Oklahoma Freight Transportation Plan | 2023–2030
January 2023

U.S. Department
of Transportation
Federal Highway Administration

Oklahoma Division

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January 26, 2023

In Reply Refer To:
HDA-OK

Tim Gatz
Executive Director
Oklahoma Department of Transportation
200 N.E. Lincoln Ave.
Oklahoma City, OK 73105

Dear Mr. Gatz:

The Oklahoma Division Office has reviewed the FY 2023-2030 Oklahoma Freight Transportation Plan (OFTP) as submitted by the Oklahoma Department of Transportation (ODOT) on October 31, 2022.

Based on our review, the OFTP satisfies all applicable federal requirements under Title 49 U.S.C. § 70202 and Title 23 U.S.C. 167 (i)(4) regarding the development of a State Freight Plan as a condition for obligating funds apportioned to Oklahoma under 23 U.S.C. § 104(b)(5). The State may now obligate such funds for projects that meet all National Highway Freight Program (NHFP) eligibility requirements provided under Title 23 U.S.C. § 167, and other applicable Federal requirements.

Please be advised that the Oklahoma Division Office finds that the Plan satisfies the requirements of 49 U.S.C. § 70202 and 23 U.S.C. § 167(i)(4) is not a determination that the projects listed in the freight investment component of the Plan and required under 49 U.S.C. § 70202(c)(2) meet all other NHFP eligibility requirements set forth in 23 U.S.C. § 167, or any other applicable Federal requirement. ODOT is responsible for determining such eligibility as with other federal-aid projects.

If you have any questions or need additional information regarding the NHFP eligibility requirements, please contact Mr. Isaac N. Akem, Community Planner at (405) 254-3343, or by email at Isaac.akem@dot.gov.

Sincerely,

Basharat Siddiqi, P.E.
Division Administrator

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Acronyms

Acronym	Definition
3D	Three-dimensional
AADTT	Average Annual Daily Truck Traffic
AFB	Air Force Base
BNSF	Burlington Northern Santa Fe
CRFC	Critical Rural Freight Corridors
CUFC	Critical Urban Freight Corridors
CV	Connected Vehicle
DMS	Dynamic Message Signs
EIA	U.S. Energy Information Administration
FAC	Freight Advisory Committee
FAF	Freight Analysis Framework
FAST Act	Fixing America's Surface Transportation
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GNBC	Grainbelt Corporation Railroad
HOS	Hours of Service
I-	Interstate Highway
IIJA	Infrastructure Investment and Jobs Act
INFRA	Infrastructure for Rebuilding America
ITS	Intelligent Transportation Systems
JIC	Just-in-Case
JIT	Just-in-Time
KCS	Kansas City Southern Railway Company
KRR	Kiamichi Railroad Company
LRTP	Long Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century Act
MCAAP	McAlester Army Ammunition Plant
MKARNS	McClellan-Kerr Arkansas River Navigation System
MPO	Metropolitan Planning Organization
MPDG	Multimodal Project Discretionary Grants
NCHRP	National Cooperative Highway Research Program
n.e.c	not elsewhere classified
NEVI	National Electric Vehicle Infrastructure
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program
NHS	National Highway System
NMFN	National Multimodal Freight Network
NPMRDS	National Performance Management Research Data Set
ODOT	Oklahoma Department of Transportation
OFTP	Oklahoma Freight Transportation Plan; *also* Plan
OKiePROS	Oklahoma Permitting and Routing Optimization System
OSOW	Oversize/Overweight
OTA	Oklahoma Turnpike Authority
PHFS	Primary Highway Freight System
Plan	Oklahoma Freight Transportation Plan; *also* OFTP
PSR	Precision Scheduled Railroading
PTC	Positive Train Control
RWIS	Road Weather Information System
SAP	State Action Plan
SF	Square Feet

Acronym	Definition
SH-	State Highway
SRP	State Rail Plan
SRIP	State Rail Investment Program
STRAHNET	Strategic Highway Network
TSMO	Transportation System Management Operations
TBD	To BE Determined
TTTR	Truck Travel Time Reliability
U.S. DOT	U.S. Department of Transportation
UP	Union Pacific Railroad
US-	U.S. Route
USACE	U.S. Army Corps of Engineers
VMT	Vehicle-Miles Traveled

1 Introduction

1.1 BACKGROUND

The Oklahoma Department of Transportation (ODOT) is charged with planning, constructing, and maintaining Oklahoma's surface transportation infrastructure, including the interstate system, the U.S. highway system, and the Oklahoma highway system. ODOT also manages state-owned freight railroads and administers other multimodal programs, including passenger rail, rural public transit, and the waterways program.

Oklahoma is located in the south-central plains of the United States and is characterized by a diverse and growing demographic and economic base. Major industries in Oklahoma include oil and gas, agriculture, aerospace, and manufacturing. The state's population in 2019 was 3.96 million and is projected to grow 20 percent by 2045. The population growth is expected to be strong in Oklahoma City and Tulsa, the state's two large metropolitan areas. Low-to-moderate growth is forecast in the remainder of the state.[1] Employment in the state is forecast to grow 4.13 percent between 2018 and 2028.[2] Freight, measured in ton-miles of travel, in Oklahoma is expected to fall in line with U.S. Department of Transportation (U.S. DOT) projections and grow at a rate of slightly over 1 percent per year.[3]

1.2 PURPOSE

ODOT is developing this Oklahoma Freight Transportation Plan (OFTP or Plan) in order to provide a safe, reliable, and productive freight transportation system that will support the growing economy and population in the state. It will accomplish the following outcomes:

- Increase attention and focus on freight needs and opportunities.
- Improve coordination of freight planning across multiple modes.
- Provide guidance for other state and regional/metropolitan freight planning efforts.
- Obtain input from the public and private stakeholders regarding state freight planning.

This OFTP was developed to be consistent with the Fixing America's Surface Transportation Act (FAST Act) and the Infrastructure Investment and Jobs Act (IIJA). The FAST Act established a new funding category dedicated to freight—the National Highway Freight Program (NHFP)—and required that states identify the use of NHFP funds within a state freight plan, which includes certain specified elements. The IIJA calls for additional elements and updates every four years.

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1 Woods and Poole data from Oklahoma Long Range Transportation Plan: 2020–2045.
2 https://oklahoma.gov/oesc/labor-market/employment-projections.html
3 Freight Analysis Framework (version 5.3) shows ton-miles growing at 1.11 percent per year for freight originating or terminating in Oklahoma and 1.22 percent nationwide through 2050.

A statewide freight plan is required to address the following components, which are summarized from the FAST Act and IIJA:

- Freight trends, needs, and issues
- Supply-chain cargo flows by mode
- Commercial ports inventory
- E-commerce impacts on freight infrastructure
- Considerations of military freight
- Truck parking assessment
- Freight policies, strategies, and performance measures to guide investment
- When applicable, a list of critical rural and urban highway corridors; critical multimodal rural facilities and corridors
- Ability to meet national freight goals and enhanced reliability and resiliency of freight transport
- Intelligent transportation systems (ITS) and other technologies and strategies to improve freight safety and efficiency
- Improvements that reduce deterioration on heavy-vehicle routes
- Goals and strategies to decrease environmental impacts of freight
- Findings/recommendations from any multi-state compact
- Inventory of, and strategies for, facilities with freight mobility issues (e.g., freight bottlenecks)
- Strategies for congestion or delay caused by freight
- Freight investment element with priority projects
- Consultation with a Freight Advisory Committee (FAC)

1.3 VISION AND GOALS

1.3.1 Guiding Freight Vision Statement

This OFTP is part of a broad policy context. ODOT has a set of established transportation goals, policies, and strategies—formulated in Oklahoma's 2020–2045 Long Range Transportation Plan (LRTP) (August 2020) and in other documents—which this OFTP supports. Additionally, this OFTP must conform to and demonstrate the achievement of national freight goals as set forth in federal legislation. To accomplish both missions—and as an expression of purpose to manage the freight system in the state—this OFTP embraces the following Freight Vision Statement for Oklahoma:

Oklahoma will continue to provide for the safe, reliable and productive performance of our multimodal freight system as a mainstay of our economy, ensuring it is resilient to interruption and sustainable for the future.

This Freight Vision Statement recognizes that Oklahoma's freight transportation system is multimodal and is important for supporting the state's economy and supplying the essential needs of its residents, workers, and visitors.

Freight Plan Context

This OFTP exists in a broad planning context. In addition to the national freight plan goals, this OFTP was guided by the Oklahoma 2020–2045 LRTP. This Plan was also informed by the Statewide Transportation Improvement Program, which incorporates metropolitan transportation improvement programs, ODOT's Federal Fiscal Year 2022–2029 Eight-Year Construction Work Plan, and numerous regional and metropolitan transportation plans from around the state. Finally, this OFTP was developed in coordination with the 2022 Oklahoma State Rail Plan (SRP).

ODOT Responsibilities and Freight Partners

ODOT is responsible for Oklahoma's surface transportation infrastructure, including the interstate system, the U.S. highway system, and the Oklahoma highway system. The network that encompasses these three highway groups is sometimes referred to as the State Highway System, and this network is the beginning framework for developing this OFTP. As this Plan proceeds, certain highways will be highlighted for their importance to freight transportation. In the freight arena, ODOT also oversees state-owned freight railroads and administers the waterways program (the McClellan-Kerr Arkansas River Navigation System [MKARNS]). In relation to freight, ODOT works closely with railroad and port owners and operators to support intermodal connectivity and mobility for goods movement.

ODOT is an active partner in additional transportation functions that involve various federal and state agencies, local jurisdictions, and private businesses. Numerous public- and private-sector organizations must fulfill their roles and work together to address the state's transportation needs.

Federal and state agencies that are critical to supporting freight transportation efforts in Oklahoma include the Federal Highway Administration (FHWA), the Federal Railroad Administration (FRA), the Federal Motor Carrier Safety Administration, the U.S. Army Corps of Engineers (USACE), the Oklahoma Corporation Commission, the Oklahoma Highway Patrol, and the Oklahoma Turnpike Authority (OTA). For freight transportation planning purposes, other critical agencies and organizations include, but are not limited to, airports, metropolitan planning organizations (MPOs), Native American tribal entities, port authorities, railroad companies, and private-sector freight transportation businesses.

1.3.2 Oklahoma Freight Goals

National Freight Program Goals

National goals for freight are enumerated in the IIJA and are summarized in Table 1-1. The Oklahoma freight goals are consistent with the national goals, as discussed next.

Table 1-1. National Freight Program Goals

	Goals
1.	Invest in infrastructure and operational improvements that strengthen economic competitiveness, reduce congestion, reduce the costs of freight transportation, improve reliability, and increase productivity
2.	Improve safety, security, efficiency, and resilience – urban and rural
3.	Improve network state of good repair
4.	Use innovation and advanced technology to improve safety, efficiency, and reliability
5.	Improve economic efficiency and productivity of networks
6.	Improve state flexibility to support multi-state planning and address highway freight connectivity
7.	Reduce environmental impacts

Source: WSP adapted from https://www.fhwa.dot.gov/bipartisan-infrastructure-law/nhfp.cfm.

Truckers regard highways as their factories and trucks as their work tools. We need highways to be improved so that the channels of commerce can work effectively.
—Oklahoma Trucking Association member

Consistency with State and National Freight Goals

Table 1-2 lists Oklahoma's freight goals in the priority order that the Oklahoma FAC determined in June 2022. The table shows how freight goals correspond to an established Oklahoma 2020–2045 LRTP goal area and to established national freight goals listed in Table 1-2.

Table 1-2. Oklahoma's Freight Goals and Correspondence to Long Range Transportation Plan Goals and National Freight Goals

2020-2045 Long Range Transportation Plan Goal Area	Oklahoma Freight Transportation Plan Freight Goals	National Freight Goal #
Safe and Secure Travel	▪ Improve the safety and efficiency of freight movement and its interaction with other vehicles. ▪ Ensure the ability of urban and rural highways to safely accommodate growth in freight traffic.	2
Infrastructure Preservation	▪ Meet freight transportation needs by maintaining the Oklahoma State Highway System in a state of good repair. ▪ Support the preservation of Oklahoma multimodal freight networks through appropriate polices and initiatives.	3, 5
Efficient Intermodal System Management and Operation	▪ Ensure the competitive performance of the Oklahoma freight system. ▪ Safeguard industry supply chains by improving resiliency of the freight transportation system to withstand disruptions, including those related to extreme weather such as stormwater runoff and flooding. ▪ Promote use of innovation and advanced technology to enhance system performance.	2, 4
Economic Vitality	▪ Promote competitive access to domestic and international markets for Oklahoma's industries. ▪ Direct freight-related transportation investments to support the state's economy.	1, 6
Mobility: Choice, Connectivity and Accessibility	▪ Foster a diverse portfolio of modal choices for Oklahoma's freight shippers and receivers in urban and rural areas. ▪ Support end-to-end operations of industry supply chains in Oklahoma markets for Oklahoma's industries.	1, 5
Environmental Responsibility	▪ Support the growth of Oklahoma clean energy by promoting clean fuel use by freight providers. ▪ Avoid, minimize, or mitigate adverse environmental impacts related to freight transportation, such as emissions and wildlife habitats. ▪ Consider the impacts of freight movement on underserved and historically disadvantaged communities.	7
Fiscal Responsibility	▪ Capitalize on federal funding and finance programs to aid investment in the freight transportation system. ▪ Coordinate freight corridor development programs with neighboring states.	6

Source: Oklahoma Freight Advisory Committee

1.4 OVERVIEW OF THIS PLAN

This Plan's base year is 2019, which means that the research and trend review looks back to the year 2019 as a consistent reference point, if the best available data permits.[4] This Plan looks forward to short-term (2023 through 2030) and long-term future (2031 through 2045) views. This Plan's products include a review of highway, freight rail, and waterway facilities, a

[4] See Appendix B for summary of data sources and years.

bottleneck analysis, and a freight investment element that identifies projects to be funded with NHFP funds. This OFTP is organized into the following remaining chapters:

- **Chapter 2 – Oklahoma's Freight Story Today**
  - Reviews Oklahoma's current freight flows, major commodities, and facilities by mode (highway, rail, marine and air).
  - Describes Oklahoma's multimodal freight assets.
  - Assesses truck parking facilities and needs.
  - Identifies conditions and challenges confronting Oklahoma's freight system today.
- **Chapter 3 – Outreach**
  - Describes stakeholder and public involvement in this Plan.
- **Chapter 4 – The Freight Future**
  - Outlines major economic, demographic, technology, and transportation trends affecting freight.
  - Reviews long-range freight forecasts.
  - Describes implications of transportation trends for the future of freight in Oklahoma.
- **Chapter 5 – Freight Bottlenecks and Mobility Issues**
  - Summarizes the results of analysis of truck bottlenecks, safety, maintenance, and other issues affecting freight movement for all modes.
- **Chapter 6 – Moving Freight**
  - Presents proposed performance measures, improvement priorities, policies and strategies and projects.
  - Recommends projects for use of freight formula funds, 2023 through 2030.
  - Identifies freight-related projects expected to be underway, 2023 through 2030.
  - Recommends freight network designations.
- **Chapter 7 – Conclusion and Next Steps**
  - Outlines Oklahoma's commitment to incorporating freight into its decision-making process going forward.

Separate technical reports provide more details on the data analysis and results, and these reports will be available on ODOT's OFTP website http://www.odot.org/2023-2030FreightPlan.

2 Oklahoma's Freight Story Today

This chapter summarizes current and forecast freight flows by tons and value. For truck, rail, water, air, and pipeline modes, it presents information on the systems, their utilization, their key facilities, and their issues and needs. This chapter also addresses new areas of emphasis for freight plans including commodity supply-chain analysis, accommodation of military freight movements, truck parking, and through traffic for other states.

2.1 OVERVIEW

The reliability, cost, speed, safety, and resiliency of freight transportation is critical to Oklahoma. In 2017, an estimated 435.5 million tons of freight worth **$300.1 billion** were transported into, out of, or within the state by truck, rail, water, air, and pipeline. This included critical commodities – food and agriculture products, fuels, building materials, motorized vehicles, electronics, machinery, pharmaceuticals, other chemicals, etc. – which must be moved to market by Oklahoma's industries, and which must be received by Oklahoma's businesses and residents. Between 2017 and 2045, Oklahoma freight movement into, out of, or within the state is projected to increase to 588.5 million tons worth $497.6 billion. Planning to accommodate current activity and future growth while maintaining the safety, reliability, and overall performance of the state's multimodal freight transportation system is essential for the well-being of the state's economy and people.

2.2 FREIGHT FLOWS BY ALL MODES

The combined movements of all freight – all modes, directions, commodities, and trade types – are referred to as "commodity flows." Commodity flow analysis is a key element of freight plans, as it provides a comprehensive view of the main functions and service characteristics of Oklahoma's multimodal freight system. Commodity flow estimates starting in 2017 and extending through 2045 and 2050 are available from the U.S. DOT Freight Analysis Framework (FAF) version 5.3. FAF provides estimates of total tonnage and value moving to, from, and within each state and the nation as a whole. These estimates can be further refined by trade type (domestic or international), domestic mode, foreign mode, origin/destination State or Census-designated Business Economic Area, and general commodity group.[5] FAF also provides interim year estimates, including projections covering the current year; however, given that 2017 is the original source year for survey data underlying FAF and that "normal" freight patterns have been disrupted over the past few years, 2017 data is used to represent current conditions.

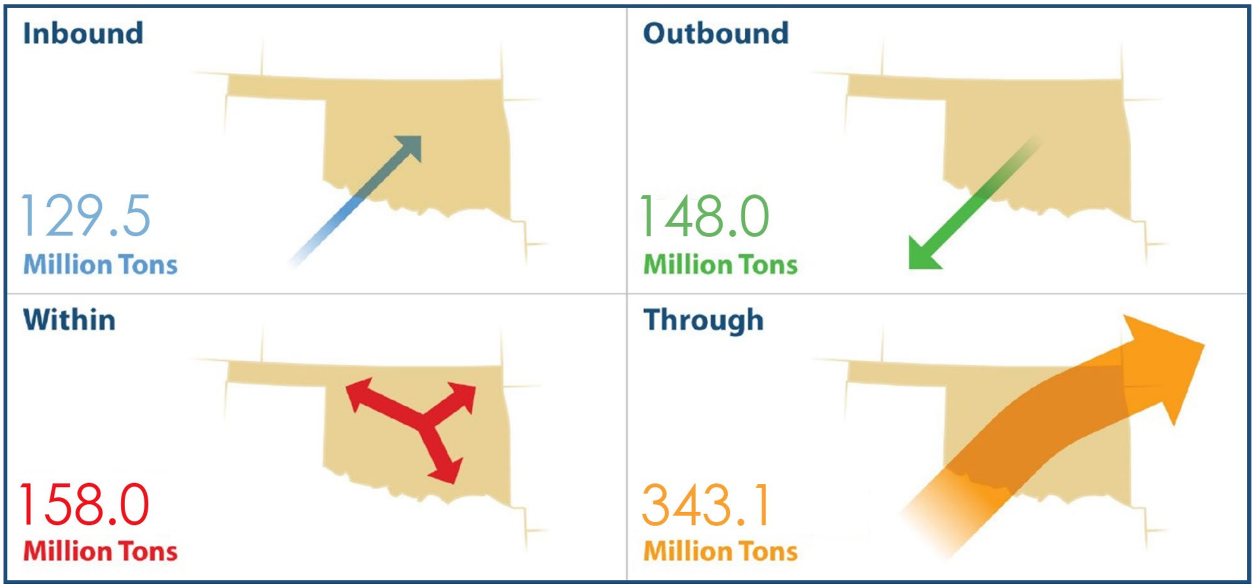
2.2.1 Freight Flows by Direction

Figure 2-1 shows total freight flows by direction (inbound, outbound, within state, and through). The inbound, outbound, and within-state estimates are directly from FAF. Through freight

[5] See current FAF documentation and tools at https://ops.fhwa.dot.gov/freight/freight_analysis/faf/.

refers to commodity moves that begin and end in other states, passing through Oklahoma and utilizing its transportation system. FAF does not estimate through freight directly, so post-processing was employed to generate this estimate.[6]

Figure 2-1. Oklahoma Freight Flows (2017) by Direction



Source: Analysis of Freight Analysis Framework 5.3 plus through estimates from WSP FAF Disaggregation (2017 data) and 2022 State Rail Plan (2019 data for pass-through rail only)

2.2.2 Freight Flows by Commodity

Oklahoma's top 10 tonnage commodities account for 76.7 percent of the state's inbound, outbound, and within-state tonnage (Table 2-1).

- The leading tonnage commodity is petroleum and coal products not elsewhere classified (n.e.c.), which includes natural gas, representing more than one-fourth of state tonnage.
- Crude petroleum is another highly significant tonnage commodity, representing 13.6 percent of state tonnage.
- Gravel represents 8.2 percent of state tonnage. Petroleum products, crude petroleum, and gravel combined represent 47.7 percent of state tonnage.

[6] Estimates for pass-through truck flows were generating using a county-to-county FAF disaggregation developed by WSP and routed over the NHS using a proportional (versus "all or nothing") route assignment process. These estimates are useful for order-of-magnitude comparison but are not based on actual counts or telematics data; corridor-specific tabulations based on origin-destination observations from GPS or similar data might show different results. Through estimates for rail flows were provided from the Oklahoma SRP based on analysis of Surface Transportation Board Waybill data. Note that estimates of through freight flows contained in previous state plans were somewhat higher, which may be due to difference in how the flow volumes were previously estimated and assigned to the national highway system.

- Other significant commodity tonnage is associated with gasoline, fuel oils, nonmetallic mineral products, cereal grains, natural sands, waste and scrap, and mixed freight. Note that waste and scrap includes both "commodity" waste (such as recyclable paper, glass, metals, or other materials with commercial value) as well as municipal waste with no commercial value. Also note that mixed freight includes combined shipments of different higher-value commodities, often moving to/from warehouse and distribution facilities, and usually in "dry van" trucks or intermodal shipping containers.

Table 2-1. Oklahoma Freight Tons by Commodity, 2017

	Tons (M)	Share of Tons	Cumulative Share
GRAND TOTAL	**435.5**		
Petroleum and coal products n.e.c.	112.8	25.9%	25.9%
Crude petroleum	59.2	13.6%	39.5%
Gravel	35.8	8.2%	47.7%
Gasoline	28.0	6.4%	54.1%
Fuel oils	24.0	5.5%	59.7%
Nonmetallic mineral products	20.6	4.7%	64.4%
Cereal grains	16.1	3.7%	68.1%
Natural sands	16.0	3.7%	71.8%
Waste/scrap	11.7	2.7%	74.4%
Mixed freight	9.7	2.2%	76.7%

Source: Freight Analysis Framework 5.3. Excludes pass-through traffic.

Oklahoma's top 10 value commodities account for 60.2 percent of the state's inbound, outbound, and within-state value. The leading commodity is mixed freight at 9.5 percent of value; mixed freight represents a much higher share of value (9.5 percent) than tonnage (2.2 percent), consistent with the high value per unit in this commodity group. Other commodity groups with high shares of value include petroleum and coal products n.e.c.; machinery; crude petroleum; electronics; gasoline; miscellaneous manufactured products; articles of base metal; and pharmaceuticals (Table 2-2).

Table 2-2. Oklahoma Freight Value by Commodity, 2017

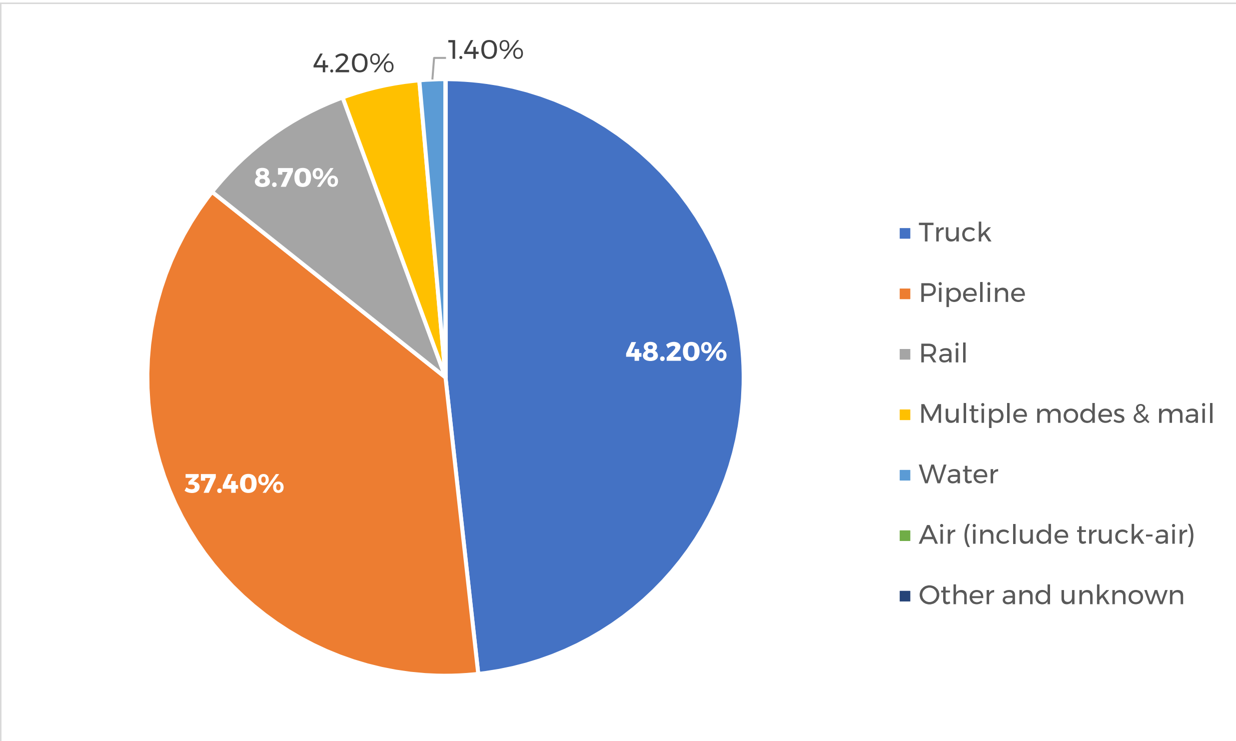
	Value ($B)	Share of Value	Cumulative Share
GRAND TOTAL	**300.1**		
Mixed freight	28.5	9.5%	9.5%
Petroleum and coal products n.e.c.	27.2	9.1%	18.6%
Machinery	21.5	7.2%	25.7%
Crude petroleum	18.8	6.3%	32.0%
Electronics	17.4	5.8%	37.8%
Gasoline	14.8	4.9%	42.7%
Motorized vehicles	14.5	4.8%	47.6%
Miscellaneous manufacturing products	13.1	4.4%	51.9%
Articles of base metal	12.7	4.2%	56.1%
Pharmaceuticals	12.1	4.0%	60.2%

Source: Freight Analysis Framework 5.3. Excludes pass-through traffic.

2.2.3 Freight Flows by Mode

Oklahoma's top domestic transportation mode by tonnage is truck (48.2 percent), followed by pipeline (37.4 percent), rail (8.7 percent), multiple modes and mail (which represents different combinations of modes, at 4.2 percent), and water (1.4 percent) (Figure 2-2).

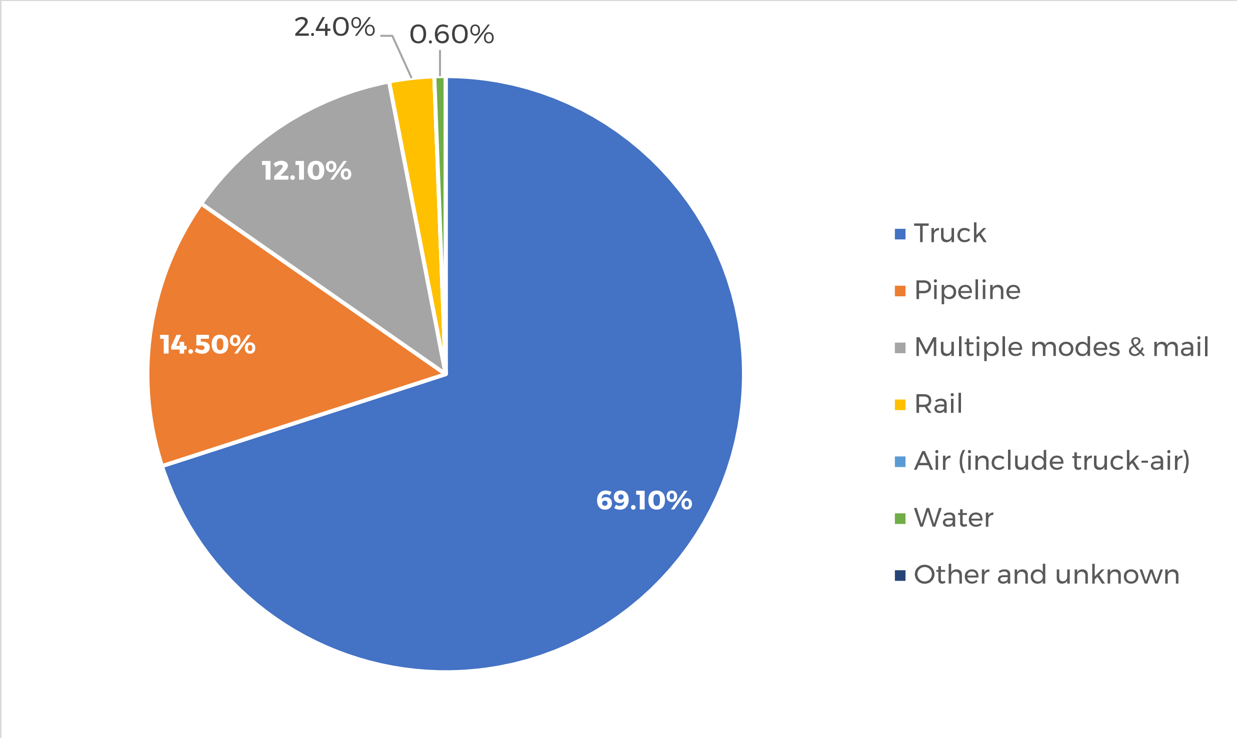
Figure 2-2. Oklahoma Freight Tons by Mode, 2017



Source: Freight Analysis Framework 5.3. Excludes pass-through traffic.

Oklahoma's top domestic transportation mode by value is truck (69.1 percent), followed by pipeline (14.5 percent), multiple modes and mail (12.1 percent), rail (2.4 percent), air (1.6 percent) and water (0.6 percent). See Figure 2-3.

Figure 2-3. Oklahoma Freight Value by Mode, 2017



Source: Freight Analysis Framework 5.3. Excludes pass-through traffic.

