	Shipping containers, semi-trailers returned empty and other empty equipment.
43	Mail or Contract Traffic	Mail, express and contract traffic.
46	Misc. Mixed Shipments	Mixed shipments, freight all kinds and miscellaneous shipments (mostly intermodal).
47	Small Packaged Freight Shipments	Small, packaged freight shipments, including less-than-carload shipments.
50	Secondary Moves	Generally includes shipments of consumer goods that move from multimodal terminals and warehouses and distribution centers.

Source: Cambridge Systematics.

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ARKANSAS STATE FREIGHT PLAN

Chapter 7

Freight Economic Trends Profile

WE MOVE ARKANSAS FREIGHT

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1.0 Introduction

Arkansas' location and the high demand for moving goods and commodities to, from, within, and through the state make Arkansas a multimodal transportation hub that is well-positioned to serve local, national, and global markets. Not only are these transportation capabilities key to fully realizing the economic potential of business opportunities, but they also offer further economic opportunity due to the significant amount of employment associated with these sectors. Freight transportation supports all goods-producing and consuming sectors of the economy and is also a leading economic sector.

Freight activity plays a significant role in Arkansas' economy. In 2019, freight-intensive output accounted for almost half of all economic activity and was responsible for one in every three jobs in the state. Manufacturing, agriculture, retail and wholesale trade are key sectors underpinning Arkansas' robust freight activity. In turn, the competitiveness of these sectors is linked to the efficiency freight transportation.

Freight transportation is a derived demand, meaning that the demand for freight arises when other goods or services are purchased. As such, this assessment highlights those industries that are heavily supported by freight activity. This Freight Economic Trends Profile provides insights into the dynamics of freight-intensive industries and how these dynamics influence economic outcomes for the state of Arkansas. It also discusses recent developments in key Arkansas industries, and provides insight into relevant economic trends and futures that may impact future freight demand in Arkansas.

1.1 Data Sources

This profile builds on the work performed for the 2017 Arkansas State Freight Plan (SFP), which established a baseline for industrial presence, freight system trends, and representative supply chains. For this SFP update, additional economic analysis and research was conducted using data from the Bureau of Economic Analysis (BEA) and the Arkansas Economic Development Commission (AEDC). Stakeholder outreach was also performed to understand developments and challenges to representative supply chains. Additionally, other national and state trends were examined for their relevance to the movement of freight in Arkansas (such as the impact of the COVID-19 pandemic).

1.2 Report Organization

The remainder of the document is organized as follows:

- **Section 2.0—Arkansas Industry Assessment** provides an industry assessment of statewide and regional industries and employment statistics.
- **Section 3.0—Recent Developments in Key Arkansas Industry Supply Chains** examines supply chain components and recent developments in key Arkansas industries, including the rice and poultry production sectors, the iron and steel industry, and e-commerce activities in Arkansas.
- **Section 4.0—Economic Trends and Futures** Discusses the economic trends and futures most likely to impact freight demand in Arkansas, including changes to federal policy, COVID-19, trucking regulations, railroad industry changes, technological advances, and near-shoring.

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2.0 Arkansas Industry Assessment

This industry assessment provides a top-down assessment of freight-generating activity at the state and the regional levels. For each geographic region, the relative size of each freight-generating sector, the industries that contribute to freight-intensive activity, and the change in their composition over the last five years is discussed. This section also examines trends in labor to understand the relative significance of freight-intensive industries for overall employment for the region.

Demand for freight services is generated by the need to transport goods to satisfy production and consumption. To better understand the activities that generate freight demand, economic output can be classified into two sectors: freight-intensive and non-freight intensive. Freight-intensive industries depend heavily on the movement of goods, while non-freight intensive industries are typically service-based and require small volumes of goods to generate final output. Table 2.1 classifies industries based on these definitions.

Table 2.1 Freight and Non-Freight Intensive Industry Sectors

Freight Intensive	Non-Freight Intensive
Agriculture, Forestry, Fishing and Hunting	Transportation – Passenger
Manufacturing	Information
Wholesale Trade	Finance and Insurance
Retail Trade	Real Estate and Rental & Leasing
Transportation and Warehousing	Professional, Scientific and Technical Services
Construction	Administrative & Support and Waste Management & Remediation Services
Mining, Quarrying, and Oil & Gas Extraction	Educational Services
Utilities	Health Care and Social Assistance
	Arts, Entertainment and Recreation
	Accommodation and Food Services
	Other Industries (Except Public Administration)
	Government

Source: Freight-intensive industry framework defined by Cambridge Systematics based on North American Industry Classification System (NAICS).

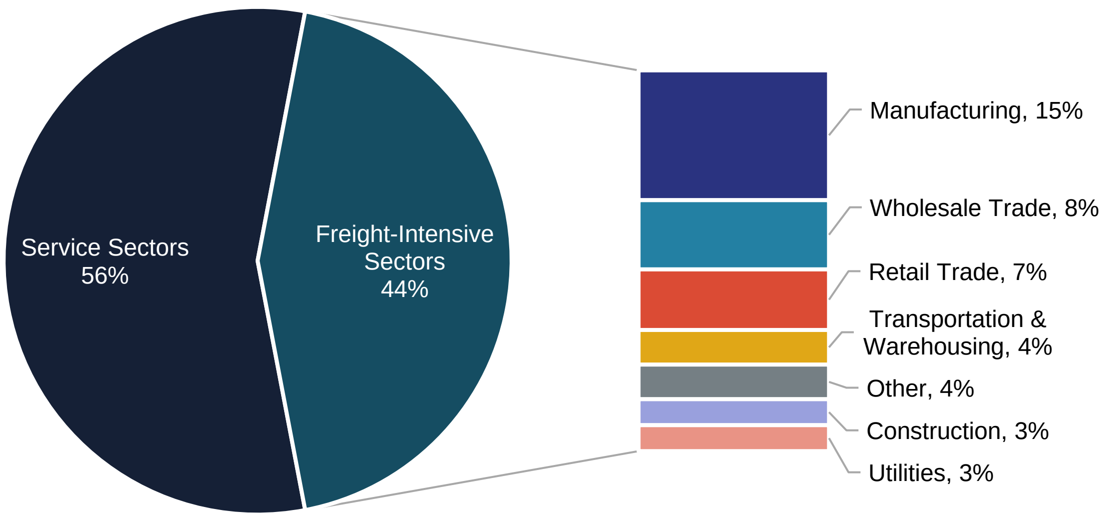
2.1 Statewide Industry Assessment

At the state level, economic output generated from freight-intensive activities was valued at $51 billion or 46 percent of total economic output in 2019. Manufacturing accounted for the largest share of freight-generating activity, followed by retail and wholesale trade. At the same time, increases in manufacturing output were the highest among freight-intensive industries over the last five years, largely driven by primary metals, petroleum and coal products, and the food and beverage sector. Employment in freight-intensive sectors accounted for around one-third of the jobs across the state, with the largest concentrations in the manufacturing and retail trade industries.

2.1.1 Industries

Freight-intensive industries comprise nearly half of Arkansas' economic activity. In 2019, the total economic output of the state was estimated at $117 billion, of which freight-intensive industries comprised $51 billion. The share of freight-intensive declined slightly between 2015 and 2019, from 46 percent to 44 percent, respectively. Figure 2.1 shows the composition of Arkansas' economic output for service and freight-intensive sectors as well as the main industries that contribute to freight-intensive activity.

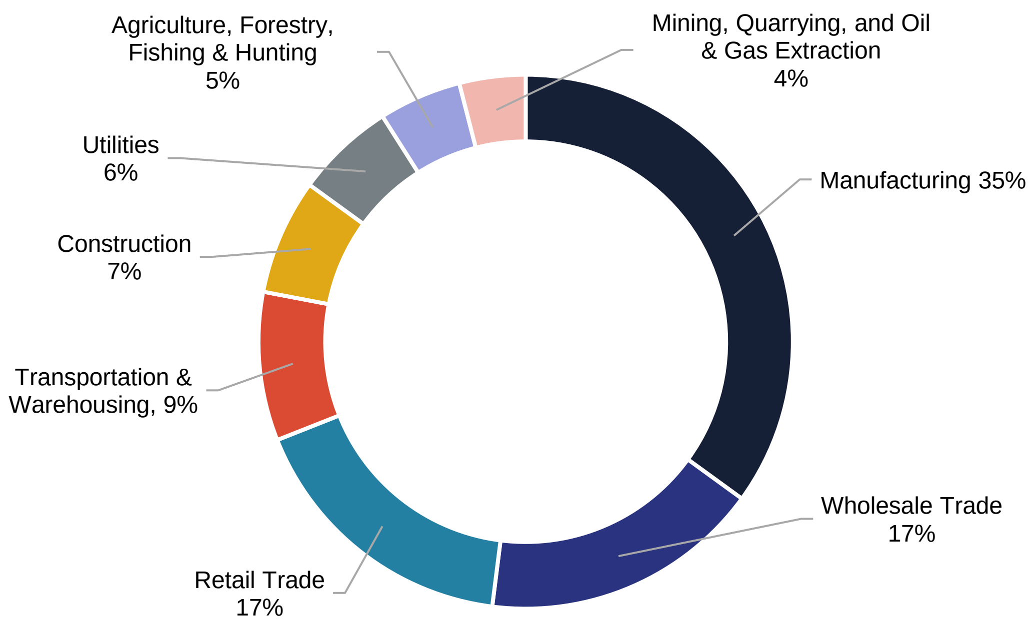
Figure 2.1 Share of Economic Output for Freight-Intensive vs. Service Sectors for the State of Arkansas, 2019



Source: Bureau of Economic Analysis.

Figure 2.2 shows that three sectors – manufacturing, wholesale trade, and retail trade – account for almost 70 percent of total freight-intensive economic activity. In 2019, manufacturing output was valued at $18.1 billion, making it the largest freight-intensive industry in Arkansas. The share of output was almost evenly split between the manufacturing of durable products (49 percent) and non-durable products (51 percent). Durable products are consumer goods that are expected to have a relatively long life span and are used over time, such as a refrigerator or sofa. Non-durable products are consumed relatively quickly and have short lifespans, such as food, drinks, and toiletries/cosmetics. Arkansas' manufacturing sector is fairly diverse, and includes the manufacturing of food, beverage and tobacco products; metals; paper; machinery; petroleum and coal products; plastics and rubber products; transportation equipment; chemicals; and wood products.

Figure 2.2 Distribution of Economic Output for Freight-Intensive Industries by Sector, 2019



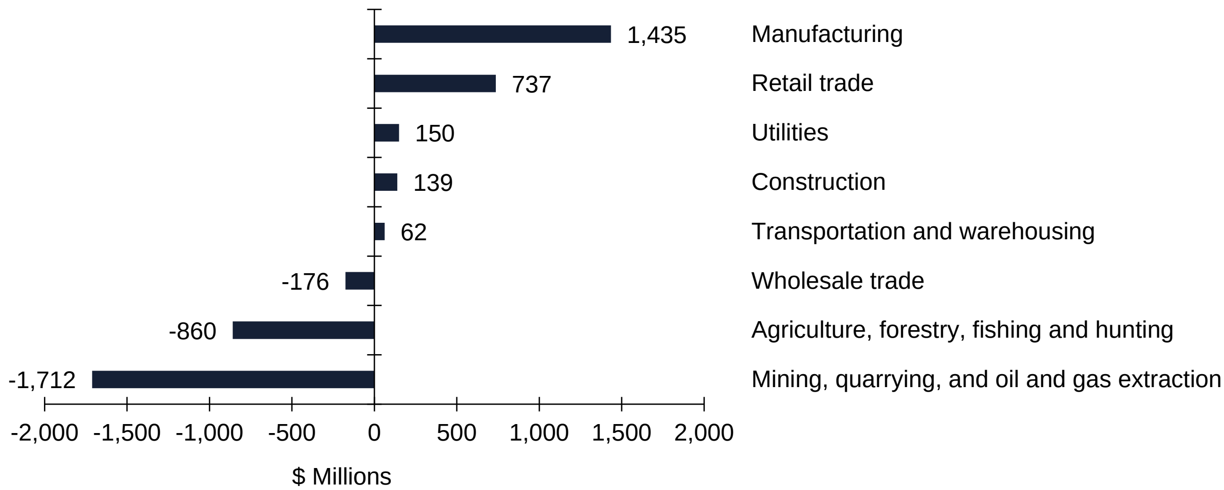
Source: Bureau of Economic Analysis.

The wholesale and retail sectors are other key industries that both rely on and generate high volumes of freight. In 2019, economic output for wholesale and retail trade amounted to $8.8 billion and $8.7 billion, respectively. When combined, activity in these two sectors account for a little over one-third of total output in freight-intensive activities. Wholesale trading in Arkansas is supported by the state's robust manufacturing sector. Top retail sectors include motor vehicles and parts, general merchandise, gasoline stations, food and beverage stores, and food services and drinking places.

Over the last five years, output increases in manufacturing and retail trade were highest among freight-intensive industries, as shown in Figure 2.3. Growth in manufacturing was largely driven by primary metals, petroleum and coal products, and the food and beverage sector. In the case of food and beverage, the Arkansas Economic Development Commission (AEDC)[1] reports that between January 2015 and April 2020, there were 94 economic development projects proposed in the food and agribusiness manufacturing industry, totaling $2.3 billion and resulting in more than 5,000 new jobs. By contrast, mining, quarrying oil and gas production, and agriculture experienced the most significant declines relative to other sectors.

1 https://www.arkansasedc.com/why-arkansas/key-industries/food-and-beverage

Figure 2.3 Change in Value of Economic Output ($M) for Freight-intensive Sectors Arkansas, 2015 – 2019



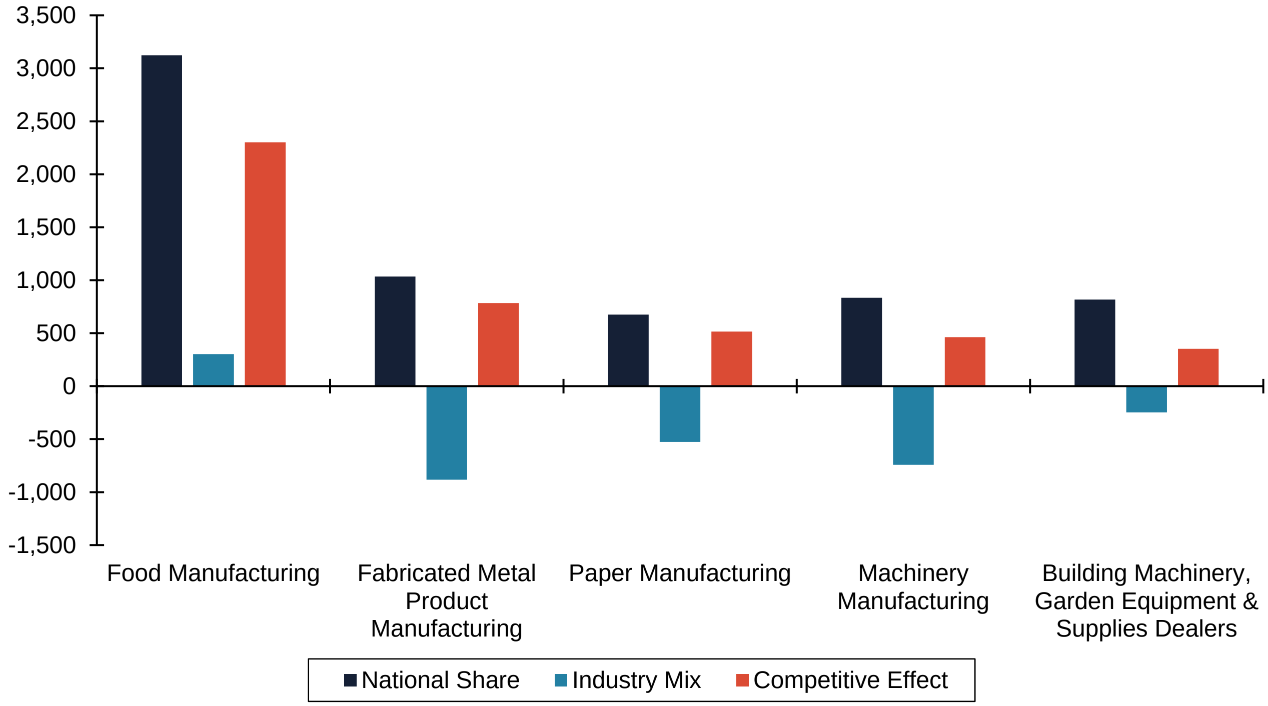
Source: Bureau of Economic Analysis.

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

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

Figure 2.4 shows the top five sectors in which Arkansas has a regional competitive advantage, as identified by the shift share analysis. Manufacturing of non-durable and durable products are prominently featured, with regional growth in food processing, fabricated metal, paper and machinery production exceeding national and industry trends. To a lesser extent, retail sales also exhibited a competitive advantage, specifically in building materials and garden equipment and supplies dealers.

Figure 2.4 Shift Share Components for Freight-intensive Sectors, 2015 – 2019



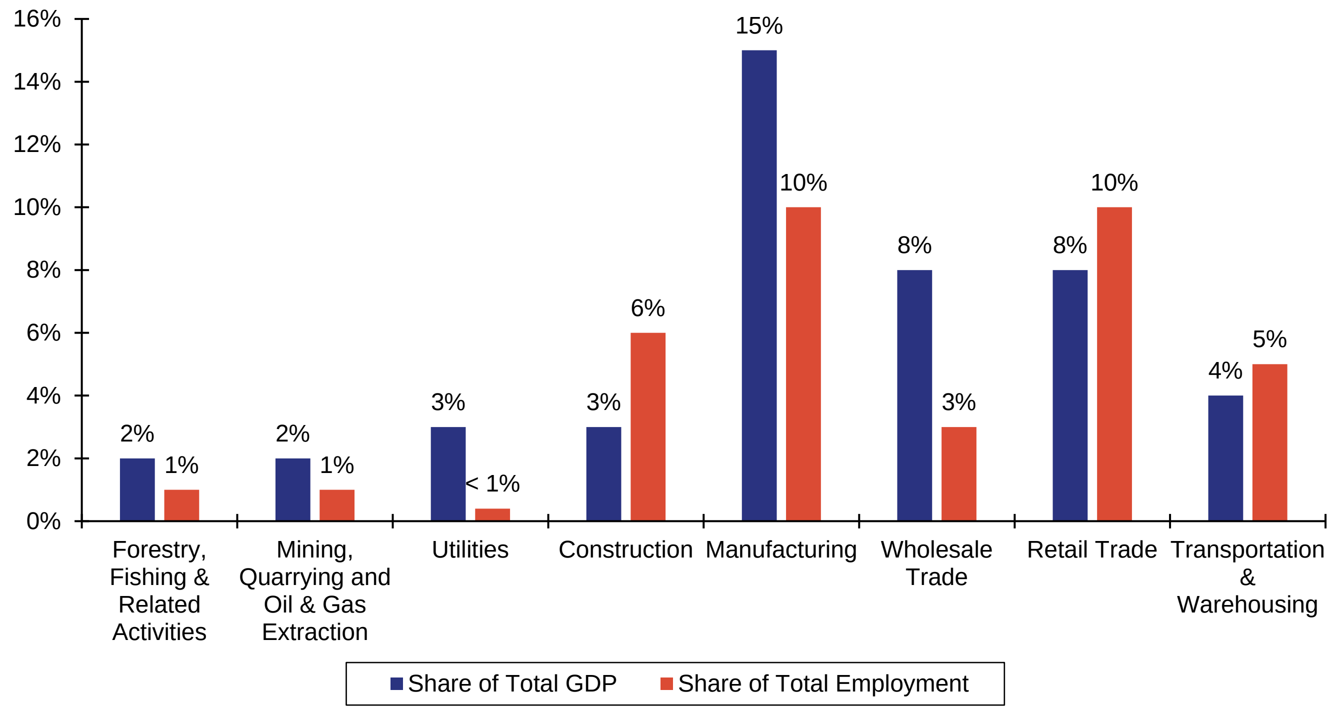
Source: Cambridge Systematics.

2.1.2 Employment

In 2019, freight-intensive sectors accounted for a little more than one-third of total employment in the state of Arkansas, with 590,000 employees out of a total workforce of 1.7 million people. Employment from manufacturing and retail trade were the highest among freight-intensive sectors, and together they contribute almost two-thirds of total freight-related employment. Construction was the third-largest industry, followed by transportation and warehousing.

Trends in employment by sector slightly differ from economic activity. Figure 2.5 shows that manufacturing and retail trade held the largest share of both GDP and employment in 2019. Wholesale trade was equally as important as retail trade when taking into account economic activity, but in the case of employment, construction was the third-largest sector. These differences largely reflect the level of labor intensity specific to each industry.

Figure 2.5 Comparison of Share of Economic Activity and Employment for Freight-intensive Sectors, 2015 – 2019

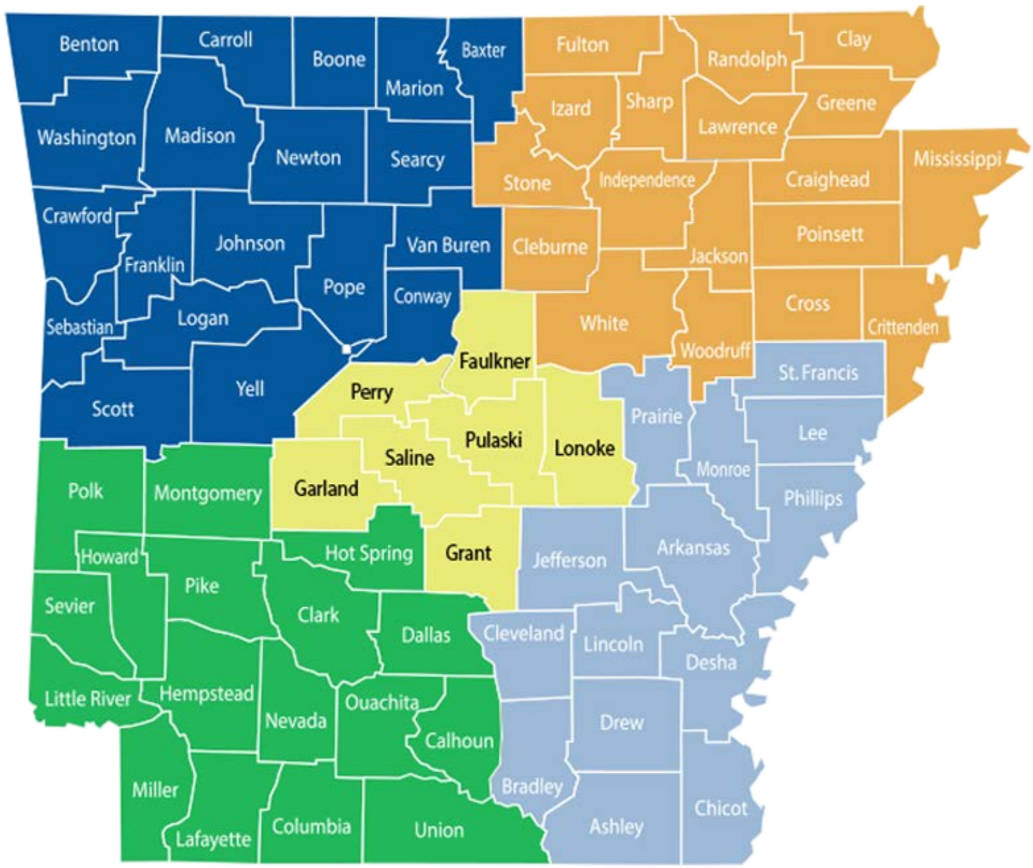


Source: Bureau of Economic Analysis.

2.2 Regional Assessment

This section provides a regional economic analysis for the five main geographic regions in Arkansas, as identified by the Arkansas Economic Development Commission (ADEC): Central, Northeast, Northwest, Southeast and Southwest (see Figure 2.6). The level of freight-intensive activity varies across these regions, and their economic structure provides a basis for understanding how current trends in freight activity and investment support or hinder their growth.

Figure 2.6 Geographic County Groupings for the State of Arkansas

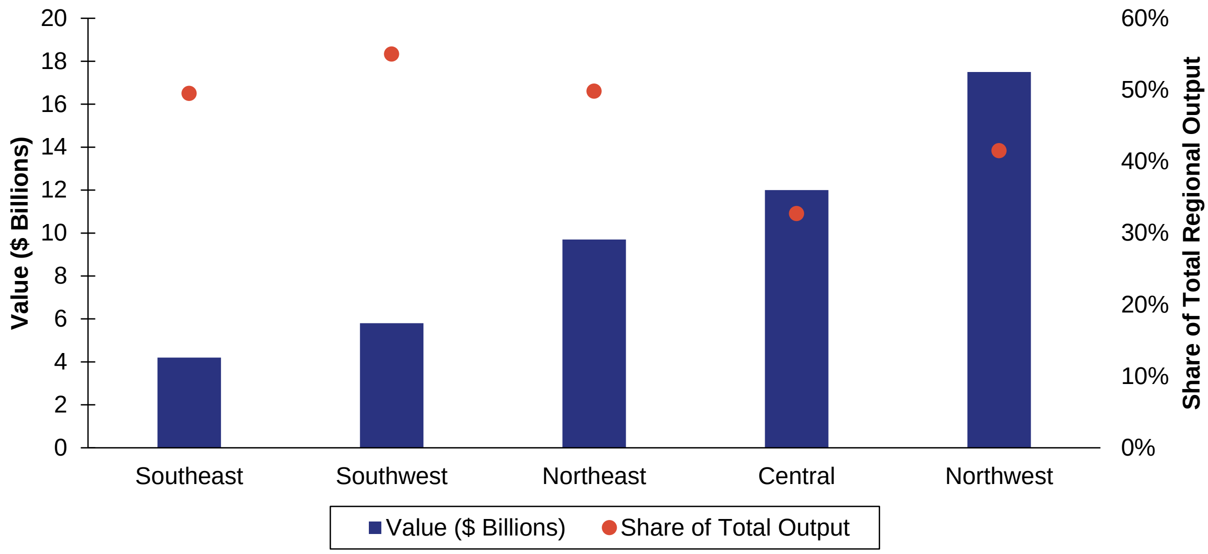


Source: Arkansas Department of Health.

The value of freight-intensive economic activity[2] varies significantly across regions, with the Southeast Region comprising the smallest share at $4.2 billion, and the Northwest Region comprising the highest share at $17.5 billion. Figure 2.7 shows that in 2019, the freight-intensive share of total GDP was highest in the generally more rural Southern and Eastern regions of Arkansas. In these portions of the state, the freight-intensive share of total GDP was approximately 50 percent. By contrast, the freight-intensive shares of total GDP in the more urbanized and developed Central and Northwestern regions of the state were between 30 and 40 percent.

[2] These values represent estimates that are consolidated from the Bureau of Economic Analysis, based on county-level GDP data by industry. Note, county-level data with single-firm results is suppressed.

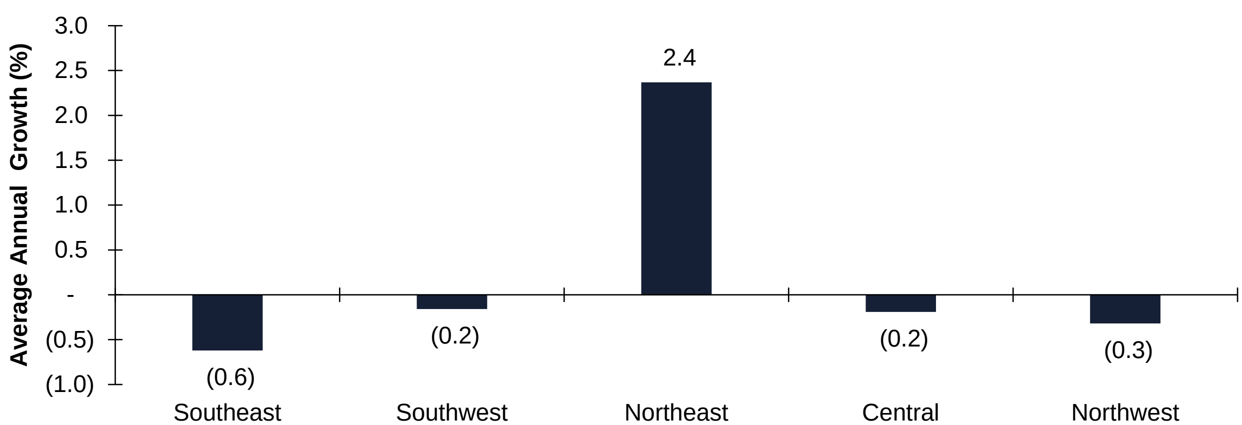
Figure 2.7 Value of Freight-intensive Output, by Arkansas Region, 2019



Source: Bureau of Economic Analysis.

Figure 2.8 depicts the average annual growth in freight-intensive output in Arkansas from 2015 to 2019. Of note, growth was positive for only the Northeast region, while the remaining regions declined slightly during this five-year period. This included declines in Northwest Arkansas, a region which has experienced significant population and economic growth in recent years. This indicates that much of the associated economic growth in this region has been generated in service sectors and other non-freight-intensive industries.

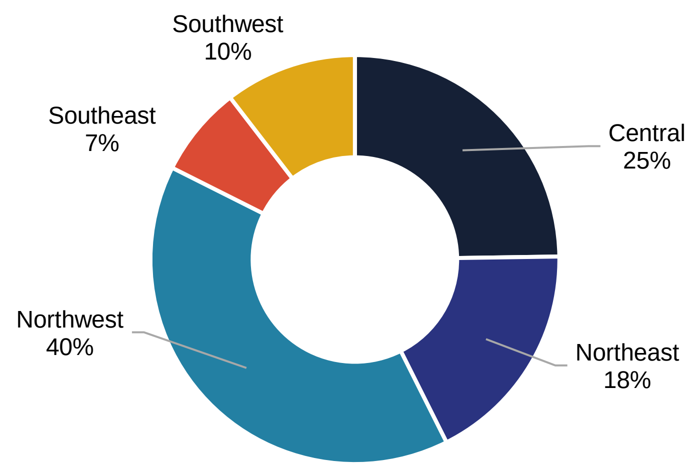
Figure 2.8 Average Annual Growth in Freight-Intensive Output, by Arkansas Region, 2015 – 2019



Source: Bureau of Economic Analysis.

Similar to trends in economic activity, share of employment for freight-intensive sectors varied across each region. Figure 2.9 depicts the share of freight-intensive employment for each of the Arkansas regions for 2019. The Central and Northwest regions account for almost two-thirds of employment generated by freight-intensive activity in the state. At the same time, Arkansas' southern regions comprised less than 20 percent of freight-intensive employment, while the Northeast region accounted for 18 percent. As expected, the distribution of employment mirrors trends in economic activity and explains why the southern regions account for the lowest share of freight-intensive employment.

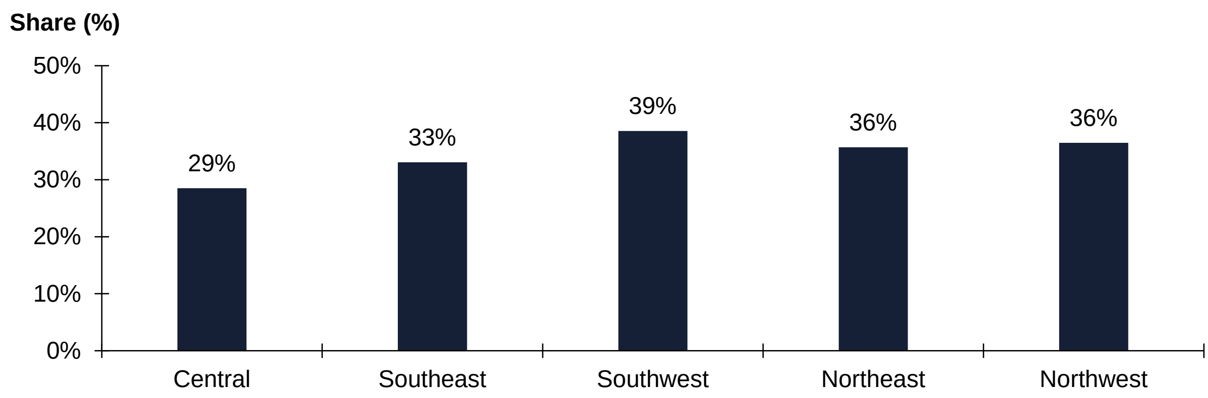
Figure 2.9 Share of Freight-Intensive Employment, by Arkansas Region, 2019



Source: Bureau of Economic Analysis.

Figure 2.10 shows the ratio of freight-intensive employment to total employment for each Arkansas region. The Southwest had the highest share, with almost four in ten jobs (40 percent) associated with freight-intensive activity. By contrast, in the Central Region, only three out of ten jobs were classified as freight-intensive.

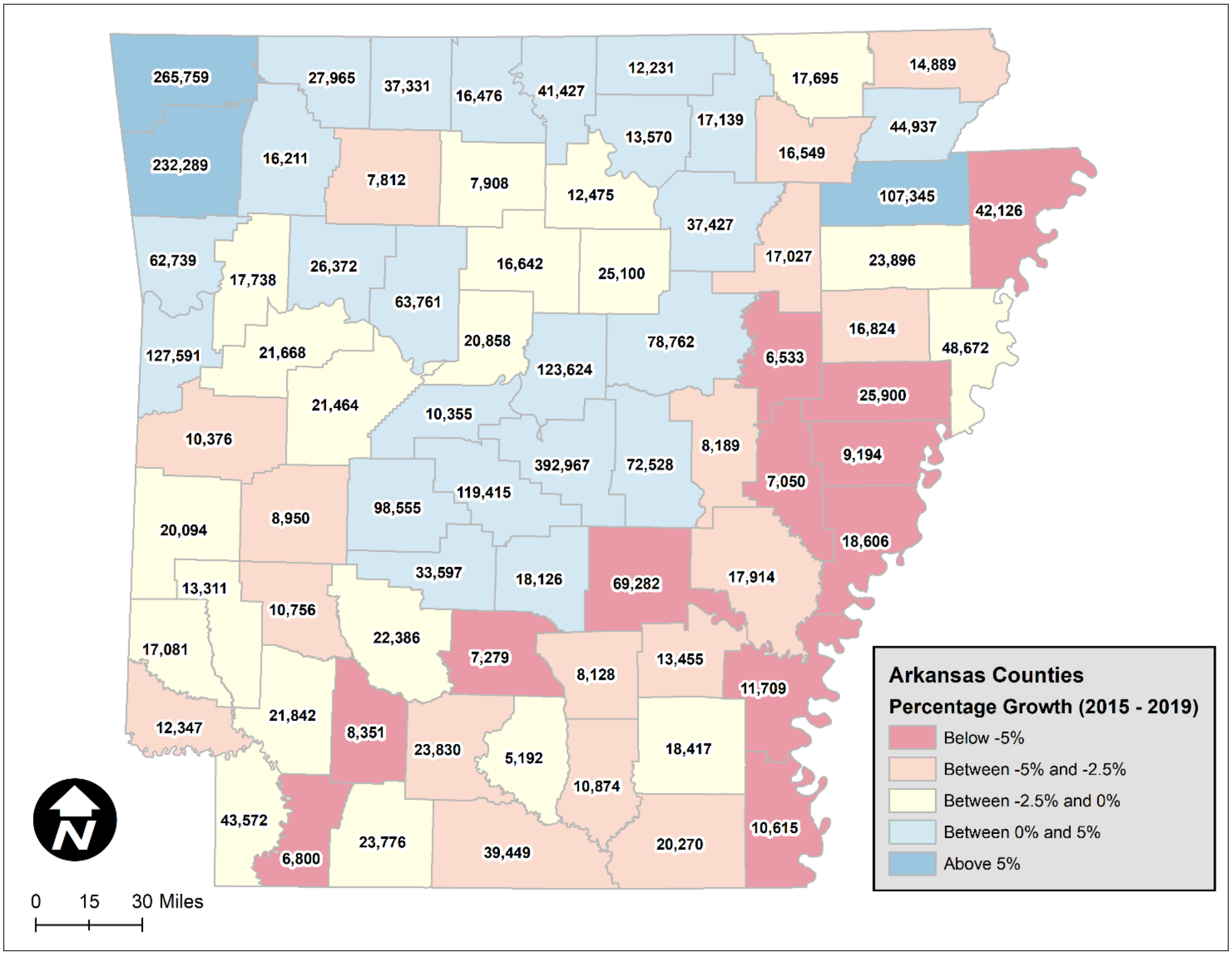
Figure 2.10 Ratio of Freight-intensive Employment to Total Employment, by Arkansas Region, 2019



Source: Bureau of Economic Analysis.

Some of the differences in employment and output can be attributed to changing population demographics throughout the state, as shown in Figure 2.11

Figure 2.11 Change in Population by County, 2015 – 2019



Source: U.S. Census Bureau.

The following subsections provide more detail on industries and output for each of the five Arkansas regions.

2.2.1 Central

The Central Region is comprised of seven counties and includes the state capitol, Little Rock, contributing an economic output of $36.5 billion in 2019 – the second-highest among the five regions. The region's economic base is primarily service-oriented with principal sectors including Finance, Insurance and Real Estate, Professional and Business Services, and Health Care and Social Assistance.

According to the Arkansas Economic Development Commission (AEDC), there are 52 companies with corporate headquarters and shared services located within this region. Pulaski County is home to a total of 38 of these headquarters, of which three employ over 500 people – the Baptist Medical Center, Dillard's, and Windstream Nuvox. The state's largest airport, Bill and Hillary Clinton National Airport, is also located in Pulaski County.

In the Central region, one-third of economic output was tied to freight-intensive activity. Almost three-quarters of this freight-intensive activity was concentrated in manufacturing, retail trade, and wholesale trade industries.

From 2015 to 2019, industries with the largest declines were mining and quarrying, durable goods manufacturing, and wholesale trade, while the highest growth came from non-durable manufacturing and construction.

The Central Region, home to one of the state's primary urbanized regions, including the capital and largest city of Little Rock, recorded the second-highest level of employment in the state, with 137,200 people in 2019. Of this amount, 29 percent of jobs (approximately 40,000 in total) were linked to freight-intensive industries. This employment was largely concentrated in retail trade, as well as construction.

2.2.2 Northeast

The Northeast region is comprised of 18 counties and includes the West Memphis/Memphis metropolitan area, with combined economic output amounting to $18.8 billion in 2019. The Northeast region also includes Jonesboro in Craighead County, the fastest growing county in Northeast Arkansas. Manufacturing is the principal industry, followed by real estate, rental and leasing.

Approximately half of the Northeast Region's economic activity was attributed to freight-intensive industries, with as much as 40 percent originating from the manufacturing industry. Retail and wholesale trade followed closely, accounting for a combined share of 27 percent. From 2015 to 2019, growth in the manufacturing and agriculture sectors largely offset declines in mining and quarrying.

In 2019, employment from freight-intensive activities in the Northeast Region amounted to 98,900 people, making it the second-highest among the regions. In terms of regional significance, freight-intensive sectors contributed around 35 percent to employment in this region.

2.2.3 Northwest

The Northwest has been identified as the fastest growing regions in Arkansas in terms of new and expanding business and population growth. This area comprises of 19 counties and includes the growing cities of Bentonville, Fayetteville, Springdale, and Rogers. It is also proximate to the neighboring cities of Tulsa, Oklahoma and Springfield, Missouri. In 2019, economic output amounted to $42.1 billion, the highest among the five regions, buoyed by activity in manufacturing and retail trade.

Although the Northwest Region recorded the highest level of freight-intensive economic output compared to the other regions, freight-intensive activities contributed to less than half (42 percent) of the region's total economic output. Similar to other regions, manufacturing, wholesale and retail trade were the largest contributors (almost three-quarters of the value) to freight-intensive activity in 2019. Further, manufacturing and retail trade were also the fastest growing sectors, while agriculture and mining and quarrying experienced declines during the five year period.

With 220,600 workers in its freight-intensive sector, the Northwest Region maintains the highest freight employment level relative to other regions. This sector contributed 37 percent of employment to this region.

2.2.4 Southeast

The Southeast region in Arkansas is comprised of 14 counties. Economic output was valued at $8.6 billion in 2019. With economic activity in the Southeast Region being the lowest in Arkansas, freight-intensive output was also the lowest among the regions at $4.2 billion. Nonetheless, freight activity contributed almost half of the region's total output. At 40 percent, manufacturing accounted for the largest share of freight-intensive activity, followed by agriculture and forestry (8.5 percent) and retail trade (6.1 percent). There was an overall decline in freight activity over the five year period, with large reductions in wholesale trade, and transportation and warehousing, despite an increase in manufacturing activity.

Freight-intensive employment in the Southeast Region amounted to 80,200 people employed in these sectors in 2019. This contributed to one-third of the region's total employment, underpinned by manufacturing and retail trade industries.

