
Arkansas

# STATE FREIGHT PLAN

prepared for

Arkansas Department of Transportation

prepared by

Cambridge Systematics, Inc.

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TRANSPORTATION 2040

WE MOVE ARKANSAS FREIGHT

**ARKANSAS DEPARTMENT OF TRANSPORTATION**

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# 1.0 FOREWORD

The movement of freight is critical to Arkansas' economy and the quality of life of every Arkansan. The multi-modal freight system puts food on our tables, transports the fuel used to power industry, delivers packages to our front doors, and creates thousands of jobs for hard-working Arkansans. Indeed, freight touches nearly every aspect of our daily lives.

There is a close relationship between socioeconomic activity and the demand for freight services. The population of Arkansas has grown over the past 15 years, and there has been a corresponding growth in the demand for consumer goods. Based on the US Census, between 2000 and 2015, the population of Arkansas grew from 2.67 million to 2.98 million, a 12 percent increase. This population growth was undoubtedly matched by an increase in the demand for goods movement and freight services on the Arkansas transportation network.

Given the vital importance of freight to Arkansas, it is imperative that we plan for the future of our freight transportation system. Across all modes, freight volumes in Arkansas are projected to grow by more than 40 percent over the next 25 years. The movement of those goods will be impacted by many forces, including emerging technologies, shifting populations, changes in national policy, and trends in international trade. Planning for those opportunities and challenges is an essential step toward delivering a safe, reliable and competitive freight system for the future.

The need for freight planning activities was recognized by the US Congress with the passage of the Fixing America's Surface Transportation (FAST) Act in 2015. The FAST Act, for the first time, provides a designated source of Federal dollars for freight investments. To ensure that those investments are sound, the Arkansas State Freight Plan (2017) (SFP) includes (among other contents): an identification of freight system trends, needs and issues; a description of the policies, strategies and performance measures that will guide investment decisions; and a freight investment plan that identifies high-priority freight projects. Final approval of this Plan by the Federal Highway Administration (FHWA) will provide for continuing eligibility for Federal freight funding.

This Plan was developed under the guidance of a diverse group of public- and private-sector freight stakeholders – the Freight Advisory Committee (FAC). The FAC advises the Arkansas Department of Transportation (ARDOT) on freight-related priorities and funding needs; serves as a forum for discussing issues affecting freight mobility; and provides a conduit for public participation in transportation planning in Arkansas. As the Plan is implemented, ARDOT will look to the FAC for continuing feedback about freight planning activities and the performance of the State freight system. FAC meeting materials (roster, agendas, presentations, and minutes) are provided in *Appendix A – FAC Meeting Materials and Summaries*.

# 2.0 FREIGHT PLAN GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

## 2.1 Supporting National Freight Policy

The FAST Act established national goals for the freight system, which include improving freight mobility, enhancing the safety of the movement of goods, and improving pavement condition. Table 1 describes the goals of the National Highway Freight Program and National Multimodal Freight Network and how they are supported through the Arkansas State Freight Plan.

**Table 1: National Freight System Goals**

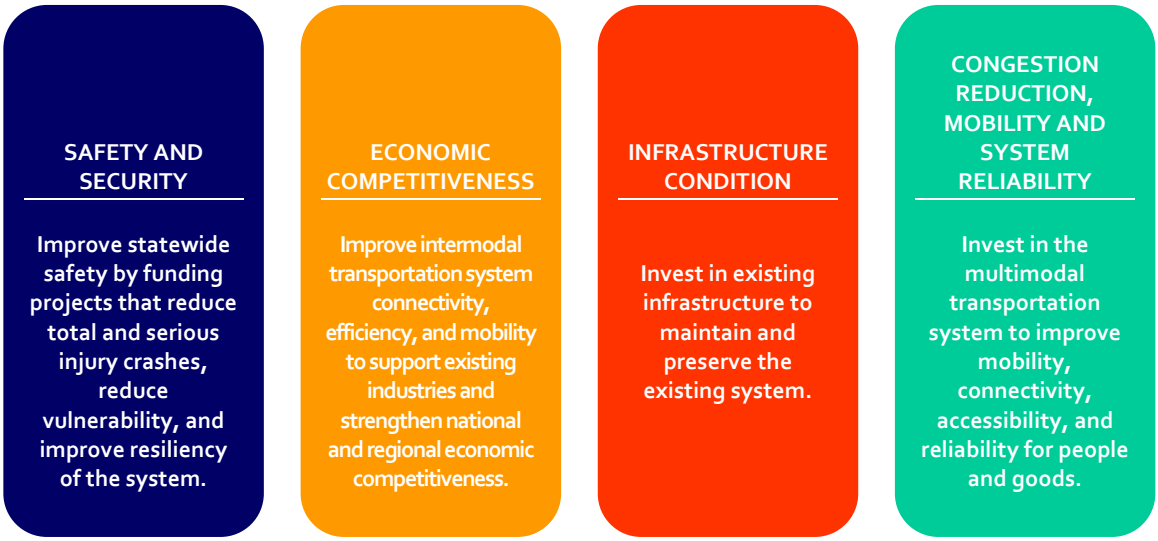
| National Freight System Goals |
|---|
| Identify policies, invest in infrastructure improvements, and implement operational innovations on the highways of the United States that:<br>A) strengthen the contribution of the National Highway and Multimodal Freight Networks to the economic competitiveness of the United States;<br>B) reduce congestion and bottlenecks on the National Highway and Multimodal Freight Networks;<br>C) reduce the cost of freight transportation;<br>D) improve the year-round reliability of freight transportation; and<br>E) increase productivity, particularly for domestic industries and businesses that create high-value jobs; |
| Improve the safety, security, efficiency, and resiliency of multimodal freight transportation in rural and urban areas; |
| Improve, achieve and maintain the state of good repair of the National Highway and Multimodal Freight Networks; |
| Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Highway and Multimodal Freight Networks; |
| Improve the efficiency and productivity of the National Highway and Multimodal Freight Networks; |
| Improve the short- and long-distance movement of goods that–<br>A) travel across rural areas between population centers;<br>B) travel between rural areas and population centers;<br>C) travel from the Nation's ports, airports and gateways to the National Multimodal 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 and Multimodal Freight Networks. |

## 2.2 Goals and Objectives

The preliminary Goals and Objective for the SFP were developed from the recently updated Statewide Long Range Intermodal Transportation Plan (2017) (LRITP), the Arkansas State Rail Plan (2015), ARDOT's Strategic Plan (2017-2022), and stakeholder and FAC input. Additional sources of information on goals and objectives were considered from interactive sessions with metropolitan planning organizations (MPOs) and a review of the US DOT National Freight Policy Goals.

The Arkansas LRITP is a policy context that addresses transportation issues across all modes in Arkansas. It provides an overarching approach to transportation needs over a long-term horizon, and it serves as a guide to inform future investment decisions on how the multimodal transportation system is preserved, maintained, and expanded. It is critical that the goals of the SFP are aligned with the LRITP to ensure the recommendations are consistent with broader transportation planning efforts across the State. Specifically, the SFP goals address Safety and Security; Economic Competitiveness; Infrastructure Condition; and Congestion Reduction, Mobility, and System Reliability. Freight-specific objectives were identified based on knowledge of the freight-related components of the Arkansas economy, specific freight modal activities in the State, and statewide freight plans from neighboring states.

**Figure 1: State Freight Plan Goals and Objectives**




The freight objectives are multimodal in nature. They include components that are relevant for trucking, rail, waterways, air cargo, and pipelines. The objectives also incorporate elements that are key to terminal operators such as inland ports, along with freight facility operators such as distribution centers and manufacturing establishments. The freight goals and objectives are emphasized throughout the SFP. Additionally, they will be points of reference regarding future multimodal plans and decisions that are made impacting goods movement in the State.

Table 2 shows the strategies that will be pursued to meet the goals and objectives of the SFP. These strategies were developed in coordination with the FAC as actions that will have a tangible impact on the movement of freight in Arkansas.

**Table 2: State Freight Plan Strategies**

| Goals | Strategies |
|---|---|
| **Safety and Security** | • Identify Interstate and non-Interstate truck crash hotspots and develop recommendations that have the potential to reduce truck-involved crashes.<br>• Partner with local governments to provide guidance on low-cost truck safety applications for local roads.<br>• Identify segments of the freight transportation system that may be at an elevated risk of failure based on infrastructure condition, system demand, or outside forces.<br>• Improve the resiliency of the freight transportation system |
| **Economic Competitiveness** | • Identify key freight routes between Arkansas and external trading partners in need of long-term additional capacity.<br>• Determine freight transportation needs of key existing freight-related industries in Arkansas.<br>• Prioritize and enhance intermodal connections for freight movement by updating designated National Highway System (NHS) intermodal connectors and documenting the use, condition, and performance of connectors.<br>• Determine the economic impact of freight-related bottlenecks on the Arkansas highway system.<br>• Collaborate with the Arkansas Economic Development Commission to identify freight projects that will improve the State's economic competitiveness.<br>• Support the maintenance and operation of State highways, bridges, rail, ports, locks, dams and airports. |
| **Infrastructure Condition** | • Provide predictable, reliable travel times on key freight corridors.<br>• Implement Intelligent Transportation System (ITS) strategies to provide commercial vehicle operators real-time information regarding weather conditions, travel times, emergencies, incidents, and delays.<br>• Consider technology advances such as connected and automated vehicles to improve freight system performance.<br>• Plan and prepare for autonomous and connected trucks.<br>• Use output from MPO Congestion Management Systems to identify and address congested areas on the NHS.<br>• Support freight multimodal transportation alternatives that best match origin-destination patterns. |
| **Congestion Reduction, Mobility, and System Reliability** | • Document freight transportation assets and needs for each mode.<br>• Provide current and forecast goods movement data for use in forecasting the future condition of freight infrastructure.<br>• Enforce weight and size restrictions to protect roads and bridges. |

## 2.3 Performance Measures

### 2.3.1 Performance Measures Based Upon FHWA Final Rulemaking

The Strategies for the SFP were further developed to define measurable impacts of freight infrastructure investments in Arkansas. Freight performance measures were identified by starting with the FHWA final rulemaking on national freight performance measures that took effect in May of 2017.

The FHWA final rulemaking on freight requires State DOTs to calculate freight travel time reliability on the Interstate highway system using the Truck Travel Time Reliability (TTTR) index. The TTTR index is calculated as the ratio of the 95th percentile travel time to the 50th percentile travel time: TTTR = 95th Percentile Truck Travel Time/50th Percentile Truck Travel Time. This can be thought of in terms of the worst travel conditions (within a month) compared to an average travel day. This analysis is conducted over a variety of time periods to capture both weekday and weekend travel characteristics. The Freight Reliability measure is a weighted average (by segment length) of the maximum TTTR.

The TTTR is calculated based on the following equation[1]:

$$\frac{\sum_{i=1}^{T}(SL_i * \max TTTR_i)}{\sum_{i=1}^{T} SL_i}.$$

Where:

- $i$ = An Interstate system reporting segment;
- $\max TTTR_i$ = The maximum TTTR of the five time periods of Interstate system reporting segment "i";
- $SL_i$ = Segment length of Interstate system reporting segment "i"; and
- T = A total number of Interstate system reporting segments.

High TTTR values indicate unreliable truck travel times, while low TTTR values indicate more reliable travel times. For example, a TTTR value equal to 2 indicates that truck travel times may be twice as long as average travel times for a given time period. The TTTR index measures the variability of travel times on the entire highway network. Highly variable or inconsistent truck travel times lead to unreliable service over the highway network.

Unreliability is a direct cost to motor carriers as they must hedge against unreliable travel times by budgeting additional time into their schedules. This translates into higher transportation costs that may be passed on to shippers. Wasted time also reduces available Hours of Service (HOS) for the truck drivers.

The TTTR is currently the only freight reliability measure required to be reported to FHWA on a biennial basis, with two- and four-year performance targets.

### 2.3.2 Performance Measures Based Upon Freight Plan Analysis

Although there is only one required performance measure, Arkansas is investigating other measures to gauge the performance of the system based on available data and measurable impacts to the freight system. Additional freight performance measures discussed by the FAC include the following:

[1] National Performance Management Measures: Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program, *Federal Register*, Vol. 82, No. 11, January 18, 2017.

- Number of truck-involved crashes and number of truck-involved fatalities – to assist in meeting the goal related to safety and security.
- Average pavement condition rating of the Arkansas Freight Highway Network and percent of Freight Highway Network in poor condition – to assist in meeting the goal on freight infrastructure condition.
- Annual tonnage moved on waterways – in recognition of the uniquely important role of waterways in Arkansas and the importance of waterways in maintaining the economic competitiveness of key industries.
- Average annual truck volumes, pavement condition and truck speeds on designated National Highway System (NHS) intermodal connectors – to support the economic competitiveness of intermodal freight facilities across Arkansas.
- Extending the TTTR calculation to the remaining NHS segments in Arkansas.

# 3.0 MULTIMODAL FREIGHT NETWORK

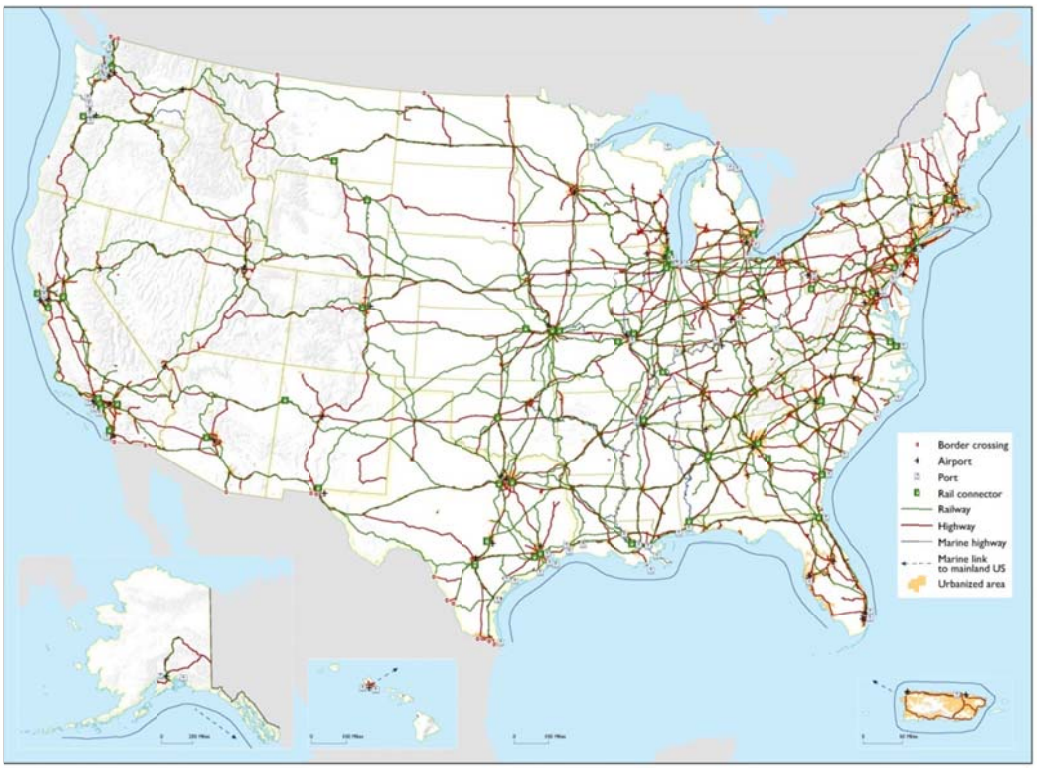
## 3.1 National Multimodal Freight Network

Arkansas has an extensive multimodal freight transportation infrastructure that includes highways, rail, waterways, air cargo, and pipelines. These systems work together to support Arkansas' freight-related industries across a number of different sectors, providing connectivity to the rest of the nation and the world. These facilities are the backbone of the system that brings goods to consumers across the State. Figure 2 displays the National Multimodal Freight Network as identified by the US DOT.

This system includes the following components (or layers) to provide connectivity and freight movement to the entire country.

- National Highway Freight Network
- Freight Rail Systems of Class I Railroads
- Public Ports with an annual trade of at least 2 million tons
- Inland and Intracoastal Waterways
- Great Lakes, St. Lawrence Seaway, and coastal/ocean routes
- 50 US Airports with the highest annual landed weight
- Other Strategic Assets (intermodal facilities, Class III railroads, Border Crossings, etc.)

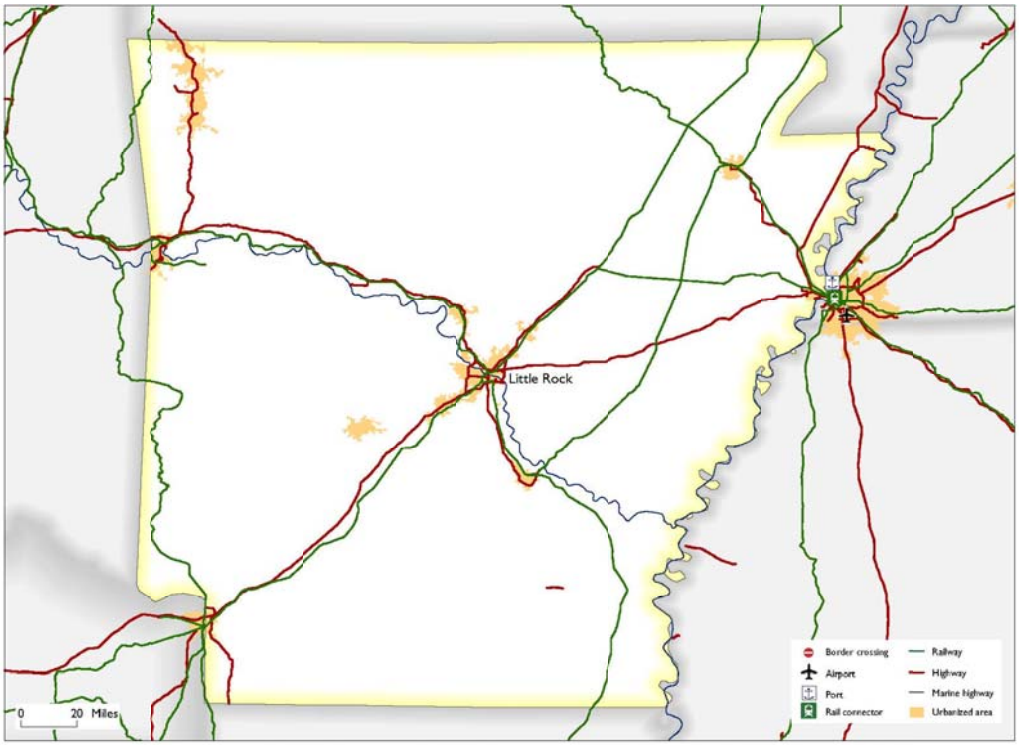
**Figure 2: Draft National Multimodal Freight Network**



## 3.2 Arkansas' Multimodal Freight Network

Arkansas' portion of the National Multimodal Freight Network is shown in Figure 3, displaying the draft multimodal freight network for highway, rail, waterways, and air cargo. This map is intended to be an identification tool to address freight movement needs. As new transportation assets are developed, they may become a part of this network. Additional detail, by mode of transportation is provided in the next section.

**Figure 3: Draft Arkansas' Multimodal Freight Network**




The Interstates are shown in red and are highlighted by I-40, which stretches across the State from the Ft. Smith region in western Arkansas to West Memphis at the eastern edge of the State, traveling through the central Arkansas metropolitan area. Interstates 40, 30, 530, and Highway 67 (Future I-57) are major roadways that converge in Central Arkansas providing connectivity to the Little Rock region from all corners of the State. Central Arkansas also features I-430, I-440, I-530, and I-630 which provide connectivity within the State.

In the western part of the State, I-49 provides a north-south connection through Benton and Washington Counties, connecting with Highway 71 in Bella Vista and then I-44 in Missouri. In Miller County, to the southwest, I-49 connects with I-20 in Louisiana. Interstate 540 provide connectivity from I-40 around the Fort Smith-Van Buren metropolitan area. Interstate 55 serves the eastern part of the State between Blytheville and West Memphis, providing connectivity to both Chicago and New Orleans. In northeast Arkansas, I-555 provides connectivity between the Jonesboro metropolitan area and Interstate 55. These roadways are supported by a series of State highways that connect points throughout Arkansas, to neighboring states, and to the nation.

Arkansas rail lines are most concentrated in the eastern half of the State, with two Union Pacific Railroad (UPRR) lines running from the northeast to the southwest, providing directional service. In the northeastern part of the State, Burlington Northern Santa Fe (BNSF Railway) provides service between Memphis and central Missouri, through Jonesboro. Kansas City Southern (KCS) serves the western part of the State with connections into Kansas City. These three Class 1 rail lines are served by several branch lines and a number of Class III railroads throughout the State. The Class III railroads provide critical service to local communities by bringing in raw materials and taking out finished products.

Both UPRR and BNSF Railway converge in the Memphis metropolitan region. UPRR operate a large intermodal facility in Marion, Arkansas (Crittenden County), adjacent to both I-40 and I-55. BNSF operates a large intermodal facility in southeast Memphis, with additional support facilities in Crittenden County.

There are numerous public and private ports and terminals in Arkansas that serve cargo moving on the inland waterway system. These ports and terminals are located on the Mississippi, Arkansas, Ouachita, White, and Red Rivers. The Mississippi River is identified as Marine Highway 55 (M-55). The Arkansas River, also known as the McClellan-Kerr Arkansas River Navigation System (MKARNS) is identified as M-40.

Arkansas also has four airports that move air cargo. However, the tonnage of freight movement from each of these airports is dwarfed by Memphis International Airport. Additionally, there is a robust pipeline network in the State for moving flowable goods.

## 3.3 Arkansas' National Highway Freight Network

Several designations of highway networks that have been established by the Federal Highway Administration. The National Network was authorized by the Surface Transportation Assistance Act of 1982, and states are required to allow conventional truck-trailer combinations to utilize this network. The National Highway System was created as part of the National Highway System Designation Act of 1995. The Fixing America's Surface Transportation (FAST) Act directed the FHWA to establish a National Highway Freight Network (NHFN) to strategically direct Federal resources and policies toward improved performance of highway portions of the freight transportation system. The NHFN consists of the following subsystems of roadways[2,3]:

- Primary Highway Freight System (PHFS): This is a network of highways identified as the most critical highway portions of the US freight transportation system, as determined by measurable and objective national data. The initial designation of the PHFS by the FAST Act is a 41,518-mile network consisting of 37,436 centerline miles of Interstates and 4,082 centerline miles of non-Interstate roads. In response to public comments, the US DOT

[2] Federal Highway Administration, Office of Freight Management and Operations. https://ops.fhwa.dot.gov/freight/infrastructure/nfn/. Accessed July 28, 2017.

[3] Federal Highway Administration, Department of Transportation, Final Designation of the Highway Primary Freight Network. https://www.transportation.gov/sites/dot.gov/files/docs/FHWA-151002-013_F%20PFN.pdf. Accessed July 28, 2017.

also developed a Multimodal Freight Network (MFN) to incorporate key infrastructure for all modes.

- Other Interstate portions not on the PHFN: These highways consist of the remaining portion of Interstate roads not included in the PHFN. These routes provide important continuity and access to freight transportation facilities. These portions amount to an estimated 9,511 centerline miles of Interstates, nationwide, and will fluctuate with additions and deletions to the Interstate Highway System.

- Critical Rural Freight Corridors (CRFCs): These are public roads not in an urbanized area that connect the PHFS and the Interstate system with important ports, significant freight generators, or other intermodal freight facilities.

- Critical Urban Freight Corridors (CUFCs): These are public roads in urbanized areas that connect the PHFS and the Interstate system with ports, significant freight generators, or other intermodal transportation facilities.

The segments of the roadway infrastructure most heavily used to move goods are the Interstate system, the United States highway network, and state routes are included on the National Highway Freight Network. These routes crisscross the State to provide connectivity for both long distance movements and first- and last-mile connections.

Figure 4 shows two of these three levels of the National Highway Freight Network. Designation of the Critical Rural and Urban Freight Corridors will be an on-going process discussed in sections 4.1.4 and *Appendix B – Arkansas Freight Network Identification Process*.

The Intermodal Connectors shown on this figure refer to the intermodal connectors identified as part of the National Highway System in 1995. Some of these facilities are no longer actively serving freight movements and will be considered for redesignation as part of the implementation of the SFP.

### 3.3.1 Primary Highway Freight Network (PHFN)

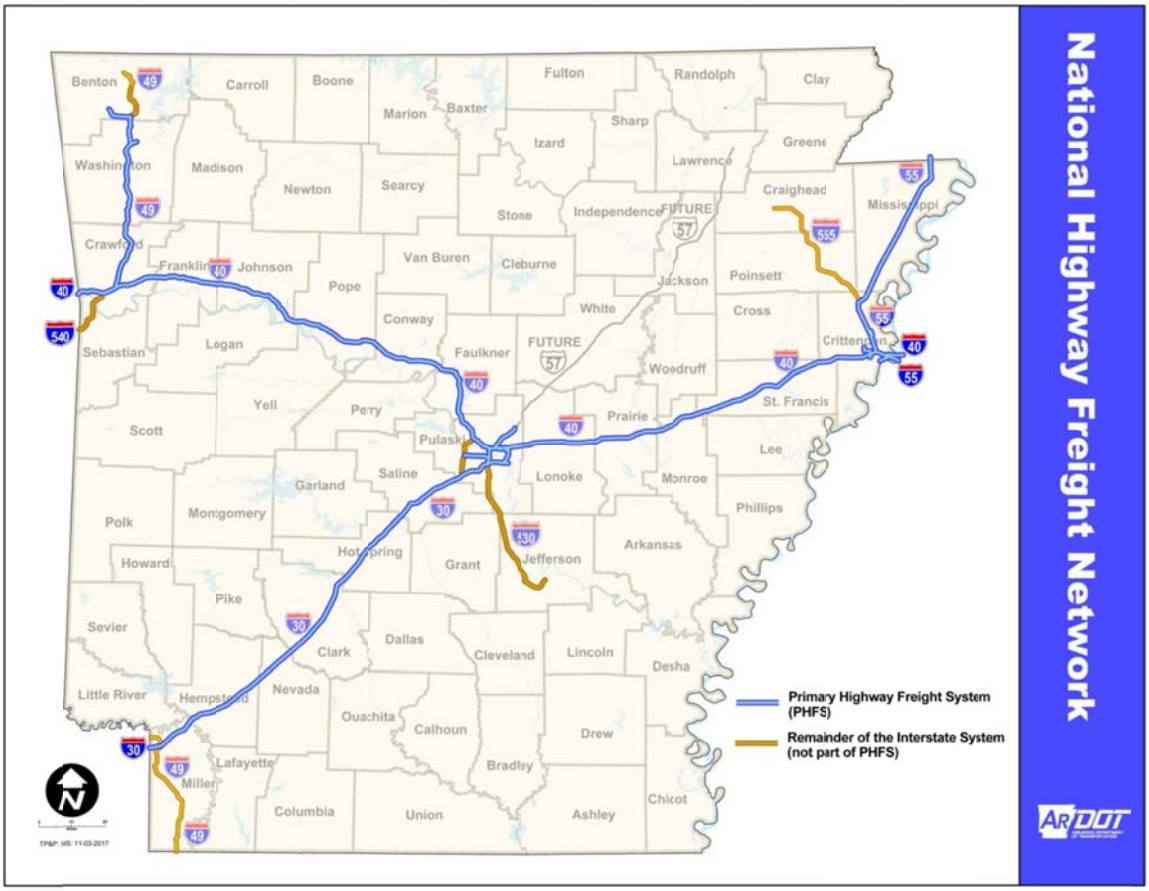
Table 3 lists the portions of the Primary Highway Freight Network (PHFN) that are located in Arkansas. The vast majority of the Interstate System in Arkansas is part of the PHFN.