2.2.4 Freight Flows by Trade Type

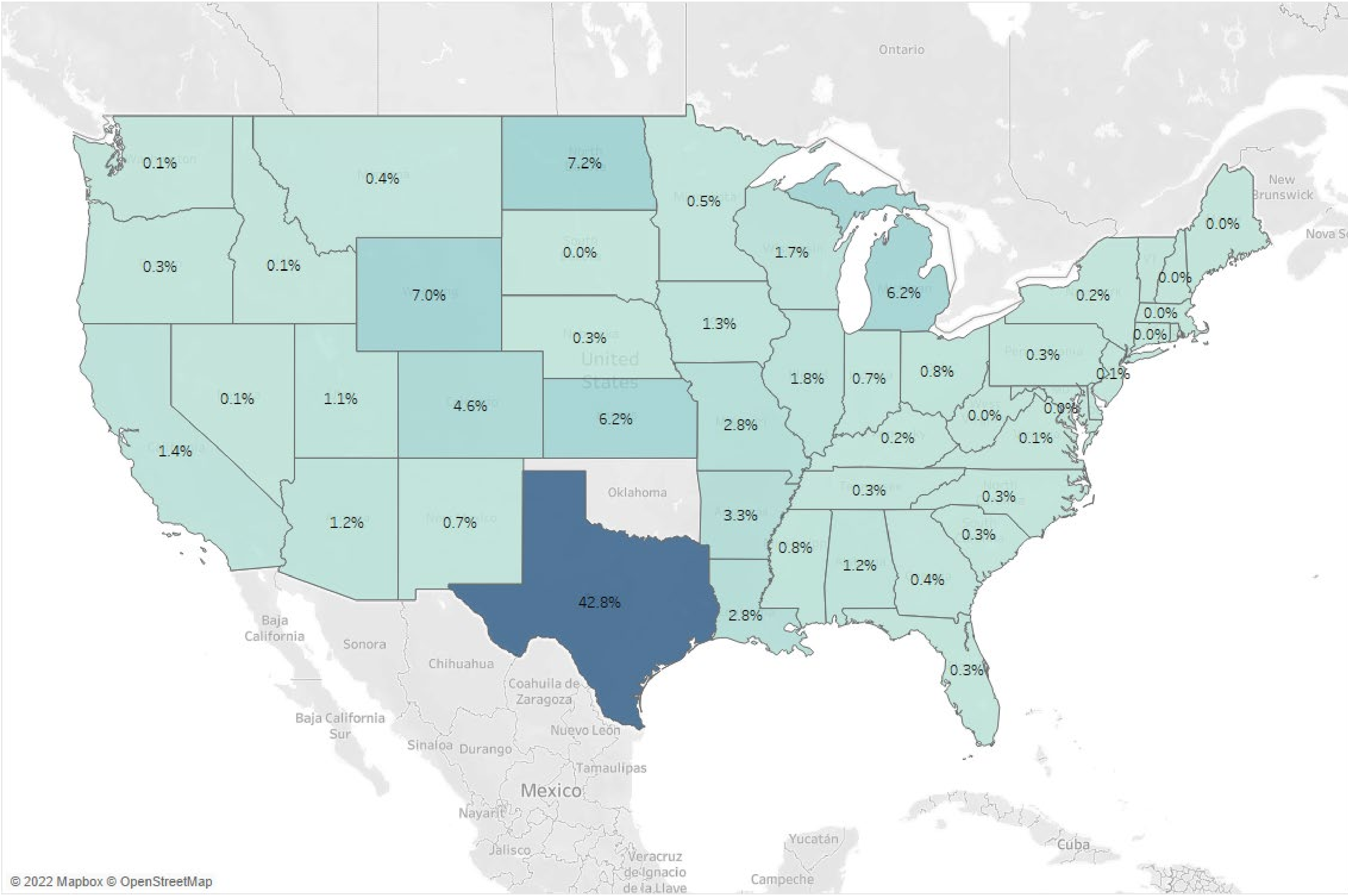
According to FAF 5.3 for year 2017, Oklahoma generated 1.6 million tons of export commodities worth **$5.5 billion** and received 16.8 million tons of import commodities worth $12.0 billion, representing around 4.2 percent of total tonnage and 5.7 percent of total value.

2.2.5 Freight Flows by Origin and Destination of Oklahoma Tonnage

For tonnage moving inbound to Oklahoma, the leading origin state by far is Texas (42.8 percent) followed by North Dakota (7.2 percent), Wyoming (7.0 percent), Kansas (6.2 percent), Michigan (6.2 percent), and Colorado (4.6 percent). See Figure 2-4

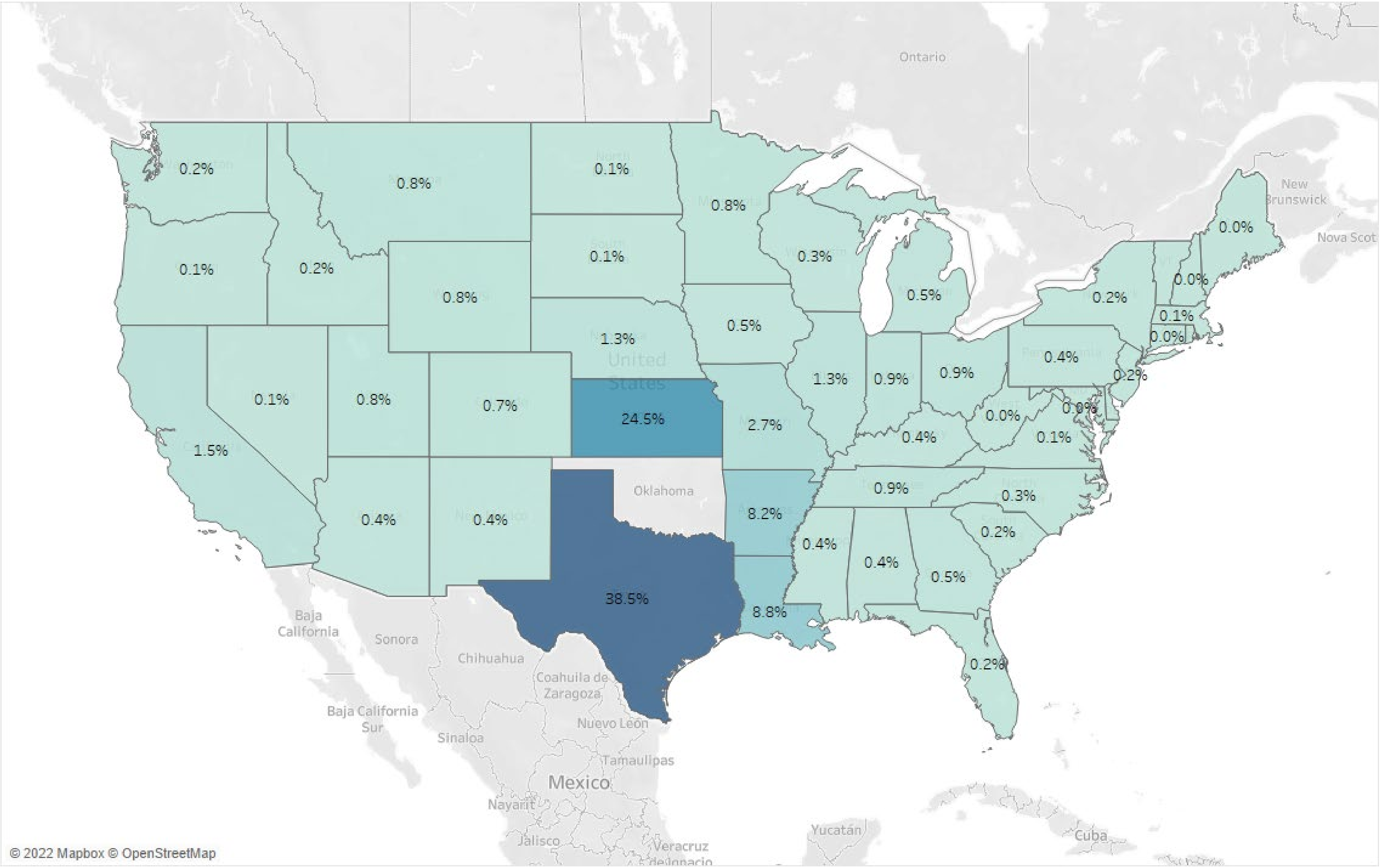
For tonnage outbound from Oklahoma, the leading destination state is Texas (38.5 percent) followed by Kansas (24.5 percent), Louisiana (8.8 percent), and Arkansas (8.2 percent). See Figure 2-5.

Figure 2-4. Origin States for Inbound Oklahoma Freight Tonnage, 2017



Source: Freight Analysis Framework 5.3. Excludes pass-through, outbound, and internal traffic.

Figure 2-5. Destination States for Outbound Oklahoma Freight Tonnage, 2017



Source: Freight Analysis Framework 5.3. Excludes pass-through, outbound, and internal traffic.

2.3 THE HIGHWAY SYSTEM

2.3.1 Oklahoma Highways and Truck Freight Flows

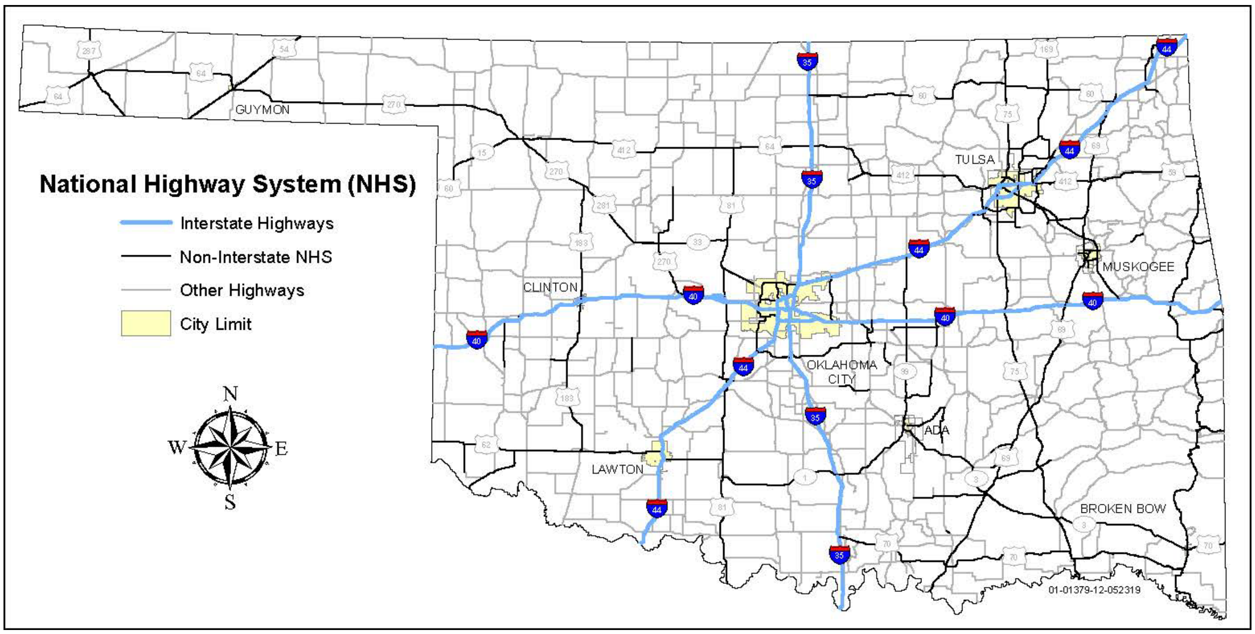
ODOT and the OTA are responsible for 12,854 highway system miles. Cities, towns, and counties are responsible for the remainder of the public road system, which are primarily minor collectors and local streets.

The State Highway System serves industries and population centers as well as freight passing through Oklahoma that originates and terminates in other states. By virtue of its location, Oklahoma is a crossroads of highway commerce. Table 2-3 summarizes the ODOT highway mileage by type. Figure 2-6 illustrates Oklahoma's National Highway System (NHS) routes.

Table 2-3. Oklahoma Highway Mileage by Classification

Year	Interstate	Other Freeways and Expressway	Other Principal Arterial	Minor Arterial	Major Collector	Total
2016	933	195	2,982	2,886	5,856	12,852
2021	933	224	2,962	2,888	5,848	12,854

Figure 2-6. Oklahoma's National Highway System Routes

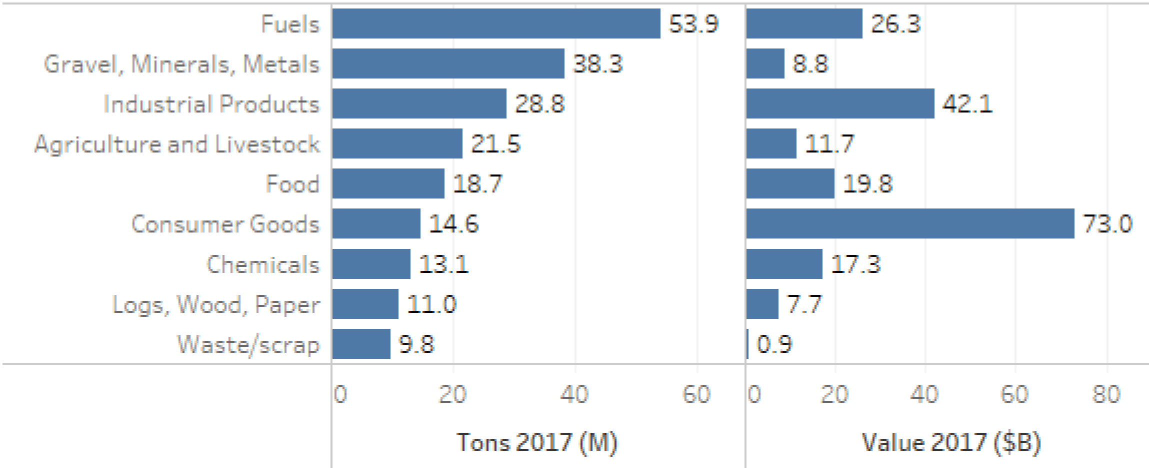


Source: Oklahoma DOT

2.3.2 Top Commodities by Truck Into, Out Of, and Within Oklahoma

The top supply-chain groups for truck tonnage and value are shown in Figure 2-7. The leading groups by tonnage are fuels; gravel, metals, and minerals; industrial products; agriculture and livestock; and food. The leading groups by value are consumer goods, industrial products, fuels, food, and chemicals.

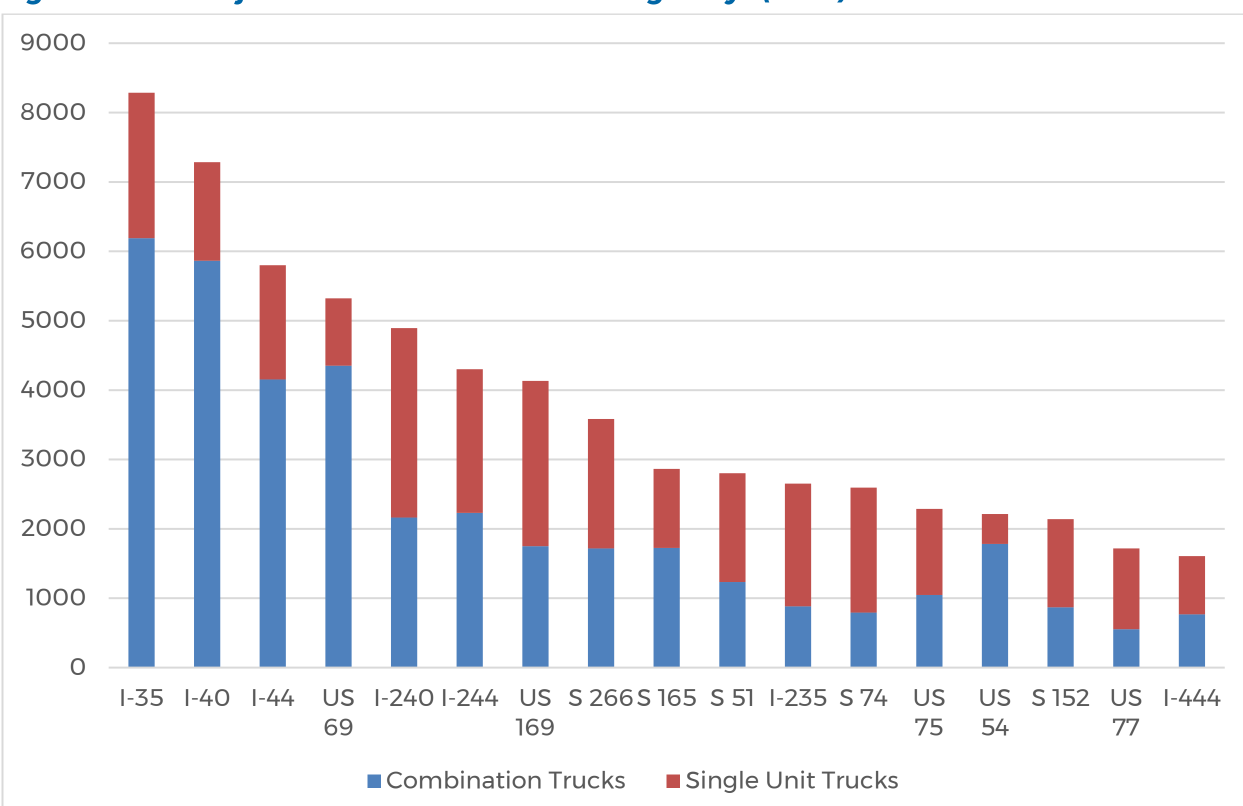
Figure 2-7. Top Oklahoma-Based Supply Chain Groups by Truck, Tons and Value, 2017



Source: Freight Analysis Framework 5.3

Figure 2-8 shows the Oklahoma highways that have the greatest truck volumes. Interstate (I-) 35 and I-40 have the most trucks, followed by I-44 and U.S. Route (US-) 69, with each of these facilities carrying more than 5,000 trucks per day. US-69 is a key north-south route that runs from Minnesota to Texas, forming an important connection between the Midwest and Dallas. It also intersects I-44 and I-40 in Oklahoma.

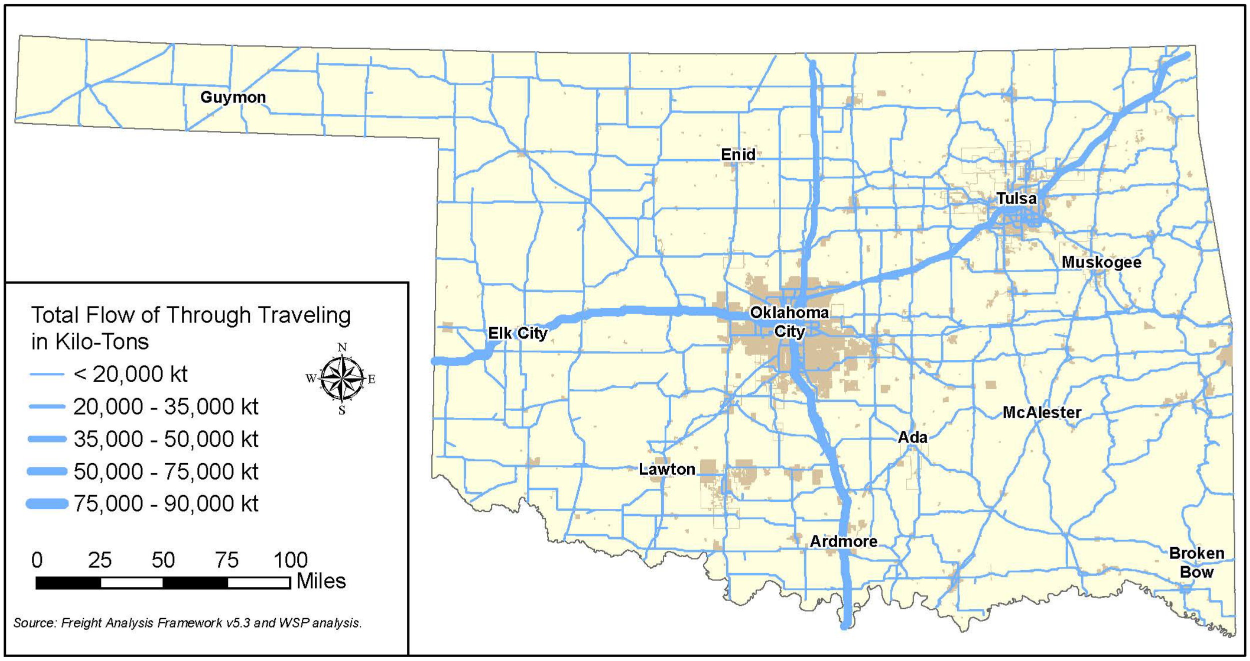
Figure 2-8. Major Oklahoma Truck Traffic Highways (2021)



Source: Oklahoma Department of Transportation, Traffic Analysis Branch, 2022

Figure 2-9 illustrates the volume of truck traffic over Oklahoma's highways.

Figure 2-9. Volume Flows on Oklahoma Highways, 2017



Source: Freight Analysis Framework 5.3, and WSP analysis.

2.3.3 ODOT Intelligent Transportation System Program

The ODOT ITS program employs and maintains technologies that benefit freight and is planning to expand its effort. This program works in parallel with project development to improve operations on the State Highway System. ITS improvements will benefit freight transportation considerably, as well as support this OFTP's goals of safety, infrastructure preservation, mobility, economic vitality, environmental responsibility, and efficient system management and operation.

The chief ITS initiatives include the following:

- Dynamic message signs (DMSs)
- Land mobile radio for first responders
- Road weather information system (RWIS)
- Bluetooth sensors to provide commercial motor vehicle origin and destination data
- Vehicle-to-infrastructure communications

ODOT manages 3,310 linear miles of fiber optics and has 66 DMSs installed statewide. While these ITS technologies help trucks and general traffic, ODOT has freight-specific applications. For example, ODOT is adding permanent full-size DMSs in both directions near the Ports of Entry around the state. The Ports of Entry personnel will be able to view and control the cameras. In addition, ODOT is installing more DMSs and cameras around the state – typically in metropolitan areas.

ODOT is expanding the Land Mobile Radio system to be statewide on a mesh network of Multiprotocol Label Switching equipment. In terms of traffic incident management, ODOT is replacing its static, public facing map with one that will report the latest road and weather conditions in real-time.

The RWIS expansion project has added 15 new sites at critical bridges along I-35 (border to border) to supplement six previous sites. ODOT also plans to add RWIS at critical locations along I-40 (border to border). The system will provide pavement, bridge deck, and subsurface temperatures, as well as moisture and air temperatures. This data will be available to field divisions to inform decisions about deployment of roadway maintenance personnel. In addition to being more efficient, it will improve roadway operations and safety – a significant factor for trucking.

ODOT has a contract with state universities to explore the use of Bluetooth sensors along I-35 and I-44, and in the Oklahoma City and Tulsa metropolitan areas. This will allow determination of origin-destination for trucks. Another demonstration project will use technology applications to develop computer recognition of vehicle classification.

These technologies allow ODOT to obtain and disseminate more up-to-the-minute information about highway conditions, which improve efficiency of operations and vehicular travel.

2.3.4 Heavy Cargo, Heavy Loads

Better ways to manage heavy cargo is a growing need in every state. For the purposes of developing a federally-compliant freight plan, the definition of heavy loads includes regulation-size vehicles carrying heavy cargo, oversize/overweight loads (OSOW), and superloads. Harmonization of regulations and processes across state lines is an important topic in most states, especially those like Oklahoma that are in the middle of the country and experience a great deal of interstate transport.

Heavy Cargo

Various industries – including construction, energy, and agriculture – use fully loaded regulation-size vehicles carrying heavy cargo. Heavy cargo includes construction aggregates, fuels (including hydrogen), water furnished to well sites, and heavy farm or oil rig equipment.

Oversize/Overweight Loads

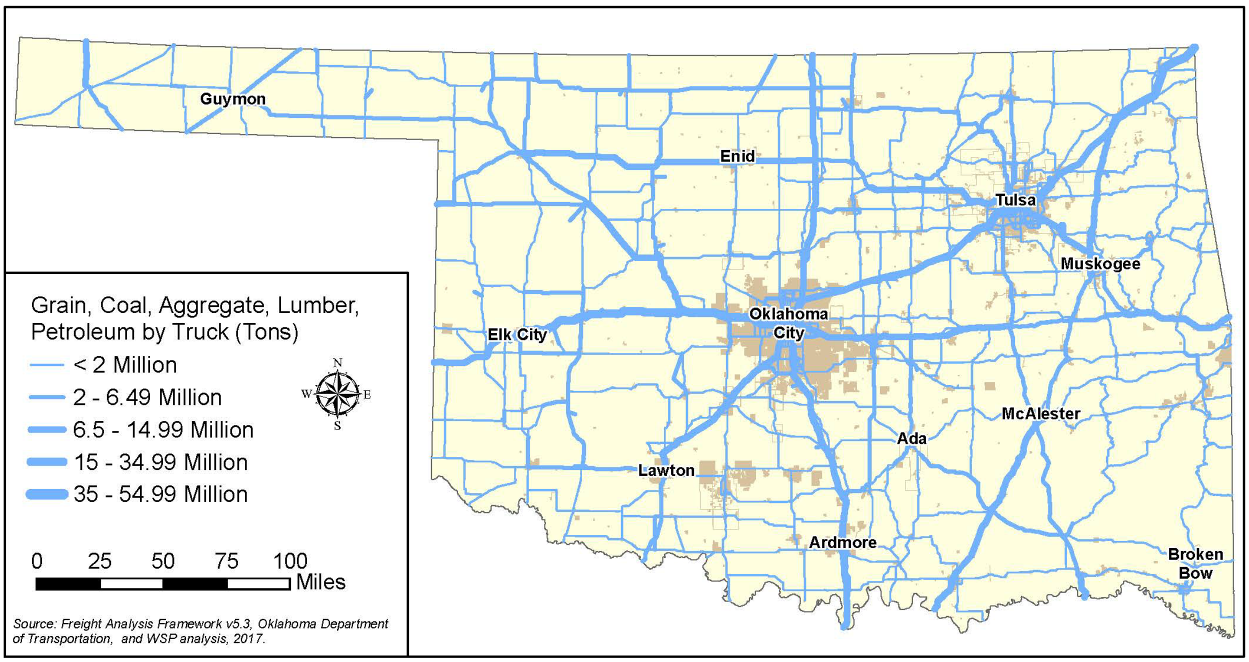
Oklahoma's highways support the movement of regular and OSOW loads in accordance with state and federal statutes. OSOW loads are trucks whose dimensions and/or weight limits exceed legal limits, and with some exceptions, cannot be split into multiple smaller loads. The Oklahoma weight threshold for the common tractor trailer combinations is 80,000 pounds on interstate highways and 90,000 pounds on non-interstate highways. Many states, including Oklahoma, have automated permit processes and capture data for reference and planning. The automated permitting and routing system in Oklahoma is managed by the Oklahoma Department of Public Safety. Known as Oklahoma Permitting and Routing Optimization System (OKiePROS8), the system speeds the approval process even for loads wide enough to affect two lanes. Creation and maintenance of databases from such systems is an important component to improving the efficiency of interstate operations.

Superloads

Loads or vehicles that are 16 feet wide by 21 feet high and 180,000 pounds or more are considered superloads in Oklahoma. When a load extends beyond the maximum dimensions or weight of a routine single-trip permit, it is subject to additional permitting requirements. Energy-related businesses rely on this type of shipment, and wind energy components and drilling and mining equipment are moving in regions not previously traversed by this type of cargo. Agricultural equipment – implements of animal husbandry – forms a special class of OSOW requirements. The axle ratios on this equipment differ from trucks and can present special challenges for geometries, clearances, and load-bearing capacities.

Figure 2-10 maps the flow of trucks with heavy commodity types traveling over the Oklahoma State Highway System, based on FAF 5.3 volume flow assignments.

Figure 2-10. Heavy Commodity Truck Flows, 2017



Source: WSP Analysis of Freight Analysis Framework v5.3

2.3.5 Truck Parking

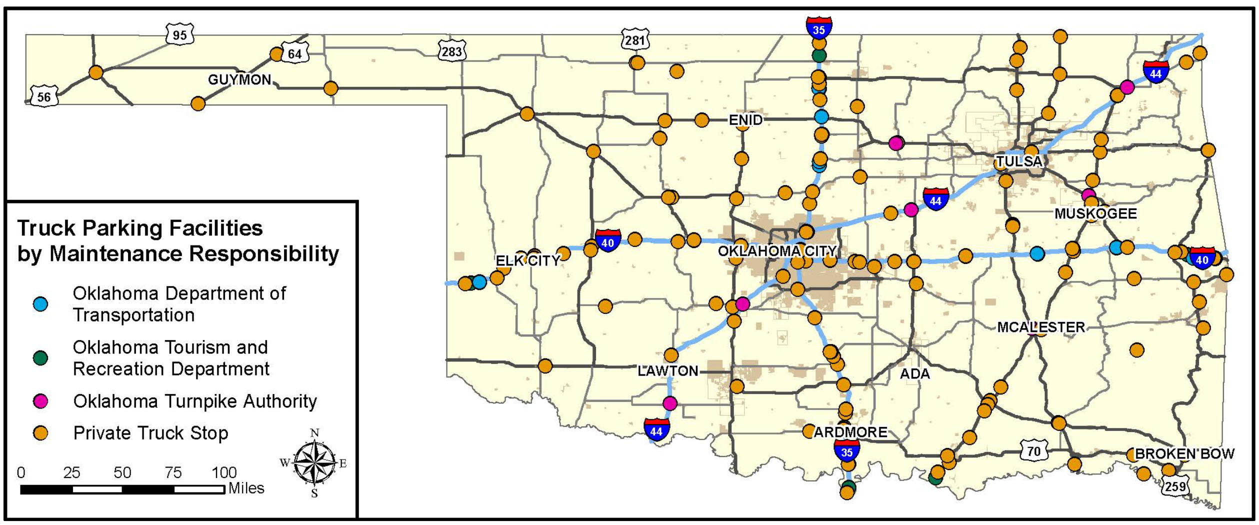
The inability to find safe parking has become one of the top issues for truck drivers nationwide. Lack of parking availability at parking facilities or commercial and industrial facilities, particularly in and around urban areas, often forces drivers to spend a considerable amount of time searching for a space, which translates directly into lost productivity and higher trucking costs. It is not uncommon for drivers to run out of hours of service (HOS) trying to find parking, forcing them to park in undesignated locations on roadway shoulders, ramps, or public lots. The sections below describe the causes of truck parking demand in Oklahoma, and how well existing facilities meets this demand.

Inventory

A technical memo was produced by the project team providing an inventory of existing truck parking spaces within the state of Oklahoma. The truck parking inventory was built upon publicly available data from the FHWA 2015 Jason's Law Report, the Trucker Path mobile app, the Park My Truck mobile app, truck stop websites, ODOT, and OpenStreetMap to develop a comprehensive list of truck parking locations. Aerial imagery and Google Street View were used to validate the number of truck parking spaces and facility amenities, such as the presence of lighting or rest rooms at parking facilities.

Truck parking facilities were categorized by maintenance responsibility. For the inventory, truck parking facilities include rest areas, welcome centers, turn outs, and truck stops which are located adjacent to highways and provide temporary parking for rest and access to restrooms, vending machines, and other basic services. Truck stops are private businesses that provide space for parking and offer a range of amenities including fuel, food, showers, and other services for truck drivers, and are generally located near the entrance and exit ramps of major interstate roads. In total, the truck parking inventory identified 7,947 spaces at 190 truck parking locations within the state of Oklahoma at the locations shown in Figure 2-11.

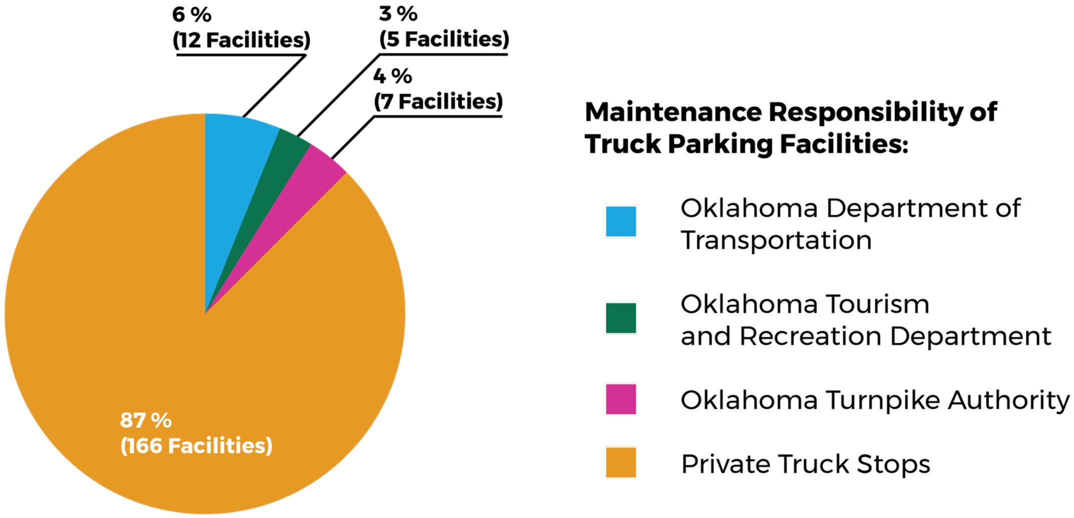
Figure 2-11. Rest Areas and Truck Stops in Oklahoma



Source: WSP analysis of public data sources including FHWA 2015 Jason's Law Report, the Trucker Path mobile app, the Park My Truck mobile app, truck stop websites, ODOT, and OpenStreetMap, aerial imagery, and Google Street View

The majority of truck parking facilities within Oklahoma are represented by private truck stops (166 facilities) compared to truck parking facilities maintained by ODOT (12 facilities), the Oklahoma Tourism and Recreation Department (5 facilities), and the OTA (7 facilities), as shown in Figure 2-12. Of the total parking spaces, 77.5 percent are striped (6,160 spaces) and 22.5 percent are unstriped or unpaved (1,787 spaces).