2.2.5 Southwest

The Southwest region in Arkansas is comprised of 17 counties, generating $5.8 billion in freight-intensive output in 2019. Despite its low value relative to other regions, freight-intensive output contributed as much as 55 percent of this region's total activity. The total value of output generated from freight-intensive sectors fell slightly between 2015 and 2019 due to declines in the agriculture sector.

Freight intensive employment in the Southwest Region consisted of 92,300 people employed in such industries. Similar to trends in economic activity, employment in this region has also been heavily reliant on freight activity, with 39 percent of total employment tied to this sector.

3.0 Recent Developments in Key Arkansas Industry Supply Chains

This section profiles four key freight-intensive industries in Arkansas, including rice production and processing, poultry production and processing, iron and steel, and e-commerce. Each profile includes an overview of key supply chain elements, as well as a discussion of opportunities and challenges associated with shipping infrastructure and transportation modes, in light of recent developments over the last five years.

The rice production and processing and poultry production and processing profiles were developed for the 2017 State Freight Plan (SFP) and were updated through latest-available industry data and recent interviews with stakeholders. The iron and steel and e-commerce profiles were newly developed for this SFP update and also leverage publicly-available industry data and perspectives from Arkansas firms and other industry stakeholders obtained through interviews.

3.1 Rice Production and Processing

Rice production is an important contributor to the U.S. economy and the food supply both domestically and abroad. In 2021, the value of U.S. rice exports was valued at $1.9 billion. The top three export markets include Mexico ($306 million), Japan ($289 million), and Haiti ($218 million).[3] Four regions produce almost the entire U.S. rice crop, including:

- Arkansas Grand Prairie, comprised of Arkansas, Lonoke, Monroe, and Prairie Counties in Arkansas.
- Mississippi Delta (parts of Arkansas, Mississippi, Missouri, and Louisiana), comprised of Chicot, Clay, Craighead, Crittenden, Cross, Desha, Greene, Lee, Mississippi, Poinsett, Phillips, and Saint Francis Counties in Arkansas.
- Gulf Coast (Texas and southwest Louisiana); and
- Sacramento Valley of California.

Planting and harvesting is seasonal and varies depending on the region, but planting in Arkansas typically begins in April with harvest in August. Exports include rough (unmilled) rice, parboiled rice, brown rice, and fully milled (white) rice.[4] Although the U.S. exports a significant amount of rice, a large amount is imported into the country as well, an amount which has been increasing sharply over the past several decades. Most imports are aromatic varieties from Asia, including jasmine rice from Thailand and basmati rice from India and Pakistan. Over the past 5 years, the U.S. has imported, on average, about 11 percent of its total supply of rice, with a record 14 percent in 2019 and 2020.[5]

The concentration of rice production by county is shown in Figure 3.1. Arkansas is the dominant player for rice production in the U.S., contributing nearly half of all rice produced in the country, including the majority of

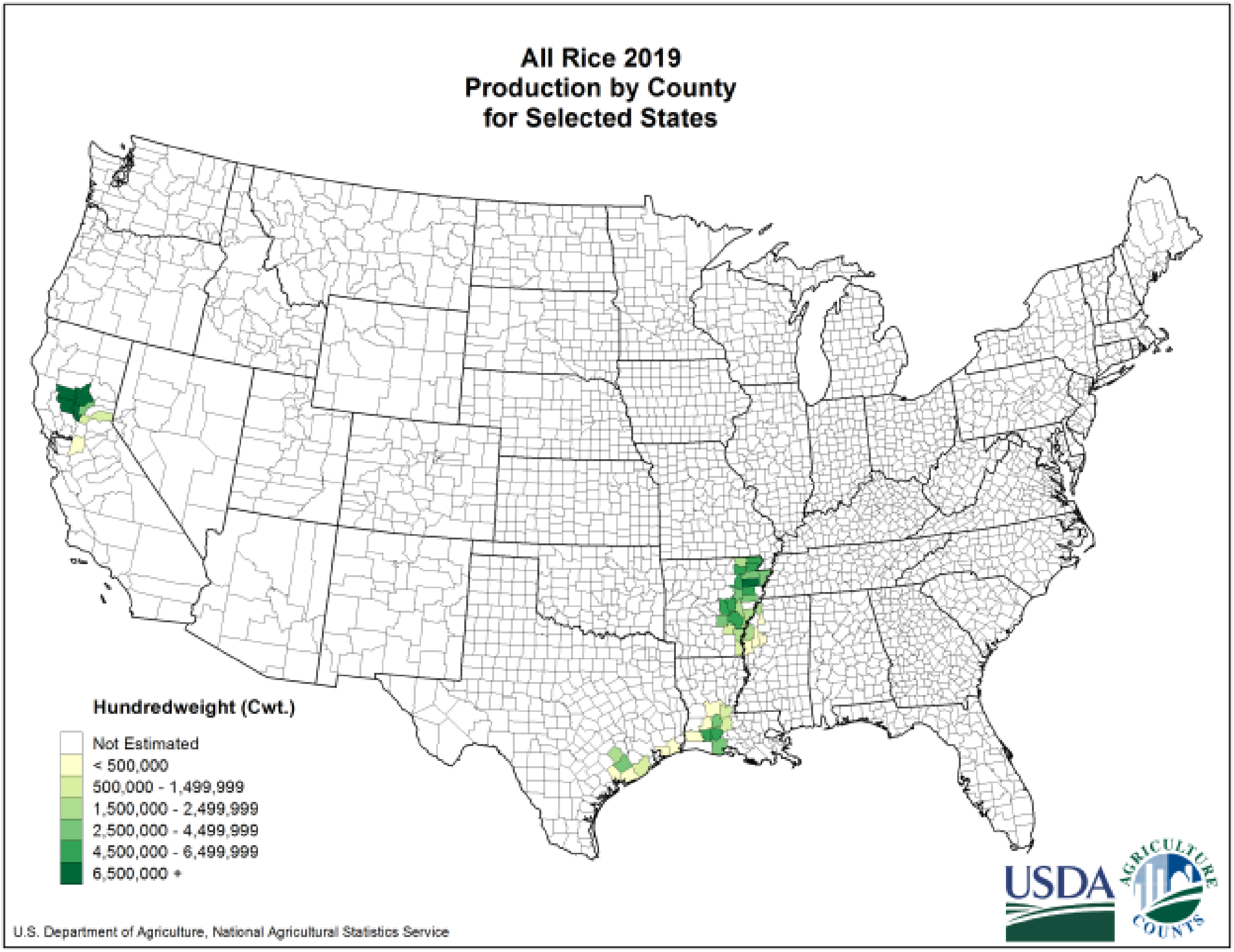
[3] https://www.fas.usda.gov/commodities/rice

[4] https://www.ers.usda.gov/topics/crops/rice/rice-sector-at-a-glance/

[5] https://www.ers.usda.gov/topics/crops/rice/rice-sector-at-a-glance/

rice produced in the eastern half of the U.S. The majority of this product is long grain rice. Additional forms of rice produced include medium grain rice, and a smaller amount of short grain rice.

Figure 3.1 U.S. Rice Production by County, 2019



Source: U.S. Department of Agriculture.[6]

Rice growers in the state produced more than 12.1 billion pounds of rice in 2020, a substantial increase from 10.8 billion pounds produced in 2012. The rice industry is concentrated in the eastern part of the state. The ten largest producing counties are listed in Table 3.1, which together represent 59 percent of all rice production in the state by volume. Poinsett County is the largest by total output, having produced roughly 1.02 billion pounds of rice in 2020. Production varies from year to year based on rice yields per harvested acre, which may be influenced by factors such as weather, drought, and crop rotation.

[6] Note that production is expressed as hundredweight or cwt. A hundredweight is equivalent to 100 pounds.

Table 3.1 Arkansas Rice Production by County, 2020

Rank	County	Acres planted	Yield per Acre (pounds)	Production (cwt)	Percent of Total Production
1	Poinsett	120,000	7,600	9,100,000	8%
2	Jackson	110,000	7,250	7,395,000	7%
3	Arkansas	89,200	7,950	7,064,000	7%
4	Lonoke	87,200	7,910	6,862,000	6%
5	Cross	86,500	7,270	6,267,000	6%
6	Clay	75,400	7,810	5,858,000	5%
7	Jefferson	78,000	7,400	5,738,000	5%
8	Greene	68,100	7,570	5,132,000	5%
9	Lawrence	69,600	7,280	5,016,000	5%
10	Prairie	62,300	8,040	4,990,000	5%
All Others		609,100	–	33,236,005	41%
Total		**1,461,000**	**7,500**	**108,107,000**	**100%**

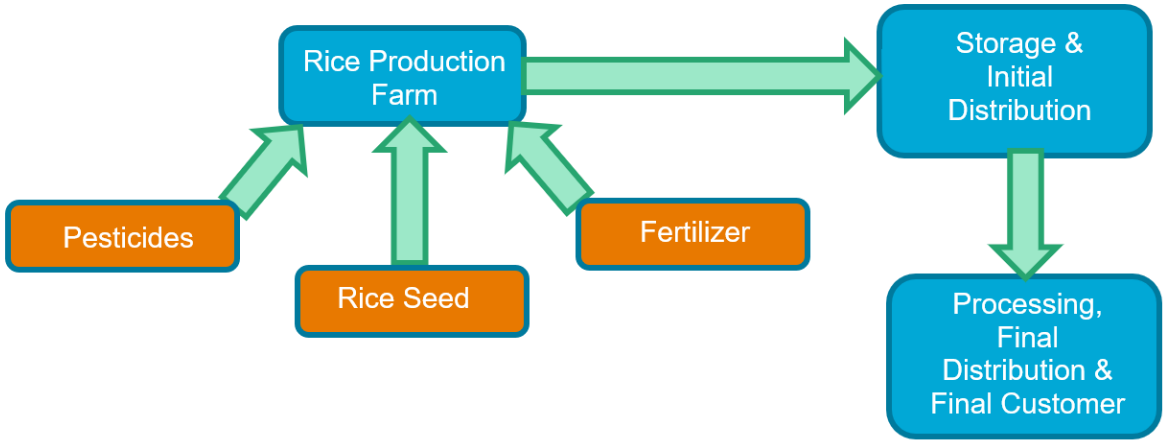
Source: U.S. Department of Agriculture, National Agricultural Statistics Service. 2021.

3.1.1 Overview of Supply Chain Elements

The process of growing rice includes several inputs including rice seed, fertilizers, and pesticides for the crop itself along with heavy farming equipment to work the land. Seed is typically purchased locally from a regional seed dealer and trucked in for delivery, while remaining inputs, including fertilizer, are typically trucked in following the use of barge or rail. In terms of specific farming conditions, the process for growing rice is rather unique. Growing to a height of approximately 4 feet, rice plants are irrigated through a process that submerges the crop in between two and four inches of water. This process of irrigated submersion is used for weed control and to improve the absorption of nutrients that allow the crop to flourish.[7] As a result, providing access to abundant water, the lowland areas of eastern Arkansas and the Mississippi River Delta provide an effective location for rice production. Once the rice is harvested, it is brought to onsite or offsite storage and distribution facilities, typically by truck. As a bulk commodity, rice is then transported by varying combinations of rail, truck, and barge, depending on the destination and geographic location.

[7] http://www.usarice.com/thinkrice/discover-us-rice/how-rice-grows

Figure 3.2 Rice Supply Chain Elements



3.1.2 Opportunities & Challenges

Identified opportunities and challenges related to the production of rice are derived from both industry research and one-on-one interviews with key industry stakeholders in Arkansas. A key challenge in relation to rice farming is flooding. Although rice is farmed in water-rich land, this also makes the crop particularly vulnerable to extreme flash-flood events.[8] In 2021 for example, severe floods caused the near-total loss of over 300,000 acres of rice in the southeast portion of the state.[9] Furthermore, mirroring national risks for more extreme weather, nearly every Arkansas county is expected to see an increase flood risk, especially those in the eastern portion of the state where rice is grown. In relation to the statewide transportation network, the challenges are twofold. Flooding can increase infrastructure degradation and require detours and rerouting away from vulnerable links. Additionally, flooding has the potential to impact and alter agricultural output, and corresponding freight traffic.

Multiple opportunities and challenges exist with respect to freight transportation access and service. In direct relation to agriculture, a recent Surface Transportation Board (STB) hearing identified significant impacts to the industry as a result of railroad delays impacting the ability to acquire necessary fertilizer and chemicals. These delays are driven by factors such as reductions in rail service and labor challenges.[10] This is concerning to many Arkansas shippers, who prefer shipping bulk rice via rail as it is more cost effective than by truck.

Other transportation issues exist with respect to road access. Although many industries use local roads for first- and last-mile connections (sometimes referred to as farm-to-market roads), farming often heavily relies on the local road network due to the rural nature of the industry. These roads are typically not built or maintained to the same standards as the State Highway System or Interstate System and can be more easily

8 https://soilcrop.tamu.edu/rice-researcher-addresses-plant-survival-during-extended-flooding/#:~:text=%E2%80%9CSince%20rice%20naturally%20grows%20in,the%20crop%2C%E2%80%9D%20she%20said.

9 https://www.ricefarming.com/departments/breaking-news/floods-cause-200-million-plus-in-crop-damage-in-se-arkansas/

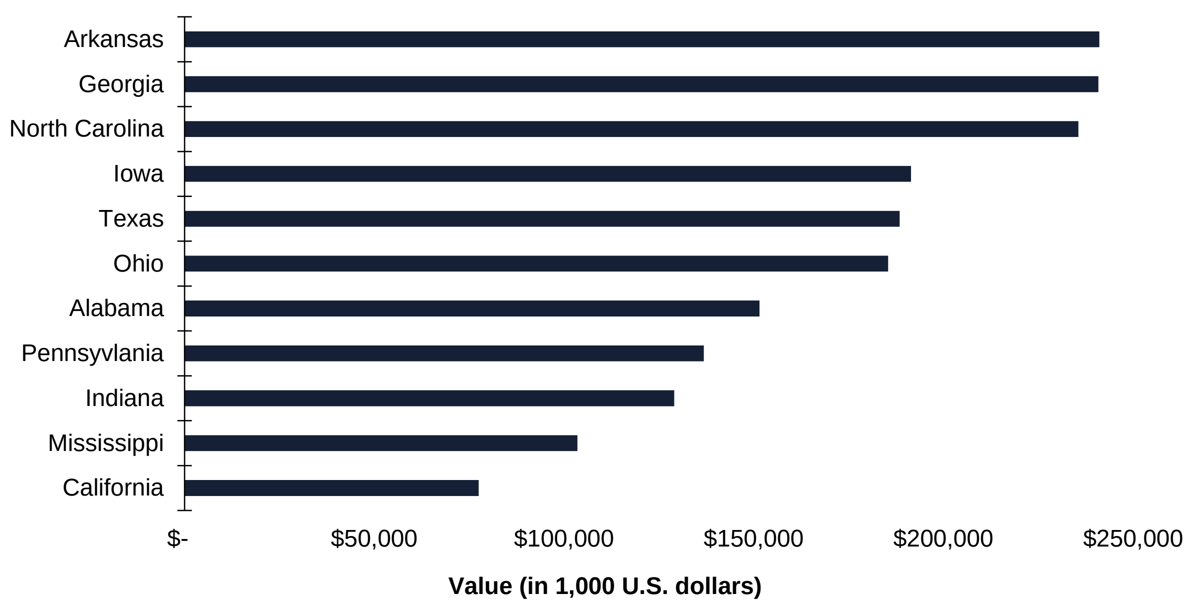
10 https://www.dtnpf.com/agriculture/web/ag/news/article/2022/05/02/stb-rail-service-hearing-exposes-2

damaged by heavy loads, including farming equipment which often must use the roads to move to and from the crops. Over the years, this equipment has become significantly larger and heavier, increasing road wear and at times restricting vehicle access due to narrow roads. This creates both inefficiencies for the industry and increased maintenance costs for local municipalities. Stakeholders also identified truck weight limits on roadways and at posted bridges to be a significant concern, particularly in rural areas with limited alternative routes for fully-loaded vehicles. More discussion about truck weight limits can be found in Section 3.2.2.

3.2 Poultry Production and Processing

The U.S. has a large and growing poultry industry, with an inventory of over 518 million chickens and 224 million turkeys. In addition to being a major consumer of poultry products, the U.S. also exports a significant amount of product. For the last decade, the U.S. has shipped about 7 billion pounds of broiler exports annually. The U.S. exports significantly more broilers than it imports, and exports turkey meat as well, with the volume of turkey exported from the U.S. in 2021 amounting to about 550 million pounds. The vast majority of U.S. turkey exports are bound for Mexico, which imported about 67 percent of the U.S. turkey exports.[11] At the state level, Arkansas is the top state based on total value of chickens (Figure 3.3).

Figure 3.3 Top 10 U.S. States Based on Total Value of Chickens, 2020



Source: Statista. https://www.statista.com/statistics/196084/top-us-states-based-on-total-value-of-chickens/

As such, poultry is one of the largest agriculture industries in Arkansas. According to the Poultry Federation, the sector provides nearly 167,000 jobs in the state, with over 6,500 farms in Arkansas producing some type of poultry. In 2020, the industry generated $3.7 billion (50 percent) of the total agriculture cash receipts. Of the poultry cash receipts, broilers were the largest contributor, providing 37 percent of the state's total agricultural cash receipts.[12] Statewide totals for 2021 included 7.5 billion pounds of broiler chicken (from more than 1.05

[11] https://www.statista.com/topics/6263/poultry-industry-in-the-united-states/#topicHeader__wrapper

[12] https://www.thepoultryfederation.com/resources/facts-figures

billion broilers), 540 million pounds of turkey (from 31 million turkeys), and 4.2 billion eggs.[13] Arkansas produces approximately 3 million table eggs (purchased by consumers at grocery stores) each year.

Moreover, poultry products are among the Arkansas' top export commodities to many different countries across the globe. In 2020, Mexico and China were the largest foreign markets for Arkansas poultry, accounting for 55 percent of shipments and valued at $239 million. Mexico was the top country in which poultry was exported ($82 million), followed by China ($48 million). Other countries to note are Guatemala ($27 million) and Canada ($21 million).[14]

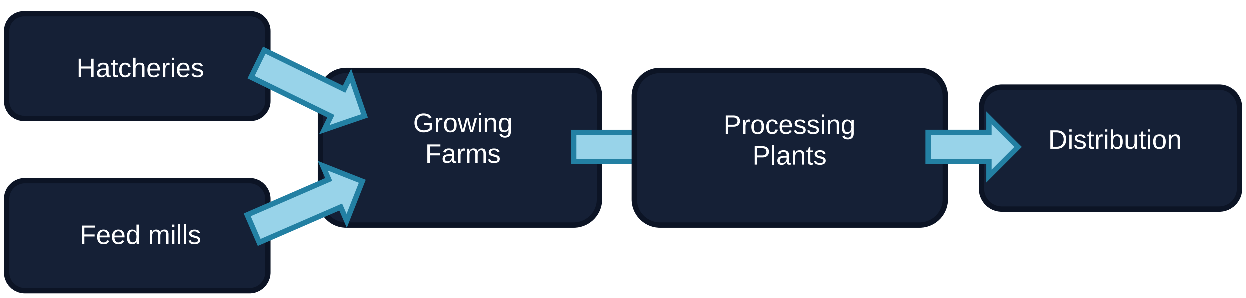
3.2.1 Overview of Supply Chain Elements

The poultry business model consists of five major elements:

1. Hatcheries,
2. Feed mills,
3. Growing farms,
4. Processing plants, and
5. Distribution for final consumption.

The first two elements – hatcheries and feed mills – provide inputs for the remaining supply chain steps, as shown in Figure 3.4. Arkansas is the only state in the top ten in each of these poultry supply chain elements.

Figure 3.4 Poultry Supply Chain Elements



More detail on four of these components is detailed as follows:

- **Hatcheries** are a specialized facility designed to hatch fertile eggs. Key inputs include feed, poultry raised for breeding, and medical products, typically brought in by truck. The main output of a hatchery are young chicks that will be transported, primarily by truck, to growing farms where independent farmers raise them to market weight under contract with poultry companies. Additional byproducts and waste includes infertile eggs, shell fragments, dead chicks, and culled chicks (chicks that have no use for the industry). Hatchery

[13] Interview with Poultry Federation, May 2022.

[14] https://www.arkansasedc.com/docs/default-source/default-document-library/2020-exports-report.pdf?sfvrsn=89c7870b_0

waste may be processed into livestock food known as hatchery by-product. A hatchery along with a feed mill and a processing plant form a “complex”.

- **Feed mills** convert raw materials, mainly corn and soybean, into finished feed. Formulas are very specific and designed to change in order to meet the nutritional requirements of the animal at every stage of life. On the input side, Arkansas imports corn from major corn producing states such as Iowa. Train and barge are the main means of transporting corn to Arkansas for the feed mills. This trend is changing as poultry companies are beginning to contract with local Arkansan corn growers for their feed products. The shorter distances involved require a change to truck shipments for corn feed products from Arkansas. Although corn is produced in Arkansas, the amount produced is not sufficient to meet the needs of the poultry industry. As such, poultry companies will continue to rely on feed products from other states. On the outbound side, processed feed is transported by truck to growing farms to be fed to chickens.

- **Growing farms** are locations where poultry is raised. Due to the high transportation costs associated with moving feed, many companies require growing farms to be located within a 10 – 30 mile radius from the feed mill in order to limit cost. Growing farms are typically located within a 60 mile radius of a poultry complex and are supplied by the feed mill and hatchery. Processed feed is transported to the growing farms by truck from the feed mill. This feed is used for one-week old chicks received from hatcheries who are raised for an additional six weeks. The processing company provides the chicks, feed and any necessary pharmaceuticals. The farmers who raise the poultry provide the growing barns, water, bedding (litter), electricity, and their own management skills. Once the chickens are seven weeks old and have reached market weight, they are transported back to the complex by truck for harvesting at the processing plants.

- **Processing plants** are facilities where chickens are harvested. Chickens are moved back to the processing plant at the complex in their cages which are placed on flatbed trucks. Approximately 21 million chickens are harvested per week in Arkansas.[15] In addition to the poultry input, an additional product necessary for the processing plant is packaging material necessary for the finished poultry product. Boxes and other packaging material are brought to the processing plant by truck and represent the largest supply by dollar value to each poultry company. The final product from the processing plants is either fresh or frozen which will be carried by trucks equipped with refrigerators to either grocery stores or other facilities for further processing. The delivery of the final products to the market (**distribution phase**) is usually done by the poultry companies themselves.

The poultry industry in Arkansas is particularly reliant on roadway infrastructure at each step of the process, while feed mills rely on rail and barge service for receiving inputs and the final distribution of product by rail. Vessels are also used for overseas exports to markets such as Asia and South America.

The poultry industry in Arkansas is concentrated in the western portion of the State. The roadway network serving east-west travel is dominated by Interstate 30 and Interstate 40. Interstate 40 in particular provides access to Oklahoma City and points west as well as Memphis to the east, which is a major distribution hub. Interstate 30 links the Little Rock area to Dallas/Ft. Worth, Texas. Travel north of Interstate 40 is served by Interstate 49, which runs north to Kansas City. This is in addition to the use of local and feeder/collector roadways used to access the key thoroughfares.

[15] Interview with Poultry Federation, May 2022.

For those components of the supply chain utilizing rail, especially for inputs and distribution, key rail carriers likely include Kansas City Southern (KCS), Union Pacific (UP), and additional short line railroads located in the western portion of Arkansas. In relation to barged raw agricultural material, the Arkansas River is navigable up to the Tulsa Port of Catoosa near Tulsa, OK using the McClellan-Kerr Arkansas River Navigation System. Goods bound for export through Louisiana ports may also utilize barges on the Mississippi River to reach the ports and be transferred to containers for foreign export.

3.2.2 Opportunities and Challenges

Truck movements are the dominant form of transportation in the poultry industry. Many of these trips move heavy, bulky goods over short distances. To facilitate the movement of the corn inputs and feed outputs involved in the process, Arkansas increased some of the legal weight limits for trucks carrying these goods on State Highways, as per Table 3.2. It is important to note that this increased weight limit does not apply to trucks using the Interstate Highway System. The majority of truck movements have been outsourced to third party logistics (3PL) carriers such as J.B. Hunt, which eliminates the need for individual feed mills to own feed trucks and hire drivers for this purpose.

Table 3.2 Arkansas Truck Weight Limits for Specific Commodities

Product	Arkansas Single Axle Weight Limit[4]	Arkansas Tandem Axle Weight Limit[4]	Arkansas Tridem Axle Weight Limit[4]	Arkansas Gross Weight Limit[4]
Regular Commodity	20,000 pounds	34,000 pounds	50,000[1] pounds	80,000 pounds (per state weight table)
Animal Feed[2]	Same	36,500 pounds	Same	80,000 pounds
Unprocessed Farm/Forest Product[3]	Same	36,500 pounds	Same	85,000 pounds

1 Within a tridem axle group, no single axle can exceed 18,000 pounds and no tandem axle group can exceed 32,000 pounds.

2 For vehicles with five axles used exclusively for hauling animal feed to owner's farm/home for consumption. 8 percent variance above allowable gross weight under federal bridge formula. Variances not allowed on the Interstate Highway System.

3 For vehicles with five axles hauling unfinished and unprocessed farm products, forest products, or other products of the soil. Exempt from federal bridge formula. Variances not allowed on the Interstate Highway System.

4 Enhanced commodity-specific weight limits are not applicable on the Interstate Highway System.

Source: http://ops.fhwa.dot.gov/FREIGHT/policy/rpt_congress/truck_sw_laws/app_a.htm#ar

One obstacle to the movement of heavy (but otherwise legal) loads is the presence of load-posted bridges, which are discussed in detail in the Highway Freight Modal Profile and Multimodal Needs Assessment Chapters. These bridges can act as chokepoints for trucks that are otherwise legal on the State Highway System or other roadways.

The heavy reliance on trucks also poses a challenge to this industry. Driver shortages are a recurrent issue across the U.S. In 2021, the American Trucking Association estimated that there were 80,000 unfilled driver positions. This figure is expected to more than double through 2030.[16] This issue is driven by a number of factors including a high turnover rate (approaching 100 percent in some segments of the industry) as well as an aging workforce.[17] The lack of drivers creates uncertainty for supply chains and raises prices for shippers since drivers can choose the best paying positions. This problem is less acute in the less-than-truckload (LTL) driver population, which typically works closer to home, has closer-to-normal work hours, and has a semi-regular set of pickup and drop-off points. Hours of service (HOS) laws, which were designed to enhance safety by reducing the number of fatigued drivers on the road, also created service challenges for the trucking industry. Inclement weather and poor road conditions combined with the HOS requirements can quickly disrupt supply chains throughout the state.

Additional opportunities and challenges were identified through interviews with industry stakeholders. A key opportunity, especially given the current labor shortage, is automation. The de-boning process presents challenging work conditions, characterized by cold, difficult, and repetitive tasks. Mechanical de-boning is one key area that producers are looking to invest in automation technology to reduce the number of workers required. Although producers lose some yield by using machines rather than people to complete these tasks, factoring the labor savings related to salary, insurance, overtime, and other costs, the costs end up evening out. According to industry personnel, the process of automation is expected to accelerate through the next two years, helping to relieve workforce-related challenges for producers. In relation to transportation, assuming demand for poultry products remain strong and automation processes will become more efficient in the upcoming years, automation has the potential to increase freight traffic into and out of poultry processing centers.

On the other hand, risks exist in relation to Avian Influenza, which carries a 100 percent mortality rate for birds. As of 2022, Avian Influenza, spreading from wild birds, has been detected in 31 states. Although Arkansas is not one of these states, the neighboring states of Missouri, Tennessee, Texas, and Oklahoma are included on this list. Although the Arkansas poultry industry has not faced issues associated with the Avian Flu, if it does spread to Arkansas, there could be significant impacts. These impacts may include a complete wipeout of international exports, and the euthanizing of at least some portion of the poultry industry population. This has the impact to significantly impact freight volumes across the Arkansas transportation network. Stemming from interviews, industry personnel also identified issues related to transporting and unloading trailers at ports, including the Port of Houston, especially due to backlogs at these facilities. Although these facilities are outside of Arkansas, these backlogs can slow, stop, or alter regional freight traffic flows, including in and through the state.

3.3 Iron & Steel Production and Processing

Iron and steel are widely used across multiple sectors of the global economy, ranging from consumer products such as cutlery and tools, to industrial equipment, construction materials, and major infrastructure systems. In 2021, the U.S. produced approximately 85 million tons of steel, making it the fourth-largest producer globally, behind China, India, and Japan.[18] Steel production in the U.S. is widely distributed across the country, with high concentrations of manufacturing in the Midwest and South. Due to an extensive infrastructure network,

[16] https://www.trucking.org/sites/default/files/2021-10/ATA%20Driver%20Shortage%20Report%202021%20Executive%20Summary.FINAL_.pdf

[17] http://cerasis.com/2016/05/03/driver-shortage/

[18] https://worldpopulationreview.com/country-rankings/steel-production-by-country

massive consumer base, and large urbanized population, the U.S. is the largest importer of steel in the world. In 2019, the U.S. imported 26.3 million tons of steel, compared to an export figure of 7.1 million. Canada, Brazil, and Mexico accounted for half of all imports, while Canada and Mexico accounted for nearly 90 percent of all exports.[19]

In Arkansas, the metals industry employs over 22,000 people and accounts for nearly 14% of total manufacturing. Located in the Northeast corner of Arkansas, Mississippi County boasts the second-largest capacity for steel production in the nation. The steel industry in Arkansas began with Nucor Corporation, which developed a steel mill on the Mississippi River in Mississippi County in the 1990s. The company has since expanded its facilities, investing $230 million in a facility expansion in 2016 and creating 100 new jobs. Other notable steel companies in Arkansas include Big River Steel, which began production in 2016, and was the first steel production process to achieve LEED Certification, the most widely used green building rating system.[20] In August 2021, Majestic Steel announced its plans to develop a new state-of-the-art service center and processing facility on the campus of Nucor Hickman in Blytheville, which is expected to be fully operational by the end of 2022. This 515,000-square-foot master distribution site was designed to better service Majestic Steel's customers, due to Arkansas' strategic location, and it provides the company with proximity to Nucor's production.[21]

In January 2022, U.S. Steel announced its plans to develop a $3 billion next-generation, highly sustainable and technologically advanced steel mill in Osceola, Arkansas. The new optimized steel production facility is expected to feature two electric arc furnaces with 3 million tons per year of advanced steelmaking capability, a state of the art endless casting and rolling line, and advanced finishing capabilities. This first use of endless casting and rolling technology in the U.S. brings significant energy, efficiency, and capability enhancements to the company's operations. The project is expected to break ground in 2022, with project completion anticipated for 2024. When completed, the new facility in combination with Big River Steel will form a 6.3 million ton mega mill capable of providing many of the most advanced and sustainable steels in North America. The location affords abundant, increasingly renewable and clean power from Entergy, Class I rail service from BNSF with connections to other railroads, Mississippi River docks and interstate trucking access.[22]

3.3.1 Overview of Supply Chain Elements

Figure 3.5 details the primary supply chain elements for steel production. Steelmaking is an energy-intensive but efficient process. At the most basic level, steel consists primarily of iron, along with varying amounts of carbon, as well as the addition of nickel, molybdenum, manganese, titanium, cobalt, and other metals, depending on the specific product. Raw material is brought into steel mills, typically by rail, truck, or barge and heated to extremely high temperatures (upwards of 2,600°F). This heating process is done through the use of natural gas (transported by pipeline) or coke (coal). This process is known as primary steelmaking, which creates the base steel product. Through secondary steelmaking, the base steel product is molded and ladled into useful products, ranging from household products to large pipes. Following any sanding, finishing, painting,

[19] https://legacy.trade.gov/steel/countries/pdfs/imports-us.pdf and https://legacy.trade.gov/steel/countries/pdfs/exports-us.pdf

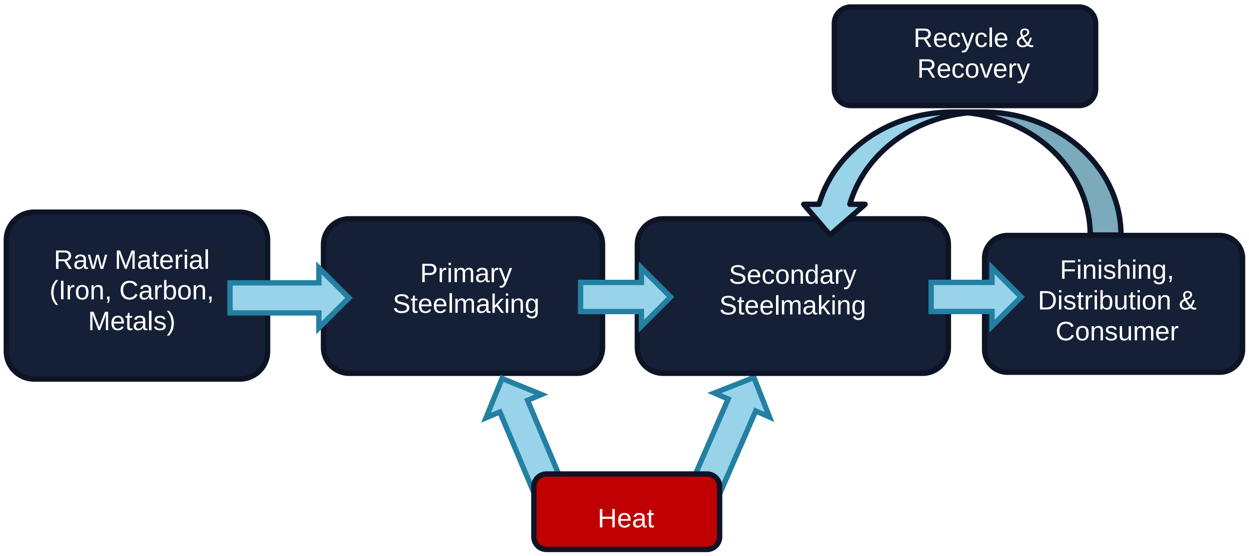
[20] https://www.arkansasedc.com/news-events/arkansas-inc-blog/post/active-blogs/2022/02/10/steel-industry-heats-up-in-arkansas

[21] https://www.majesticsteel.com/majestic-steel-announces-new-service-center-on-nucor-hickman-campus/

[22] https://www.arkansasedc.com/news-events/newsroom/detail/2022/01/11/u.-s.-steel-selects-osceola-arkansas-as-location-for-most-advanced-steelmaking-facility-in-north-america

and other value-added processes, products are shipped to distribution and consumer endpoints, typically using varying combinations of rail, truck, and barge as well as vessel if exported overseas. Approximately 98 percent of steel can be recycled, meaning scraps can be remolded and refigured into new products.[23]

Figure 3.5 Steel Supply Chain Elements



Source: Cambridge Systematics.

3.3.2 Opportunities & Challenges

Opportunities and challenges for Arkansas' iron and steel industry were informed by interviews with key industry stakeholders in the state, as well as industry research. In relation to truck freight, a key strength for producers in Arkansas is the versatility of the statewide rural highway network. There appears to be sufficient rural highway capacity, including in production areas around the City of Osceola and Mississippi County, to support new growth. On the other hand, the scarcity of truck drivers, related to challenges with driver recruitment and retention (discussed in Section 3.2.2), continues to be a concern.

For freight rail transport, stakeholders identified two key topics of concern. Many shippers rely on and prefer freight rail service to move large volumes of heavy raw material and product, such as pipe or coils. Currently, the biggest shortcoming of freight rail transport, despite its overall efficiency, is the turnaround time it takes to move cars from one location to another. Combined with the lack of ability to track railcars in real-time, industry personnel see a need for increased efficiency and improved transparency. Stakeholders also noted that changing expectations of customers have led them to ship more outbound product by truck directly to where it is needed, rather than relying on multimodal transfers.

Lastly, stakeholders noted that additional barge services are needed in the southbound direction. Oftentimes, there is demand for outbound transport of intermediate and finished products in this direction, but no services available. As such, industry personnel suggested that a partnership could be helpful to establish increased service along this route.

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

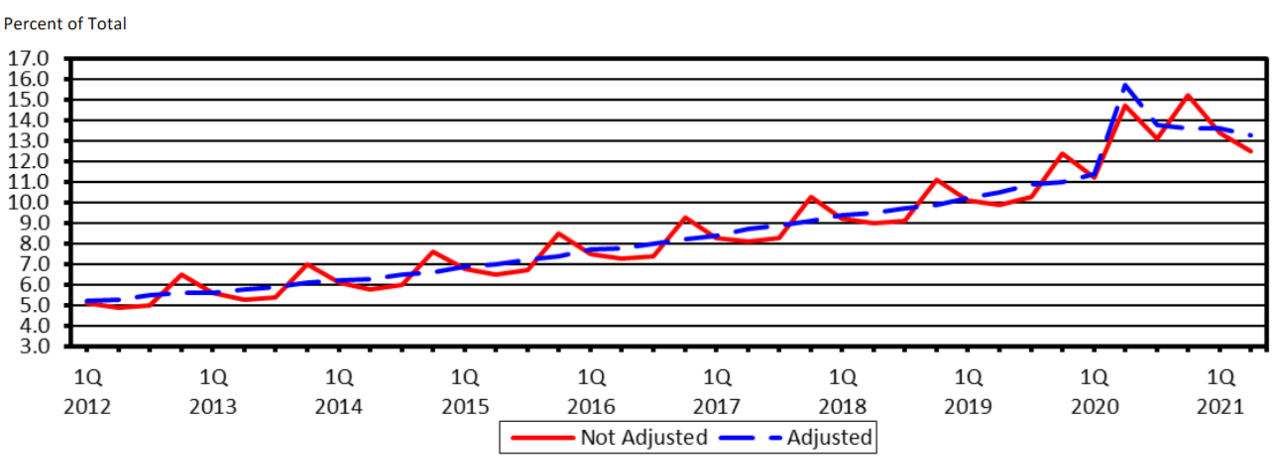
3.4 E-Commerce

E-commerce is a purposefully broad term referring to goods that are bought and sold online, and comprises economic activity across multiple industries, ranging from food to consumer products. As such, e-commerce involves the direct use of nearly every mode of freight transportation. Goods that are produced abroad in markets such as Asia and South America are often shipped by marine vessel to the nation's largest ports, including Los Angeles/Long Beach, Houston, and New York. To reach end users from ports or domestic production/finishing sites, goods are shipped either by rail or truck, including through containerized multimodal shipments.

Given the expansiveness and interconnectedness of the e-commerce sector, it is difficult to acquire data for consumption or shipping patterns in specific states as it is often proprietary. However, over the past decade, the promise of fast delivery for nearly every consumer product imaginable has led the rise in air cargo demand nationally, and has transformed how people in the U.S. purchase many types of goods. E-commerce allows consumers to shop at any time of day from the comfort of their home. The adoption of e-commerce in rural communities in particular, including in Arkansas, has been rapidly growing, as it has enabled access to a variety of goods otherwise not available locally.

COVID-19 was a catalyst that initially accelerated e-commerce growth in the U.S., resulting in a temporarily intensified jump in the share of e-commerce in total retail sales, as shown in Figure 3.6. During the initial months of the pandemic, lockdowns, store closures, and fear of illness led even more people to opt to shop for essential and non-essential goods online. Americans spent $791.7 billion on e-commerce sales during 2020, an increase of 32.4 percent from 2019 spending, translating to e-commerce accounting for 14 percent of total retail sales as compared to 11 percent in 2019. Commodities such as groceries, recreational goods (such as sporting goods, musical instruments, and books), and home improvement drove the increase in sales. Although it is unclear whether the rapid adoption of e-commerce will be sustained in the long-term, some shopper buying preferences may permanently shift to certain online retailers or goods after a positive experience with e-commerce during the pandemic. Retailers have also restructured their operations to better serve e-commerce, and these decisions and investments are likely to have a long-term impact on future business models.