**Table 3: Primary Highway Freight System (PHFS) Routes**

| Route | Beginning | Ending | Length (miles) |
|---|---|---|---|
| I-30 | Arkansas/Texas Line | I-40 | 145.53 |
| I-40 | Arkansas/Oklahoma Line | Arkansas/Tennessee Line | 284.67 |
| I-440 | I-30 | I-40 | 10.41 |
| I-540 | Wagon Wheel Road | I-40 | 56.22 |
| I-55 | Arkansas/Tennessee Line | Arkansas/Missouri Line | 69.85 |
| I-630 | I-430 | I-30 | 7.62 |
| U167 | I-40 | West Main Street | 8.91 |

Source: US DOT.

**Figure 4: Arkansas' Portion of the National Highway Freight Network (Partial)**




## 3.3.2 Other Interstate Portions Not On the PHFN

The FAST Act included the entirety of the Interstate System—including Interstate facilities not located on the PHFS—in the NHFN. However, all Interstate System roadways may not yet be reflected on the national and State NHFN maps and tables. FHWA will update the maps and tables on a periodic basis incorporating those new roads added to the Interstate System that become part of the "non-PHFS Interstate System Highways" component of the NHFN.

In the interim, FHWA maintains an Interstate System Route Log and Finder. All Interstate System routes reflected in the Route Log and Finder are components of the NHFN, either as part of the PHFS or non-PHFS Interstate System. Table 4 lists the routes currently identified as Non-PHFS Interstate System Highways in Arkansas.

Arkansas has received Federal approval to designate the section of Highway 67 between North Little Rock and Walnut Ridge as Future Interstate 57. The approval allows Arkansas to request that any segment of the highway that is built to interstate standards be officially added to the Interstate system.

**Table 4: Non-PHFS Interstate System Highways**

| Route | Beginning | Ending | Length (miles) |
|---|---|---|---|
| I-430 | I-30 | I-40 | 12.88 |
| I-530 | Highway 65 | I-30 | 46.42 |
| I-540 | Wagon Wheel Road | Highway 62 | 23.84 |

### 3.3.3 Arkansas Freight Intermodal Connectors

Designated National Highway System (NHS) freight intermodal connectors are critical components of the Arkansas freight network. NHS freight connectors are public roads that connect major intermodal terminals to the highway network. The following criteria were used to identify these intermodal connectors in 1995:

Primary Criteria for NHS Connectors:

- **Commercial Aviation Airports –** 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 20-foot equivalent units (TEU) per year or other unit measures that would convert to more than 100 trucks per day in each direction; or 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.
- **Truck/Rail –** 50,000 TEUs per year, or 100 trucks per day, in each direction on the principal connecting route, or other unit measures that would convert to more than 100 trucks per day in each direction; or
- **Pipelines –** 100 trucks per day in each direction on the principal connecting route.

Secondary criteria may be also used to justify an NHS connection:

- 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; or
- Connecting routes targeted by the State, an MPO, or others for investment to address an existing or anticipated deficiency as a result of increased traffic.

Freight intermodal connectors meeting these criteria in Arkansas are listed in Table 5. The identified intermodal connectors include two airports, two port terminals, seven truck/rail facilities, and three truck/pipeline terminals. As several of these intermodal facilities are in the process of development, the descriptions of these connectors may evolve over time.

## Table 5: Freight Intermodal Connectors

| County | Type | Terminal Facility | Description | PHFS Intermodal Connector |
|---|---|---|---|---|
| Pulaski | Truck/Rail Facility | UPRR Rail/Truck Ramp, North Little Rock | From I-40 along Hwy 161 and on Bethany Road. | Yes |
| Pulaski | Truck/ Pipeline Terminal | Central AR Pipeline/ Fuel Storage Complex, North Little Rock | From I-440 along Hwy 70 and on Central Airport Road. | Yes |
| Pulaski | Port Terminal | Little Rock Port Complex, Little Rock | From I-440 along Fourche Dam Pike, Lindsey Road, Industrial Harbor Drive, Slackwater Harbor Drive, Intermodal Loop Drive to entrance. | Yes |
| Crittenden | Truck/Rail Facility | BNSF Intermodal Terminal (IMX), Sunset | From I-55 along Company Road 4 and Hwy 77. | Yes |
| Crittenden | Truck/ Pipeline Terminal | Truman Arnold Fuel Storage Complex, West Memphis | From I-40 along Martin Luther King Jr. Drive, Hwy 38, South Loop, South 8th Street . | Yes |
| Crittenden | Truck/Rail Facility | UPRR Ebony Terminal (IMX), West Memphis | From I-40 along Hwy 118, Hino Boulevard, Kuhn Road to the intermodal terminal. | Yes |
| Sebastian | Airport | Fort Smith Regional Airport, Fort Smith | From I-540 along Hwy 22, 74th Street, Outer Loop Road. | |
| Crawford | Port Terminal | Port of Van Buren Complex, Van Buren | From I-540 along Hwy 59, Port Road, Riverfront Road. | |
| Pope | Truck/Rail Facility | River Valley Intermodal Complex (IMX), Russellville | From I-40 along Hwy 64, Hwy 247 to complex entrance road. | |
| Pulaski | Airport | Little Rock National Airport, Little Rock | From I-440 along Bankhead Drive, Airport Drive, Temple Street. | |
| Jefferson | Truck/Rail Facility | Port of Pine Bluff | From US 65B access ramps along 2nd Avenue, Nebraska Avenue, Port Road, Emmett Sanders Road. | |
| Drew | Truck/Rail Facility | Southeast Arkansas Regional Intermodal Facility (IMX), Wilmar | From US 425 along Hwy 278 to location of proposed intermodal facility. | |
| Union | Truck/ Pipeline Terminal | Lion Oil Pipeline/ Refinery/Fuel Storage Complex, El Dorado | From US 82 along Hwy 15, on Company Road 550, Hinson Road, Company Road 70. | |
| Mississippi | Truck/Rail Facility | Blytheville/Mississippi County Industrial and Transportation Complex, Blytheville | From I-55 along Hwy 18 to Nucor Yamato Steel Mill. | |
| Benton/ Washington | Airport* | Northwest Arkansas Regional Airport | From I-49 new location to Highway 264. | Yes |

* Not included in the NHS listing of intermodal connectors.
Source: FHWA Office of Planning.

### 3.3.4 Critical Rural and Urban Freight Corridors

Critical Rural Freight Corridors (CRFCs) and Critical Urban Freight Corridors (CUFCs) are defined as facilities that provide connectivity to other elements of the National Highway Freight Network. Designation of CRFCs and CUFCs allows for expanded use of Federal funds to improve freight system performance in Arkansas.

Arkansas has the opportunity to designate up to 150 miles of CRFCs and up to 75 miles of CUFCs, based on the total Primary Highway Freight System mileage of the State. The basic eligibility criteria for CRFCs and CUFCs are set forth in the FAST Act. Those criteria provide flexibility in designating highways that have significant freight volumes, provide connectivity to intermodal facilities, serve a major freight generator, or provide resiliency to other elements of the freight network.

Currently, the designation of CUFCs and CRFCs is an on-going process that is coordinated with the FAC. *Appendix B – Arkansas Freight Network Identification Process* highlights the methodology used to identify portions of the Arkansas Freight Highway Network in a process similar to that used at the Federal level. The CRFCs and CUFCs will be chosen from this network as needs arise.

## 3.4 Rail Infrastructure

The State Rail Plan includes information on freight rail, intercity passenger rail, and commuter rail. This section summarizes the elements of the rail plan pertaining to Arkansas's freight rail infrastructure.

There are approximately 2,662 miles of active rail lines in Arkansas. The vast majority of these rail lines are owned by either Class I or Class III railroads. Class I railroads are those that have a revenue of at least $467 million as of 2013. There are seven such railroads meeting these criteria in the nation. Class III railroads are those that have annual operating revenue of $37.4 million or less. There are no regional (Class II) railroads currently operating in Arkansas. There are some industrial spurs that are owned by port authorities or municipalities, as well as a rail segment owned by the Southeast Arkansas Economic Development District (SEAEDD).

Of the rail lines in Arkansas, the mileage operated by each railroad is as follows:

- 1,327 miles operated by Union Pacific Railroad (Class I);
- 198 miles operated by Burlington Northern Santa Fe Railway (Class I);
- 158 miles operated by Kansas City Southern Railroad (Class I); and
- 979 miles operated by 23 short line railroads.

The locations of the rail lines are shown in Figure 5 and are labeled based on the owner and operator of each segment.

There are also four Class I rail classification yards and intermodal facilities located in Arkansas:

1. Union Pacific Rail/Truck Ramp, North Little Rock, Pulaski County;
2. Port of Pine Bluff, Jefferson County;

3. BNSF Intermodal Terminal, Sunset, Crittenden County; and
4. Union Pacific Ebony Terminal, West Memphis, Crittenden County.

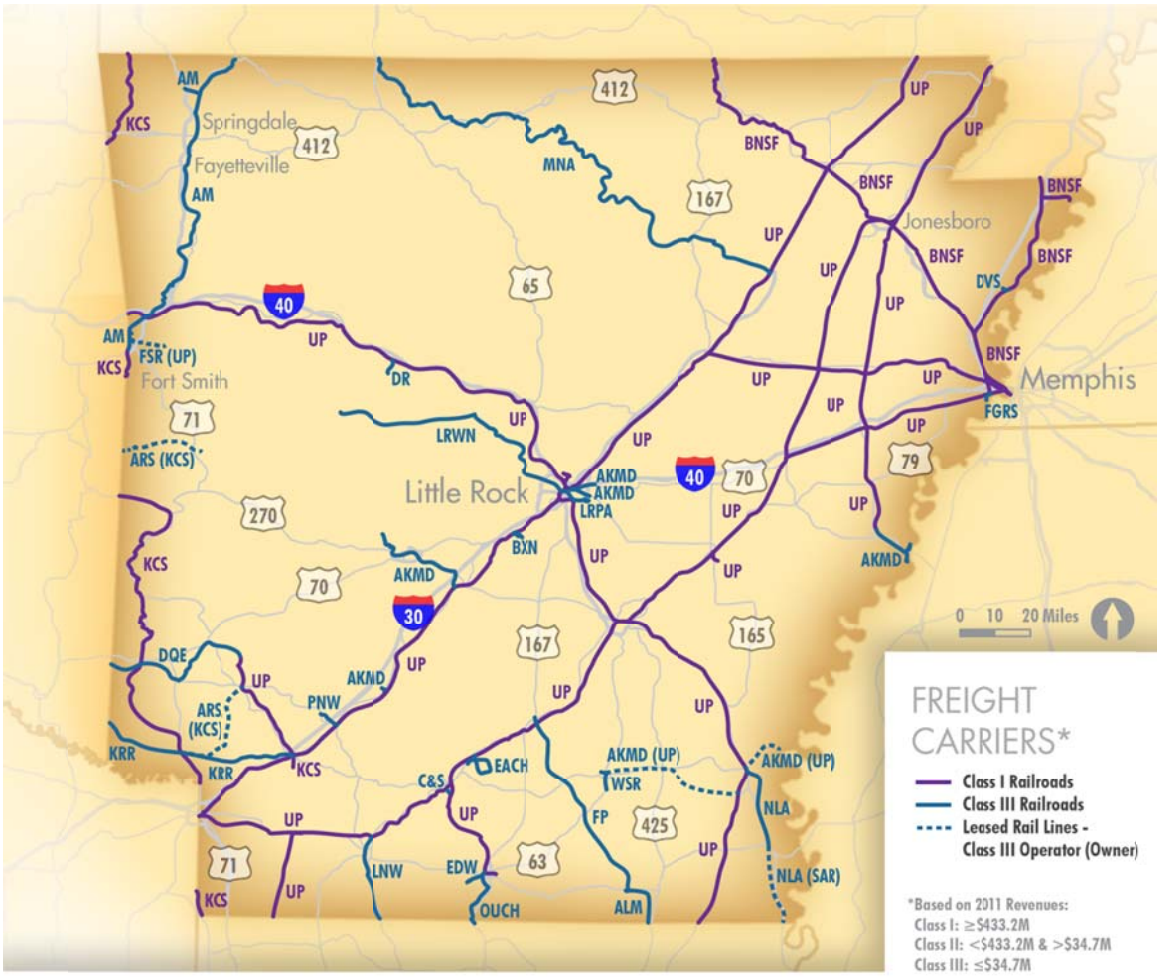
The UPRR facility in North Little Rock, while not an intermodal facility, contains the largest locomotive repair shop and one of the largest freight car classification yards in the UP system in addition to being UP's operational hub in Arkansas. An average day will see nearly 2,000 railcars pass through this facility. The locomotive repair shop, known as Jenks Shop, performs maintenance on UPRR's fleet of 7,000 locomotives, including overhauls for over 400 locomotive engines annually. In addition to the main shop are other structures and designated areas, which include a material storage yard, storage tracks, load test facility, shutdown/start up area, prewash building, tank farm, pumphouse, locomotive paint shop, air brake shop, wheel shop, turbo repair shop, and component remanufacturing center.

The Port of Pine Bluff is a 372-acre Harbor Industrial District and is the oldest public port on the McClellan-Kerr Arkansas River Navigation System. Seven industries are located in this district, as well as a US Army Corps of Engineers (USACE) marine terminal and US Coast Guard station. A 20-acre public terminal offers barge transloading, warehousing, and bulk storage. Rail service is provided by UPRR, who also operates a classification yard in Pine Bluff, with reciprocal switching by BNSF.

The BNSF Intermodal Terminal in Sunset, Arkansas is located in Crittenden County and is also known as the Harvard Yard. BNSF Railway is attempting to lease this facility or convert it this to a transload facility. This would allow BNSF to move shipments from railcars onto trucks for delivery to local customers.

UPRR is the largest Class I railroad operating in Arkansas, anchored by their intermodal terminal in Marion, Arkansas (in the Memphis metropolitan area), which is also referred to as the Ebony Intermodal Terminal due to its proximity to the town of Ebony. The Marion facility was opened in 1998 as a $70 million state-of-the-art, 600-acre intermodal facility. This terminal has a capacity to handle 375,000 containers per year. An analysis of TRANSEARCH data suggests that intermodal drayage to/from Arkansas is dominated by intermodal ramps in the Memphis metropolitan area. For intermodal drayage to/from ramps on a statewide level, 66 percent has either an origin or destination in the Memphis BEA (Tennessee, Mississippi, and Arkansas portions) with intermodal ramps in Crittenden County alone accounting for 31 percent of these drayage movements. Intermodal drayage in Crittenden County is anticipated to grow around 25 percent between 2013 and 2040, compared to 43 percent in the Memphis region as a whole. Statewide, the number of trips to and from intermodal ramps is anticipated to nearly double between 2013 and 2040.

## Figure 5: Arkansas' Rail Infrastructure




Source: State Rail Plan.

## 3.5 Ports and Waterways Infrastructure

### 3.5.1 United States Inland Waterway System

The United States Inland Waterways System (IWWS) is made up of nearly 12,000 miles of Federally maintained navigable waterways on rivers, lakes, and coastal bays, touching 38 of the 48 contiguous states and handling shipments to/from the 38 states. The IWWS is part of a larger system designated as America's Marine Highways.

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.

### 3.5.2 Arkansas Waterway System

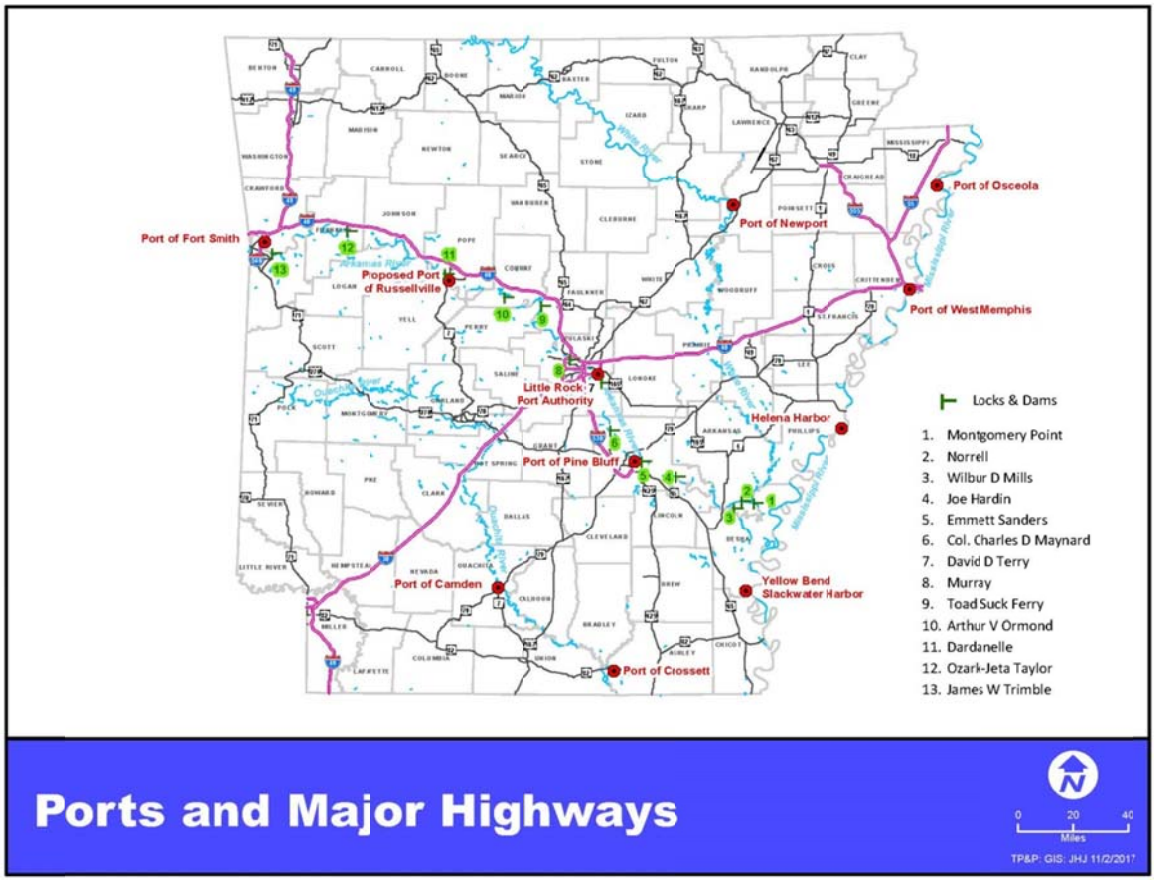
The Inland Waterways System links Arkansas to coastal ports in the Gulf of Mexico like Mobile, New Orleans, Morgan City, Houston, and Brownsville. The waterways also link Arkansas to domestic markets such as Minneapolis, Chicago, Pittsburgh, Chattanooga, and Tulsa. Figure 6 shows the Arkansas inland 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. There are also 15 locks and dams in Arkansas, which make navigation possible. Thirteen 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.

The five navigation systems listed above 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 characteristics of the five river systems are as follows:

1. The Mississippi River forms the eastern border (320 miles) of the State. 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. About 200 million tons of cargo pass by the State on the waterway each year. 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.

**Figure 6: Arkansas' Ports and Major Highways**




5. The Arkansas River (McClellan-Kerr Arkansas River Navigation System, MKARNS) provides navigation through Arkansas from its connection to the Mississippi River south of Helena to Catoosa, Oklahoma. About 308 miles of channel are located in Arkansas. The river is currently navigable with a 9-foot draft. It is authorized, but not funded, for 12-foot navigation. Public ports are located at Pine Bluff, Little Rock, and Fort Smith/Van Buren.

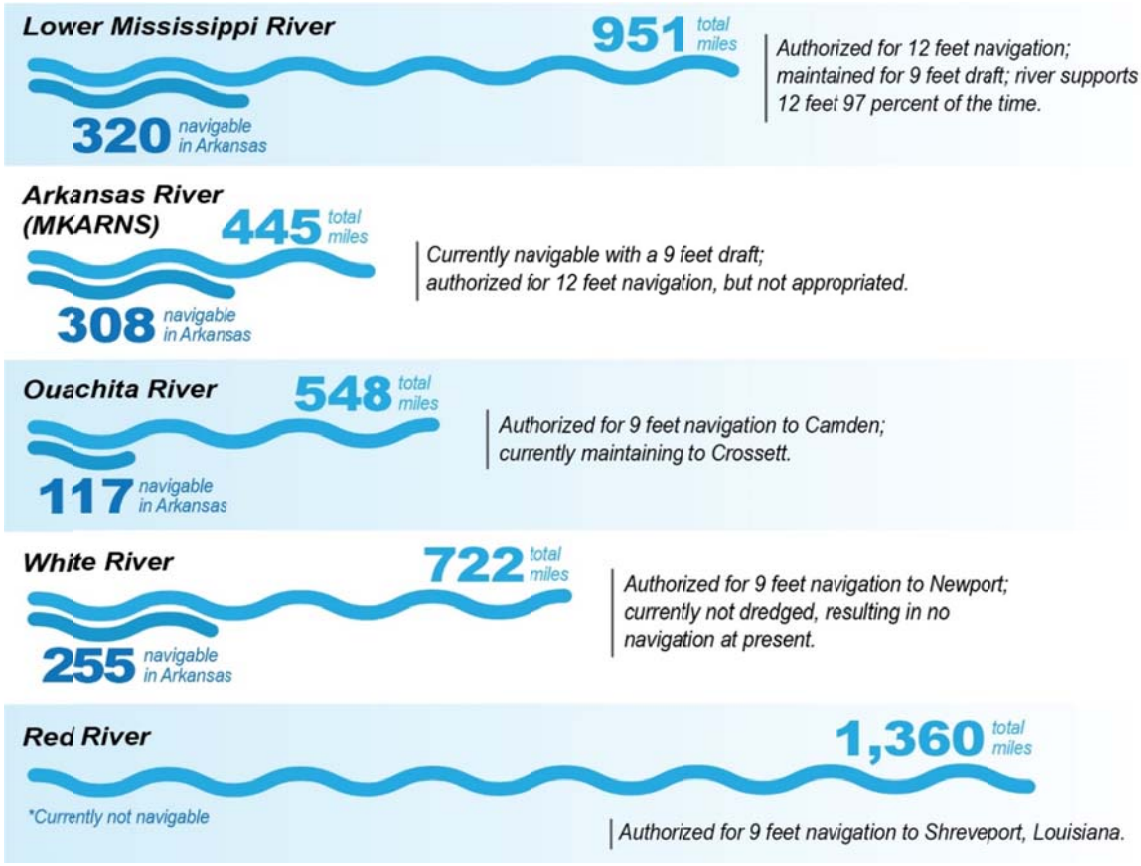
6. The Ouachita River (Ouachita/Black Navigation System) flows from south central Arkansas to its confluence with the Tensas River near Jonesville, Louisiana, where it becomes the Black River, and enters the Mississippi River north of Baton Rouge via the Old River Lock. The Ouachita is authorized for a 9-foot-deep channel from the Louisiana state line to Camden, Arkansas, a distance of 117 miles. The towns of Camden and Crossett both have public ports. The river has recently been dredged only to Crossett.

7. The Red River is currently navigable from the Mississippi River north of Baton Rouge to Shreveport, Louisiana. A study was conducted by the USACE to allow navigation into Arkansas to Index Bridge between Texarkana and Ashdown, Arkansas. Variations of the study call for navigation to Garland City and Fulton, Arkansas. Information available at this time indicates the cost/benefit ratio for channel improvements does not meet the minimum requirement set by the USACE.

8. 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 USACE is currently studying expanding navigation from about 57 percent of the year to 95 percent. The river is currently not dredged, thereby resulting in no navigation.

Summary characteristics of the rivers in Arkansas are shown in Figure 7.

**Figure 7: Arkansas' River Characteristics**




### 3.5.3 MKARNS

A major component of the Arkansas inland waterway freight system is the freight moved along the Arkansas River. The Arkansas River is part of the MKARNS and provides navigation from the Mississippi River in the east to Catoosa, Oklahoma in the west. The US DOT Maritime Administration (MARAD) recently designated the MKARNS as Marine Highway 40 (M-40). 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 on the MKARNS at the Ports of Little

Rock, Muskogee, and Tulsa. About 42 countries have traded commerce with the Arkansas River Basin Region via the MKARNS[4].

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.

The USACE maintains a 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[5].

## 3.6 Air Cargo Infrastructure

Arkansas is home to 77 airports listed in the Federal Aviation Administration's (FAA) National Plan of Integrated Airport Systems (NPIAS). This list is updated every two years to identify existing and proposed airports t are considered significant for national air transportation. Of these 77 airports, four are considered primary airports for passenger and cargo movements:

- Bill and Hillary Clinton National/Adams Field (LIT);
- Fort Smith Regional (FSM);
- Northwest Arkansas Regional (XNA); and
- Texarkana Regional-Webb Field (TXK).