Figure 2-12. Total Statewide Truck Parking Locations



Source: ODOT; WSP analysis of public data sources including FHWA 2015 Jason's Law Report, the Trucker Path mobile app, the Park My Truck mobile app, truck stop websites; and OpenStreetMap, aerial imagery, and Google Street View

Truck parking locations are heavily concentrated along the Interstate system in Oklahoma, with 4,913 (61.8 percent) spaces and 98 (51.9 percent) locations along Interstates. Outside of the Interstate system, there are 2,862 (36.0 percent) spaces and 81 (42.9 percent) locations along U.S. highways.

Key corridors that connect to major trade regions and other destinations are I-40, I-35, I-44, US-69, US-412, and US-54. Table 2-4 displays the total number of truck parking spaces and locations by key corridor. Overall, there are 128 parking locations and 6,408 parking spaces located along key corridors, which accounts for 67.4 percent of total statewide parking locations and 80.6 percent of all parking spaces.

Table 2-4. Total Parking Spaces by Key Corridor

Maintenance Responsibility	I-40	I-35	I-44	US-69	US-412	US-54	Total
Oklahoma Department of Transportation	112	68	0	0	0	0	180
Oklahoma Tourism and Recreation Department	49	41	0	8	0	0	98
Oklahoma Turnpike Authority	0	0	151	32	0	0	183
Private Truck Stop	2,225	1,670	575	1,045	285	147	5,947
TOTAL	**2,386**	**1,779**	**726**	**1,085**	**285**	**72**	**6,408**

Source: WSP analysis of public data sources including FHWA 2015 Jason's Law Report, the Trucker Path mobile app, the Park My Truck mobile app, truck stop websites, ODOT, and OpenStreetMap, aerial imagery, and Google Street View

Amenities at truck parking facilities provide truck drivers with basic needs such as restrooms, showers, and food. For long-haul drivers, some facilities provide a space to park overnight in order to comply with hours-of-service regulations. Truck stops offer several more amenities or services than rest areas. Nearly all truck stops offer fuel, restrooms, convenience markets, and cell phone service. Most have a restaurant, laundry facilities, and parking lot lighting. Some of the larger truck stop chains such as Love's and Flying J, allow for drivers to reserve overnight parking spots in advance. None of the rest areas provide fuel, showers, a convenience market, restaurant, laundry machines, repair facilities, idle-reduction, or truck wash. All ODOT rest areas have basic amenities such as restrooms, drinking fountains, cell phone service, vending machines, and lighting in the parking lots. The exception is the ODOT turnout locations, which offer the fewest number of amenities.

Demand Patterns

In Oklahoma, and throughout the country, truck drivers have many reasons for needing to park. They could be loading or unloading, taking breaks per federal rest requirements, stopping for lunch or amenities, staging to avoid arriving too early to a delivery window, parking overnight, or in case of emergencies. Table 2-5 summarizes where trucks typically park for these reasons. Parking can take place at shipper or receiver facilities, or at multimodal facilities such as airport cargo or rail intermodal terminals. Parking at these locations is often strictly dependent on delivery windows and loading/unloading times. Trucks also park in rest areas or commercial truck stops. Parking at these facilities is often free (assuming drivers pay for fuel or other goods and services); however, many in and around urban areas can fill up during peak hours of the day. Fee-based reservation systems might be available, but these often represent a small share of the available parking spaces. Trucks can also park at truck terminals, if part of a fleet or agreement, often for storing vehicles overnight. Lastly, many trucks drivers decide to park in undesignated locations because of convenience or inability to find designated parking. This could be on roadway shoulders, vacant lots, public use parking lots, and other locations.

Table 2-5. Truck Parking Reasons and Locations

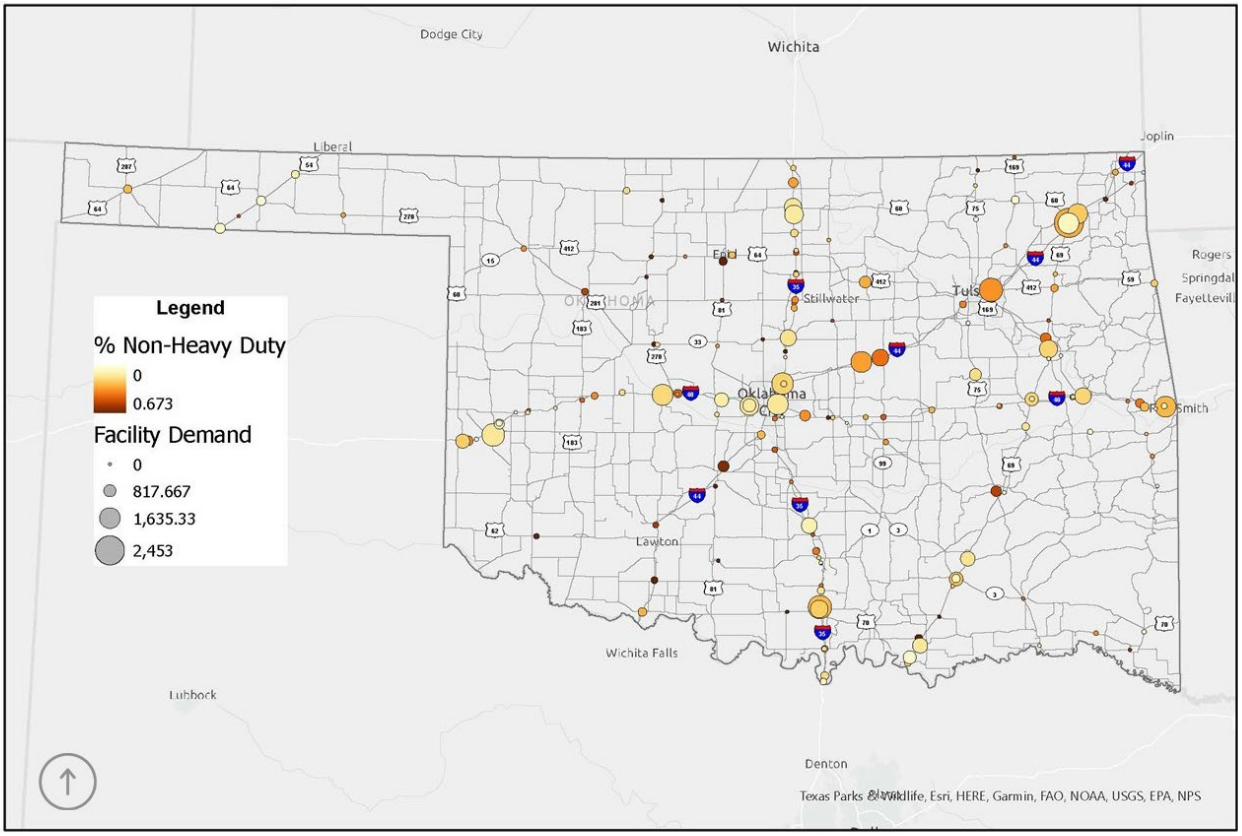
Reasons for Parking/Parking Location	Rest Area or Truck Stop	Shipper or Receiver Establish-ments	Multimodal Facilities	Undesignated Locations	Truck Terminals
Loading or unloading		x	x		
30-minute required rest break	x	x	x	x	
Overnight required rest break	x			x	
Staging	x			x	
Overnight Storage				x	x
Waiting for next load	x			x	x
Emergency	x	x	x	x	x

Source: Guerrero, S.E. et al (2022) Modeling Truck Parking Demand at Commercial and Industrial Establishments, Transportation Research Record, in-press.

Data was acquired from Geotab showing a sample of truck operations in Oklahoma to better understand truck parking demand in the state. The parking facilities identified in the inventory were georeferenced to isolate the trucking activity in the Geotab dataset using these facilities. This provides information about who is parking at these facilities and the function the facilities play in trucking operations. In Figure 2-13, the size of the dots represents the number of trucks that are parking at facilities throughout Oklahoma, and the color represents the percent of non-heavy-duty vehicles parking at these facilities. Overall, 92.6 percent of trucks parking at the parking facilities are heavy duty (gross-vehicle-weight rating of 26,000 pounds or higher), with 1.5 percent being medium-duty (gross-vehicle-weight rating between 10,000 pounds and 26,000 pounds), and 5.8 light-duty (gross-vehicle-weight rating under 10,000 pounds). The following findings can be drawn from Figure 2-13:

- As expected, the parking facilities with the highest demand are located on the key interstate corridors: I-35, I-40, I-44.
- The largest facilities with the highest demand tend to be used more intensely by heavy-duty trucks, as these facilities are located on interstates and cater to the needs of long-haul truckers. On the other hand, smaller facilities have higher usage by medium and light trucks. These are most likely typical gas stations or rest areas with truck parking spaces that do not offer the amenities and services that long-haul truckers need.
- Some medium-sized facilities on high volume truck corridors, such as on the interstates, have a significant proportion of non-heavy-duty usage. Heavy-duty truck drivers often complain that parking spaces are taken up by smaller trucks. Because of their smaller dimensions, these trucks could park elsewhere, freeing up capacity for heavy-duty trucks.

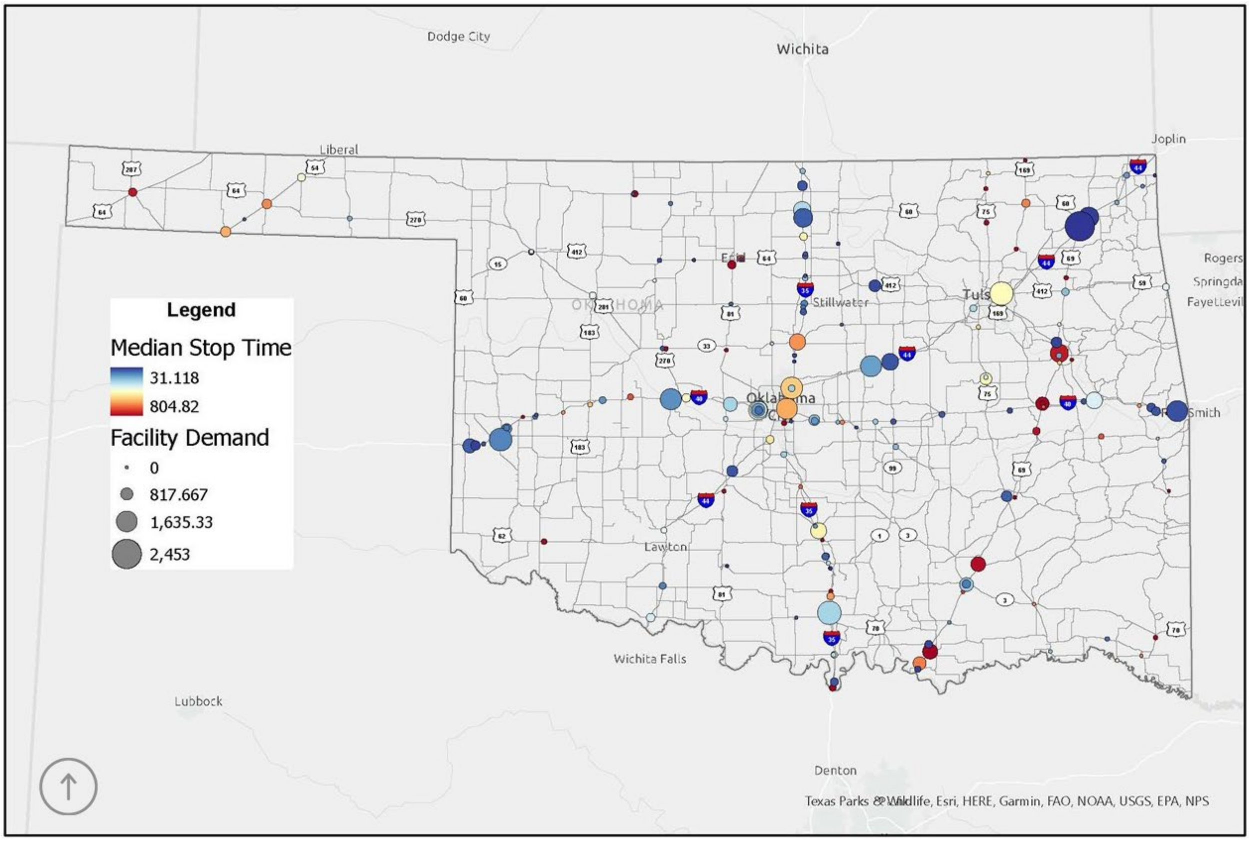
Figure 2-13. Percentage of Demand Non-Heavy-Duty



Source: Geotab Data

As described in Table 2-5, one of the key distinctions in truck parking demand is whether trucks are parking for overnight rest on long-haul shipments, or for a short time to stage to serve local demand. Figure 2-14 shows the median time that trucks are parking at facilities. The facilities with the longest stopped times are more likely to be used for overnight rests or truck storage. In rural areas away from highway corridors the long stop times are likely caused by truck storage. Many of the large truck stops on interstate corridors in rural areas have relatively short stop times, likely because of the prevalence of stops during the day for refueling and/or accessing amenities, especially meals. The large facilities in urban areas have median stop times in the middle, likely resulting from the prevalence of stopping overnight before making early morning deliveries and the use of these facilities for staging during the day.

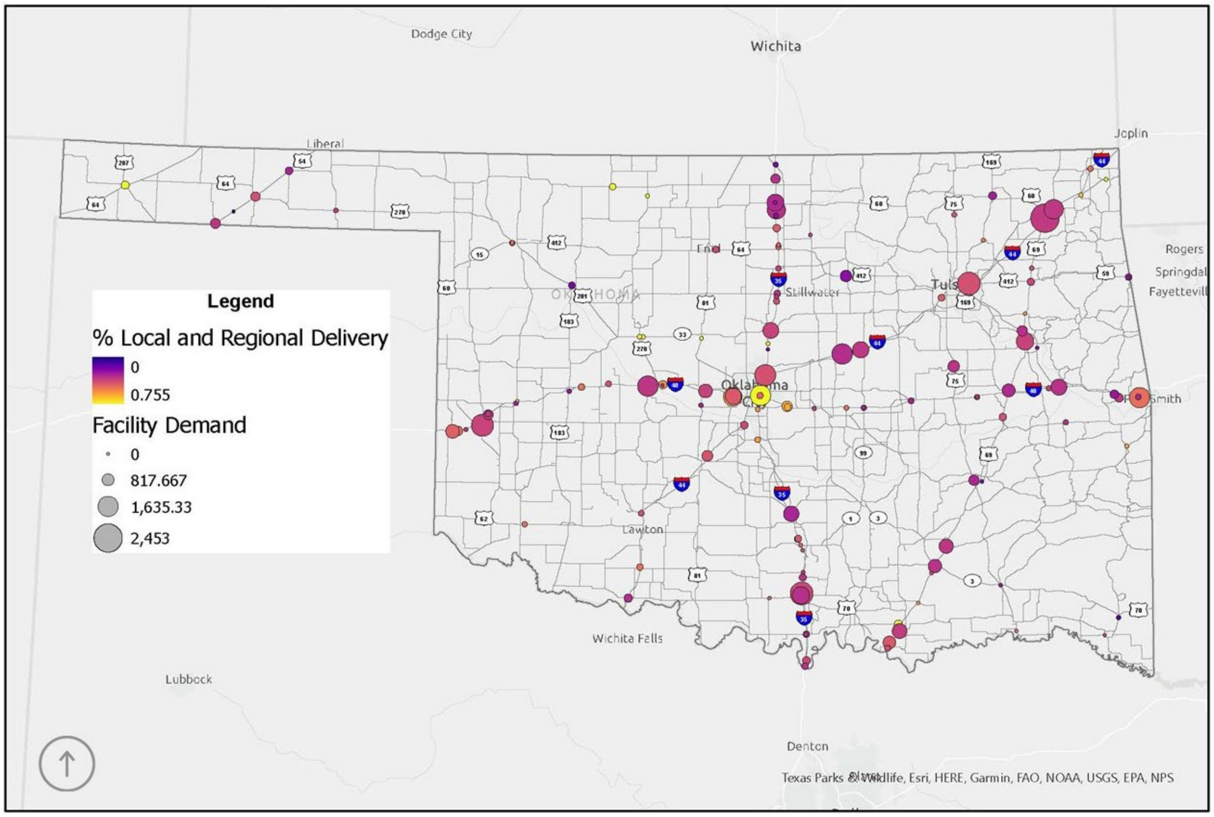
Figure 2-14. Median Stop Time



Source: Geotab Data

The Geotab data uses a proprietary process to classify trucks by the type of service they provide based on the characteristics of the vehicle and how it is operated. Figure 2-15 shows the percent of truck parking activity by trucks that perform a local or regional delivery service and are not involved in long-haul. The parking needs of local and regional trucking differ from long haul. Local and regional firms typically have a home-base where the trucks park overnight and the driver rests at home. This type of trucking uses other parking facilities during the day, in-between deliveries, or if they are likely to arrive early at a destination and are waiting for their delivery appointment. Most of this parking occurs during the day, when parking facilities are the least busy, as long-haul truckers are on the road. As expected, Figure 2-15 shows how local and regional delivery trucking is most common in urban areas, particularly in Oklahoma City.

Figure 2-15. Percent of Demand Local or Regional Delivery (Not Long Haul)



Source: Geotab Data

Availability of Spaces

The Park My Truck application was monitored for 2 weeks (June 6, 2022, to June 17, 2022) to identify if any parking facilities in the state routinely run out of availability. Even though this application only reports the availability of 13 truck stops in the state, these include some of the largest facilities and they are spread out throughout the state, so that shortages at any of these facilities is a good indicator of shortages in that area. The availability of spaces is the lowest at night (midnight to 2 a.m.), when long-haul truck drivers stop to rest for the evening; however, no facility was observed to completely run out of available spaces.

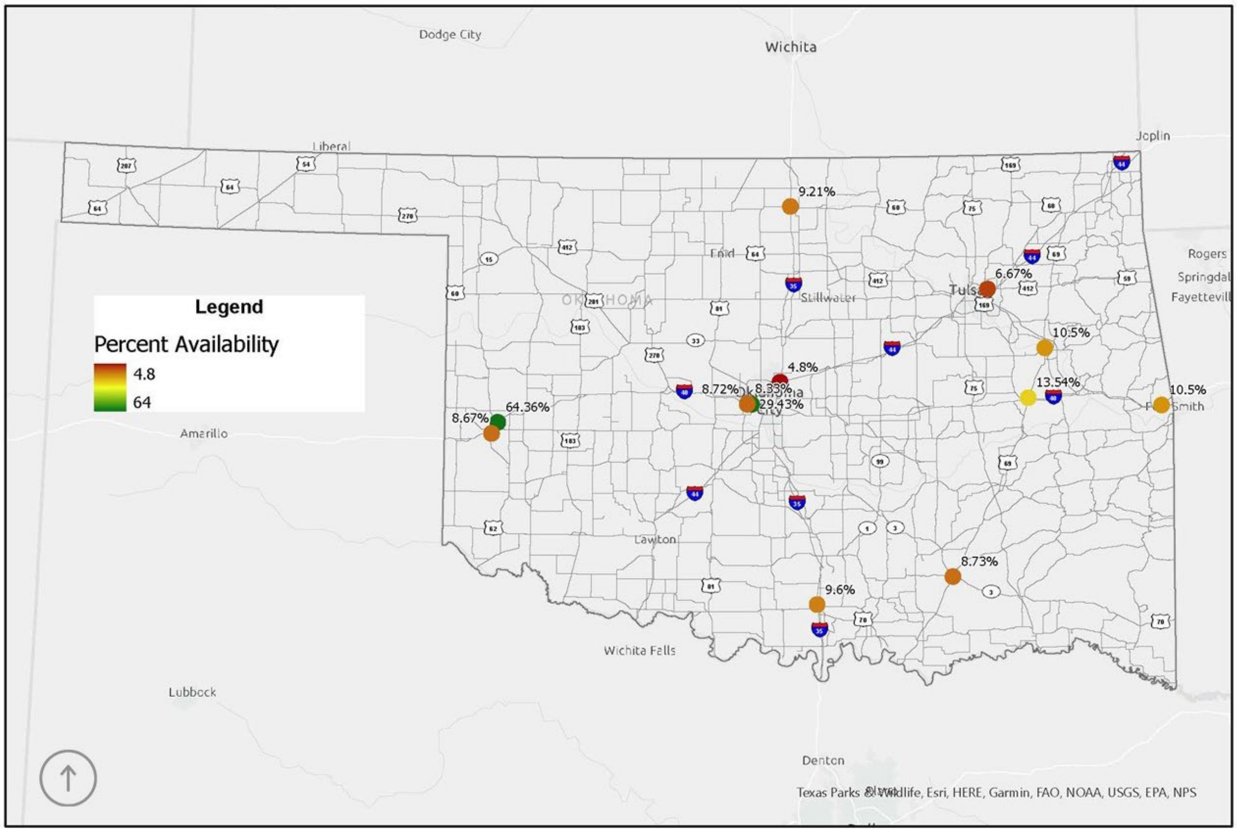
The results of this monitoring can be observed in Table 2-6. Parking availability decreases steadily from 4 p.m. until midnight, when it reaches the lowest point. However, none of the facilities monitored were found to completely run out of spaces during the monitoring period. Figure 2-16 maps the availability at midnight at these facilities. Most facilities had between 6 percent and 15 percent of spaces remaining during peak hours of the day, and some reported substantial availability at that time.

Table 2-6. Average Availability of Spaces at Different Times of the Day

Parking Facility	Location	Total Number of Truck Parking Spaces	Hours of the Day (12-hour clock) 4:00 PM	8:00 PM	11:00 PM	7:00 AM
Pilot Travel Center #196	Roland, OK	125	44	18	10	28
Pilot Travel Center #259	Muskogee, OK	117	44	18	10	34
Flying J Travel Plaza #702	Checotah, OK	150	53	21	13	33
Flying J Travel Plaza #706	Tulsa, OK	179	65	25	16	46
Pilot Travel Center #498	Atoka, OK	63	22	9	5	16
Pilot Travel Center #1004	Tonkawa, OK	80	28	11	7	20
Flying J Travel Plaza #704	Edmond, OK	116	26	10	6	18
Travel Centers of America #059	Oklahoma City, OK	101	54	53	49	17
Pilot Travel Center #460	Oklahoma City, OK	145	51	21	12	37
Flying J Travel Plaza #703	Oklahoma City, OK	172	61	24	15	46
Flying J Travel Plaza #701	Ardmore, OK	137	48	19	12	35
Travel Centers of America #152	Sayre, OK	101	78	70	60	26
Flying J Travel Plaza #705	Sayre, OK	150	53	21	13	50

Source: Park My Truck Application monitored 06/06/2022 to 06/24/2022

Figure 2-16. Map of Percent (%) Spaces Available at Midnight on Weekdays



Source: Park My Truck Application monitored 06/06/2022 to 06/24/2022

Truck Parking Survey

An industry-focused survey was conducted using the MetroQuest platform to collect feedback on truck parking issues and recommendations to address current and future truck parking needs. The survey was distributed to the project's stakeholder list which included local and national freight and logistics companies as well as other industry groups.

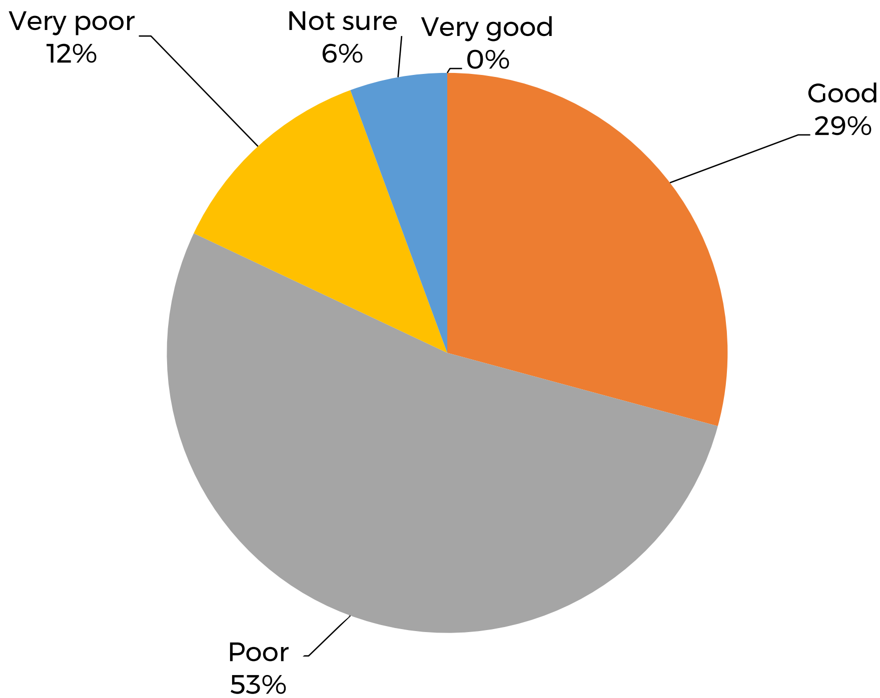
Participants could take the survey online from June 10, 2022, to July 10, 2022. During this time, there were 261 total visits to the survey website and 98 respondents completed the survey.

Respondents were primarily experienced truck drivers. Respondents were nearly evenly split between national and regional/local range of operations, however the vast majority travel in Oklahoma regularly and are familiar with the area. 53 percent of respondents have national operations, 39 percent selecting 'Regional', and 8 percent selecting that their usual range is 'International'. The majority of respondents (71 percent) indicate that they park in Oklahoma more than once a week.

In keeping with the diverse range of operations, the drivers indicated a variety of needs for truck parking. Among respondents, the most common responses were needing to meet HOS requirements, meal/restroom breaks, and 10-hour breaks. Thirty-minute breaks and staging for picks-ups or delivery were less common responses. Within the wide range of reasons for stopping, restrooms were the most commonly sought-after amenity. Security and safety were next in priority.

As shown in Figure 2-17, there is a serious shortage of truck parking in the region according to survey respondents, with 65 percent rating the availability as 'Poor' or 'Very Poor'. Fifty-nine percent of respondents reported difficulty finding parking in the area three or more times per month. Seven percent of respondents park outside of Oklahoma more than six times a month due to the lack of parking in the state According to participants, the top truck parking issues in Oklahoma are the overall lack of parking, lack of truck parking in certain areas, parking limitations at rest areas, and difficulty in knowing whether parking is available.

Figure 2-17. How would you rate the availability of truck parking in Oklahoma?



Participants were asked to rate various strategies and associated sub-strategies that could address truck parking issues. There were high levels of support for most strategies. 'Expansion of Facilities' was the most popular strategy followed by 'Delivery Hours', which refers to extending delivery hours at shippers and receivers. The lowest rated strategy was 'Paid parking'. The highest rated sub-strategies were 'Expand existing public rest areas' and 'Require shippers to allow parking for staging'. The lowest rated sub-strategy was 'Paid on-street truck parking'.

Based on these results, it appears that there is a significant truck parking problem for long-haul owner-operators in Oklahoma. Solutions to be considered should include expansion of designated parking facilities (both public and private), increased information, and incentivizing local businesses to allow truck parking.

Freight Advisory Committee Input

At the June 2022 FAC meeting, members were asked through Mentimeter what the top truck parking issues are in Oklahoma. The top results were as follows:

1. Lack of amenities
2. General lack of parking
3. Limited parking in specific areas
4. Parking safety issues.

Regarding amenities, according to the FAC, these should include restrooms, food service, showers, and safe/secure areas, and drivers will often bypass stops offering only fuel for those offering amenities.

Regarded lack of truck parking, the FAC noted that it is important that drivers have information about available parking and amenities (i.e., through phone apps). Major truck stops often provide parking and amenity information but smaller providers often do not.

The next Mentimeter question asked about strategies for addressing truck parking needs. The top three responses were:

5. Expand public parking
6. Encourage private investment in truck stops
7. Incentivize businesses to allow parking

In a follow up discussion, the FAC mentioned that the State has closed rest areas on interstates, and this has shifted responsibility to private truck stops. In particular, rest areas on the outskirts of metro areas are convenient for drivers to plan to avoid peak hour congestion. The FAC stated that the State could consider leasing closed rest areas to concessions so that these assets could be put to use. Members indicated that the transportation industry needs to make sure sufficient parking is available so drivers do not exceed HOS.

Other truck parking issues mentioned include:

- The Turner Turnpike is an area where undesignated parking is an issue.
- US-69 near McAlester/Atoka –has high freight volumes –ODOT should consider a freight corridor around the towns.
- US-412 now has interstate designation –there will be challenges east of Tulsa especially around Siloam Springs

Further Review of Truck Parking Needs and Solutions

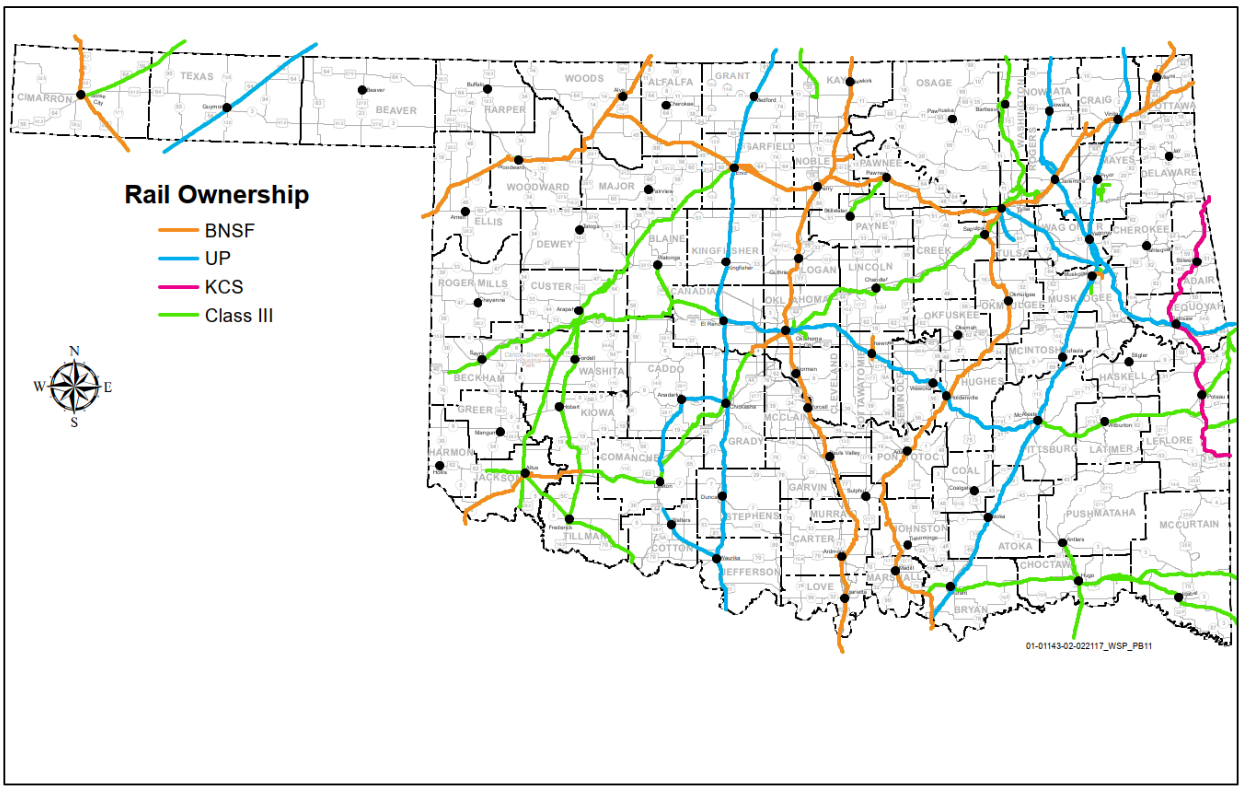
The truck parking survey and FAC members identified significant concerns about truck parking availability and information that require further examination. Additional study of Geotab truck parking data will be performed in fall 2022 to identify patterns of truck parking outside of designated truck parking facilities. This data analysis, along with the truck parking survey results and FAC input, will be used to identify locations of truck parking needs. Based on the additional review, ODOT will explore potential truck parking strategies to address the identified needs.