Figure 3.6 Estimated Quarterly U.S. Retail E-commerce Sales as a Percent of Total Quarterly Retail Sales: 2012 – 2021

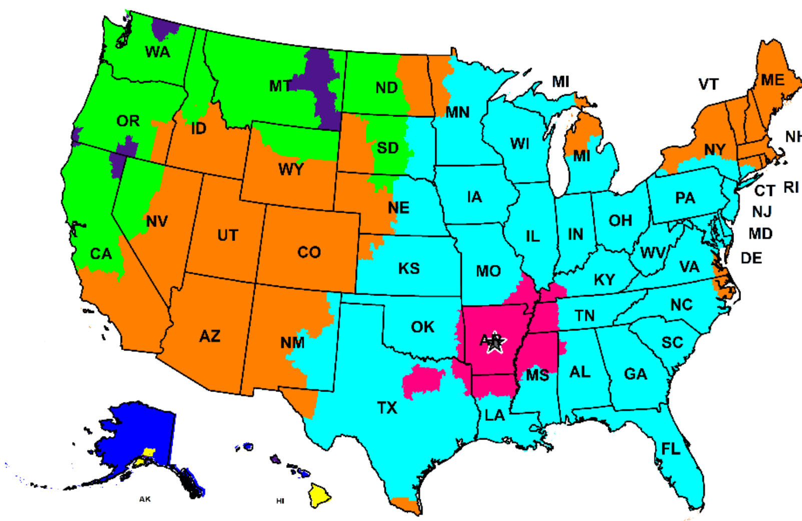


Source: U.S. Census, https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf

3.4.1 Overview of Supply Chain Elements

Primarily a development of the 21st century, e-commerce has largely risen alongside increased availability of high-speed internet and mobile smartphone usage. The ability for everyday consumers to order virtually any product within seconds for delivery to their front door has given rise to unprecedented demand for expedited shipping. As of 2019, Amazon, the nation's largest e-commerce retailer, was able to provide same-day shipping for many products to 72 percent of the U.S. population.[24] For packages bound for the Little Rock area via FedEx, three-day ground shipping is available from a large portion of the U.S. spanning from Boston to Los Angeles, as shown in Figure 3.7.[25]

Figure 3.7 FedEx Ground Shipping Delivery Times for Shipments to Little Rock



When will your FedEx Home Delivery shipment be scheduled for delivery?

If picked up on...	1 day	2 days	3 days	4 days	5 days	6 days	7+ days
	Will be delivered by...						
Monday	Tue	Wed	Thu	Fri	Mon@	Tue@	Wed=
Tuesday	Wed	Thu	Fri	Mon	Tue@	Wed@	Thu=
Wednesday	Thu	Fri	Sat	Tue	Wed@	Thu@	Fri=
Thursday	Fri	Sat	Sun^	Wed	Thu@	Fri@	Mon=
Friday	Sat	Sun^	Mon	Thu	Fri@	Mon@	Tue=
Saturday	Tue*	Wed	Thu	Fri	Mon@	Tue@	Wed=
Sunday	Tue**	Wed	Thu	Fri	Mon@	Tue@	Wed=

*Sunday^ delivery if the shipper is enrolled in weekend spotted trailer pickups
**Monday delivery if the shipper is enrolled in weekend spotted trailer pickups

^Monday if not a Sunday eligible ZIP code
@ The following week
= Earliest possible delivery the following week

This map illustrates service schedules in business days as of April 2022 for FedEx Home Delivery shipments

Source: FedEx.

In relation to transportation infrastructure needs, e-commerce operations are heavily centered on last-mile logistics as well as the ability to efficiently reach customers across a wide range of geographies. This includes

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

[25] https://www.bigcheckstore.com/questions/shipping-days.html

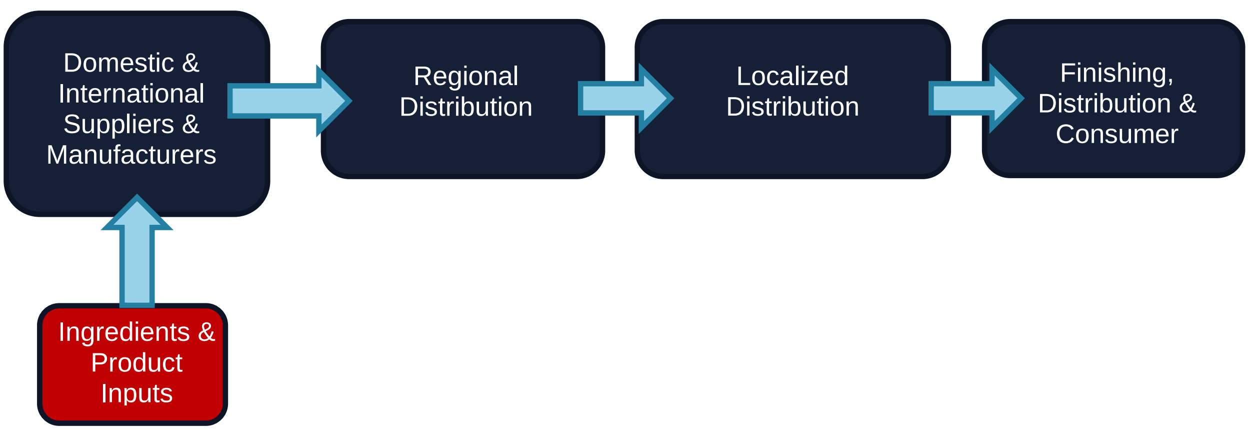
the use, citing, and operation of warehouses and distribution center networks, and reliance on trucks and smaller delivery vehicles to access customers. Locally within Arkansas, there are over 80 distribution centers and 22 major trucking companies employing more than 85,000 Arkansans.[26] Geographically, these facilities are located primarily in and around the urbanized portions of the state, including Little Rock, Jonesboro, and Northwest Arkansas. A number of key large e-commerce facilities are identified in Table 3.3.

Table 3.3 Key E-Commerce Facilities in Arkansas

Facility	Location	Square Footage
Walmart Fashion & Apparel Distribution Center	Bentonville	1,250,000
Dillard's Fulfillment Center	Maumelle	850,000
Amazon Fulfillment Center	North Little Rock	825,000
E-Commerce Park (Under Construction)	Jonesboro	3,000,000
Lowe's (Planned)	North Little Rock	1,200,000
Tractor Supply Co. Distribution Center (Planned)	Maumelle	900,000

Sources: Walmart Fashion & Apparel Distribution Center - https://talkbusiness.net/2019/03/bentonville-home-for-new-walmart-fashion-distribution-center/ Dillard's Fulfillment Center - https://metrolittlerockalliance.com/success-stories/dillards/#:~:text=The%20Arkansas%2Dbased%20Fortune%20500,other%20products%20ordered%20by%20customers. Amazon Fulfillment Center - https://metrolittlerockalliance.com/success-stories/dillards/#:~:text=The%20Arkansas%2Dbased%20Fortune%20500,other%20products%20ordered%20by%20customers. E-Commerce Park - https://www.kait8.com/2021/11/12/200-million-e-commerce-park-slated-jonesboro/ Lowe's - https://www.arkansasonline.com/news/2022/jun/10/lowes-confirms-facility-for-nlr/ Tractor Supply Co. Distribution Center - https://corporate.tractorsupply.com/newsroom/news-releases/news-releases-details/2022/Tractor-Supply-Announces-New-Distribution-Center-in-Arkansas/default.aspx

Figure 3.8 E-Commerce Supply Chain Elements



3.4.2 Opportunities & Challenges

Based on the characteristics of the e-commerce sector, key opportunities and challenges associated with transportation infrastructure needs are largely related to truck movements across the highway network. In relation to truck parking, the vast majority of truck parking sites (both public and private) along Arkansas'

[26] https://www.arkansasedc.com/industries/distribution-logistics-services

Interstate Highways are observed to have truck parking demand in excess of truck parking capacity (parking spaces) during annual, overnight surveys.

Another challenge is the need for effective land use planning in relation to the citing of warehousing facilities. Opportunities for growth especially in and around West Memphis may exist given the availability of cheaper land and proximity to freight generators and facilities in and around Memphis. Although this growth has the potential to increase economic output and generate job growth, negative externalities from increased truck traffic will also need to be considered. Because land use planning is primarily managed at the municipal level, local municipalities will need to effectively assess these factors when accommodating for e-commerce growth.

A key opportunity relates to the potential for expedited e-commerce delivery to rural areas, characteristic of many portions of Arkansas. In an effort to maximize profit, e-commerce platforms have traditionally focused their resources on service to urban and economic centers. However, since at least 2021, Amazon has been developing a strategy to improve rural delivery service.[27] This strategy involves utilizing "mom and pop" shops in rural areas and small towns to deliver orders to Amazon customers within a set radii. In exchange, these businesses are paid a fee by Amazon. The strategy, known as the Amazon Hub Delivery Program, is currently being tested in ten states, including Arkansas. Citing shortcomings of partner package delivery services, Amazon's strategy is part of a larger goal to have greater control over its entire shipping process. At the local level, the strategy can potentially provide an effective and necessary financial boost for local small businesses, which may be particularly impacted by ongoing supply chain issues in the post-COVID-19 era. Additional information about breakthroughs and advances in last mile delivery are discussed in Section 4.5, particularly in relation to unmanned and automated vehicles.

[27] https://www.vox.com/recode/2022/5/9/23063528/amazon-rural-small-business-delivery-program-hub-partners-usps

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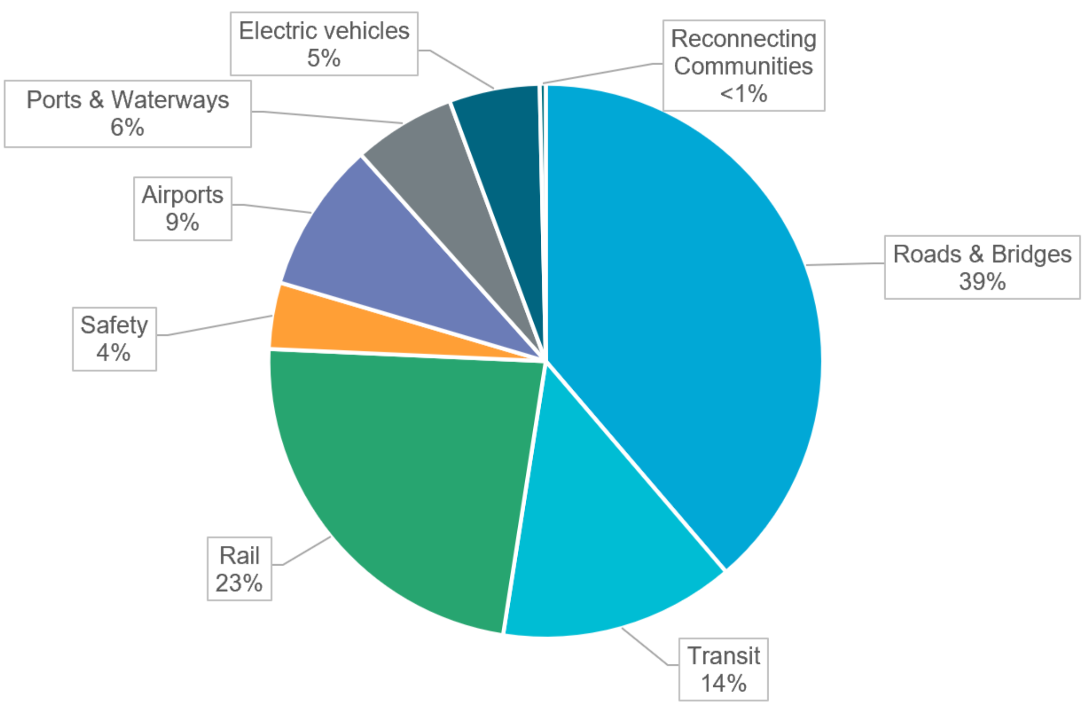
4.0 Economic Trends & Futures

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

4.1 Federal Policy

On November 15, 2021, the Infrastructure Investment and Jobs Act (P.L. 117-58) (IIJA) was signed into law. Over the next five federal fiscal years (FFY 2022–2026), the IIJA will provide $973 billion in funding, of which $550 billion is allocated for new investments in all modes of transportation as depicted in Figure 4.1. A White House fact sheet[28] described the IIJA as critical legislation needed to improve supply chain resiliency and efficiency. Modernization of transportation infrastructure is a key component of the new investment funding, with $284 million directed towards modernizing and making improvements across all modes of transportation.

Figure 4.1 Funding Allocations under the Infrastructure Investment and Jobs Act



Source: National Association of Counties

[28] https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/10/fact-sheet-the-bipartisan-infrastructure-deal-improves-the-supply-chain-from-ship-to-store/

The Whitehouse Factsheet identifies the main ways IIJA will impact freight efficiency:

- Upgrade the nation's airports and ports to strengthen supply chains and reduce costs, improve U.S. competitiveness, reduce emissions.
- Repair and rebuild roads and bridges critical to trucking goods movement and lower costs for American families.
- Increase investments in freight rail and intermodal infrastructure to improve safety, efficiency, and job growth for long-distance inland goods movement
- Make supply chain infrastructure resilient against the impacts of climate change, cyber-attacks, and extreme weather events.

To achieve these objectives, several of the grant programs created or continued by IIJA will have a direct impact on freight transportation. Table 4.1 identifies key funding competitive funding programs dedicated to freight transportation projects.

In a U.S. DOT news release[29], it was reported that Arkansas can expect to receive approximately $3.8 billion over the next five years in Federal highway formula funding for highways and bridges. This amount is 32 percent greater than the average annual State Federal-aid highway formula under the previous law.

Table 4.1 Selected Grant and Formula Funding Programs for Freight Transportation Infrastructure

Program	2022 Funding Authorization	Description
Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	$1.5 Billion	Supports a wide range of surface transportation projects of local and/or regional significance.
Infrastructure for Rebuilding America (INFRA)	$1.53 Billion	Provides funding to state and local governments for projects of regional or national significance, with a focus on freight needs. IIJA also raises the cap on multimodal projects to 30% of program funds.
Mega Projects	$1 Billion	Similar to RAISE and INFRA grants, Mega grants support a wide range of transportation projects. However, an emphasis is placed on particularly large and complex projects.
Promoting Resilient Operations for Transformative, Efficient, and Cost-Savings Transportation (PROTECT)	$1.4 Billion	Provides grants for resilience improvements to protect surface transportation assets, including highway projects, and port facilities.
Consolidated Rail Infrastructure and Safety Improvements Program (CRISI)	$1.4 Billion	Provides funding for projects that improve safety, efficiency, and reliability of intercity passenger and freight rail.
Bridge Investment Program	$2.4 Billion	Authorizes funding to reduce the number of national bridges in "poor" condition or in "fair" condition and at risk of falling into "poor" condition.
Port Infrastructure Development Program	$450 Million	Authorizes funding to upgrade nationwide ports with an emphasis on addressing resiliency and reducing pollution.

[29] https://www.transportation.gov/sites/dot.gov/files/2021-11/BIL_Arkansas.pdf

Program	2022 Funding Authorization	Description
America's Marine Highways (AMH)	$25 Million	Supports concepts for new services or expansion of existing Marine Highways, including port and landside infrastructure development.
Airport Improvement Program	$1.5 Billion	Provides grants for the planning and development of public-use airports, including for cargo-related uses.
Railroad Crossing Elimination Grant Program	$500 Million	Provides funding for the elimination or improvement of highway-rail grade crossings.
Rural Surface Transportation Grant Program	$300 Million	Aims to improve and expand surface transportation infrastructure in rural areas to increase connectivity, improve safety, and support the movement of people and freight, in order to generate regional economic growth.
Reconnecting Communities Pilot Program – Planning Grants and Capital Construction Grants	$195 Million	Supports planning grants and capital construction grants, as well as technical assistance, to restore community connectivity through the removal, retrofit, mitigation, or replacement of eligible transportation infrastructure facilities. This includes studying the impacts related to freight mobility.
Reducing Truck Emissions at Ports Program	$250 Million	Funds efforts at ports to look at electrification and emerging technology can reduce emissions from idling trucks.
Formula Funding Programs, including: • National Highway Freight Program • National Highway Performance Program • Rail-Highways Crossing Program • Surface Transportation Block Grant Program	Varying Amounts	Formula funding programs apportioned across each state.

Source: National Association of Counties

4.2 Impacts of COVID-19

The impact of the COVID-19 pandemic continues to have far-reaching consequences for global, national, and local supply chains. The early phases of the pandemic were characterized by strong disruptions in freight transportation and economic activity, followed by rapid upswings in demand as travel restrictions and initial lockdowns were lifted. According to the U.S. International Trade Commission[30], in early 2020 the COVID-19 pandemic interrupted global maritime shipping and air freight services, leading to canceled sailings and flights, port delays, and container shortages. These disruptions had implications for international shipping rates and delivery times. As travel restrictions were relaxed, overall commodity and product supply was unable to keep pace with the upsurge in demand, resulting in exacerbated choke points within supply chains.

Issues of elevated demand and exacerbated supply chain choke points continued into 2021. In direct relation to Arkansas, the meat and poultry industry was suddenly thrown into the national spotlight. Risks in relation to the hyper-concentration of production by a small number of firms, ability to attract to workers, and continuing risks of COVID-19 sickness to workers in confined spaces and the resulting impacts to production were

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

particularly evident. Similar labor shortages, along with increased shipping costs, began to affect other industries, including statewide sectors such as agriculture, metals, and aerospace.

Through 2022, the global impacts of the COVID-19 pandemic have contributed to increased inflation. National inflation, measured by the Consumer Price Index (CPI), reached a near four-decade high of 9.1 percent from June 2021 to June 2022.[31] These issues of inflation are highly complex. Although COVID-19 cases are occurring at reduced levels of severity in comparison to 2020 and 2021, the disruptions caused by the initial shock of the pandemic still persist. The most significant example of this is in relation to the energy. During the sudden plunge in demand and economic activity occurring in the first half of 2020, the number of rigs drilling for oil across the U.S. plunged by more than 70 percent. Even as overall demand and economic activity have rebounded to pre-pandemic levels, the number of rigs drilling for oil remains down by nearly 30 percent compared to December 2019 levels.[32] The primary reason for the reluctance to increase drilling appears to be prudence in relation to the deployment of capital, especially as talks of a recession in 2023 arise. Secondary reasons also include environmental and social governance pressures, lack of access to financing, and government regulations.[33] Further contributing to these issues are the geo-political ramifications of the Russia-Ukraine conflict, which have resulted in further increases in energy, steel, and grain prices.

Although recent monthly releases of CPI numbers have shown slower monthly inflation rates, inflation continues to be of concern in Arkansas and nationally. Elevated prices have also begun to raise the risks of possible reductions in economic activity, and recession fears into 2023. Additionally, while COVID hospitalizations remain low, current variants are proving to be highly transmissible. On the other hand, the labor market continues to remain strong. From 2021 to 2022, every metropolitan region of Arkansas saw reductions in jobless rates.[34] Additionally, although layoffs and hiring freezes have started to appear in the technology sector, particularly in the financial technology ("fintech") and cryptocurrency industries, these layoffs appear to be largely focused within tech hubs such as Silicon Valley, and follow previous trends of overly aggressive hiring for highly speculative positions.[35] Furthermore, employment in nearly every other industry, especially those most relevant within Arkansas, appears to be extremely strong. If these trends continue, freight generation and corresponding traffic will continue to remain equally strong. On the other hand, threats of an economic slowdown have the potential to impact total freight traffic, particularly if inflation concerns begin to impact consumer product demand.

4.3 Trucking Regulations

Two related issues have heavily influenced recent trucking regulations: COVID-19 and the supply chain crisis. In response to COVID-19 impacts, the Federal Motor Carrier Safety Administration (FMCSA) activated a emergency declaration in March 2020, which lasted through October 2022. The FMCSA emergency declaration granted relief from Federal Motor Carrier Safety Regulations Part 395.3, the maximum driving time for property-carrying vehicles, with certain restrictions. The waiver was applicable to motor carriers engaged

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

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

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

[34] https://talkbusiness.net/2022/06/all-arkansas-metro-areas-see-year-over-year-jobless-rates-improve-in-may/

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

in "direct assistance in support of relief efforts" for immediate restoration of essential services, such as medical care, or essential supplies such as vaccines, related to COVID-19 outbreaks during the national emergency.

Truck driver retention and recruitment has been an underlying issue that has been amplified during the recent crisis. According to FMCSA 2021 press release[36], for large trucking companies, driver turnover rates between companies and out of the industry for long haul drivers are over 90 percent annually. To manage supply chain bottlenecks while maintaining minimum truck driving standards, FMCSA created the following programs[37]:

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

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

In Arkansas, there are approximately 5,200 trucking companies employing over 36,000 drivers. As previously referenced throughout this chapter, Arkansas faces many of the same issues for the trucking industry as the rest of the nation, including a lack of skilled drivers, retention of existing drivers, and truck driver quality of life issues. As recent developments, it remains to be seen what the impacts of the recent regulatory action will be.

4.4 Railroad Industry Consolidation

The proposed merger between Canadian Pacific Railway (CP) and Kansas City Southern (KCS) – the new, combined entity to be known as CPKC – has garnered a significant amount of attention in recent months. When the merger is completed, the company would hold the first single-line railroad linking Canada, the United States, and Mexico (Figure 4.2).

As of November 2022, the Surface Transportation Board (STB) has concluded hearings on the proposed acquisition, with an anticipated decision expected by early 2023. Assuming STB approval, the merger is expected to be completed over a three-year period. As part of these plans, CP and KCS have laid out a number of anticipated benefits:[38]

- According to CP and KCS, CPKC will be able to capture an additional $716 million in annual revenue. CPKC's growth will stem from traffic gained from other railroads, and traffic gained from trucks as a result of tapping into new markets. This ability to tap into new markets is the result of increased efficiency not previously possible.

- The resulting intermodal service is expected to take 64,000 trucks annually off the North American highway system, reducing greenhouse gases by approximately 377,000 per year.

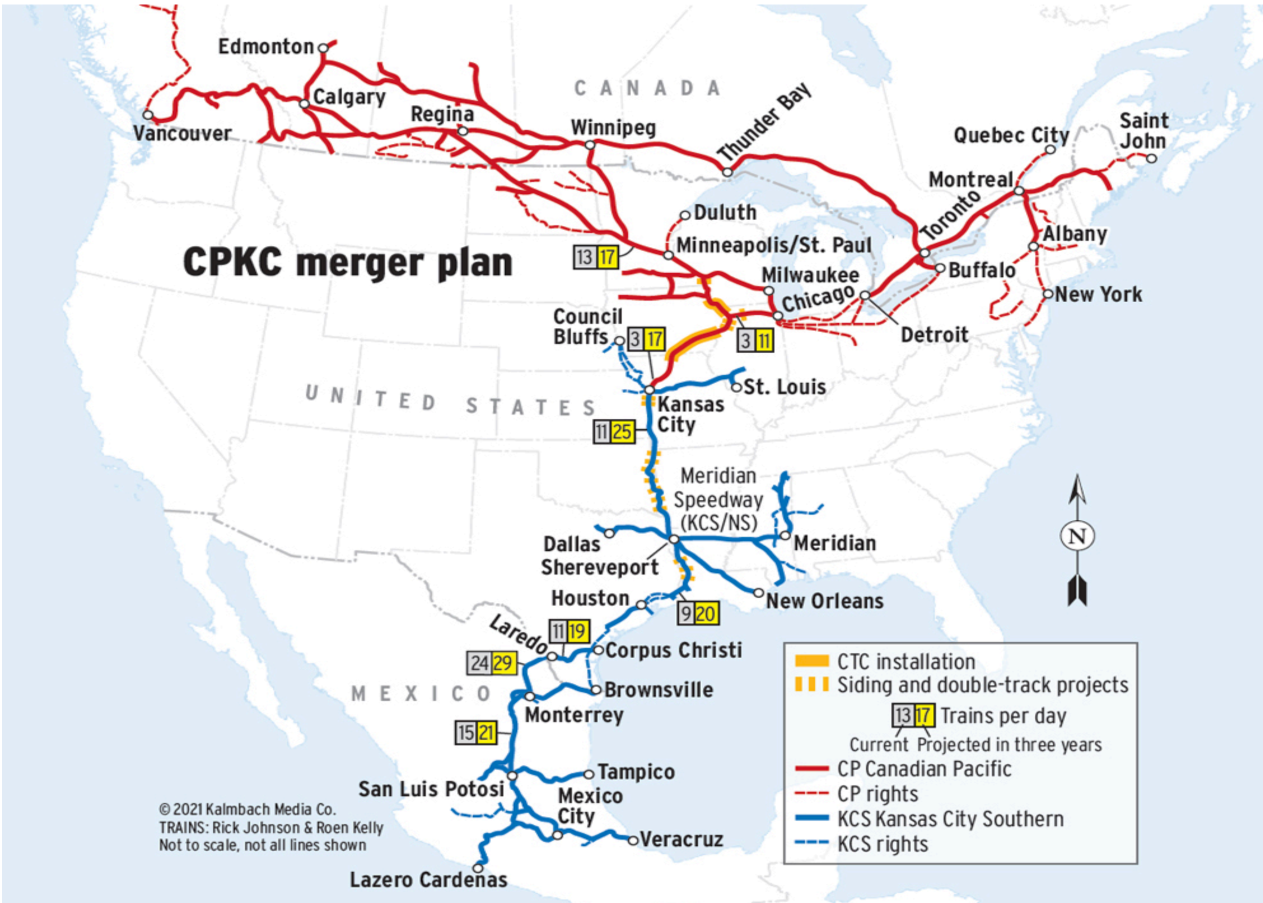
[36] https://www.fmcsa.dot.gov/newsroom/fmcsa-deputy-administrator-meera-joshi-convenes-meetings-midwest-discuss-truck-driving-and

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

[38] Trains Magazine 'CP – KCS Merger Plans for Growth' Vol. 22 Issue 1

- Increased rail traffic is expected in the transport of a range of commodities, including grain, chemicals, forest products, appliances, auto parts, finished vehicles, and intermodal.
- As a result of projected increases in traffic, CPKC expects to add at least 1,000 union jobs, of which approximately 800 will be located in the United States.

Figure 4.2 Map of Existing Routes and Planned Improvements for Canadian Pacific – Kansas City Southern Merger



Source: www.trains.com

In addition to these anticipated benefits, CPKC documentation lays out expected impacts to rail traffic along the network, proposed capacity improvements and projects, details on expanded intermodal service, and operational changes. Because the merger is still in the review stage, it is difficult to fully assess the direct impacts to the Arkansas rail network and local rail shippers and customers. However, CP and KCS estimate an increase in total daily trains from 13.5 to 28.5 along the Pittsburgh Sub between Kansas City and Shreveport, which includes the primary KCS track through Arkansas.

4.5 Technological Advances

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

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

  In relation to freight transportation, there is significant merit in these types of applications. Key examples include vehicle-to-vehicle and vehicle-to-infrastructure communication systems that can transmit useful information such as real-time truck parking availability or traffic data in relation to route selection. As an example of freight ITS implementation, the Texas Department of Transportation (TxDOT) is currently advancing an initiative known as the Texas Connected Freight Corridors (TCFC), designed to further these technologies. Deployed along the Dallas – Houston – San Antonio 'Texas Triangle' of portions of Interstates 10, 35, and 45, TCFC is a public/private partnership focused on deploying these applications to improve safety and congestion.[39] The initiative includes deployment on over 1,000 vehicles, with a goal of collecting and transmitting data in relation to potential hazards, as well as to understand key driver and system needs.

- **Electric Vehicles:** Free of tailpipe exhaust emissions, electric vehicles (EVs) are a potentially effective strategy for improving air quality and reducing fuel costs. Although medium- and heavy-duty trucks make up less than 5 percent of all vehicles on the road, they contribute more than a quarter of greenhouse gas (GHG) emissions.[40] Furthermore, given the current elevated prices of fuel, the cost to fill up a heavy-duty diesel truck in 2022 can easily exceed $1,000 leading to reduced profitability and increased consumer prices.[41]

  Previously hindered by exorbitant costs and limited battery capacity, advances in electric trucks are increasing the feasibility of large-scale implementation. In the U.S. there are multiple programs and initiatives designed to facilitate the deployment of electric vehicle infrastructure, including charging stations. A number of these are described in Table 4.2. Combined with private sector technological advances that will further lower costs capital costs of electric trucks, these programs have the potential to further advance overall market adoption of electric trucks.

[39] https://www.txdot.gov/inside-txdot/division/traffic/freight-corridors.html

[40] https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions

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

Table 4.2 Nationwide Vehicle Electrification Opportunities[42]

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

At the statewide level, coalitions and partnerships can further assist in the accommodation of electric trucks. Formed in 2021, Regional Electric Vehicle Midwest (REV Midwest) is a coalition of five Midwest states (Illinois, Indiana, Michigan, Minnesota, and Wisconsin) developed to accelerate electric vehicle charging infrastructure development. In relation to electric trucks, the coalition includes a coordinated effort to align state regulations and truck charging efforts.[43]

- **Automated Vehicles:** Automated vehicles (AVs) are a potentially effective method for addressing truck driver shortages, especially for long-haul transport, as well as 'last mile' delivery needs, two complex issues impacting the nationwide freight system. Primarily spearheaded by the private sector in states with enabling legislation for testing and deployment, driverless trucks are being tested with the presence of an in-vehicle safety engineer to takeover if needed. An example of this type of testing is being conducted by Walmart. In partnership with Gatik, a developer of autonomous trucks, Walmart has been testing the use of light- and medium-duty driverless trucks to perform deliveries in Bentonville.

  With a focus on last mile solutions, personal delivery devices (PDDs) and drones/unmanned aircraft systems are increasingly being studied for package deliveries. PDDs such as FedEx's Roxo and Amazon's Scout are small, unmanned vehicles that can travel on sidewalks and deliver packages across short (up to approximately five miles) distances. Currently, these vehicles are being tested on sidewalks in varying cities across the U.S. to examine reliability and to identify/plan for potential hazards or unforeseen circumstances.[44] In the early stages of research, drones/unmanned aircraft systems are being studied for package delivery through the private and public sectors. Examples include Amazon's Prime Air, as well as research being conducted by Ohio Unmanned Aircraft Systems Center and the Texas Lone Star UAS Center of Excellence and Innovation of Texas A&M University.

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[42] https://www.transportation.gov/rural/ev/toolkit/ev-infrastructure-funding-and-financing/federal-funding-programs

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

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

Although these developments have been spearheaded by the private sector and university research centers, the public sector, and notably state transportation agencies, have a pivotal role to play. In Arkansas, two legislative programs and statutes have helped spur these developments. In relation to truck platooning, Arkansas Code § 27-51-1408 (2017) allows for the operation of a driver-assistive truck platooning system on a street or highway of Arkansas by filing a plan for general platoon operations with the State Highway Commission.[45] In addition, Arkansas Code § 27-51-2002 (2019) establishes parameters, application requirements, and reporting needs for general autonomous vehicle operations.[46]

4.6 Near-shoring

Over the past several decades, U.S. trade policy focused on supporting globalization, which allows businesses to buy and sell products more easily worldwide. Through the backing of free trade agreements, American companies took advantage of lower costs of labor in Asia and Latin America. Supply chains for even the most essential items became complicated. The shift away from transglobal trade began in recent years but intensified since the onset of the COVID-19 pandemic. It exposed major weaknesses in the supply chains for manufactured items, resulting in prolonged shortages of essential items such as personal protective equipment. A global supply chain model prioritizes cost reduction, just-in-time production and forecasting methods that do not consider major disruptions such as a global pandemic or other natural disasters. Reimagining supply chains that leverage local industries and transportation linkages could not only remediate the weaknesses exposed during the COVID-19 pandemic but could also increase jobs in manufacturing sectors and provide economic development opportunities for U.S. regions that are positioned to grow their advanced manufacturing base.[47]

The recent package of infrastructure legislation includes the Build America, Buy America Act, which requires all federal agencies to ensure that no federal financial assistance is provided for infrastructure projects unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.[48] The extension of previous Buy America requirements to more infrastructure project types and other materials signals a continuing policy shift towards domestic sourcing of commodities and products to protect U.S. supply chains. An increase in investment in domestic sourcing and/or localized manufacturing could generate increased demand from Arkansas-based firms, referred to as “near-shoring.” This could result in increasing inbound and outbound freight flows relative to through-state flows, which currently comprise most freight movements in the state. Employment in advanced manufacturing could also increase, especially in metals manufacturing, which is already a strong sector in Arkansas. Likewise, demand for industrial space for new manufacturing or repurposed manufacturing sites could grow. A strong workforce across agriculture, advanced manufacturing, and transportation sectors would be essential as the state builds upon its strengths to meet domestic demand for goods.

[45] https://law.justia.com/codes/arkansas/2017/title-27/subtitle-4/chapter-51/subchapter-14/section-27-51-1408/

[46] https://www.ardot.gov/wp-content/uploads/2021/09/AV-Rules-Approved-By-Commission.pdf

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

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

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ARDOT

ARKANSAS DEPARTMENT OF TRANSPORTATION

ARKANSAS STATE FREIGHT PLAN

Chapter 8

Multimodal Freight Needs Assessment

WE MOVE ARKANSAS FREIGHT

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1.0 Introduction

In 2019, Arkansas' freight network enabled the transport of nearly 600 million tons of freight valued at $1.1 trillion to serve the state's residents, businesses, and visitors. Each shipment may rely on a singular mode of transportation or may require a multimodal move. The anticipated increase in the volume of goods shipped due to growth in businesses or population will create a need for higher functionality of the freight network. This multimodal freight needs assessment aims to identify critical investment categories necessary to maintain and expand the quality and capacity of the freight network in order to facilitate goods movement. Specific projects identified for addressing the needs of the multimodal freight system are identified in Appendix A (Freight Investment Plan) and Appendix B (Unconstrained List of Priority Freight Projects).

1.1 Report Organization

This Needs Assessment is organized as follows:

- **Section 2.0—Multimodal Freight Needs and Themes** describes shared needs across multiple modes of freight transportation in Arkansas.

- **Section 3.0—Highway Freight Needs and Themes** describes freight highway needs including truck parking, truck safety, system connectivity and mobility, asset management, and transportation technology.

- **Section 4.0—Railroad Freight Needs and Themes** describes freight rail needs including system enhancement, funding, track quality and weight restrictions, safety, and service and labor challenges.

- **Section 5.0—Air Cargo Needs and Themes** describes air freight needs including ground access and capitalizing on available capacity.

- **Section 6.0—Inland Waterway Needs and Themes** describes inland waterway freight needs including funding, highway access, rail access, lock and dam infrastructure, and dredging.

1.2 Methodology

This Multimodal Freight Needs Assessment builds on the work performed for the 2017 Arkansas State Freight Plan (SFP), which established a baseline for freight system needs across all modes. For this SFP update, additional stakeholder engagement, data analysis, and comparison to recently completed studies was performed not only to validate previously identified needs, but also to identify new freight system needs. Needs across all freight modes are discussed below, both thematically and in detail.

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2.0 Multimodal Freight Needs and Themes

Arkansas' primary freight modes of highway, rail, air, and water each have their own unique operating characteristics, commodities and markets served, and investment needs. However, through the process of identifying modal freight needs, common themes arose between the different freight modes. These themes include access, capacity, aging Infrastructure and deferred maintenance, resiliency, and funding. This section explains each of these themes and relates them to needs identified within the modes.

2.1 Access

Access is a critical component of a freight network that meets the needs of businesses and industries. Access can be defined by a variety of factors, including actual physical access to a facility, access by a particular mode, or increased connectivity to reduce transport times.

One of the primary ways of increasing freight access throughout the state is by the completion of the planned Interstate System. Recently, Interstate 49 was extended to the Missouri state line in northwest Arkansas, and Interstate 49 is planned to connect to southern Arkansas (and ultimately Louisiana), providing a vital north-south link in western Arkansas. Similarly, the completion of Interstate 69 will provide southern Arkansas with access to large ports such as Corpus Christi, Texas; Houston, Texas; Memphis, Tennessee; and more, with the national goal of providing an Interstate route stretching from Mexico to Canada.

Another example is Northwest Arkansas Airport (XNA), which is working with ARDOT to build a connector road between Highway 264 and Highway 612 (which ultimately connects the airport with Interstate 49). One goal of this project is to better facilitate the movement of air cargo to and from the Interstate Highway System. Airport leadership has heard from air cargo service providers that once this project is complete, more than one would be interested in developing on-site facilities to increase air cargo handling at the airport to support the Northwest Arkansas region.

For the state's freight railroad network, there is a need to enhance the system to increase access to Class I and shortline carriers and services. Needed access improvements include the implementation of additional spurs and sidings to serve local rail customers, as well as additional freight rail facilities. These enhancements will increase the available sites with railroad capacity and support rail-to-truck conversions, which could be funded through innovative financing methods.

2.2 Capacity

After securing access to a freight mode or facility, ensuring sufficient capacity is critical in order to avoid significant congestion and delays. Improving capacity across modes can be achieved in a variety of ways including physical expansion of existing facilities or technology deployments.

For both the inland waterway network and freight rail network, expanded capacity of the actual network is necessary to move higher volumes of goods. For the inland waterways system, port authorities, businesses, and lawmakers alike have continued to push for a 12-foot channel (versus the 9-foot channel depth maintain at some locations) in order to increase the capacity of river barges by 40 percent. Achieving this depth will enable a greater utilization of marine assets, which are currently underutilized, to increase the capacity and reliability of the waterway mode and allow shippers to achieve economies of scale by shipping higher volumes. The freight rail network is similarly constrained by portions of the network that do not support 286,000-pound railcars, the generally accepted weight standard for the national rail network. These areas include trackage around Fort Smith and in southern Arkansas.

On the highway freight network, truck parking availability is limited. Annual truck parking surveys reveal that the majority of truck parking facilities (considering both public and private) experience demand that exceeds available parking capacity. Meeting the demand for truck parking will require a combination of additional truck parking facilities, expansion of existing facilities, public and private investments, and the implementation of advanced technology like truck parking notification systems.

For Arkansas' air cargo-handling airports, capacity exists to handle additional air cargo volumes. The biggest challenge for Arkansas' airport authorities is determining ways to attract future tenants and compete with highly active neighboring facilities.

2.3 Aging Infrastructure & Deferred Maintenance

The U.S. transportation network was primarily developed in the early-to-mid 1900s. The Great Mississippi Flood of 1927 led to the construction of levees and floodways still in place today. Authorization of locks and dams along the Arkansas River began in 1946. This was followed by the development of the Interstate Highway System beginning in 1956. As a result, much of the nation's freight network relies upon infrastructure that is approaching or past its useful design life. Combined with the necessary maintenance to provide a state of good repair, aging infrastructure will lead to a long-term and potentially expensive problem in Arkansas's freight network.

In some cases, maintenance is deferred when it does not present an immediate threat to the safety and well-being of users due to a need to address other, more imminently pressing, system needs. However, this can still lead to a reduced in capacity or efficiency of the freight network. For instance, the existence of load-posted bridges on otherwise suitable freight corridors may result in longer delivery routes – increasing fuel consumption and delivery times and making it more challenging for drivers to complete their deliveries within hour of service requirements. Deferring maintenance may also exacerbate existing issues and result in more costly repairs at a later date.

Deferred maintenance has been a significant issue on Arkansas' waterway system, and the current backlog of maintenance at the locks and dams along the river system was a significant cause for concern during the 2019 flooding events. Maintenance, repair and replacement of critical lock and dam components and channel bank stabilization along the MKARNS are vital to continued marine operations. As evidenced from the 2019 flood, the safe, efficient movement of goods along the MKARNS is critical to the economy of Arkansas and to the efficiency of other transportation modes as they must handle a greater capacity when the river system cannot, meaning that addressing the aging infrastructure and deferred maintenance issues impact all of the state's freight transportation modes.

2.4 Resiliency

The resiliency of the freight transportation network ensures that goods movement is reliable and can accommodate disruptions to the system. Disruptions can impact any mode, and in the cases of extreme weather (such as excessive prolonged flooding), disruptions can impact surface transportation assets in addition to facilities, businesses, and residents located in or near the waterways system.

Safety is one element of establishing resiliency of the network. For the freight rail network, resources are needed to monitor the effects of precision scheduled railroading (PSR) on overall safety metrics. Additionally, it is important to focus on safety needs and issues on those portions of the network that do not have PSR implemented. Trespassing remains an issue for railroads, indicating a need for an education-based campaign to highlight related issues and dangers. On the part of grade crossing safety, there is a need for implementation of cost-effective protections where grade crossing removal (or grade separation) is not feasible. Safety issues for other modes were also identified.

In relation to resiliency and economic vitality, additional support is needed to ensure that supply chain disruptions do not impact economic development opportunities in the state. There have been persistent labor and workforce challenges impacting nearly every industry sector since the onset of COVID-19, which has put pressure on many industries, particularly manufacturing and transportation/logistics, to adjust their supply chain operations to move essential freight.

2.5 Funding

Securing additional funding will be necessary to address the state's on-going freight infrastructure needs. While some smaller, "quick-fix" projects can be implemented, many of the needs identified in this assessment are multi-million-dollar investments. Without funding to address all freight infrastructure needs, consideration should be given to the impacts investments have on the freight supply chain and the alignment of those investments with the goals of this State Freight Plan.

It can be particularly difficult for ports and shortline railroads to secure funding for priority projects. Local matching requirements can make it difficult for inland ports and shortline carriers to pursue federal funding opportunities. In addition, many inland waterways projects, such as dredging or lock and dam infrastructure, fall within federal jurisdiction and therefore must wait for additional federal funding and congressional approvals.