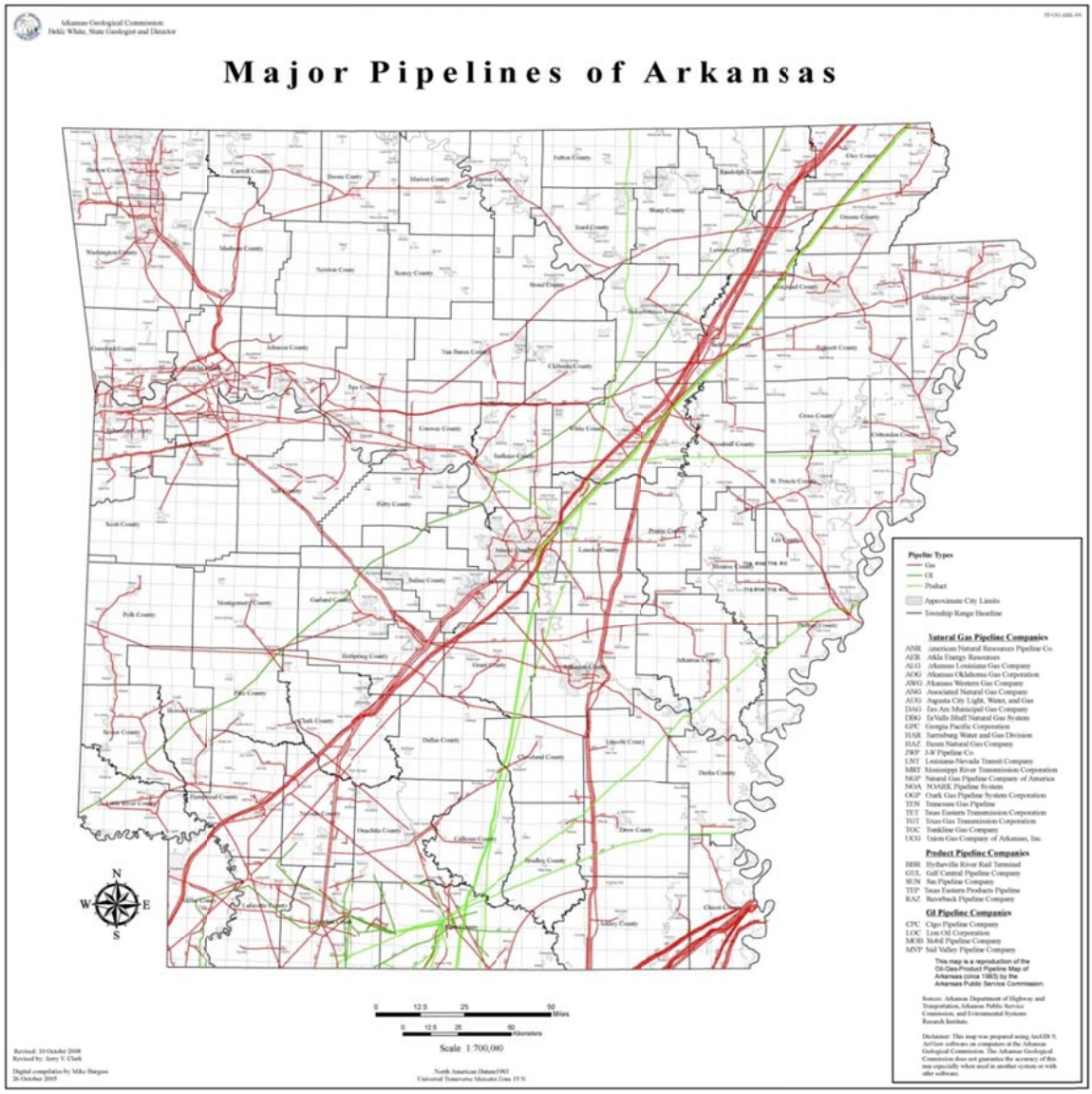
## 3.7 Pipeline Infrastructure

Pipelines are another critical component of the freight network of Arkansas responsible for transporting large quantities of both hazardous liquids and natural gases each year. The locations of these pipelines are maintained by the National Pipeline Mapping System (NPMS). However, due to the sensitive nature of these products and several thousand miles of unprotected pipelines, data is not publically available on the exact locations of these transmission lines. A State map of these pipelines is shown in Figure 8.

[4] Regional Economic Impact Study for the McClellan Kerr Arkansas River Navigation System, Maritime Transportation Research and Education Center Tier 1 University Transportation Center, UNITED STATES DOT, August 2015.

[5] 2015 Inland Waterway Fact Sheet, Oklahoma Department of Transportation, 2015.

**Figure 8: Major Pipelines of Arkansas**




Source: Arkansas Geological Commission

## 3.8 Transportation Support Systems

Vehicles used to transport freight shipments typically weigh significantly more than a typical passenger car, resulting in operating conditions much different than a typical passenger vehicle – both in relation to other vehicles and in relation to the transportation infrastructure. Critical to these relationships is communication between the drivers of the vehicles and in some cases communication between the driver and the actual infrastructure.

Heavier vehicles also result in increased wear and tear on the roadway system. For this reason, vehicles are limited to a maximum gross weight of 80,000 pounds in most cases. For some industries, such as mining, agriculture, energy cargo and equipment, and timber, exceptions are more commonly made through the State's oversize/overweight permitting process to allow

vehicles to haul more than this 80,000 pound limit. To issue these permits, an analysis of the routes is typically undertaken to ensure that the roadways are capable of handling the additional load. Additionally, ARDOT is in the process of developing a Transportation Asset Management Plan (TAMP) to provide strategic direction for operating and maintaining the State's multimodal infrastructure.

A well-maintained infrastructure also allows the communication of roadway conditions to road-users through connected or automated vehicles (CV/AV). Therefore, it is important that all portions of the roadway are maintained in a manner that allows information to be gathered by vehicle sensors.

### 3.8.1 Pavement Marking and Profiling

On-going maintenance activities include pavement profiling and marking crews responsible for striping, patches, minor overlays, and left turn installations. Striping and marking Arkansas' highways will increase visibility in critical roadway components such as lane designations, on and off ramps, merging lanes, reduced speed zones, and more. Striping and marking highways and maintaining striping helps drivers see the road ahead of them better both day and night. Visible striping and the addition of left turn lanes will help freight by fostering a safer and more efficient system of highways. With higher visibility in pavement and markings, operators can see further, giving them more time to react to changing road conditions. For example, markings of reduced speed for tolls ahead or a merging lane can be seen from greater distances allowing improved driver reaction time resulting in more efficient driving cycles.

Pavement milling helps to create a safer and more level base for fresh pavement and a safer, smoother ride for all vehicles. Milling and pavement patching can improve the efficiency of freight movement by reducing potential road hazards, such as potholes, uneven lanes, or extreme grades. Milling for deteriorated pavements or paving new roads not only creates a safer highway system but also saves drivers money and is better for the environment.

*According to a study at the Massachusetts Institute of Technology, "Together with rough road surfaces, pavement deflection costs American drivers in total about $15.6 billion in added fuel costs and is responsible for 46.5 million metric tons of CO2 emissions." This MIT study predicted fresh pavement could save 273 million barrels of crude oil per year.*

### 3.8.2 Facilities Management

Facilities Management is responsible for the construction and remodeling of rest areas, tourist information centers, weigh stations, and more. They also oversee the construction or remodeling of the central office complex facilities, 10 district headquarters, 84 area headquarters, and 32 resident engineer offices. Facilities Management treats rest areas and tourist information centers as a recreational enhancement to the user experience for the traveling population. Creating pleasant rest areas is beneficial to freight operators as there is a correlation between parks and green space and mental and physical health. The provision of enjoyable rest areas is crucial for operators to utilize the restroom, eat, relax, and recharge during breaks in order to promote a better physical and mental state when returning to the road. These rest areas also provide much needed capacity for truck parking in order for drivers to comply with Federal HOS laws.

In addition to constructing and remodeling buildings and landscaping, Facilities Management oversees electrical components, such as lighting. Underground storage tanks, video surveillance systems, and wastewater treatment plants also coincide with Facilities Maintenance. These functions all aim to create a safer, cleaner atmosphere at rest areas along Arkansas' highways.

### 3.8.3 Maintenance Management System

The Maintenance Management System oversees the financial responsibility of actual maintenance operations and projects including the District Maintenance Expense Budget, Road Improvement Program, Overlay Allotment, Contract Mowing Funds, and Equipment Replacement Funds. The Maintenance Management System ensures all divisions of highway maintenance are adequately funded to carry out operations and to complete projects.

### 3.8.4 Traffic Services

Traffic Services oversees all aspects of traffic signs from design to installation and is responsible for conducting traffic studies. Traffic Services not only designs and installs signage but also manufactures it. Maintaining old signage and keeping up-to-date with new signage is crucial for safe and efficient highway travel. Traffic Services is beneficial to freight by maintaining a safe driving environment and increased capacity. With effective and visible signage, more vehicles can pass through highways more efficiently. All signage, from mile markers and speed limits to construction or exit signs, provide information vital to the safe and efficient flow of traffic, including freight.

### 3.8.5 Heavy Bridge

The Heavy Bridge Division is in charge of the maintenance, repair, and inspection of Arkansas' 62 largest bridges. These bridges include, but are not limited to, bridges crossing the Mississippi River and the Arkansas River, which connect traffic to adjacent states. These bridges are critical components to the national freight infrastructure to ensure that trucks can safely travel on I-30, I-40, and I-55 for movements to, from, and within Arkansas. Heavy Bridge maintenance seeks to keep the structural integrity of heavy bridges intact by fixing pot holes, rust, joints, cracks, and more. The Heavy Bridge Division also helps other Districts with bridge repairs as a result of serious accidents. This Division is important to keeping freight moving through Arkansas into neighboring states. The maintenance, inspection, and repairing of heavy bridges is vital to the safety of all vehicular traffic, especially freight.

# 4.0 Economic Impact of Freight Movement in Arkansas

## 4.1 Economic Basis for Freight Demand

As mentioned previously, a close relationship exists between socioeconomic activity and the demand for freight services. Growth in the demand for consumer goods has mirrored growth in population, both in Arkansas and in the nation.

Economic output by industries is another key driver of freight activity. These industries can be divided into two categories: 1) freight-dependent industries and 2) non-freight dependent industries. Freight dependent industries have a heavy reliance on the movement of goods. They tend to be in the business of extracting or developing raw materials, transforming a physical product into a processed good for consumption by other entities, or in the business of actually moving goods between suppliers, producers and consumers. These industries include agriculture, manufacturing, construction, wholesale/retail trade, and transportation/warehousing.

Non-freight dependent industries are often associated with the service sector. They consume much smaller amounts of goods, with shipments often being parcel-size and supplies being those needed to stock office buildings and light commercial activity. Table 6 details which industries fall into the freight dependent and non-freight dependent categories.

**Table 6: Freight and Non-Freight Dependent Industry Definitions**

| Freight Dependent | Non-Freight Dependent |
|---|---|
| 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 |

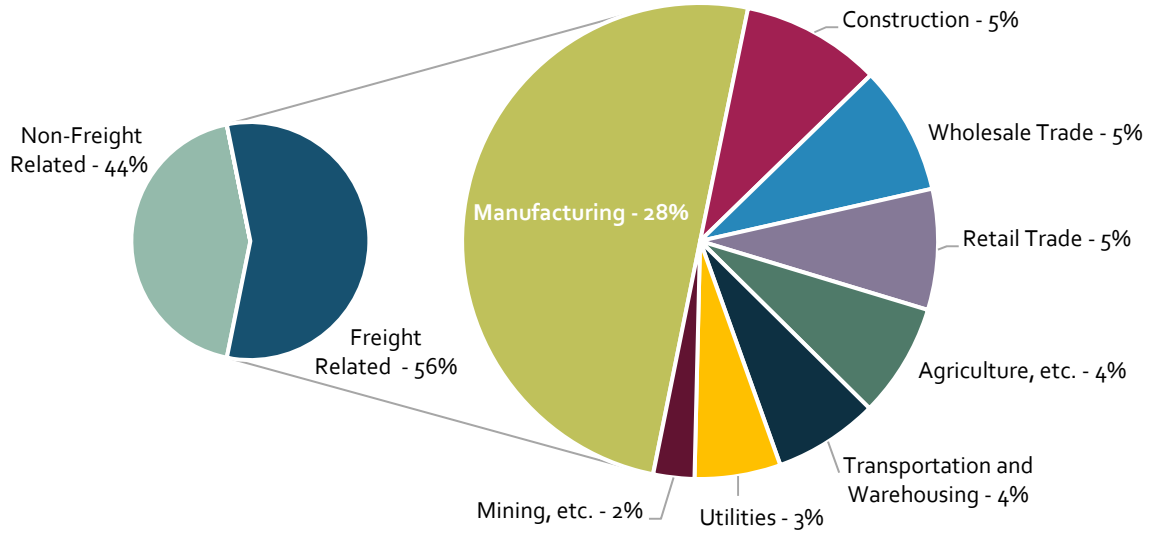
Source: Cambridge Systematics.

Figures 9 and 10 show the economic output and employment distribution of Arkansas for freight dependent and non-freight dependent industries in 2013, respectively. Freight dependent industries are responsible for 56 percent of the total economic output for Arkansas. The total economic output of the State in 2013 is estimated to be $252 billion and freight-dependent-industries represent $142 billion. Freight dependent industries are responsible for 38 percent of the employment in Arkansas – or roughly 600,000 employees.

Roughly half of the economic output of the freight dependent industries is produced from the manufacturing industry. Other key industries for economic output include agriculture, construction, retail trade and wholesale trade. In terms of employment, approximately one-quarter of the freight dependent employment is in manufacturing with another one-quarter in

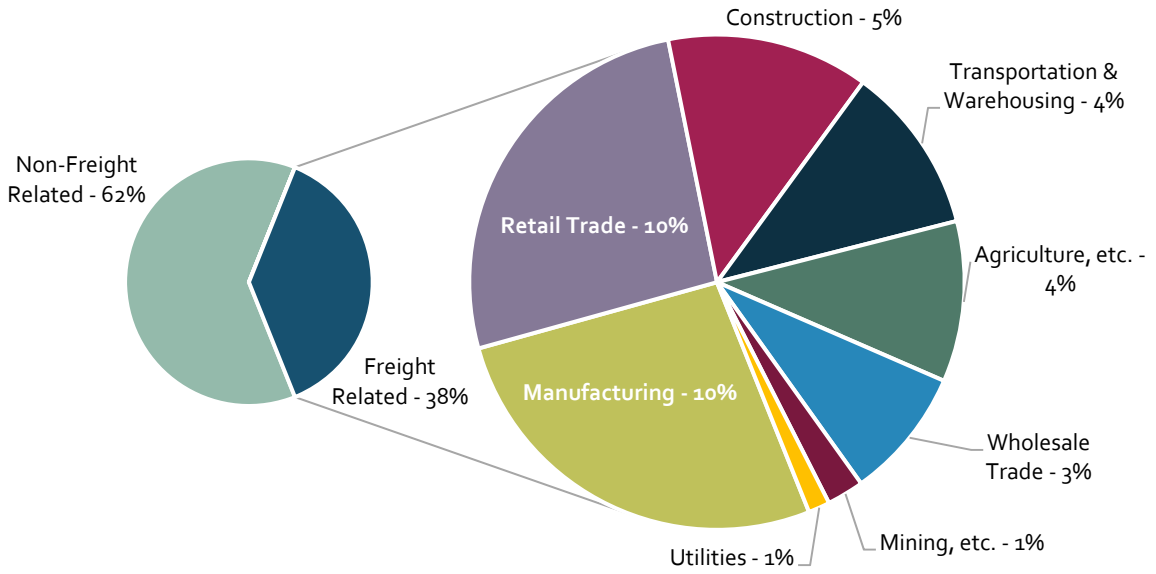
retail. Construction, agriculture, and transportation/warehousing are other industries with a large proportion of employees in freight dependent industries.

**Figure 9: Share of Arkansas' Economic Output by Industry**




Source: IMPLAN.

**Figure 10: Share of Arkansas Employment Distribution by Industry**




Source: IMPLAN.

## 4.2 Statewide Flows by Mode and Direction

IHS/Global Insight TRANSEARCH freight flow data was used to analyze freight flows in Arkansas. Table 7 shows that trucks are the dominant mode for moving goods in Arkansas. Trucks carry 157 million tons of goods, representing over 70 percent of the goods that are moved

in the State from a tonnage perspective. Freight rail is the second highest mode in terms of tonnage, moving 20 percent of the total tons; followed by waterways, which move 8 percent of the total goods in the State. Air cargo is the smallest mode for moving freight, with 20,000 tons moved in 2013. It should be noted that air cargo volumes do not include FedEx or USPS.

### Table 7: Arkansas Freight Movement by Mode, Tonnage, and Value, 2013

| Mode | Tonnage (Thousands) | Percent of Total | Millions of Dollars | Percent of Total |
|---|---|---|---|---|
| Truck | 157,093 | 72% | 132,474 | 75% |
| Rail | 44,645 | 20% | 34,608 | 19% |
| Water | 17,409 | 8% | 9,128 | 5% |
| Air | 20 | < 1% | 1,734 | 1% |
| **Total** | **219,167** | **100%** | **177,944** | **100%** |

Source: TRANSEARCH.

Table 8 shows the tonnage volumes by mode for outbound, inbound, and internal flows. Each of the modes has very different origin-destination patterns. The trucking mode has a relatively even balance of inbound, outbound and internal flows. Internal trucking flows are the lowest of all of the directional flows, but still represent 29 percent of all of trucking goods moved.

The rail mode features much longer freight trips compared to the trucking mode. Less than one percent of rail modes have both the origin and destination within Arkansas. There was an estimated 28 million tons of inbound rail flows in 2013. This represented 63 percent of all rail flows in Arkansas. Of these inbound rail flows, 17 million tons were coal shipped to Arkansas from Wyoming.

The waterways mode also features much longer trip distances relative to trucks, but does have over two million tons of goods that are shipped purely within the State. This is over seven times the tonnage of internal flows of the rail mode. These internal waterway trips are important to Arkansas because they represent shipments that are both produced by an in-state company and used as supplies for further processing by an in-state company.

Air cargo is roughly evenly balanced between inbound and outbound flows with no within-state air cargo movements being reported.

### Table 8: Arkansas Freight Movement by Mode and Direction, 2013

| Mode | Tonnage (1,000) | | | |
|---|---|---|---|---|
| | Inbound | Outbound | Internal | Total |
| Truck | 50,494 | 61,205 | 45,394 | 157,093 |
| Rail | 28,179 | 16,182 | 284 | 44,645 |
| Water | 6,697 | 8,676 | 2,035 | 17,409 |
| Air | 11 | 9 | --- | 20 |
| **Total** | **85,381** | **86,072** | **47,713** | **219,167** |

Source: TRANSEARCH.

## 4.3 Top Trading Partners

Table 9 shows the top trading partners for Arkansas by Bureau of Economic Analysis (BEA) region by mode. The largest trading partner for Arkansas is the Casper BEA in Wyoming. This is due to the 17 million tons of coal that are shipped to the State from the Casper BEA. Arkansas is the fifth largest recipient of coal from Wyoming trailing only Texas, Illinois, Missouri, and Wisconsin.[6] About 54 percent of the electricity in Arkansas is generated from coal-fired electric power plants, compared to 33 percent nationwide.[7,8] Conversely, just four percent of Arkansas' electricity consumption is from natural gas compared to 33 percent nationwide. According to the US Energy Information Administration, this four percent share was actually a six-fold increase above the share of natural gas in 2005. The combination of increasingly stringent environmental regulations on coal-fired plants and the likely long-term low prices of natural gas have the potential to decrease the consumption of coal in Arkansas, thereby decreasing rail flows into the State from Wyoming.

### Table 9: Top Trading Partners by Tonnage, 2013

| BEA Name | Truck | Rail | Water | Air | Total |
|---|---|---|---|---|---|
| Casper, WY | 53,289 | 17,091,198 | – | – | 17,144,487 |
| Dallas-Fort Worth, TX | 9,965,608 | 1,408,029 | – | 738 | 11,374,375 |
| Memphis, TN-MS-AR[9] | 9,513,454 | 1,240,127 | 208,374 | 7 | 10,961,962 |
| New Orleans-Metairie-Bogalusa, LA | 1,868,043 | 257,512 | 8,350,195 | 143 | 10,475,893 |
| Jackson-Yazoo City, MS | 6,612,763 | 383,400 | 153,840 | 41 | 7,150,044 |
| Houston-Baytown-Huntsville, TX | 4,270,695 | 1,289,825 | 1,071,310 | 263 | 6,632,093 |
| Shreveport-Bossier City-Minden, LA | 4,269,008 | 2,311,199 | 13,663 | 2,694 | 6,596,564 |
| Tulsa-Bartlesville, OK | 5,350,194 | 316,124 | 337,743 | 75 | 6,004,136 |
| St. Louis-St. Charles-Farmington, MO-IL | 3,911,737 | 824,428 | 642,809 | 147 | 5,379,121 |
| Springfield, MO | 5,306,085 | 69,264 | – | – | 5,375,349 |
| All Others | 60,578,168 | 19,170,176 | 4,595,406 | 16,337 | 84,360,087 |
| **Total** | **111,699,044** | **44,361,282** | **15,373,340** | **20,445** | **171,454,111** |

Source: TRANSEARCH. Note internal flows excluded.

The Dallas and Memphis BEA regions are the second and third largest of Arkansas' trading partners; both with roughly 11 million tons traded in 2013. The trade to both of these regions is dominated by the trucking mode, but over 10 percent of these flows are by rail. The large volume of trade to these two BEA regions also demonstrates the importance of I-40 and I-30 for moving

[6] The 2015-16 Concise Guide to Wyoming Coal, Wyoming Mining Association.

[7] U.S. Energy Information Administration, Arkansas State Profile and Energy Estimates, 2015.

[8] U.S. Energy Information Administration, Frequently Asked Questions, 2015, http://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3.

[9] BEAs which include portions of Arkansas do not include the tonnage associated with Arkansas under the individual BEA. Rather, those are included in the Arkansas internal movements.

goods within Arkansas and to the Memphis and Dallas regions. The large volumes of both truck and rail flows with these trading partners indicate that these are corridors which can be examined for the potential to increase truck-rail diversion.

The New Orleans BEA region is the fourth-largest trading partner with Arkansas with over 80 percent of the 10.4 million tons of trade with the region occurring by waterway using the Mississippi River. The waterway trade with the New Orleans BEA represents over half of all the Arkansas waterway trade. The majority of this waterway trade consists of grain (e.g. rice) and oil kernels, nuts, or seeds, which comprise 38 percent and 33 percent of the tonnage, respectively. These movements are predominantly outbound movements from Arkansas to the New Orleans region. Other key Arkansas trading partners for waterways include the Houston, Baton Rouge, and St. Louis BEAs.

Other key trading partners that are connected to Arkansas by the trucking modes include the nearby BEAs of Jackson, Mississippi; Houston, Texas; Shreveport, Louisiana; Tulsa, Oklahoma; and Springfield, Missouri. Each of these BEAs trade more than 4 million tons annually with Arkansas by truck. Corridors within Arkansas that connect to these destinations are therefore of particular importance to freight-related industries within Arkansas.

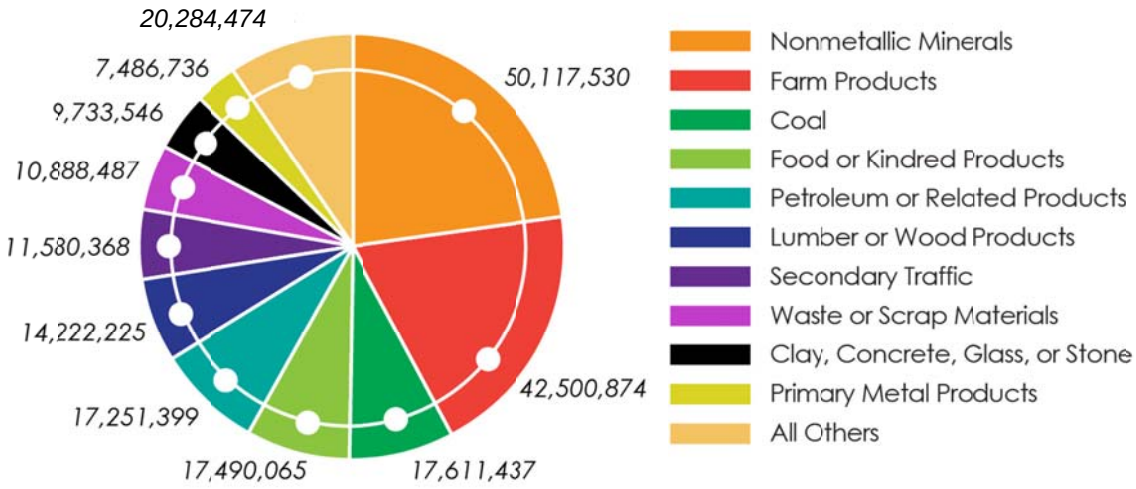
The Houston BEA is noteworthy as it is the only trading partner with more than one million tons by each of the truck, rail, and waterway modes for Arkansas. Similar to the Dallas and Memphis BEAs, the corridors between Arkansas and Houston can be examined for the potential for diverting truck traffic to alternative modes. The freight hubs of the Kansas City BEA and the Los Angeles BEA also generate a significant amount of trade with Arkansas. Each of these BEAs has over 1 million tons of rail trade with Arkansas and the Kansas City BEA has 2.5 million tons of truck traffic trade with Arkansas.

It should also be noted that destinations that are international ports (Houston, New Orleans, etc.) reflect only the shipment traveling to the port. The ultimate destination of the tonnage reported could be domestic or international.