2.4 RAIL

2.4.1 Oklahoma's Railroads

Figure 2-18 shows the location of the railroads within the state. The three Class I railroads in Oklahoma are the BNSF Railway (BNSF) which owns 966 route-miles in the state, Union Pacific Railroad (UP) with 894 route-miles, and Kansas City Southern (KCS) Railway Company with 152 route-miles. Class I railroads serve multiple markets and population centers in the state as well as handling through traffic. The Federal Surface Transportation Board divides all railroad companies based on annual revenue criteria. Railroads with annual income equal to or exceeding $504,803,294 are designated as Class I, those with income equal to or more than $40,384,263 but less than $504,803,294 are designated as Class II railroads. Any Railroad with annual income below $40,388,263 is designated as a Class III railroad.[7]

Figure 2-18. Oklahoma Rail Network



Source: ODOT, 2022

7 Income values subject to annual escalation. The numbers shown are for 2019.

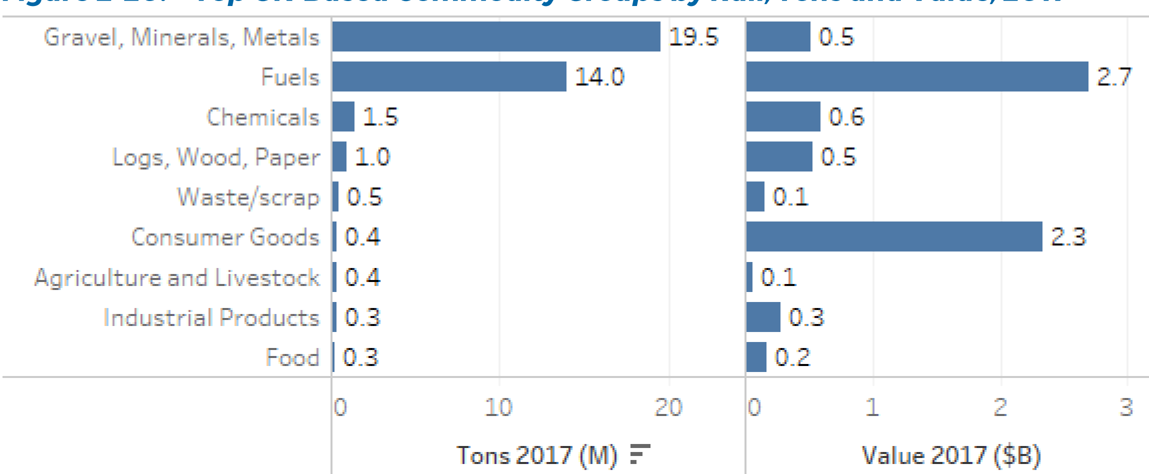
Oklahoma has 18 short-line railroads, a Federal Surface Transportation Board designation, that provide critical connection to businesses in various parts of the state and play an important role in local economies. An image of an example short-line train is shown in Figure 2-19.

Figure 2-19. Wichita, Tillman and Jackson Train

2.4.2 Commodity Flows by Rail Into, Out of, and Within Oklahoma

The top supply-chain groups for rail tons and value are shown in Figure 2-20. The leading groups by tonnage are gravel, metals, and minerals; fuels; and chemicals. The leading groups by value are fuels, consumer goods (primarily transportation equipment), and chemicals. Note that Oklahoma is also served by intermodal rail (included in multiple modes and discussed in Section 2.6) via rail-truck transfer terminals located in other states.

Figure 2-20. Top OK-Based Commodity Groups by Rail, Tons and Value, 2017



Source: Freight Analysis Framework 5.3

The Gravel, Minerals and Metals group is particularly volatile at this point because of changes in the sourcing protocols for sand. Commercial decisions on the part of the drillers to use different standards for frac sand allows for use of more locally sourced sands and reduces the reliance of the previously sourced rail-delivered sand. The FAF 2017 estimate of rail tonnage

(39.7 million) is very close to the number cited in the 2022 SRP of 38.4 million tons reported by the Federal Surface Transportation Board in 2019.

2.5 OKLAHOMA WATERWAY SYSTEM

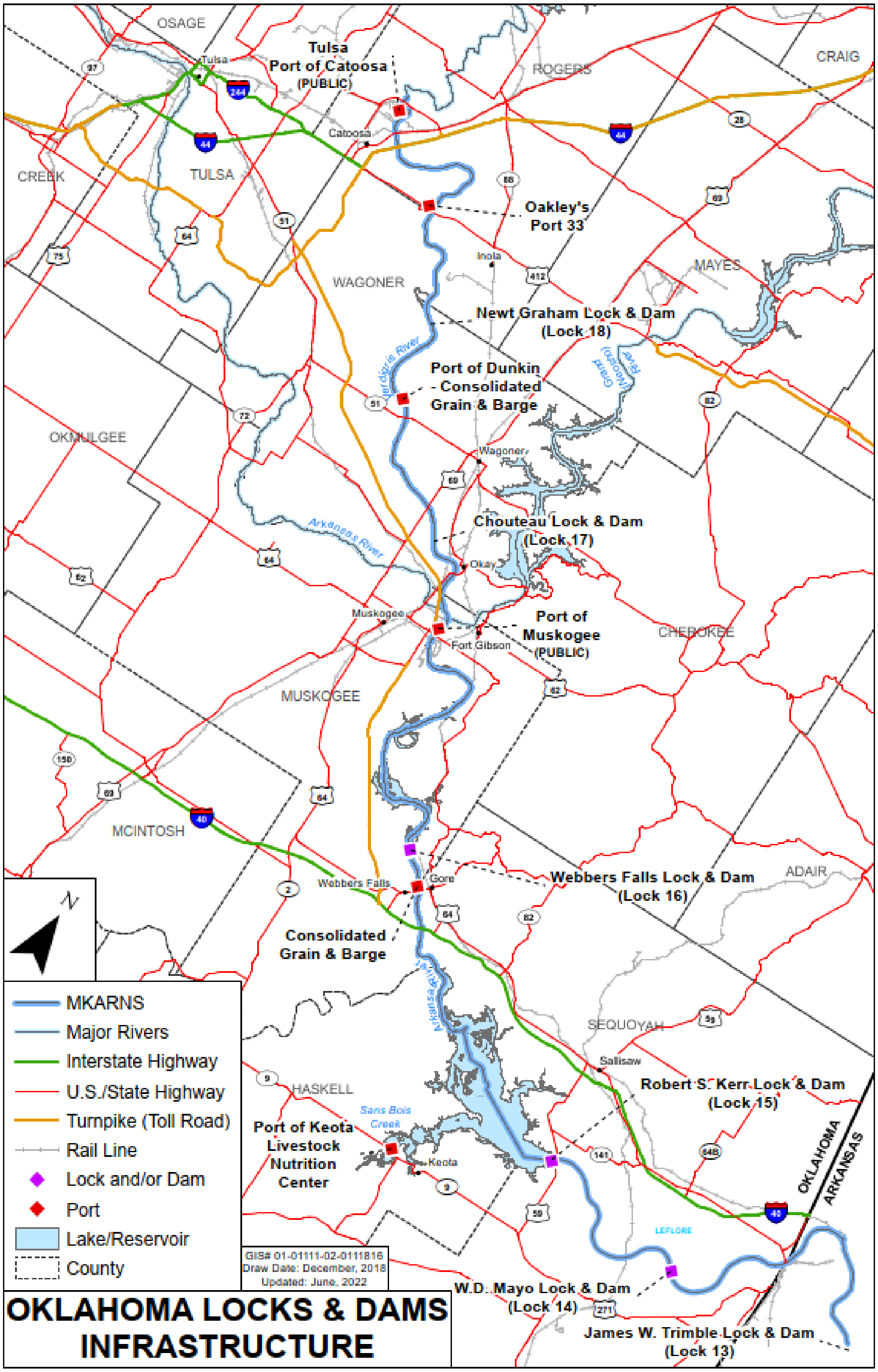
2.5.1 Oklahoma's Waterways

Oklahoma's waterborne freight traffic is handled entirely via the MKARNS, which connects Oklahoma to the Lower Mississippi River, providing access to states along the Mississippi/Missouri/Ohio river system, the Great Lakes, the Gulf of Mexico, the U.S. Intracoastal Waterway system, and deep-draft open-ocean shipping lanes, and linking Oklahoma with global waterborne trading partners. The MKARNS is a 445-mile navigation channel that includes the Verdigris, Arkansas, and White Rivers. From the Mississippi River, the channel follows the Arkansas River across the Oklahoma state line to the Port of Muskogee; from there, the navigation channel follows the Verdigris River, running 51 miles upstream to the Tulsa Port of Catoosa.

The MKARNS is an all-season, ice-free system offering high reliability. There have been no closures due to low water events. However, operations were suspended for three months in 2015 due to heavy rains, and for four months in 2019 due to historic flooding. Current navigation depths are limited to 9 feet, but planning is underway to deepen the system to 12 feet, allowing for heavier-loaded barges and greater system volume and cost-effectiveness.

Figure 2-21 displays the MKARNS system in Oklahoma and identifies each lock and/or dam.

Figure 2-21. McClellan-Kerr Arkansas River Navigation System



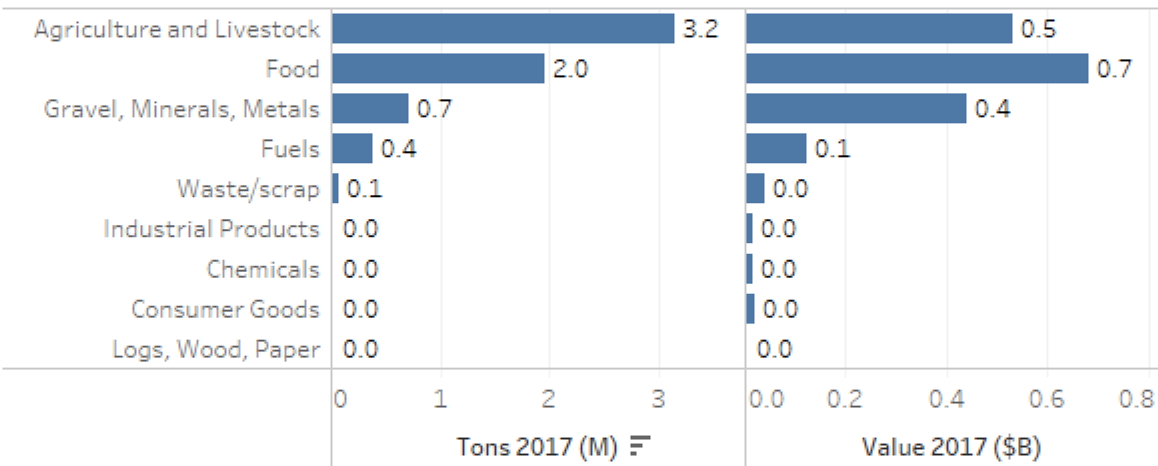
Source: Oklahoma Department of Transportation, 2022

2.5.2 Commodity Flows by Water Into, Out of, and Within Oklahoma

Waterborne transport plays a critically important role in allowing Oklahoma to ship and receive fertilizer, grain, metal products, large machinery and equipment, and other cargo that is physically or economically impractical to move by other modes. Oklahoma's ports also serve freight shippers and receivers in Kansas and other states via landside truck and rail connections.

The top supply-chain groups for water tons and value are shown in Figure 2-22. The leading groups by tonnage are agriculture and livestock; food; gravels, minerals, metals; and fuels. The leading groups by value are food; agriculture and livestock; gravel, minerals, and metals; and fuels. The top four commodity groups in both tons and value transported by waterways in Oklahoma are chemical products, agriculture, metal products, and refined petroleum products. As previously noted, Louisiana is a major destination for agriculture and food products, which are transloaded from barges to ocean-going vessels at southern Louisiana ports.

Figure 2-22. Top OK-Based Commodity Groups by Water, Tons and Value, 2017



Source: Freight Analysis Framework 5.3

2.5.3 Key Facilities

Tulsa Ports

Tulsa Ports consists of two facilities: the established Tulsa Port of Catoosa, and the new Port of Inola which is not yet operational.

The Tulsa Port of Catoosa is located at the head of the MKARNS in northeast Oklahoma. The port is situated on approximately 2,500 acres, accommodating an industrial park with 70 facilities, primarily including manufacturing, distribution, and goods processing companies. An aerial image of the Tulsa Port of Catoosa is shown in Figure 2-23. Along its 1.5-mile channel, the port offers a diversified set of cargo handling facilities, including unique capabilities for the handling of OSOW project cargo. Port facilities handled more than 1.5 million tons of waterborne freight in 2021.

Figure 2-23. Tulsa Port of Catoosa

Source: Port of Catoosa

The Port of Inola consists of 2,000 acres in Inola, Oklahoma, acquired as part of a land transfer from the Public Services Company of Oklahoma, and is being master planned to attract large-scale economic development projects. There is currently no waterborne cargo activity at the site.

Port of Muskogee

The Port of Muskogee is located near the confluence of the Arkansas, Verdigris, and Grand Rivers. The port is situated on approximately 450 acres. The port also owns the John T. Griffin Industrial Park, which consists of 527 acres. In 2021, the port handled 539,000 tons of cargo. An aerial image of the Port of Muskogee is shown in Figure 2-24.

Figure 2-24. Port of Muskogee

In addition to terminals, mooring and dock facilities, and a 94,000-square-foot warehouse, the port has overhead and mobile cranes for transloading between barge, rail, and truck, including a 100-metric-ton marine travel lift. The Port of Muskogee provides extensive rail service (via UP) to its users. In 2021, the port was served by 1,939 railcars handling 173,673 tons of freight. The port cannot accommodate unit trains due to track curvature issues and has submitted a Transportation Investment Generating Economic Recovery grant application to extend tracks and reduce curvature.

Oakley's Port 33

Oakley's Port 33 is a privately owned port located in Catoosa, southeast of the Tulsa Port of Catoosa and east of Tulsa, just north of the US-412 bridge over the Verdigris River. Formerly named Johnston's Port 33, Bruce Oakley purchased the port in 2014. The original facility consisted of 35 acres and includes six transfer docks and warehousing for 10 different fertilizer companies. In 2009, a 90-acre expansion area (Port 33 South) was added, which will allow the port to double its capacity. Collectively, Port 33 offers eight docks and five 70-foot truck scales, with fleeting for around 100 barges. Port 33 is entirely truck-served; there is no direct rail service to the site. The nearest rail service is BNSF, which is seven miles away in Catoosa. An aerial image of Oakley's Port 33 is shown in Figure 2-25.

Figure 2-25. Oakley's Port 33

2.6 OKLAHOMA'S AIR CARGO SYSTEM

Access to reliable air freight services is important to many businesses with high-value products or those requiring rapid transport. This includes medical instruments and advanced manufacturing components as well as many other commodities. Many manufacturers also utilize air freight for repair parts and stock outs. Adequate air service is an integral part of the capabilities necessary to support robust supply chains in the state. Oklahoma is fortunate to have air cargo access through Tulsa and Oklahoma City, and through its proximity to Dallas-Fort Worth, Texas.

There are four primary commercial service airports in Oklahoma: Lawton-Fort Sill Regional in Lawton, Will Rogers World in Oklahoma City, Tulsa International in Tulsa, and Stillwater Regional in Stillwater. Table 2-7 shows the freight and mail through these airports in pounds. A primary service airport enplanes more than 10,000 people annually with scheduled service. There are two secondary commercial service airports at Enid and Ponca City. There are numerous regional and small private airports throughout the state for general service aviation and chartered freight service.

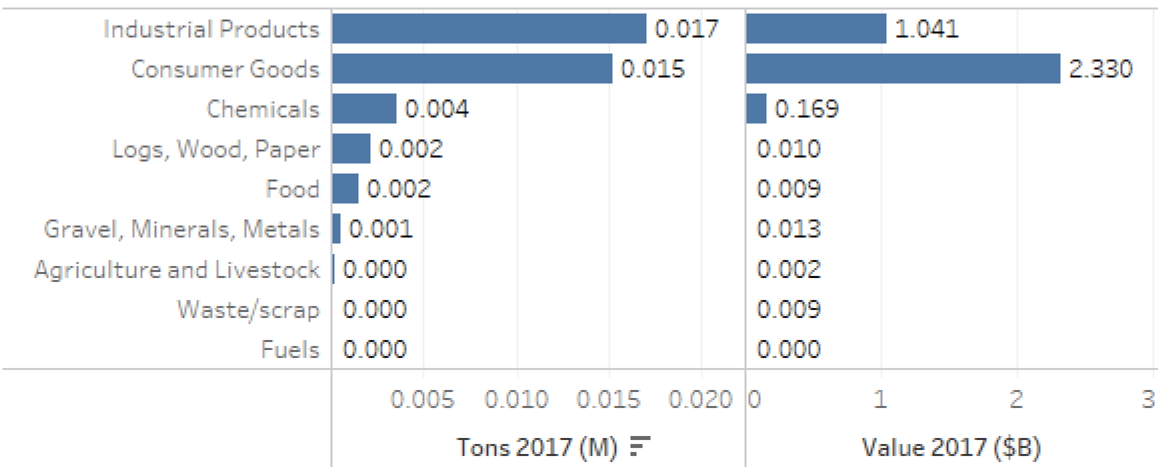
Table 2-7. Freight and Mail (pounds) through Oklahoma Airports

Airport	2020	2021
Tulsa	132,000,000	131,000,000
Will Rogers World	84,000,000	80,000,000
Stillwater	46,000	55,000
Lawton	996	1,255

Source: Bureau of Transportation Statistics

The top supply-chain groups for air tons and value are shown in Figure 2-26. The leading groups by tonnage are industrial products and consumer goods. The leading groups by value are consumer goods and industrial products.

Figure 2-26. Top OK-Based Commodity Groups by Air, Tons and Value, 2017



Source: Freight Analysis Framework 5.3

2.7 OKLAHOMA PIPELINE SYSTEM

According to the U.S. Energy Information Administration:[8]

- In 2021, Oklahoma was the nation's fifth-largest producer of marketed natural gas and the sixth-largest producer of crude oil. Overall, the state consumed only one-third of the energy it produced.
- As of January 2021, Oklahoma had five operable petroleum refineries with a combined daily processing capacity of almost 522,000 barrels per calendar day. That is nearly 3 percent of the total U.S. crude oil refining capacity.

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[8] United States Energy Information Administration. (19 May 2022). Oklahoma: State Profile and Energy Estimates. Retrieved 17 June 2022, https://www.eia.gov/state/print.php?sid=OK.

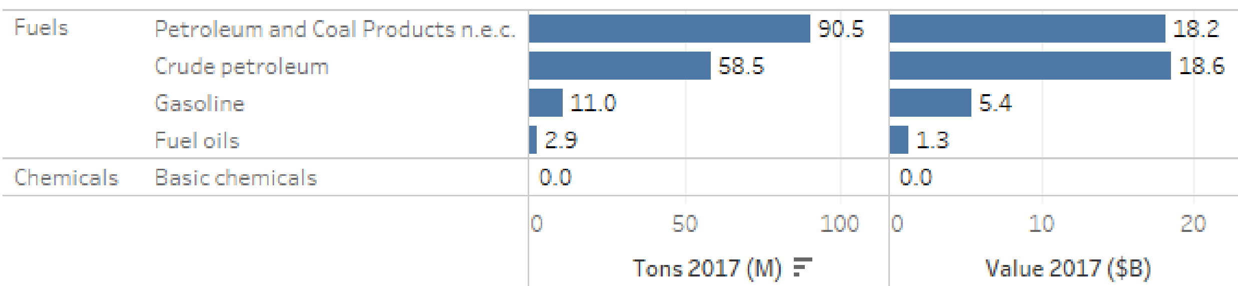
- In 2021, wind supplied 41 percent of Oklahoma's total electricity net generation, surpassing natural gas' share for the first time. Wind accounted for 91 percent of the state's renewable generation, and the state ranked third in the nation in total electricity net generation from wind.
- The benchmark price in the domestic spot market for the U.S. crude oil known as West Texas Intermediate is set at Cushing, Oklahoma, which is home to about 14 percent of the nation's commercial crude oil storage capacity.
- In 2020, Oklahoma was the nation's fourth-largest consumer of natural gas on a per capita basis. The electric power sector and the industrial sector together use slightly more than four-fifths of the natural gas delivered to consumers in Oklahoma.

In 2022, Oklahoma announced it would be joining with Arkansas and Louisiana to create a regional hub to produce hydrogen for use as a fuel and for manufacturing feedstock, expanding the state's energy activity in this emerging market sector.

Oklahoma's energy industry is supported by an expansive pipeline network consisting of 14,949 miles of liquid product pipelines and 48,606 miles of gas product pipelines.[9]

The top supply-chain groups for pipeline tons and value are shown in Figure 2-27.

Figure 2-27. Top OK-Based Commodity Groups by Pipeline, Tons and Value, 2017



Source: Freight Analysis Framework 5.3

2.8 OKLAHOMA MULTIMODAL FREIGHT ASSETS

An important element of the freight system is the multimodal freight transfer of commodities. These are facilities where freight is transferred from one mode to another. The facilities may also provide storage capacity as well as services that add value to the product being shipped.

Oklahoma is fortunate to have options for several modes of freight transportation, including truck, rail, air, and waterways. In addition, multiple modes are often involved in goods movement by using transload facilities. Transload of freight occurs because of delivery or financial advantages for the shipper or receiver and constitutes a growing trend for freight

[9] U.S. DOT Pipeline and Hazardous Materials Safety Administration, 2021, Gas Pipeline Miles by System Type, Portal Data as of 6/22/2022, https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-mileage-and-facilities

shipments in Oklahoma. In particular, there is an increasing demand for shipments that travel on Oklahoma rail or water systems and use truck for "last-mile" transport.

For purposes of this OFTP, three types of multimodal assets are addressed:

- Truck-rail container and trailer-transfer terminals (hereafter referred to as "intermodal terminals")
- Transload terminals
- Grain elevators

2.8.1 Intermodal Terminals

Freight transportation planning has historically been mode oriented. Increasingly, planning is shifting to a supply-chain focus with network connectivity being as important as the individual modal structure. Oklahoma's ability to reach markets outside the state and the nation depends on the efficient interaction of the different modes and the way in which shippers can access the network.

Oklahoma has not had an intermodal terminal since 2005, when BNSF closed its intermodal terminal near Oklahoma City due to lack of demand. Container service for Oklahoma shippers and receivers is provided outside the state by way of facilities in Dallas, Texas, Kansas City, Missouri, or Memphis, Tennessee, depending on the location of the shipper in the state and the direction of the shipment. While some state development agencies might hope for new container services within the state, the realities of logistics and market costs make that nearly impossible. With relatively short distances to three major intermodal terminals, Oklahoma is, in the view of the railroads and intermodal service providers, better served by utilizing the three nearby hubs than by stopping intermodal trains at a location in Oklahoma.

The railroads and the asset-based intermodal service providers are engaged in efforts to increase the productive use of their equipment and improve levels of service in selected markets. This is true of all intermodal equipment but particularly for domestic, 53-foot containers. This need for efficiency in turning equipment pushes the services away from areas with a lower density of freight traffic. This is generating movement toward consolidating service to key hub terminal locations. The current intermodal service network fostered by this trend toward consolidation determines service offerings for Oklahoma intermodal shippers.

2.8.2 Transload Terminals

Transloading of commodities is another form of transfer of freight from one mode of transportation to another; however, it pertains to non-containerized freight. It is used by railroad customers who wish to consolidate freight, utilize a railroad public delivery track, do not have direct access to a rail line, or who want a competitive option to a railroad that directly serves the shipper.

Transload operations can involve products shipped in liquid or dry bulk or as break-bulk, dimensional cargo. Dry bulk commodities are shipped in unpackaged quantities. When direct truck-rail transfer is not possible, dry bulk commodities can be stored in an open stockpile (aggregates, minerals, ore, etc.) or in covered storage such as silos (agricultural products). Liquids (petroleum, chemicals) are stored in tanks.

Oklahoma has over 40 transload terminals that handle a spectrum of products including sand, aggregates, agricultural products, bulk, and dimensional products.

2.8.3 Grain Elevators

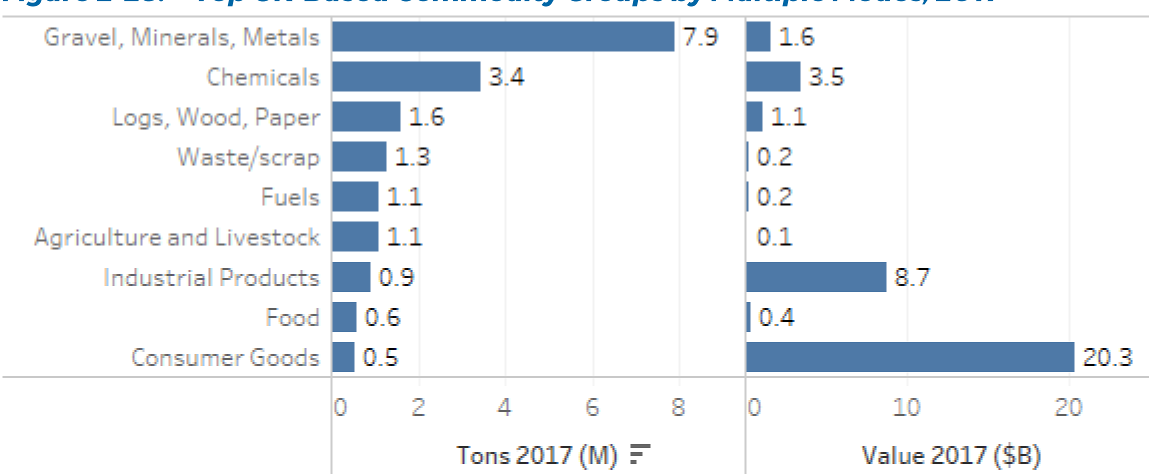
Grain elevators are a special form of a transload facility. Grain is delivered to the elevator by truck, stored, and then loaded into grain cars. The elevator provides storage capacity not available on the farm, but also aggregates smaller shipments into larger, often train-sized, blocks. Large blocks or unit trains provide economies of scale that in turn result in reduced transportation costs to the shipper.

There are 101 grain elevators, located in 29 of Oklahoma's 77 counties. Garfield County, with Enid as the County Seat, has the largest number with 12 elevators. This is no surprise since western Oklahoma produces the state's largest crop (wheat), and Enid sits at the intersection of the UP, BNSF, and Grainbelt railroads. The 2022 SRP covers the topic of elevators and rail service in greater detail.

2.8.4 Commodity Flows by Multiple Modes Into, Out of, and Within Oklahoma

The top supply-chain groups for air tons and value are shown in Figure 2-28. The leading groups by tonnage are gravel, minerals, and metals; chemicals; and logs, wood, and paper. The leading groups by value are consumer goods; industrial products; and chemicals.

Figure 2-28. Top OK-Based Commodity Groups by Multiple Modes, 2017



Source: Freight Analysis Framework 5.3

2.9 CURRENT CONDITIONS AND CHALLENGES

This section describes current needs and issues. Trends affecting the future demand for freight transportation are further detailed in Chapter 4.

2.9.1 Truck Operations Concerns and Needs

There are some specialized concerns affecting truck freight operations that warrant further consideration.

Military Use

Oklahoma is home to six military installations, including three Air Force bases (AFBs), two Army installations, and one Air National Guard Base. These installations serve as traffic generators for both inbound and outbound freight in order to provide the necessary materials for manufacturing military equipment as well as the consumer goods required to support the base population. The U.S. military relies on the Oklahoma freight system for the movement of cargo to both serve military installations and deploy national defense.

The Strategic Highway Network (STRAHNET) is a 62,000-mile system of roads deemed necessary for emergency mobilization and peacetime movement of heavy armor, fuel, ammunition, repair parts, and other commodities to support U.S. military operations. All STRAHNET facilities are also classified as part of the NHS. Maintaining connectivity from the STRAHNET to military installations is critical.

McAlester Army Ammunition Plant (MCAAP) is a critical base for sending and receiving supplies for weapons manufacturing and is the largest ammunition storage facility in the nation. The facility relies on deliveries by truck and rail to receive supplies and goods. US-69, a nationally significant corridor part of the National Highway Freight Network (NHFN) and STRAHNET, travels northwest through MCAAP from Texas and connects to I-40 to the north. US-75 also travels north-south adjacent to the facility and connects to Tulsa to the north. Safety due to the transport of hazardous materials to and from the base is a critical concern.

Oklahoma AFBs, including Vance AFB, Tinker AFB, and Atlus AFB, serve as hubs for aviation maintenance and require large amounts of materials to be imported by truck for distribution. Located southeast of Oklahoma City, Tinker AFB is accessed on the northern boundary of the base by I-40 (apart of the NHFN) and on the southern end by I-240. Tinker AFB is among the military facilities of high importance due to the U.S. Navy tenants and the multiple missions of the Department of Defense. Due to its proximity to Oklahoma City, oversized freight loads maintaining access to the base alongside increasing traffic volume on I-40 and I-240 is a concern for operational efficiency and national security. Atlus AFB, located in southwest Oklahoma is accessed by US-62, which travels east-west and connects to Fort Sill AFB and I-40 to the east. Fort Sill AFB is the largest military base in the state. Fort Sill is bisected by I-44, which travels north-south through the base connecting to Oklahoma City to the north and the Texas border to the south. Due to its focus in artillery training, large amounts of ammunition are delivered and stored at the base.

All the installations have rapid deployment needs that require a surge in capacity from commercial providers. A deployment surge would severely push the limits of the connecting highways by requiring multiple flatbeds around the clock for possible interstate deliveries of parts, equipment, and ammunition. The movement of trucks is highly likely from MCAAP to Tinker AFB Airport, utilizing US-69 and I-40 as main routes, for ultimate aerial delivery of supplies.

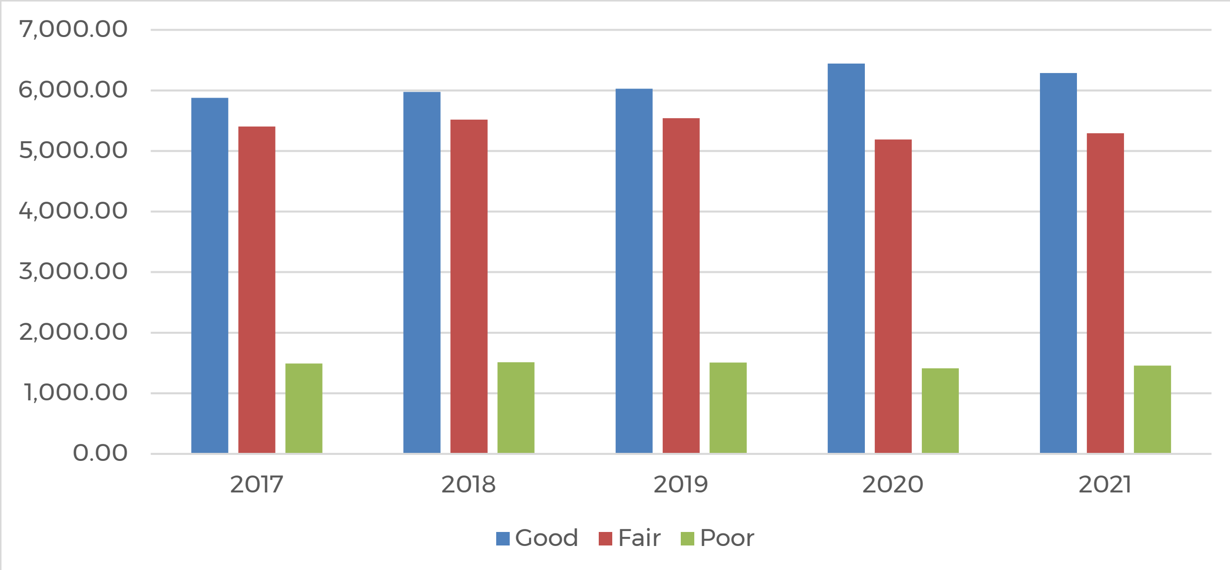
Other Specialized Uses

- Oversize/Overweight Cargo. The agricultural bulk-transport sector has long been a proponent of higher weight limits, as have the logging and steel industries. Oklahoma has most of these commodity groups at the top of its economy. The higher weight limits reduce the number of trucks and improve hauling capacity. However, as weight increases, so does roadway deterioration. It is important that states plan for and develop effective infrastructure on a network of routes that can accommodate the OSOW needs. This includes incorporating bridge limits and height restrictions. In Oklahoma, superload permits often trigger additional requirements, and can be more expensive than routine OSOW permits.
- Agriculture. As small family farms have given way to larger agricultural operations, equipment size has grown. It is necessary for this equipment to travel on local roads in order to move from field to field, or to deliver commodities to other locations, such as grain elevators, using farm trailers and trucks. Off-highway equipment, such as combines, has different axle ratios that do not necessarily match that of regular trucking equipment. Load-posted bridges can require equipment to travel significant out-of-route miles to move on a single property. Given that agriculture is one of Oklahoma's largest industries, this situation requires full consideration in infrastructure planning. One particular issue is the lack of shoulders on rural two-lane highways, which makes passing less safe, and affords no provision to pullover when breakdowns occur.
- Hazardous Materials. Just as OSOW cargo is increasing in volume, so is the amount of hazardous material, which includes chemicals and petroleum products that are part of the Oklahoma economy. Railroads are limiting their availability for some commodities, thereby pushing the haulage to truck. In Oklahoma, US-69 is heavily used by the military to transport explosives. This is another example of the need for planning for hazardous routing and public safety.