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3.0 Highway Freight Needs and Themes

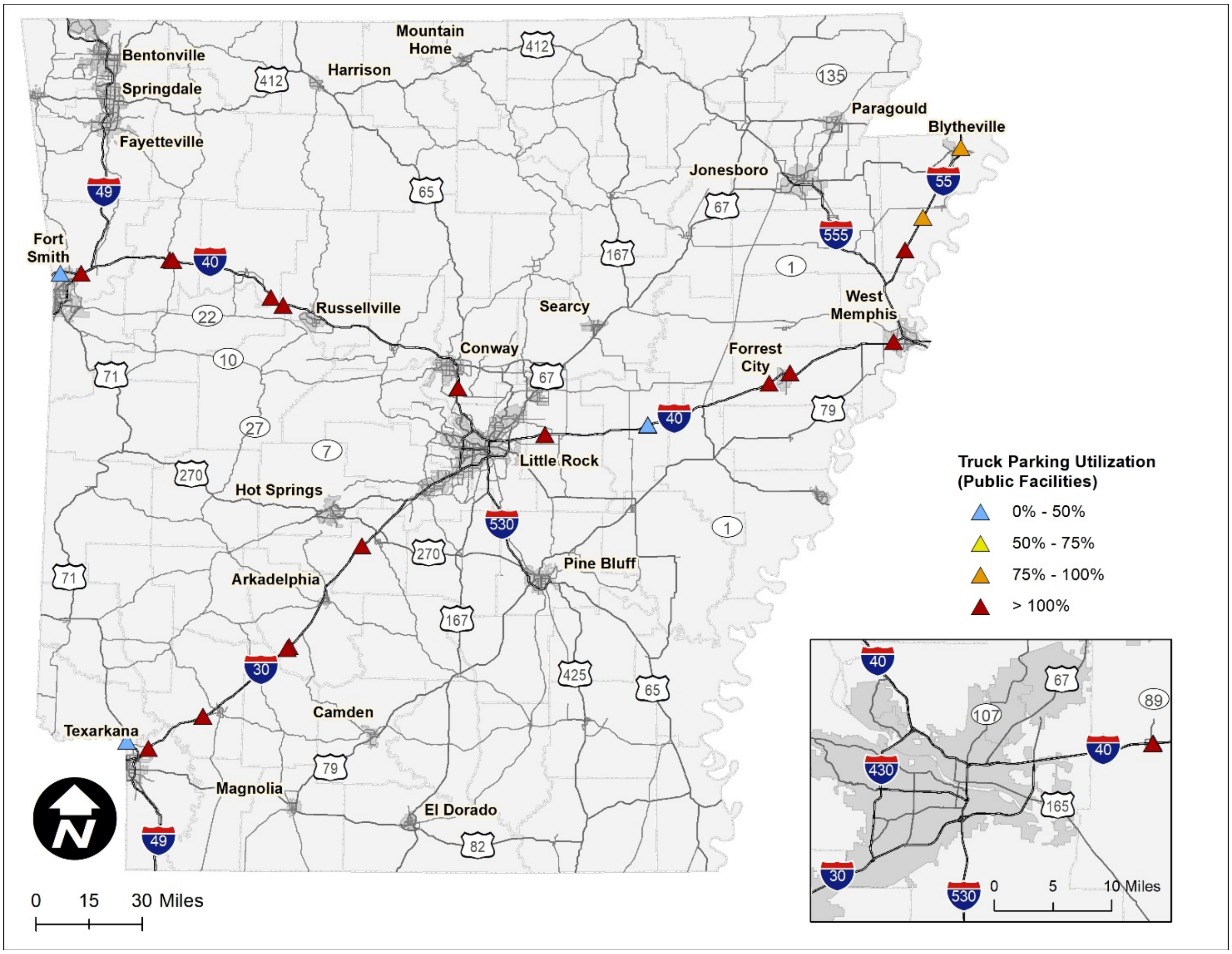
This section highlights general freight highway needs and themes for Arkansas, including truck parking, truck safety, system connectivity and mobility, asset management, and transportation technology.

3.1 Truck Parking

One of the most prevalent needs heard from stakeholders throughout the development of this State Freight Plan was the need for additional and better truck parking throughout the state. A lack of truck parking creates challenges for truck drivers who are constrained by federal hours of service (HOS) requirements. Some truck drivers reported parking in places such as shoulders of exit ramps, shoulders of local roads, and other unauthorized or undesirable locations, which can create safety issues (discussed further in Section 3.2).

Figure 3.1 shows truck parking in public (ARDOT-owned) facilities along Interstates by utilization (as documented during the 2019 overnight truck parking survey). Utilization refers to the percentage of truck parking spaces that are occupied by trucks at a specific point in time. Twenty of the 26 public facilities (77 percent) were reported as being over capacity, which aligns with comments from truck-industry stakeholders. There are a number of private operators of truck parking facilities throughout the state that also help meet the demand for parking and other truck driver amenities. Installing more truck parking locations or partnering with private businesses to install more parking would address the concerns of these stakeholders, increase safety on Arkansas roadways, and facilitate more efficient movement of freight throughout the state.

Figure 3.1 Truck Parking in Public ARDOT Facilities, 2019



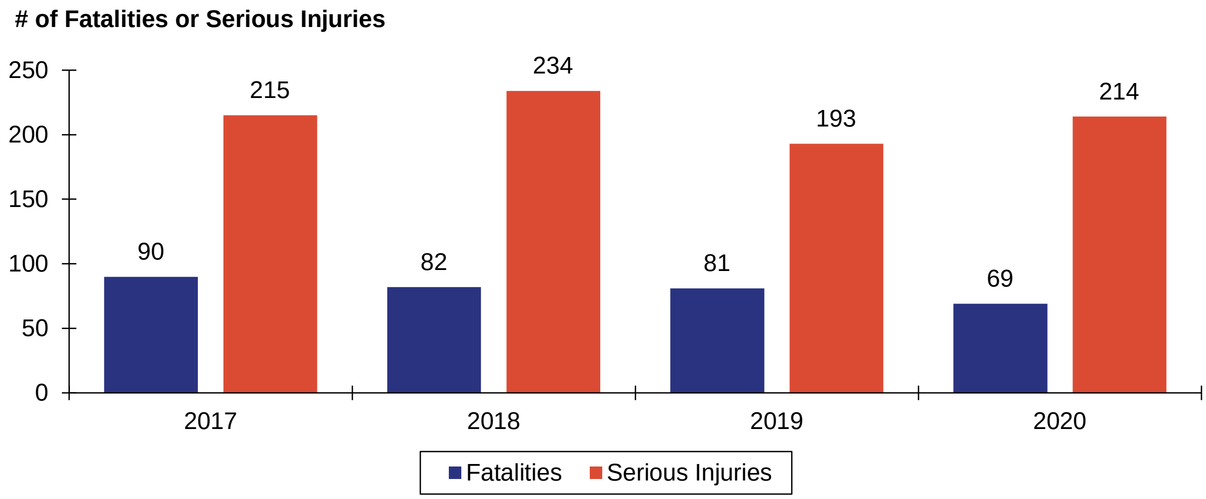
Source: ARDOT.

3.2 Truck Safety

Safety projects are those implemented to reduce fatalities, serious injuries, and crashes on Arkansas' roadways. Truck safety is an important priority for the state.

Figure 3.2 illustrates that truck-involved fatalities declined from 2017 to 2020, though serious injuries did not demonstrate a consistent trend during that period.

Figure 3.2 Truck-Involved Crashes with Fatalities and Serious Injuries per Year, 2017 – 2020



Source: ARDOT.

The most recent version of Arkansas' Strategic Highway Safety Plan (SHSP) highlights "Special Road Users", which include large commercial motor vehicles, as a critical emphasis area to improve the safety of Arkansas' roads. Strategies to improve safety within this emphasis area include:

- Increasing the availability and/or visibility of truck parking,
- Educating the public on sharing the roads with commercial motor vehicles,
- Increasing enforcement of commercial motor vehicles with fatigued drivers and other safety violations, and
- Encouraging policies that requires new safety technology in commercial motor vehicles.

The SHSP was developed for alignment with other safety plans, such as the Commercial Vehicle Safety Plan.

3.3 System Capacity, Connectivity, and Mobility

Capacity projects are those that involve large-scale upgrades that increase the ability of segments of roadway to move more vehicles. Capacity projects include the addition of more lanes to existing facilities, new roadway construction, or other types of projects. Operational projects improve roadway capacity at targeted locations through projects such as interchange redesigns, intersection redesigns, and other projects that can increase the efficiency of traffic flow without resorting to large-scale projects like a road widening.

Having multiple high-quality routes for truck traffic throughout the state is crucial for the efficient transport of freight. A well-connected network will not only allow freight to more easily reach all areas of the state, but will also provide redundancy when other parts of the network experience delays or closures.

Recently, Interstate 49 was extended to the Missouri state line in northwest Arkansas, which reduced truck travel times in that region. Eventually, Interstate 49 is slated to traverse the entire length of western Arkansas, which will improve north-south mobility of highway freight. Additionally, Interstate 69 is slated to be constructed across the south and southeastern portions of Arkansas, linking Arkansas with important coastal and inland ports, with the ultimate vision of providing an Interstate connection from Canada to Mexico passing through Arkansas. Completing these Interstates, as well as other major highways throughout the state (including the Four Lane Grid), will allow for the efficient movement of truck traffic throughout Arkansas.

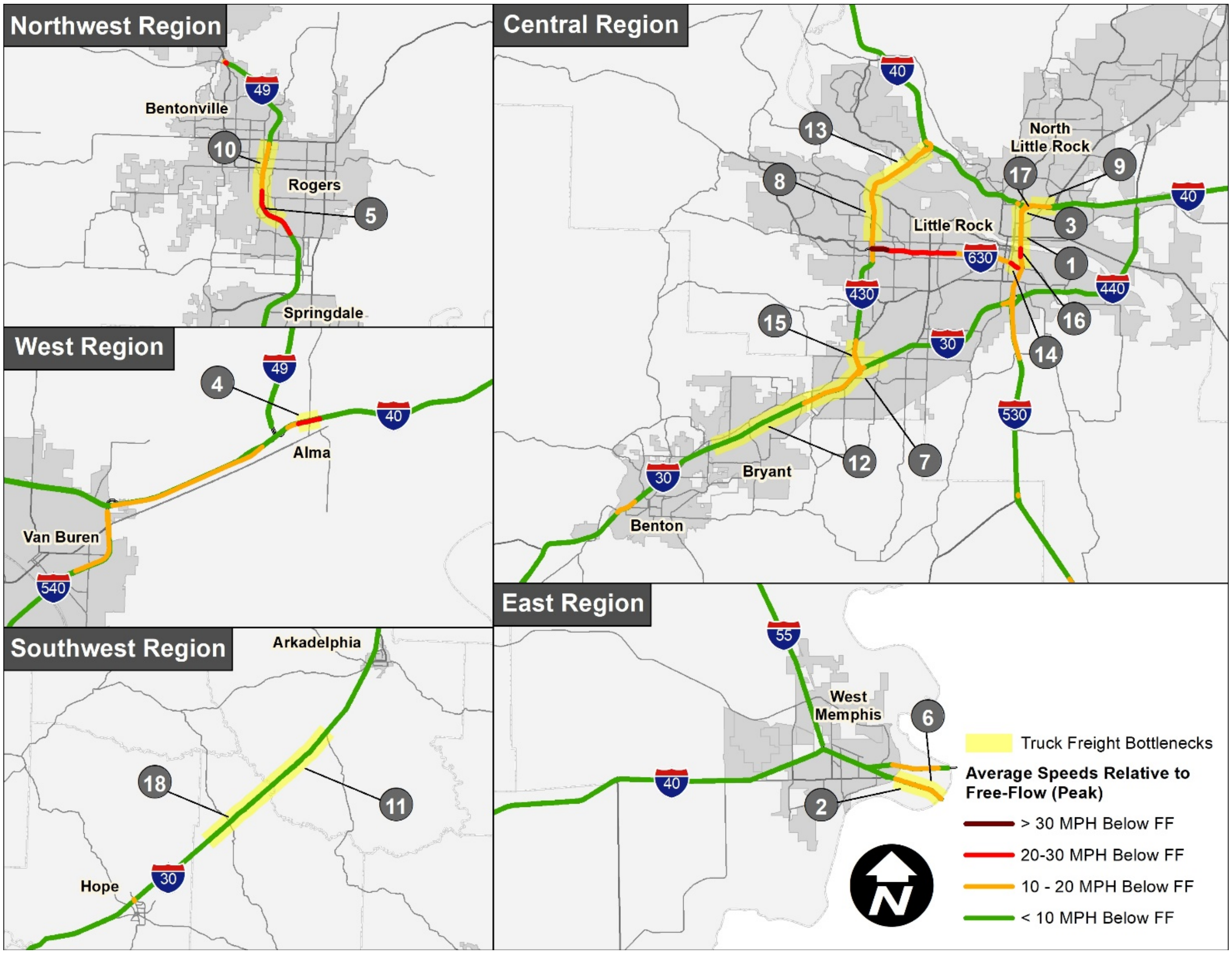
Locations that have recurring issues related to excess truck delay, poor levels of service, steep grades, frequent crashes, or recurring construction can be analyzed as “truck bottlenecks”. In 2019, ARDOT identified the most important truck freight bottlenecks in the state using Truck Travel Time Reliability (TTTR) as calculated using data from the National Performance Management Research Data Set (NPMRDS) to identify bottleneck conditions. The results are shown in Table 3.1 and Figure 3.3. Figure 3.3 overlays the freight bottleneck locations with Average Truck Speeds to illustrate how the efficient movement of freight is impacted at truck freight bottlenecks.

Table 3.1 2019 Truck Freight Bottlenecks in Arkansas

ID	Segment	Description
1	I-30 EB	From I-30/I-630 Intersection to I-30/I-40 Intersection
2	I-55 NB	Between Tennessee State Line and Exit 3A
3	I-30 WB	From I-30/I-40 Intersection to I-30 downtown area
4	I-40 West	Eastbound, nearing Alma, Highway 71 (Exit 13)
5	I-49 NB	Near Rogers, from Exit 82 to Exit 85
6	I-55 SB	Between Exit 1 and Tennessee State Line
7	I-30 WB	From I-30/I-430 Intersection (Exit 129) to Bryan (Exit 126)
8	I-430 NB	Between I-430/I-630 Intersection (Exit 8) to I-40/I-430 Intersection (Exit 13)
9	I-40 WB	Between US-67/I-40 Intersection (Exit 154) to I-30/I-40 Intersection (Exit 153)
10	I-49 SB	Near Rogers, from Exit 85 to Exit 83
11	I-30 WB	Near Gurdon, Exit 54
12	I-30 EB	From Bryant (Exit 123) to I-30/I-430 Intersection (Exit 128)
13	I-430 SB	From I-40/I-430 Intersection (Exit 12) to Hwy 10/I-430 Intersection (Exit 9)
14	I-630 EB	Near I-30/I-630 Intersection (Exit 1)
15	I-430 NB	Near I-30/I-430 Intersection (Exit 1)
16	I-630 WB	Near I-30/I-630 Intersection (Exit 1)
17	I-40 EB	Between I-30/I-40 Intersection (Exit 153) to US-67/I-40 Intersection (Exit 154)
18	I-30 EB	Near Gurdon, Exit 54

Source: ARDOT Mid-Year Report on Truck Freight Bottlenecks, 2020.

Figure 3.3 Identified Truck Freight Bottlenecks in Arkansas



Source: ARDOT Mid-Year Report on Truck Freight Bottlenecks, 2020; National Performance Management Research Data Set, 2019; analysis by Cambridge Systematics.

In addition to addressing these existing bottlenecks, ARDOT will continue to update this list on a regular basis to identify new bottlenecks and to determine whether these identified bottlenecks are temporary or persistent issues.

3.4 Asset Management

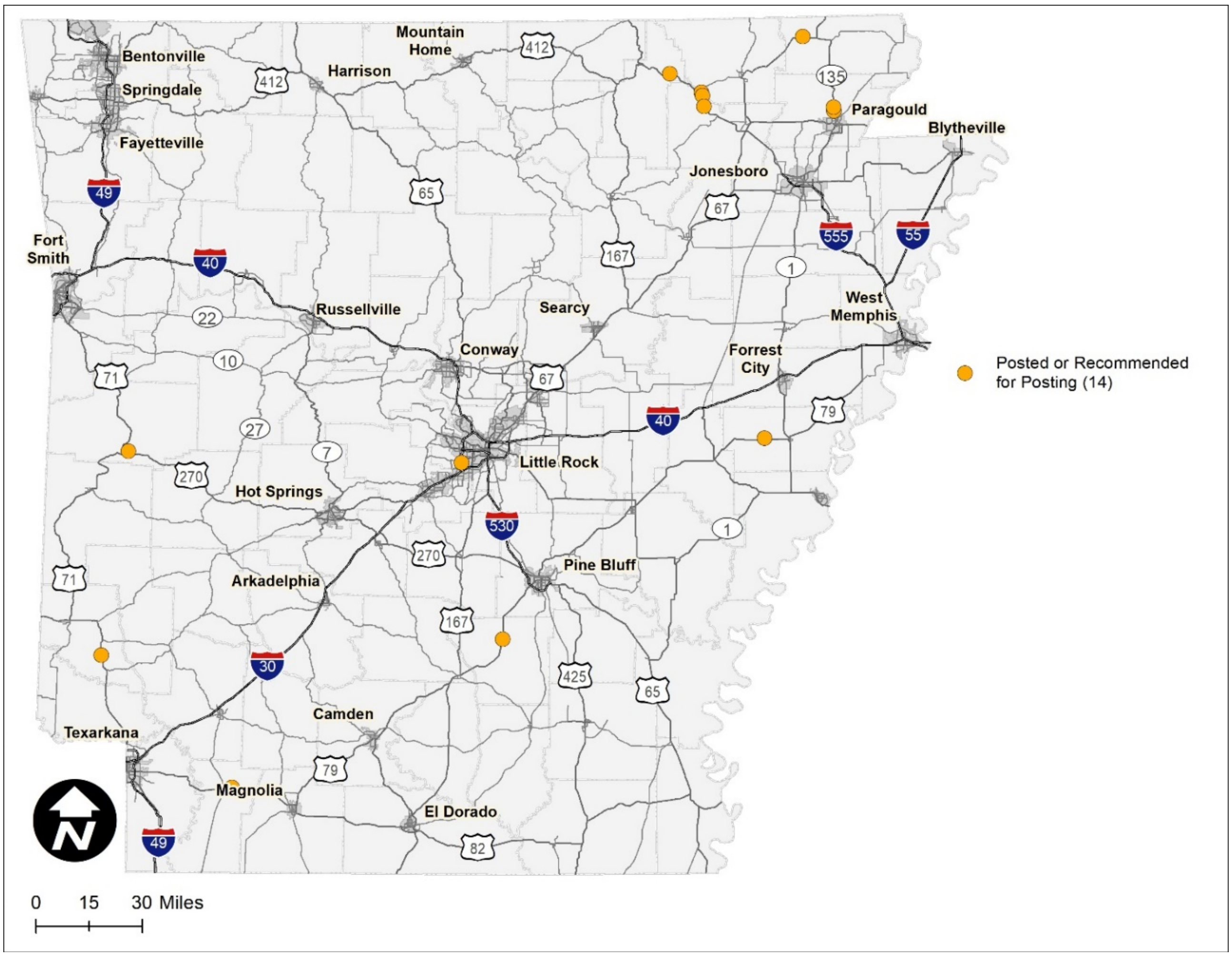
Asset management needs pertain to bridge and pavement conditions on Arkansas roadways. In 2022, Arkansas's most recent Transportation Asset Management Plan (TAMP) was completed. The TAMP provides a summary of pavement and bridge conditions on the National Highway System and describes how ARDOT plans to manage NHS assets in accordance with TAM principles. Maintaining adequate bridge and pavement conditions will allow freight to move efficiently throughout the state by preventing or correcting structural conditions that limit truck movements.

As part of the most recent TAMP, ARDOT analyzed the gap between current conditions, projected conditions in 2028, and the desired conditions. The inventory of current pavement conditions showed that 72 percent of

NHS roadway mileage was in a state of good repair (projected 75 percent in 2028), which were both lower than the desired state of good repair of 82 percent. Similarly, the inventory of current bridge conditions showed that 53 percent of NHS bridges were in a state of good repair (projected 57 percent in 2028), which were both lower than the desired state of good repair of 59 percent. To make progress towards the desired state of good repair goals, ARDOT will continue to invest in preservation, maintenance, and other cost-effective and strategic improvements to the NHS (as well as other non-NHS assets).

A specific freight highway need identified from interviews with industry stakeholders centered on load-posted bridges. In rural Arkansas, stakeholders identified load-posted bridges as an obstacle to transporting freight. Some drivers risk using these bridge rather than be diverted for several miles (potentially hours) even though their vehicles are over the posted weight limit. Figure 3.4 is a map of load-posted bridges along the NHS. While other non-NHS bridges serve highway freight needs, the NHS system (particularly the Interstate System) carries the bulk of truck vehicle miles traveled, which reflects a priority for addressing load-posted assets. Conversely, because one maximum legal weight truck creates several orders of magnitude more damage to bridges and pavements than passenger vehicles, highway freight routes also require higher structural design standards, and more proactive preservation and maintenance to maintain a state of good repair.

Figure 3.4 Posted Bridges on the NHS in Arkansas, 2021

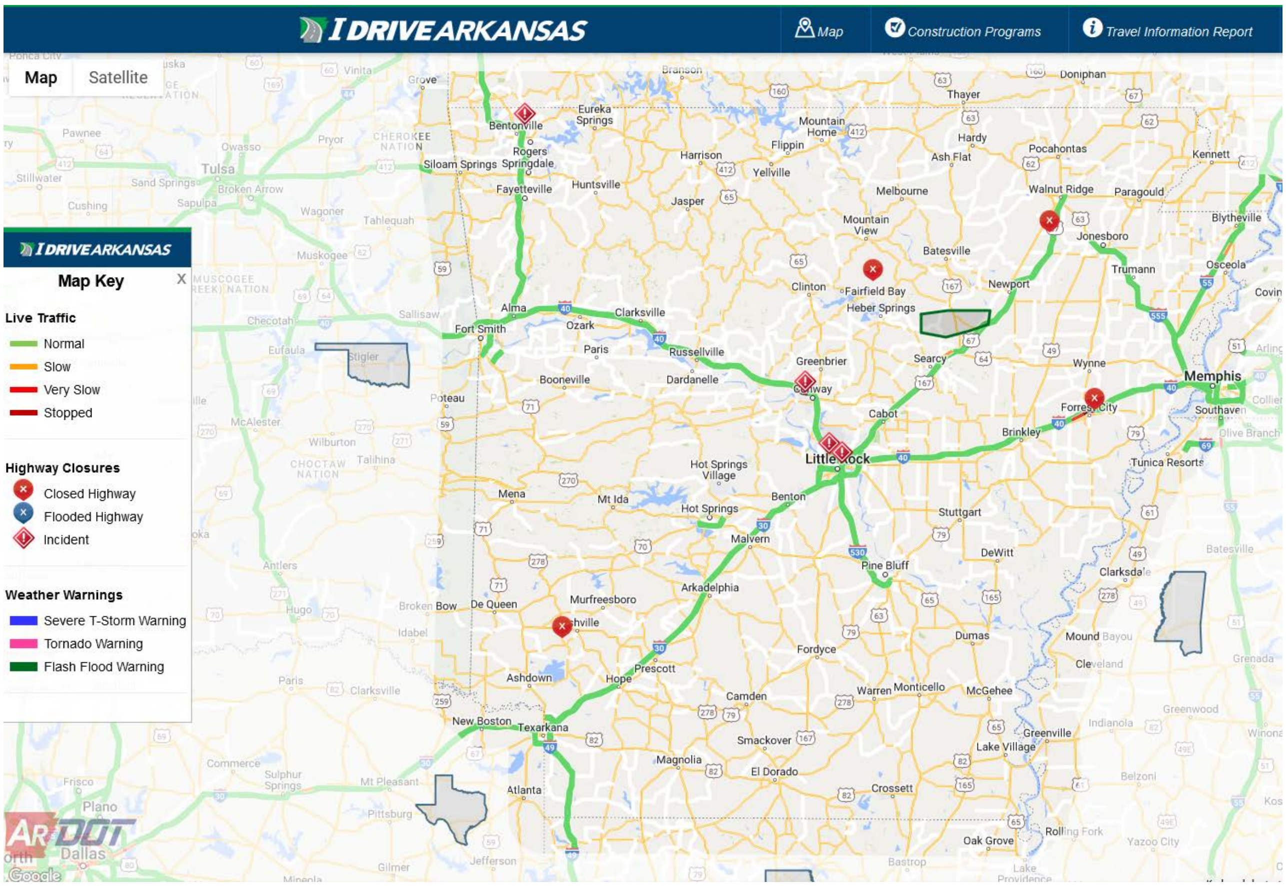


Source: National Bridge Inventory.

3.5 Transportation Technology

ITS projects implement state-of-the-art technology along Arkansas roadways and can help increase the overall reliability of the transportation system without resorting to more expensive capacity-type upgrades. Transportation technology at ARDOT is managed by the Intelligent Transportation Systems (ITS) Section within the Maintenance Division. The ITS Section currently manages numerous ITS assets including a transportation management center (TMC), dynamic messaging signs, land mobile radio system, iDrive Arkansas (Figure3.5), and other technologies. To maintain the efficiency of the transportation network, Arkansas should continue to invest in these vital systems. This will continue to allow the state to monitor, detect, and respond to incidents the affect the highway network.

Figure 3.5 iDrive Arkansas



Source: https://www.idrivearkansas.com/.

Other transportation technology should be evaluated as a possible future investment, including truck parking notification systems. Truck parking notification systems can assist truck drivers in finding open parking spots in public and private facilities within the state and can limit the need for these truck drivers to park in illegal or otherwise undesirable locations, as well as support compliance with hours of service requirements.

Additionally, ARDOT is in the process of developing its first Transportation Systems Management and Operations (TSMO) Plan, which will include strategic, programmatic, and tactical elements. Specific recommendations that are impactful to the movement of trucks are expected to be included in the tactical component of the plan and will likely include ITS elements.

4.0 Railroad Freight Needs and Themes

This section highlights general railroad needs and themes for Arkansas, including additional capacity, improvement and elimination of at-grade crossings, system enhancement, funding, track quality and weight restrictions, general rail safety, and service and labor challenges.

4.1 Additional Capacity

Increasing capacity is a necessary means of allowing for the operation of additional (or heavier) trains along the statewide network. This capacity can be achieved through various means, including the construction of additional main line tracks, replacement of substandard track, yard and terminal capacity, sidings to trains to pass, or spurs for access to industrial sites. The following project serves as an example of the type of capacity-related projects that were recently implemented on Arkansas' freight rail network:

- **Rail Extension and Rehabilitation at the Port of West Memphis.** This project involved rehabilitation and the extension of 2.25 miles of track owned by the City of West Memphis at the International Port Rail Logistics Park. The purpose of this project was to allow for heavier loads into and out of the industrial park and facilitate the construction of a new bulk commodity transload facility.

  This project completed in 2022. West Memphis Base Railroad L.L.C leases the rehabilitated and extended track segment from the City of West Memphis. The railroad is fully operational, includes a new transload facility, and allows for additional capacity into and out of the Port Rail Logistics Park and Mississippi River navigational transportation system.

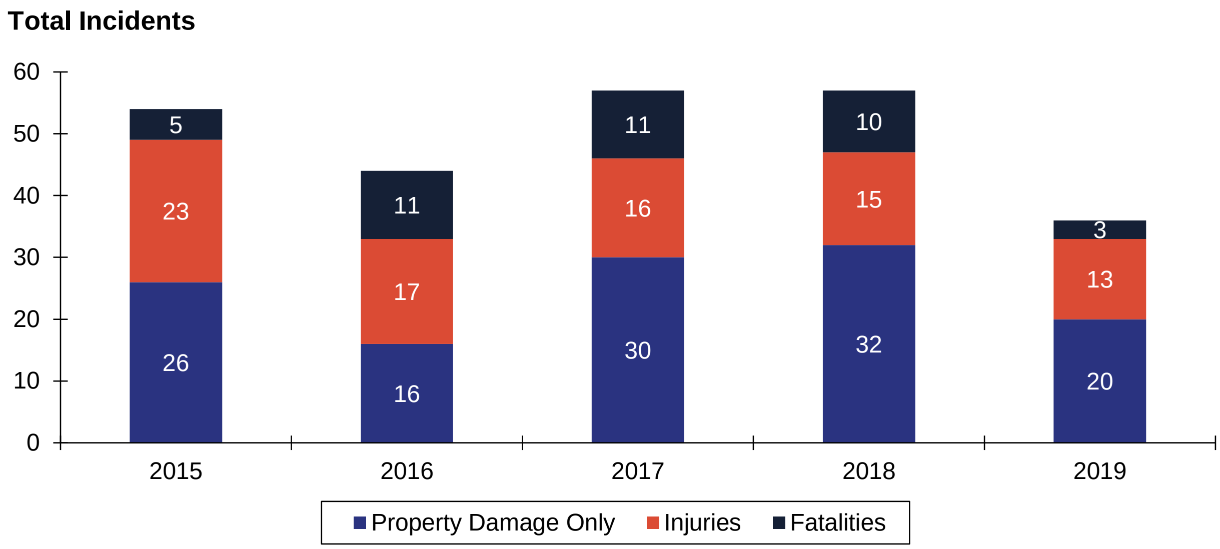
4.2 Improvement and Elimination of At-Grade Crossings

Reducing the number of at-grade crossings is the most effective way to improve the safety of highway-rail interactions. Highway-rail at-grade crossings require additional focus given their unique safety implications, risks, and varying design characteristics. The following project serves as an example of a grade-separation project recently implemented on Arkansas' freight rail network:

- **Highway 18 Railroad Overpass (City of Jonesboro).** This project received a $1.2 million TIGER grant for project development in 2014. The replaced an at-grade crossing between State Highway 18 an BNSF trackage near the City of Jonesboro's industrial parks. The grade-separated overpass was opened to traffic in April 2022.

As shown in Figure 4.1, grade crossing safety incidents continue to occur across Arkansas. Given the specific and unique safety considerations of at-grade crossings, grade crossing safety is still considered a key need to be addressed as part of the statewide freight planning process. From a funding perspective, Arkansas typically receives approximately $4 million annually in FHWA Section 130 (Rail-Highway Crossings Program) funding, which funds approximately 10 grade crossing safety projects each year.

Figure 4.1 Grade Crossing Incidents by Year, 2015 – 2019



Source: FRA 2021 Accident/Incident Overview Dashboard.

Based on the considerations of constrained funding, there is a continued emphasis on implementation of cost-effective protections in the form of passive and active traffic control devices. Passive control devices include regulatory signs, warning signs, guide signs, and pavement markings. Active control devices include lights, gates and crossbucks. Where feasible, grade-crossing closures and grade separations should be considered, though it is acknowledged that the former is often difficult from a political perspective and the latter from a funding perspective.

4.3 System Enhancement

System enhancement needs are identified as a means of increasing the versatility of the statewide freight rail system. This includes a strategy centered around implementing additional spurs and sidings to serve local rail customers, building additional capacity (which is related to track weight and quality, discussed in Section 4.5), additional freight rail facilities, and expanded intermodal connections. Even for those sites already served by rail and have available space and railroad capacity, there is a need for increased incentives and initiatives to attract new customers to rail-served sites.

Addressing a backlog of maintenance needs is necessary to restore rail lines and structures to a functional state of good repair. This can be especially important in rural areas, those regions further away from operational Class I railroads, and where a railroad or rail segment was previously operational. The following projects serve as examples of system enhancement projects on Arkansas' freight rail network:

- **Rail Rehabilitation of the North Louisiana and Arkansas Railroad**. This project allocated $13 million to rehabilitate and improve track quality along the North Louisiana and Arkansas Railroad, originally funded through a variety of sources, including the U.S. Economic Development Administration, Southeast Arkansas Economic Development District (SEAEDD), Lake Providence Port Commission, State of Louisiana, Delta Regional Authority, and Arkansas Short Line Railroads, Inc. As of 2022, rehabilitation efforts and related planning along the railroad continue in both Arkansas and Louisiana. In 2019, an additional $10.5 million federal funding through the Infrastructure for Rebuilding America (INFRA) grant program was awarded to continue these efforts.

4.4 Funding

Securing funding for priority projects is an on-going issue for freight rail owners, but it can be particularly challenging for shortline (Class III) carriers. In addition, some freight railroads expressed the need for dedicated funding support. Currently, Arkansas does not have a dedicated state funding source specifically for freight rail needs. On the other hand, some neighboring states maintain funding programs for multi-modal and freight rail projects. Tennessee's Short Line Railroad Preservation Grant Program provides funding to preserve rail service to local communities and expand rail connectivity to sites along existing rail corridors.[1] Mississippi Freight Rail Service Projects Revolving Loan (RAIL) Program provides loans to municipalities and counties to finance freight rail service projects in Mississippi.[2] Rail spurs and other rail-related enhancements are also eligible for Missouri's Freight Enhancement Program, although Missouri DOT acknowledges that available funding is often not sufficient to cover these types of projects.[3] However, other peer states, including Oklahoma, do not maintain a dedicated state funding source for freight railroads.

Shortline carriers rely on federal grant funding sources to implement major projects. For example, in 2019 the Southeast Arkansas Economic Development District was awarded $10.5 million in INFRA grant funds to upgrade shortline track to accommodate higher speeds and train weights.[4] In 2022, the Port of Little Rock was awarded $5.6 million in federal Consolidated Rail Infrastructure and Safety Improvements (CRISI) grant funds to support the Port of Little Rock Freight Rail Capacity Improvement Project, which constructed an engine maintenance and inspection facility and constructed over two miles of storage track.[5] While both projects are examples of recent successes, the process of applying for grant opportunities can be challenging for smaller carriers with limited resources but sizable potential for growth and development.

4.5 Track Quality & Weight Restrictions

For the most part, Arkansas freight rail trackage has a weight standard of at least 286,000 pounds (286K). This includes all BNSF and Union Pacific Class I rail trackage, and most Kansas City Southern trackage. These Class I rail networks comprise the majority of statewide trackage. However, as shown in Figure 4.2, there are multiple portions of the statewide rail network that do not meet the 286K weight standard. Most of this trackage is concentrated in southern, and especially southeastern, portions of Arkansas. There are additional concentrations of such trackage in and around Fort Smith. Nationally, a weight standard of at least 286K is considered to be the general track quality standard for freight railroads. For those railroads or rail segments with weight standards below the 286K standard, weight constraints can decrease efficiency and reduce the overall competitiveness of rail in comparison to other modes.

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[1] https://www.tn.gov/tdot/transportation-freight-and-logistics-home/competitive-rail-connectivity-grants.html

[2] https://mississippi.org/wp-content/uploads/rail-loan-program.pdf

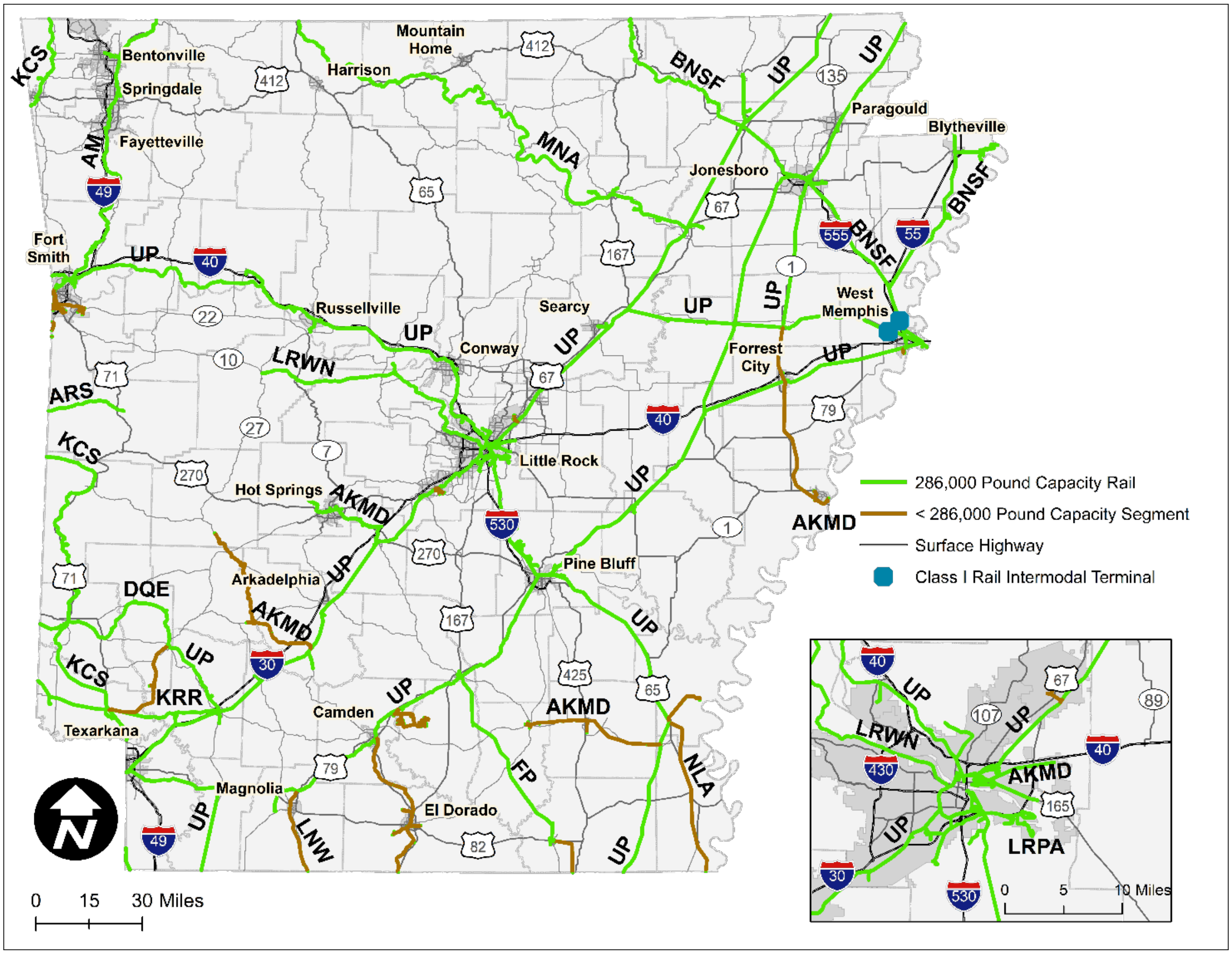
[3] 2022 Missouri State Freight and Rail Plan, Economic Futures and Needs Assessment Report. https://www.modot.org/sites/default/files/documents/Economic%20Futures%20and%20Needs%20Assessment%20FINAL.pdf

[4] https://www.transportation.gov/sites/dot.gov/files/docs/grants/344906/fy2019-infra-fact-sheets.pdf

[5] https://www.kark.com/news/little-rock-port-authority-receives-5-5-million-grant/

Upgrades to freight rail trackage can be implemented as part of a larger statewide economic development strategy. For example, based on the insight from the outreach portion of the planning process, the timber industry was identified as a key industry requiring 286K rail accessibility. As such, in coordination with statewide railroads and key industries, and given funding constraints, there is a need to identify those track segments where infrastructure upgrades would provide the best return on investment.

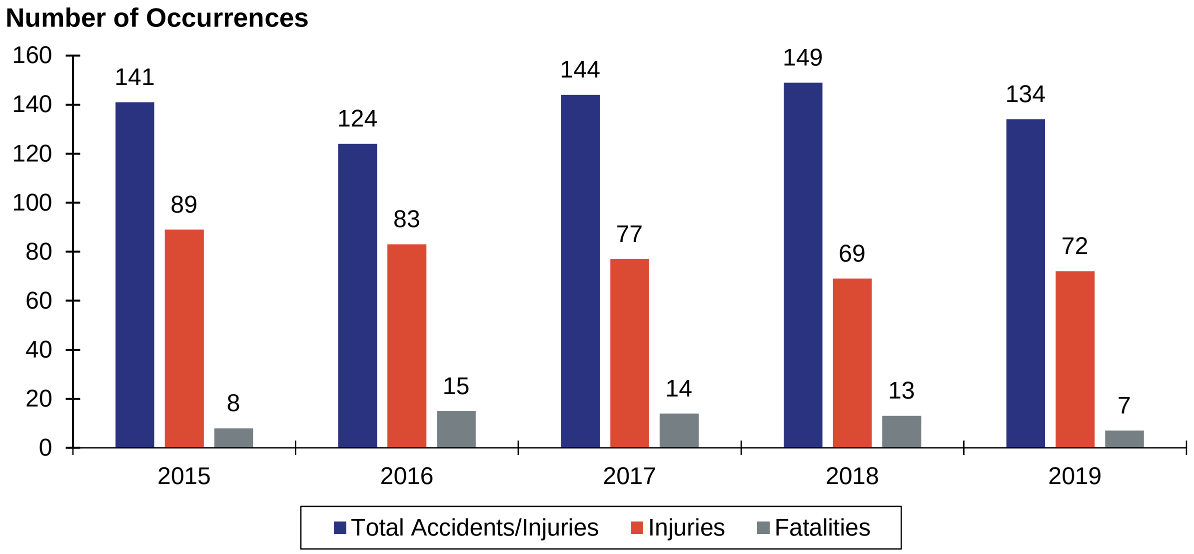
Figure 4.2 Arkansas Rail Network Weight Restrictions



4.6 General Rail Safety

General rail safety improvements and monitoring emerged as a key freight rail need. General rail safety refers to the need for a broad and comprehensive strategy to address related statewide issues across the freight rail network. As Figure 4.3 shows, total numbers of safety incidents remained relatively consistent from 2015 to 2019. This indicates a continuous need for effective and innovative strategies.