## 4.4 Top Commodities

The top commodities moved in Arkansas (including outbound, inbound, and internal flows) are shown in Figure 11 with detailed information in Table 10. This table shows that over 50 million tons of nonmetallic minerals are transported in Arkansas making it the largest commodity moved in the State, representing 23 percent of all Arkansas' freight flows. Nonmetallic minerals are used for road and building construction. A related commodity is the clay, concrete, glass or stone commodity, which represents another 10 million tons moved in Arkansas. These commodities are both heavy bulk commodities that are widely available and tend to be sourced from locations as close as possible to where they will be used for construction to minimize transportation costs. These short-distance trips lend themselves to the trucking mode. However, the rail and waterway modes can also be used to move these commodities as they are also cost-effective for medium-distance trips of these commodities.

**Figure 11: Top Commodities Moved in Arkansas by Tonnage, 2013**




Source: TRANSEARCH.

**Table 10: Top Commodities Moved in Arkansas by Tonnage, 2013**

| Commodity | Truck | Rail | Water | Air | Total | Percent of Total |
|---|---|---|---|---|---|---|
| Nonmetallic Minerals | 42,826,277 | 4,896,220 | 2,395,029 | 4 | 50,117,530 | 23% |
| Farm Products | 34,018,666 | 2,063,806 | 6,418,402 | | 42,500,874 | 19% |
| Coal | 8,525 | 17,193,302 | 409,610 | | 17,611,437 | 8% |
| Food or Kindred Products | 14,218,094 | 3,073,962 | 197,952 | 58 | 17,490,065 | 8% |
| Petroleum or Related Products | 14,826,997 | 473,710 | 1,950,692 | | 17,251,399 | 8% |
| Lumber or Wood Products | 12,929,680 | 1,250,367 | 42,124 | 53 | 14,222,225 | 6% |
| Secondary Traffic | 11,580,368 | | | | 11,580,368 | 5% |
| Waste or Scrap Materials | 6,875,783 | 1,376,677 | 2,636,026 | | 10,888,487 | 5% |
| Clay, Concrete, Glass, or Stone | 7,966,984 | 1,625,757 | 140,805 | | 9,733,546 | 4% |
| Primary Metal Products | 1,907,005 | 3,664,493 | 1,915,176 | 62 | 7,486,736 | 3% |
| All Others | 9,934,955 | 9,026,492 | 1,302,759 | 20,267 | 20,284,474 | 9% |
| **Total** | **157,093,334** | **44,644,786** | **17,408,575** | **20,445** | **219,167,141** | **100%** |
| | **72%** | **20%** | **8%** | **<1%** | | |

Source: TRANSEARCH.

## 4.5 Forecast Freight Flows

The TRANSEARCH database also includes a forecast of freight flows for Arkansas. It forecasts that the tonnage moved in Arkansas will grow from 219 million tons in 2013 to 306 million tons in 2040, a growth of 40 percent. This echoes national forecasts of growth in freight movement. For the same time period, the population of Arkansas is expected to grow by nearly 30%. The difference in these forecast growth rates indicates that suppliers and manufacturers around the country will have an impact on freight movement in Arkansas, either as consumers of raw materials or providers of finished goods.

Figure 12 shows how the current top commodities, by tonnage, are anticipated to change in the future. Many of the top commodities traded today will continue to see above average growth through 2040. This is largely driven by growth in key commodity groups such as nonmetallic minerals (52 percent), food and kindred products (69 percent), waste or scrap materials (97 percent), and secondary traffic (91 percent). The largest decrease in commodity groups is coal. This product is anticipated to see a 37 percent decrease between 2013 and 2040, or roughly 6.5 million tons. Based on recent layoffs at major coal mines supplying Arkansas as well as the initiative to use alternative energy sources, this decrease in coal movements is expected. The reduction in coal shipments will have a dramatic and profound impact on rail shipments through Arkansas.

**Figure 12: Arkansas Freight Growth by Commodity, 2013 to 2040**


Source: TRANSEARCH.

# 5.0 STATEWIDE FREIGHT DEMAND AND FREIGHT FLOWS

Simply quantifying the existing freight movements into and out of Arkansas is not adequate to anticipate the future of freight-related infrastructure investments. The previous section highlighted the anticipated growth in freight movement by 2040. It is highly unlikely that all of the freight shipment modes will grow at that same rate whether due to infrastructure, space, or funding constraints. The following section will describe the anticipated growth by mode beginning with the most common mode of shipment in Arkansas – trucking.

## 5.1 Surface Transportation Conditions (Trucking)

The trucking mode is the largest of the freight modes in terms of tonnage moved and it is also provides last-mile delivery for many multimodal freight shipments. Therefore, understanding the demand for trucking services is critical to understanding statewide freight flows. Additionally, disruption to trucking operations has the potential to impact a number of supply chains across the State. Truck freight flows will be examined in conjunction with the identification of bottlenecks, followed by impacts to safety, and finally, emerging issues.

### 5.1.1 Truck Origin-Destination Patterns

The origins and destinations of truck trips are merely where the trip began and ended its travel. At the national level there are a number of tools available to forecast the general movement of freight, including the FHWA Freight Analysis Framework (FAF), TRANSEARCH data, and regional travel demand models. These tools were developed to examine the movement of freight at the macro scale, and as such do not provide refined or granular data related to first and last mile connections. It is important to understand key trade partner relationships as defined by mode and commodity.

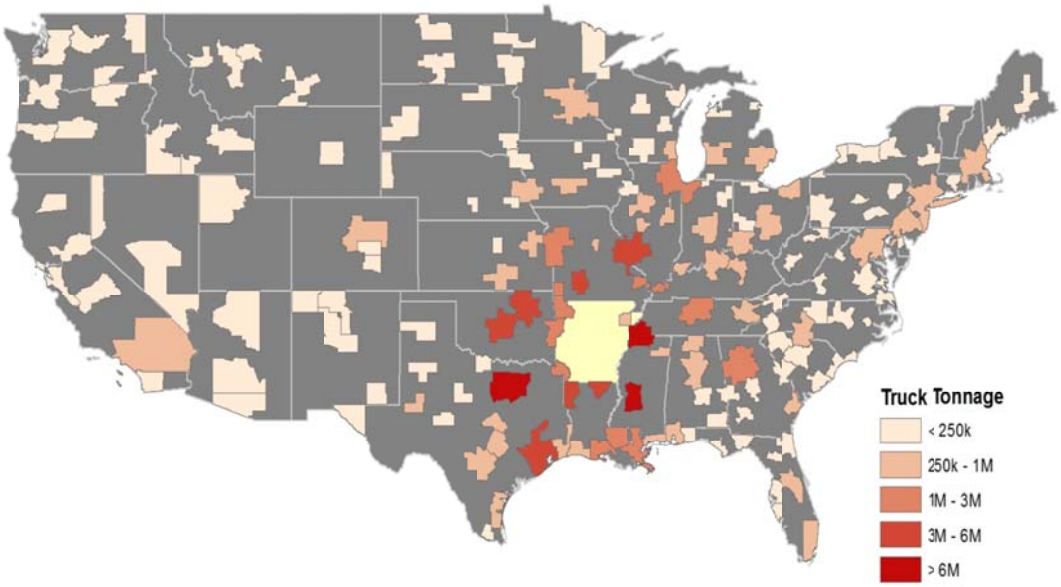
#### 5.1.1.1 Key Truck Trading Partners at State Level

Figure 13 shows the truck trading partners for Arkansas at the BEA level throughout the US. There is a strong correlation between the proximity of the trading region, the economic activity of the trading region, and the amount of truck traffic between Arkansas and the region. Specifically, the Dallas, Memphis, Jackson, Tulsa, and Springfield (MO) regions have the highest concentration of truck traffic, respectively.

Figure 14 shows truck trading partners at the State level. Of the tonnage originating in Arkansas, nearly a third is destined within Arkansas indicating a large number of internal truck trips. Nearby states also trade large volumes of goods with Arkansas by truck. Texas is the largest external trading partner with Arkansas accounting for 12 percent of all truck trade by tonnage. Texas is also the largest contributor of inbound tonnage. Missouri is the second largest external trading partner, and is the largest receiver of goods from Arkansas.

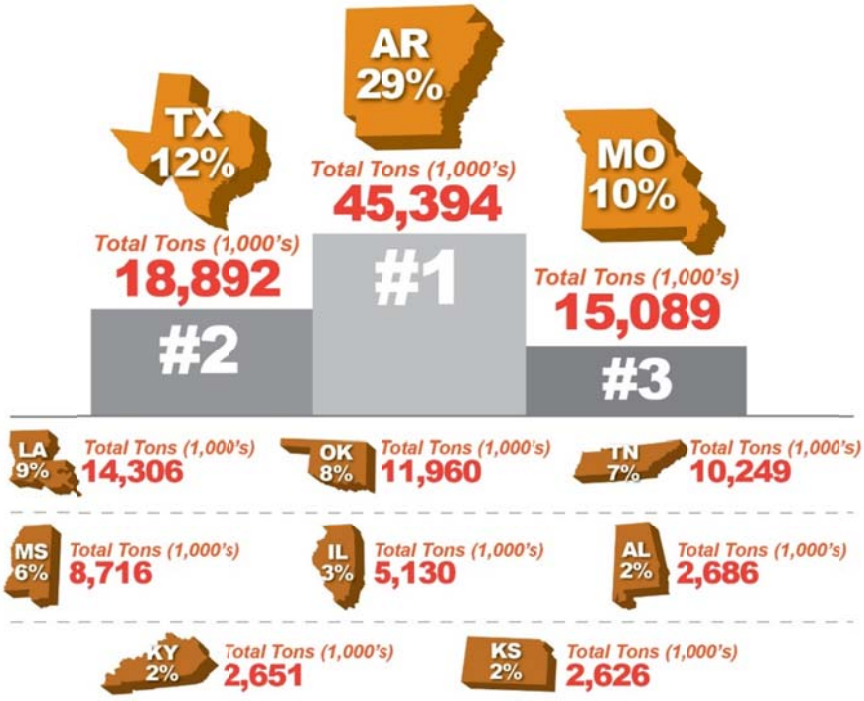
Understandably, the remainder of the states adjacent to Arkansas are the next four top trading partners based on truck movements. The top ten truck-based trading partners also include Illinois, Alabama, Kentucky, and Kansas.

### Figure 13: Arkansas Region-Level Trading Partners via Truck Movements




Source: TRANSEARCH.

### Figure 14: Top Trading Partners by Truck Tonnage, 2013




Source: TRANSEARCH.

#### 5.1.1.2 Truck Trip Ends at the County Level

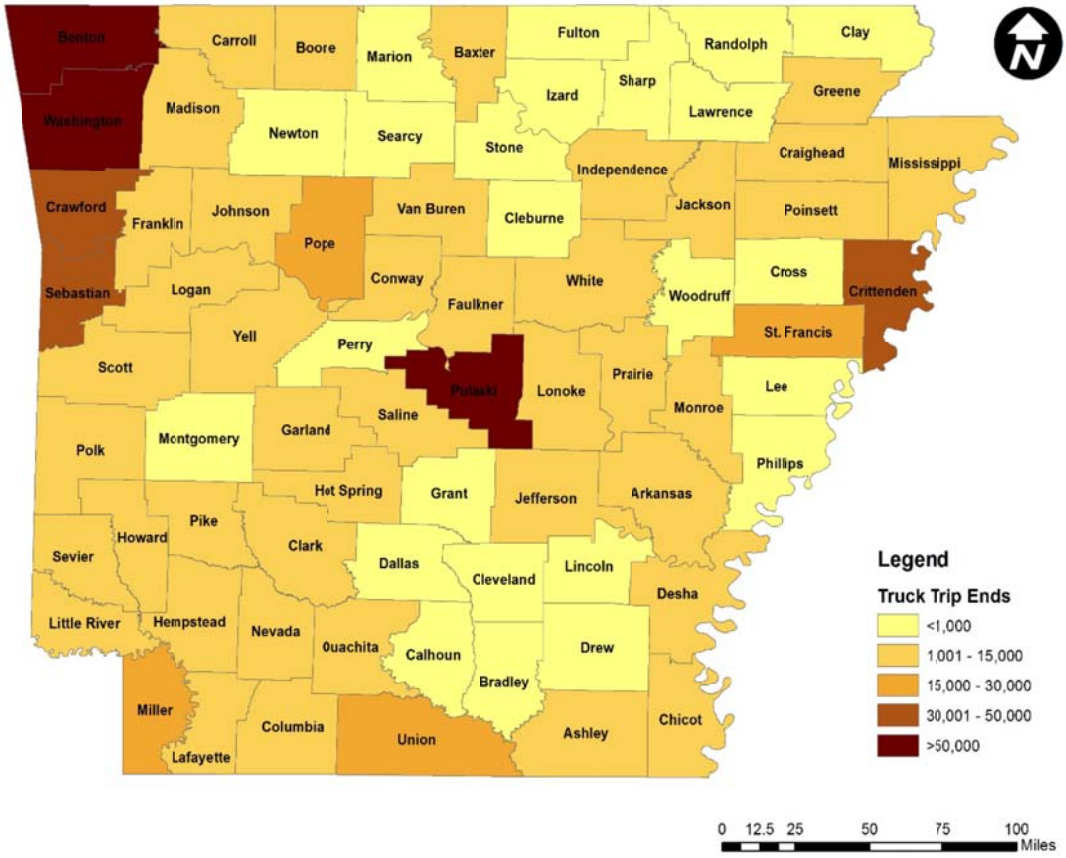
Within Arkansas, the locations of truck trip ends were developed using truck GPS data acquired from the American Transportation Research Institute (ATRI). Figure 15 shows the truck trip generation intensity by county with the most concentrated areas identified as the central Arkansas, northwest-Arkansas, and West Memphis-Marion metropolitan areas. Additionally, there are also significant truck trip generation activities occurring in Pope, St. Francis, Union, and Miller Counties.

Table 11 shows the truck trip generation for the top 10 counties in Arkansas. Over half of all truck trip ends are located in Pulaski, Washington, Benton, Crittenden, Sebastian, and Crawford counties. It also shows that the four counties in northwest Arkansas are responsible for 30 percent of the truck trip ends in the State. This far exceeds the 13 percent generated in Pulaski County and the 11 combined percent generated in Crittenden and St. Francis Counties near West Memphis.

When comparing the truck trip end intensity to the actual volume of truck traffic traveling along Arkansas roadways, it is apparent that a large portion of the traffic consists of through trips along Interstates 30 and 40, as confirmed by Figure 16, displaying the Freight Analysis Framework 2012 Truck Flow map from FHWA.

This disparity in truck trip generation and actual truck flows indicates trucks travelling in the northwest part of the State are much more likely to be directly tied to economic activity that is occurring within Arkansas. The data also indicate that northwest Arkansas is a potential location where there may be sufficient demand in the future to support additional freight facilities, such as transload or intermodal rail terminals.

## Figure 15: Truck Trip Generation Intensity by County




## Table 11: Top 10 Counties for Truck Trip Generation in Arkansas

| Rank | County | Number of Truck Trip Ends Generated | Percent of Total |
|---|---|---|---|
| 1 | Pulaski | 80,126 | 13% |
| 2 | Washington | 59,709 | 10% |
| 3 | Benton | 52,930 | 9% |
| 4 | Crittenden | 41,617 | 7% |
| 5 | Sebastian | 31,956 | 5% |
| 6 | Crawford | 30,506 | 5% |
| 7 | Pope | 25,401 | 4% |
| 8 | St. Francis | 23,803 | 4% |
| 9 | Miller | 22,445 | 4% |
| 10 | Union | 19,617 | 3% |
| N/A | Remainder of State | 215,351 | 36% |
| N/A | Total | 603,461 | 100% |

Source: American Transportation Research Institute, consultant analysis.

**Figure 16: Average Long-Haul Truck Traffic on the National Highway System: 2015**


Source: Freight Analysis Framework (version 4.3), 2017.

### 5.1.2 Statewide Truck Bottleneck Analyses

The truck flow map in Figure 16 presents flows along the National Highway System, which includes only a portion of the State Highway System. The Arkansas Travel Demand Model (ARTDM) includes all state highways in Arkansas and is also used to identify bottlenecks on the road network through the use of volume-to-capacity (V/C) ratios. High V/C ratios are locations where total traffic is close to or exceeding design capacity. Figures 17 and 18 show the V/C ratios from the travel demand model for the base year of 2010 and the forecast year of 2040, respectively. These maps illustrate that congestion is not an issue for most of the highway network in Arkansas over a 24-hour period. However, in central Arkansas, northwest Arkansas, and in other isolated areas, there are recurring congestion issues.

Without capacity improvements, these congestion issues are expected to get worse over time, both in terms of intensity and geographic scope, as shown in Figure 19. Likewise, congestion does and will continue to occur along the major commercial and supply chains and will be particularly vulnerable to the impact of isolated and recurring incidents. Forecasts by FHWA indicate most of Arkansas' current and future Interstate routes will experience peak-period congestion in 2045 as shown in Figure 19.

**Figure 17: Volume-to-Capacity Ratios Using ARTDM, 2010**

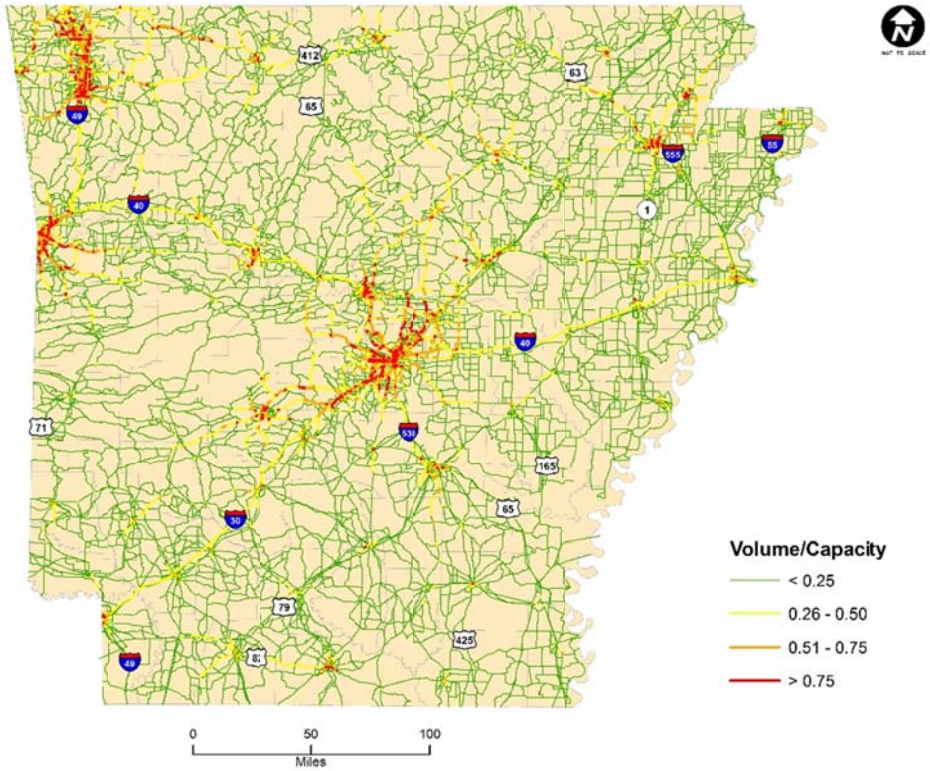



**Figure 18: Volume-to-Capacity Ratios Using ARTDM, 2040**

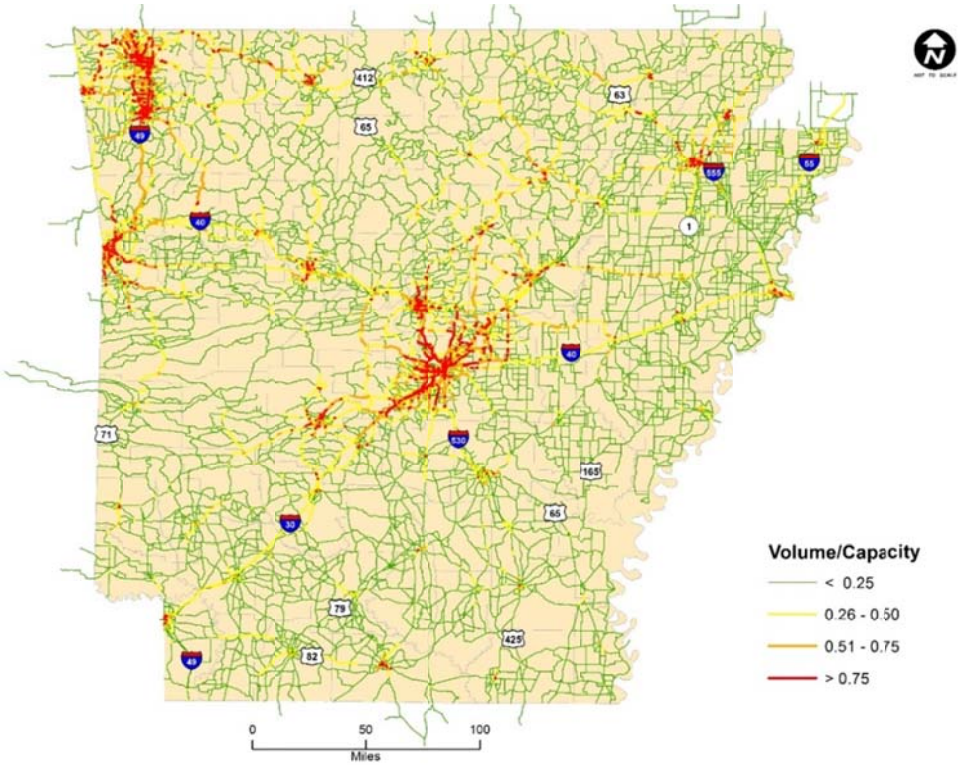
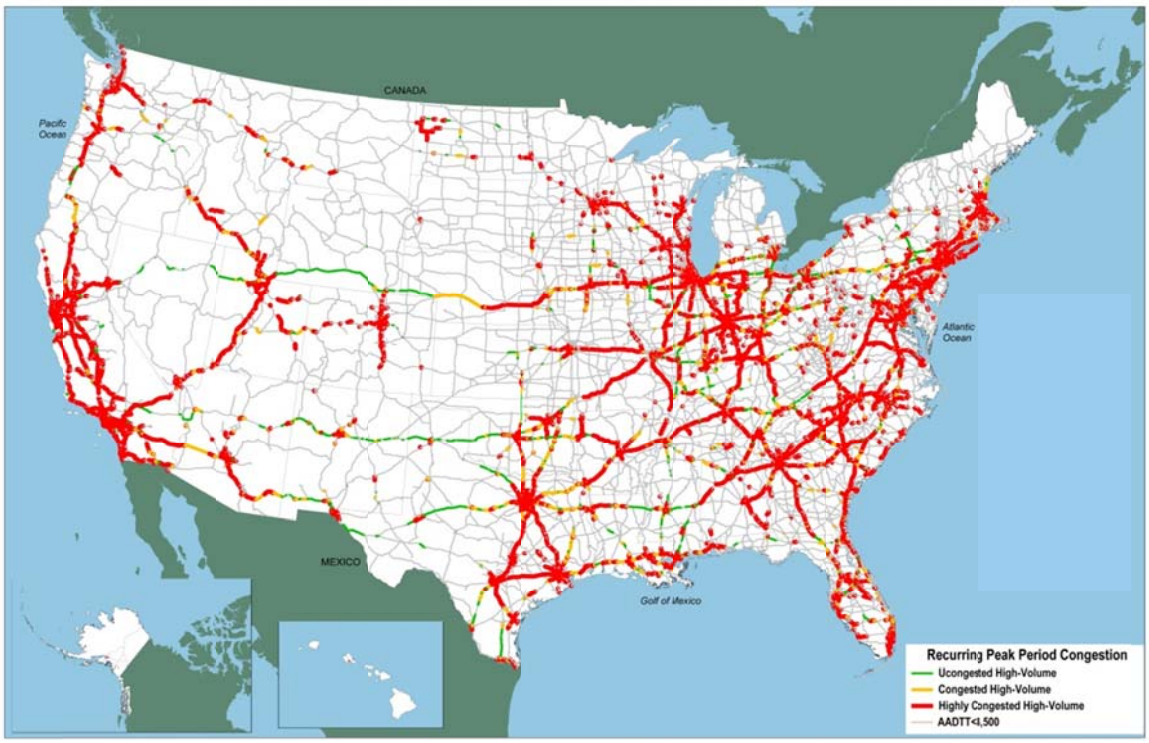


**Figure 19: Peak Period Congestion on High Volume Portions of the National Highway System, 2045**



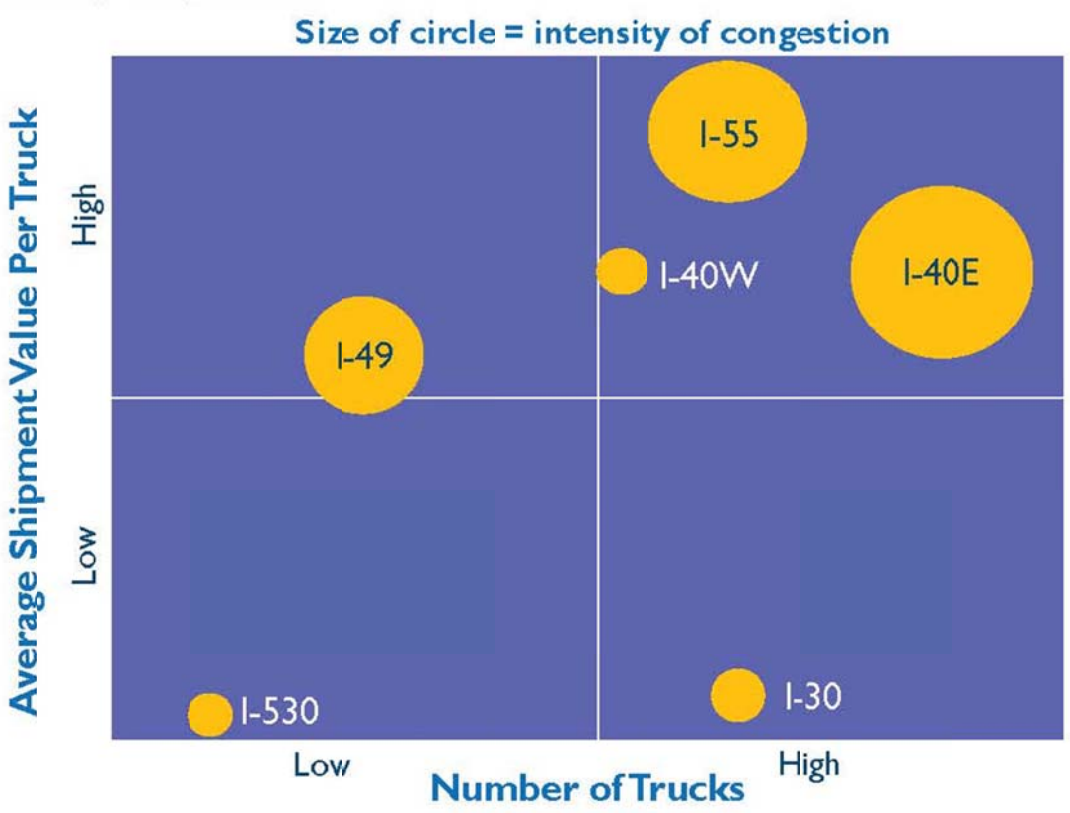

Source: Freight Analysis Framework (version 4.3), 2017.