Pavement Condition

Reducing the amount of poor-quality pavement is important for both freight and passenger mobility. In 2021, 89 percent of Oklahoma highway centerline mileage was rated in good or fair condition using the International Roughness Index. Between 2017 and 2021, the amount of mileage in good condition increased from 5,878 to 6,287, while the amount in poor condition decreased from 1,491 to 1,457 (Figure 2-29).

Figure 2-29. Pavement Condition, 2017-2021

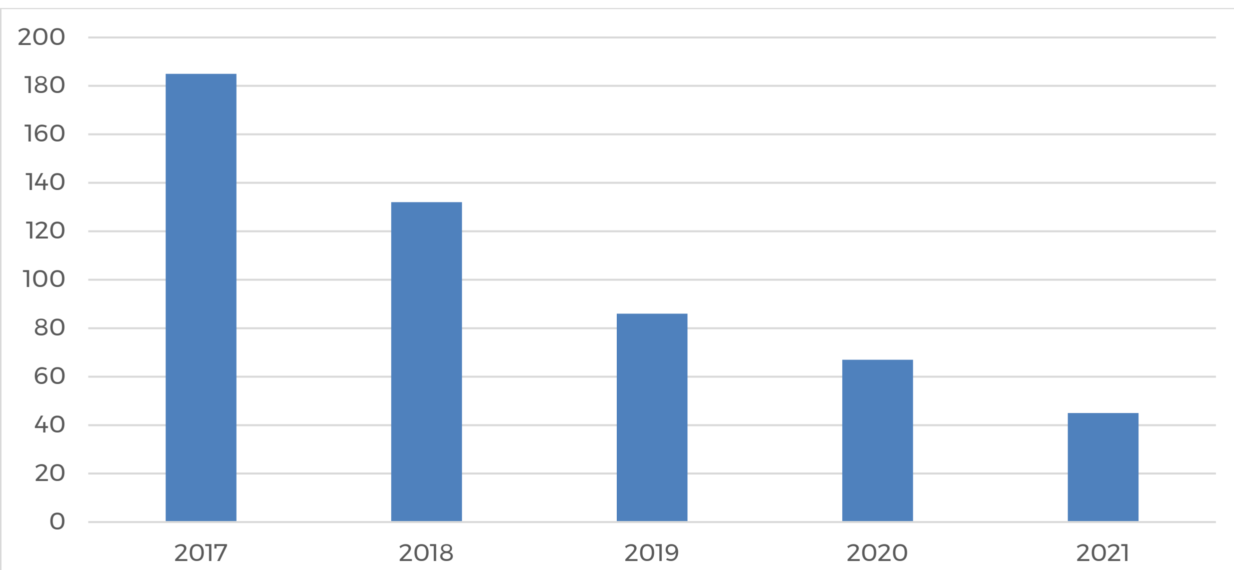


Source: Oklahoma DOT

Bridge Condition

ODOT has a very aggressive bridge repair program in place. The number of structurally deficient bridges in the state has dropped from 185 in 2017 to 45 in 2021 (Figure 2-30).

Figure 2-30. Structurally Deficient Bridges, 2017-2021



Source: Oklahoma DOT

Reliability

Congestion has a direct economic impact on business. More equipment is required when transport times are longer, inventory requirements increase when deliveries are unreliable, and additional distribution centers are needed to quickly meet market demand. Restricted traffic flow in the highway network contributes to a higher cost of goods for business and consumers. Congestion affects transport time in two ways: reducing speed and decreasing reliability. The reliability of travel time is more important to the planning of capacity and on-time service than is overall speed. More details on reliability are presented in Chapter 5.

Truck Parking

Based on extensive new analysis, truck parking needs in Oklahoma can be summarized as follows.

- While no major truck parking shortfalls appear to exist statewide, continued investments in truck parking capacity are needed to accommodate expected increases in truck volumes. The lower population density and greater availability of land has led Oklahoma to currently have adequate truck parking capacity overall. Moreover, if parking facilities start getting full, there is typically a place nearby, often a gravel lot, where trucks can park. Relatively affordable land prices have allowed for significant parking facility development, both in quantify and size, that appears to largely serve the current needs of the trucking sector. However, additional investments in truck parking infrastructure will be required in the coming decades to accommodate the expected increase in trucks on the roads. A truck parking survey is being conducted that will help determine what ODOT can do to improve the quality of parking facilities, by investing in greater amenities in public rest areas and encouraging development of additional facilities in particular areas. This would help improve the quality of life of drivers, particularly those involved in long-haul trucking, helping ease the driver shortage pressure currently being faced throughout the country.
- Undesignated parking on interstate corridors and urban areas – One of the main truck parking challenges in Oklahoma is the frequency of undesignated parking, particularly in urban areas. This type of parking occurs on interstate corridors, as shown above, but also off the highway system, on vacant lots, public parking lots (where expressly allowed, such as at Walmart and Home Depot, but also at other retailers), and sometimes on the right-of-way. As described above, parking in these locations is undesirable for safety, security, and traffic operations reasons.
- Solutions to parking in undesignated locations require a carrot-and-stick approach. Enforcement should be ramped-up, especially in locations where trucks pose a clear safety issue to pedestrians, other vehicles, and themselves. The capacity of the truck parking system should also be expanded via smaller parking facilities distributed throughout the area instead of at large facilities where designated parking is currently concentrated. This will increase the chance that parking is available for staging reasons in convenient locations for drivers.
- Lack of information about parking availability – One of the main challenges often brought up by truck drivers is the inability to know in real-time where there are parking spaces available. There are currently two ways that truck drivers ascertain availability information in Oklahoma, and both of them have significant drawbacks:

  - The Park My Truck application reports the availability of spaces at parking facilities; however, it only covers 13 out of the 190 facilities in the state.
  - The Trucker Park application reports the availability of more facilities; however, the application reports availability only in the broad categories of "some availability" and "full," which are crowdsourced and not entirely reliable.

- Encouraging participation in these applications could benefit drivers through finding available spaces. Better information about the location, amenities, and capacity of these parking facilities will help drivers have confidence about their parking decisions, rather than resort to parking in undesignated locations. This will be particularly helpful for newer drivers who are not familiar with the region.
- Truck parking is a regional issue, where the decisions and investments made in neighboring states have a significant impact on truck parking needs in Oklahoma. Closer coordination with neighboring states on parking issues is recommended, particularly given the high volume of truck traffic that travels through the state.

2.9.2 Freight Railroad Concerns and Needs

The 2022 SRP discusses needs and opportunities related to freight-rail service which were identified through ODOT's efforts to determine strategic activities. Needs specified in the plan are listed below:

- The need to support and promote rational growth of the short-line industry and passenger rail service in the state
- The need to find new sources of funds to replace lease revenues lost as rail lines owned by the state revert to the rail operators as part of the lease-purchase program
- The need to leverage the economic and public benefits of rail transportation
- The need to inform the public of the benefits of rail transportation

Need to Support Companies Served by the Short-Line Rail Industry

Oklahoma's short-line railroads are important to the economy of the state. They provide rail service to many of the state's smaller economic centers and communities. Several needs have been identified to preserve the companies that rely on rail and allow the short-line railroads to relieve pressure on local infrastructure:

- Track Upgrades – Upgrading all critical lines to accommodate the higher capacity freight cars will permit Oklahoma's rail customers to remain competitive in the national and global marketplace. A number of Class III (short-line) railroads within the state are unable to accommodate industry-standard 286,000-pound gross weight railcars. In some cases, track infrastructure limits railcar allowable weight on rail; at other times, bridges are inadequate to withstand the weight of these heavier railcars.

  An additional consideration to the issue of bridge renovations is the matter of horizontal and/or vertical clearance. Correcting clearance envelope issues allows dimensional traffic (sometimes referred to as "high and wide") to move over more of the Oklahoma state network. This impacts the ability to adequately serve, among others, the energy sector.

- Rail Infrastructure sized/designed to meet current rail operations models – In the last century the American architect Frank Lloyd Write famously said, "Form follows function." That advice can be applied equally well when viewing railroad infrastructure. As relates to traffic to and from Oklahoma, there are two distinct types of traffic, each of which requires a different type of rail yard/infrastructure:
  - Unit Train Capacity – The rail industry has shifted toward handling certain commodities, such as coal, frac sand, and grain in unit trains. Currently, the typical unit train includes at least 110 cars of a single commodity moving between a single origin-destination pair. However, not all of Oklahoma's rail infrastructure can accommodate unit trains. For example, connections between Class I (large) railroads and the regional Class III railroad at Enid, Oklahoma, limits train size to 50 cars, which is far smaller than most unit trains.
  - The other common train type is "manifest" trains, which are assembled at classification yards with railcars of multiple origins and destinations. This is a mixed freight containing various types of cars and commodities grouped in blocks based on destination to allow the train to efficiently set off and pick up blocks of cars at various locations along the route.

    Simply put, each of these functions defines the required form of infrastructure. This is ultimately driven by the needs of the businesses, farmers, and other rail customers in the state. The evolution of rail infrastructure, whether it be to handle heavier capacity cars, oversize shipments, unit trains, or increased manifest freight is entirely a function of meeting those end user needs.
- Rail Corridor Preservation – A rail corridor preservation program to retain abandoned rail lines for future rail use (even in those instances where the tracks have been removed) should be considered. Some Oklahoma rail lines are underutilized, which is a cause for concern.

Need for Rail-Served Industrial Parks

The need to establish more rail-served industrial parks has been identified. The industrial parks would generate new rail business not only for the short-line and Class I railroads but also additional economic development in smaller communities. There is need for rail spurs and industrial rail leads connecting Oklahoma's industrial properties to the Oklahoma rail network.

Both Oklahoma City and Tulsa have been cited as areas where additional transload facilities could enhance economic development. Additional team tracks would provide alternatives to shippers that are not directly served by rail in rural areas. In some cases, multimodal facilities need to be upgraded. For example, the track geometry at the Port of Muskogee prevents use by six-axle locomotives and long blocks of 286,000-pound railcars. Since corrective action would require changing the radius of one or more curves, this improvement involves assessing land use issues and may provide additional development opportunities. As opportunities for new industries arise, rail improvements need to be addressed.

Highway-Rail Grade-Crossing Improvement

When asked about freight bottlenecks for the "Oklahoma State Rail Plan: 2018–2021 stakeholders cited impeded highway freight mobility attributable to at-grade highway-rail crossings. These included crossings in Claremore, Moore, Owasso, and Thomas, as well as the BNSF Red River Subdivision in Oklahoma City.

Elimination of Bottlenecks and Other Impedances

A critical need, which will be examined and addressed in more detail in later sections, is the elimination of operating hindrances due to capacity restrictions or physical obstructions. Capacity restrictions include track and facility capacity. Physical obstructions limit the ability to use larger profile freight cars, particularly in transporting containers or automobiles. These impedances must be addressed both as they relate to horizontal clearance (adjacent structures and obstructions) and vertical clearance (overhead bridges, etc.)

2.9.3 Waterways Concerns and Needs

MKARNS Maintenance Backlog

While the MKARNS offers strong performance and high reliability, it also faces a significant maintenance backlog. Although Oklahoma's ports have different individual plans and needs, there is agreement that the single most important priority is to preserve the safe, reliable, and productive operation of the MKARNS itself.

Like the rest of the U.S. Inland Waterway system, the MKARNS has a substantial list of unfunded "critical backlog" projects, above and beyond routine maintenance. "Critical backlog" is defined as an estimated 50 percent chance of component or asset failure within a five-year period. The current total of needed expenditures to address critical backlog on the MKARNS is $301.7 million systemwide, with $160.4 million of that amount on the Oklahoma segment.

MKARNS Deepening

The MKARNS has a 9-foot controlling navigation depth, while most of the Inland Waterway system offers at least 12-foot depths. The shallower 9-foot depth means that barges cannot be as heavily loaded. This, in turn, means that the costs of barge shipment must be spread over less tonnage, producing higher cost-per-ton rates for shippers.

Long-discussed, unadvanced plans to deepen the MKARNS to 12 feet received a significant boost from the Bipartisan Infrastructure Law (BIL), which allocated an additional $168.5 million for the USACE Little Rock District, of which $62.7 million is for operations and maintenance to provide reliable navigation and $92.6 million is for the 12-foot channel deepening project. The deepening, when completed, would provide a significant cost savings for port customers, leading to maintained and expanded waterborne cargo volumes over the system and through Oklahoma's ports.

Port-Identified Needs

Each of Oklahoma's ports has specific needs, which are described in more detail in Chapter 5. General concerns include:

- MKARNS operability and state of good repair
- Flood protection
- Mooring structure condition and capacity
- Dockside rail improvements
- Truck access improvements
- Land development and Foreign Trade Zone opportunities

Freight Advisory Committee Input

At the June 2022 FAC meeting, the members were asked about the biggest challenges for freight in Oklahoma. Responses included:

- Increasing congestion on highways and in metro areas
- Need for funding
- Rising costs of fuel
- Rising costs of goods and materials
- Staffing issues/driver shortages
- Truck rest areas/parking
- Air quality issues – if congestion continues and accidents continue air quality will be affected. Would be nice to see electrical hookups at truck stops rather than trucks needing to idle.
- Preparing for connected vehicles (CVs)
- System maintenance
- High and wide loads
- Hazardous materials transportation in populated areas

Discussion of these responses revealed additional issues including:

- Long trains block vehicle traffic at at-grade intersections (e.g., 76th Street N. in Owasso)
- Highway ramps that do not provide enough merging/weaving distance for trucks – Oklahoma should identify and prioritize these areas
- Intermodal needs around Tulsa – including Port of Catoosa, BNSF, and near the airport
- SRP documented rail and intermodal concerns
- Driver shortages

2.9.4 Accommodation of Critical Supply Chains

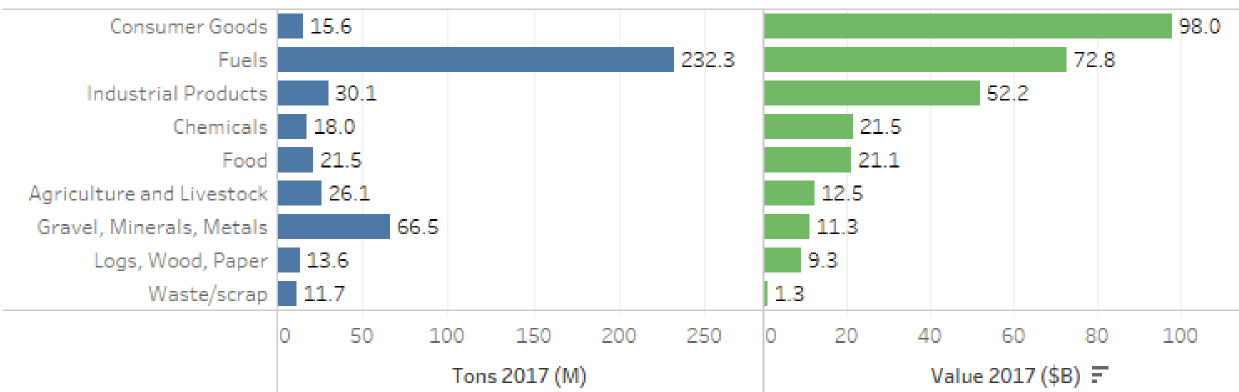
Freight flows over Oklahoma's freight transportation system are generated by its producing industries, consuming industries, and consuming population. Different industries use the system in different ways, organizing their movement of commodities in terms of structured "supply chains" based on the commodity type, origin-destination, transportation mode, and other factors.

Every industry supply chain is unique, but at a high level, industries handling similar commodities tend to have similar or related needs. Oklahoma's most important supply-chain clusters include:

- Consumer Goods
- Fuels
- Industrial Products
- Food
- Chemicals
- Agriculture and Livestock
- Gravel, Minerals, Metals
- Logs, Wood, Paper
- Waste and Scrap

By value, the most important supply chains are consumer goods, fuels, and industrial products, followed by chemicals and food. Fuels account for by far largest share of tonnage, followed by gravel, minerals, and metals (Figure 2-31).

Figure 2-31. Oklahoma Supply Chain Group Commodities – Tons and Value, 2017



Source: Freight Analysis Framework 5.3

Details for each of these supply-chain clusters are presented in Figure 2-32 through Figure 2-37, and key findings are summarized below.

- The <u>Consumer Goods</u> cluster (15.6 million tons worth $98 billion) includes electronics, furniture, mixed freight, motorized vehicles, pharmaceuticals, precision instruments, printed material, textiles/leather, tobacco, and transportation equipment. Tonnage of consumer goods is transported within, into, and out of the state primarily by truck. A larger dollar amount of consumer goods is transported into the state than is transported internally or out of state; nevertheless, a substantial value of goods move in all directions by truck, multiple modes, rail, and air. The leading outbound and inbound tonnage move is to Texas by truck. The leading outbound value moves are to Texas by truck and multiple modes, and Kansas, California, and Arkansas by truck. The leading inbound value moves are from Texas by multiple modes including from Ohio by rail (primarily auto and transportation); from California by truck and multiple modes; and from Mississippi, Kansas, and Arkansas by truck.

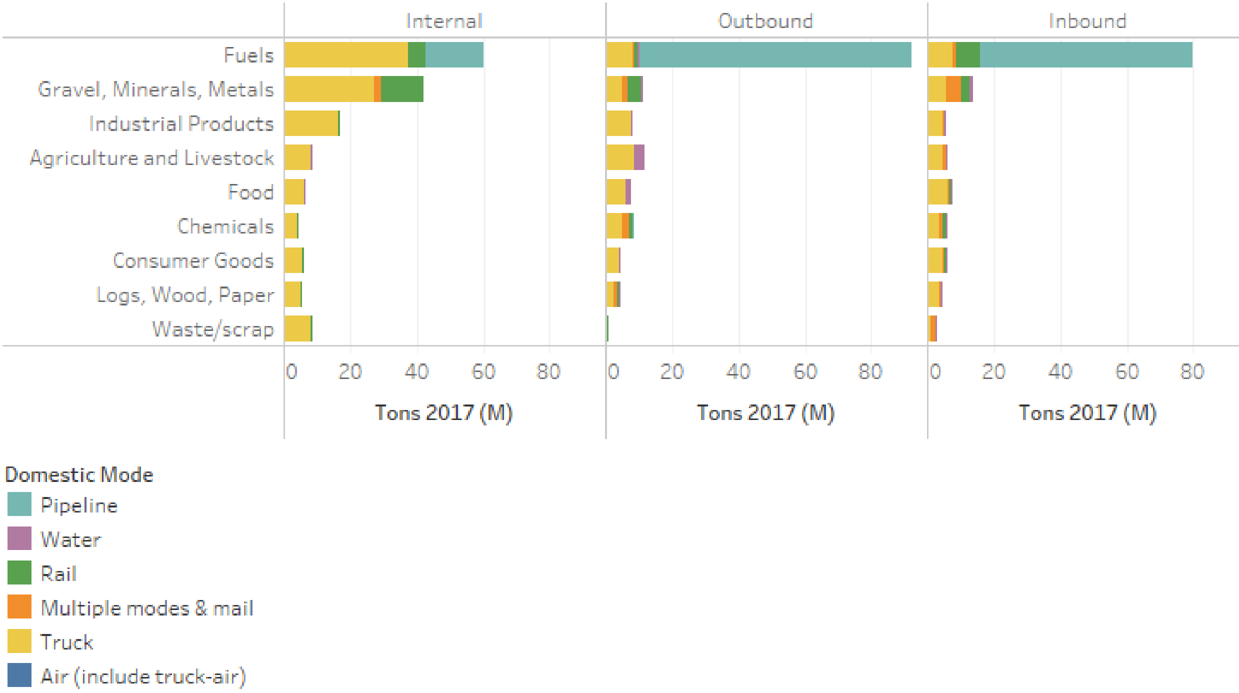
- The Fuels cluster (232.3 million tons worth $72.8 billion) includes coal, crude petroleum, fuel oils, gasoline, and other petroleum and coal products, including liquid natural gas. Pipelines transport the majority of the tonnage of fuel into and out of the state while truck, rail, and multiple modes transport lower but still significant tonnage. Trucks are used for most of the tonnage transported within the state, but rail and pipeline are also used. A similar modal split is observed for the dollar amount (value) of fuel transported across the three directions except for trucking, which transports a larger share of the value amount of fuel as trucks handle higher-value commodities. The leading outbound tonnage moves are to Texas by pipeline and truck and to Kansas, Arkansas, and Louisiana by pipeline. The leading inbound tonnage moves are from Texas by pipeline and truck, Wyoming by carload rail (primarily coal), and North Dakota, Michigan, Colorado, and Louisiana by pipeline. The leading outbound value moves are to Texas by pipeline and truck, and Kansas, Louisiana, and Arkansas by pipeline.
- The Industrial Products (30.1 million tons worth $52.2 billion) cluster includes articles of base metal, building stone, machinery, misc. manufactured products, and nonmetallic mineral products. Around half the tonnage of industrial products is transported internally, and largely by truck while smaller amounts are transported by rail and multiple modes. The value picture is different as a similar dollar amount of industrial products are transported within, into, and out of the state, and because a higher share of moves are fulfilled by multiple modes. The leading outbound and inbound tonnage moves are to and from Texas by truck. The leading outbound and inbound moves of industrial products are to and from Texas by truck.
- The Chemicals cluster (18.0 million tons worth $21.5 billion) includes basic chemicals, chemical products, fertilizers, and plastics/rubber. The tonnage of chemicals transported across all three directions is similar in quantity and is primarily by truck, with support from rail and multiple modes. A larger dollar amount of chemicals is transported out of the state than is transported within or into the state. The majority of the dollar amount of chemicals across all directions is transported by truck, while some is transported through multiple modes, rail, and water. Inbound and outbound tonnage is diversified across many different trading partners; inbound and outbound value is primarily truck to and from Texas.
- The Food cluster (21.5 million tons worth $21.1 billion) includes alcoholic beverages, meat/seafood, milled grain products, other agricultural products, and other foodstuffs. The tonnage of transported food is relatively similar between inbound, outbound, and within-state moves, and is mostly by truck, but water also plays an important role. The dollar amount of food transported is also similar between inbound, outbound, and within-state moves and is also largely transported by truck. The leading outbound tonnage moves are to Texas and Kansas by truck and Louisiana by water. The leading inbound tonnage move, inbound value move, and outbound value move is to/from Texas by truck.
- The Agriculture and Livestock cluster (26.1 million tons worth $12.5 billion) includes animal feed, cereal grains, and live animals/fish. The amount of tonnage of agriculture and

livestock transported within, into, and out of the state is similar between the three directions. Outbound direction moves are primarily by truck and some water, while inbound direction moves are primarily by truck and partially by multiple modes. The dollar amount of transported agriculture and livestock show similar direction and modal split patterns. The leading outbound tonnage and value moves are to Kansas and Texas by truck and to Louisiana by water. The leading inbound tonnage move is from Kansas by truck.

- The Gravel, Minerals, Metals cluster (66.5 million tons worth $11.3 billion) includes base metals, gravel, metallic ores, natural sands, and nonmetallic minerals. Tonnage for this cluster is primarily transported internally, with smaller outbound and inbound moves, and is largely transported by truck; however, there are very substantial shares of conveyance by rail, multiple modes, and water. A larger dollar amount of gravel, minerals, and metals are transported into the state than are transported internally or out of state, suggesting that higher-value commodities within the cluster are being imported as indicated by low tonnage. The leading outbound tonnage moves are to Texas by rail and truck and to Missouri by truck. The leading inbound tonnage and value move is from Texas by truck.
- The Logs, Wood, Paper cluster (13.6 million tons worth $9.3 billion) includes logs, newsprint/paper, paper articles, and wood products. The total tonnage of logs, wood, and paper transported within, into, and out of the state is relatively similar with slightly larger amounts of internal movement. Movements across all three directions are primarily by truck with some rail, multiple modes, and water. The value of logs, wood, and paper transported across the three directions is more balanced and uses similar split of transportation modes.
- Waste and Scrap (11.7 million tons worth $1.3 billion) consists of waste or scrap metal, glass, paper, or other materials or products with commodity resale value. Tonnage is largely transported within the state by truck with small amounts of waste and scrap imported through multiple modes and water and some exported by rail. The value waste and scrap transported within, into, and out of the state is extremely low compared to other clusters.

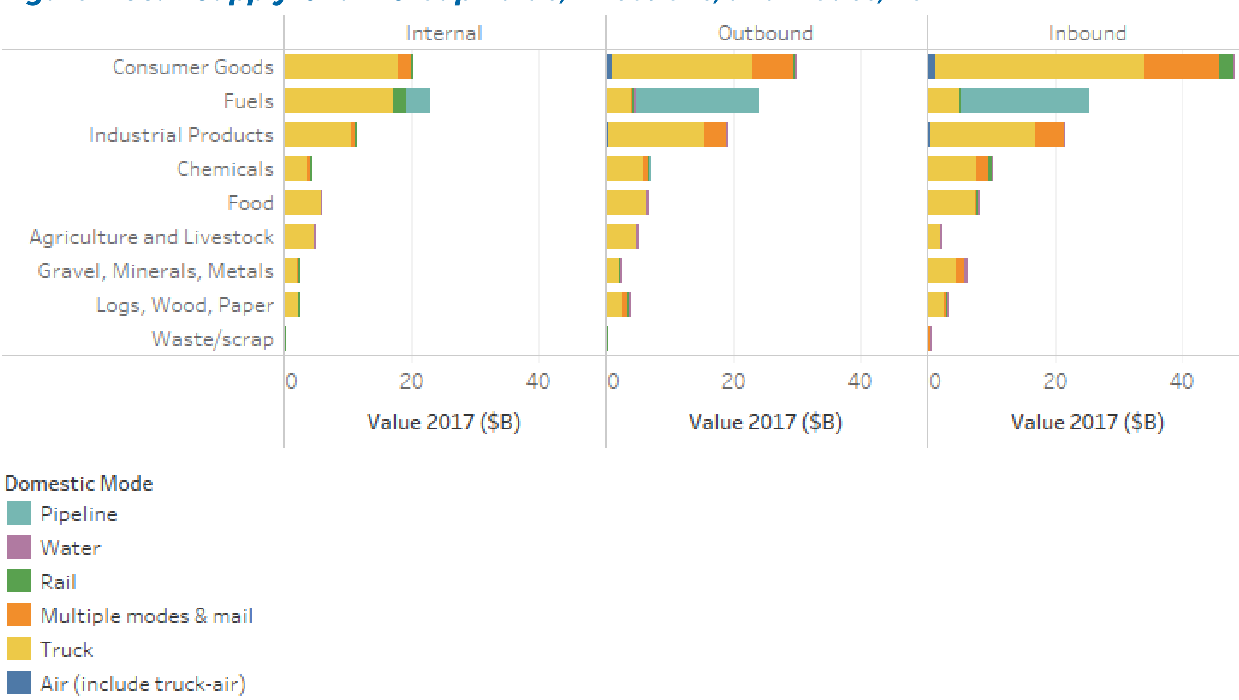
Understanding and accommodating the performance requirements – reliability, speed, cost, safety, connectivity, resiliency, etc. – of these key supply chains is essential to the health and growth of the state's economy and the needs of its residents.