Figure 4.3 Safety Incidents by Year, 2015 – 2019



Source: FRA 2021 Accident/Incident Overview Dashboard.

Since the release of the 2017 State Freight Plan, positive train control (PTC) technology, designed to prevent collisions, derailments, and other incidents, has been implemented across all 57,536 miles of nationwide trackage where it was originally required. Since PTC implementation was only completed at the end of 2020, it is too early to fully assess the full effects on general safety needs.

Additionally, the implementation of PTC is not applicable to the entire statewide rail network. This is because implementation was required only for the Class I rail network on any track sections with 5 million or more gross tons of annual rail traffic, trackage where certain hazardous materials are transported, and on any main lines over which intercity or commuter rail passenger service is regularly provided. As a result, there may be a need for the allocation of resources to safety needs on statewide track segments where PTC has not been implemented.

Lastly, trespassing continues to remain an in issue, as reported by rail owners and operators. As such, there is a need for a coordinated effort between ARDOT and other roadway authorities, affected railroads, and organizations such as Operation Lifesaver, to effectively address and deter trespassing. This should include a robust education component, as well as coordination with local law enforcement personnel.

4.7 Service and Labor Challenges

Since the onset of COVID-10, there have been persistent labor and workforce challenges impacting nearly every industry sector, which has put pressure on many industries, particularly manufacturing and transportation/logistics. This pressure is forcing both shippers and carriers to pivot their operators in order to move essential freight. In the freight rail industry, this has led to operational challenges for both shippers and carriers, and, for some businesses, moving less freight on the freight rail network and more on the freight highway network.

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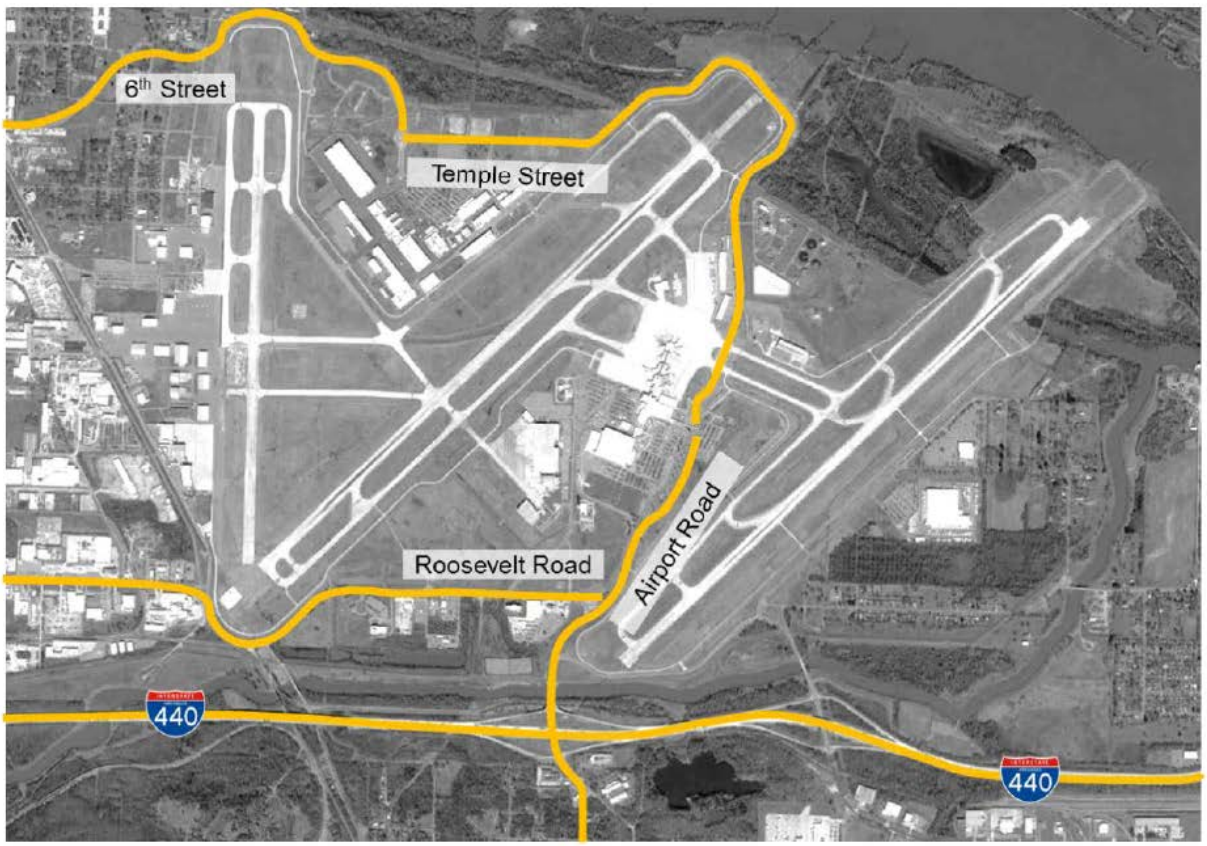
5.0 Air Cargo Needs and Themes

This section highlights general freight highway need and themes for Arkansas, including ground access and capitalizing on available capacity.

5.1 Ground Access

Freeway access to Bill and Hillary Clinton National Airport (LIT) is provided by Interstate 440 via interchanges at Bankhead Drive and Lindsey Road. On-site, a system of access roads (including Roosevelt Road, Temple Street, and Airport Road, shown in Figure 5.1) provide connectivity to the passenger and cargo terminals and supporting development (including general aviation services, a Dassault Falcon Jet service center, parcel services, and others). From stakeholder outreach, the airport authority does not see a current for roadway improvements to facilitate air cargo, but the need for such improvements would need to be re-evaluated

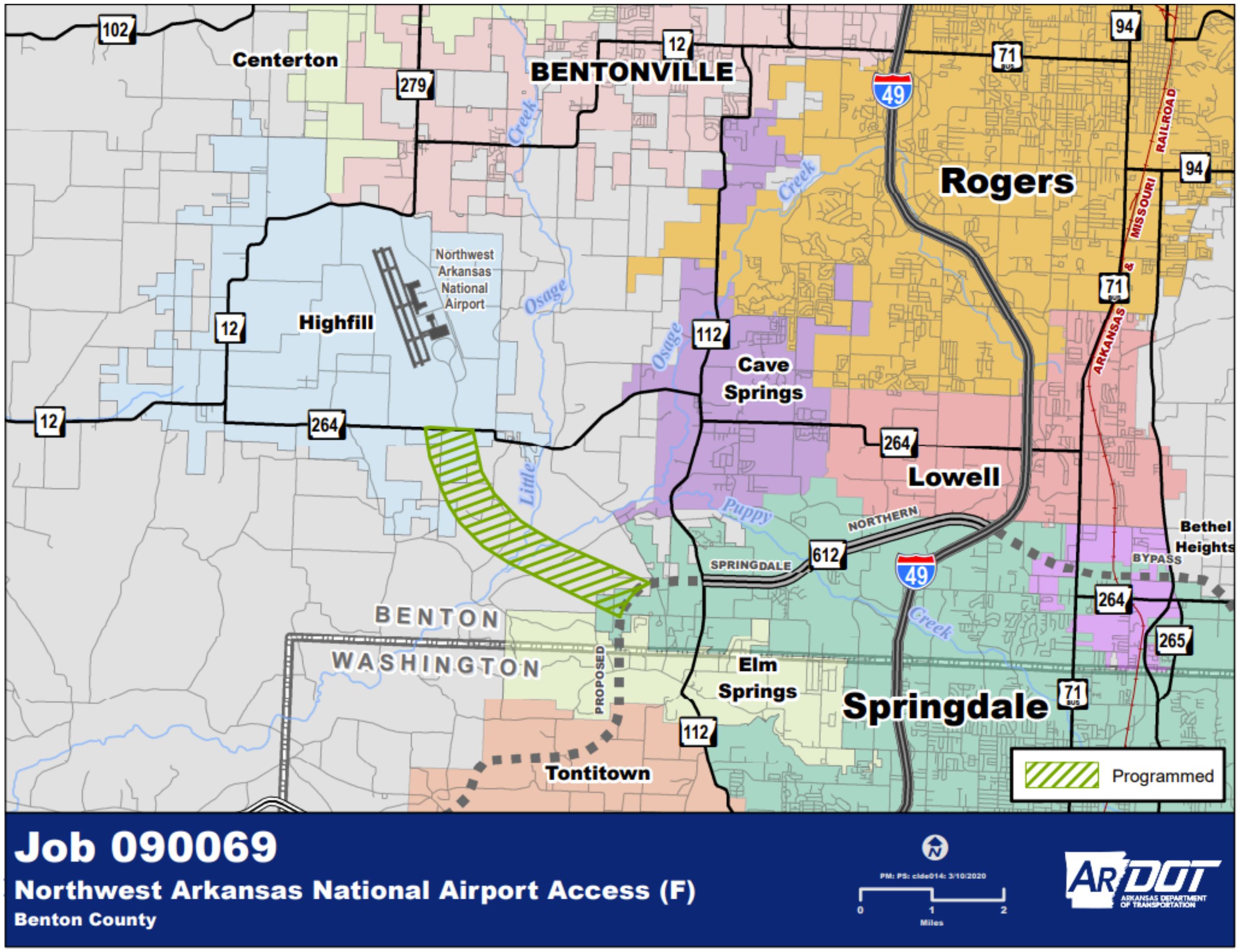
Figure 5.1 LIT Airport Access Roadways



Source: Bill and Hillary Clinton National Airport Master Plan, 2018.

Northwest Arkansas Regional Airport Authority is working with ARDOT to build a fully-access controlled connector road between State Highway 612 and the entrance to Northwest Arkansas National Airport (XNA) at State Highway 264. Once completed, the route will provide connectivity between XNA and Interstate 49 (Figure 5.2), which will better facilitate the movement of air cargo freight to and from the Interstate highway system. Northwest Arkansas Regional Airport Authority has had conversations with several air cargo service providers that are interested in locating on-site once the access road is completed, indicating that growing air cargo activity at the airport is likely to occur in the coming years. With scheduling subject to funding availability, this project is programmed in the FFY 2023-2026 Statewide Transportation Improvement Program.

Figure 5.2 Northwest Arkansas National Airport Access



Source: ArDOT.

5.2 Capitalizing on Available Capacity

Arkansas' air cargo-handling airports have capacity to handle increased air cargo volumes. Clinton National Airport handles nearly all air cargo in Arkansas and has sufficient airfield and terminal capacity to accommodate projected future demand. It currently has three cargo buildings that facilitate various cargo-related activities. Based on the 2018 Master Plan[6], the airport's facility improvement plans are primarily focused on terminal upgrades for passenger amenities. However, there is capacity at existing facilities, as well as vacant land available for future expansion if the market demands. The proximity of Memphis International

[6] Bill and Hillary Clinton National Airport Master Plan, 2018.

Airport, one of the top air cargo facilities in the nation and located just two hours away by truck, presents a challenge for Clinton National Airport to compete and grow its air cargo customer base.

XNA is the second largest cargo-carrying airport in Arkansas; however, it typically handles small volumes (roughly 100 tons annually) of cargo transported in the belly of passenger planes. While XNA does not have a dedicated cargo terminal, it has several shovel-ready sites on the east side of the airport that would be ideal for development of on-site air cargo facilities. There is also land available on the west side of the airport, but those parcels lack road/utility infrastructure and would require greater investment to make viable. The airport is optimally located to grow given its location in Northwest Arkansas, which has seen strong population growth and growing industries in recent decades, making it an ideal e-commerce hub.

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6.0 Port and Waterway Needs and Themes

This section highlights general port and waterway needs and themes for Arkansas, including funding, highway and rail access, lock and dam infrastructure, dredging and navigation.

6.1 Funding

Availability of funding is an on-going issue at both the federal and local levels. As of 2022, funding needs along the MKARNS reached $230 million, with members of Congress from Arkansas, Oklahoma, and Kansas requesting the U.S. Army Corps of Engineers (USACE) to direct funds to this waterway system.[7] Between fiscal years 2021 and 2023, a total of $226 million was budgeted for the MKARNS as part of the USACE's annual Civil Work Operation and Maintenance work plans to address these needs; the increased funding in fiscal years 2022 and 2023 was tied to the additional multimodal funding made available through the Infrastructure Investment and Jobs Act (IIJA).[8]

While the IIJA provided numerous competitive grant opportunities with eligibility for freight projects, limited availability of local matching funds can make it difficult for inland ports to pursue those funding opportunities. The lack of (and challenges with matching) available funding, coupled with rising costs of parts and materials and lengthening delivery times, has had a direct impact on the ability of port operators to make repairs or improvements at their facilities.

A further complication in acquiring adequate funding is the means of allocating federal funding amounts. Currently, the Waterborne Commerce Statistics Center (WCSC) within the USACE captures information on vessels, tonnage, commodities, and origin/destinations – data presented in this State Freight Plan Update as part of Ports & Waterways Modal Profile. WCSC data is used to analyze the feasibility of new projects and to set investment priorities.[9] Current efforts by the WCSC aim to update the statistical port boundaries used for this information[10]; however, port and waterway stakeholders in Arkansas expressed a desire for greater transparency about the methods used to collect and estimate commodity flow data to ensure that Arkansas' waterways are allocated appropriate funding amounts for the volume of goods served by Arkansas' ports.

At the state level, funding is available through the Arkansas Waterways Commission (AWC) through the Arkansas Port, Intermodal and Waterway Development Grant Program and the Arkansas River Navigation System Fund.[11] The Arkansas Port, Intermodal, and Waterways Development Grant Program provides

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[7] Oklahoma Department of Transportation. *McClellan-Kerr Arkansas River Navigation System (MKARNS) Mooring Modernization Project*. https://oklahoma.gov/content/dam/ok/en/odot/federal-grants/raise/2022/mkarns/MKARNS%20Mooring%20Modernization%20Project.pdf

[8] https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll6/id/2258%20target=

[9] U.S. Army Corps of Engineers. Waterborne Commerce Statistics Center. https://www.iwr.usace.army.mil/About/Technical-Centers/WCSC-Waterborne-Commerce-Statistics-Center-2/

[10] U.S. Army Corps of Engineers. *Statistical Port Boundary Project.* https://aapa.cms-plus.com/files/2021H%26NdecTujague.pdf

[11] This funding is possible through Act 561 of 2019 which states the following: "Any taxes and penalties collected from water transportation companies under Ark. Code Ann. § 26-26-1614 in excess of two million five hundred fifty thousand dollars ($2,550,000) shall be deposited into the State Treasury and credited as follows: 1) $50,000 to AWC Operating Budget; 2) 30% to The Arkansas Port, Intermodal, and Waterway Development Grant Program Fund; and 3) 70% to The Arkansas River Navigation System Fund to be used exclusively for the purposes set forth in Ark. Code Ann. § 15-23-205."

financial assistance to Arkansas port and intermodal authorities for the purpose of funding port development projects. The goals of the program are to provide public funds to build landside infrastructure dredging. Port and intermodal authorities located within Arkansas along the Mississippi, Ouachita, Red, and White Rivers are eligible to apply for assistance through this program. In 2022, this program awarded nearly $2 million to the following projects:

- Helena-West Helena/Phillips County Port Authority – awarded $535,000 to construct a truck staging lane for Helm Fertilizer Road Expansion;
- Osceola Port Authority – awarded $417,102 to replace aging cargo handling equipment; and
- West Memphis-Crittenden County Port Authority – awarded $1,000,000 to remove metal dolphins north of dock to alleviate eddy/safety issues and improve water flow, debris mitigation, and dock substructure strengthening.

6.2 Highway and Rail Access

Several port operators reported a need for roadway improvements to facilitate growth. Adequate intermodal access is an important feature of ports in order to attract additional users.

As an example, Metroplan (the metropolitan planning organization for Central Arkansas), in cooperation with the Port of Little Rock, the City of Little Rock, and Pulaski County, has contracted with a consulting firm to perform a planning study of the South Loop corridor between Interstate 440 and Interstate 530. The study will evaluate alternative for improving access to the Port of Little Rock and surrounding industrial development, which is home to 7,000 plus employees and is a major traffic generator and intermodal facility for the region. That study will build upon previous planning efforts to analyze travel patterns and demand, identify potential routes, and assess potential environmental and economic impacts of the proposed South Loop connector.

Numerous port operators identified rail as a critical need for serving existing customers and attracting new tenants. As exhibited by recently completed port projects, rail is an important component for growth. Port stakeholders report a continued increase by potential tenants for rail access, and some past opportunities have not come to fruition due to the lack of rail capabilities such as rail-to-barge.

Refer to the Unconstrained List of Priority Freight Project (Appendix B) for additional rail and highway improvement projects identified by stakeholders.

6.3 Lock and Dam Infrastructure

For some of Arkansas' ports, working locks are a critical need for reliable operations. For example, the Port of Crossett is the northern-most point on the Ouachita River that the USACE will dredge and is dependent upon working locks. Prolonged closure at the Columbia Lock & Dam due to seepage issues, among others, caused the port to lose a tenant who would ship a few barge loads a month. At this point, the Port of Crossett has not had any river shipments for the last four or five years.

An improved tow haulage system has also been identified as a need at all locks. All of the locks and dams in Arkansas have a single lock chamber for passing, such that during lock closures no vessels can pass which greatly impacts river traffic. In 2019, the Arkansas Waterways Commission signed a memorandum of agreement (MOA) with the USACE Little Rock District to pay for up to half of a design contract, not to exceed

$50,000 for a new tow haul lock system. A new design was developed for Lock 7 but is pending appropriations. The Arkansas Waterways Commission is prepared to provide a cost share with USACE to update tow haulage at one lock per year, which will be necessary to accommodate a 12-foot channel.

6.4 Dredging and Navigation

Extreme weather events have exacerbated dredging needs along Arkansas' waterways. Flooding impacts have caused silting problems along some portions of the waterway system that are yet to be addressed. Other portions of the waterway system, such as the White River, have not been dredged to an adequate depth to handle barge traffic. This makes the development of new facilities, such as Newport, all the more difficult. Consistent, annual dredging and adequate water depth is necessary to support reliable operations at inland ports. Beyond maintenance dredging, several ports would like to see the MKARNS, in particular, deepened to 12 feet, or three feet deeper than the nine feet minimum depth currently maintained. The additional depth would have a significant impact on the ability to increase use of the inland ports, and would improve inland port capacity for larger tows. Dredging would also improve navigability of the Red River, White River, and Ouachita River, which are only partially navigable.

6.5 Recently Funded Inland Waterway Projects

As part of the State Freight Plan development process, inland waterway stakeholders were contacted to identify current and future needs for their facilities, as well as recently completed projects. Several port operators identified projects that they have recently completed (or are underway) as shown in Table6.1. This list is not inclusive of every inland-port related project, but does highlight the types of marine infrastructure improvements (and funding sources) that are being implemented in Arkansas. Other navigational funding elements are identified at the federal level through the Infrastructure Investment and Jobs Act (IIJA). Projects identified for FFY 2022 are included as Table 6.2. The largest project reported in Table 6.2 is for repairs to revetments throughout a seven-state area at a cost of over $202 million. Of note is the $92.6 million investment towards work to deepen the MKARNS to 12 feet, which has consistently been identified as a high priority by stakeholders.

Table 6.1 Recently Completed Capital Improvement Projects

Project Description	Project Location	Project Purpose	Mode(s) Impacted	Est. Cost	Construction Start/End Year(s)
Container Yard	Helena Harbor	Building small container yard	Port	$200,000	January 2022
Fiber Cable	Helena Harbor	Expanding AT&T Fiber	Port	$49,000	February 2022
Surface Transportation Phase II	Helena Harbor	Improving a gravel road to support increased truck traffic from Helm Fertilizer expansion	Road, Port	$775,000	March 2022
Helm Dock	Helena Harbor	New dock for increased barge traffic	Port	$6,000,000	April 2022
Intermodal Loop Road	Little Rock	Extension to new TIGER docks	Road, Rail, Port	$10.2M – TIGER Grant	2017 – 2021
Warehouse	Little Rock	Construction of new 30,000 sf warehouse	Port		
Conveyor	Little Rock	Provide conveyor/conveyor dock with direct rail-to-barge capacity	Rail, Port		
Dock and Winch System	Little Rock	Provide additional 200’ x 120’ dock and winch system connected to existing railroad track	Port		
Mooring	Little Rock	Provide dditional mooring for barges	Port, Waterway		
Scale house and scale	Little Rock	Construct scale house and scale	Port		
Addition of Rail	Little Rock	Add 6,000 lf of rail to complete second loop in Slackwater Harbor Area	Port, Rail		
Laydown yard	Little Rock	Add 392,040 sf laydown yards by main terminal (9-acres)	Road, Rail, Port		
Extend Rail Spur to Trex	Little Rock	Construction of a new 7,500 linear foot north-south railroad spur south to Thibault Road as the primary rail trackage for the southern portion of the port area.	Rail	$4.255M – EDA	Ongoing – Starting NEPA, design 2022
Fourche Dam Pike Widening	Little Rock	Widening and crossing improvements on Fourche Dam Pike from Interstate 440 to Frazier Pike Road	Road	$3.5M	2021 – 2022
Engine Shed	Little Rock	Construct engine maintenance facility with inspection pit	Rail	$7.5M – CRISI Grant	Ongoing – Funding awarded 2022
Slackwater Harbor Rail Storage	Little Rock	Construct 11,215 feet of track	Rail		
North Marshalling Yard Storage	Little Rock		Rail		

Project Description	Project Location	Project Purpose	Mode(s) Impacted	Est. Cost	Construction Start/End Year(s)
Mooring Upgrades	Little Rock	The project will replace fifteen unsafe deadman ground anchors that are near the end of their useful life with steel monopile dolphins, and install an additional thirty-two dolphins in other locations	Port	$3.8M – PIDP Grant	Ongoing – Funding awarded 2021
Road Phase I	Newport	Paved Access Road & Signage	Road	$106,376	2018
Road Phase II	Newport	Paved Access Road & Signage	Road	$140,000	2019
Warehouse Roof & Door Replace	Pine Bluff		Port	$493,296	March 2015
Roof – Main WH Pine Bluff (Lower, Upper, Canopy)	Pine Bluff		Port	$275,018	December 2015
Rep Bin Wall – Pine Bluff	Pine Bluff		Port	$386,701	December 2015
Bld Loading Station Canopy – Pine Bluff	Pine Bluff		Port	$101,717	April 2017
Pine Bluff – Fertilizer Building Column	Pine Bluff		Port	$254,676	September 2019
Pine Bluff – Fertilizer Canopy Rebuild	Pine Bluff		Port	$115,956	December 2020
Other Projects	Pine Bluff		N/A	$347,820	Mar 2015 – Jan 2021

Source: Stakeholder input.

Table 6.2 Arkansas Navigation Funding – IIJA/FFY 2022

Project Description	Project Location	Project Type	Mode(s) Involved / Impacted	Est. Cost (2022 dollars)	Budget Year
Continuing Construction (Slack Water Harbor)	Russellville Harbor	Construction Work Plan	Port, Waterway	$8,553,000	FFY 2022
Complete Construction	Three Rivers	Construction Work Plan	Port, Waterway	$109,147,000	FFY 2022
Damage repairs to stone structures and dike repairs	Channel Improvement, Dikes (AR, IL, KY, LA, MS, MO & TN)	Mississippi River and Tributaries Work Plan*	Port, Waterway	$64,800,000	FFY 2022
Damage repairs by dredging mason-cessions tow head; and maintain shallow draft dredging	Channel Improvement, Dredging (AR, IL, KY, LA, MS, MO & TN)	Mississippi River and Tributaries Work Plan*	Port, Waterway	$6,265,000	FFY 2022
Damage repair to revetments and revetment scour; and revetment repairs and removal of sunken barges on existing revetments	Channel Improvement, Revetments (AR, IL, KY, LA, MS, MO & TN)	Mississippi River and Tributaries Work Plan*	Port, Waterway	$202,450,000	FFY 2022
Dredging and Surveys	Osceola Harbor	Operation and Maintenance Work Plan*	Port, Waterway	$1,025,000	FFY 2022
Repair H.K. Thatcher Lock and Dam Hinge Crest Gate; and Repair/Replace Felsenthal Lock and Dam Tainter Gate	Ouachita and Black Rivers (AR & LA)*	Operation and Maintenance Work Plan*	Port, Waterway	$3,918,000	FFY 2022
Construct channel training structures near NM 222; paint and rehab tainter gates Ozark dam No. 12; purchase 19 – 60' stoplogs; install stoplog slots in upstream lock walls; and repair stoplog centerpost receives and inspect miter gates at W.D. Mills Lock No. 2, Murry Lock No. 7, Toad Suck Ferry Lock No. 8, and James W. Trimble Lock No. 13	MKARNS (AR Segment)	Operation and Maintenance Work Plan	Port, Waterway	$72,300,000	FFY 2022
Increase channel depth to 12 feet (select sections)	MKARNS	Channel Improvements	Port, Waterway	$92,600,000	FFY 2022
Maintenance and dredging	Helena Harbor	Operations and Maintenance	Port, Waterway	$15,000	FFY 2022
Maintenance and dredging	Osceola Harbor	Operations and Maintenance	Port, Waterway	$15,000	FFY 2022
Commonly performed O&M work plus dredging and LA will share some funds	Ouachita and Black Rivers (AR & LA)	Operations and Maintenance	Port, Waterway	$9,525,000	FFY 2022
Maintenance and dredging	White River	Operations and Maintenance	Port, Waterway	$375,000	FFY 2022
Maintenance and dredging	Yellow Bend Port	Operations and Maintenance	Port, Waterway	$127,000	FFY 2022

*Note: Some funds will be shared with other Mississippi River and tributary states.

Source: U.S. Army Corps of Engineers, Civil Words Budget and Performance. https://www.usace.army.mil/missions/civil-works/budget/

ARKANSAS DEPARTMENT OF TRANSPORTATION

ARKANSAS STATE FREIGHT PLAN

Chapter 9

Strategies, Actions, & Freight Investment Plan

WE MOVE ARKANSAS FREIGHT

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1.0 Introduction

The 2022 Arkansas State Freight Plan (SFP) was developed to meet the growing demand for movement of goods in Arkansas and to promote the Arkansas Department of Transportation's (ARDOT) mission to provide safe and efficient transportation solutions to support Arkansas' economy and enhance quality of life for generations to come. To that end goals and objectives were established to provide a framework for freight system decision-making. To support and advance those goals and objectives, strategies and actions were identified through stakeholder outreach and aligned with other ARDOT plans to ensure consistency and continuity. In addition, a financially-constrained Freight Investment Plan (FIP) was developed consistent with ARDOT's vision for improving the highway freight system, and an unconstrained List of Priority Freight Projects was developed to document major investment needs for all freight modes.

1.1 Report Organization

The remainder of this report is organized as follows:

- **Section 2.0—Strategies and Action** presents the strategies and actions developed for this State Freight Plan.
- **Section 3.0—Freight Investment Plan and Other Priority Freight Projects** discusses the financially-constrained Freight Investment Plan (FIP) and the unconstrained List of Priority Freight Projects.

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2.0 Strategies and Actions

The recommended strategies and actions represent a combination of both mode-specific and cross-cutting implementation steps that support the goals and objectives of this State Freight Plan. The selected strategies and actions were developed through engagement with the Freight Advisory Committee (FAC) and other stakeholders; informed by federal planning requirements; and aligned with other statewide plans to ensure consistency, continuity, and synergy. The following sections describe the selected strategies and actions, nested within the goals areas that each supports.

Within each goal area, this Plan identifies multiple strategies and actions. These strategies and actions were developed and selected to address multimodal freight transportation challenges in Arkansas considering multiple strategic approaches, including:

- *Operations & technology opportunities*. Specific planning, engineering and public works improvements to support improved multimodal freight mobility and safety.
- *Program opportunities*. A collection of programs and initiatives that can be undertaken to achieve policy goals.
- *Policy, outreach & coordination opportunities*. Broad policy recommendations to help change the way Arkansas approaches multimodal freight planning, including expanding communication and interaction with critical stakeholders.
- *Project opportunities*. Specific infrastructure projects that support policy goals and improve multimodal freight movement throughout Arkansas.

The following subsections describe each strategy and the associated actions.

2.1 Safety and Resiliency

Five strategies were identified to support the goal of improving statewide safety by funding projects that reduce fatal and serious injury crashes, reducing vulnerability, and improving resiliency of the system.

- **Continue to implement the railway-highway crossing improvement program.** The primary source of funding for grade crossing improvements in Arkansas is the Federal Railway-Highway Crossings Program (also known as Section 130). The Section 130 program provides funding for protective devices (such as flashing lights and gates) and hazard elimination (such as geometric improvements and crossing closures) at public at-grade crossings. Section 130 projects are identified through a data-driven selection and prioritization process emphasizing crossing hazard. Each year, ARDOT is apportioned approximately $4 million in Section 130 funding, which supports improvements to approximately 10 crossings per year. ARDOT will continue to collaborate with railroad, local, and safety stakeholders to implement grade-crossing safety improvements and other grade-crossing safety enhancement strategies.

- **Implement Commercial Vehicle (truck) safety strategies from the 2022-2026 Strategic Highway Safety Plan (SHSP).**[1] The recently-adopted SHSP identifies as a number of commercial motor vehicle (CMV)-specific strategies and actions. ARDOT is one of several safety partners responsible for the implementation of the SHSP to improve safety on Arkansas' highways. Select CMV strategies from the SHSP include:
  - Reducing the risk of CMV crashes due to driver fatigue.
    - Continue efforts to open/re-open truck parking areas and spaces on public and/or private facilities.
    - Research and review information on available truck parking applications and how they can be widely used in Arkansas.
    - Review truck parking need assessments that have been performed to identify corridors/areas of focus and other opportunities to consider.
    - Increase electronic logging device (ELD) trainings.
  - Encouraging rulemaking that requires new technology to increase safety in large commercial motor vehicles.
    - Support additional research and potential future rulemaking for proven safety technologies (lane departure, collision mitigation system, rear end collisions, etc.).
    - Explore the use of in-vehicle technologies to send work zone safety messages to CMV drivers.
  - Providing education and outreach to the public and industry on how to safety operate in and around commercial motor vehicles.
    - Continue promoting how to safely "Share the Road" program with CMVs.
    - Encourage the inclusion of CMV related topics in driver education such as "driving around a CMV" lessons in student driver manuals.
    - Collaborate with safety partners including the Federal Motor Carrier Safety Administration (FMCSA) to present information to the public and the transportation industry.
    - Continue hosting trucker appreciation events and conduct free educational seminars statewide to motor carriers and their respective drivers.
  - Encouraging occupant protection usage in CMVs.
    - Add CMV focus to "Click It or Ticket" type campaigns.
  - Identifying high crash corridors and developing engineering solutions to reduce CMV crashes.

[1] https://www.ardot.gov/wp-content/uploads/2022/06/ARDOT_SHSP_2022.pdf

      - Identify and report high-crash corridors for CMV crashes each year and provide information to safety partners.
      - Invite trucking industry stakeholders to participate in an annual freight forum to discuss new technologies, policies, and strategies for the CMV Focus Area.
      - Implement appropriate recommended actions from the CMV Safety in the Work Zone Action Plan.
      - Identify and deploy engineering solutions (e.g., interactive truck rollover and curve warning signage) and best practices to improve commercial motor vehicle safety, particularly at work zones, intersections, interchanges, and entry/exit ramps.
   - Increasing CMV enforcement of safety violations.
      - Investigate multi-state/regional Law Enforcement Officer (LEO) partnerships at points-of-entry to assist in CMV enforcement efforts.
      - Conduct driver or vehicle inspections to ensure CMVs are in proper working order and drivers are properly credentialed and fit for duty.
      - Develop multi-agency CMV enforcement task forces throughout the state to enhance CMV safety in work zones and high CMV crash areas.
      - Utilize data-driven approach to strengthen CMV enforcement on high-speed corridors.
      - Conduct on- or off-site Safety Audits with new carriers to ensure they understand safe behaviors on the roadway and the federal and state regulations that motor carriers are required to follow.
      - Continue monitoring traffic enforcement efforts through the E-Citation system to ensure effectiveness, consistency, and correlation to FMCSA's national traffic enforcement priority.
   - Increasing the number of enforcement personnel trained to enforce CMV-specific laws.
      - Offer CMV enforcement training for local law enforcement officers.
      - Allocate resources for additional enforcement officers to conduct special enforcement per districts.
- **Encourage development and expansion of truck parking areas.** Truck parking was identified as a priority need by the FAC and other truck-industry stakeholders. Sufficient truck parking helps support federal hours of service (HOS) requirements, which mandates drivers stop driving at certain points of their workday, and helps mitigate safety aspects of unlawful or undesirable parking, such as parking along highway shoulders or ramps. Private facilities not only help meet demand for truck parking, but also offer amenities for drivers, such as restrooms, showers, vending, and other features. While additional public truck parking facilities may be pursued, the total need for truck parking can only be met through a combination of public and private facilities.

- **Evaluate emergency response protocols to better support the trucking industry.** Truck drivers operate around the clock, year-round to deliver essential goods across the state and nation. They are often expected to operate in inclement weather, including heavy rain and snow. Severe winter weather, including snow, sleet, freezing rain, and ice can be particularly dangerous for drivers of all motor vehicles. During these events, drivers often have to consider their hours of service (HOS) requirements when deciding if and when to stop, even if it may ultimately be safer to continue driving longer to find a safe location out of the storm path. In these instances, the Governor of Arkansas can declare a state of emergency, which relaxes enforcement of HOS for commercial vehicle drivers during emergencies, as was done in February 2022 during a particularly severe weather event.[2]

- **Support initiatives and investments that increase the resiliency of the multimodal freight network.** Disruptions can happen across all freight transportation modes, leading to concerns about safety and reliability of freight shipments and overall mobility. In parts of the state with limited access to one or more freight modes, disruptions can mean that freight stops moving entirely, or is forced to be routed many miles off course, leading to increased shipping times and costs. These types of situations threaten the safe and efficient movement of freight to and from Arkansas' industries and consumers. Initiatives and investments that increase the reliability and resiliency of the multimodal freight network should be pursued to provide Arkansans with reliable access to goods, many of which are critical to quality of life.

2.2 Economic Competitiveness

Eight strategies were identified to support the goal of improving intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.

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

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

[2] https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/2022-02/Arkansas%20Emergency%20Declaration_0.pdf.

- **Support public and private investments in inland ports, transload terminals, and intermodal terminals.** Inland ports, transload terminals, and intermodal terminals are often privately operated facilities that have a significant impact on the safe and efficient movement of multimodal freight. It is in the public interest to support the development of these facilities to maximize the use and availability of multimodal shipping options available in Arkansas.

- **Continue working with the Freight Advisory Committee (FAC) to identify infrastructure improvements that are important to economic competitiveness for Arkansas.** The FAC was established to guide the update of the SFP, and includes key freight and industry stakeholders, many of whom participated in the 2017 SFP development process. The FAC met three times during the development of the 2022 SFP to discuss system goals and priorities and potential freight transportation investments in Arkansas. The relationships established between FAC members are invaluable in state freight planning efforts, and regular meetings of the FAC subsequent to the adoption of this SFP would provide continuity in those planning efforts.

- **Improve communication between modal authorities.** Multimodal freight shipping options and connectivity are two of Arkansas' transportation strengths. To safely and efficiently facilitate multimodal movements, it is important for modal authorities – including ARDOT and other road authorities, port authorities, airports, railroad operators, and other facility operators – to communicate regularly about operational and maintenance needs, issues, and priorities.

- **Promote "Be Pro Be Proud" Initiative in Arkansas to support workforce attraction and retention of skilled labor, particularly in manufacturing and transportation and warehousing sectors.** The "Be Pro Be Proud"[3] initiative is led by the Associated Industries of Arkansas, which is spearheading the movement to bring a new generation of pride, progress, and professionals to Arkansas' skilled workforce. As the current skilled workforce is at or near retirement age, Be Pro Be Proud seeks to change perceptions of these essential jobs, and offers opportunities for job seekers, skilled professionals, employers, and teachers to be involved through training, workshops and more. Highlighted professions include roles in freight-intensive industries such as automation and robotics, machine operators, construction services, commercial truck drivers, heavy equipment operators, and other skilled professions. It is in the public interest to encourage employment in these areas to support industry and economic development opportunities.

- **Coordinate with the Arkansas Economic Development Commission (AEDC), Planning Development Districts (PDD), Economic Development Districts (EDD), Metropolitan Planning Organizations (MPO), and other economic development stakeholders to identify transportation projects or improvements needed to support local and regional economies.** Economic development stakeholders, including AEDC, PDDs, EDDs, and MPOs, are most aware of local needs and opportunities for economic development. Economic development stakeholders are encouraged to continue their engagement with modal authorities and other owners and operators to identify the infrastructure needed to support local and regional economies.

- **Promote the importance of all freight modes to local, state, and national economies.** While the supply chain issues present since the onset of the COVID-19 pandemic have increased awareness of the role of freight in public life, there are still opportunities to educate the public about the importance

[3] https://www.beprobeproudar.org/

of the multimodal freight system to local, state, and national economies. Although Arkansans are generally aware of trucking activities, they may not be as familiar with the freight rail, marine, and air cargo activities that take place statewide, including freight activity at multimodal and intermodal facilities. Promoting the importance of all freight modes, and especially less visible non-highway modes, can help build public support for freight infrastructure projects that increase economic development opportunities and facilitate the efficient movement of freight throughout the state.

2.3 Infrastructure Condition

Three strategies were identified to support the goal of investing in existing infrastructure and supporting technologies to maintain and preserve the existing system.

- **Evaluate, adjust, and enforce posted-speed, routing, weight, size and other restrictions on roads and bridges to balance the competing needs of infrastructure preservation, quality of life, safety, and freight mobility.** ARDOT recognizes both the critical importance of, and industry challenges relating to, truck routing, posted speeds, weight and size limits, and enforcement. Consistent with legal requirements, historic and current design standards, and other technical, environmental, and financial constraints, ARDOT will continue to evaluate, adjust, and enforce highway freight restrictions to balance the competing needs of infrastructure preservation, quality of life, safety, and freight mobility.

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

- **Prioritize maintenance of existing assets over construction of new infrastructure.** Arkansas' multimodal freight system is composed of a complex network of highways, bridges, railroads, intermodal/transload facilities and connectors, air cargo hubs, ports, locks, and dams. Some of these assets are underutilized and approaching the end of their useful lives and are in need of modernization, maintenance, or reconstruction to extend their service and maximize their utility and benefits to freight mobility in Arkansas. As such, and given limited resources for freight investments, it is important for modal authorities – including ARDOT and other road authorities, port authorities, airports, railroad operators, and other facility operators – to prioritize maintaining existing freight infrastructure over construction of new freight infrastructure.

2.4 Congestion Reduction, Mobility, and System Reliability

Seven strategies were identified to support the goal of investing in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.

- **Continue to invest in Transportation Systems Management and Operations (TSMO) including enhanced Intelligent Transportation Systems (ITS) and other driver information systems.** ARDOT's ITS Section manages a variety of transportation technologies, including a transportation management center (TMC), dynamic messaging signs, land mobile radio system, IDrive Arkansas, and others. In addition, ARDOT is developing TSMO Plan to include strategic, programmatic, and tactical elements.

- **Deploy truck parking availability system along Interstates.** Data analysis and stakeholder outreach conducted for this SFP indicated strong support for, and potential benefits of, investing in truck parking notification systems to help truck drivers find and navigate to available truck parking spaces. This investment would benefit drivers, particularly those who are not familiar with Arkansas' truck parking facilities, as well as those who are struggling to find available space during peak hours.

- **Update the statewide travel demand model, including the freight module.** ARDOT has invested in and uses a travel demand model to assist in long range planning efforts. The model provides corridor and system-level traffic forecasts. Recent advancements in and availability of freight commodity flow data, including location-based data on freight, provide an opportunity to improve the freight forecasting ability of future travel demand models.