When estimating the impacts of truck bottlenecks and other congestion on the transportation system, it is also important to consider the value of the shipments impacted by the congestion. The average value of truck shipments on Arkansas' Interstates varies, based on the ATRI data. This is primarily due to the wide variety of goods shipped – from agricultural goods, to building materials, to merchandise destined for retail locations. Combining the truck volumes, shipment values, and congestion intensity provide a better demonstration of the impact of congestion on the movement of freight in Arkansas as shown in Figure 20.

### 5.1.2.1 Truck Bottleneck Relief

Because freight-related truck traffic is a major part of the traffic along Arkansas' Interstate highways, any time there is a disruption in the operations of commercial traffic, the impact is felt by all users of the facility. This applies to both recurring congestion and incidents. Identification and corrections to trucking bottlenecks will have a positive benefit on all road users and the system as a whole. The truck GPS analysis and the ARTDM have identified several truck bottlenecks across the State. These bottlenecks are consistently most severe on the Interstates in the central and northwest Arkansas urbanized areas. Locations that are noted as congested will be priority locations for improvement.

**Figure 20: Roadway Congestion and Shipment Value**




*Note: I-40 W represents I-40 from the Oklahoma State line to North Little Rock; I-40 E represents I-40 from North Little Rock to the Tennessee State line.*

Locations identified as congested by the truck GPS data, but not the statewide travel demand model will be monitored through the implementation of the SFP to determine if the truck GPS bottlenecks are the result of construction, weather or other factors that cannot be improved upon by typical bottleneck improvement projects. Locations identified as congested in the ARTDM but not the GPS data will be investigated to determine if actual current volumes are close to capacity and the model is early in its identification of congestion.

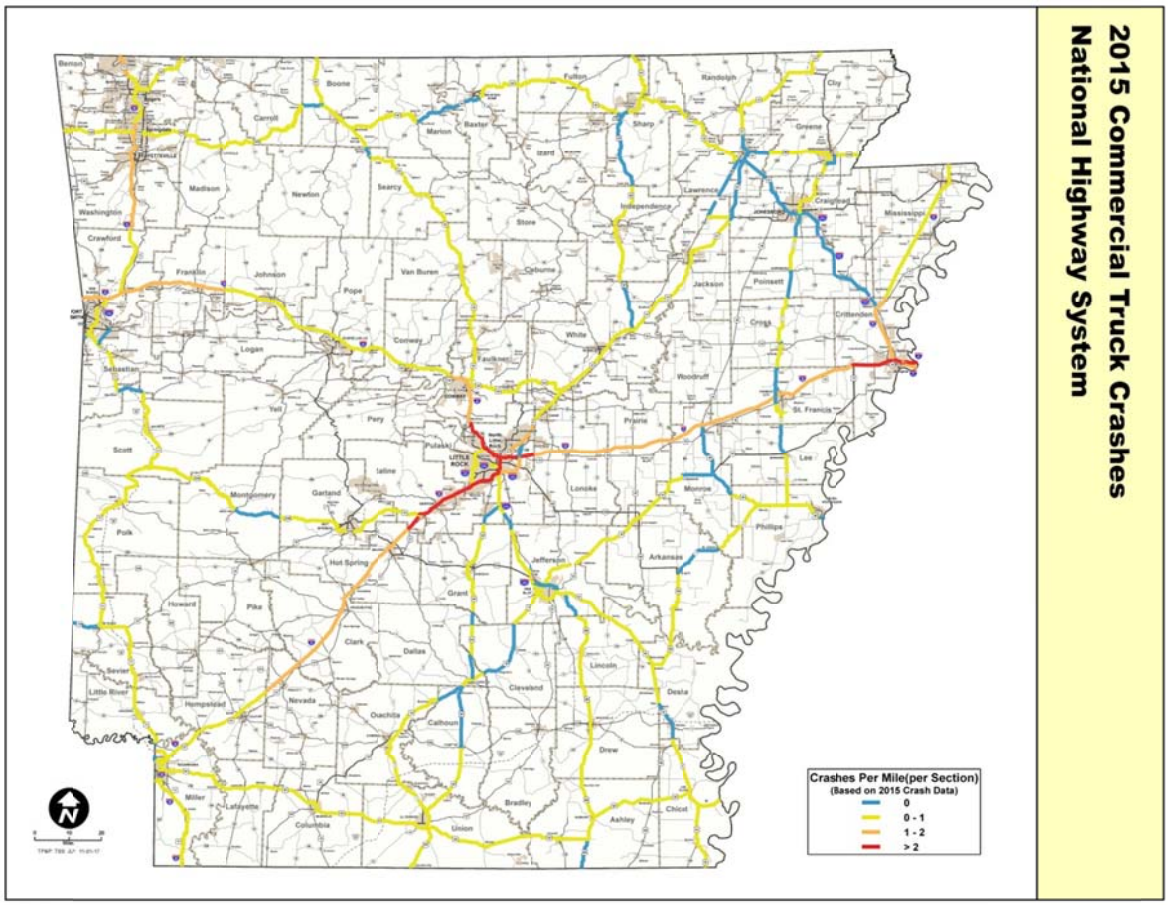
The ARTDM 2040 forecast was used to identify locations where operations appear to decline significantly between 2013 and 2040. This deterioration was compared to both the base year model results and truck GPS analysis to identify a second tier of locations that are operating well today, but at risk of becoming future bottlenecks without improvements.

### 5.1.3 Truck Safety Analyses

Often, when there are crashes involving commercial vehicles there are immediate impacts on the remainder of the roadway transportation infrastructure. Crashes involving large commercial vehicles and passenger vehicles are more likely to involve a fatality due to the size differences between the two vehicles. Over 14 percent of all roadway fatalities in Arkansas involved a large commercial vehicle in 2015. Figure 21 shows the 2015 crashes per mile involving commercial

vehicles. Similar to the congestion maps presented previously, there is a concentration of activity in the central Arkansas and Crittenden County areas.

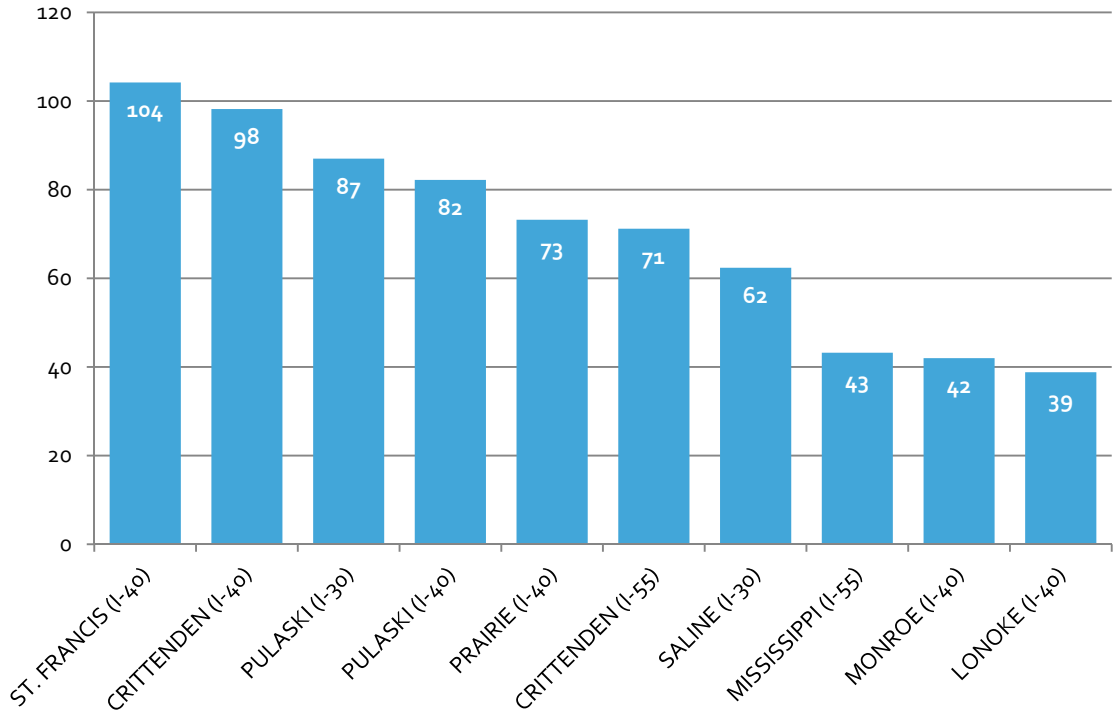
**Figure 21: Commercial Vehicle Crashes on the National Highway System, 2015**




### 5.1.3.1 Statewide and County-Level Analysis

Counties that are served by Interstate highways tend to have a greater number of crash incidents than counties that are not served by Interstate highways. This result is driven, in part, by the much higher volume of truck traffic on Interstates relative to other roads. I-40/I-30 from West Memphis to Texarkana are particularly noteworthy in terms of number of crashes. For the period 2011 to 2015, nine of the top ten counties in terms of number of crashes are located on the I-40 E section (North Little Rock to the Tennessee State line). The only county identified below not located along I-40E is Saline County, along the I-30 corridor. Figure 22 displays the annual average number of crashes (2011-2015) for the top 10 counties.

**Figure 22: Top Ten Counties – Annual Average Crashes (2011-2015)**




### 5.1.3.2 Truck Safety Improvements

ARDOT recently updated the Strategic Highway Safety Plan, which includes specific coordination with the Commercial Vehicles Safety Plan to address enforcement and behavioral safety elements, with large commercial motor vehicles as a primary emphasis area. Strategies to reduce the number of crashes involving commercial vehicles include efforts to reduce driver fatigue, improved education of all drivers regarding sharing the road with large vehicles, installation of high-performance barriers, and increased use of passenger protection devices.

Generally speaking, the number of fatalities on Arkansas' roadways has declined in recent years. However, additional improvements are needed to further reduce fatalities and crashes in general. One opportunity to reduce fatal truck crashes is the implementation of technology. Members of the FAC indicated that successful technology implementation has reduced the number of rear-end collisions within some vehicle fleets by 95 percent. There are also opportunities for additional research and potential future rulemakings for proven safety technologies (lane departure, rear end collisions, etc.). These technology improvements help alert a driver to surrounding conditions so that they can more appropriately respond.

Technology can also be used to alert drivers that they are approaching a road segment where truck rollover crashes are more likely to occur. This can encourage drivers to take preemptive steps, such as slowing down, to prevent an incident. The data underlying this technology can also be used to determine where infrastructure improvements can be implemented to reduce truck rollover crashes. ARDOT has been working to identify low-cost safety improvements at interchange ramps. An example of this would be the I-40/I-540 Interchange in Van Buren, which

was identified by the FAC as being a potential location to investigate measures to improve commercial vehicle operations.

Implementing improved highway work zone policies also has the potential to improve truck safety. The American Transportation Research Institute has developed recommendations for work zone design that may be implemented at construction sites. Effective methods include keeping two lanes of traffic open, preventing queue jumpers, providing back of queue warnings, and disseminating information through technology such as PrePass and DriveWyze.

### 5.1.4 System Connectivity

#### 5.1.4.1 Highway and Modal Connectivity

The connectivity of the various freight networks in Arkansas is critical to system efficiency. ARDOT has worked on strengthening its Interstate system to improve this connectivity. Recent designations of I-49, I-555, and future I-57 are expected to improve network connectivity and ensure that those roadways meet Interstate standards leading to more efficient freight movement. The most significant outstanding need from a connectivity standpoint is the completion of I-49 along the entire western portion of the State and I-69 in the southeast part of the State.

Portions of I-49 have been completed in recent years and capacity improvements are underway to improve operations in Washington and Benton Counties. A re-evaluation of the I-49 Corridor between I-40 and Highway 22 in Sebastian and Crawford Counties has been initiated recently. However the portion between Texarkana and Fort Smith remains to be constructed.

Interstate 69, connecting Shreveport, Louisiana and points to the south to Memphis, Tennessee and points north is being constructed as funds become available. A portion of the Monticello Bypass in Drew County (which will ultimately be identified as I-69) is under construction, and project development is underway between Monticello and Highway 65. Neither the I-49 nor the I-69 corridors are currently funded in their entirety. ARDOT continues to pursue funding for those and other critical corridors within the State.

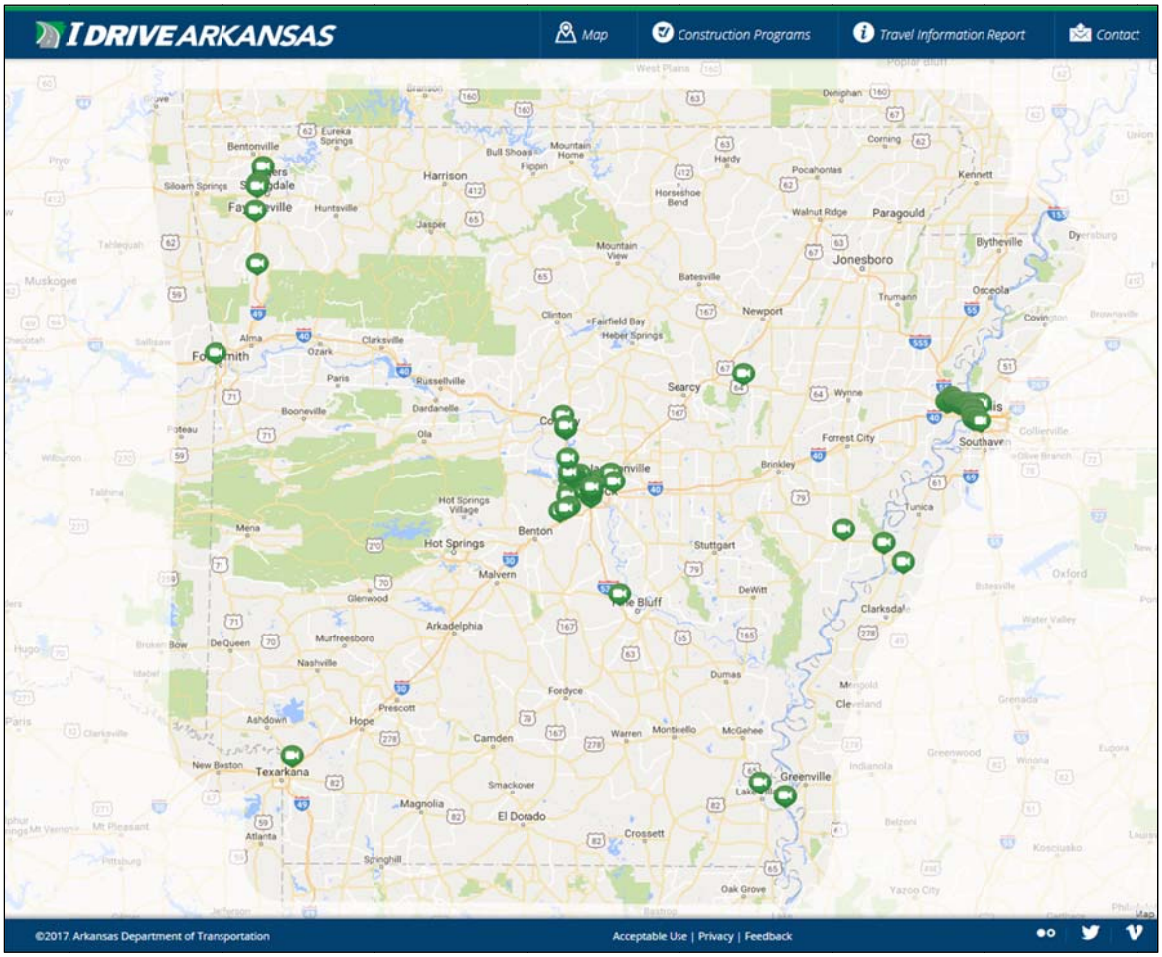
In addition to the major connectivity afforded by a robust Interstate system, there are connectivity issues related to height and weight restricted roadways and structures. These types of limitations may cause a driver to take a more circuitous route, resulting in additional miles and travel time costs. The FAC identified several bridges with weight restrictions, which impact their operations. This includes several structures in northeast and northcentral Arkansas. Energy production areas such as the Fayetteville Shale Play area should be monitored for necessary accessibility and connectivity needs.

#### 5.1.4.2 Dynamic Message Boards and Traffic Cameras

ARDOT has a system of dynamic message boards around the State. There are permanent installations as well as mobile boards. These signs have been acquired over a period of time via a number of methods. This has resulted in a broad range of specifications and capacities. With this variability of equipment, there is a need to streamline the mechanism by which messages are shared with the public.

In 2017, ARDOT improved the IDriveArkansas driver information page to include connections to over 70 traffic cameras throughout the State. The intent of the traffic cameras is to share roadway and traffic conditions throughout the State. ARDOT frequently uses the information from the cameras when sharing information with the public. These cameras may also be accessed by the general public for their information when planning travel in Arkansas. Figure 23 shows the location of the traffic cameras currently available for viewing on the www.idrivearkansas.com site.

**Figure 23: Traffic Cameras**




### 5.1.4.3 Connected and Automated Vehicles

The commercial vehicle industry is on the cutting edge of developing and implementing technologies to allow for connected and automated vehicles (CV/AV). These advances will require ARDOT and their partners to work together, providing compatibility of technology, the roadway network, and communications. Benefits that will be realized through the implementation of CV/AV technology include crash reduction, additional capacity, and increased freight flows along the existing network.

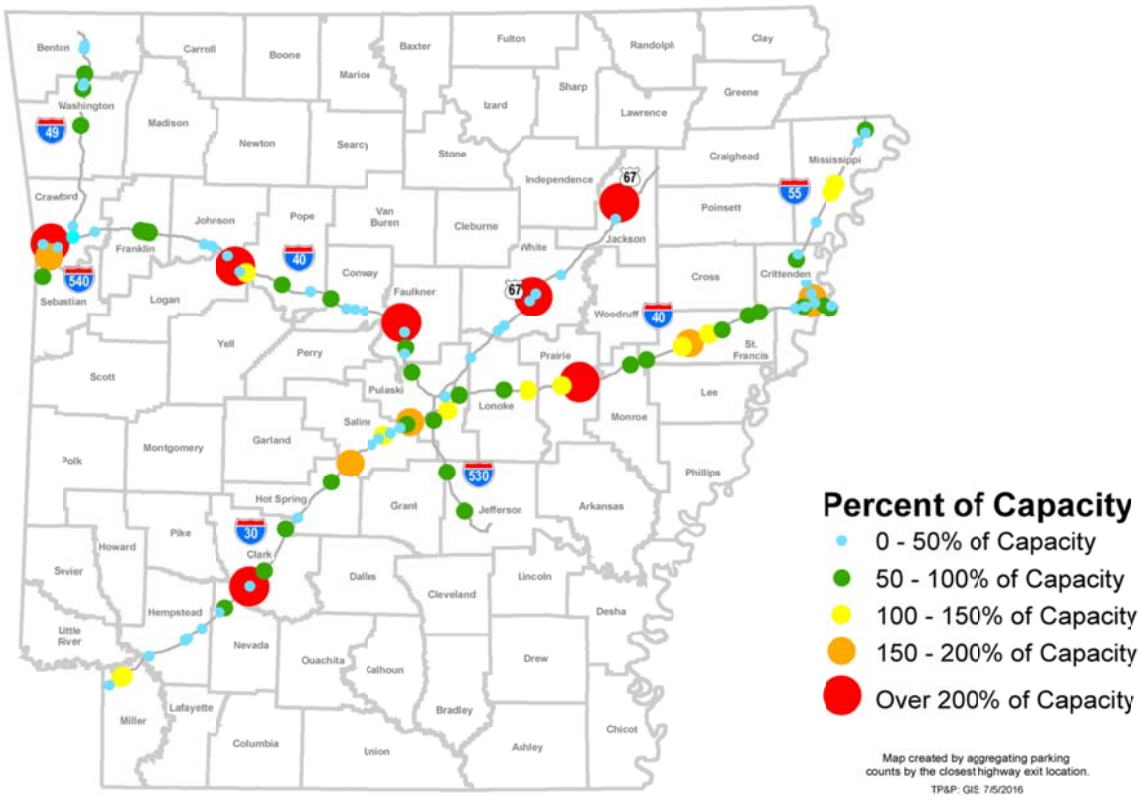
Implementation of the technology within the fleet of commercial vehicles will occur in stages as equipment is retrofitted or upgraded. Likewise, infrastructure investments will be

implemented in conjunction with other improvements to the roadway network. Additionally, all improvements put in place to enhance freight flows will also improve travel for all users of the system.

### 5.1.4.4 Truck Parking

An additional need identified by the freight community is the lack of truck parking, and the impact of truck-parking shortages on ability to comply with Federal HOS regulations implemented by the Federal Motor Carrier Safety Administration (FMCSA). These new regulations have resulted in truck drivers spending more time looking for parking. This sometimes occurs beyond their maximum allotted hours and results in trucks parking in unsafe or illegal locations. Since 2006, ARDOT has conducted a multi-year analysis of truck parking supply and demand at rest areas and interchanges across the State. Figure 24 presents the results of the 2015 Truck Parking Survey in terms of the percentage of capacity at each interchange along Arkansas' Interstates and other freeways. Examination of the historic data from this survey reveals overcrowding occurs at various locations each year. Additional information regarding the Truck Parking Survey can be found in *Appendix C – Truck Parking Information*.

**Figure 24: Overcrowding of Truck Parking Facilities by Exit, 2015**



#### 5.1.4.5 Impact on and by Other Modes

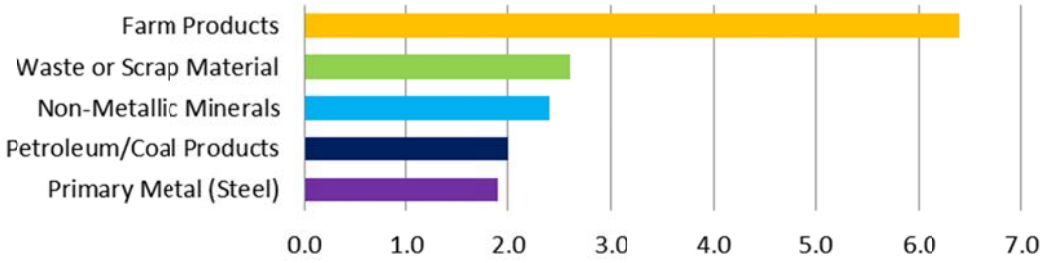
Locations where the various modes of freight interact are critical to the entire freight system. Through work with the FAC, there is ongoing identification of locations where modal interactions impact the system – at-grade rail crossings that cause delay, truck parking/staging areas near terminals and intermodal facilities, as well as the bottlenecks identified earlier. As with other aspects of freight movement, solutions to these issues are based on effective and efficient communication between all of system users. Knowledge and awareness of the capacities and challenges faced by all modes allows for coordinated solutions.

## 5.2 Waterway Demands and Needs

### 5.2.1 Commodity Flows

Arkansas is home to the third-most inland waterway miles of all states in the US. Many of Arkansas' major shippers – including Tyson Foods, Riceland Foods, and Oakley Grain – rely on Arkansas' waterways for transportation of their products. It is estimated that 17.4 million tons of goods are moved on these waterways annually as shown on Figure 25. Over three-quarters of the goods shipped over water fall into one of the following five categories:

**Figure 25: Goods Shipped by Waterways (Millions of Tons), 2013**




1. Arkansas-based **Farm Products** shipped to customers (6.4 million tons) using a wide range of ports (predominately New Orleans).
2. **Waste or Scrap Materials** that are imported into Arkansas (2.6 million tons). This is primarily imported through the Port of Osceola on the Mississippi River from Houston, New Orleans, and Minneapolis.
3. **Nonmetallic Minerals** that are predominately shipped between Arkansas locations used for roadway and building construction (2.4 million tons).
4. **Petroleum or Coal Products** shipped out of the State (2.0 million tons) using the Arkansas portion of the Port of Memphis going to locations such as Cincinnati and Houston.
5. **Primary Metal** products shipped into the State (1.9 million tons). This is primarily steel sheets and bars shipped to fabricating plants in Arkansas to the Port of Osceola through New Orleans and Baton Rouge.

Table 12 displays the commodity origins for the largest ports in Arkansas. Four counties, Mississippi, Crittenden, Philips, and Crawford, account for 75 percent of all waterway tonnage.

Table 13 shows the top commodities moved from these counties in terms of waterway flows. Figure 26 provides a visual representation of waterway tonnage based on the county of origin.