Figure 2-32. Supply-Chain Group Tons, Directions, and Modes, 2017



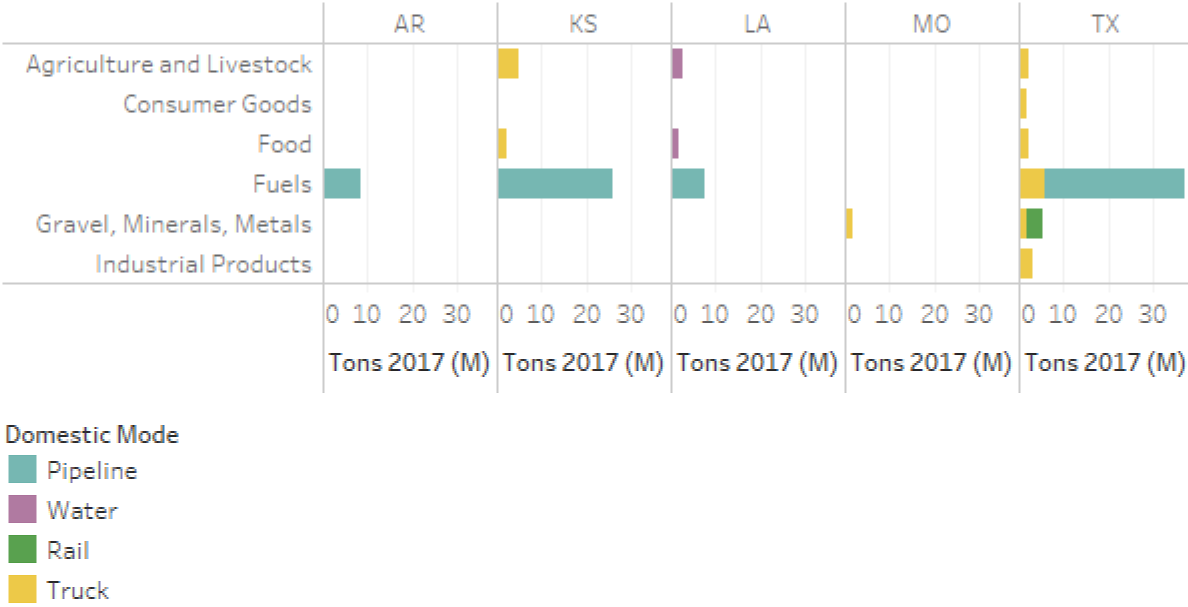
Source: Freight Analysis Framework 5.3

Figure 2-33. Supply-Chain Group Value, Directions, and Modes, 2017



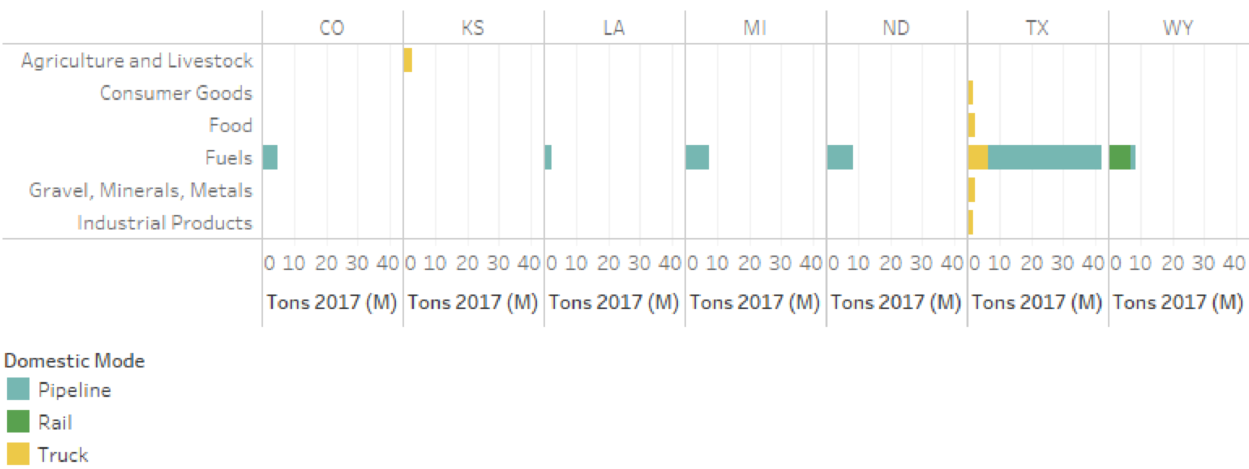
Source: Freight Analysis Framework 5.3

Figure 2-34. Leading Outbound Tonnage Moves by Supply-Chain Group, Mode, and Destination State, 2017



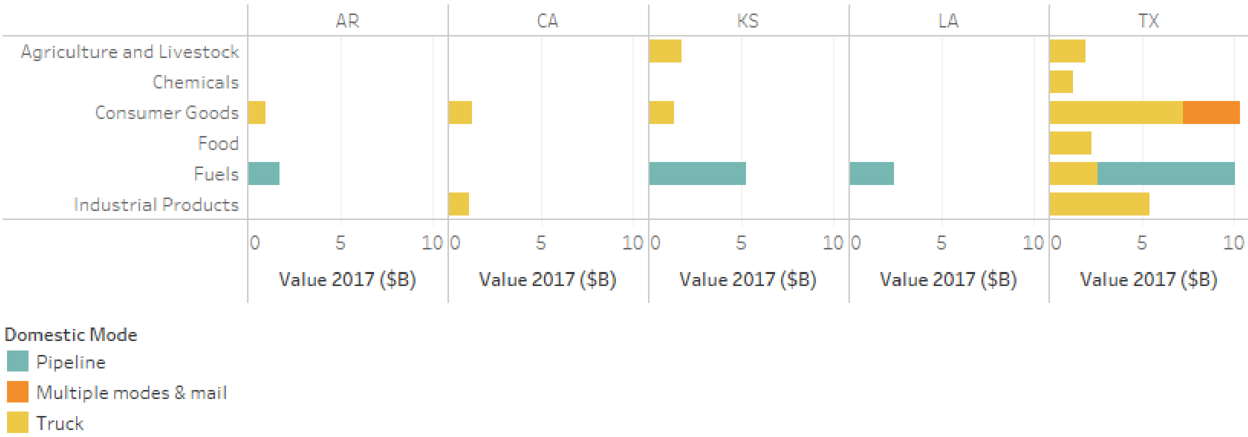
Source: Freight Analysis Framework 5.3

Figure 2-35. Leading Inbound Tonnage Moves by Supply-Chain Group, Mode, and Origin State, 2017



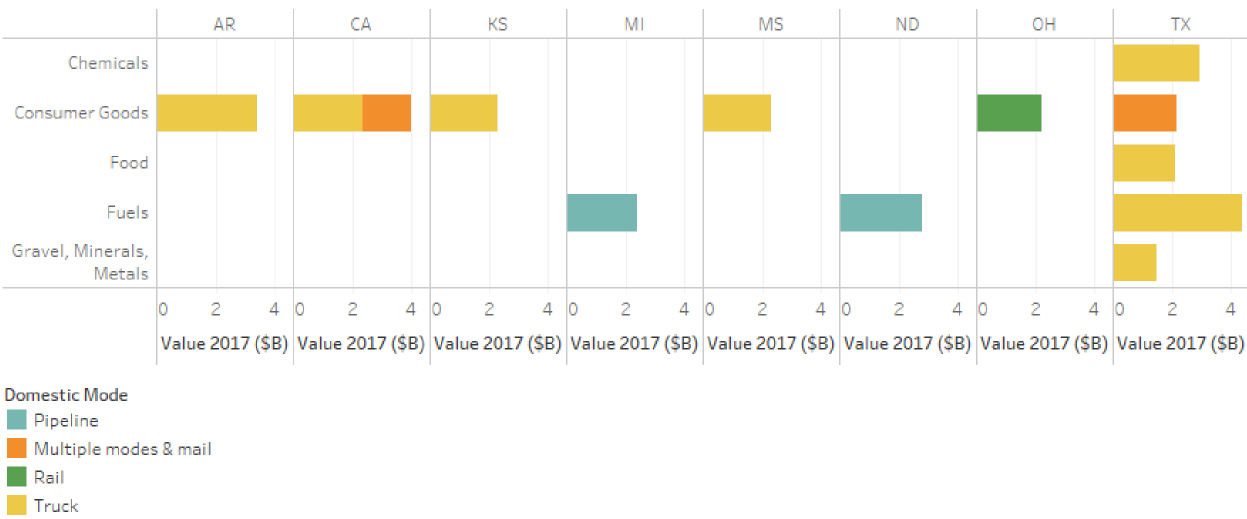
Source: Freight Analysis Framework 5.3

Figure 2-36. Leading Outbound Value Moves by Supply-Chain Group, Mode, and Destination State, 2017



Source: Freight Analysis Framework 5.3

Figure 2-37. Leading Inbound Value Moves by Supply-Chain Group, Mode, and Origin State, 2017



Source: Freight Analysis Framework 5.3

2.9.5 Financial Challenges

Freight transportation requires smooth pavement, structurally sound bridges, and ongoing railroad and waterway infrastructure improvements to deliver products safely and efficiently. Highways need to be maintained and interchanges need to be reconstructed. Growth needs to be accommodated without deterioration in freight service performance. Freight-rail systems require track repair and bridge rehabilitation, and rail-highway crossings must be safe. The MKARNS needs to address deferred maintenance on its locks and dams.

Revenue to address these needs has increased for state fiscal year 2023. The budget for state fiscal year 2023 is $2.2 billion, and the highway program is $2.0B or 88 percent of the budget The Highway program revenue is comprised of:

- Federal — $897 million, or 45 percent
- State Motor Fuel Taxes — $ 363 million, or 18 percent
- Other — $748 million, or 37 percent, from a combination of Motor Vehicle Collections, Income Taxes, TIFIA loans, anticipated Bond issuance and deposits for third-party match.

However, financial challenges for ODOT are increasing as it seeks to maintain and improve the state transportation system. The infrastructure plan is currently being impacted by increased cost of materials, supply-chain disruptions, and an increasingly tight labor market. Price hikes are anticipated to diminish the value of the increases to the infrastructure plan.

With vehicle fuel efficiency increasing, and accelerating demands on the system, Oklahomans must address transportation funding issues. Oklahoma's 2020 through 2045 LRTP shows that the expected funding gap averages $284 million per year over 25 years, if current trends continue.[10] Needs exceed expected available revenues by nearly 20 percent annually. Clearly a major component of addressing Oklahoma's freight needs is the challenge of finding additional funding.

[10] https://static1.squarespace.com/static/5cd1d280f9df7d00015c6297/t/5f5bbbb6785a5f69c44e3d04/1599847366823/Oklahoma+2045+LRTP+Final+August+2020.pdf

3 Outreach

Outreach to industry stakeholders and to the public has played a significant role in developing this OFTP. Multiple channels were used to gather information. Each method was important for gathering information from different perspectives and supporting the research and informing this Plan.

[We] need to have [a] conversation with [an] eye to the future [in the face of] increased demand for goods, more trucks, more congestion, and more risk of safety concerns.
-Jim Newport, Oklahoma Trucking Association

3.1 WEBSITE

A website was created to facilitate outreach and gather input from stakeholders and the public (https://okstatefreight.transportationplanroom.com/). The website provided background information on the Plan Update, a fact sheet, a timeline for the OFTP update, a section on the goals of the plan update, a public survey, a truck driver survey, an interactive map, a section on the FAC, and a general comment form. Included in the project website was a fact sheet, shown in Figure 3-1, which provides a general project overview, an Interim National Multimodal Freight Network (NMFN) Map, the project purpose, and information on population growth in Oklahoma. Also included on the website was a project timeline, shown in Figure 3-2, which displayed anticipated project milestone dates. Updates were made to the website as the plan progressed and information became available.

The website was the primary tool for disseminating information about the OFTP update and for gathering public input. The website address was provided to the FAC members who were encouraged to distribute it to their freight partners. ODOT also published the website on its social media accounts, encouraging the public to visit the site and leave feedback. No in-person public meetings were held.

Figure 3-1. Fact Sheet Provided in Outreach Website

OKLAHOMA Transportation

Oklahoma Freight Transportation Plan Update 2023-2030

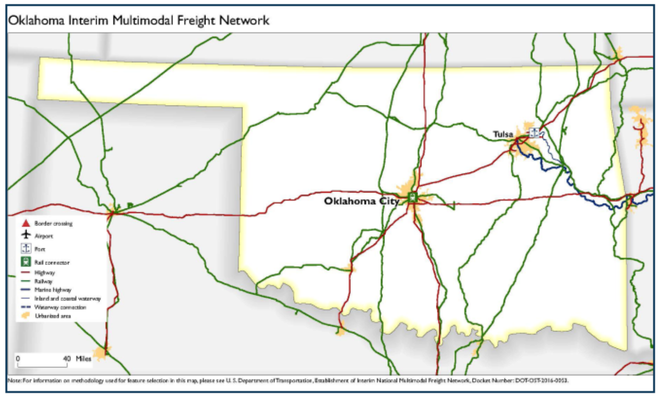
Project Fact Sheet

The Oklahoma Department of Transportation (ODOT) is proposing to update the 2018-2022 Oklahoma Freight Transportation Plan (OFTP). The existing OFTP was developed in 2017 and described freight trends, needs, and issues across the state of Oklahoma. The OFTP identified critical rural and urban freight corridors, and included policies, strategies, and performance measures to guide investment.

The 2023-2030 OFTP will include updated information on statewide population growth, economic trends, and infrastructure needs as they relate to freight. New sources of data will be employed and will inform the analysis of freight trends.

This plan will engage three main groups:

- The Freight Advisory Committee (FAC)
- Key private-sector freight stakeholders
- The general public



PROJECT PURPOSE

The purpose of the project is to reassess Oklahoma's freight needs and identify any necessary changes to the 2018-2022 Oklahoma Freight Transportation Plan.

ODOT's mission is to provide a safe, economical, and effective transportation network for the people, commerce, and communities of Oklahoma.

POPULATION GROWTH

Oklahoma's population in 2019 was 3.96 million[1] and is expected to

EXCEED

4.7 million residents in 2045[2]

Source: [1] 2019 ACS 1-year estimates, U.S. Census Bureau
[2] Oklahoma Long Range Transportation Plan 2020-2045

Population growth is expected to be strong in Oklahoma City and Tulsa, the state's two large metro areas.

Oklahoma Freight Transportation Plan Update 2023-2030

Figure 3-2 below displays the project timeline featured on the project website.

Figure 3-2. Project Timeline Featured in Outreach Website

3.2 SURVEYS

The website provided access to two surveys developed for this OFTP. The survey results helped to gauge interest in different modes of freight transportation. A general survey was developed for the public that asked high-level questions about freight priorities statewide. This survey consisted of six questions related to challenges facing Oklahoma's freight system, mode importance, freight bottlenecks, and rural vs. urban freight issues. Forty-three (43) responses were received. The Public Survey Summary technical report will be available on the Plan website http://www.odot.org/2023-2030FreightPlan.

A separate industry-focused survey was developed to evaluate truck parking supply and demand. This survey was conducted using the MetroQuest platform to collect feedback on truck parking issues and recommendations to address current and future truck parking needs. Ninety-eight (98) responses to the truck parking survey were received. The Truck Parking Survey Summary technical report will be available on the Plan website http://www.odot.org/2023-2030FreightPlan. Figure 3-3 below shows the Truck Parking Survey incorporated for public comment on the website.

Figure 3-3. Truck Parking Survey Included in the Outreach Website

3.3 FREIGHT ADVISORY COMMITTEE

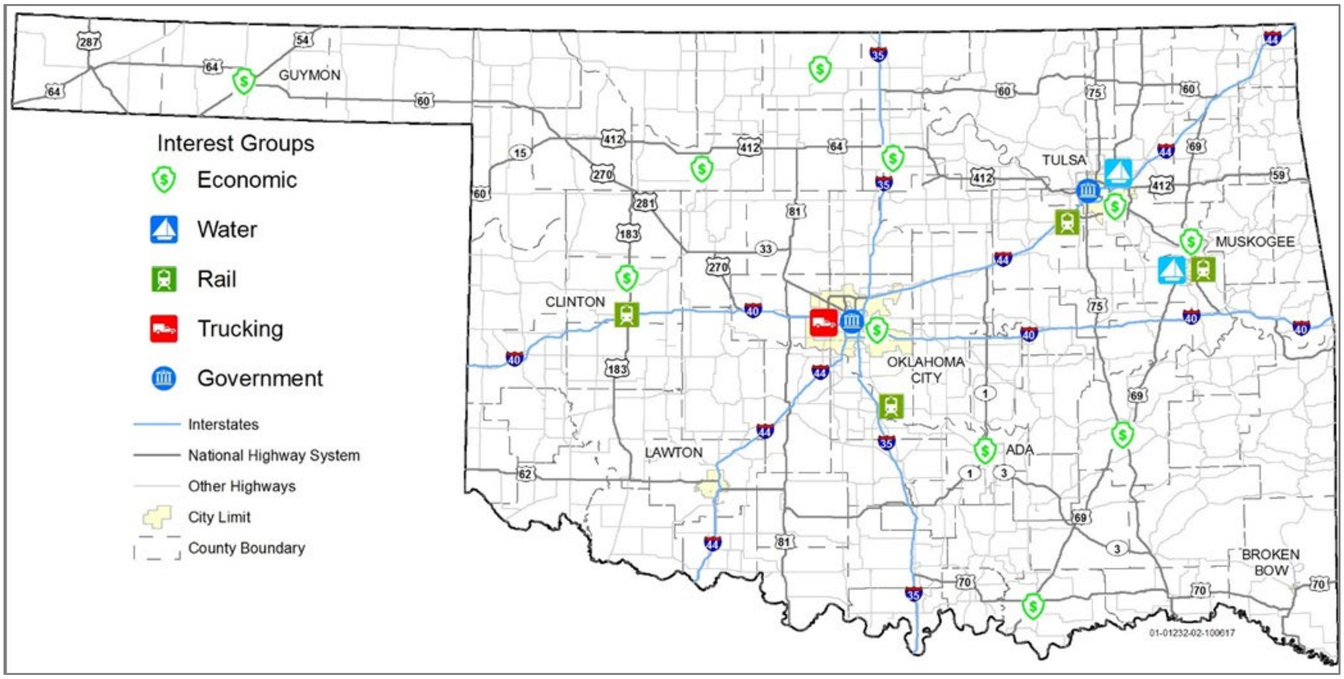
The FAC from the 2018-2022 Freight Plan was reconvened to assist with the 2023-2030 Plan Update. ODOT updated the membership of the FAC to reflect current staff and several new members to better represent e-commerce interests. The FAC was created to assist in the OFTP process by helping to prioritize goals and identify concerns around particular operational issues such as bottlenecks. The FAC was important to sharing information related to industry, regulatory, and public trends and priorities; identifying issues and concerns; and providing input on proposed strategies and projects.

Members of the FAC included representatives from industries critical to the state's economy, representatives of transportation service providers, and multimodal facilities such as ports shown in Table 3-1. Safety enforcement, planning organizations, tribal governments, and other state and federal agencies were also included. Two FAC meetings were held, one in June 2022 and one in October 2022.

Table 3-1. Freight Advisory Committee Members

Entity Name	Representative
Association of Central OK Governments	John Sharp
BNSF Railway	Paul Cristina
Chesapeake Energy Corporation	Jake Kimery
Chickasaw Nation	Bo Ellis
Chickasaw Nation	Brad Williams
Farmrail Corporation	Judy Petry
FHWA - OK - Planning	Isaac Akem
FHWA - OK - Safety	Huy Nguyen
Indian Nations Council of Governments	Viplav Putta
ODOT Tribal Liaison	Rhonda Fair
ODOT Asset & Performance Management	Matthew Swift
ODOT Legal	Mitch Surrett
ODOT Rail	Jared Schwennessen
ODOT Traffic Engineering	Lauren Parrish
ODOT Bridge	Justin Hernandez
Arkansas Waterways Commission	Cassandra Caldwell
ODOT Waterways	Thaddaeus Babb
US Army Corps of Engineers, Tulsa District	Rodney Beard
US Army Corps of Engineers, Tulsa District	Kenneth Todd
Oklahoma City Chamber of Commerce	Derek Sparks
Oklahoma Corporation Commission	Mark Willingham
Oklahoma Department of Agriculture	Jan Lee Rowlett
Oklahoma Department of Agriculture	Blayne Arthur
Oklahoma Department of Commerce	Jon Chiappe
Oklahoma Highway Patrol, CMV	Lt. Kirby Logan
Oklahoma Highway Patrol, CMV	Lt. Ron Jenkins
Oklahoma Highway Patrol, CMV	Lt. Preston Lay
DPS, Over Size Over Weight Permitting	Carolyn Owings
Oklahoma Railroad Association	Lori Peterson
Oklahoma Trucking Association	Jim Newport
Oklahoma Turnpike Authority	Joe Echelle
Tulsa Ports (Port of Catoosa, Port of Inola)	David Yarbrough
Tulsa Ports (Port of Catoosa, Port of Inola)	Daniel Grisham
Port of Muskogee	Kimbra Scott
Port 33 (Oakley's)	Josh Taylor
US Army Corps of Engineers	Shane Charlson
Tinker Air Force Base	Stephanie Wilson
Tulsa International Airport	Mike Kerr

Figure 3-4. Headquarters of Major Business Locations of Freight Advisory Committee Members



3.4 INTERVIEWS

Telephone interviews were completed with freight industry professionals. The interviews were used to learn about freight issues from the perspective of industry stakeholders. Participating companies were grouped into two categories: logistics service providers and shippers. The logistics service providers represented three types of service: ports and industrial park, bulk trucking, and heavy haul trucking. Two military establishments were also included. The selection of candidates was designed to provide a distribution across commodity groups, transportation modes, and geographic urban and rural locations. The Interview Summary Report will be is available on the Plan website http://www.odot.org/2023-2030FreightPlan.

Participants outlined their operations, facilities, locations, geographic reach, markets, and types of goods transported. They discussed their use of multiple modes of transportation if applicable to their activity. Their specific performance goals and metrics were discussed, as well as what constraints are placed on this performance by the state of the transportation system and other conditions. Interviews also covered e-commerce, technology, trends and risks, and recommendations. Together these interviews provided a day-to-day outlook on Oklahoma's freight transportation system from the perspective of major users.

3.5 PUBLIC MEETINGS

While no in-person public meetings were held, the project website provided information on various topics related to the Plan update and offered several opportunities for the public to provide input. The draft OFTP Update document was also made available to the public for a two-week review prior to final ODOT and FHWA approval.

3.6 COORDINATION WITH OTHER STATES

Oklahoma is bordered by Kansas, Missouri, and Colorado to the north, Arkansas to the east, New Mexico to the west, and Texas to both the south and west. ODOT regularly communicates with the neighboring state departments of transportation and Arkansas Waterways Commission under the Arkansas Department of Commerce. The topics of interest across state lines concerned areas where water, rail, or highway freight corridors affected multiple states and where the states share the economic impact of freight transport.

4 The Freight Future

Freight transportation is strongly interconnected to changes and trends in the economy and goods movement patterns. Given this interconnection, freight transportation is continually evolving. This chapter describes the future trends that are likely to affect freight transportation in Oklahoma.

4.1 ENERGY TRENDS

Oklahoma is a major energy producing state, which has important implications for national and international freight movements. Oklahoma's energy production profile includes crude oil, refined petroleum products, natural gas, and wind. In 2021, the state ranked sixth in the nation for crude oil production and third in the amount of electricity generated from wind.[11]

4.1.1 Oil and Natural Gas

Oklahoma has leveraged its location and history of oil production to become a hub of oil movement and pricing in the U.S. Tank facilities—housing up to 15 percent of U.S. oil storage capacity, located in the town of Cushing and connected to a system of pipelines crisscrossing the country—primarily influence the movement of oil throughout Oklahoma. Cushing serves as the basis for the pricing of U.S. sweet crude oil and is integral to both the physical movement of oil and the movement of the oil commodity market. Oil comes by way of two key sources:

- Oil extracted locally in Oklahoma—comprising about 4 percent of the nation's oil reserves as well as 4 percent of U.S. annual oil production, totaling 143 million barrels in 2021
- Oil from the outside the state, including from the Bakken Formation (the Bakken) in North Dakota as well as Canada

Figure 4-1. Pipeline Landmark in Cushing, OK

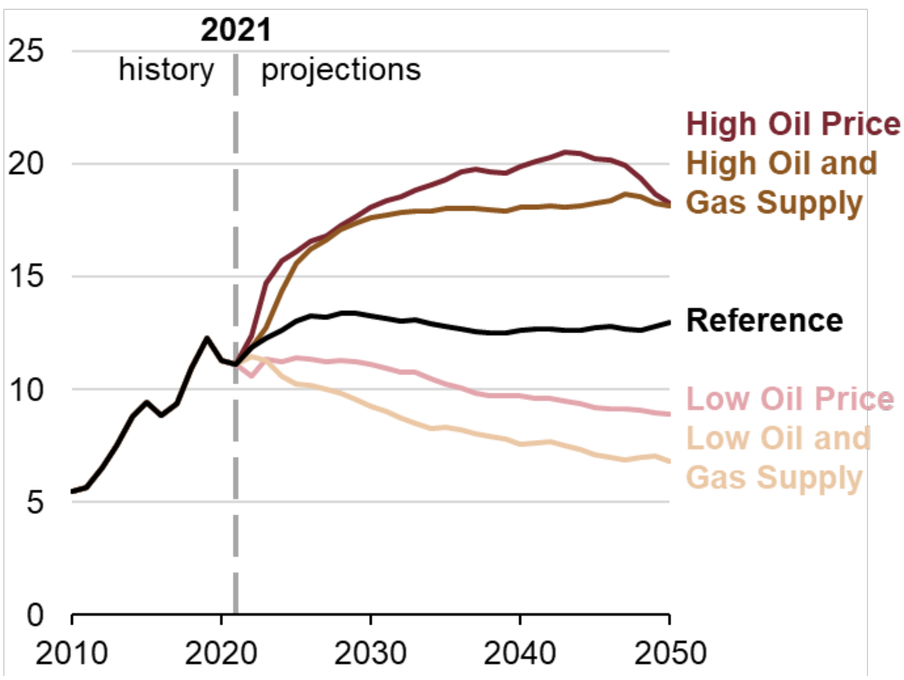
Source: StateImpact Oklahoma, 2022

[11] U.S. Energy Information Administration, Oklahoma State Energy Profile and Energy Estimates, 2021.

Oil and natural gas are crucial commodities to world energy usage, and trends affecting their extraction, storage, usage, and future are tied to international economic, social, and political factors that often change daily. At a high level, residual effects of the COVID-19 pandemic are likely to continue to affect energy commodities. In its 2021 energy forecast, the U.S. Energy Information Administration (EIA) notes that increasing demand for oil and gas for industrial uses and for export has incentivized production following a dip in demand during the early months of the COVID-19 pandemic. The EIA also forecasts that production will reach pre-pandemic levels by 2023 before stabilizing through 2050 (Figure 4-2). Figure 4-2 also illustrates U.S. oil production under differing price and supply scenarios, including a “Reference” (base) scenario. The Annual Energy Outlook Reference case includes the following assumptions:

- Petroleum and natural gas will remain the most-consumed sources of energy in the U.S. through 2050, but renewable energy will be the fastest growing.
- Wind and solar incentives, along with falling technology costs, will support robust competition with natural gas for electricity generation, while the shares of coal and nuclear power will decrease in the U.S. electricity mix.
- U.S. crude oil production will reach record highs, while natural gas exports will increasingly drive natural gas production.

Figure 4-2. U.S. Crude Oil Production under Five Scenarios (million barrels per day)

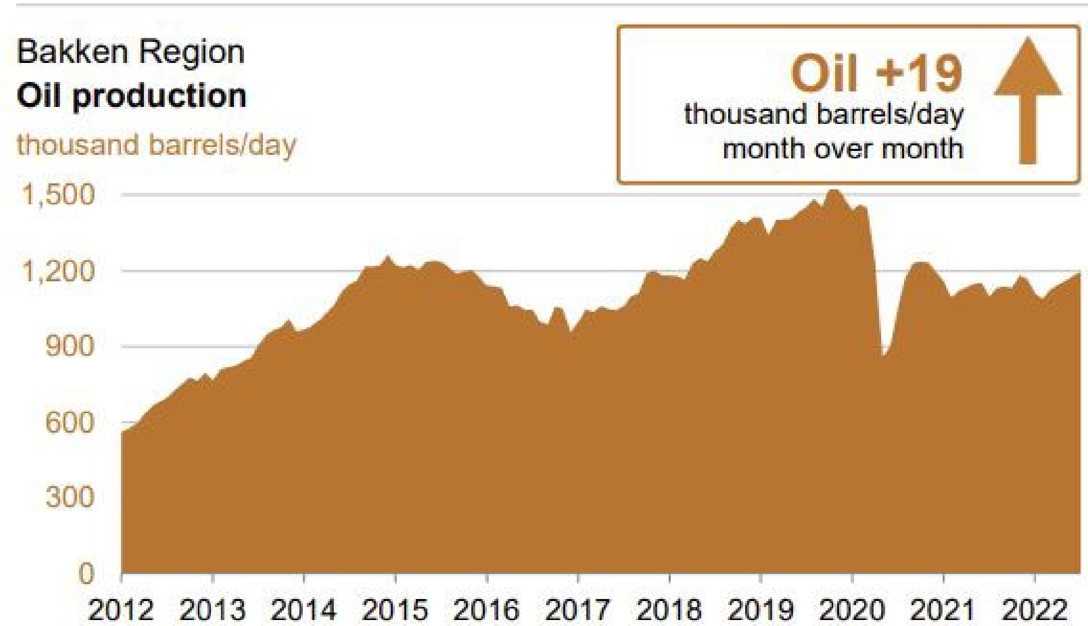


Source: U.S. Energy Information Administration, Annual Energy Outlook, 2022

Note that the EIA’s forecast was conducted prior to the start of the Russian invasion of Ukraine. International sanctions on Russian oil have affected global oil prices and movements, and the long-term impacts of these changes remain to be seen.

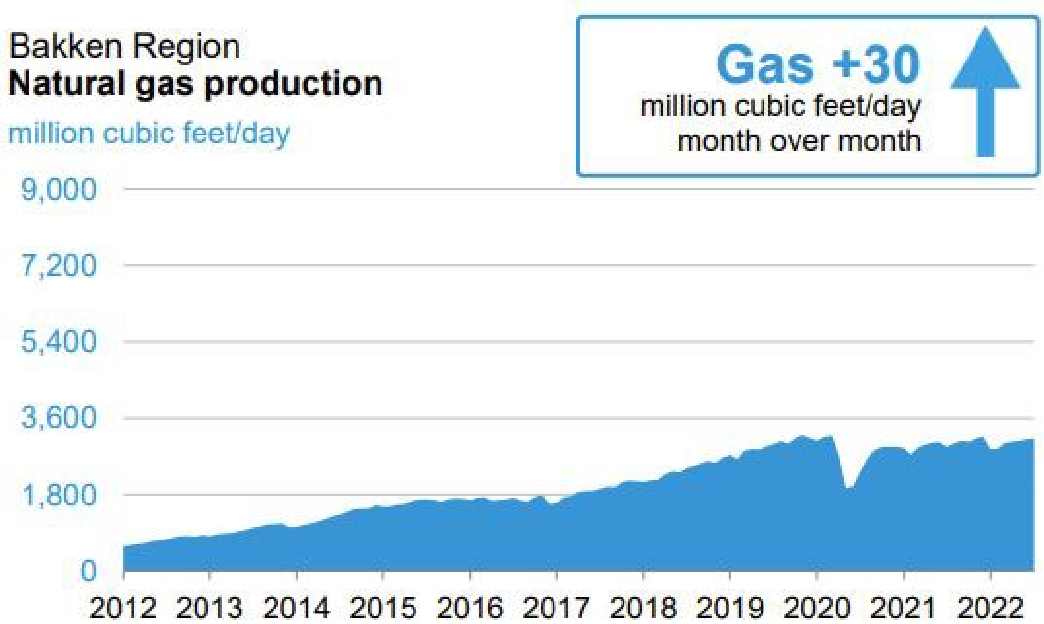
Oil and gas production originating from the Bakken Formation influences the amount of those commodities that flow into Oklahoma for storage and shipment to additional markets, including for international export through the Gulf of Mexico. While both oil and gas production dropped sharply in early 2020, production has generally followed the EIA's estimate of recovering to pre-COVID-19 pandemic levels (Figure 4-3 and Figure 4-4).

Figure 4-3. Historic Oil Production in the Bakken Region



Source: U.S. EIA Drilling Productivity Report, June 2022

Figure 4-4. Historic Natural Gas Production in the Bakken Region



Source: U.S. EIA Drilling Productivity Report, June 2022

Since 2013, pipeline capacity serving the Bakken Region has increased. Pipeline and refinery projects are planned that would more than double refining and pipeline takeaway capacity in the region. For the most part, rail transportation will be limited to shipping to markets not accessible by pipeline, particularly the East and West Coasts' refineries and ports. Consequently, crude oil moving by rail into Oklahoma from the Bakken Region is not expected to reach levels seen in past years.

Anadarko Basin: Oil and Gas

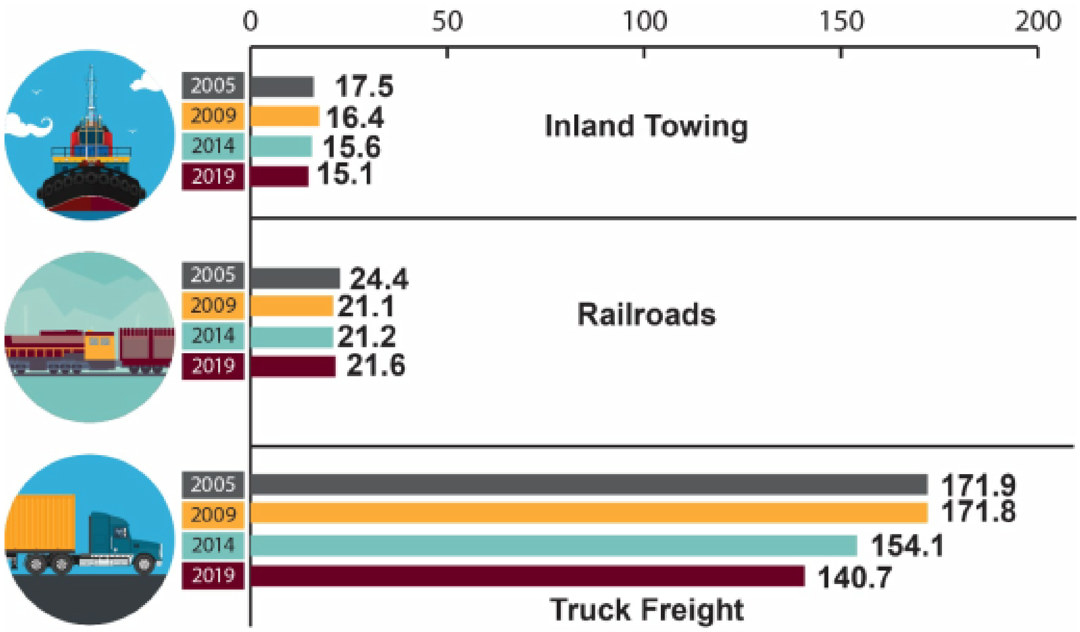
The Anadarko Basin located in the western part of the state is a major source of natural gas, and to a lesser extent, crude oil. While oil production is significantly diminished, natural gas production has increased and is expected to continue to grow. In 2021, Oklahoma was the nation's fifth-largest producer of natural gas, most of which flowed out of the state via pipeline. Although natural gas is shipped by pipeline, the sand, water, gravel, and heavy equipment that is required in the extraction process is moved primarily by rail and truck.