- **Identify critical freight corridors.** The Fixing America's Surface Transportation (FAST) Act established the National Highway Freight Network (NHFN), which is comprised of Interstate and non-Interstate highway mileage identified as the most critical highway portions of the U.S. freight transportation system. States are also permitted to designate critical rural freight corridors (CRFCs) and critical urban freight corridors (CUFCs) to be included as part of the NHFN. Designation of CUFCs/CRFCs not only establish a conceptual hierarchy of freight highways, but also makes those locations eligible for certain Federal formula and competitive aid programs. With the passage of the Infrastructure Investment and Jobs Act (IIJA), ARDOT may designate up to 600 miles of CRFCs and up to 150 miles of CUFCs. Moving forward, consideration may be given to a combination of systematic and strategic CUFC and CRFC designations in Arkansas.

- **Support dredging of McClellan–Kerr Arkansas River Navigation System (MKARNS) to 12 feet.** The MKARNS is an important marine freight corridor that originates at the Tulsa Port of Catoosa and runs southeast through Oklahoma and Arkansas to the Mississippi River. Consistent, annual dredging and adequate water depth is necessary to support reliable operations at the inland ports. Beyond maintenance dredging, many would like to see the MKARNS deepened to 12 feet, or three feet deeper than the nine feet currently maintained at some locations. The additional depth would have a significant impact on the ability to increase use of the inland ports.

- **Coordinate with Class I/III railroads to identify opportunities for enhanced rail access and service.** The freight rail network in Arkansas is privately owned and operated by a variety of Class I and Class III (shortline) carriers. Many freight stakeholders expressed strong support for expanded rail access and service to businesses throughout the state to facilitate and increase multimodal freight activity. Shippers, economic development authorities, and other stakeholders should continue to coordinate with Class I and shortline rail carriers to identify opportunities for enhanced rail access and service, and assist, as appropriate, in moving those projects forward.

- **Integrate multimodal freight with regional planning activities.** ARDOT conducts statewide freight planning activities and produces a State Freight Plan on regular cycle. However, there are numerous regional planning authorities (including MPOs and PDD/EDDs) that contribute to the totality of transportation planning activities in Arkansas. Regional planning authorities are encouraged to begin, continue, or enhance their freight planning activities where feasible.

2.5 Environmental Sustainability

Four strategies were identified to support the goal of enhancing the performance of the transportation system while avoiding, minimizing, and/or mitigating impacts to natural and cultural resources.

- **Consider local air pollution impacts when developing alternatives for system improvements and selecting operations/maintenance strategies.** Air pollution emitted from transportation contributes to poor air quality conditions, which has negative impacts on the health and welfare of residents. Pollutants that contribute to poor air quality include particulate matter (PM), nitrogen oxides (NO_X), and volatile organic compounds (VOCs). Some modes of freight transportation can lead to more air pollution relative to other modes, and facility/vehicle design and access can also have an impact. Local air pollution impacts should be considered when developing alternatives for freight transportation system improvements, selecting operations and maintenance strategies, and for other planning and policy-development purposes.

- **Consider flooding and stormwater impacts when developing alternatives for system improvements and selecting operations/maintenance strategies.** Extreme weather and other natural disasters, such as flooding, can have a significant impact on freight mobility across all modes. The flooding event of 2019 had a profound impact on the use of Arkansas' inland waterway system, as well as other surface transportation assets that were submerged and/or damaged. The resulting flood-related damage required emergency maintenance and repairs to critical components of the system. While it is not always possible to prevent flooding during these types of extreme weather events, it is important to consider potential impacts when constructing or upgrading transportation assets to mitigate these effects as much as possible.

  It is also important to consider the impacts of freight infrastructure on flooding and stormwater runoff. Construction of surface transportation infrastructure typically results in an increase in impermeable surface and consequently an increase in stormwater runoff. In addition, highway and railway infrastructure in particular can stretch for many miles and cross numerous waterways and watersheds, and the runoff from these facilities can include pollutants from freight vehicles, which can have adverse impacts on the human and natural environments.

  As such, the impacts of extreme weather on freight mobility, and conversely the impacts of the freight system on flooding and stormwater runoff, should be considered when developing alternatives for freight transportation system improvements, selecting operations and maintenance strategies, and for other planning and policy-development purposes.

- **Consider impacts to wildlife habitat when developing alternatives for system improvements and selecting operations/maintenance strategies.** Forestland covers 56 percent of the state of Arkansas, or more than 19 million acres containing 11.9 billion trees.[4] In addition, Arkansas has one of the largest inventories of navigable waterways in the nation with more than 1,000 miles along five rivers,

[4] https://www.agriculture.arkansas.gov/wp-content/uploads/2020/05/2017_Forest_Facts_of_Arkansas.pdf.

as well as an estimated 2.8 million acres of wetlands. These forests, waterways, and wetlands are home to critical wildlife habitats that contribute to a healthy and functioning ecosystem.

Construction projects, including transportation infrastructure, can have an impact on the surrounding environment and wildlife. The environmental review under the National Environmental Policy Act (NEPA) process is intended to evaluate whether a construction project will have significant environmental impacts, including direct effects, indirect effects and cumulative impacts, which would include establishing that a loss in wetland area could result in loss of floodwater storage, water quality, and wildlife habitat.[5] The impacts of freight on wildlife habitats (including habitat loss) should be considered when developing alternatives for freight transportation system improvements, selecting operations and maintenance strategies, and for other planning and policy-development purposes.

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

[5] https://ceq.doe.gov/docs/ceq-publications/ccenepa/sec4.pdf

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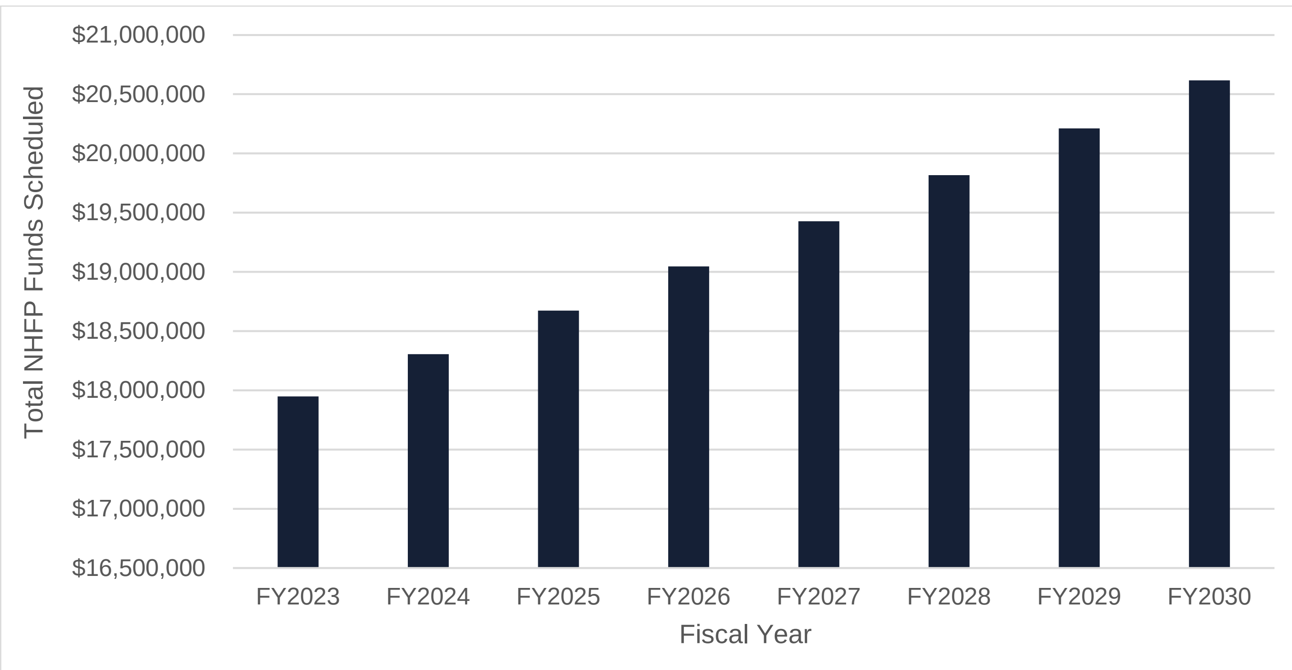
3.0 Freight Investment Plan and other Priority Freight Projects

Appendix A documents ARDOT's financially-constrained Freight Investment Plan (FIP). The FIP reflects anticipated National Highway Freight Program (NHFP) funding levels for the next eight Federal Fiscal Years (FFYs) and highway freight improvement projects that are currently programmed to utilize NHFP funding. For FFYs 2023 to 2026, the FIP includes projects that are programed with NHFP funding in the FFY 2023-2026 Statewide Transportation Improvement Program (STIP). Consistent with the practice of the Arkansas Highway Commission and ARDOT, NHFP investment priorities have not been established beyond the final year of the current STIP. NHFP investment priorities for FFYs 2027 through 2030 will be determined in future STIP cycles. NHFP funding anticipated to be available for FFY 2023 through FFY 2030 is shown in Figure 3.1.

In addition to the generalized projects and needs identified in other chapters, Appendix B documents other unfunded or partially funded needs across all modes of the multimodal freight system. Collectively, the projects reported in Appendix B constitute an Unconstrained List of Priority Freight Projects.

Figure 3.1 Anticipated National Highway Freight Program Funding, FFY 2023 – 2030



Source: ARDOT.

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Appendix A. Freight Investment Plan

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Table 1 Financially-Constrained Freight Investment Plan – FFY 2023 – 2030

FFY 2023[1]

STIP Job No.	STIP Job Name	County	Route	Type Work	NHFP	Other Federal	State/ Local Match	Total Cost
	Estimated NHFP Apportionment for FFY 2023				$17,948,000			
CA0602	I-530—Hwy. 67 (Widening & Reconst.) (I-30 & I-40) (F)	Pulaski	I-30 & I-40	Capacity Improvements & Reconstruction	$17,348,000	$92,652,000	AC Conversion	$110,000,000
XX2023-10	PE/Right-of-Way/Utilities/CENG	Statewide	Various	Project Development	$600,000	$15,400,000	$4,000,000	$20,000,000
	Total NHFP Funds Scheduled for FFY 2023				$17,948,000			
	Under/Over Programmed for FFY 2023				$–			

FFY 2024[1]

STIP Job No.	STIP Job Name	County	Route	Type Work	NHFP	Other Federal	State/ Local Match	Total Cost
	Estimated NHFP Apportionment for FFY 2024				$18,307,000			
CA0602	I-530—Hwy. 67 (Widening & Reconst.) (I-30 & I-40) (F)	Pulaski	I-30 & I-40	Capacity Improvements & Reconstruction	$17,730,000	$83,270,000	AC Conversion	$101,000,000
XX2024-10	PE/Right-of-Way/Utilities/CENG	Statewide	Various	Project Development	$577,000	$15,423,000	$4,000,000	$20,000,000
	Total NHFP Funds Scheduled for FFY 2024				$18,307,000			
	Under/Over Programmed for FFY 2024				$–			

FFY 2025[1]

STIP Job No.	STIP Job Name	County	Route	Type Work	NHFP	Other Federal	State/ Local Match	Total Cost
	Estimated NHFP Apportionment for FFY 2025				$18,673,000			
040901[2]	Hwy. 22—Gun Club Road (S)	Crawford & Sebastian	I-49	New Location	$16,813,000	$188,707,000	$51,380,000	$256,900,000
040889	I-540/Hwy. 255 Intchng. Impvts. (Zero St.) (Fort Smith) (S)	Sebastian	I-540 & 255	Interchange Improvements	$1,260,000	$-	$140,000	$1,400,000
XX2025-10	PE/Right-of-Way/Utilities/CENG	Statewide	Various	Project Development	$600,000	$15,400,000	$4,000,000	$20,000,000
	Total NHFP Funds Scheduled for FFY 2025				$18,673,000			
	Under/Over Programmed for FFY 2025				$–			

FFY 2026[1]								
STIP Job No.	STIP Job Name	County	Route	Type Work	NHFP	Other Federal	State/ Local Match	Total Cost
Estimated NHFP Apportionment for FFY 2026					$19,047,000			
06X507	I-30—Hwy. 67 (30-Xing Phase 2) (S)	Pulaski	I-30 & I-40	Interchange Improvements	$18,447,000	$41,553,000	$15,000,000	$75,000,000
XX2026-10	PE/Right-of-Way/Utilities/CENG	Statewide	Various	Project Development	$600,000	$15,400,000	$4,000,000	$20,000,000
Total NHFP Funds Scheduled for FFY 2026					$19,047,000			
Under/Over Programmed for FFY 2026					$–			

FFY 2027[3]								
STIP Job No.	STIP Job Name	County	Route	Type Work	NHFP	Other Federal	State/ Local Match	Total Cost
Estimated NHFP Apportionment for FFY 2027					$19,428,000			
FFY 2027 freight investment plan to be developed in conjunction with the FFY 2025–2028 Statewide Transportation Improvement Program.								
Remaining for FFY 2027					$19,428,000			
Under/Over Programmed for FFY 2027					$–			

FFY 2028[3]								
STIP Job No.	STIP Job Name	County	Route	Type Work	NHFP	Other Federal	State/ Local Match	Total Cost
Estimated NHFP Apportionment for FFY 2028					$19,817,000			
FFY 2028 freight investment plan to be developed in conjunction with the FFY 2025–2028 Statewide Transportation Improvement Program.								
Remaining for FFY 2028					$19,817,000			

FFY 2029[3]								
STIP Job No.	STIP Job Name	County	Route	Type Work	NHFP	Other Federal	State/ Local Match	Total Cost
Estimated NHFP Apportionment for FFY 2029					$20,213,000			
FFY 2029 freight investment plan to be developed in conjunction with the FFY 2027–2030 Statewide Transportation Improvement Program.								
Remaining for FFY 2029					$20,213,000			

FFY 2030[3]								
STIP Job No.	STIP Job Name	County	Route	Type Work	NHFP	Other Federal	State/ Local Match	Total Cost
Estimated NHFP Apportionment for FFY 2030					$20,617,000			
FFY 2030 freight investment plan to be developed in conjunction with the FFY 2027–2030 Statewide Transportation Improvement Program.								
Remaining for FFY 2030					$20,617,000			

[1] Scheduled NHFP investments as reflected in the FFY 2023–2026 Statewide Transportation Improvement Program (STIP). Amounts for NHFP, Other Federal, State/Local Match, and Total Cost subject to change. Obligation year subject to change.

[2] Other Federal amount for Job 040901 includes $98,900,000 to be authorized as Advance Construction (AC).

[3] Consistent with the practice of the Arkansas Highway Commission and Arkansas Department of Transportation, NHFP investment priorities have not been established beyond the final year of the current STIP. NHFP investment priorities for 2027 through 2030 to be determined in future STIP cycles.

Appendix B. Unconstrained List of Priority Freight Projects

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Table 1 Proposed Highway Freight Projects

Project Description	Project Location	Project Purpose	Mode(s) Involved/ Impacted
Add capacity to US Hwy. 412	Northwest Arkansas	Truck-intensive network, supports local economic activity (not through truck trips), high level of peak hour congestion, high truck volumes on state highway	Highway
Improved connections	Union County	One of the most truck-intensive portions of the State, far from Interstate network; Over 2,000 trucks per day, high forecast growth on US Hwy. 167	Highway
Add capacity or improve operations on I-40	Between North Little Rock and West Memphis	Highest truck volume corridor in Arkansas, connects State to Memphis regional freight hub, high number of crashes, high growth corridor, relatively high shipment values per truck	Highway
Continue expansion of Little Rock Interstate system	Little Rock	Worst truck congestion in Arkansas and forecast to get worst, high truck volumes on most interstates, Pulaski County has highest total number of truck trips and truck tonnage generated	Highway
Improve pavement quality for access roads	Various	Improve ride quality and reduce truck maintenance costs	Highway
Safety improvements on I-40	Oklahoma to Tennessee	Reduce crashes	Highway
Access road and rail access to ports (including the Yellow Bend Port Industrial Corridor)	Statewide (Desha County)	Improve access of trucks to get to port gates	Highway, Rail, Port
Real-time truck parking information	Interstates and other Freeways	Improve utilization of available truck parking spaces, highway safety, and compliance with hour of service requirements	Highway
Improve interchanges on I-30 and I-55	Various	Safety	Highway
Additional rest areas	Statewide	Safety	Highway
Identify select sites for economic development and improve landside connections	Statewide	Economic development	Highway
Complete I-49 from Fort Smith to Texarkana	West Arkansas	Economic development, freight mobility	Highway
Maintenance or replacement of load-posted county roads and bridges	Statewide	Ability to handle heavy agricultural industry loads	Highway
Traffic management during I-40 rehabilitation	West Memphis	Maintain access to Memphis freight hub	Highway
More intermodal yards for wood chips and timber	Central, South, and West Arkansas	Economic development	Highway, Rail, Port
Improve farm access roads, notably US 63 and Marked Tree Rd	Statewide	Economic development	Highway
Raise two low clearance bridges	Hwy. 161	Safety, mobility	Highway
Improve east-west access	North Arkansas	Reduce traffic on interstates through Little Rock	Highway

Project Description	Project Location	Project Purpose	Mode(s) Involved/ Impacted
Complete construction of US Hwy. 67 (Future I-57)	Northeast Arkansas between Walnut Ridge and Poplar Bluff	Improve connection from Little Rock to St. Louis	Highway
Complete construction of I-69	Statewide	Freight mobility, economic development	Highway
Reroute trucks from downtown Ft. Smith	Fort Smith	Safety of drivers and pedestrians	Highway
Pavement improvements on A Street, B Street, and Wheeler Road	Fort Smith	Reduce vehicle wear and tear, improve driver comfort	Highway
Improvements to Hwy. 59	Van Buren	Safety and mobility improvements relating to steep grade	Highway
Improve state highways due to lack of interstates, including US Hwy. 70, US Hwy. 270, Hwy. 7, Hwy. 7 Spur, US Hwy. 70/270 Bypass	Garland County	Improve mobility	Highway
Add capacity to Hwy. 49 (Red Wolf Blvd)	Jonesboro	Reduce congestion	Highway
Improve trucking operations on Hwy. 18 spur and Commerce Drive	Jonesboro	Truck mobility	Highway
Add capacity to I-49, US Hwy. 412, Hwy. 71B, Hwy. 59 and Hwy. 112	Northwest Arkansas	Improve congestion during peak commute periods	Highway
Improved ITS for traveler information	Statewide	Improve truck and auto operations	Highway
Extend Southland Drive to 7th Street	West Memphis	Connectivity of local freight facilities	Highway
Complete 4-lane US 65 from Little Rock to Harrison	Northwest Arkansas	High truck volumes on 2-lane road	Highway
Improve Hwy. 59 in Siloam Springs	Northwest Arkansas	Improve highway freight mobility	Highway
Improve US Hwy. 412 through Springdale	Northwest Arkansas	Improve highway freight mobility	Highway
Improve E. 19th Street in Texarkana	Southwest Arkansas	Improve highway freight mobility	Highway
Improve Hwy. 63 and 79 connecting Stuttgart to I-40 and Pine Bluff	Central Arkansas	Improve highway freight mobility	Highway
Improve Interchange ramps on US Hwy. 67 and Loop 245	Texarkana	Increase reliability	Highway
Construct Alternate Arkansas River crossings	Fort Smith	Connectivity	Highway
Replace rail bridge structures with inadequate vertical clearance	Central Arkansas	Freight mobility	Highway
Truck parking on primary and secondary roads with amenities	Statewide	Insufficient parking	Highway
Improve Connectivity to Big River Steel and I-55	Osceola	Increase capacity, reliability and Economic Development	Highway
Complete 4 lanes of I-530	I-530 in Pine Bluff to US Hwy. 278 in Drew County	Improve highway freight mobility	Highway

Project Description	Project Location	Project Purpose	Mode(s) Involved/ Impacted
Complete 4 lanes of U.S. Hwy. 425	U.S. Hwy. 425 from Monticello south to Hamburg	Improve highway freight mobility	Highway
Great River Bridge/I-69	Desha County to Drew County	Improve highway freight mobility. The location of this bridge is outside the active New Madrid area, giving assurance that seismic activity will not sever the freight corridor between east and west U.S. This bridge will connect programmed new road location for the Future I-69 corridor and will relieve traffic congestion on I-40.	Highway
Construct I-30 truck parking facility	Rockport (Exit 99/Hwy. 270)	Enhance roadway and driver safety by increasing availability of safe, accessible commercial truck parking. Reduce unauthorized parking, increase hours-of-service compliance and driver efficiency. Estimated cost of $25M (2022 dollars) for 50 spaces, though cost would vary by potential layout).	Highway
Bypass at Brinkley, Arkansas	I-40 to US Hwy. 49	Improve highway freight mobility	Highway
Widen US Hwy. 49 from Brinkley to Marvell	US Hwy. 49	Improve highway freight mobility	Highway
Maintenance on Hwy. 20 Pavement and Bridges	Hwy. 20 from US Hwy. 49 to Elaine	Improve highway freight mobility	Highway
Hwy. 20 to Hwy. 44 Connection Project	Hwy. 20 South of Hwy. 20 Spur to Hwy. 44	Improve highway freight mobility	Highway
Highway 20 Shoulder Safety Project	Hwy. 20 from US Hwy. 49 to Hwy. 20 Spur	Improve highway freight mobility	Highway
US Hwy. 64 UPRR grade separation	Fair Oaks	Improve highway freight mobility and safety	Highway/Rail
Construct passing lanes and shoulders on rural freight routes	Various	Improve highway freight mobility and safety	Highway
Construct new Saline River Bridge	Haskell	Redundancy and resiliency of highway freight	Highway
Study new Mississippi River Bridge	West Memphis	Redundancy and resiliency of highway freight	Highway

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Table 2 Proposed Freight Rail Projects

Project Description	Location	Project Purpose	Est. Cost (1000s)/ Funding	Carrier(s)/Class
Partner on a study examining potential closures/improvements/road redesigns for grade crossings along the Thayer South Subdivision between Ravenden and Marion. A proposal to get Federal grant funding could then be developed as has been done in other states.	Includes Ravenden, Imboden, Black Rock, Hoxie, Sedgwick, Bono, Jonesboro, Truman, Marked Tree, Turrell, Clarkedale, and Marion	Grade Crossing	$400–$500 for initial study	BNSF, Class I
Upgrade signalized crossings with OBS equipment to latest signal circuitry across the entire statewide network as needed.	Entire BNSF Network	Infrastructure Upgrade	$75–$150 per crossing	BNSF, Class I
Upgrade signalized crossings with LED lights across the entire statewide network as needed.	Entire BNSF Network	Infrastructure Upgrade	$75–$150 per crossing	BNSF, Class I
Improve road infrastructure to/from major BNSF served sites across the entire statewide network as needed.	Entire BNSF Network	Access Existing or New Customers		BNSF, Class I
Identify greenfield sites for dual BNSF/Union Pacific access.	Multiple sites	Access Existing or New Customers		BNSF, Class I
Extend Sedgwick siding to reduce congestion along the Thayer South Subdivision	Sedgwick	Infrastructure Upgrade		BNSF, Class I
Upgrade of 2 bridges along the Cypress Bend Branch	McGehee	Infrastructure Upgrade	$1,000	AKMD, Class III
Improve drainage in McGehee Yard.	McGehee	Improve Civil Works	$100	AKMD, Class III
Rail improvements (3,229 tons) along the Helena Branch	Helena	Infrastructure Upgrade	$2,400	AKMD, Class III
Upgrade of 7 bridges along the Hot Springs Branch	Multiple sites	Infrastructure Upgrade	$5,000	AKMD, Class III
Construction/upgrade of 8 turnouts along the Jacksonville Branch	Jacksonville	Access Existing or New Customers	$560	AKMD, Class III
Rail improvements (345 tons).	Multiple sites	Infrastructure Upgrade	$350	LRWN, Class III
Upgrade of 2 bridges.	Multiple sites	Infrastructure Upgrade	$500	LRWN, Class III
Rail improvements (848 tons).	Prescott	Infrastructure Upgrade	$635	PNW, Class III
Construction/upgrade of 14 turnouts.	Prescott	Infrastructure Upgrade	$980	PNW, Class III
Upgrade of ALM segments to 286K capacity.	Crossett	Infrastructure Upgrade		ALM, Class III
Transload Facility and Levee Relocation	Little Rock	Infrastructure Upgrade	$4,700–$9,000 (varies based on scope of improvements for transload facility) plus $1.5M for levee relocation	LRPA, Class III

Project Description	Location	Project Purpose	Est. Cost (1000s)/ Funding	Carrier(s)/Class
Fourche Dam Pike Trestle – Construction of a second bridge as alternative route. Since the existing bridge is the only rail access into and out of the Port of Little Rock, unforeseen infrastructure issues would halt port operations for up to 12-15 months.	Little Rock	Infrastructure Upgrade	$3,100	LRPA, Class III
Western Rail Loop – Construction of a new rail line and rail yard to access the Port of Little Rock by land, via the Union Pacific Main Line.	Little Rock	Infrastructure Upgrade	$25,000	LRPA, Class III
Transload facility improvements and upgrades.	Fort Smith	Infrastructure Upgrade	$2,000	FSR, Class III
Rail replacements across FSR network.	Fort Smith	Accelerated Maintenance	$16,000	FSR, Class III
Crosstie replacements across FSR network.	Fort Smith	Accelerated Maintenance	$2,500	FSR, Class III
Switch crossties replacement across FSR network.	Fort Smith	Accelerated Maintenance	$250	FSR, Class III
Ballast renewal across FSR network.	Fort Smith	Accelerated Maintenance	$500	FSR, Class III
Surfacing renewal across FSR network.	Fort Smith	Accelerated Maintenance	$650	FSR, Class III
Marshaling yard improvements and upgrades.	Fort Smith	Infrastructure Upgrade	$2,000	FSR, Class III
Lift equipment upgrade.	Fort Smith	Infrastructure Upgrade	$250	FSR, Class III
Extend rail infrastructure 3.5 miles to serve industries within Chaffee Crossing and upgrade current infrastructure.	Fort Smith, Fort Chaffee	Infrastructure Upgrade	$6,000	FSR, Class III
Bridge upgrades across FSR network.	Fort Smith	Infrastructure Upgrade	$1,000	FSR, Class III
New capacity and upgrades across FSR network.	Fort Smith	Infrastructure Upgrade	$5,000	FSR, Class III
Development of 2,400 acres area adjacent to terminal for rail served industrial use.	West Memphis	Infrastructure Upgrade	TBD	WMBR, Class III
New Y-track to access Union Pacific Mainline from Friday—Graham Rail Spur	West Memphis	Infrastructure Upgrade	TBD	WMBR, Class III
Van Buren Yard Slots—Construct Slot at Van Buren	Van Buren	Infrastructure Upgrade	$15,000	UP, Class I
White Bluff Sub Connection to Pine Bluff Sub—Construct connection from White Bluff Sub to Pine Bluff Sub.	Redfield	Infrastructure Upgrade	$8,000	UP, Class I
Van Buren Sub Sidings—Construct 4-6 sidings between Little Rock and Van Buren on the Van Buren Sub.	Van Buren	Infrastructure Upgrade	$50,000	UP, Class I
McGehee Sub Sidings—Construct 4-6 sidings south of Pine Bluff on the McGehee sub.	McGehee	Infrastructure Upgrade	$50,000	UP, Class I
White Bluff Sub Sidings and Double Track Construct 2-3 sidings between Little Rock and Pine Bluff, double track extensions extending 3-5 miles out of terminals of Little Rock and Pine Bluff.	Pine Bluff, Little Rock	Infrastructure Upgrade	$70,000	UP, Class I

Project Description	Location	Project Purpose	Est. Cost (1000s)/ Funding	Carrier(s)/Class
3rd Main Track at North Little Rock. Construct additional mainline at North Little Rock yard to facility fueling, inspection, crew change activities.	North Little Rock	Infrastructure Upgrade	$17,000	UP, Class I
Double Track Little Rock to Marche.	Little Rock, North Little Rock, Marche	Infrastructure Upgrade	$45,000	UP, Class I
Double Track Marion to Presley Jct. Construct approximately six miles of 2nd main track between Marion and Presley Jct.	Marion, West Memphis	Infrastructure Upgrade	$30,000	UP, Class I
Little Rock Area Transload facility—Develop new transload capability in the Little Rock/Central AR area.	Little Rock	Infrastructure Upgrade	$20,000	UP, Class I
Brinkley Connection—Enhance connection at Brinkley.	Brinkley	Infrastructure Upgrade	$5,000	UP, Class I
Little Rock & Hoxie Subs Double Track—Construct 150—200 miles of double track between Arkansas/ Missouri State Line and Texarkana.	Multiple sites	Infrastructure Upgrade	$750,000	UP, Class I
Centralized Traffic Control (CTC) Van Buren Sub—Install CTC signal system between Van Buren and North Little Rock.	Multiple sites	Infrastructure Upgrade	$35,000	UP, Class I
Power McGehee Sub Sidings—Power all sidings on McGehee sub	McGehee	Infrastructure Upgrade	$10,000	UP, Class I
Expansion of Marion—Construct additional ramp capability (tracks, parking) to support intermodal growth	Marion	Infrastructure Upgrade	$40,000	UP, Class I

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Table 3 Proposed Port and Waterway Projects

Project Description	Project Location	Project Purpose	Mode(s) Involved / Impacted
Improvements to physical security measures	Helena Harbor	Security	Port
Build infrastructure that will enable businesses to take advantage of road/rail/river transportation assets	Helena Harbor	Capacity; estimated cost of $600,000 (2022 dollars)	Road, Port, Rail
Container on Barge Warehouse	Helena Harbor	Capacity; estimated cost of $10M (2022 dollars)	Port, Rail
Improve rail siding capacity	Helena Harbor	Infrastructure Improvement; estimated cost of $7M (2022 dollars)	Rail, Port
Improve barge mooring capacity	Helena Harbor	Capacity; estimated cost of $2M (2022 dollars)	Port
Transload Facility Levee Relocation	Little Rock	Capacity; estimated cost in the range of $4.7M to $9M depending on scope of transload facility plus $1.5M for levee relocation (all in 2022 dollars)	Port
Repair/Enlarge Original Dock. Rehabilitation of original dock, and expansion of 200 feet to build a new rail-accessible bulkhead, and an additional gantry crane.	Little Rock	Maintenance; Est. $25M for dock improvements plus $3M for office/warehouse relocation (all in 2022 dollars)	Port
South Slackwater Harbor Improvements (short term) – Add fill (retained by sheet piles) south of Fred L Brown Industrial Harbor to raise elevation by 11 feet (to the 247’ 100-year flood level). Would enable existing leaseholder to more effectively and safely haul armor stone.	Little Rock	Efficiency and safety; estimated cost of $3.0M (2022 dollars)	Port
Facility repairs and improvements	Pine Bluff	Maintenance, Capacity; estimated cost of $24M (2022 dollars)	Port
Eight miles of rail from Halley to port	Yellow Bend	Rail – Access	Rail
Crane Covering	Yellow Bend	Equipment	Port
Extending Crane	Yellow Bend	Equipment	Port
Sheet Piling Berth	Yellow Bend	Capacity	Port
Dolphins	Yellow Bend	Waterside – Capacity	Port
Hard Surface Covering	Yellow Bend	Roadway/Laydown maintenance	Highway, Port

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Appendix C. Freight Advisory Committee Meeting Materials

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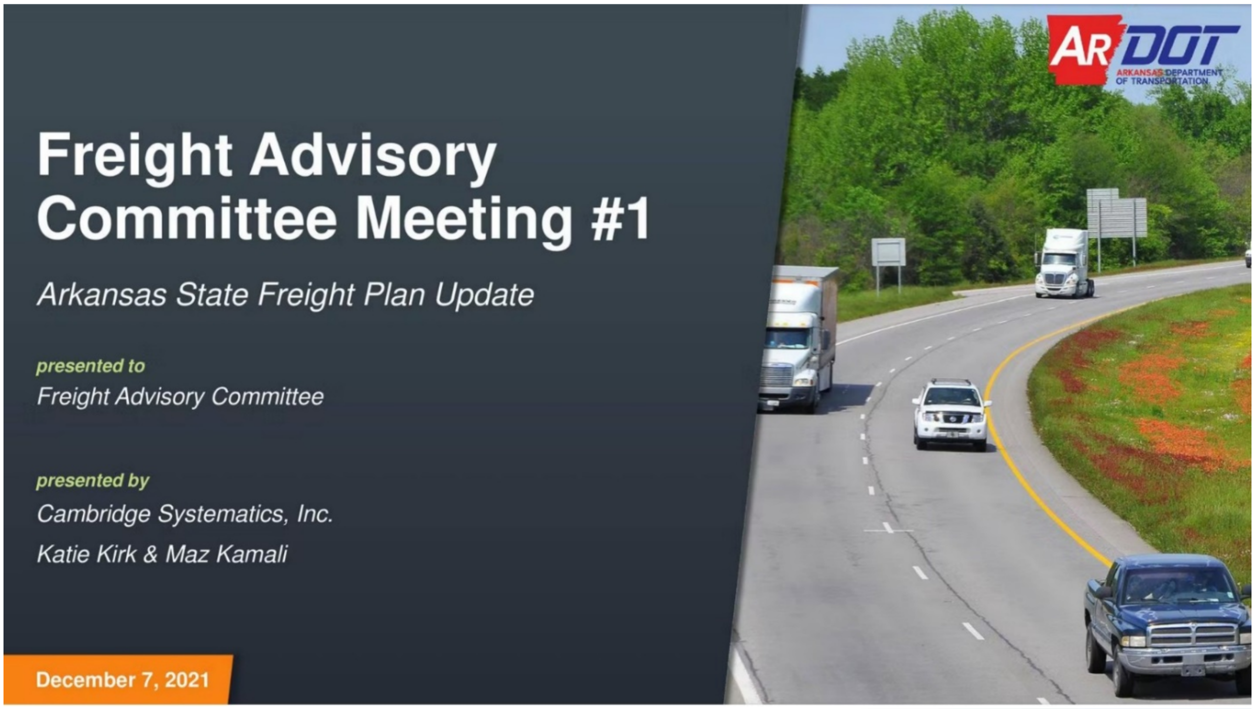
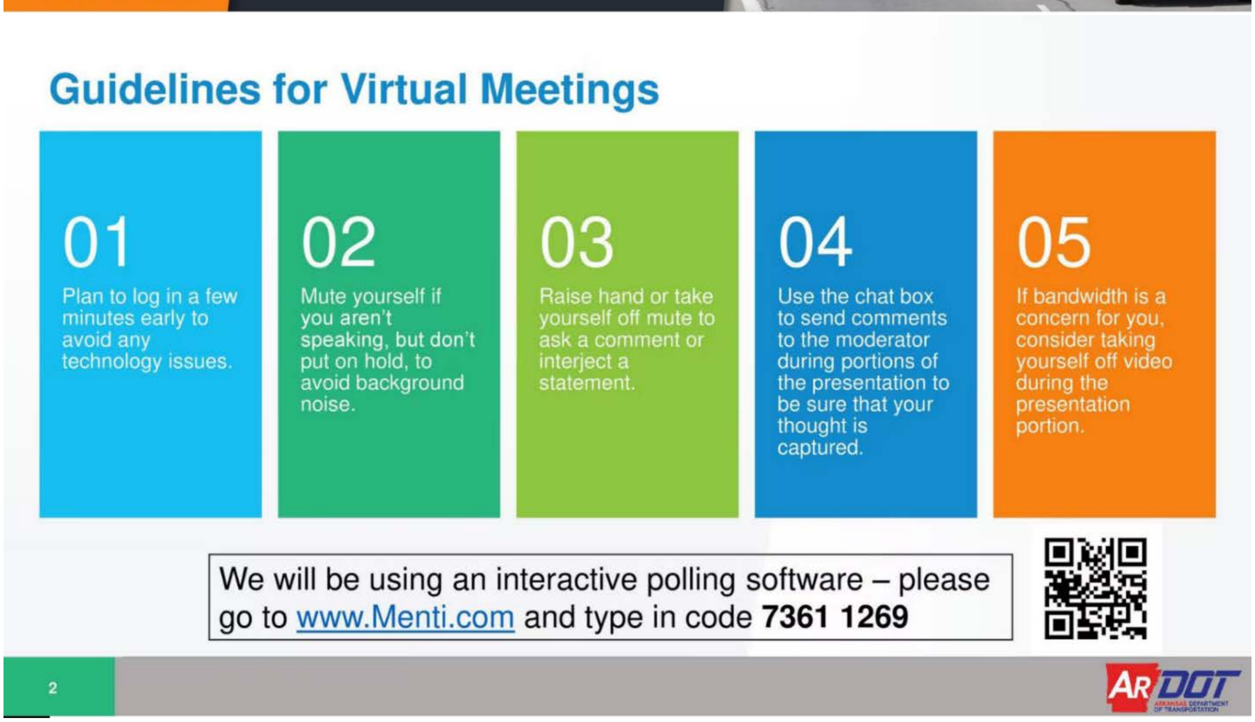
C.1 Freight Advisory Committee Meeting #1 – Virtual, December 2021





Agenda

- Introductions
- Overview of Freight Advisory Committee
- Overview of State Freight Plan
- State Freight Plan Goals
- Initial Findings from Existing & Future Conditions Assessment
- Next Steps

3

Team Introductions

Travis Brooks, P.E.
ARDOT Project Manager

Katie Kirk, AICP
Project Manager

Paula Dowell, PhD.
Principal in Charge

Josilyn Mitchell
ARDOT Deputy Project Manager

Maz Kamali
Deputy Project Manager

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Overview of the Freight Advisory Committee

Who?

- Advisors, stakeholders and subject matter experts

Why?

- Confirm goals and objectives
- Offer insight on local and regional freight and rail related issues, trends and needs
- Inform recommendations, solutions and strategies
- Provide input on processes and decisions on potential freight projects & investments
- Define and communicate the importance of freight activity at the regional, State, and national levels

When?

- Up to 4 meetings over next 10-12 months

6

Motivation for the SFP

Federal requirement to use National Freight Program Funds (IIJA/FAST)

Increase competitiveness for Federal discretionary grant programs

How does transportation maintain/grow/support our economy?

How do we leverage our assets for economic growth & quality of life?

How do we make the business case for freight investment?

How do we plan for and manage supply chain disruptions?

What is going to happen in the future and how do we plan for it?

What can I influence?