### Table 12: Waterway Trade by County/Port, 2013

| | | Tonnage (Thousands) | | | |
|---|---|---|---|---|---|
| County | Commodity | In to County | Out of County | Within County | Total |
| **Mississippi (Port of Osceola)** | | **3,462** | **1,412** | **8** | **4,882** |
| | Metal Scrap or Tailing | 2,429 | 1 | 8 | 2,438 |
| | Blast Furnace or Coke Oven Products | 510 | 9 | 0 | 518 |
| | Oil Kernels, Nuts, or Seeds | 0 | 486 | 0 | 486 |
| | Grain | 0 | 459 | 0 | 459 |
| | Primary Iron or Steel Products | 62 | 288 | 0 | 350 |
| | All Others | 461 | 170 | 0 | 631 |
| **Crittenden (Port of Memphis)** | | **1,464** | **1,926** | **107** | **3,497** |
| | Petroleum Refining Products | 248 | 1,021 | 107 | 1,376 |
| | Oil Kernels, Nuts, or Seeds | 0 | 397 | 0 | 397 |
| | Bituminous Coal | 306 | 0 | 0 | 306 |
| | Grain | 0 | 212 | 0 | 212 |
| | All Others | 455 | 148 | 0 | 603 |
| **Phillips (Helena Harbor)** | | **439** | **2,276** | **0** | **2,715** |
| | Grain | 0 | 1,352 | 0 | 1,352 |
| | Oil Kernels, Nuts, or Seeds | 0 | 913 | 0 | 913 |
| | All Others | 439 | 11 | 0 | 450 |
| **Crawford (Port of Ft. Smith)** | | **94** | **229** | **1,717** | **2,040** |
| | Gravel or Sand | 19 | 162 | 1,717 | 1,899 |
| | All Others | 75 | 40 | 0 | 115 |
| **Other Counties** | | **1,238** | **2,833** | **203** | **4,275** |
| | Grain | 7 | 1,545 | 1 | 1,553 |
| | Oil Kernels, Nuts, or Seeds | 2 | 1,035 | 0 | 1,037 |
| | Primary Iron and Steel Products | 380 | 1 | 1 | 382 |
| | Other | 1,416 | 461 | 201 | 2,078 |
| **Totals** | | **6,697** | **8,676** | **2,035** | **17,409** |

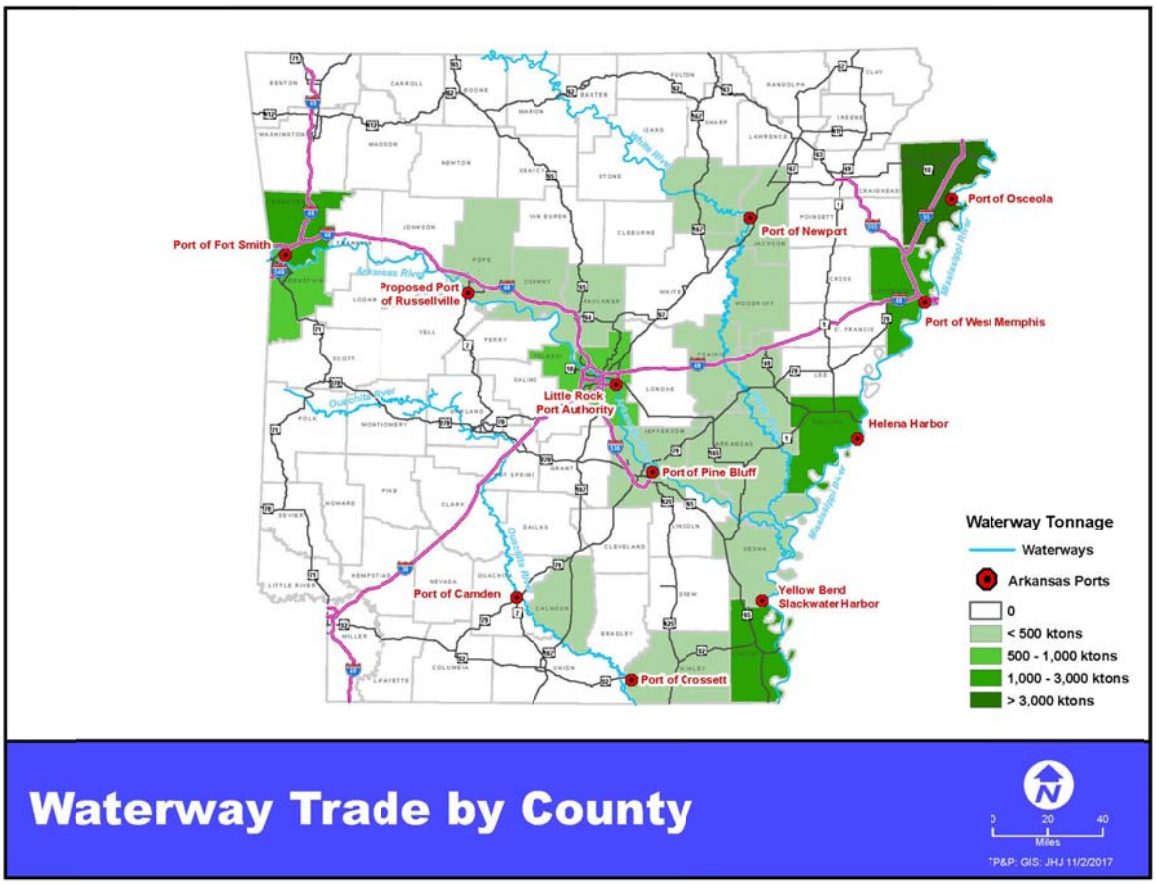
Source: TRANSEARCH.

## Table 13 Top Commodities Moving via Arkansas Waterways, 2013

| Commodity | Tonnage (1,000's) | | | | Percent of Total |
|---|---|---|---|---|---|
| | Inbound | Outbound | Internal | Total | |
| Farm Products | 9 | 6,408 | 1 | 6,418 | 37% |
| Waste or Scrap Materials | 2,337 | 199 | 100 | 2,636 | 15% |
| Nonmetallic Minerals | 442 | 168 | 1,785 | 2,395 | 14% |
| Petroleum or Coal Products | 634 | 1,175 | 141 | 1,951 | 11% |
| Primary Metal Products | 1,589 | 326 | 1 | 1,915 | 11% |
| Chemicals or Allied Products | 690 | 49 | 0 | 738 | 4% |
| Coal | 373 | 36 | 1 | 410 | 2% |
| Metallic Ores | 278 | 42 | 5 | 326 | 2% |
| Fabricated Metal Products | 89 | 113 | 0 | 202 | 1% |
| Food or Kindred Products | 148 | 50 | 0 | 198 | 1% |
| All Others | 109 | 111 | 0 | 220 | 1% |
| **Total** | **6,697** | **8,676** | **2,035** | **17,409** | **100%** |

Source: TRANSEARCH.

## Figure 26: Waterway Tonnage by County, 2013



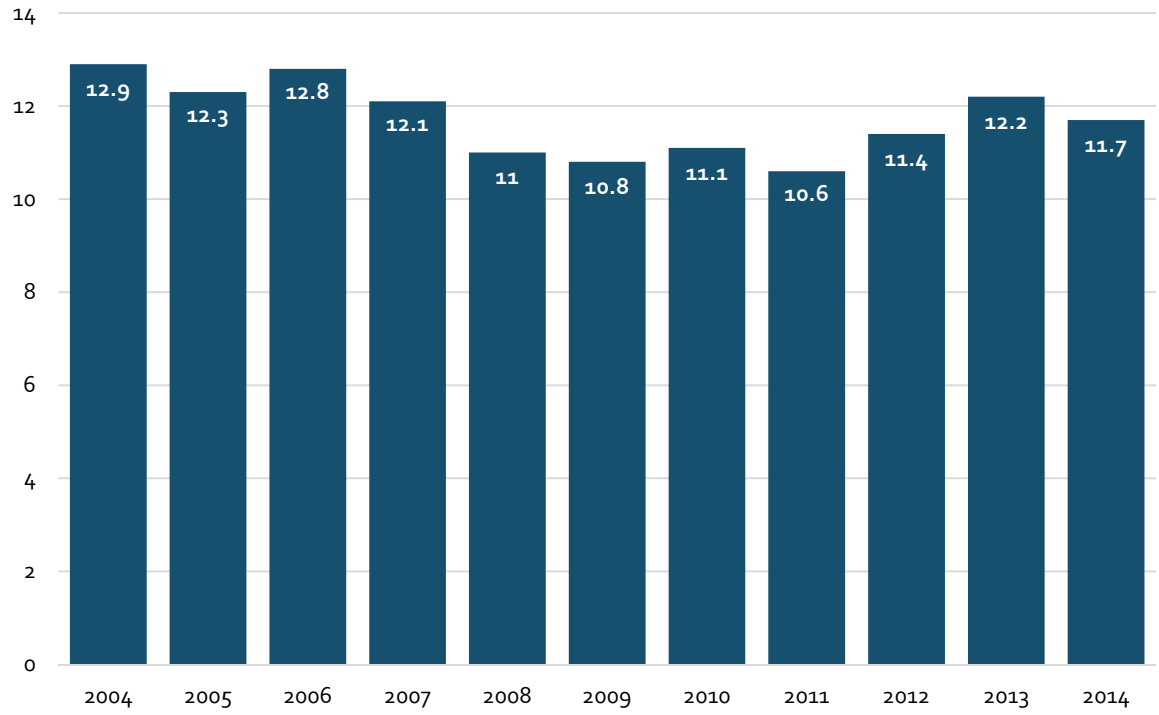

Source: TRANSEARCH.

### 5.2.2 Waterway Flows on the MKARNS

The McClellan-Kerr Arkansas River Navigation System (MKARNS) was completed in 1968, with most of its locks and dams completed between 1967 and 1970.[10] Despite being roughly 50 years old, the locks and dams on the MKARNS are amongst the newest in the US. Much of the inland waterway system in the US was developed in the late 1800s and early 1900s.

In 2013, 12.2 million of the 17.4 million tons (70 percent) of waterway flows in Arkansas moved on the McClellan-Kerr Arkansas River Navigation System (MKARNS). The MKARNS connects the Arkansas River at the Mississippi River in southeast Arkansas through Little Rock and extends west to Fort Smith, ultimately into Oklahoma connecting with the Port of Tulsa. Figure 27 shows the waterway flows on the MKARNS from 2004 to 2014. The MKARNS 2016 Inland Waterway Fact Sheet reports that in 2015, 10 million tons of cargo was moved on the waterway. A high tonnage value of 12.9 million tons was reported in 2004.

**Figure 27: MKARNS Tonnage (Millions of Tons), 2004 to 2014**



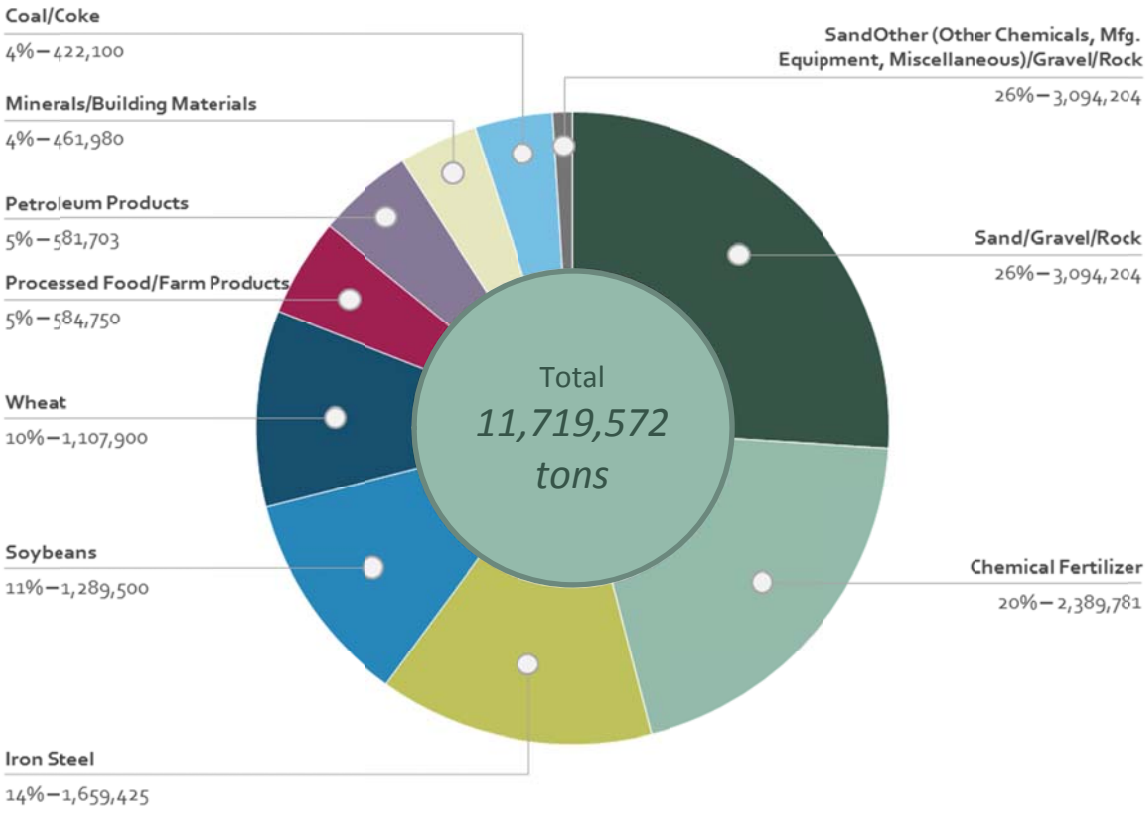

Source: US Army Corps of Engineers Navigation Data Center.

Figure 28 reports the goods shipped on the MKARNS for 2014, the most recent year that these data are available. Aggregates—sand, gravel, and rock—are the largest commodity, with

[10] The Encyclopedia of Arkansas History and Culture, http://www.encyclopediaofarkansas.net/encyclopedia/entry-detail.aspx?entryID=2309. Accessed July 28, 2017.

more than one-fourth of the total shipments on the waterway. Chemical fertilizers used to support the farming industry in Arkansas are the second most common good shipped on the MKARNS. Most of the chemical fertilizers shipped originate in refinery complexes on the Gulf Coast and are shipped to Arkansas port terminals for distribution to local and regional retailers.

**Figure 28: Commodity Distribution on MKARNS, 2014**




Source: US Army Corps of Engineers Navigation Data Center.

### 5.2.3 Arkansas Inland Port Operations, Markets Served, and Needs[11]

Twelve ports are recognized in Arkansas. In 2013, seven of these ports had active freight operations reporting tonnages to the USACE. Other ports may have had freight operations through privately-owned terminals for which volumes are not reported. There are also many some smaller privately-owned terminals that are not actively tracked by the USACE. The following describes the operations at the seven publicly-owned ports with reported tonnage.

#### 5.2.3.1 Port of West Memphis/Memphis

On the inland river system, ports are often defined by river miles. For example, the Port of Memphis includes terminals on both the Tennessee and Arkansas sides of the Mississippi River

[11] Much of the information in this section was taken from the Arkansas Waterways Commission website, http://www.waterways.arkansas.gov/ports-and-terminals. Accessed in April 2016.

from river mile 725 to 740. Within this 15-mile segment of the Mississippi River, there are 68 waterfront facilities, of which 37 are terminal facilities moving products such as petroleum, tar, asphalt, cement, steel, coal, salt, fertilizers, rock and gravel, and grains.[12]

The public facilities located on the Arkansas side of the port are owned by the Memphis-Crittenden County Port Authority. The public facilities on the Tennessee side of the port are owned by the Memphis and Shelby County Port Commission. The entire Port of Memphis reported handling 14.2 million tons in 2013, making it the fourth largest inland port in the nation. In 2013, about 3.5 million tons at the Port of Memphis tonnage were attributed to Arkansas.

The West Memphis-Crittenden County Port Authority owns a general purpose river terminal and a special purpose grain terminal on the Mississippi River. The general purpose terminal is operated by Kinder Morgan. Rail service is available nearby. The port is within five miles of both I-40 and I-55. West Memphis is one of the deepest river ports in a crucial reach of the Mississippi River. It is not impacted by low water conditions and remains open even when low water limits barge access to the Port of Memphis across the river.

The West Memphis port, in partnership with local economic development entities, plans to develop approximately 2,000 acres north of the current site as a multimodal industrial park, attracting new jobs and tax base to Arkansas. Improvements to roadway connectors are a vital part of the plan.

The port has successfully demonstrated that economic development in the region is a critical component in the national transportation system as well. As part of the US DOT's Transportation Investment Generating Economic Recovery (TIGER) discretionary grant program, West Memphis was awarded $10.9 million to expand rail infrastructure at this port. The successful application for this competitive grant illustrates the economic benefits of this port.

#### 5.2.3.2 Port of Osceola

The Port of Osceola is located on a chute of the Mississippi River, behind an island, 55 miles north of Memphis. Most of the time the chute is a slackwater harbor. The port is owned by the Osceola Port Authority and operated by Poinsett Rice and Grain. Interstate 55 is the nearest Interstate highway. Rail access is provided by BNSF. Annually, more than 200,000 tons of agricultural products are moved through the public port. Additional cargoes are moved through nearby private terminals. Port business currently includes loading grains and rice to barges and unloading fertilizer and aggregates from barges.

The Port of Osceola's main export is soybeans. Within the past 10 years, numerous improvements and investments have been made at the port, including a new barge winching system, repairs to the mooring dolphin, paving access roadways, construction of a maintenance shop, a new truck-to-barge facility, new truck dump pit, new conveyors and improvements to existing conveyors, a new telescoping spout, and additional grain storage.

[12] Port of Memphis website. http://portofmemphis.com/about/. Accessed on July 31, 2017.

The Port Authority and its operator foresee demand for general cargo transloading, handling, and storage, and plan to add general cargo capabilities to the port complex. Osceola has a substantial inventory of potential industrial sites. There are approximately 600 contiguous acres available for development. This acreage is within the 500-year flood protected land with access to rail, highway, and utilities either on-site or within one mile. New markets may also be developed as a result of the new $1.3 billion steel mill (Big River Steel), which opened in early 2017. Steel processors and other industries with heavy transportation needs are often attracted to locations near a mill. This mill also provides high paying jobs to 450 individuals who will in turn provide secondary economic benefits to the region.

Additional landside access improvements are needed on local roadways to address issues related to safety, congestion, and efficient freight flow. Grade separation of a critical rail/highway crossing would help resolve both the safety and congestion issues. Roadway issues include paved or stone shoulder on Highway 239 for truck queuing during harvest season. Improvements are needed at the intersection of Highways 61 and 325 south of American Greetings and the intersection of Highway 325 and County Road 732.

#### 5.2.3.3 Helena Harbor – Phillips County Port Authority

Helena Harbor, located on the Mississippi River, south of the Highway 49 Bridge, is a port and industrial park owned by the Helena-West Helena/Phillips County Port Authority. The nearest Interstate is I-40 in Memphis via Highways 20, 61, and 49. The Helena Harbor Industrial Park consists of 4,000 acres of virtually flood-proof industrial sites featuring a 2.25-mile, nine-foot-deep slackwater harbor. The harbor channel is 300 feet in width and features an additional 50 feet of berthing space over much of its length. A large turning basin is located at the head of the channel.

Helena Harbor reported 2.2 million tons of cargo moving through their facility in 2013. Primary business at the port includes receipt and shipment of break-bulk general cargo and miscellaneous dry-bulk commodities, including steel, coal, and grain. In its efforts to grow, port personnel expressed a need to focus on acquiring new businesses with 250 or fewer employees.

#### 5.2.3.4 Port of Yellow Bend

Located directly on the Mississippi River just south of Arkansas City, Yellow Bend is a slackwater harbor easily accessed from the main river channel through a 250-foot wide entrance into a 350 x 810-foot turning basin. The Port of Yellow Bend is managed by Big River Grain. It is convenient to I-20 in Tallulah, Louisiana. The proposed I-69 bridge will be built six miles north of the port, at the south end of Big Island at Caulk Landing. Yellow Bend has large tracts of land zoned for industrial use. The port is used for receipt and shipment of general cargo and steel products and shipment of cottonseed, grain, and miscellaneous dry-bulk commodities. In 2013, the port moved 477,200 tons, primarily of grain products.

#### 5.2.3.5 Port of Pine Bluff

The Port of Pine Bluff's 372-acre Harbor Industrial District is located on a natural slackwater harbor just off the MKARNS main channel. Seven industries are located in the District, one of which operates two separate plants, in addition to a Corps of Engineers marine terminal and a US

Coast Guard station. The 20-acre public terminal owned by the Pine Bluff-Jefferson County Port Authority and operated by Watco Terminal & Port Services, offers barge transloading, warehousing, and bulk storage. Watco became operator of the port's public terminal in March 2015. The terminal has nearly 100,000 square feet of on-site warehouse space, 44,000 square feet of bulk storage space, and heavy-duty cranes for loading and unloading goods.

The port is located near I-530 with good connecting roads. Rail service at the port is provided by UPRR with reciprocal switching by BNSF Railway. The larger region is served by UPRR and BNSF Railway, and UPRR maintains a major switching yard in Pine Bluff that is one of the area's leading employers. In the past, as much as 300,000 tons of cargo has been handled at the port. Imports and exports at Pine Bluff include rice, corn, wheat, milo, soybeans, fertilizer, aluminum, paper products, wood, and steel. The public terminal is a true intermodal facility with the ability to transfer most bulk and packaged cargoes to and from barge, rail, and truck.

#### 5.2.3.6 Port of Little Rock

The Port of Little Rock, located approximately seven miles east of downtown Little Rock, has two public docks—one directly on the MKARNS and the other on a 4,500-foot slackwater harbor, 320 feet wide and 15 feet deep. The harbor has a 190-foot dock and a one-barge berth facility, allowing two barges two deep on both sides of the harbor and a turning basin so barges have easy access back into the river. The port is operated by Logistic Services Incorporated (LSI).

The Little Rock port owns and operates a 2,600-acre industrial park that primarily attracts manufacturing and logistics companies, many of which are served by the port. About 40 port employees support 4,000-4,500 mostly skilled jobs at industries in the area. The port and the Industrial Park are located along I-440, providing direct connections to I-30 and I-40. The Little Rock Port also maintains its own railroad and is a Foreign Trade Zone. About 80 percent of the port's activity is inbound bulk materials, most of it transloaded from ship to barge in New Orleans, with steel and industrial goods comprising the majority of these imports.

#### 5.2.3.7 Port of Fort Smith/Van Buren

The Port of Fort Smith is located on the Poteau River, 1.7 miles above Mile 308.7 on the Arkansas River. Major facilities at the port at Fort Smith and the port at Van Buren are both operated by Van Buren-based Five Rivers Distribution. Fort Smith, a major regional transportation hub, sits at the crossroads of two major Interstates (I-40 and I-49), is served by one major and two regional/switching railroads, and is surrounded on three sides by the Arkansas River.

With intermodal connectivity, the Port of Fort Smith is poised and planning for growth and new opportunities. The primary cargo is steel, including coiled plate, coiled wire rod, and bars. The port at Van Buren handles 300,000 tons per year, including bulk and break bulk, hot and cold coils and wire rod, and supports industries that employ more than 3,000 people associated with commerce at the Van Buren facility .

### 5.2.4 Inland Port Needs

A detailed list of the needs of each of the ports is provided in *Appendix D – Port Improvement Needs*. These needs were identified through interviews of port terminal owners and operators at

each of the seven publicly-owned ports in Arkansas. Generally, needed improvements as identified by the ports can be grouped into the following categories: roadway, rail, other land-based improvements; maritime improvements; and equipment. Common needs identified as needs include roadway resurfacing, truck parking/staging, rail extensions, storage and warehouse upgrades, dredging near docks, upstream improvements to reduce silting, and wetland mitigation. Additionally, several ports identified the need for upgraded equipment for moving cargo to and from barges and within the port confines.

### 5.2.5 Summary of Major Issues and Needs for Arkansas Ports and Waterways

Based on the TRANSEARCH data, freight movement along Arkansas' waterways is anticipated to grow nearly 14 percent by 2040. Locally-identified issues must be addressed to prepare for the anticipated growth. The issues and needs of the Arkansas waterways system identified by State waterways officials, directors of the public ports, and the FAC fall into the following categories:

- Twelve-foot MKARNS Channel;
- Critical Maintenance Backlog;
- Upgrading of Locks;
- White River Improvements;
- Underutilization;
- Need for Grant Programs; and
- Marketing Program for Ports.

**Twelve-foot MKARNS Channel.** All stakeholders interviewed stated a need to have a 12-foot channel on the rivers of the MKARNS. It is currently navigable with a 9-foot draft, even though in the Energy and Water Development Act of 2004, Congress authorized the channel at 12 feet. Arkansas locks were built for a 12-foot draft. Funds were never appropriated for the change, however. A 12-foot draft would allow more weight to be placed on barges, thus increasing the current total of 1,500 short tons of capacity per barge by 200 tons for each additional foot of draft. This would make the system more competitive with other inland rivers in transporting goods and bring economic growth to the region. It should be noted that the Mississippi River is also authorized for twelve feet, but maintained for nine; however, the river supports a twelve foot draft nearly 97 percent of the year.

**Critical Maintenance Backlog.** There is a backlog of critical maintenance needed on the 100-percent Federally-funded navigation features of the system. The USACE, responsible for operation and maintenance, defines "critical maintenance" projects as having a 50 percent or greater probability of failure within the next five years. One failure would stop traffic on the entire system. The State contains 15 locks and dams that make navigation possible on the Arkansas and Ouachita Rivers. The 13 locks and dams on the MKARNS were built in the late 1960s and are more than 40 years old. The system was dedicated in 1971 and has more traffic now than in the 1970s, but less manpower. Preventive maintenance has given way to repairs when needed. Activities such as de-water inspections, where the lock is drained for inspection twice a year as shown in Figure 29, have been suspended. As Federal funding has decreased, there have been discussions regarding contributions from stakeholders. The current Federal administration has proposed charging a lockage fee per barge, but the inland waterways industry is opposed to such, requesting instead that the diesel fuel tax be increased.

Federal funding decreases also impacted the operations of the locks and dams on the Ouachita River System. Between July 2012 and November 2015, operations were reduced from 24/7/365 to only 10 hours daily Monday through Friday in Arkansas. Furthermore, a reduction in tonnage in 2015 to below one million tons classifies this river system as "Low Use" which makes competing for the Federal funds necessary to do critical maintenance more difficult.

### Figure 29: Lock Inspection on the Arkansas River

**Upgrading of Locks.** Another issue mentioned by port directors is the upgrading of locks with additional tow haulage vessels and improved wiring and piping. Without tow haulage vessels available, lock time for tows of nine to seventeen barges is nearly doubled. If there are more than eight barges, the tow has to be separated, because there is only room in a lock for eight barges and a towboat. Tow haulage wiring and piping refers to the connecting equipment between the barge and the tow vessel that is used to reconnect the two ships if they ever become separated. Improved wiring and piping will make operations more efficient, which will increase the capacity of the locks and reduce major disruptions as well.