4.1.2 Environmental Issues and Clean Fuels

While Oklahoma maintains a favorable federal air quality standard, there remains a sharp focus on upholding this status. Transportation remains the largest source of greenhouse gas (GHG) emissions in the U.S., and the increasing number of vehicles on the transportation system presents opportunities to find innovative ways of sustaining environmental integrity in Oklahoma.

Oklahoma is poised to support industries producing clean energy and using clean energy technology as a means of meeting federally mandated air quality standards. Oklahoma continues to improve alternative fuel corridors, providing clean energy options to motorists—including charging stations and compressed natural gas stations on federally designated alternative fuel corridors. Other opportunities to improve sustainability of freight and reduce impacts on the environment lie with increasing utilization of rail and waterway services to transport goods due to their large carrying capacity and lower shipping costs. Both rail and inland maritime freight transport modes contribute far fewer emissions per million ton-miles of cargo moved than trucks, as they can move many more tons per trip than a tractor trailer and have better fuel efficiency. Figure 4-5, from the Texas Transportation Institute, illustrates the GHG emissions per ton-mile of freight moved by mode. Trucking contributed 140.7 metric tons of GHG emissions per million ton-miles in 2019, while inland towing contributed only 15.1 metric tons of GHG emissions in the same year.

Figure 4-5. Metric Tons of Greenhouse Gas per Million Ton-Miles (2005, 2009, 2014, and 2019)



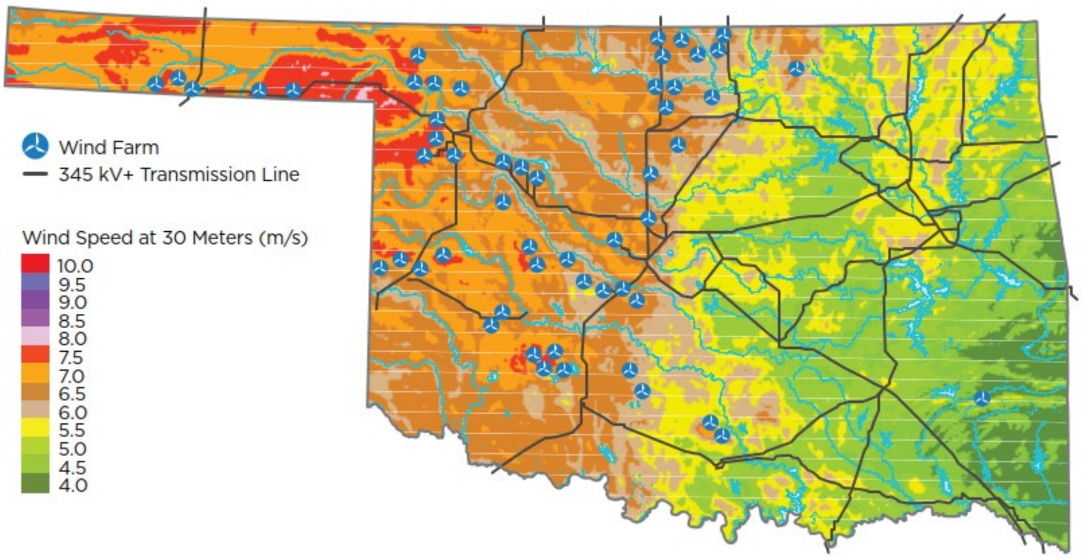
Source: Texas Transportation Institute, 'A Modal Comparison of Domestic Freight Transportation Effects on the General Public: 2001-2019," January 2022.

4.1.3 Wind Energy

According to the EIA, in 2021 Oklahoma ranked third in the nation in net electricity generation from wind, which provided over 41 percent of the state's electricity. Oklahoma's wind turbines account for 9 percent of the nation's total wind power generation, and new generation continues apace, as the 998-megawatt Traverse Wind Project came online in early 2022. Figure 4-6 shows the locations of wind farms and transmission lines within the state, highlighting Oklahoma's concerted effort to expand this sector.).

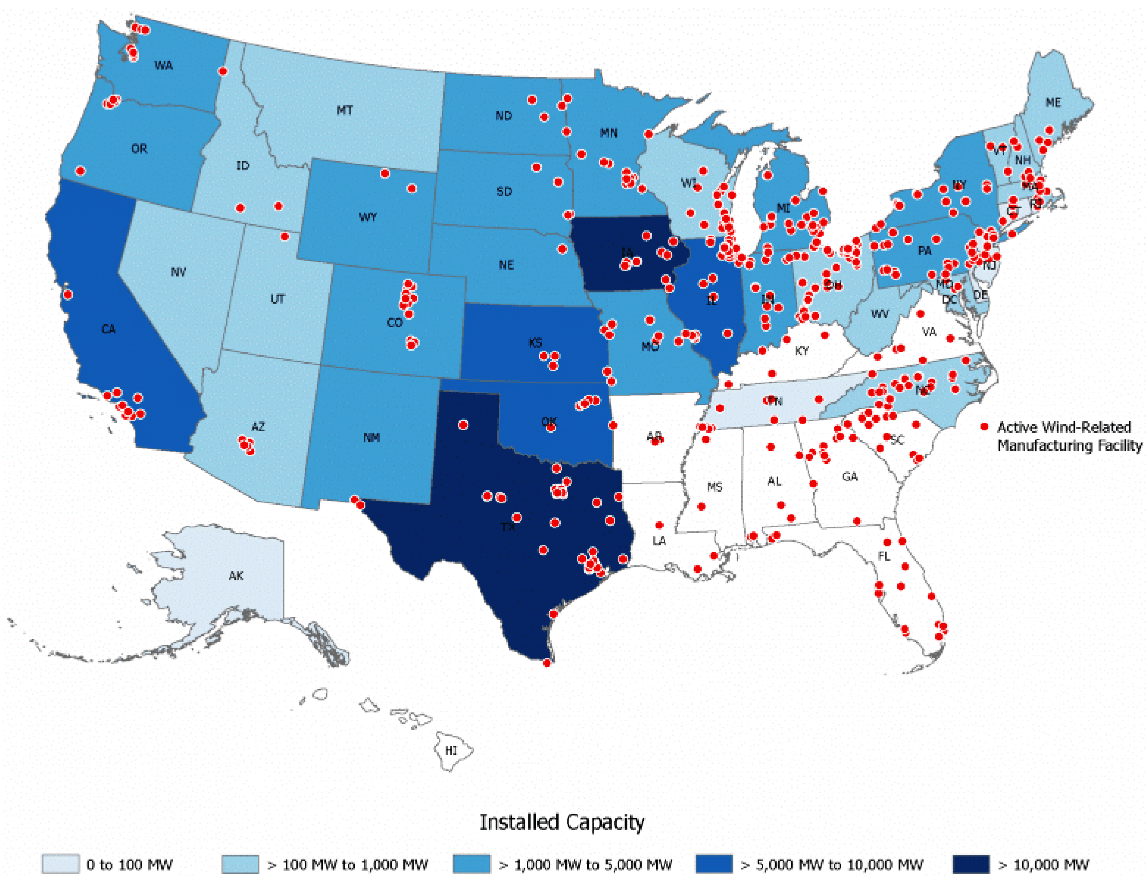
Wind farms generate significant freight movements during their construction, when many components, both large and small, are being brought in by truck, rail, or in some cases, ships. Wind farms are less freight intensive once operational. According to the U.S. Department of Energy, "the average utility-scale wind turbine contains roughly 8,000 parts, including blades averaging 116 feet in length and towers averaging around 80 meters (262 feet) high, roughly the height of the Statue of Liberty." These parts run from the very small, such as specialty parts used in the mechanics of the turbines, to the very large, i.e., blades and bases. The large pieces require special transport, often via rail. Oklahoma is home to about half a dozen wind turbine manufacturing outfits, with most of the nation's turbine manufacturing capacity located east of the Mississippi (Figure 4-7). Turbine manufacturing generates ongoing freight and care should be taken to ensure rail connections where needed and strength of roads and bridges for the shipment of larger components.

Figure 4-6. Traverse Wind Farm



Source: Oklahoma Commerce, 2022

Figure 4-7. Turbine Manufacturing Capacity



Source: Office of Energy Efficiency & Renewable Energy, 2022 https://www.energy.gov/eere/wind/wind-manufacturing-and-supply-chain

4.1.4 Implications of Energy and Environmental Trends

Oklahoma has long been a leader in the energy sector and will continue to maintain that status. In addition to raw materials extraction, core components of Oklahoma's energy system include the manufacturing of natural gas products and its related machinery and distribution systems. The state is also proud of its ability to meet air quality standards, leveraged in part by proactive efforts in developing wind energy.

Energy freight movements are sensitive to national and global market forces; therefore, Oklahoma's freight transportation will need to position itself to be responsive to changes in the international scene. Oklahoma's rail, truck, and waterway systems provide ways to respond to the changing demand for this commodity. The volatile energy market poses a unique challenge to the transportation system due to the high volume of heavy loaded vehicles traveling through rural communities that are not equipped to handle the size and scale of these shipments.

4.2 DEMOGRAPHIC TRENDS

4.2.1 Population

Oklahoma is the 28th most populated state. July 2021 Census estimates the population of Oklahoma has grown to 4.0 million since April 2020, which represents a 0.7 percent increase, exceeding the national growth rate of 0.1 percent for the same period.

The state's population is anticipated to exceed 4.4 million people by 2040—a 10.9 percent increase over 2020—reflecting a tapering of growth from prior years. Growth is expected to be centered in the existing metropolitan areas.

4.2.2 Employment

As of May 2022, Oklahoma's unemployment rate is at its lowest in nearly 50 years (2.8 percent), which is nearly a percentage point below the national average of 3.6 percent. This indicates a strong labor market in Oklahoma with positive economic recovery efforts post-COVID-19 pandemic. Looking ahead, unemployment rates in the state are expected to be around 2.3 percent through 2023, as compared to U.S. forecast rates of 3.6 percent, suggesting continued growth of Oklahoma's labor market.

Industry employment projections are developed by the Oklahoma Employment Security Commission. Table 4-1 illustrates the importance of freight-related industry employment to Oklahoma. Roughly 53 percent of the state's employment depends on freight transportation. Table 4-1 highlights fourth-quarter 2021 employment across all sectors, totaling nearly 1.6 million employees. Freight-dependent industries—including Manufacturing, Goods Producing, and Trade, Transportation, and Utilities—employ a significant portion of the state's labor force, accounting for nearly 45 percent of total state employment. The increase in Oklahoma's labor force mirrors recent increases seen at the national level, which will likely influence an increase in freight-sector jobs as the economy continues to see growth in the period following the COVID-19 pandemic.

Table 4-1. Oklahoma Economic Sector Employment (Fourth Quarter, 2021)

Sector	Average Employment
Other Services	**410,777**
Government	**325,378**
Trade, Transportation, and Utilities*	**321,877**
Retail Trade	187,320
Transportation and Warehousing	69,962
Wholesale Trade	54,984
Utilities	9,610
Goods Producing	**245,621**
Manufacturing	**129,828**
Construction	**77,768**
Natural Resources and Mining	**38,025**
Agriculture, Forestry, Fishing, and Hunting	**10,065**
TOTAL	**1,559,339**

Source: Oklahoma Employment Security Commission and the U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), 2022. https://www.bls.gov/eag/eag.ok.htm
* Note that the Trade, Transportation, and Utilities sector includes Retail Trade, Transportation and Warehousing, Wholesale. Trade, and Utilities

4.2.3 Implications of Demographic Trends

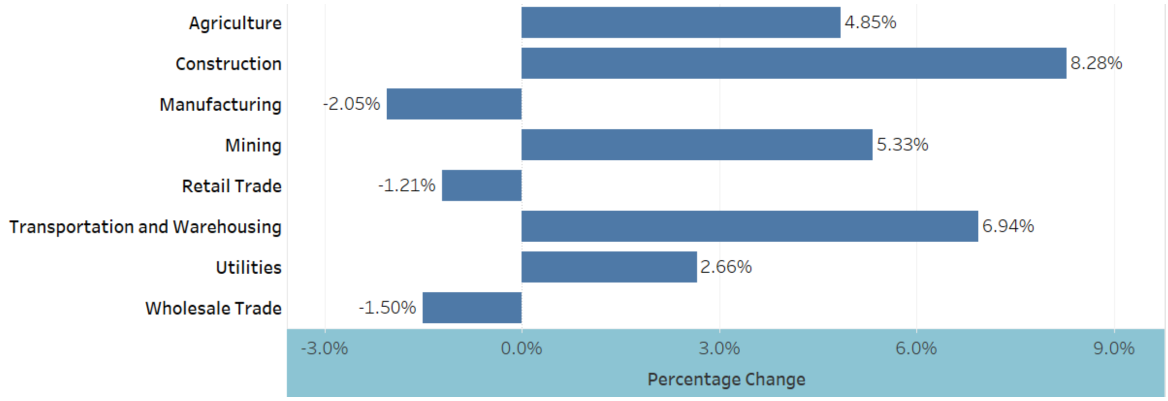
Oklahoma, like many other Midwestern and South Central states, is expecting modest growth in population and employment over the next decade. With growth concentrated in urban areas, freight flows, congestion, and conflicts are likely to increase. The expected future increase in population concentration in Oklahoma City and Tulsa will have a twofold impact on freight transportation in the state:

- The two major population centers will experience an increase in demand for goods, intensifying truck movements in the metropolitan areas due to increasing e-commerce purchases and shift toward increased urban warehousing and last-mile delivery strategies.
- Increased inbound truck activity combined with a growth in personal auto travel associated with the increase in population will contribute to additional congestion on the Oklahoma City and Tulsa road networks. Adding further to the congestion will be increased traffic passing through the two metropolitan areas.

As rural populations are more dispersed, other issues related to efficient freight transport will need to be addressed. In rural areas, increased home delivery and consolidation of commercial rail and intermodal services present challenges as further described later in this chapter.

Figure 4-8 shows the projected change in employment for Oklahoma freight-related industries between 2018 and 2028.

Figure 4-8. Projected Employment Growth (2018 through 2028)



Source: Oklahoma Employment Security Commission, August 2020. https://www.ok.gov/oesc_web/Services/Find_Labor_Market_Statistics/Projections/

During this time period, construction and transportation and warehousing are expected to demonstrate the greatest employment growth. Air transportation is expected to increase nearly 18 percent, while warehousing and storage is expected to increase by roughly 15 percent, highlighting a continued shift in delivery strategies to account for heightened delivery volumes seen across the state as e-commerce sales continue to increase post-COVID-19 pandemic. As delivery strategies move toward a last-mile approach, warehousing and storage in both urban and rural areas have influenced a sizable increase in employment needs.

The manufacturing as well as retail and wholesale trade sectors are expected to have a decrease in employment. The decrease in manufacturing is expected to be driven largely by a reduction in apparel manufacturing as well as textile/textile product mills and printing manufacturing decline. A decrease in computer and electronics manufacturing will also add to the decline, likely for the foreseeable future as supply-chain issues fueled by the COVID-19 pandemic and geopolitical tensions have reduced availability of global superconductors, requiring domestic production to meet rising needs across multiple sectors. The decrease in retail-trade employment is expected to stem largely from a decline in employment at electronics and appliance stores, likely influenced by the semiconductor shortage that is reducing the supply of electronics globally. The decline in wholesale trade will be influenced by a decrease in both durable and nondurable goods.

4.3 ECONOMY AND TRADE

4.3.1 Economic Growth

Measured by annual real gross domestic product (GDP), U.S. economic growth declined sharply in 2020 due to the COVID-19 pandemic. In 2020, annual GDP fell 3.4 percent, following annual growth of 2.2 percent in 2019. A rebound in economic activity and job growth followed the pandemic's peak in 2021 as cases declined and vaccine rollout became widespread. GDP increased 5.7 percent, the fastest growth seen since 1984.[12] As the economy shrunk in 2020 due to the impacts of the pandemic, so did freight traffic as the U.S. saw a decrease in both rail carload and intermodal volumes. Rail carloads had already been in decline between 2018 and 2019 (even with positive growth in GDP), falling 4.9 percent annually. In 2020, rail carloads decreased sharply by 12.9 percent, while intermodal containers and trailers fell by 1.8 percent.[13] By the end of 2020, higher grain and intermodal shipments, as well as reopening of auto assembly plants, influenced near pre-pandemic level rail volumes. In 2021, freight-rail traffic increased 5.7 percent, as grain saw its strongest year for freight-rail volumes since 2008, and coal carloads increased sizably due to significantly higher natural gas prices.[14]

Oklahoma's GDP began to slowly increase between 2017 and 2019, increasing 3.9 percent before the COVID-19 pandemic. In 2020, those gains were lost as gross state product fell 4.9 percent. While Oklahoma's GDP recovered by 2.7 percent in 2021, it did not reach pre-pandemic levels. Oklahoma experienced challenges with economic growth due to weakness in the state's energy sector leading into early 2020.[15] The U.S. GDP recovered to pre-pandemic levels by the second quarter of 2021 while Oklahoma's had not. While Oklahoma's labor market did not fall as steeply as the U.S. labor market during the height of the pandemic, Oklahoma's rebound was less pronounced, with fewer total nonfarm jobs by the end of 2021 than prior to the pandemic. Freight-related activity within the state shows truck vehicle-miles traveled (VMT) decreased 12.7 percent between 2019 and 2020, following pandemic-related declines in both U.S. and state GDP. Preliminary truck VMT data for 2021 signals considerable recovery (10.4 percent), within the state associated with increased economic activity and recovery from the COVID-19 pandemic.[16]

As captured by the Bureau of Economic Analysis, Oklahoma GDP growth in 2021 occurred across freight-dependent industries such as mining (including oil and gas), construction, manufacturing, retail trade, transportation and warehousing, and transportation and utilities. Construction saw its GDP share in the state increase by 1.8 percent above pre-pandemic levels, while nondurable goods manufacturing saw a 6.7 percent increase. Transportation and warehousing saw a 4.6 percent increase above pre-pandemic levels, while wholesale trade saw a near 1.5 percent increase. Retail trade saw the steepest increase in state GDP, increasing 21.7 percent above 2019 levels, accounting for 6.8 percent of the state's total GDP. Oklahoma's real GDP is projected to increase 5.6 percent in 2022, which would surpass pre-pandemic levels.[17] In comparison, U.S. GDP is expected to grow just 2 percent in 2022, while averaging 2.1 percent growth through 2026 and 1.8 percent through 2031.[18] Oklahoma's projected GDP

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12 https://www.washingtonpost.com/business/2022/01/27/gdp-2021-q4-economy/
13 https://www.logisticsmgmt.com/article/aar_reports_2020_u.s._rail_carload_and_intermodal_volumes_are_down_annually/railfreight
14 https://www.progressiverailroading.com/rail_industry_trends/news/AAR-North-American-freight-rail-traffic-rose-in-2021--65599
15 https://business.okstate.edu/site-files/archive/docs/economy/economic_outlook_2021_caer_update.pdf
16 ODOT, July 2022.
17 Economic_Forecast_2022.pdf (greateroklahomacity.com)
18 Global Economic Outlook (conference-board.org)

growth in 2023 is 3.3 percent, as compared to 0.6 percent forecast for the U.S., indicating Oklahoma's relative strength in recovery efforts compared to the national level.

4.3.2 Agriculture Products – Transmodal Transport

According to the U.S. Department of Agriculture, about 28 percent of U.S. agricultural shipments and about 10 percent of U.S. grains are shipped in containers. Containerized (intermodal) transport allows shippers to maintain the identity of bulk agricultural products and allows customers to buy in small lot sizes. Based on an average between 2017 and 2021, agriculture accounts for about 1.4 percent of Oklahoma's GDP and has been identified as a critical user of the transportation system. Intermodal transportation can benefit a wide range of shippers, including agriculture producers. In 2018, BNSF Railway opened a new intermodal logistics center in Oklahoma City.

Similar to the intermodal transportation, there is a growing demand for transload facilities so that noncontainerized freight can be transferred from one mode to another. In particular, there is an increasing demand for shipments that travel on Oklahoma rail or water systems and use truck for either "first mile" or "last-mile" transport. In Oklahoma, wheat production is a key agricultural product that uses transload facilities. Because wheat—among other agricultural products— are grown largely in low-density western areas of the state, farmers rely on trucks and short-line railroads to get product to barges and/or Class I railroads.

4.3.3 E-Commerce

Online sales of goods serve both businesses and consumers. However, business-to-consumer (B2C) e-commerce is the principal front of competition, pitting traditional storefront retailers against e-commerce merchants in pursuit of consumer spending. This segment is also forcing major changes in transportation patterns by replacing large, consolidated truck deliveries to stores with small, dispersed deliveries to residences, and therefore eliminating some consumer shopping trips and altering the origins of shipments. These changes, discussed further below, have significant impacts on goods movement in Oklahoma.

E-commerce has been growing rapidly for two decades; however, the COVID-19 pandemic rapidly accelerated this growth, particularly B2C. From 2002 to 2018, e-commerce sales grew at 7.1 percent per year for wholesale, 11.0 percent per year for manufacturing, and 16.6 percent per year for retail. The growth was especially dramatic for retail. In 2002, e-commerce retail sales were less than $45 million, and by 2018 they had grown more than tenfold to $520 million.[19]

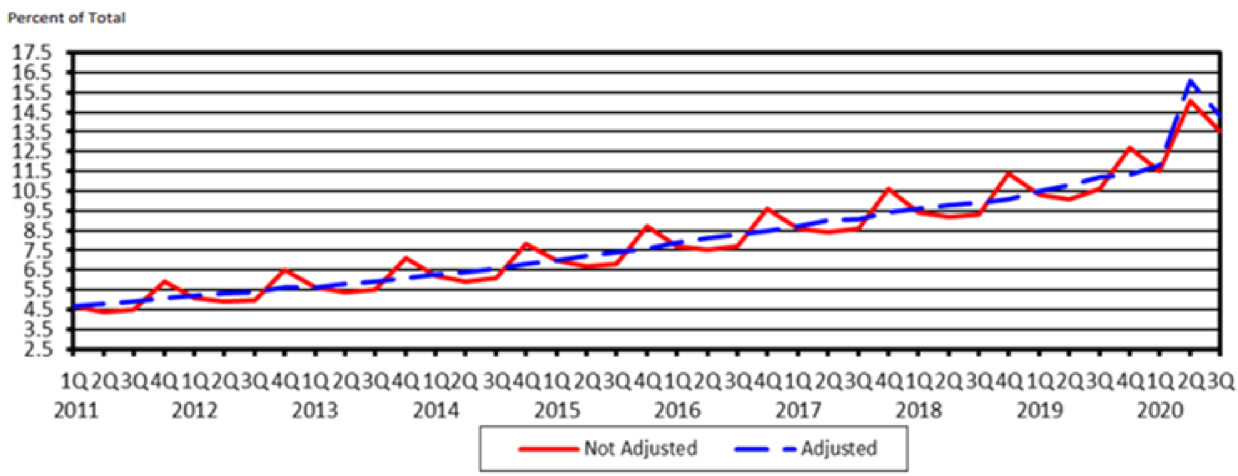
Technological advances support online sales growth by allowing consumers greater access to product information, quick and easy price comparisons, and faster, cheaper, personalized delivery options. Moreover, as same-day delivery and free shipping on returns become more commonplace, the traditional value of brick-and-mortar stores diminish further, and many

[19] https://www.mckinsey.com/industries/retail/our-insights/solving-the-paradox-of-growth-and-profitability-in-e-commerce

brick-and-mortar stores have begun accommodating the pickup of orders placed online, along with in-store e-commerce returns.

The start of the COVID-19 pandemic led to a dramatic increase in e-commerce from 11.8 percent in the first quarter of 2020 to 16.1 percent in the second quarter (Figure 4-9). In subsequent quarters, the seasonally adjusted share of e-commerce has decreased slightly and even stabilized at around 13 percent of retail sales.[20] This stabilization suggests that the pandemic had mostly a transitory effect on e-commerce sales, with the share of retail returning to levels only slightly higher than predicted by pre-pandemic forecasts. It is too early to assess with confidence the effect of the pandemic on the long-term prospects of the e-commerce sector. It is possible that the share of e-commerce will continue to increase at pre-pandemic rates until market absorption is maximized. Some analysts expect e-commerce growth to continue strongly, accelerated by changes in customer attitudes precipitated by the pandemic, reaching half of retail sales in the near future.

Figure 4-9. Estimated Quarterly U.S. Retail E-Commerce Sales as a Percentage of Total Quarterly Retail Sales



Source: U.S. Bureau of the Census, 2022

4.3.4 Warehouse Location and Automation

Distribution centers and warehouses have proliferated at an astounding pace, with annual development of new sites across the country more than tripling in the past 5 years. The increasing prominence of supply chains that emphasize faster times to market—combined with the pandemic-related growth in e-commerce—is leading to growing demand for warehouses, distribution centers, and fulfillment centers to support these activities.[21] Same- and next-day delivery requires more warehouses as well as warehouses closer to final market

[20] https://www.census.gov/data/tables/2018/econ/e-stats/2018-e-stats.html

[21] CBRE 2020 North America Industrial Big Box Review & Outlook https://www.cbre.com/-/media/project/cbre/shared-site/insights/local-responses/industrial-big-box-report-memphis/local-response-2020-ibb-memphis-overview.pdf

destinations (i.e., consumer homes and business). Some analysts estimate that e-commerce requires three times more warehousing space per product than traditional retail stores.[22]

Below are brief descriptions of the facilities that play a warehousing function in supply chains:

- Warehouses temporarily store product inventory and then send it on to end-points. Many retailers have evolved sophisticated inventory management systems to “pull” materials from warehouses on an as-needed basis, optimizing space usage. Supply chains will continue to seek to minimize inventory because it is expensive to own and hold. Inventory carrying costs typically total between 18 and 25 percent of the value of goods.
- Distribution centers also store products, although the duration of storage tends to be shorter than a warehouse, and distribution centers may also offer value-added services like cross-docking, product mixing, packaging, and order fulfillment.
- Fulfillment centers are a type of distribution center specializing in or offering order fulfillment. The term “warehouse” is often assumed to include both distribution centers and fulfillment centers (because the main function in each case is storage of goods).

4.3.5 Implications of Economic and Trade Trends

Innovations in transportation and e-commerce will affect the future for agriculture, retail, and warehouse operations.

As agriculture productivity and global demand for Oklahoma products such as wheat and soybeans increase, transportation efficiency will be of heightened importance. Oklahoma exports are likely to be transported by truck to rail or barge terminals. These transmodal (noncontainerized) operations present an opportunity to leverage the strengths of each mode to reduce agriculture transportation costs.

Multiple factors related to retail trade have the following implications for Oklahoma:

- Delivery vehicles in urban residential areas are likely to increase. As volumes grow, traffic and congestion can become an issue for residents and businesses.
- Delivery delays and their causes will be more visible to Oklahoma residents. This could lead to a higher incidence of complaints but could also make the challenges of freight delivery more tangible and meaningful to citizens.
- Concern for the safety and environmental qualities of delivery trucks is likely to continue. Adoption of different and new technology is apt to accelerate, including use of natural gas and hybrid electric trucks, and safety advances associated with connected and automated/autonomous vehicles. The ability for drivers to see—and vehicles to sense—

[22] Prologis (June 17, 2020), COVID-19 special report #6: “Accelerated Retail Evolution Could Bolster Demand for Well-Located Logistics Space.” https://www.prologis.com/news-research/global-insights/covid-19-special-report-6-accelerated-retail-evolution-could-bolster

activity and obstacles all around them, promises substantial reductions in incidents and accidents, and makes trucks far more neighborhood friendly.

4.4 TECHNOLOGY AND INNOVATION

4.4.1 Connected and Automated/Autonomous Vehicles

Advanced vehicle technologies for trucking (including driver assistance) and autonomous and CVs are evolving quickly. Automation could substantially reduce fuel, labor, or equipment costs for trucking, thereby potentially reducing the cost of truck transportation for the region's freight customers. For example, predictive cruise control, which combines cruise control with GPS and topographical data, can optimize fuel performance across varying terrains, while platooning can also improve fuel efficiency. Drivers being able to fulfill their rest requirements while in their vehicles means hiring fewer truck drivers, completing more deliveries in each period, and purchasing fewer trucks by fleet operators. These savings would be offset by the technology costs, but even so, there is the potential for meaningful advantage to customers.

FedEx recently collaborated with Paccar and Aurora in a test to send packages on a 500-mile trip between Houston and Dallas on an autonomous truck.[23] Kodiak Robotics has partnered with third-party logistics firm Ceva Logistics to autonomously transport cargo between Texas and Oklahoma City on I-35 and completed the first pilot run of the service in 2022.[24] (Figure 4-10).

Figure 4-10. Ceva and Kodiak Automated Tractor Trailer

Source: Ceva Logistics, 2022

[23] https://www.bizjournals.com/pittsburgh/inno/stories/news/2021/09/24/fedex-paccar-aurora-partner-autonomous-trucks.html

[24] https://www.freightwaves.com/news/kodiak-hauling-autonomous-loads-for-ceva-from-texas-to-oklahoma-city

In 2022, the Oklahoma legislature passed a law allowing fully automated vehicles to operate on public roads. This law, known as SB 1541, authorizes the operation of fully autonomous vehicles without human drivers, so long as an automated driving system is engaged, and the vehicle meets certain standards. Persons or companies wishing to operate a fully autonomous vehicle without a driver must provide the state with a law enforcement interaction plan. Additionally, Oklahoma's law SB189, provides for truck platoons of up to two vehicles. This law allows trucks to follow more closely than non-platooned motor vehicles as long as their speeds are electronically coordinated.

Automation could provide meaningful transportation safety benefits by reducing truck crashes. Human error—typically a truck driver or other drivers—causes or worsens most commercial truck accidents. There is some evidence that technologies such as forward collision warnings, camera systems, and automatic emergency braking systems do enhance safety. However, higher levels of automation for trucks have not yet been proven in real-world applications.

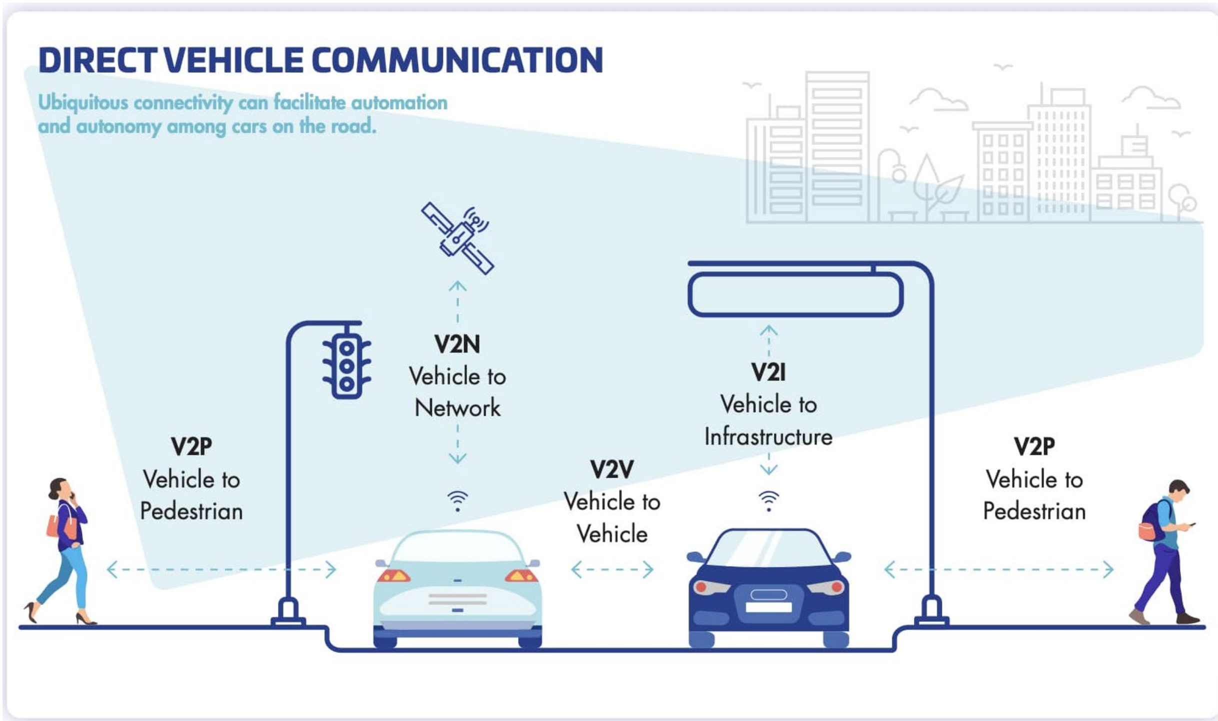
While there are many potential cost savings and societal advantages to deploying automation in trucking, widespread adoption of high levels of automation is unlikely in the medium term. Barriers remain for this technology to be commercially viable and to realize the benefits described above. These include challenges navigating roadway work zones, perceptual challenges during adverse weather, and operational requirements for staff to travel with the shipment even if they are not driving for loading/unloading, refueling, vehicle breakdowns, other emergencies, etc.