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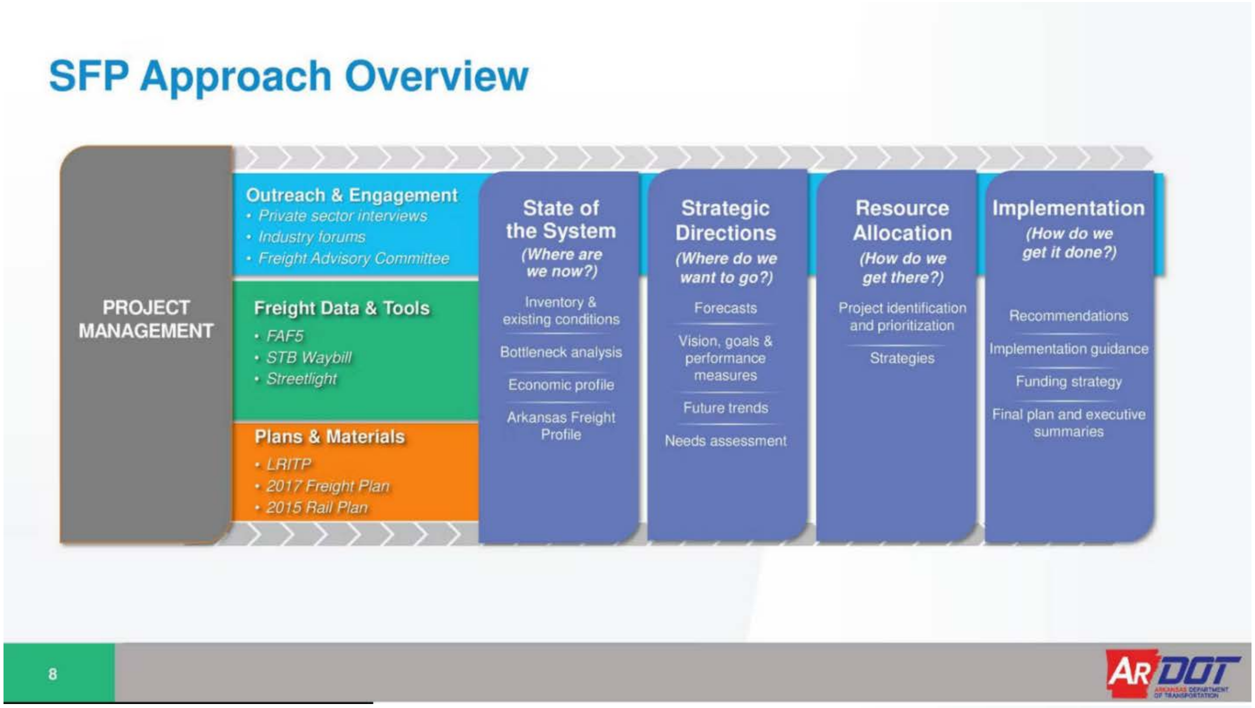
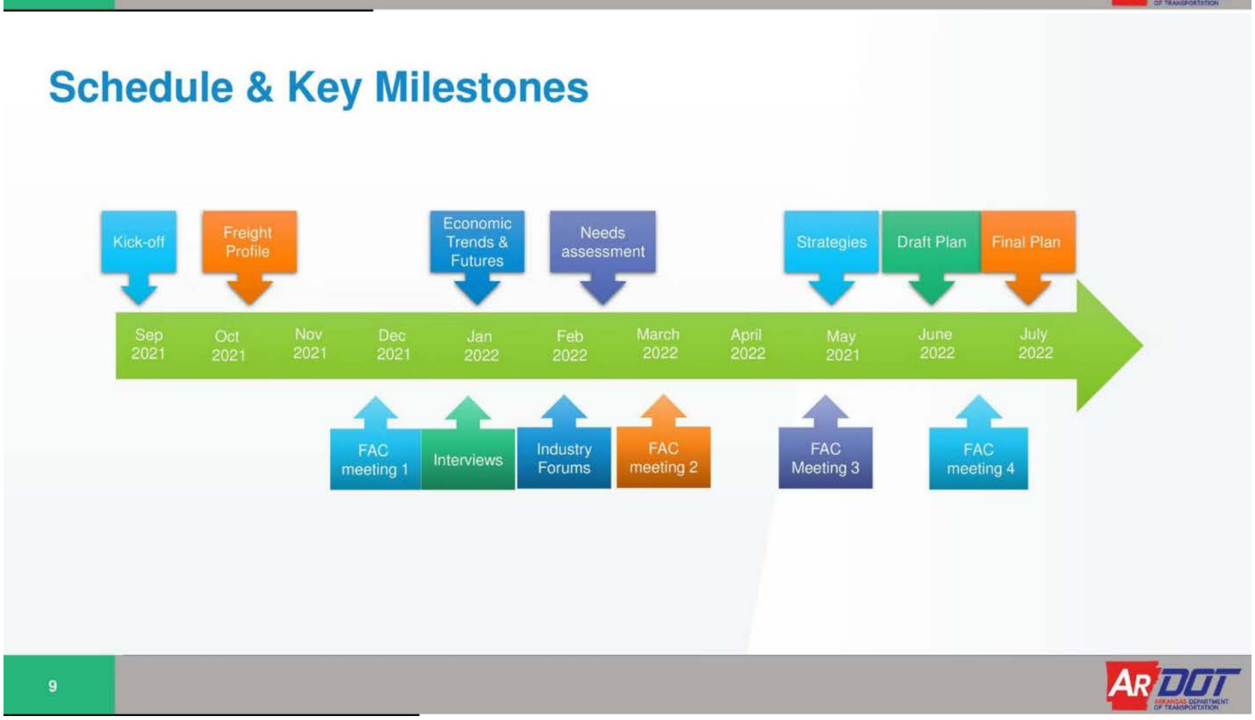

SFP Approach Overview
PROJECT MANAGEMENT
Outreach & Engagement
• Private sector interviews
• Industry forums
• Freight Advisory Committee
Freight Data & Tools
• FAF5
• STB Waybill
• Streetlight
Plans & Materials
• LRITP
• 2017 Freight Plan
• 2015 Rail Plan
State of the System
(Where are we now?)
Inventory & existing conditions
Bottleneck analysis
Economic profile
Arkansas Freight Profile
Strategic Directions
(Where do we want to go?)
Forecasts
Vision, goals & performance measures
Future trends
Needs assessment
Resource Allocation
(How do we get there?)
Project identification and prioritization
Strategies
Implementation
(How do we get it done?)
Recommendations
Implementation guidance
Funding strategy
Final plan and executive summaries
8
ARDOT


Schedule & Key Milestones
Kick-off
Freight Profile
Economic Trends & Futures
Needs assessment
Strategies
Draft Plan
Final Plan
Sep 2021
Oct 2021
Nov 2021
Dec 2021
Jan 2022
Feb 2022
March 2022
April 2022
May 2021
June 2022
July 2022
FAC meeting 1
Interviews
Industry Forums
FAC meeting 2
FAC Meeting 3
FAC meeting 4
9
ARDOT

SFP Goals

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Current SFP Goals

Safety & Security

Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system.

Economic Competitiveness

Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.

Infrastructure Condition

Invest in existing infrastructure to maintain and preserve the existing system.

Congestion, Reduction, Mobility, and System Reliability

Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.

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Existing Conditions

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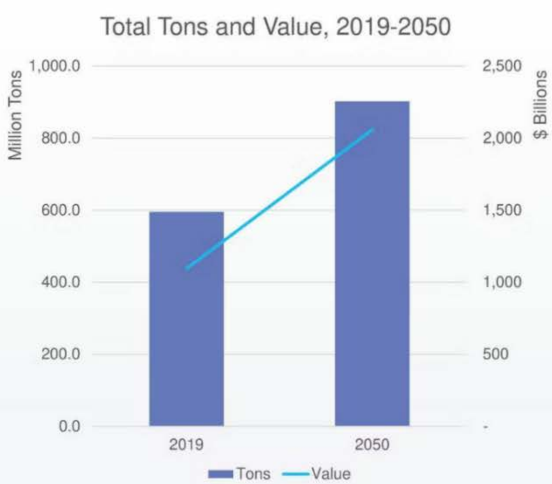
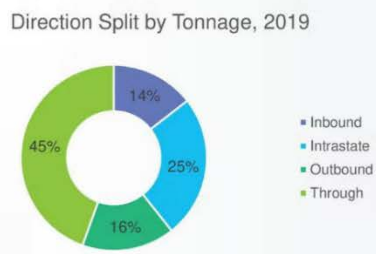
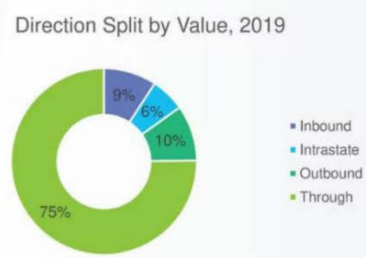
Commodity Flows in Arkansas







Source: FAF5 & STB Waybill

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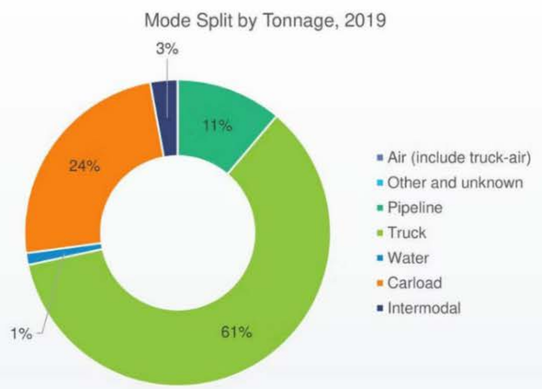
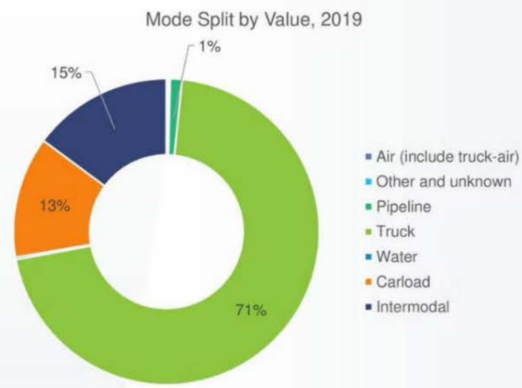
Commodity Flows in Arkansas





Source: FAF5 & STB Waybill

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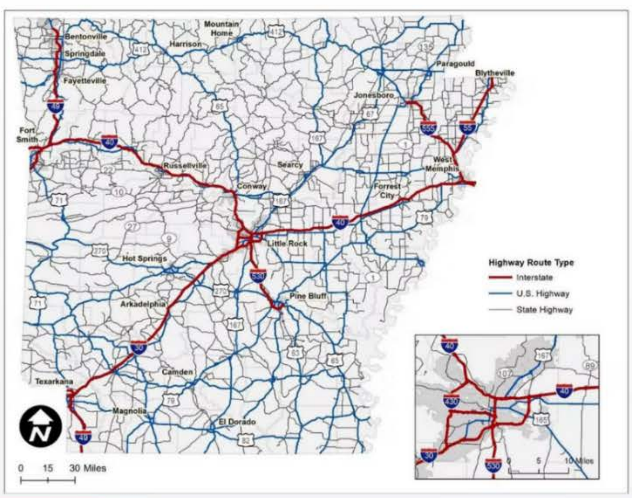
Freight Highways



- Approx. 102,600 miles of public roads
  - 16,451 miles on the State Highway System
    - 749 miles of Interstate Highways
      - Approx. 99% of Interstate pavement miles in good or fair condition
- More than 12,800 bridges on public roads
  - Approx. 7,400 owned by the State
  - Approx. 95% in good or fair condition

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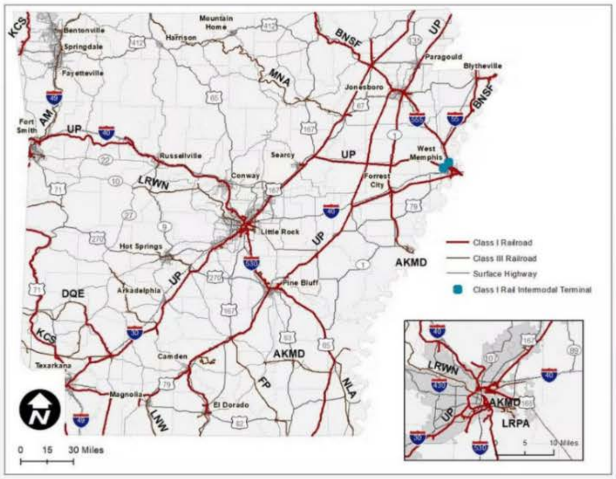
Freight Rail



- 2,600+ miles of railroads operated by 3 Class I RRs and 17 Class III RRs
- Two intermodal terminals in Memphis region:
  - Marion Terminal (UP)
  - Harvard Terminal (BNSF) – reopened Aug 2021 after surge in demand due to COVID-19
- Rail connection available at multiple public port facilities

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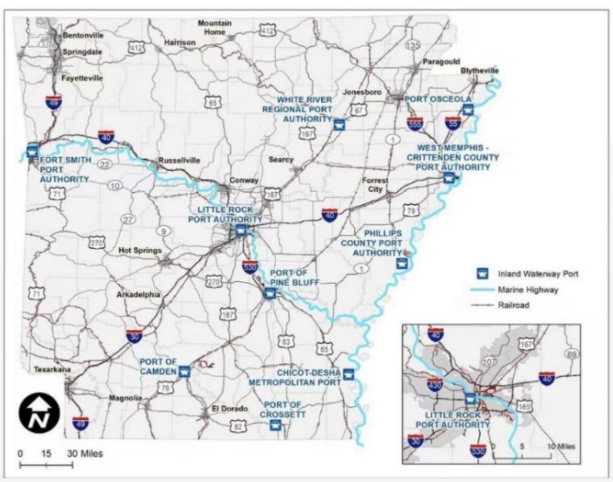
Ports & Waterways



- Arkansas is 3rd in the nation for inland waterway miles, providing access to national & international markets
- Barge transportation ideal for large quantities of bulk commodities
- 2019 flooding significantly disrupted marine shipments, resulting in 30% less volume than 2018

IN 2018, ARKANSAS' PORTS, INLAND WATERWAYS, AND INLAND WATERWAYS-DEPENDENT INDUSTRIES SUPPORTED

Over **55,500 jobs**

$2.5 billion *in personal income*

$4.4 billion *in Gross State Product*

$10.5 billion *in total output*

...Giving rise to more than ***$277.8 million*** *in state & local tax revenue*

Source: National Waterways Foundation

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Air Cargo

- Typically handles low-weight, high value goods, heavily supports e-commerce
- Little Rock Airport (LIT) handles 99.7% of statewide tonnage
- Memphis International Airport is the largest airport in U.S. for air cargo activity
  - 11 miles east of state border
  - 2 hours by car from Little Rock

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Next Steps

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Next 90 Days
Complete stakeholder interviews
Hold Freight Industry Forums
Complete Arkansas freight profile
Initiate needs assessment
22

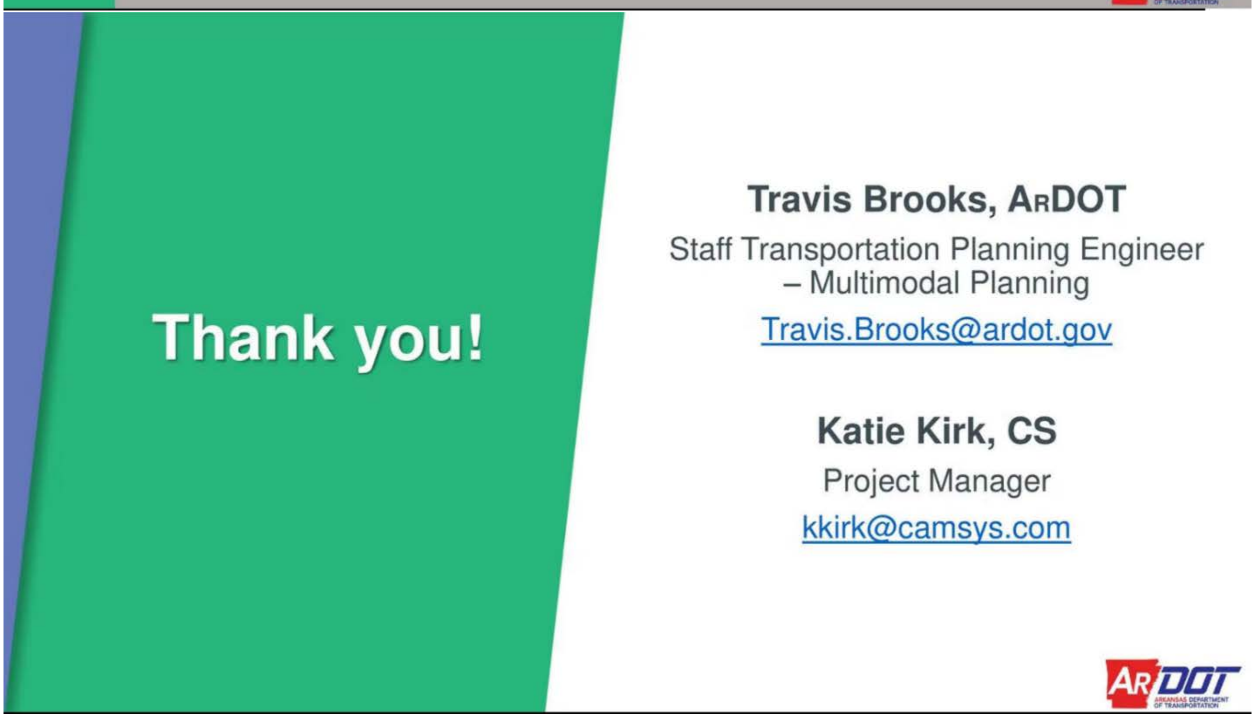
Thank you!
Travis Brooks, ArDOT
Staff Transportation Planning Engineer – Multimodal Planning
Travis.Brooks@ardot.gov
Katie Kirk, CS
Project Manager
kkirk@camsys.com

Table 1 Freight Advisory Committee Meeting #1 – Attendance

First Name	Last Name	Position Title	Organization
Brad	McCaleb	TPP Division Engineer	Arkansas Department of Transportation
Steve	Sparks	Director, Existing Business Resources	Arkansas Economic Development Commission
Robert	Coats	Economist	Arkansas Department of Agriculture
Cassandra	Caldwell	Director	Arkansas Waterways Commission
Randy	Zook	President	Arkansas State Chamber of Commerce
Tanner	Riggin	Northeast District Director	Arkansas Farm Bureau
Joe	Quinn	Executive Director	Arkansas Good Roads and Transportation Council
Marsha	Guffey	Grants and Special Projects Manager	Port of Little Rock
Tim	Kirby	Director, Transportation	Riceland Foods
John	Edwards	Economic Development Director	Helena Harbor
Jon	Witherow	Vice President and General Manager	Nucor-Yamato Steel
Max	Braswell	Executive Vice President	Arkansas Forestry Association
Nita	McDaniel	Executive Director	Monticello Economic Development Commission
Jeff	Hawkins	Executive Director	Northwest Arkansas Regional Planning Commission
Reese	Brewer	MPO Director	Western Arkansas Planning and Development District
Drew	Tessier	Senior Director – Public Affairs	Union Pacific Railroad
Kevin	Breedlove	Division Administrator	Federal Motor Carrier Safety Administration – Arkansas Division
Ross	Batson	Captain	Arkansas Highway Police
David	Clark	Technical Section Supervisor	Arkansas Department of Environmental Quality
Amy	Heflin	Planning/Air Quality/Team Leader	Federal Highway Administration – Arkansas Division
Katie	Kirk*	Consultant Project Manager	Cambridge Systematics, Inc.
Maz	Kamali*	Consultant Deputy Project Manager	Cambridge Systematics, Inc.
Paula	Dowell*	Consultant Principal in Charge	Cambridge Systematics, Inc.
Travis	Brooks*	Project Manager	Arkansas Department of Transportation
Josilyn	Mitchell*	Deputy Project Manager	Arkansas Department of Transportation

*Denotes Project Team Member

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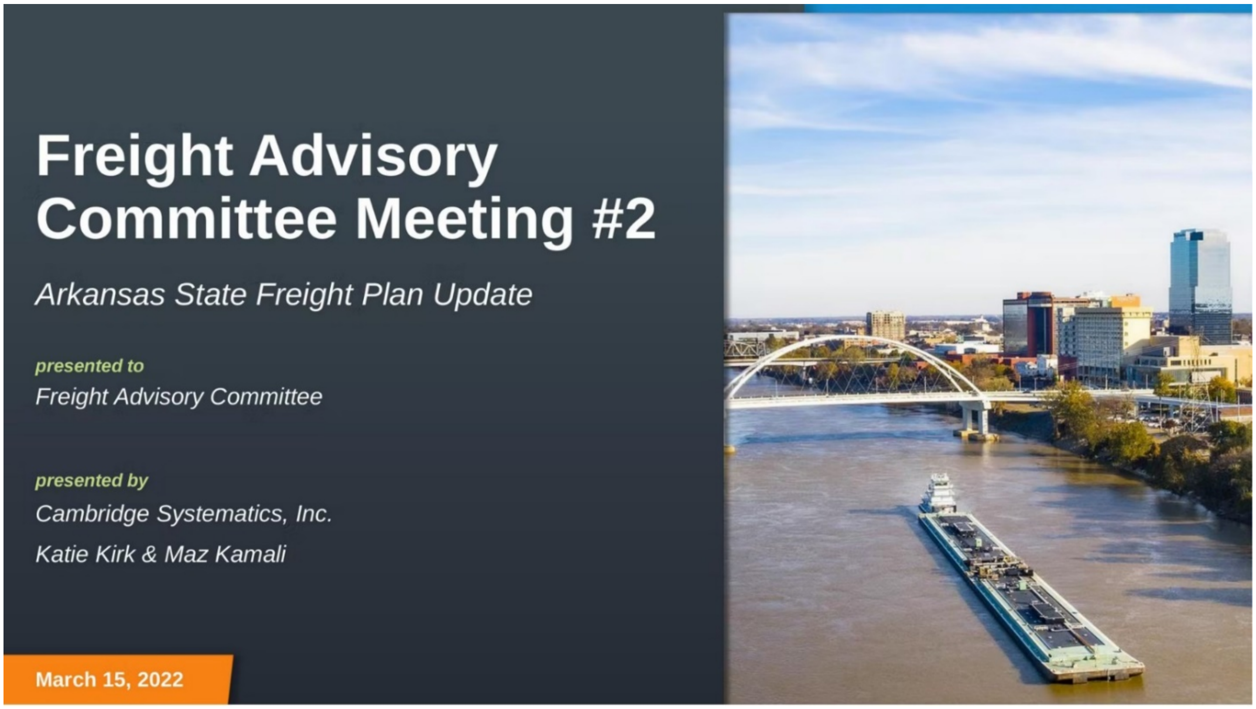
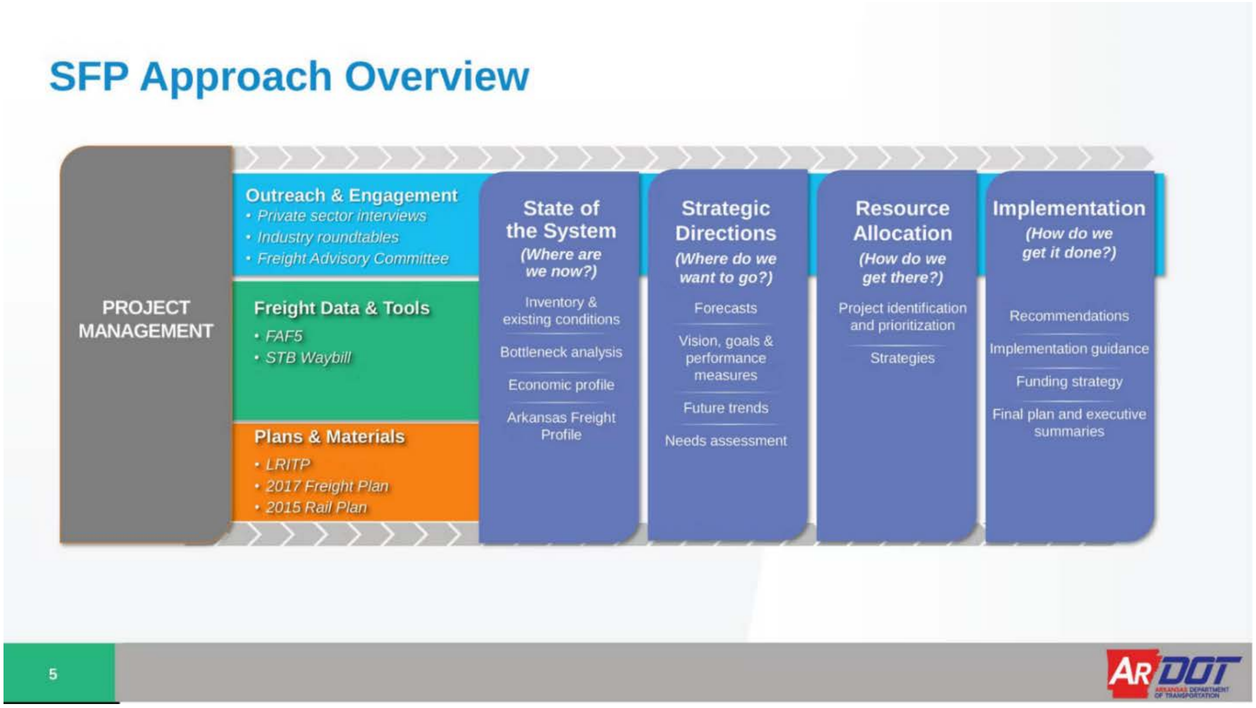
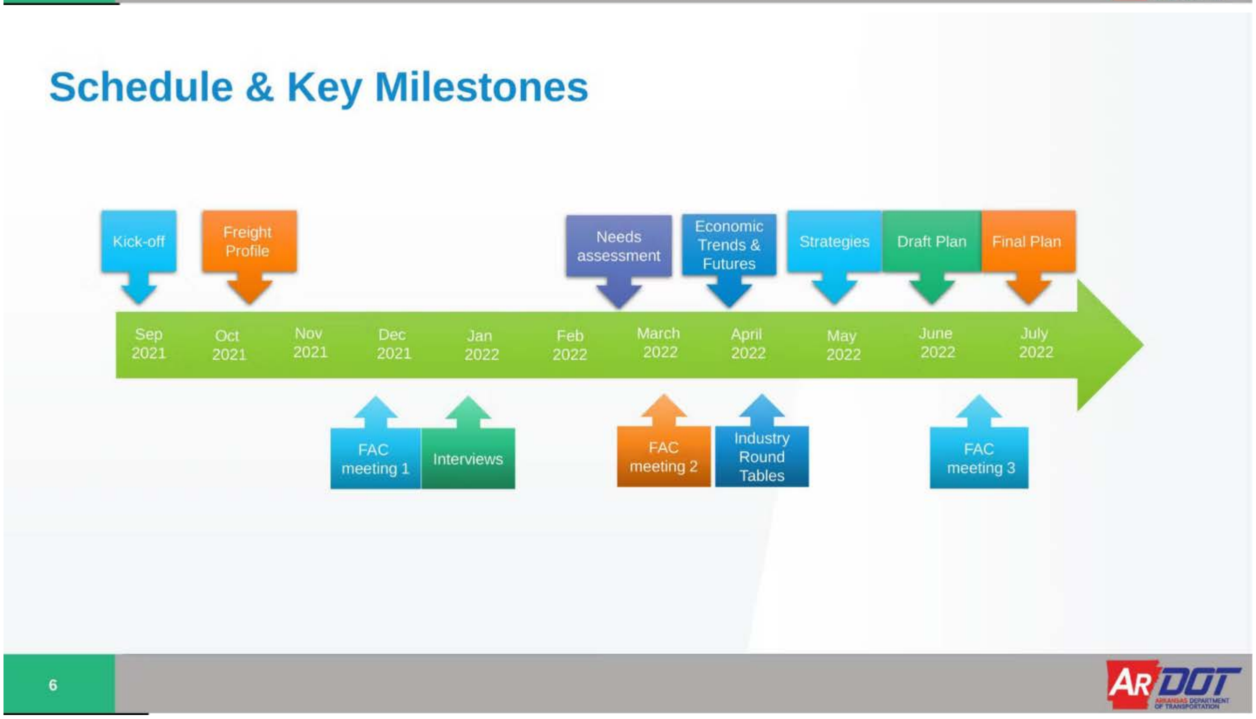
C.2 Freight Advisory Committee Meeting #2 – Virtual, March 15, 2022




SFP Approach Overview
PROJECT MANAGEMENT
Outreach & Engagement
• Private sector interviews
• Industry roundtables
• Freight Advisory Committee
Freight Data & Tools
• FAF5
• STB Waybill
Plans & Materials
• LRITP
• 2017 Freight Plan
• 2015 Rail Plan
State of the System
(Where are we now?)
Inventory & existing conditions
Bottleneck analysis
Economic profile
Arkansas Freight Profile
Strategic Directions
(Where do we want to go?)
Forecasts
Vision, goals & performance measures
Future trends
Needs assessment
Resource Allocation
(How do we get there?)
Project identification and prioritization
Strategies
Implementation
(How do we get it done?)
Recommendations
Implementation guidance
Funding strategy
Final plan and executive summaries
5

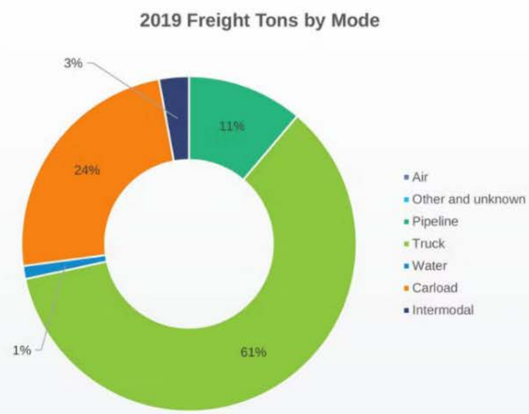

Schedule & Key Milestones
Kick-off
Freight Profile
Needs assessment
Economic Trends & Futures
Strategies
Draft Plan
Final Plan
Sep 2021
Oct 2021
Nov 2021
Dec 2021
Jan 2022
Feb 2022
March 2022
April 2022
May 2022
June 2022
July 2022
FAC meeting 1
Interviews
FAC meeting 2
Industry Round Tables
FAC meeting 3
6

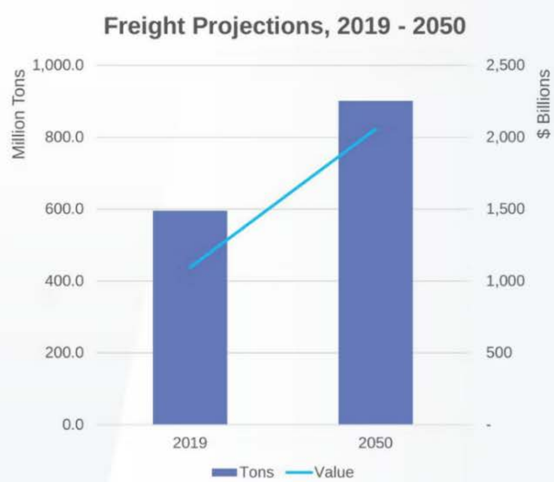
Commodity Flows

7

ARDOT Arkansas Department of Transportation

Commodity Flows in Arkansas





Source: FHWA FAF5.2 and 2019 STB Waybill Data

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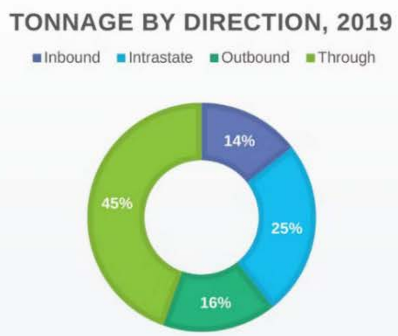
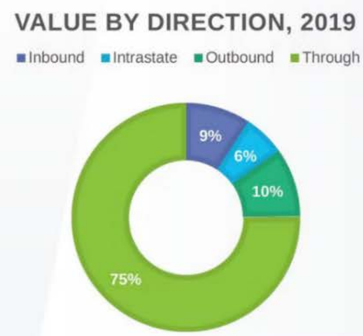
ARDOT Arkansas Department of Transportation

Directional Flow – All Modes

- In 2019, through traffic comprised the largest share by weight and value
- Inbound and outbound flows roughly even





Source: FHWA FAF5.2 and 2019 STB Waybill Data

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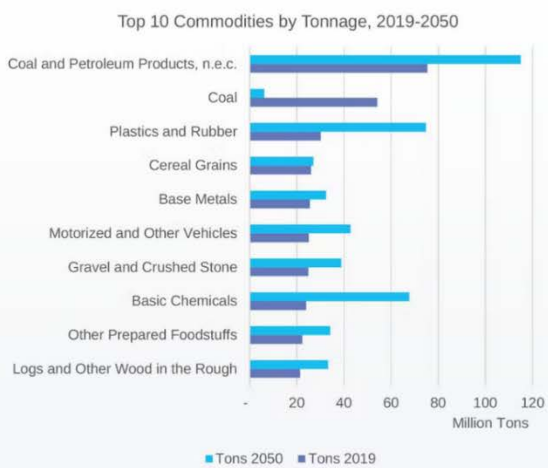
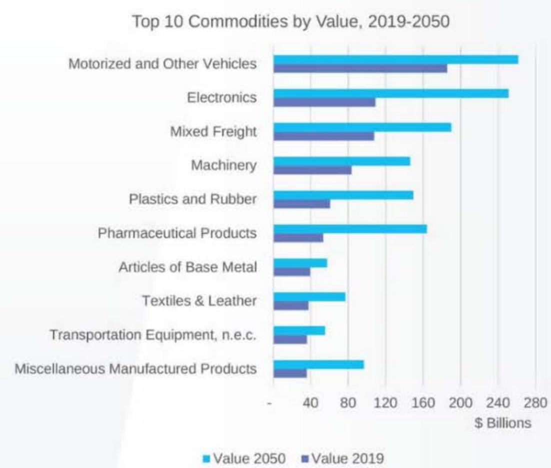
Top Commodities – All Modes and Directions





Source: FHWA FAF5.2 and 2019 STB Waybill Data

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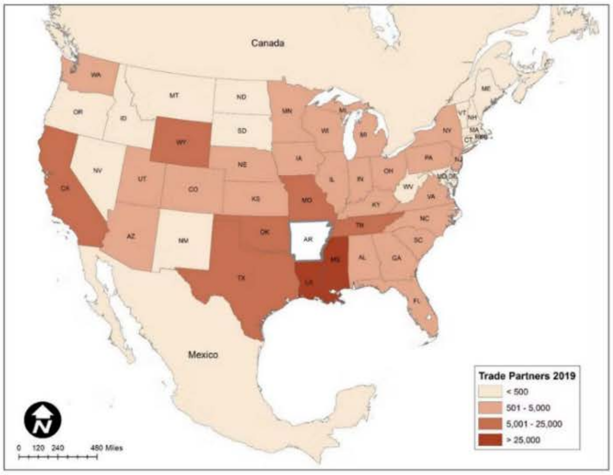
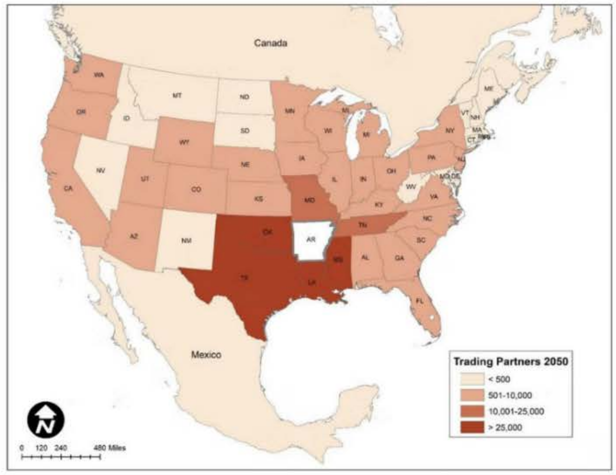
Arkansas Domestic Trading Partners by Weight
(Millions of Tons)





Source: FHWA FAF5.2 and 2019 STB Waybill Data

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Multimodal System Performance

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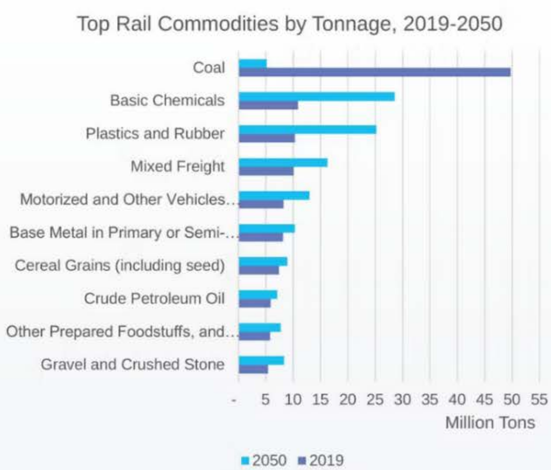
Freight Rail

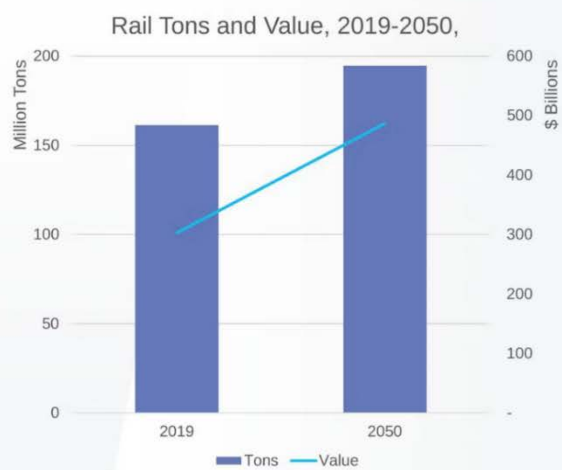
Source: FRA North American Rail Network supplemented with information from freight railroad websites.

- Class I RRs comprise 61% of total trackage
  - Union Pacific (UP) comprises 48% of total trackage
- Marion Terminal is the only active intermodal facility in Arkansas
- Potential for increased freight between Kansas City & Shreveport due to CPKC merger

1

Shifting Demand Expected for Freight Rail





Source: FHWA FAF5.2 and 2019 STB Waybill Data

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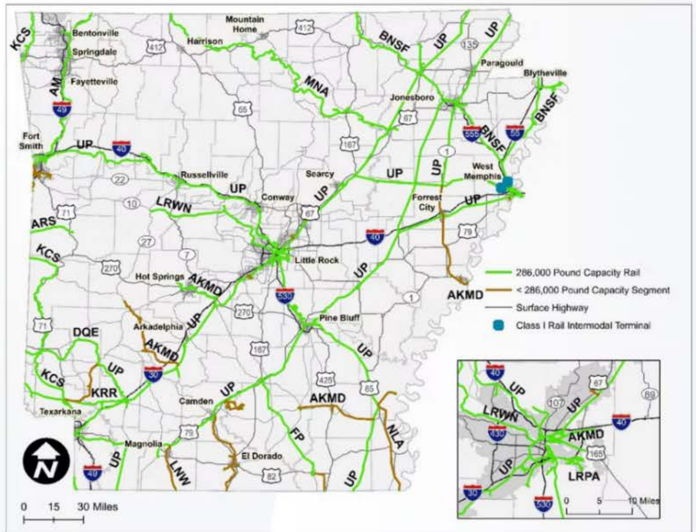
Freight Rail

Track Weight Restrictions



Source: Freight railroad websites and Arkansas 2015 State Rail Plan

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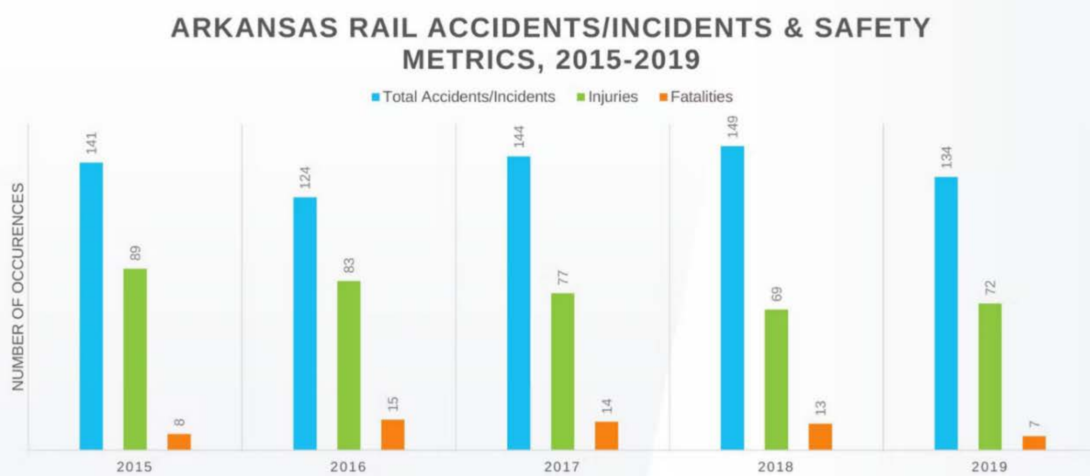
Freight Rail – Safety



Source: FRA 2021 Accident/Incident Overview Dashboard

2

Ports & Waterways

» Lower Mississippi, Arkansas River (MKARNS), and Ouachita all operate year-round

» River channel depth varies:
- Lower Mississippi supports 12' depth 97% of the time
- Remaining rivers authorized for 9' navigation

» White and Red rivers currently not navigable

Source: U.S. Army Corps of Engineers.

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Ports & Waterways Commodity Flow

Top Commodities on the MKARNS:
- Sand & gravel
- Soybeans
- Nitrogenous fertilizer
- Iron & steel
- Other fertilizers

Top Commodities on the Ouachita River:
- Distillate fuel oil
- Gasoline
- Soybeans
- Limestone
- Corn

Top trade partners:
1. Louisiana
2. Texas
3. Kentucky
4. Illinois
5. Missouri

Source: U.S. Army Corps of Engineers.