**White River Improvements.** In southeastern Arkansas near the Mississippi River, the White River and the MKARNS are separated by roughly 200 acres of hardwood forest. The proximity of these rivers has sparked discussion over the course of many years to align the channels of these two rivers. There are concerns of the risk of breach between them, particularly during high water events. A resulting breach would create numerous navigation hazards. The USACE Little Rock District is currently investing $4 to $5 million every 10 years to build and repair a series of temporary structures as a stopgap measure to prevent the White River from reaching the Arkansas River. The rivers generate over $5 billion annually, support thousands of jobs, and are important to the State and regional economy.

One longer-term solution to this situation is to allow the White River to cut its own new natural channel. However, this process would result in navigation on the MKARNS to cease for at least

one year, during which time industries and shippers would find it necessary to secure other modes of transport to move their cargoes. At present, the *Three Rivers Study* conducted by the USACE is assessing long-term solutions to promote a continued safe and reliable economic use of the MKARNS.

**Underutilization.** Arkansas is third in the nation in navigable river miles and 31st in shipments by water by tonnage. The State's waterways are by some measures underutilized. Port directors expressed a need for a stronger advocate for waterways in Arkansas at the State level. In 2013, the MKARNS transported 12.2 million tons of cargo worth about $4 billion. This equates to 62,000 tractor-trailers or 26,000 rail cars. This is significant when considering congestion on I-40 between Little Rock and Memphis as well as congestion on the Class I railroads in Arkansas. According to the Arkansas Waterways Commission (AWC), the MKARNS is only at 30 percent capacity when considering the potential to deepen the river to 12 feet.

**Grant Program.** In 2014, the AWC began operating the Arkansas Port, Intermodal, and Waterway Development Grant program based on adoption of Act 1483 by the State of Arkansas 89th General Assembly. This program provides funds for public ports and intermodal authorities for capital improvement projects and dredging. The grant program is designed to increase Arkansas' ability to be competitive in the global economy. It is paid for by an ad valorem tax on barge operators assessed by the Public Services Commission (PSC).

Previously, after the tax was collected, it was transferred to three State agencies: the PSC, Arkansas Assessment Coordination Department, and Legislative Audit. Act 1483 was amended such that transfers of these tax revenues to these three agencies were capped at $2.5 million total. Tax revenues related to this ad valorem tax in excess of $2.5 million are directed to the AWC for port infrastructure development.

Arkansas ports and waterways would benefit from revamping tax incentives to provide additional funding for better land-side access to ports with turn lanes, infrastructure to access a port, and wider access, with tax credits a part of this plan.

**Marketing Program for Ports.** The State of Arkansas could benefit from a statewide marketing program for ports to highlight the advantages of waterborne transportation as part of a multimodal effort to attract industry, provide jobs, and grow the economy. This marketing program could include a description of the cost savings benefits of waterways relative to other freight modes, the impact of savings on competitiveness, and provide examples of companies that are currently benefiting from this mode of transportation.

## 5.3 Rail Demand and Needs

### 5.3.1 Rail Commodity Flows

Table 14 shows the top commodities in Arkansas moved by rail. Coal is the single-largest rail commodity, constituting roughly 40 percent (17 million tons) of the rail shipments that originate in or are destined for Arkansas. These coal shipments are almost exclusively from Wyoming and serve various coal-fired power plants throughout Arkansas.

Nearly 5 million tons of nonmetallic minerals are shipped by rail annually in Arkansas making it the second largest rail commodity in the State. Nonmetallic minerals include sand, gravel and other elements used in the construction of buildings and roads. Nonmetallic minerals are primarily generated in Hot Spring, Polk and Pulaski Counties and are destined for locations in Louisiana and Texas. Primary metal products are the third largest commodity with these goods flowing in and out of Mississippi County with destinations in Texas and Canada.

Food or kindred products (which are primarily composed of processed foods) are the only other commodity with more than five percent of the total goods moved in the State. Within Arkansas, this commodity is generated in Arkansas and Craighead Counties with destinations in the major US population centers of California, Illinois and Texas. International exports of agricultural and food products go to destinations such as Mexico, Central America, Northeast Asia, the Caribbean, and the Middle East.

**Table 14: Top Rail Commodities (Domestic Freight), 2013**

| Commodity | Tonnage (1,000) | Percent of Total | Main Origin(s) | Main Destination(s) |
|---|---|---|---|---|
| Coal | 17,193 | 39% | Wyoming | Jefferson, Independence, and Mississippi Counties |
| Nonmetallic Minerals | 4,896 | 11% | Hot Spring, Polk, and Pulaski Counties | Louisiana Texas |
| Primary Metal Products | 3,664 | 8% | Mississippi County | Texas, Canada, Mississippi County |
| Food or Kindred Products | 3,074 | 7% | Arkansas and Craighead Counties Iowa | California, Illinois, Texas |
| Chemicals or Allied Products | 2,281 | 5% | Louisiana Texas | Pulaski and Benton Counties |
| Misc. Mixed Shipments | 2,145 | 5% | California Crittenden County | Crittenden County California |
| Farm Products | 2,064 | 5% | Kansas, Illinois Minnesota | Benton and Howard Counties Texas |
| Pulp, Paper, or Allied Products | 1,663 | 4% | Pulaski and Little River Counties Missouri | Texas, Louisiana, North Dakota |
| Clay, Concrete, Glass, or Stone | 1,626 | 4% | Jefferson County Little River County | Sebastian County California, Texas |
| Waste or Scrap Materials | 1,377 | 3% | Missouri, Kansas Oklahoma | Mississippi and Sebastian Counties |
| All Others | 4,661 | 10% | | |
| **Total** | **44,645** | **100%** | | |

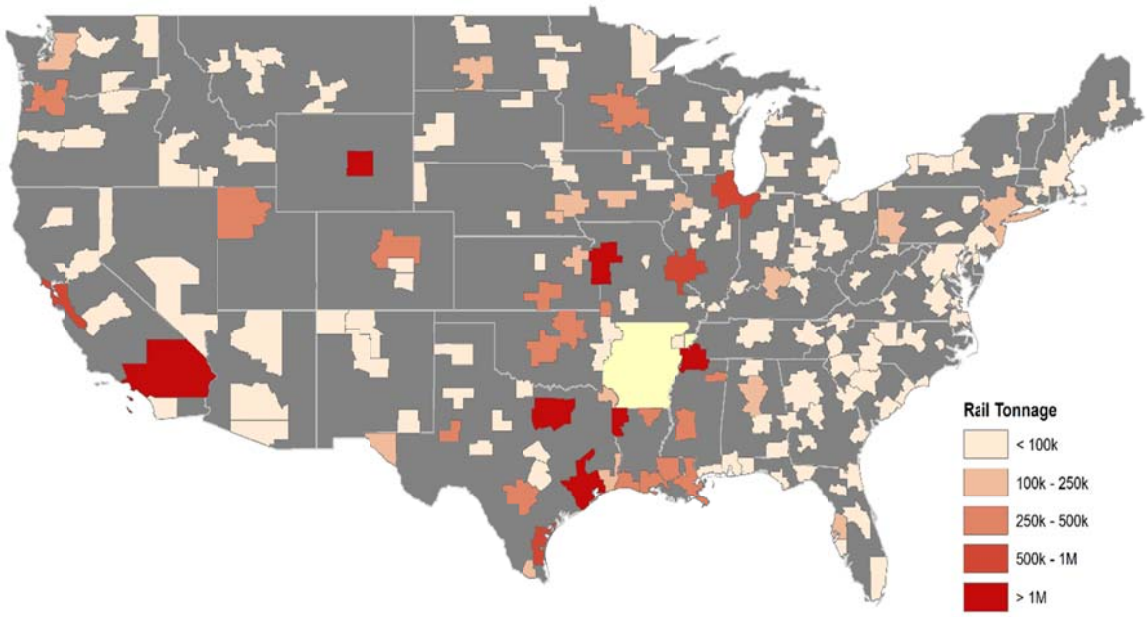
Source: TRANSEARCH.

## 5.3.2 Rail Trading Partners

Figure 30 and Table 15 show where Arkansas' rail trading partners are located. In comparison with truck movements, major rail trading partners tend to be farther away. The largest trading partner by rail tonnage, and overall for the entire State, is Casper, Wyoming. This is due to a significant amount of coal production in that region. Future coal movements may see a decline, indicated by the recent layoffs of nearly 500 persons at major coal mines in the region. The

second largest trading partner is the Los Angeles/Long Beach region with over 2.5 million tons. This region has a large volume of import/export activity from which products are railed across the country to consuming markets. These products are likely shipped to the Marion intermodal terminal. Rounding out the top five locations are regions in Louisiana and Texas, namely Shreveport, Dallas, and Houston.

**Figure 30: Arkansas Trading Partners via Rail Movements**




Source: TRANSEARCH.

### 5.3.3 Rail through Flows

Rail through flows are shipments moved by the railroads that travel through Arkansas, but have neither their origin nor destination in the State. The TRANSEARCH database contains an estimate of 138 million tons of rail through flows annually in Arkansas. This represents over three-quarters of the total 183 million tons of rail flows in Arkansas (Figure 31). The top origin of through rail flows is Wyoming with 30 percent of the total amount. As indicated above, rail tonnage from Wyoming is predominantly coal, therefore it can be estimated that much of the through rail traffic in Arkansas is coal. Of the through rail traffic moving in Arkansas, Texas was the second highest origin point accounting for 12 percent of such traffic by tonnage. Texas was also the single largest recipient of through rail traffic with 24 percent of the total. Other major contributors to this traffic include North Dakota, Illinois, Tennessee, and Louisiana.

## Table 15: Top Rail Trading Partners by Tonnage, 2013

| BEA Name | Carload and Rail NEC | Intermodal | Total |
|---|---|---|---|
| Casper, WY | 17,091,198 | | 17,091,198 |
| Los Angeles-Long Beach-Riverside, CA | 300,760 | 2,440,480 | 2,741,240 |
| Shreveport-Bossier City-Minden, LA | 2,311,199 | | 2,311,199 |
| Dallas-Fort Worth, TX | 1,408,029 | 1,800 | 1,408,029 |
| Houston-Baytown-Huntsville, TX | 1,282,265 | 7,560 | 1,289,825 |
| Memphis, TN-MS-AR[13] | 1,240,127 | | 1,240,127 |
| Kansas City-Overland Park-Kansas City, MO-KS | 1,207,250 | | 1,207,250 |
| St. Louis-St. Charles-Farmington, MO-IL | 824,428 | | 824,428 |
| Non-CMA Alberta | 624,861 | | 624,861 |
| Chicago-Naperville-Michigan City, IL-IN-WI | 606,516 | | 606,516 |
| San Jose-San Francisco-Oakland, CA | 346,840 | 232,600 | 579,440 |
| Corpus Christi-Kingsville, TX | 567,644 | 9,240 | 576,884 |
| Non-CMA Ontario | 462,545 | | 462,545 |
| Minneapolis-St. Paul-St. Cloud, MN-WI | 455,340 | | 455,340 |
| Monroe-Bastrop, LA | 449,292 | | 449,292 |
| San Antonio, TX | 442,900 | | 442,900 |
| Midland-Odessa, TX | 425,576 | | 425,576 |
| Lake Charles-Jennings, LA | 405,473 | | 405,473 |
| Jackson-Yazoo City, MS | 383,400 | | 383,400 |
| Denver-Aurora-Boulder, CO | 341,816 | | 341,816 |
| Wichita-Winfield, KS | 326,968 | | 326,968 |
| Tulsa-Bartlesville, OK | 316,124 | | 316,124 |
| Joplin, MO | 310,236 | | 310,236 |
| Oklahoma City-Shawnee, OK | 288,088 | | 288,088 |
| Baton Rouge-Pierre Part, LA | 281,356 | | 281,356 |
| All Others | 8,492,811 | 478,360 | 12,253209 |
| **Total** | **41,191,242** | **3,170,040** | **44,361,282** |

Source: TRANSEARCH. Note: internal flows excluded.

## Figure 31: Arkansas Rail Flows by Direction, 2013

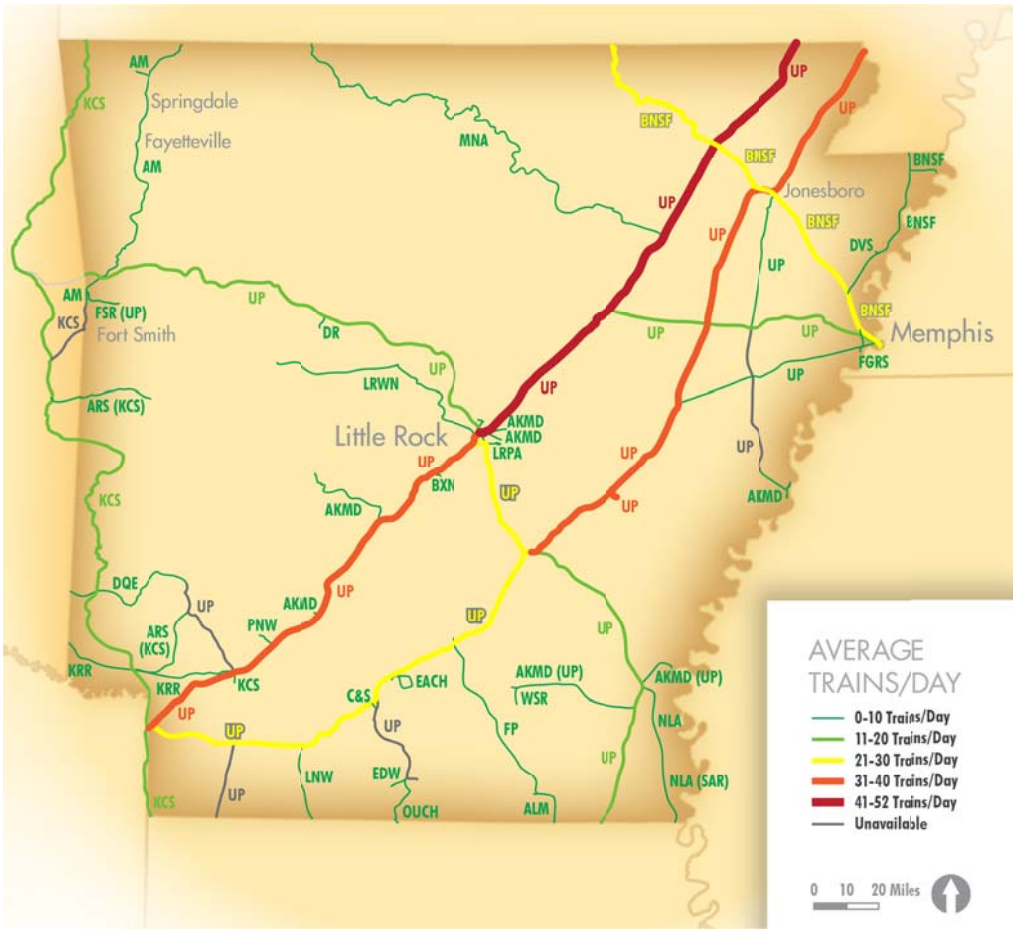

Source: TRANSEARCH.

[13] BEAs which include portions of Arkansas do not include the tonnage associated with Arkansas under the individual BEA. Rather, those are included in the Arkansas internal movements.

### 5.3.4 Arkansas Train Volumes

Figure 32 displays train volumes for rail lines in Arkansas. The UP Railroad mainlines running across the State from the northeast to the southwest typically have the highest train densities. These segments of the UP Railroad system connect Chicago, St. Louis, and Texas. The BNSF line located in the northeastern part of the State also serves a relatively high volume of trains as part of the BNSF Transcon Corridor's "Southeast Gateway". Also displayed on this map are a number of routes that are not Class I mainlines but that are leased from the Class I railroads by Class III rail entities.

**Figure 32: Trains per Day of Arkansas Class I Railroad Subdivisions**




Source: State Rail Plan.

### 5.3.5 Rail Freight Forecast

Most of the top rail commodities today will see significant growth in the coming years (Table 16). The exception to this is coal due to a decrease in coal production in the US as a result of stiffer competition from natural gas as a source of power production and stricter emissions regulations. The largest growth rate for the rail mode will be farm products at an overall growth of 153 percent, or 2.7 million tons, forecast between 2013 and 2040. The largest overall tonnage increase will be primary metal products with nearly 4.2 million additional tons being transported by rail in 2040, a growth of 134 percent.

**Table 16: Forecasted Rail Growth**

| Commodity | 2013 Tonnage (1,000) | Percent of 2013 Total | 2040 Tonnage (1,000) | Percent of 2040 Total | Percent Change, 2013-2040 |
|---|---|---|---|---|---|
| Coal | 17,193 | 39% | 10,623 | 18% | -38% |
| Nonmetallic Minerals | 4,896 | 11% | 7,829 | 13% | 63% |
| Primary Metal Products | 3,664 | 8% | 7,327 | 12% | 50% |
| Food or Kindred Products | 3,074 | 7% | 4,957 | 9% | 62% |
| Chemicals or Allied Products | 2,281 | 5% | 4,062 | 8% | 56% |
| Misc. Mixed Shipments | 2,145 | 5% | 5,190 | 8% | 41% |
| Farm Products | 2,064 | 5% | 4,591 | 7% | 45% |
| Pulp, Paper, or Allied Products | 1,663 | 4% | 2,851 | 5% | 58% |
| Clay, Concrete, Glass, or Stone | 1,626 | 4% | 2,513 | 4% | 65% |
| Waste or Scrap Materials | 1,377 | 3% | 2,253 | 4% | 61% |
| All Others | 4,661 | 10% | 8,062 | 13% | 58% |
| **Total** | **44,645** | **100%** | **60,257** | **100%** | **35%** |

Source: TRANSEARCH.

### 5.3.6 Rail Freight Needs

The State Rail Plan identified a number of rail freight needs throughout the State. As is often the case, these needs far exceed available funding sources. Six projects are currently funded for improvements as listed in Table 17, representing over $46 million in investments in the short term. Two of these projects, one at the Port of West Memphis and another in Jonesboro, were partially funded from US DOT TIGER grants in 2012 and 2014. These grants are designed to improve safety and economic opportunity through innovative transportation improvement projects, including multimodal and multi-jurisdictional efforts. Between 2009 and 2016, the TIGER grant program has provided a combined $5.1 billion to 421 projects throughout the Nation, leveraging funding from private-sector partners, states, and local governments.

### 5.3.7 Summary of Major Issues and Needs for Arkansas Railways

Issues and needs of rail transport in Arkansas identified by representatives of the Class I and Class III rail lines generally fall into the following categories:

- Additional Capacity;
- Critical Maintenance Backlog; and
- Reduction of At-Grade crossings.

*Appendix E – Rail Improvement Needs* contains a listing of identified rail needs excerpted from the State Rail Plan. These needs were defined by the rail owners and operators. There is no public funding mechanism identified to fund these improvements. However, inclusion of the identified needs in the State Rail Plan will enhance the attractiveness and eligibility of these proposed improvements when applying for discretionary funds.

**Table 17: Funded Rail Projects in Arkansas (Short-Term Investment Program)**

| Project Description | Cost | Funding Mechanism | Project Benefits |
|---|---|---|---|
| Rail extension and rehabilitation at the Port of West Memphis | $27 million | $10.9 million from 2012 TIGER grant, other local and private funds | Economic development and modal connectivity |
| Rail Rehabilitation of the North Louisiana and Arkansas Railroad | $13 million (includes work within Louisiana) | US Economic Development Administration, State of Arkansas SEAEDD, Lake Providence Port Commission, State of Louisiana, Delta Regional Authority, Arkansas Short Line Railroads, Inc. | Economic development, rail system preservation/state of good repair, freight system efficiency |
| City of Jonesboro Railroad Corridor Highway 18/BNSF Crossing Planning for environmental and designs | $1.5 million | $1.2 million from 2014 TIGER grant, $0.3 million in local match | Safety, reduces community impacts |
| Arkansas Passenger Rail Study | $0.9 million | $0.4 million from FRA HSR (pre HISPR)<br>$0.5 million from State of Arkansas | Investigates potential transportation options |
| AKMD Warren Branch Rail Line Rehabilitation | $3.4 million | $2.7 million from FRA Rail Line Relocation and Improvement Program,<br>$0.7 million from AKMD | Rail system preservation/ state of good repair, freight system efficiency |
| Ouachita Railroad Bridge Rehabilitation | $370,000 | $330,000 from FRA Rail Line Relocation and Improvement Program,<br>$40,000 from OUCH | Rail system preservation/ state of good repair, freight system efficiency |

Source: 2015 Arkansas State Rail Plan.

## 5.4 Air Cargo and Needs

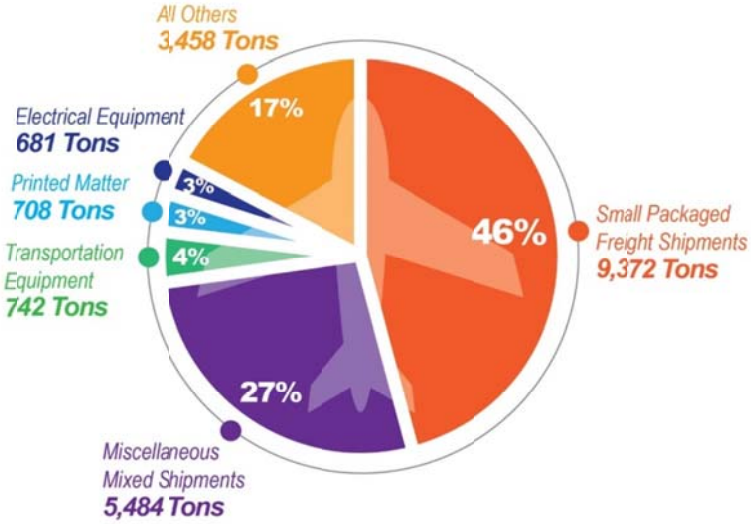
### 5.4.1 Statewide Air Cargo Freight Flows

Air cargo is the smallest of the freight modes in terms of tonnage and total value, but it is a critical element of the freight transportation system as it allows for movement of goods where there is a high importance on rapid delivery. Based on the role of air cargo in the freight transportation system, it tends to carry goods of high value as identified by high value-ton ratios in freight flow databases. Figure 33 shows the value-ton ratio of all modes in Arkansas based on the Arkansas TRANSEARCH freight flow database. The 20,445 tons carried by air cargo in had a value over $1.7 billion giving it a value-ton ratio of 86.70. This is over 100 times the value-ton ratio of each of the other freight modes.

Figure 34 shows that small packaged freight shipments and miscellaneous mixed shipments represent nearly three-quarters of the total air cargo moved in Arkansas. This illustrates the practice of air cargo moving high-value, low-tonnage shipments.

**Figure 33: Arkansas Ton-Value Ratios by Mode, 2013**


**Figure 34: Air Cargo Commodity Distribution, 2013**




Source: TRANSEARCH.

## 5.4.2 Air Cargo Flows by Arkansas Airport

Arkansas is home to four airports that serve air cargo: Bill and Hillary Clinton National/Adams Field (LIT), Fort Smith Regional (FSM), Northwest Arkansas Regional (XNA), and Texarkana Regional-Webb Field (TXK). The vast majority of air cargo movement occurred at the Little Rock airport. Air cargo is forecast to nearly triple between 2013 and 2040 based primarily on increased demand for small packaged shipments.

The Bill and Hillary Clinton National (LIT) in Little Rock accounts for over 99 percent of all air cargo tonnage in the State. As shown in Table 18, small amounts of cargo are reported at both Northwest Arkansas Regional Airport (XNA) and Fort Smith Regional Airport (FSM). Less than a ton of air cargo was reported from other Arkansas airports.

### Table 18: Air Tonnage by Airport, 2013

| County | Airport | Tonnage | | | Value ($1,000) | | |
|---|---|---|---|---|---|---|---|
| | | Inbound | Outbound | Total | Inbound | Outbound | Total |
| Pulaski | Bill and Hillary Clinton National | 11,048 | 9,350 | 20,399 | 888,857 | 836,083 | 1,724,940 |
| Benton | Northwest Arkansas Regional | 19 | 13 | 33 | 3,430 | 1,955 | 5,384 |
| Sebastian | Fort Smith Regional | 1 | 12 | 13 | 123 | 3,471 | 3,594 |
| Other* | --- | | 0.6 | 0.6 | | 55 | 55 |
| **Total** | | **11,069** | **9,376** | **20,445** | **892,409** | **841,564** | **1,733,973** |

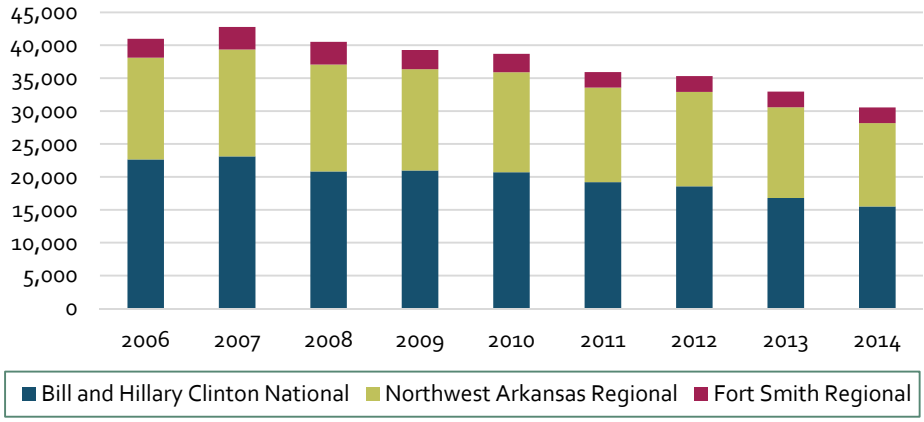
* Note: "Other" includes cargo shipments through the Texarkana Regional-Webb Field Airport and other airports within the State.

Source: Transearch.

Air cargo tonnage and trading partners are somewhat related to the passenger airline connections in that some air cargo moves in passenger airplanes. Figure 35 illustrates the number of scheduled departures on an annual basis, with details provided in Table 19. This data, available from the Bureau of Transportation Statistics, does not include scheduled services for freight and mail, but it does offer an insight to the magnitude of operations at each airport, particularly as there are few dedicated cargo operations in Arkansas.