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Flooding & Aging Infrastructure

» May 2019 flooding had significant impacts:
- Disruptions resulted in 30% less volume
- $3.2 billion in damages and five fatalities

» Aging lock and dam infrastructure and lagging maintenance on the MKARNS is a longstanding issue
- One of the contributing factors to May 2019 flood damages

Arkansas River Flooding in downtown Little Rock and North Little Rock, May 2019

Image Source: Arkansas Gazette.
https://www.arkansasonline.com/news/2019/jun/05/lr-nlr-soaked-river-s-crest-shifts-2019-1/

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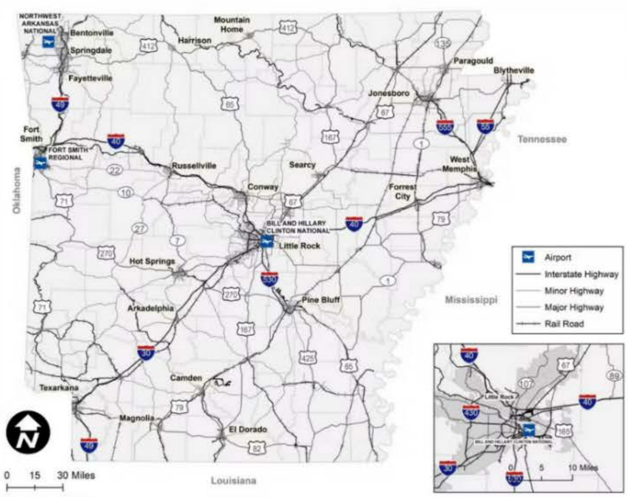
ARDOT ARKANSAS DEPARTMENT OF TRANSPORTATION

Air Cargo



» Typically handles low-weight, high value goods, heavily supports e-commerce

» Little Rock Airport (LIT) handles 99.7% of statewide tonnage

» Memphis International Airport is the largest airport in U.S. for air cargo activity
- 11 miles east of state border
- 2 hours by car from Little Rock

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ARDOT ARKANSAS DEPARTMENT OF TRANSPORTATION

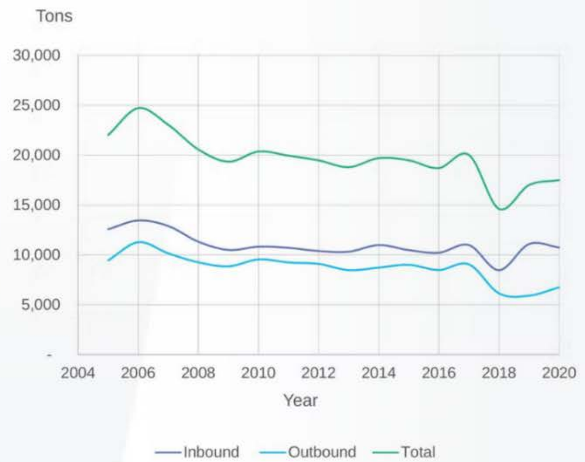
Air Cargo Volumes & Commodities in Arkansas

Top Commodities by Volume:

- Machinery
- Electronics & electrical equipment
- Precision instruments
- Animal feed & products

Top Commodities by Value:

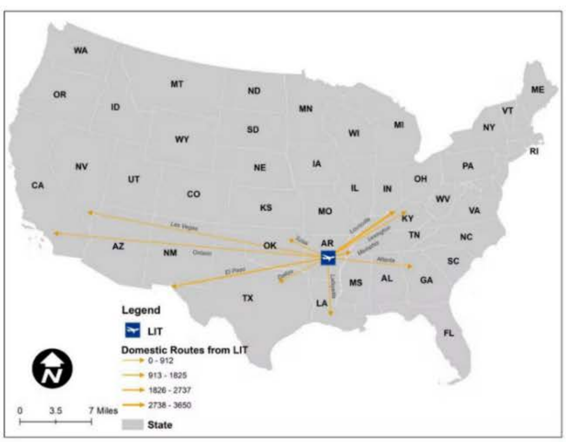
- Electronics & electrical equipment
- Machinery
- Misc. manufactured products
- Pharmaceuticals

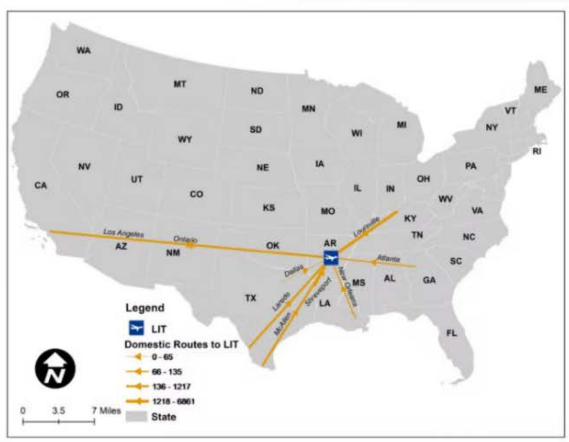


Source: Bureau of Transportation Statistics, FHWA FAF5.2

5

Air Cargo Domestic Trade Partners





Source: Bureau of Transportation Statistics

2

Trends Impacting Air Cargo

- E-commerce growth
- Aging Infrastructure
- Aviation workforce shortage
- COVID-19
- Unmanned aerial systems

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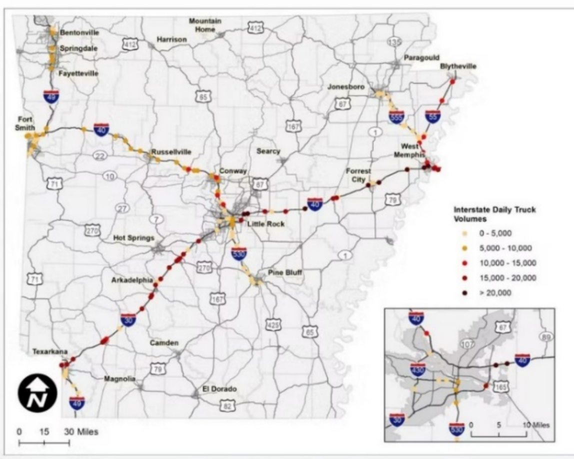
ARDOT

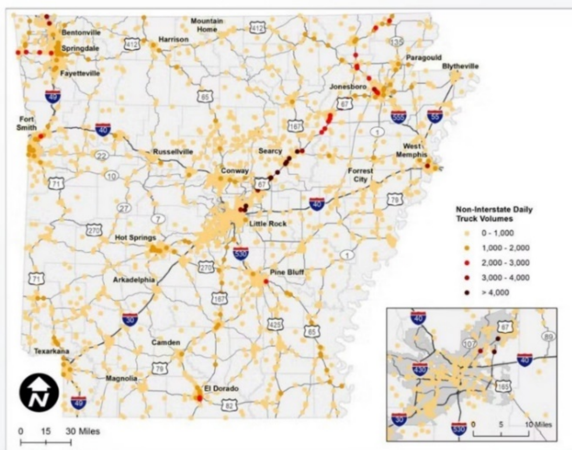
Freight Highways – Truck Volumes

Interstate Daily Truck Volumes



Source: ARDOT

Non-Interstate Daily Truck Volumes



Source: ARDOT

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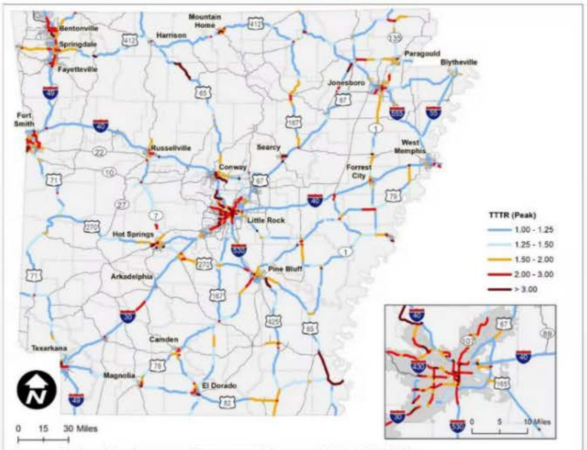
ARDOT

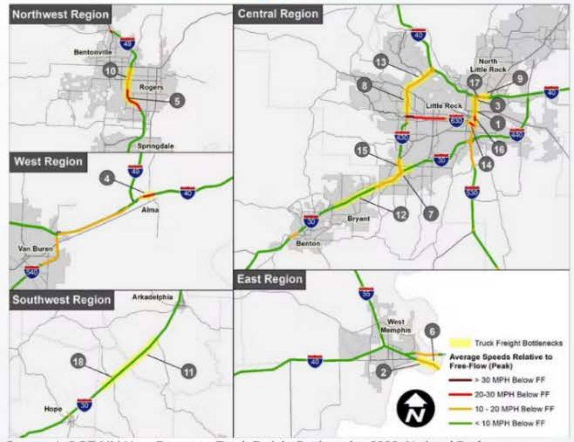
Freight Highways – Reliability

Truck Travel Time Reliability During AM and PM Peak Hours (2019)



Source: National Performance Management Research Data Set, 2019

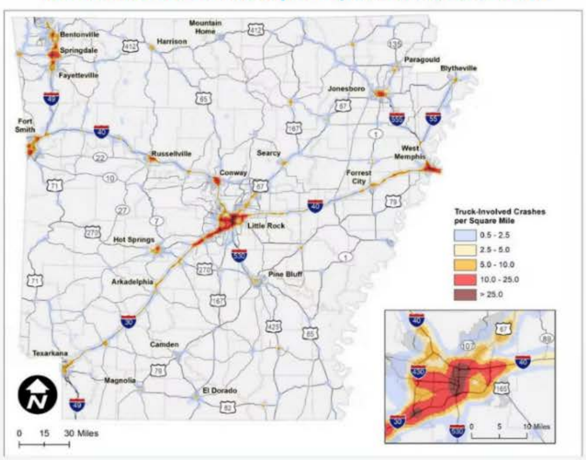
Truck Freight Bottlenecks



Source: A$_R$DOT Mid-Year Report on Truck Freight Bottlenecks, 2020; National Performance Management Research Data Set, 2019

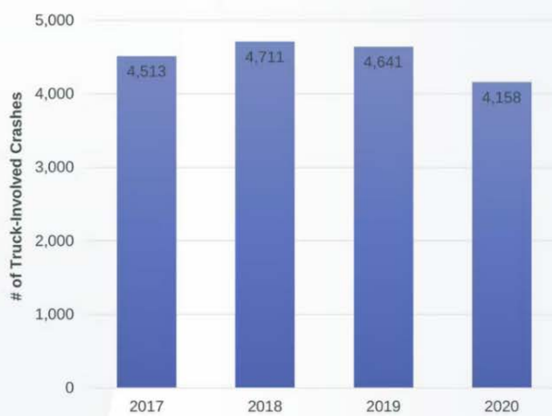
Freight Highways – Safety

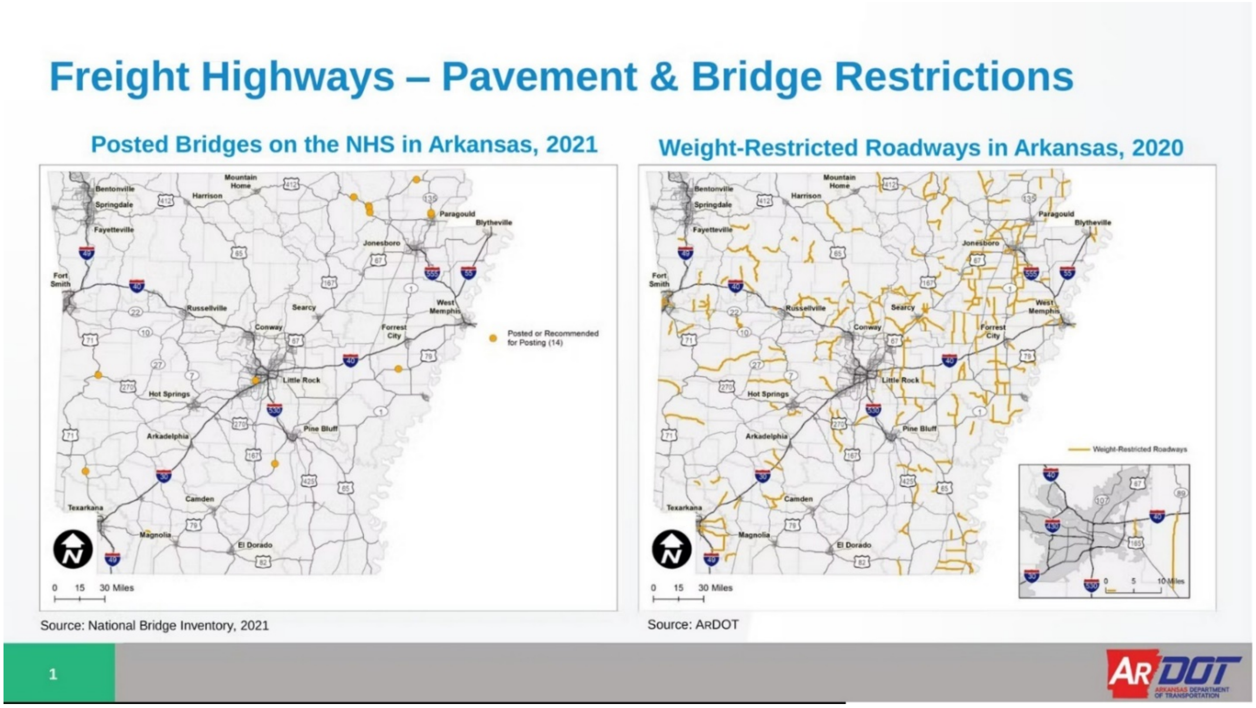
Truck-Involved Crashes per Square Mile, 2017-2020

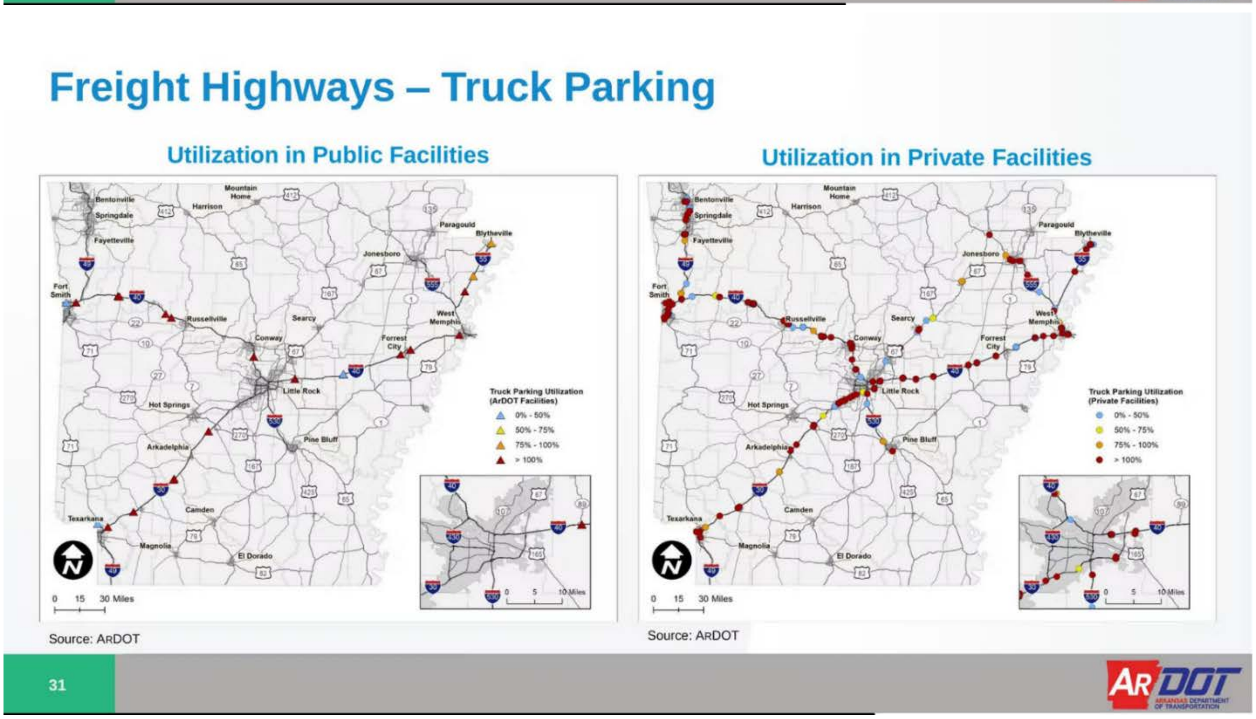


Source: ARDOT

Truck-Involved Crashes per Year, 2017-2020




Freight Highways – Pavement & Bridge Restrictions
Posted Bridges on the NHS in Arkansas, 2021
Posted or Recommended for Posting (14)
0 15 30 Miles
Source: National Bridge Inventory, 2021
Weight-Restricted Roadways in Arkansas, 2020
Weight-Restricted Roadways
0 15 30 Miles
Source: ArDOT
1
ArDOT


Freight Highways – Truck Parking
Utilization in Public Facilities
Truck Parking Utilization (ArDOT Facilities)
0% - 50%
50% - 75%
75% - 100%
> 100%
0 15 30 Miles
Source: ArDOT
Utilization in Private Facilities
Truck Parking Utilization (Private Facilities)
0% - 50%
50% - 75%
75% - 100%
> 100%
0 15 30 Miles
Source: ArDOT
31
ArDOT

Multimodal Freight Needs Discussion

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Discussion

1. Identify needs on multimodal network – site-specific, systemic, policy, and programming needs. Example needs categories may include:

Safety

Truck parking

Technology

Mobility & Reliability

Asset preservation

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Ran out of time? Submit your feedback!

» Reach out to Katie Kirk (kkirk@camsys.com)

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Next Steps

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Next 90 Days

- Complete stakeholder interviews & roundtables
- Complete needs assessment
- Complete strategies & actions
- Begin drafting State Freight Plan

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ArDOT

Thank you!

Travis Brooks, ArDOT

Staff Transportation Planning Engineer – Multimodal Planning

Travis.Brooks@ardot.gov

Katie Kirk, CS

Project Manager

kkirk@camsys.com

ArDOT

Table 2 Freight Advisory Committee Meeting #2 – Attendance

First Name	Last Name	Position Title	Organization
Brad	McCaleb	TPP Division Engineer	Arkansas Department of Transportation
Steve	Sparks	Director, Existing Business Resources	Arkansas Economic Development Commission
Robert	Coats	Economist	Arkansas Department of Agriculture
Cassandra	Caldwell	Director	Arkansas Waterways Commission
Randy	Zook	President	Arkansas State Chamber of Commerce
Tanner	Riggin	Northeast District Director	Arkansas Farm Bureau
Joe	Quinn	Executive Director	Arkansas Good Roads and Transportation Council
Marsha	Guffey	Grants and Special Projects Manager	Port of Little Rock
Tim	Kirby	Director, Transportation	Riceland Foods
John	Edwards	Economic Development Director	Helena Harbor
Jon	Witherow	Vice President and General Manager	Nucor-Yamato Steel
Max	Braswell	Executive Vice President	Arkansas Forestry Association
Nita	McDaniel	Executive Director	Monticello Economic Development Commission
Jeff	Hawkins	Executive Director	Northwest Arkansas Regional Planning Commission
Reese	Brewer	MPO Director	Western Arkansas Planning and Development District
Shannon	Newton	President	Arkansas Trucking Association
Joshua	Hendricks	Chief, Maintenance Engineering Section	U.S. Army Corps of Engineers – Little Rock District
Drew	Tessier	Senior Director – Public Affairs	Union Pacific Railroad
Kevin	Breedlove	Division Administrator	Federal Motor Carrier Safety Administration – Arkansas Division
Glen	Holloway	Acting Chief	Arkansas Highway Police
Ross	Batson	Captain	Arkansas Highway Police
Amy	Heflin	Planning/Air Quality/Team Leader	Federal Highway Administration – Arkansas Division
Katie	Kirk*	Consultant Project Manager	Cambridge Systematics, Inc.
Maz	Kamali*	Consultant Deputy Project Manager	Cambridge Systematics, Inc.
Paula	Dowell*	Consultant Principal in Charge	Cambridge Systematics, Inc.
Travis	Brooks*	Project Manager	Arkansas Department of Transportation
Josilyn	Mitchell*	Deputy Project Manager	Arkansas Department of Transportation

*Denotes Project Team Member

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C.3 Freight Advisory Committee Meeting #3 – Virtual, June 9, 2022

Agenda

- Welcome
- Project Update & Schedule
- Summary of Multimodal Freight Strengths, Challenges & Needs
- Strategies & Actions
- Next Steps

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Project Update and Schedule

5

Work Completed Since the March 2022 FAC Meeting

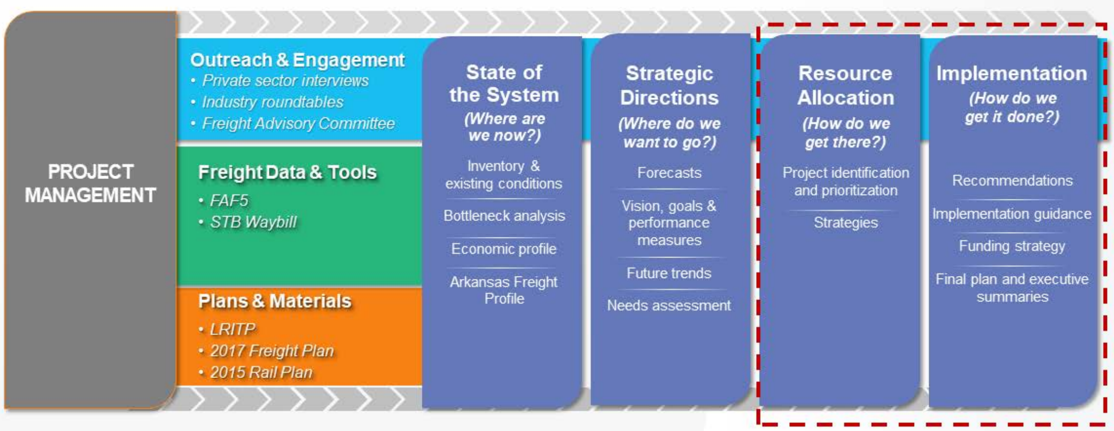
» Deliverables submitted:
- Individual modal profiles: Highway, Freight Rail, Air Cargo, and Ports & Waterways
- Commodity Flow Profile

» Deliverables in progress:
- Goals & Objectives Memo
- Freight Economic Trends Profile
- Needs Assessment Memo
- Strategies & Actions Memo

» Stakeholder interviews and industry roundtables

6

SFP Approach Overview



7

Schedule & Key Milestones

8

Multimodal Freight Strengths, Challenges & Needs

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Multimodal Freight System Strengths
Geographic Location
Multimodal Offerings
Balanced Production/ Consumption
Meets Key Industry Needs


Multimodal Freight System Needs
Access
Capacity
Funding
Aging Infrastructure & Deferred Maintenance
Resiliency

Limited Intermodal Connections

Shifting Commodity Demand

Track Weight Restrictions

Safety

Service & Labor Challenges

Freight Rail Challenges

Freight Rail Needs
System Enhancement

- Increase versatility of freight rail system:
  - Spurs to serve local rail customers
  - Additional freight rail facilities
  - Additional capacity
  - Intermodal connections

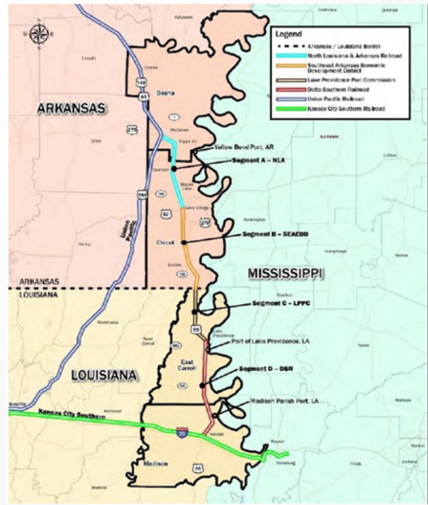
The City of Wynne, AR was awarded $2M in federal funding to construct a new industrial rail spur facility to support local manufacturers.

Image Source: https://katv.com/news/local/wynne-receives-2-million-for-rail-spur-facility-10-20-2021

Freight Rail Needs
Funding

» Can be challenging to secure funding for priority projects, particularly for Class III carriers

- Recent success: Southeast Arkansas Economic Development District awarded $10.5M in INFRA grant funds to upgrade short line track to accommodate higher speeds and train weights



Multimodal Freight Corridor Improvement Project

Image Source: https://www.transportation.gov/sites/dot.gov/files/docs/grants/344906/fy2019-infra-fact-sheets.pdf

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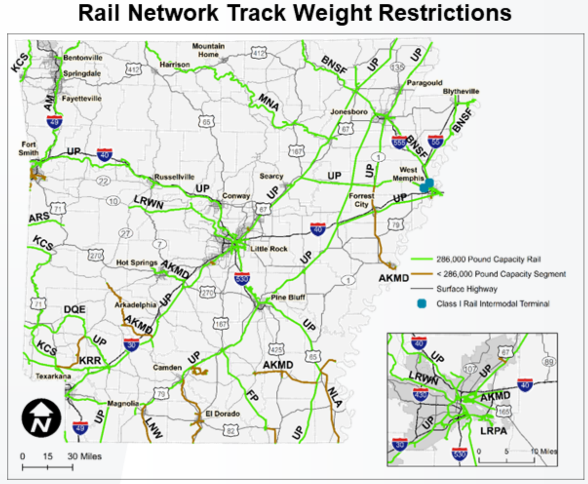
Freight Rail Needs
Track Quality and Weight Restriction

» Most freight rail trackage meets 286K-pound weight standard

» Most trackage that does not meet this standard is concentrated in the south, especially southeastern Arkansas

» Weight constraints can decrease efficiency and reduce competitiveness

Rail Network Track Weight Restrictions



Source: ArDOT; Survey of Railroads.

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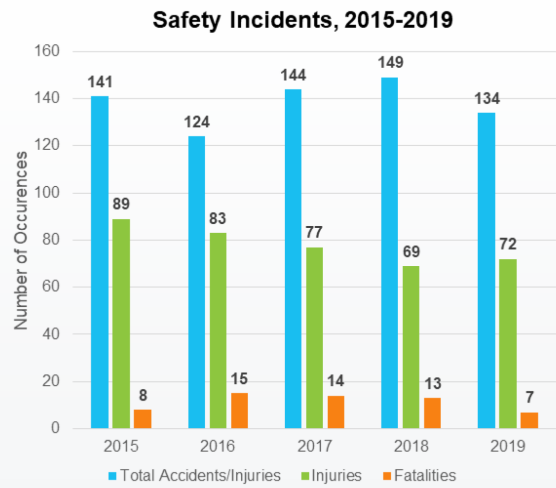
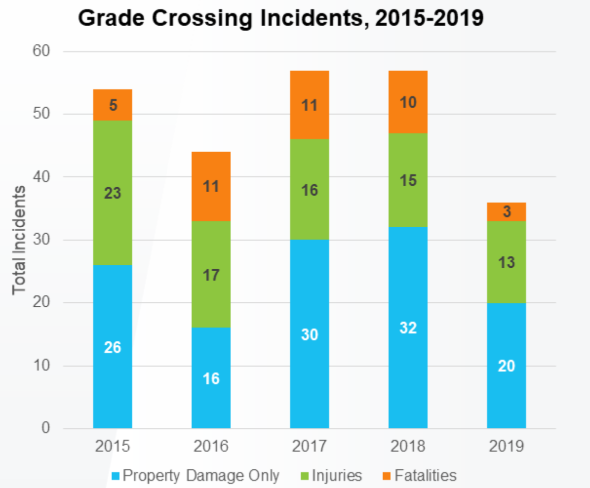
Freight Rail Needs
Safety





Source: FRA 2021 Accident/Incident Overview Dashboard

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Freight Rail Needs
Service & Labor Challenges

» Alignment of needs and priorities between shippers and carriers

» Labor and workforce challenges have put pressure on many industries, especially manufacturing and transportation sectors

Image Source: https://www.rtands.com/freight/class-1/union-pacific-plans-83m-in-improvements-in-arkansas/

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Flooding

Aging Lock & Dam Infrastructure

Ports & Waterways Challenges

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Ports & Waterways Needs
Funding

» Availability of funding is an on-going issue at both federal and local levels

» Local matching makes it difficult for inland ports to go after funding opportunities such as federal grants
  - Recent success: Port of Little Rock awarded $5.6M in CRISI grant funds

» Coupled with rising costs of parts and materials and lengthening delivery times, lack of funds has had a direct impact on the ability to make repairs or improvements at the inland ports

Image source: https://www.kark.com/news/little-rock-port-authority-receives-5-5-million-grant/

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Ports & Waterways Needs
Highway & Rail Access

» Roadway improvements needed to support growing ports, examples:
  - Improved access to Helena Harbor
  - Alternative southern routes to the Port of Little Rock (I-30 and I-530) (*study pending*)

» Expanded intermodal and multimodal (*i.e.*, rail-to-barge) access

» Rail access essential for serving existing customers and attracting new ones

Rail access at the Port of Little Rock
Image Source: https://www.portoflittlerock.com/transportation-infrastructure/rail/

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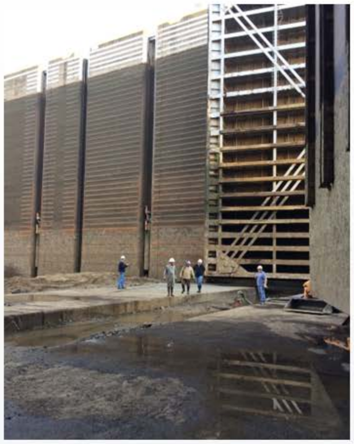
Ports & Waterways Needs
Lock & Dam Infrastructure



Dewatering the Dardanelle Lock & Dam (L&D No. 10), MKARNS in Russellville, AR (2017).
Image Source: ARDOT.

» For some ports, locks are a critical need for continued operations

» Prolonged closures can be incredibly disruptive
  - Port of Crossett has not had river shipments for past 4-5 years

» Need for improved tow haulage system
  - All locks & dams have single lock chamber for passing

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Ports & Waterways Needs
Dredging

» Consistent, annual dredging and adequate water depth is necessary to support reliable operations

» Extreme weather events have exacerbated dredging needs

» Some portions of the waterway system have not been dredged to an adequate depth to handle barge traffic

- Makes the development of new port facilities more difficult

» Deepening waterways to 12 feet would have a significant impact on the ability to increase use of the inland ports

Dredging on Arkansas River in Little Rock District, Mile 222 (2019).
Image Source: https://www.dredgingtoday.com/2019/11/11/arkansas-river-busy-with-dredging-operations/

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Mobility & Reliability

Truck Freight Bottlenecks

Safety

Asset Management

Truck Parking

Freight Highway Challenges

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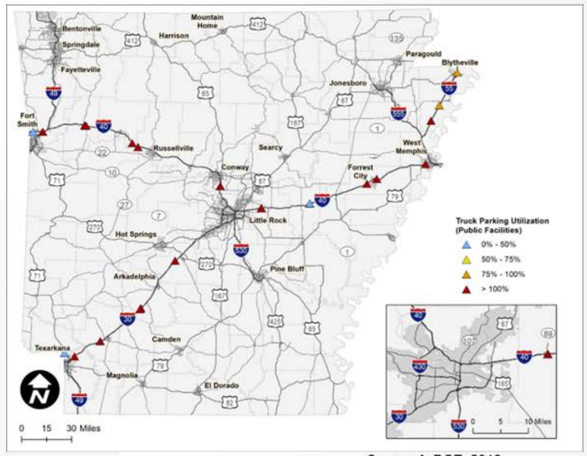
Freight Highway Needs
Truck Parking

» Need for more truck parking facilities throughout the state
  - Support HOS requirements
  - Mitigates safety aspects of unauthorized parking

» In 2019, 77% of public facilities were reported as being over capacity

» Private facilities (i.e. Love's, Flying J) help meet demand and typically offer amenities for drivers

Truck Parking in Public Facilities



Source: ARDOT, 2019

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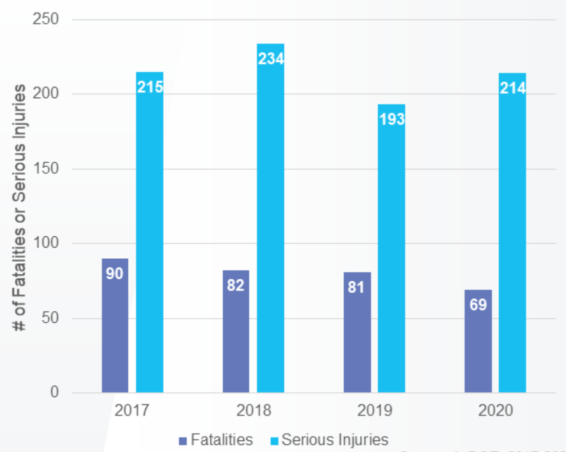
Freight Highway Needs
Truck Safety

» Truck safety remains an important priority for the state

» Arkansas' Strategic Highway Safety Plan recommends strategies to improve commercial vehicle safety:
  - Increasing the availability and/or visibility of truck parking
  - Educating the public on sharing the roads with commercial motor vehicles
  - Increasing enforcement of commercial motor vehicles with fatigued drivers and other safety violations

Truck-Involved Crashes with Fatalities and Serious Injuries per Year, 2017-2020



Source: ARDOT, 2017-2020

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Freight Highway Needs
System Connectivity & Mobility

» Completing four-lane grid system

» Truck Bottlenecks
- Includes locations that have recurring issues related to excess truck traffic and delay, poor levels of service, steep grades, high crash totals, or recurring construction
- ARDOT evaluates bottlenecks on an annual basis

Source: ARDOT Long Range Intermodal Transportation Plan

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Freight Highway Needs
Asset Management

» Pavements in good condition*
- 63% of Interstate Highway pavement
- 35% of Non-Interstate NHS pavement

» Bridges in good condition*
- 43% of NHS bridges

» Load posted bridges impact freight mobility and competitiveness

*Pavement and bridge conditions as reported in latest ARDOT *Transportation Asset Management Plan Implementation report*

Load Posted Bridges on the NHS in Arkansas

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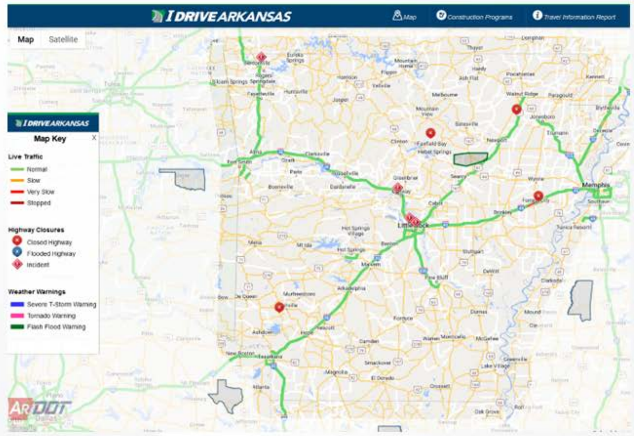
Freight Highway Needs
Transportation Technology

- Intelligent Transportation Systems (ITS) Section manages transportation management center (TMC), dynamic messaging signs, land mobile radio system, IDrive, and others
- Potential to invest in truck parking notification systems
- Arkansas Transportation Systems Management & Operations (TSMO) Plan development currently underway



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Freight Highway Data Opportunity: VIUS

- FHWA is conducting the 2021 Vehicle Inventory and Use Survey (VIUS)
- Collects detail on vehicle type, miles traveled, commodities carried, and other attributes
- Results will help guide investments into improved infrastructure, decreased traffic congestion, and increased safety, among other desired outcomes

Go to: www.bts.gov/vius

Survey opened	Feb 2022
Survey closed	Oct 2022
Data released	Fall 2023

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Competition From Neighboring Hubs

Lack of Demand

Infrastructure Limitations

Air Cargo Challenges

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Air Cargo Needs
Little Rock International Airport (LIT)

- » Handles nearly all air cargo in Arkansas
- » Facility needs primarily related to terminal upgrades for passenger amenities
- » Available existing facilities and vacant land for potential future expansion if market demands

Image source: 2018 Little Rock Airport Master Plan Update, Executive Summary

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Air Cargo Needs
Northwest Arkansas National Airport (XNA)

- XNA is one of the newer airports in the U.S. (1998)
- Currently only a small volume (~100 tons annually) of freight moved via belly cargo
- XNA Airport Access Road is the most critical project for the airport to increase air cargo handling activities

Northwest Arkansas National Airport

Image source: https://www.fayettevilleflyer.com/2019/12/11/xna-changes-name-to-northwest-arkansas-national-airport/

Strategies & Actions

Arkansas State Freight Plan Goal Areas

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Safety and Security

Improve statewide safety by funding projects that reduce fatal and serious injury crashes, reduce vulnerability, and improve resiliency of the system.

» Implement the *Arkansas Highway-Rail Grade Crossing Action Plan* (*pending*)

» Implement Commercial Vehicle safety strategies from the *Strategic Highway Safety Plan* (*update pending*)

» Encourage development and expansion of truck parking areas

» Evaluate emergency response protocols to better support the trucking industry

» Support initiatives and investments that increase the resiliency of the multimodal freight network (*i.e.*, extreme weather and natural disasters)

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Economic Competitiveness

Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.

- Improve road & rail access to inland port facilities, air cargo facilities, transload, and intermodal terminals
- Improve last-mile access roads to Arkansas' rural industries, farms, and other freight-generating facilities
- Support public and private investments in inland ports, transload terminals, and intermodal terminals
- Continue working with the FAC to identify infrastructure improvements that are important to economic competitiveness for Arkansas

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Economic Competitiveness

Improve intermodal transportation system connectivity, efficiency, and mobility to support existing industries and strengthen national and regional economic competitiveness.

- Improve communication between modal authorities
- Promote "Be Pro Be Proud" Initiative in Arkansas to support workforce attraction and retention of skilled labor, particularly in manufacturing and transportation and warehousing sectors
- Coordinate with the AEDC, PDD/EDD, MPOs, and other economic development stakeholders to identify transportation projects or improvements needed to support local and regional economies
- Promote the importance of all freight modes to local, state, and national economies

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Infrastructure Condition

Invest in existing infrastructure and supporting technologies to maintain and preserve the existing system.

» Evaluate, adjust, and enforce weight and size restrictions on roads and bridges to balance the competing needs of infrastructure preservation and freight mobility

» Continue implementation of *Transportation Asset Management Plan* (*update pending*)

» Prioritize maintenance of existing assets over construction of new infrastructure

» Strengthen partnerships between modal authorities, operators, and other stakeholders for improved system maintenance

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Congestion Reduction, Mobility, and System Reliability

Invest in the multimodal transportation system to improve mobility, connectivity, accessibility, and reliability for people and goods.

» Continue to invest in Transportation Systems Management and Operations (TSMO) including enhanced ITS and driver information systems

» Deploy truck parking availability system along Interstates

» Update the statewide travel demand model to include freight module

» Identify critical freight corridors

» Support dredging of MKARNS to 12 feet

» Coordinate with Class I/III railroads to identify opportunities for enhanced rail access and service

» Integrate multimodal freight with regional planning activities

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Environmental Sustainability

Enhance the performance of the transportation system while avoiding, minimizing, and/or mitigating impacts to natural and cultural resources.

» Consider local air pollution impacts when developing alternatives for system improvements and selecting operations/maintenance strategies

» Consider flooding and stormwater impacts when developing alternatives for system improvements and selecting operations/maintenance strategies

» Consider impacts to wildlife habitat when developing alternatives for system improvements and selecting operations/maintenance strategies

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Next Steps

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Next Steps

- Finalize Technical Memos
- Complete Needs Assessment
- Finalize Strategies & Actions Framework
- Project Identification and Prioritization
- Submit Draft State Freight Plan

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Thank you!

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Table 3 Freight Advisory Committee Meeting #3 – Attendance

First Name	Last Name	Position Title	Organization
Brad	McCaleb	TPP Division Engineer	Arkansas Department of Transportation
Steve	Sparks	Director, Existing Business Resources	Arkansas Economic Development Commission
Robert	Coats	Economist	Arkansas Department of Agriculture
Cassandra	Caldwell	Director	Arkansas Waterways Commission
Jerry	Chism	Director	Arkansas Department of Aeronautics
Tanner	Riggin	Northeast District Director	Arkansas Farm Bureau
Joe	Quinn	Executive Director	Arkansas Good Roads and Transportation Council
Marsha	Guffey	Grants and Special Projects Manager	Port of Little Rock
John	Edwards	Economic Development Director	Helena Harbor
Jon	Witherow	Vice President and General Manager	Nucor-Yamato Steel
Max	Braswell	Executive Vice President	Arkansas Forestry Association
Nita	McDaniel	Executive Director	Monticello Economic Development Commission
Jeff	Hawkins	Executive Director	Northwest Arkansas Regional Planning
Reese	Brewer	MPO Director	Western Arkansas Planning and Development District
Kevin	Breedlove	Division Administrator	Federal Motor Carrier Safety Administration – Arkansas
Ross	Batson	Captain	Arkansas Highway Police
Katie	Kirk*	Consultant Project Manager	Cambridge Systematics, Inc.
Maz	Kamali*	Consultant Deputy Project Manager	Cambridge Systematics, Inc.
Elaine	McKenzie*	Consultant Principal in Charge	Cambridge Systematics, Inc.
Travis	Brooks*	Project Manager	Arkansas Department of Transportation
Josilyn	Mitchell*	Deputy Project Manager	Arkansas Department of Transportation

*Denotes Project Team Member

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