With a comparable number of flights into and out of the Little Rock and Northwest Arkansas Regional Airports, it is interesting to note the differences in the tonnage of freight in and out of each airport. This disparity highlights a potential area for improved use of existing freight infrastructure.

### Figure 35: Total Departures from Arkansas Airports, 2006 to 2014




Source: US DOT, Bureau of Transportation Statistics.

### Table 19: Scheduled Departures from Arkansas Airports (thousands)

| Airport | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Percentage Change 2006-2014 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Bill and Hillary Clinton National** | 22.7 | 23.1 | 20.8 | 21.0 | 20.7 | 19.2 | 18.6 | 16.8 | 15.5 | -33% |
| **Northwest Arkansas Regional** | 15.5 | 16.2 | 16.2 | 15.4 | 15.2 | 14.4 | 14.3 | 13.8 | 12.7 | -22% |
| **Fort Smith Regional** | 2.9 | 3.4 | 3.5 | 2.9 | 2.8 | 2.4 | 2.4 | 2.4 | 2.4 | -20% |
| **Sub-Total 3 Airports** | 41.0 | 42.8 | 40.5 | 39.3 | 38.7 | 35.9 | 35.3 | 33.0 | 30.6 | -29% |
| **Total US** | **9,708** | **9,836** | **9,376** | **8,767** | **8,700** | **8,648** | **8,445** | **8,324** | **8,109** | **-16%** |

Source: US DOT, Bureau of Transportation Statistics.

For the three top airports in Arkansas, there has been a significant decrease in airlifts since the peak in 2007. Combined, there was a decrease of 29 percent in scheduled departures from Arkansas airports from the peak in 2007 to 2014. Since 2010, there has been a continued decrease in the number of scheduled departures, with a total decline of 21 percent. Between 2007 and 2014, scheduled passenger departures in the US decreased by roughly half as much as the three top airports in Arkansas.

## 5.4.3 Air Cargo at Nearby Airports

Much of the air cargo needs of Arkansas shippers are met through facilities located in neighboring states. The Memphis International Airport is the largest air cargo airport in the US, based on a landed weight of nearly 12 million tons in 2015. The Dallas/Fort Worth International Airport is 10th largest, with nearly 1.6 million tons of landed weight. The capacity of these

airports, combined with their proximity to Arkansas shippers and Arkansas markets, results in a limited amount of air cargo traffic through Arkansas airports

Table 20 shows the top air cargo airports in the US, by landed weight, according to the Federal Aviation Administration. It also shows the landed weight for many airports close to Arkansas along with the distances from these airports in adjacent states to the Arkansas State line.

Most notably, the Memphis International Airport sits just 11 miles east of the Arkansas-Tennessee State Line. With a total annual landed weight of 23.8 billion pounds and numerous connecting cities across the country, it is difficult for smaller airports in Arkansas to compete with Memphis International Airport for air cargo traffic. Most air cargo is handled by third-party logistics companies that typically have bulk rates negotiated with specific carriers for specific airports. It is generally less expensive for them to drive to the airport where they have the bulk rate than to use an airport where they do not have a special rate simply because it is a little bit closer. These third-party logistics companies will get the best bulk rate deals with air carriers that serve many cities and move large cargo volumes.

**Table 20: Landed Weight of Top Ten Air Cargo Airports and Other Nearby Airports**

| Rank Among US Air Cargo Airports | Airport | 2014 Landed Weight (Millions of pounds) | Distance to the Arkansas State Line (Miles) |
|---|---|---|---|
| 1 | Memphis International Airport | 23,760 | 11 |
| 2 | Ted Stevens Anchorage | 16,272 | |
| 3 | Louisville International-Standiford | 11,568 | |
| 4 | Chicago O'Hare International | 7,541 | |
| 5 | Miami International | 7,193 | |
| 6 | Indianapolis International | 5,356 | |
| 7 | Los Angeles International | 4,297 | |
| 8 | Cincinnati/Northern Kentucky | 3,644 | |
| 9 | John F. Kennedy International | 3,170 | |
| 10 | Dallas/Ft. Worth International | 3,141 | 200 |
| 41 | Kansas City International | 498 | |
| 60 | Lambert-St. Louis International | 381 | 185 |
| 71 | Louis Armstrong New Orleans | 297 | 257 |
| 85 | Will Rogers World (Oklahoma City) | 219 | 188 |
| 90 | Springfield-Branson National (Missouri) | 198 | 62 |

Source: US DOT, Federal Aviation Administration.

Airports in Dallas, Kansas City, St. Louis, New Orleans, Oklahoma City and Springfield (MO) all recorded more landed weight than Little Rock in 2014. Additionally, these facilities are all located within a four-hour drive of the State and likely offer competitive rates to their customers.

### 5.4.4 Air Cargo Needs

Cargo operations at Arkansas' freight airports have experienced a significant decrease from prior volumes. At the Bill and Hillary Clinton National Airport, this was due to the discontinuation of FedEx and Airborne Express services at this airport. In 2001, Federal Express (now FedEx Express) entered into an agreement with the United States Postal Service (USPS). This agreement

resulted in a large amount of airmail being trucked to and from Memphis, rather than traveling through airports in Arkansas. This had a profound impact on air cargo in Arkansas, with a reduction of almost 15 million pounds attributed to a reduction in airmail. This coupled with the 25 percent reduction in national mail volumes from the 2006 peak suggests that new customers will be needed to get back to 2000-era air cargo volumes in Little Rock. There is the potential for other airports in Arkansas, such as the Northwest Arkansas Regional Airport, to increase cargo volumes, but that is dependent on identifying and securing new customers.

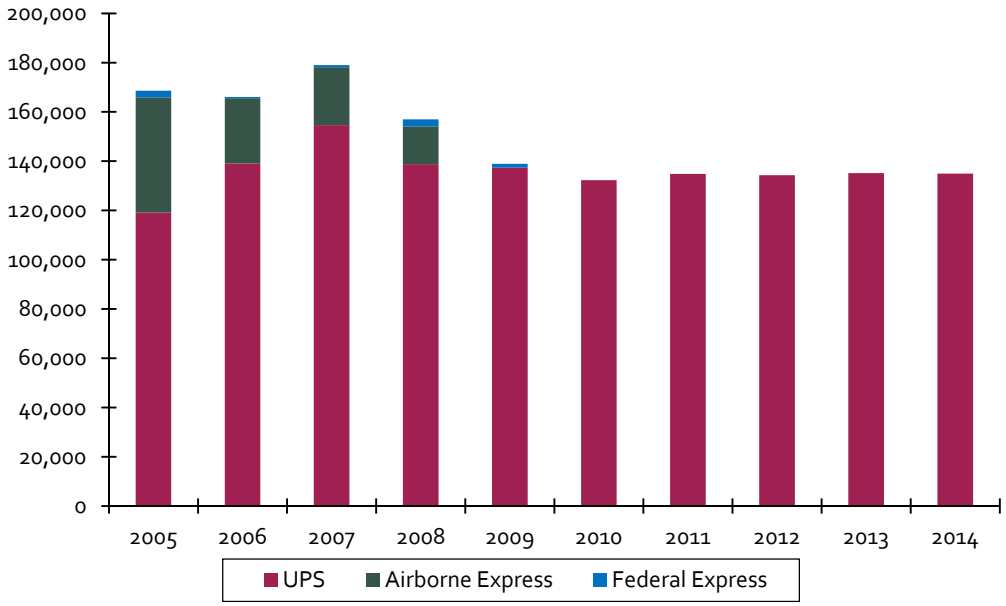
#### 5.4.4.1 Clinton National Airport

Clinton National Airport is the largest airport in the State by both passenger and air cargo volumes – generating over 90 percent of the air cargo in Arkansas. It is host to six airlines serving nearly 2.2 million passengers annually. This airport is located in Pulaski County, Arkansas and is owned by the City of Little Rock. Aircraft are served by three separate runways: Runway (RWY) 18-36 with a length of 6,224 feet, RWY 04L-22R with a length of 8,273 feet, and RWY 04R-22L with a length of 8,251 feet.

One of the notable commercial air cargo activities in Arkansas is the movement of Dassault Falcon Jets. Incomplete planes are flown into the facility from France to the company's Completion Center in Little Rock, where optional avionics and custom interiors are installed and exteriors are painted. Dassault Aircraft Services is based at the Clinton National Airport and performs inspection, maintenance, modification, completion and repairs for Dassault Falcon Jets.

The total volume of the air cargo operations in Little Rock can be seen in Figure 36. Currently, the majority of air cargo operations are attributed to UPS. Airborne Express and FedEx previously accessed this airport, but this traffic dropped significantly between 2000 and 2008 as mentioned above. The landed weight of cargo aircraft peaked in 2007 at nearly 180 million pounds. Recent loss of service as well as the economic downturn has caused the landed cargo weight to decline. Cargo volumes have held steady at a landed weight of nearly 140 million pounds over the last five years. Based on data from the FAA, these volumes would put LIT at roughly 100$^{th}$ in the ranking of US airports by landed weight of cargo. Of note, the discussed volumes are reported as landed weights of cargo aircraft and would not include cargo that is carried in the belly of passenger aircraft.

**Figure 36: Airline Landed Weight - Clinton National Airport (Thousands of Pounds)**




Source: LIT Comprehensive Annual Financial Report Fiscal Year Ended December 31, 2014.

The airport has three buildings dedicated to cargo use totaling 52,298 square feet, in addition to 386,000 square feet of dedicated cargo ramp area. Air cargo operators include UPS, Delta Airlines, American Airlines, and Southwest Airlines. UPS operates two flights on weekdays and one on Saturdays, while those moving belly cargo operate on schedules related to their passenger movements. The Little Rock Airport reports there is space available to expand the air cargo market at the airport, but there is insufficient demand to justify additional cargo services.

Clinton National Airport recently began updating its Airport Master Plan, which will reconsider priorities regarding air cargo needs for their Airport. As part of this plan the airport will revisit the findings/recommendations included in the 2004 Little Rock National Airport Air Cargo Study as part of the Airport Master Plan. The following projects were included as recommendations in the 2004 air cargo study:

- **Air cargo terminal with US Customs.** It was recommended the terminal be moved closer to the UPS processing center. Existing truck traffic must use a tunnel under a taxiway. The Transportation Security Administration noted that this poses a security risk. A new terminal should include ample warehouse space for package sorting and packing.

- **Dedicated air cargo taxiway.** Construction of a dedicated air cargo taxiway would allow for cargo aircraft to easily takeoff and land at the airport. Air cargo activities would have a smaller impact and have fewer conflicts with passenger airplane ground movement.

- **Realignment of E. Roosevelt Road**. This improvement was included in the City of Little Rock's planned highway improvements in 2004. This project could enhance access to the existing air cargo terminal.

- **Highway access/route improvements**. Five options were identified as possible ways to improve landside access to the existing air cargo terminals. In all cases, highway capacity improvements such as intersection widening and signalization, additional traffic lanes and shoulder widening to facilitate truck movement were suggested.

#### 5.4.4.2 Northwest Arkansas Regional Airport

The Northwest Arkansas Regional Airport (XNA) is the second largest airport in the State by passenger volumes. The airport currently does not have any dedicated cargo flights. It does move some belly cargo from the passenger airlines and is actively pursuing air cargo service. The 2015 Northwest Arkansas Regional Airport Masterplan noted one key project to improve the ability of the airport to support air cargo in the future – a new intermodal access road. A preliminary Financial Analysis Report, developed in March 2016, provided by the Airport, outlined this project along with several other airport improvements and provided information regarding how these infrastructure improvements could be funded.

XNA is currently evaluating two access road alignment alternatives and two construction scenarios (an initial scenario that assumes construction of a two-lane roadway, and ultimate scenario that assumes construction of a four-lane roadway) for the access road. The cost associated with these options varies between $55.9 million and $88.1 million.

### 5.4.5 Summary of Major Issues and Needs for Arkansas Air Cargo Providers

As noted in the narrative regarding capacity for cargo movements through the Bill and Hillary Clinton National Airport, even as the busiest cargo airport in the State, there is still excess capacity and opportunities for additional activities with the current infrastructure. Both the Little Rock and Northwest Arkansas airports indicated a need for enhanced land-side access, also described as enhanced highway access and roadway improvements.

With the relatively low volume of air cargo moving through Arkansas' airports, there is not a mandate for freight-related investments at this time. However, at the national level, there is an expectation of more than doubling air cargo movements. Currently, air cargo moves around 20 thousand tons per year with an anticipated growth to nearly 60 thousand tons per year in 2040, representing a 190 percent increase in air cargo tonnage.

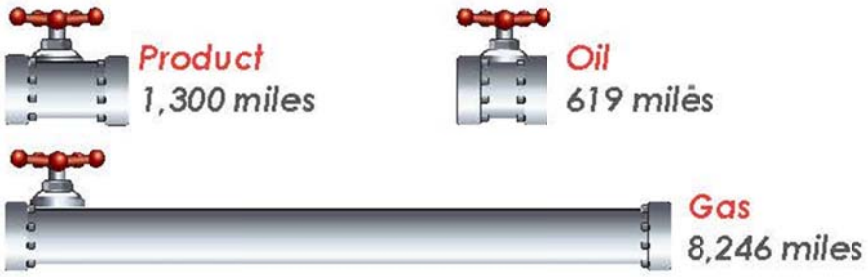
## 5.5 Pipeline Demands and Needs

Pipeline locations in Arkansas were presented in Figure 8. Due to the private and proprietary nature of the pipeline industry, there is little available information to be analyzed or presented regarding existing and projected needs. Pipelines, by their very nature, operate away from the typical movement of people and vehicles. Additionally, connections between the pipeline mode and other conveyances occur at very tightly-defined locations outfitted for the transfer of very specific products.

There are over 10,000 miles of pipelines in Arkansas. However, not all of the pipelines are identical in capacity. Depending on the materials being transported, the pipes are of different dimensions and in some situations multiple pipes follow a single alignment. Care should be exercised any time infrastructure investments are under consideration to ensure there are no

conflicts with the pipeline system. Figure 37 displays the three major types of pipelines in Arkansas and their approximate mileages.

**Figure 37: Pipelines in Arkansas (miles)**




The FAC did not specifically address pipelines as a means of cargo conveyance. Products shipped within the pipelines enter the transportation network at terminals either through the transfer of the materials to rail cars or trucks. This is an opportunity for further investigation and expanded coordination between the modes.

# 6.0 PROJECT IDENTIFICATION AND SCREENING

Based on the findings discussed above, trucking is expected to continue as the dominant mode of freight movement in Arkansas for the foreseeable future. Consequently, significant investments in the highway freight system will be necessary to meet the demand for highway freight movements. However, improvements to other modes will also be necessary to provide an integrated and competitive State freight system. Currently, ARDOT has authority to obligate funds only to the State Highway System. Generally, improvements to other modes of freight must be originated with the owners or custodians of those resources, though some competitive funding opportunities are available for non-highway modes. The SFP includes an unconstrained list of freight system needs across all modes, and a separate, fiscally-constrained list of freight-related highway improvements funded through the National Highway Freight Program.

## 6.1 Project Identification

During the course of developing the SFP, potential improvements to the freight infrastructure system were identified through: (1) technical analysis, (2) stakeholder outreach, and (3) previous studies. Through the process of identifying Freight Goals, certain Objectives were defined as screening criteria for proposed improvements.

Technical analysis was conducted primarily as part of the assessment of freight demand and needs. Highway bottlenecks were identified using both the ARTDM and ATRI truck GPS data. This revealed congestion along the roadway systems. Additionally, safety hotspots on the highway network were identified through an analysis of statewide crash data. Locations where delays are primarily the result of crashes were considered prime locations where operational and intelligent transportation systems (ITS) were considered. Interstate 40 between Little Rock and Memphis is a prime example of this type of location. The operational strategies considered for I-40 include:

- Installing variable message signs along I-40 to notify travelers about downstream traffic conditions, perhaps coupled with increasing capacity on facilities within the I-40 corridor;
- Enhancing ITS system investments statewide and in use in neighboring states – including dynamic message boards, traffic cameras, and driver advisory activities;
- Encouraging the implementation of truck platooning technologies;
- Enhancing crash clearance operations along I-40, including investigation of public-private partnerships to reduce clearance times from incidents along the corridor.

Overall, a detailed operational and long-term capacity study is recommended for I-40 to identify the most effective solutions to deal with current operational issues and emerging recurring capacity issues.

The technical analysis also developed solutions specifically focused on freight mobility issues, such as bottlenecks. The most straightforward approach to dealing with these issues is to add capacity to the roadways that experience the worst bottlenecks. All of the capacity enhancement projects that are on the project list were developed to address current and projected bottlenecks. Additionally, improvements to roadways that allow vehicles to avoid congested locations were also considered. Adding capacity to Highway 412 throughout Arkansas to possibly reduce congestion in central Arkansas is an example of this type of improvement.

Stakeholders were engaged across all modes through a series of forums and interviews. Members of the FAC were interviewed in one-on-one settings to discuss goals for the study, primary issues, and potential solutions to these issues. Additionally, the FAC met on six separate occasions to review the technical work conducted in the study and discuss specialty topics related to freight transportation. Each of the Metropolitan Planning Organizations (MPOs) in Arkansas were interviewed to identify local freight issues and determine which of the broader freight issues were most relevant to their jurisdictions.

Likewise, port operators and managers from the three largest airports in Arkansas were interviewed. Finally, a series of private sector interviews of freight stakeholders were conducted across industries, modes, and geographies. These interviews were used to identify the private-sector perspective on freight transportation in Arkansas and to generate ideas for potential freight improvement projects.

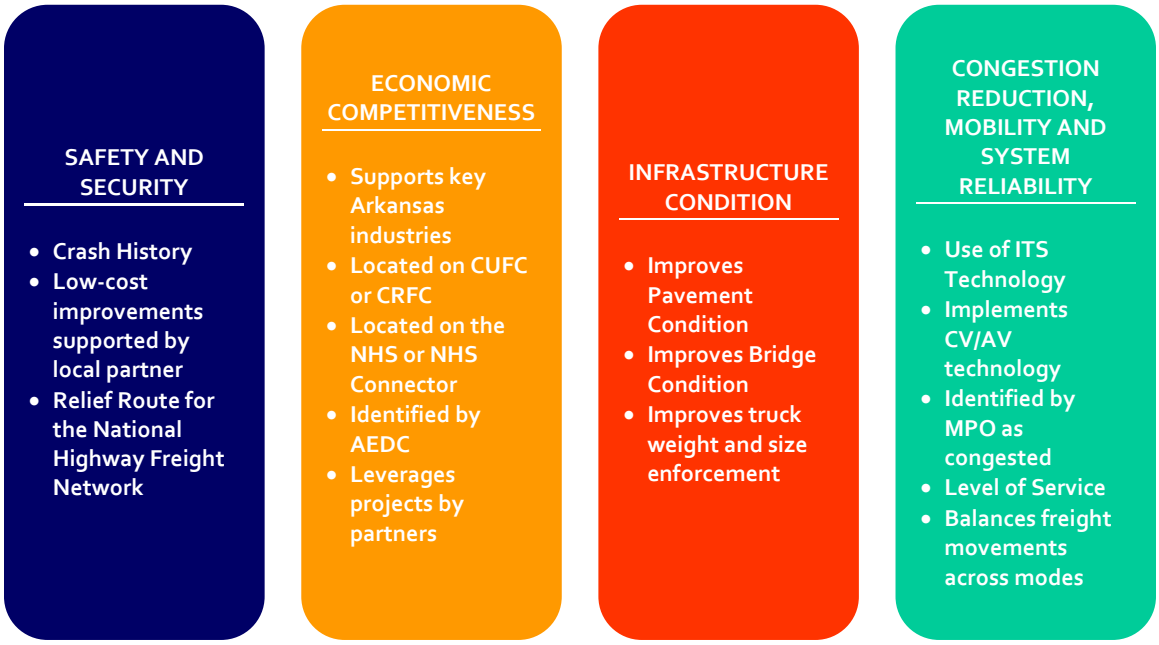
Previous studies were consulted to supplement the rail and waterway portions of this study. The State Rail Plan was a comprehensive effort covering both freight and passenger rail; including a detailed description of rail infrastructure, rail needs, and list of freight improvement projects in the State identified by Class 1 and Class 3 rail operators. Additionally, there have been several studies of the waterways in Arkansas. These studies were particularly important to describe the benefits of dredging the MKARNS to 12 feet.

*Appendix F – Needs Identified Through Stakeholder Outreach and Technical Analysis* lists the needs and potential improvements that were identified through this process, includes the source of each project, the rationale behind the project, the modes impacted, and the type of improvement considered.

## 6.2 Project Screening

To screen the list of potential freight improvement projects, merit criteria were identified and developed based on the Goals and Objectives of the Plan.

**Figure 38: Goal Areas and Screening Criteria**




The project list was screened using the criteria resulting in a generalized listing of priority freight improvements. Projects that met four or more of the criteria passed through the screen. Following this screening process, the priority project list was reviewed to ensure geographic and modal representation.

Additionally, general categories of near-term highway projects were added to the list to balance the long-term project development needed for most of the highway projects identified in the preliminary list. This resulted in a set of projects across four categories as presented in Figure 39.

**Figure 39: Priority Freight Needs**


The near-term highway improvement projects were identified as a part of the unconstrained projects. They were further grouped together based on their eligibility for FAST Act National Highway Freight Program Funding. These projects are included in the 2016-2020 Statewide Transportation Improvement Program (STIP). The specific projects that fall into this category are presented in *Appendix G - Projects Funded with National Highway Freight Program as included in the 2016-2020 Statewide Transportation Improvement Program.*

## 6.3 Moving Forward

The FAST Act's National Highway Freight Program provides funding for near-term freight projects. Identifying funding for medium-term and long-term freight improvement projects will be a challenge. There are many more high-priority freight improvement projects identified than funds are currently available to develop the projects.

Private sector stakeholders are potential sources of freight improvement projects. The UPRR has invested $588 million into its Arkansas freight rail infrastructure, and continued investment is expected to occur on a similar scale into the future. The State Rail Plan identified over $45 million of funded freight rail projects. Private-sector stakeholders may also express interest in developing transload terminals, the development of additional inland ports, and building new truck rest areas.

The US Army Corps of Engineers operates and maintains the inland waterways in the United States and would be the lead agency on deepening the McClellan-Kerr Arkansas River Navigation System and improving the navigation status of the Red River. The 2017 fiscal year annual budget for the USACE is $4.6 billion, which is used for flood and storm damage, commercial navigation, and aquatic ecosystem restoration across the entire country. This results in many other competing projects for those funds.

Discretionary funding sources may also be pursued. The US DOT has provided funding in the past through the TIGER, FASTLANE, INFRA, and other discretionary grant programs. Likewise, other discretionary grant programs work to provide infrastructure improvements that meet other federal program goals.

Investments in the State's freight transportation system also mean investments in transportation as a whole. As these facilities are improved, travel will become more efficient and more economical for all users, thus making Arkansas more attractive for long-term economic development. ARDOT will continue to pursue all opportunities for State and Federal funds as well as partnering opportunities with public and private entities. *Appendix G* contains the list of projects currently committed for National Highway Freight Program funding in the FY 2016-2020 STIP. This presents a snapshot of current commitments for freight investment and serves as the Investment Plan. Both the project listing and the Investment Plan will be updated in coordination with the updating of the STIP.

Implementation activities associated with the SFP will include continued coordination with the FAC on a regular basis to examine and discuss freight movement needs and solutions. Going forward, efforts which address both the national and state freight goals will be promoted. Table 21 below displays the relationship of the national and state goals with objectives and strategies.

## Table 21: Alignment of SFP with National Freight Policies

| National Freight System Goals | Strategic Support Activities |
|---|---|
| Identify policies, invest in infrastructure improvements, and implement operational innovations on the highways of the United States that:<br>A) strengthen the contribution of the National Highway and Multimodal Freight Networks to the economic competitiveness of the United States;<br>B) reduce congestion and bottlenecks on the National Highway and Multimodal Freight Networks;<br>C) reduce the cost of freight transportation;<br>D) improve the year-round reliability of freight transportation; and<br>E) increase productivity, particularly for domestic industries and businesses that create high-value jobs; | • Development of short- and long-term infrastructure improvements that improve freight flows across the State.<br>• Reducing bottlenecks and improving reliability and resiliency of major freight corridors<br>• Investments in all modes to reduce the cost of freight transportation<br>• Identification of roadways used by key industries in Arkansas and description of their travel speed performance. |
| Improve the safety, security, efficiency, and resiliency of multimodal freight transportation in rural and urban areas; | • Location and remediation of crash hot spots.<br>• Identification and remediation of modal conflicts<br>• Enhance ITS technology to leverage industry advances in connected and automated vehicles<br>• Increased public and private partnerships for transload facilities, truck parking, and other support services |
| Improve, achieve and maintain the state of good repair of the National Highway and Multimodal Freight Networks; | • Location and remediation of roadways key to the movement of freight on the State Highway System that are in poor condition.<br>• Enforce weight and size restrictions to protect the infrastructure<br>• System preservation (all modes) |
| Use innovation and advanced technology to improve the safety, efficiency, and reliability of the National Highway and Multimodal Freight Networks; | • Pursuit of truck platooning demonstration projects, particularly on I-40 between Little Rock and Memphis.<br>• Improved connectivity to rail and water terminals |
| Improve the efficiency and productivity of the National Highway and Multimodal Freight Networks; | • Education of partners regarding the importance of freight improvements on multiple modes, including the MKARNS.<br>• Preservation and maintenance of the MKARNS. |
| Improve the short- and long-distance movement of goods that–<br>A) travel across rural areas between population centers;<br>B) travel between rural areas and population centers;<br>C) travel from the Nation's ports, airports and gateways to the National Multimodal Freight Network; | • Improved access to agricultural and energy production areas.<br>• Coordinate with adjacent states to develop a corridor-based approach for reliability and resiliency. |
| 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 | • Coordination with adjacent states and multi-state metropolitan areas in the development of their freight plans. |
| Reduce the environmental impacts of freight movement on the National Highway and Multimodal Freight Networks. | • Education of decision-makers regarding the potential traffic diversion from trucking to other modes allowing a balancing of demand and impacts on the individual systems. |