CV technologies allow vehicles to communicate with one another (vehicle-to-vehicle), with infrastructure (vehicle-to-infrastructure), and with other equipment, objects, or persons (vehicle-to-everything) (Figure 4-11). CV technologies are closely aligned with Automated Vehicle technologies, but the key difference is that CV is connecting the vehicle with external sources. CV technologies can offer benefits to safety, mobility, and operations. Transportation agencies have been investing in vehicle-to-infrastructure technologies for Transportation System Management Operations (TSMO) activities to communicate roadway conditions such as backups, truck parking availability, and intersection information directly to vehicles. These agencies have invested in roadside infrastructure, or roadside units which communicate with a vehicle's onboard unit. A key component of enabling agency-controlled CV technology is the presence of fiber and electric connections to provide power and communicate data back to agencies.

ODOT works closely with the University of Oklahoma ITS Laboratory. ODOT has also participated in Heartland region ITS and TSMO research, and the city of Tulsa maintains an Urban Mobility Innovation Team, aiming to "Develop a policy and technical action plan to lower barriers for emerging transportation technology adoption in Tulsa."[25]

25 https://www.cityoftulsa.org/government/departments/finance/performance-strategy-and-innovation/urban-mobility-innovation-team/

Figure 4-11. Connected Vehicle Configurations



Source: Thales Group

4.4.2 Vehicle Electrification

Commercial-vehicle electrification has reached the point of being viable and cost effective in several applications. As the costs have decreased—and governments increase incentives for electrification and raise standards for diesel-powered trucks—the electrification of truck fleets has become more of a practical possibility than ever. Truck electrification includes a wide range of technologies, each with different advantages. Truck electrification using batteries is the most common type, encompassing battery-only electric, hybrid electric, and plug-in hybrid electric.

Americas Commercial Transportation Research Co. projects that battery-electric trucks will make up half of Classes 4 through 8 vehicles sold in the United States by 2035.[26] Their cost analysis found that battery-electric medium-duty trucks have cheaper total cost of ownership than comparable diesel trucks, and this advantage is expected to increase as battery technology continues to improve and new regulations are introduced to curtail diesel emissions. The highest adoption rates are forecast for Classes 6 through 7 trucks (60 percent in 10 years), while Classes 4 through 5 trucks are more likely to switch to gasoline engines. Class 8 trucks are likely to favor diesel engines until emission regulations are tightened.

In addition to traditional plug-in charging, electromagnetic induction, or wireless, charging technologies have been piloted for transit systems and show promise for freight use along

[26] https://www.truckinginfo.com/10161524/act-half-of-class-4-8-sales-to-be-bev-by-2035

local delivery routes. Induction charging involves in-pavement coils which transmit electricity to a vehicle outfitted with corresponding coils. The vehicles can park on top of the induction charging infrastructure for short intervals to receive partial charge. In 2021, Tesla partnered with WAVE, owned by Ideanomics, to pilot induction charging for its Semi electric truck. WAVE estimates charging power of 500 kilowatts to 1 megawatt.[27]

The following factors are driving growth in truck electrification:

- Lower total cost of ownership for some applications, including lower maintenance costs.
- Governmental incentives and regulations intended to reduce GHG emissions and nitrogen oxides emissions. These include both incentives that facilitate electrification and more stringent requirements for traditional diesel or gasoline trucks. Many analyses find that the cost competitiveness of the technology in the short term depends critically on these governmental actions.
- Continued improvements in truck electrification and battery technology.
- Further developments and testing of battery technology by truck manufacturers.
- Surge in e-commerce increasing demand for light-duty trucks for deliveries, which are more conducive to electrification.
- Significant interest from businesses to take advantage of cost savings and lead technology adoption.
- Some businesses see truck electrification as a way of showcasing environmental stewardship. Amazon ordered 100,000 electric delivery vans from Rivian with the intention of deploying them by 2030.[28] Ikea has plans to use electric trucks to perform all home deliveries in New York City and Los Angeles by 2025.[29] Walmart also has significant plans to roll out electric trucks in the coming year. FedEx has committed to replacing their entire fleet with electric trucks by 2040.[30]

The following barriers are slowing the electrification of the truck fleet:

- High capital costs relative to conventional trucks, though lifetime costs are quickly reaching parity with diesel vehicles
- Difficulties securing loans for more expensive electric trucks, especially without governmental support
- Slowness of recharging requires significant changes in how many trucks are operated today. However, Daimler unveiled a new battery composition that will charge a truck to 80

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27 https://www.vehiclesuggest.com/tesla-move-to-wireless-charging/
28 2 Lambert, Fred. "Closer Look at Rivian's Electric Delivery Van for Amazon." Electrek, 6 Feb. 2020, electrek.co/2020/02/06/ rivian-amazon-electric-delivery-van-closer-look/
29 Zero Emissions for Home Deliveries. https://about.ikea.com/en/sustainability/%20becoming-climate-positive/zero-emissions-for-home-deliveries
30 https://www.mjbradley.com/sites/default/files/EDF_EV_Market_Report_April_2021_Update.pdf

percent within 30 minutes, which could be a promising new technology to speed charging.[31]

- Lack of charging infrastructure
- Significantly less service support available for maintenance and repairs
- Concerns about longevity and depreciation, particularly with batteries

Given the characteristics of the technology, the following trucking applications are favorable to electrification, particularly for a state like Oklahoma with both urbanized cities and long distances between destinations:

- Urban delivery applications that require frequent braking and slow speeds, allowing benefits from regenerative braking
- Applications where the truck returns to home base—facilitating rapid charging—and operates within a range of 100 to 150 miles. In some cases, these can be strung together in relay routes of longer distance
- Long-haul routes where drivers have the opportunity to coincide their rest schedules with refueling

Oklahoma National Electric Vehicle Implementation Plan

The IIJA bill authorized a new formula funding program (National Electric Vehicle Infrastructure, or NEVI), which allocates money to states specifically for vehicle electrification projects. Oklahoma is set to receive approximately $66.3 million between 2022 and 2026 under this new program. To meet program requirements, each state must submit a NEVI plan. In 2022, FHWA approved Oklahoma's plan, which documents the existing conditions regarding to statewide vehicle electrification infrastructure and outlines planned infrastructure investments. Oklahoma's plan is ambitious, aiming to keep the state in the top 10 states for charging stations per capita. The state's leading status in wind energy generation provides a significant opportunity to decrease total emissions because renewable resource would produce the electricity used to power vehicles. Figure 4-12 illustrates the evident gaps in electric vehicle charging locations along Oklahoma's interstate highways. This map provides a potential path forward to building out the state's commercial-vehicle charging network.

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[31] Freight Waves, September 2022

Figure 4-12. Oklahoma Electric Vehicle Charging Station Gaps Along Interstate Highways

Source: Oklahoma NEVI Plan, 2022

4.4.3 Commercial Vehicles Equipment and Other Technology

For some time, truckers have been employing technology in their operations and supporting public initiatives to add technologies on the highways. The products that have developed are important to safety, cost monitoring, and efficient operations.

Truck and Trailer Information Systems

Trucking equipment is continually evolving to include technologies to monitor the performance and operation of the vehicle, to improve communication with company personnel and for the safety and convenience of the operator. These technologies cover a wide range of capabilities from speed control, engine monitoring, communication, and driver comfort and convenience.

Highway Technology

Highway technologies are also evolving and being deployed with greater frequency. Current applications of electronic signage help drivers avoid problem areas and improve their trips by having access to current travel time and alternate route notification. Commercial-vehicle monitoring allows enforcement officials to monitor regulatory compliance of passing vehicles.

Load Access

Online load boards have been around for a considerable length of time. New technological capabilities have allowed the concept of real-time load access to grow. Brokers, logistics services, and trucking companies with excess freight are all developing some form of a cellphone application that gives drivers access to potential loads to capture detailed load information and report status.

Unmanned Aerial Vehicles

Unmanned aerial vehicles (or drones) are lightweight aircraft that operate remotely without a pilot physically onboard. However, drones must be operated by a pilot registered with the

Federal Aviation Administration. Over 850,000 drones have been registered through 2021, with nearly 260,000 remote pilots receiving their certification. While drones have not advanced so far as to replace entire tractor-trailers on the nation's roadways, they can offer an advantage for last-mile deliveries, especially in rural areas.

4.4.4 Three-Dimensional Printing

3D printing technology is advancing rapidly. Three-dimensional (3D) printing is a type of additive manufacturing where products are formed by layering materials, as opposed to subtractive (cutting away) or formative (molding) manufacturing techniques. 3D printers are operated from software containing the design specifications. The size of the additive manufacturing industry was $15.4 billion worldwide in 2020, growing 21 percent over 2019 and forecast to grow at a compound annual rate of 21.8 percent through 2027.[32]

An important consideration in understanding the potential impacts of additive manufacturing/3D printing is that it is not primarily about stand-alone machinery for fabricating entire products. Rather, it is a flexible and sometimes superior technique for improving production of components within existing manufacturing processes, reducing costs, and making manufacturing more competitive. Because of its benefits, many manufactured elements may be printed, including intermediate products, original and replacement parts, and sub-assemblies. To that end, GE Renewable Energy is piloting 3D printing to manufacture of turbine components, including concrete bases, to help reduce transportation costs—a development that could allow portions of wind turbine manufacture to be done in-state, rather than be transported by truck or rail.

4.4.5 Railroad Technology

As an example of next generation technology, drones are being used to inspect difficult locations like tunnels and bridges. The Positive Train Control (PTC) systems that railroads are implementing nationwide promise improvement in safety performance. Additionally, regulators at the FRA and the Pipeline and Hazardous Materials Safety Administration called for a new electronically controlled pneumatic braking system that would prevent—or lessen the severity of—crashes involving hazardous materials.

4.4.6 Waterways Innovation and Technology

The IIJA has awarded federal funds to the USACE – Tulsa District to deepen the Arkansas River navigation channel to 12 feet. The MKARNS is a 445-mile-long waterway containing 18 locks and dams (including five in Oklahoma) serving three primary Oklahoma ports (Tulsa Port of Catoosa, Muskogee, and Oakley's Port 33). Deepening the channels will allow barges to handle an additional 400 tons—a capacity increase of 40 percent—which will reduce the transportation cost per ton by water and increase its attractiveness and competitiveness versus other transportation modes.

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32 https://www.businesswire.com/news/home/20210916005909/en/15.4-Billion-Worldwide-Additive-Manufacturing-Material-Industry-to-2027---Latest-Advancements-and-Innovations---ResearchAndMarkets.com

4.4.7 Implications of Transportation Technology Trends

The implications of automated vehicle technology for Oklahoma are many and uncertain. The safety benefits when a driver is present in an automated vehicle could be substantial and would accrue from the interaction with technology-enabled automobiles as well as from enabled trucks. Advancements in safety could reduce community concerns about truck traffic and would be especially helpful in the context of home deliveries. However, without a driver actively behind the wheel, the public perception is apt to be different and risk-averse, even if the safety profile is eventually proven to be equally strong. Other legal, technological, and market issues could slow or speed implementation. As a result, truck and automobile technologies are likely to evolve by degrees, and automated operations are likely to coexist with traditional ones for years.

ODOT will have a role in implementing new vehicle technology as it interacts with the transportation network. Information technology and ITS applications will need to continue to evolve and expand to address various levels of communication and automation.

The rail and waterways industries are using new and sustainable methods for their systems as well. Drone technology, new braking systems, and improved replacement or repair components for locks and dams will improve efficiency and safety for rail and waterways.

4.5 TRANSPORTATION INDUSTRY TRENDS

4.5.1 Supply Chains

Supply-chain sourcing relates to where retailers obtain products for sale, where manufacturers obtain materials and components, and relatedly, where manufacturers locate the production that supplies retailers. The concept of supply-chain management or logistics is about efficient management of business operations from initial input (sourcing) to final product delivery. An optimized transportation system plays an essential role. Oklahoma is involved in complex supply chains that require goods movement across the globe. Supply chains in the state could be conceived as twofold (though somewhat interrelated):

- Supply chains handling bulk energy and agricultural goods
- Supply chains moving finished goods to businesses and consumers

Whereas prior to 2020, “just-in-time” (JIT) delivery was the leading phrase in logistics, rolling shortages of various goods occurred in the 2020 through 2022 time period, businesses started focusing on a “just-in-case” (JIC) model. JIC is an inventory management strategy used to deal with uncertainty in the supply chain and/or the anticipation of emergencies or sudden increases in demand. The U.S. shipping industry spent the previous decades perfecting JIT, managing lean inventories based on insights from machine learning, artificial intelligence, and big data. But the COVID-19 pandemic spurred unforeseen surges in demand, compounded by shortages caused by worldwide closures of factories and ports as well as trade policies. Businesses had to pivot to JIC, building up inventories to prepare for potential future shortages of key goods, and ordering well ahead of seasonal demands due to delays across the supply chain.

Import distribution centers have been challenged to pull containers from marine terminals, contributing to significant and widespread port congestion and nationwide delays. While container volumes were on the increase before the COVID-19 pandemic, imports across all sectors have since skyrocketed, partially due to increased ordering to cover JIC inventory planning. Rail has been integral to moving containers off congested ports and toward inland ports or other distribution points. Following the early 2020 facility closures and the lean operations of Precision Scheduled Railroading (PSR), the railroad industry had to reconfigure its operations to move from JIT to JIC and accommodate the record cargo volumes. The reconfiguration took time and effort to implement, and rail's importance to the supply chain was evidenced by the container backlogs that occurred while the industry was ramping up capacity. However, PSR still informs Class I rail operations, and unreliable service, fewer trains, and longer timeframes remain key issues in utilizing rail service in the current market environment.

Regarding the movement of finished goods in particular, "last mile" (the final stage of delivery to a customer's home or business) performance is especially important for e-commerce. B2C delivery has forced many retailers to focus more on last-mile logistics, which is generally considered to be the most complex and costly portion of the delivery process. While many continue to outsource this service to one of the big three delivery companies (UPS, FedEx, and USPS), some are opting for their own delivery services and service networks. The result of these developments is that the rise in e-commerce has produced a significant number of new participants in the distribution network, as well as new vehicles on the road. At the same time, the customer may also be responsible for the last mile through "buy online pickup in store" transactions use of Amazon lockers, UPS access points, etc.

Multistage logistics and automation have driven rapid growth in the development of smaller distribution centers. The average size of distribution centers has dropped to 220,000 square feet (SF), a decline of 15 percent between 2013 and 2017. In fact, the growth in these centers has occurred at both the larger (1 million+ SF) and smaller (under 250,000 SF) ends of the size range, as one would expect from multistage distribution strategies. The growth is driven by the continuing demand for faster times to market, with e-commerce a significant driver. More distribution staging closer to end-markets is the result, emphasizing delivery more than storage.

Warehouse development means more truck trips on both the inbound and outbound sides. Distribution-center cluster development is significantly affecting truck-trip distribution and network assignment patterns. With goods being moved between warehouses to meet short delivery timeframes—rather than goods being moved directly from warehouses to retail or wholesale locations—truck-trip generation will grow. This trend will add more trucks to the roadway system, especially in clustered developments, where truck trips may be generated and destined for many unique locations, as opposed to a more limited and predictable number.

4.5.2 Railroad

Demand for freight-rail service is expected to continue in Oklahoma, enhanced by the state's geographic location. Twenty-one freight railroads, including three Class I carriers, operate in the state. Railroads are regularly implementing new technology to improve the safety and efficiency of rail operations.

One area of safety focus is PTC, which is a technologically based means of ensuring train separation and derailment avoidance. PTC is mandated and regulated by the FRA and required on lines where regularly scheduled passenger trains operate and where certain freight commodities are carried. This system, which is interconnected with a train's throttle and braking systems, monitors the track ahead for conditions that could affect the movement of a train (such as track occupancies, restricting signals, or misaligned switches). The system advises a train engineer of a condition requiring remedial action. If the train engineer does not take remedial action within the prescribed time period, the system will stop the train. PTC is an overlay on already existing signal systems and dispatch systems that control the movement of trains across North America.

Another area of safety focus is grade-crossing safety. Motor vehicles of all sorts enter into a rail-highway grade crossing too often, either without taking proper precautions to observe surrounding conditions or intentionally ignoring active warning devices. The railroads—in concert with the U.S. DOT and state departments of transportation—are working to make drivers more aware and are closing crossings where possible.

As for efficiency, railroads are improving their physical plants to allow larger capacity railcars to move throughout the system. This provides commercial benefits to shippers and receivers in Oklahoma and other states. Additionally, Class I railroads are running longer trains, both for unit trains and merchandise freight. To do this, the railroad companies are utilizing advanced computerized dispatching systems and a locomotive allocation system called "distributed power." With distributed power, a train can have locomotives (power) at the front of the train, mid-train, and (often) at the rear of the train. These locomotives are all controlled by the engineer in the front of the train. The distributed power allows a single train to pull tens of thousands of additional tons of commodity. This economy of scale improves the fluidity of the railroad, frees capacity for additional freight or passenger trains, and expedites freight movements across the country. At the same time, the short-line (Class III) railroads are working to more efficiently serve local customers, with creative crew assignments, prepositioned locomotives, preblocked cars, and multiple switches per day. While low tech, these are customer-focused initiatives.

Railroads have used railcar trip planning for years to plan train consists, crew and locomotive allocation, fuel supplies, and fueling schedules. With the advancements in technologies, railroads are continuing to improve the integration of these functions in a model generically referred to as PSR. PSR allows the railroads to leverage the legacy systems with the efficiencies described above to get more asset utilization, both from the physical plant and rolling stock.

Freight railroads in the U.S. are private organizations that are responsible for their own maintenance and improvement projects. It is anticipated that railroad companies will need to continue investing in their infrastructure as well as adding to their systems to address the growth in rail traffic over the next decades.

4.5.3 Implications of Transportation Industry Trends

Changes surrounding supply-chain management, international shipping logistics, trucking, and rail infrastructure affect where goods will be shipped, in what quantities, and how they will be transported.

Supply-chain matters for freight planning because it affects the location and types of transportation infrastructure investments as well as local land use and economic vitality. Understanding Oklahoma's industrial profile is important, so that opportunities and threats can be recognized, new developments can be observed closely, and forecasts are viewed as guides to the future.

The trucking industry in Oklahoma is strong and plays a significant role in the economy. Trucking in Oklahoma includes every type of carrier from individual haulers and small companies with a few trucks to the largest national carriers. The types of vehicles in operation and the commodities that they carry are equally diverse. Conditions such as driver shortages and HOS—combined with an economy that continues to prefer faster and more customized service—reinforce the need for the continued growth and development of this industry.

Demand for freight-rail service is expected to continue in Oklahoma, enhanced by the state's geographic location. Twenty-one freight railroads, including three Class I carriers, operate in the state. Railroads are regularly implementing new technology to improve the safety and efficiency of rail operations.

4.6 FUTURE GROWTH

Freight tonnage and value growth forecasts for the Plan were developed from FAF (version 5.3), using base year 2017 and forecast year 2045.

As shown in Table 4-2, Oklahoma is expected to add 153.0 million tons of freight moving into, out of, and within the state between 2017 and 2045 (a 35 percent increase). More than half the increase (79.5 million tons) will be for trucking, and 45 percent of trucking growth will be for moves within the state. Pipeline is forecast to grow by 54.8 million tons, with 50 percent of pipeline growth in the inbound direction. Multiple modes is forecast to add 10.2 million tons, mostly inbound and outbound. Rail is forecast to add 6.7 million tons internal and 2.4 million tons outbound, but to lose 3.7 million tons (primarily coal) inbound, for a net increase of 5.4 million tons. Water is forecast to add 3.1 million tons, almost all moving outbound.

Table 4-2. Tonnage Growth, 2017-2045

Domestic Mode	OK Flow Direction	Tons 2017 (M)	Tons 2045 (M)	Growth (M)
Truck	Inbound	42.5	62.6	20.1
	Outbound	48.3	71.6	23.3
	Internal	119	155.1	36.1
	TOTAL	**209.8**	**289.3**	**79.5**
Pipeline	Inbound	63.5	91.4	27.9
	Outbound	81.8	98.4	16.6
	Internal	17.5	27.8	10.3
	TOTAL	**162.9**	**217.7**	**54.8**
Multiple Modes & Mail	Inbound	10.7	16.2	5.5
	Outbound	5.9	10	4
	Internal	1.9	2.5	0.7
	TOTAL	**18.5**	**28.7**	**10.2**
Rail	Inbound	11.9	8.1	-3.7
	Outbound	7.2	9.6	2.4
	Internal	18.8	25.5	6.7
	TOTAL	**37.9**	**43.2**	**5.4**
Water	Inbound	0.8	1	0.1
	Outbound	4.8	7.6	2.9
	Internal	0.7	0.9	0.1
	TOTAL	**6.3**	**9.5**	**3.1**
Air (include truck-air)	Inbound	0.0	0.0	0.0
	Outbound	0.0	0.0	0.0
	Internal	0.0	0.0	0.0
	TOTAL	**0.0**	**0.1**	**0.0**
Other and unknown	Inbound	0.0	0.0	0.0
	Outbound	0.0	0.0	0.0
	Internal	0.0	0.0	0.0
	TOTAL	**0.0**	**0.0**	**0.0**
GRAND TOTAL	**TOTAL**	**435.5**	**588.5**	**153.0**

Source: Analysis of Freight Analysis Framework 5.3, excluding pass-through traffic

As shown in Table 4-3, Oklahoma is expected to add $197.5 billion in value of freight moving into, out of, and within the state between 2017 and 2045 (a 66 percent increase). Trucking is forecast to increase by $141.6 billion, accounting for 72 percent of the growth; growth in all directions is expected, with the largest share for inbound moves. Multiple modes is forecast to add $37.7 billion, mostly inbound and outbound. Pipeline is forecast to grow by $11.7 billion, mostly inbound. Rail is forecast to add $3.0 billion in all directions. Note that although inbound rail tonnage declines, inbound rail value actually increases, because the tonnage loss is largely in coal, a low-value/high-weight commodity. Air is expected to add $2.9 billion, with around two-thirds inbound. Water is projected to add $0.8 billion, mostly outbound.

Table 4-3. Value Growth, 2017-2045

Domestic Mode	OK Flow Direction	Value 2017 ($B)	Value 2045 ($B)	Growth ($B)
Truck	Inbound	79.3	140.2	60.9
	Outbound	62.9	108.2	45.3
	Internal	65.2	100.6	35.4
	TOTAL	**207.5**	**349.1**	**141.6**
Multiple Modes & Mail	Inbound	20.6	39.7	19.1
	Outbound	12.1	26.1	14.1
	Internal	3.6	8.1	4.5
	TOTAL	**36.2**	**73.9**	**37.7**
Pipeline	Inbound	20.3	27.3	7.0
	Outbound	19.4	22.2	2.7
	Internal	3.8	5.8	2.0
	TOTAL	**43.5**	**55.2**	**11.7**
Rail	Inbound	3.2	4.3	1.2
	Outbound	1.6	2.7	1.1
	Internal	2.6	3.3	0.7
	TOTAL	**7.3**	**10.3**	**3.0**
Air (include truck-air)	Inbound	1.9	3.7	1.8
	Outbound	1.7	2.7	1.0
	Internal	0.0	0.0	0.0
	TOTAL	**3.6**	**6.4**	**2.9**
Water	Inbound	0.5	0.6	0.1
	Outbound	1.2	1.8	0.7
	Internal	0.2	0.2	0.0
	TOTAL	**1.9**	**2.6**	**0.8**
Other and Unknown	Inbound	0.0	0.0	0.0
	Outbound	0.1	0.1	0.0
	Internal	0.0	0.0	0.0
	TOTAL	**0.1**	**0.1**	**0.0**
	GRAND TOTAL	**300.1**	**497.6**	**197.5**

Source: Analysis of Freight Analysis Framework 5.3, excluding pass-through traffic

As shown in Table 4-4, petroleum and coal products account for 59.6 million tons (30 percent) of projected tonnage growth. Other leading tonnage growth commodities include gravel, chemicals, nonmetallic mineral products, fertilizers, mixed freight, sands, live animals and fish, crude petroleum, and animal feed. Fuel oils, coal, and gasoline tonnages are projected to decline.

Table 4-4. Tonnage Growth by Commodity, 2017-2045

	Tons 2017 (M)	Tons 2045 (M)	Growth (M)
Petroleum and Coal Products n.e.c.	112.8	172.4	59.6
Gravel	35.8	48.8	13.0
Basic Chemicals	6.6	18.9	12.2
Nonmetal Min. Prods.	20.6	29.8	9.2
Fertilizers	6.6	15.0	8.4
Mixed Freight	9.7	16.6	6.9
Natural Sands	16.0	22.6	6.7
Live Animals/Fish	3.1	8.7	5.6
Crude Petroleum	59.2	63.7	4.5
Animal Feed	6.9	11.3	4.4
Plastics/Rubber	3.1	6.9	3.8
Nonmetallic Minerals	8.0	11.5	3.5
Misc. Mfg. Prods.	2.2	5.5	3.3
Wood Prods.	4.8	8.0	3.2
Other Foodstuffs	6.9	9.9	3.0
Cereal Grains	16.1	18.9	2.7
Newsprint/Paper	3.3	5.4	2.1
Chemical Prods.	1.6	3.6	2.0
Motorized Vehicles	2.4	4.1	1.7
Articles-Base Metal	4.3	5.9	1.6
Other Commodity Tons	45.1	59.0	13.8
Fuel Oils	24.0	20.4	-3.6
Coal	8.2	1.3	-6.9
Gasoline	28.0	20.3	-7.8
TOTAL	**435.5**	**588.5**	**153.0**

Source: Analysis of Freight Analysis Framework 5.3, excluding pass-through traffic

As shown in Table 4-5, projected value growth is distributed across a diverse range of leading commodities, including pharmaceuticals; mixed freight; miscellaneous manufactured products; electronics; petroleum and coal products; machinery; live animals and fish; plastics and rubber; and motorized vehicles. Values of coal, fuel oils, and gasoline transported are projected to decline.

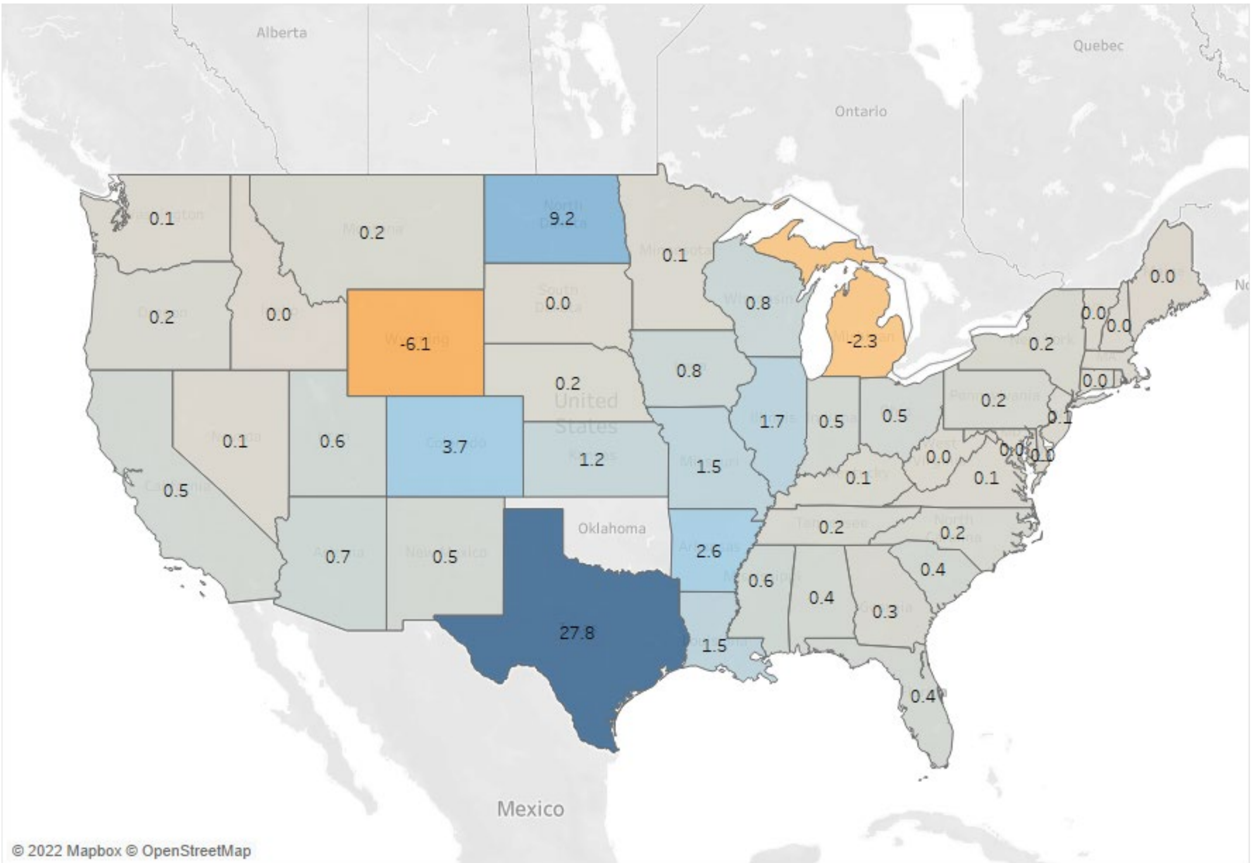
Table 4-5. Value Growth by Commodity, 2017-2045

	Value 2017 ($B)	Value 2045 ($B)	Growth ($B)
Pharmaceuticals	12.1	32.7	20.6
Mixed Freight	28.5	48.4	20.0
Misc. Mfg. Prods.	13.1	33.0	19.9
Electronics	17.4	34.2	16.8
Petroleum and Coal Products n.e.c.	27.2	41.7	14.5
Machinery	21.5	34.4	12.9
Live Animals/Fish	7.0	19.7	12.7
Plastics/Rubber	9.5	20.8	11.3
Motorized Vehicles	14.5	24.0	9.6
Chemical Prods.	6.1	13.8	7.7
Basic Chemicals	4.1	11.5	7.4
Textiles/Leather	6.9	13.7	6.8
Precision Instruments	6.3	12.8	6.5
Articles-Base Metal	12.7	17.3	4.6
Meat/Seafood	7.3	10.6	3.3
Other Foodstuffs	6.5	9.5	3.0
Furniture	3.9	6.6	2.7
Wood Prods.	3.4	5.9	2.5
Paper Articles	3.2	5.6	2.5
Fertilizers	1.8	4.2	2.3
All Other Commodity Value	60.4	76.8	16.4
Coal	0.1	0.0	-0.1
Fuel Oils	11.9	10.0	-1.9
Gasoline	14.8	10.6	-4.3
TOTAL	**300.1**	**497.6**	**197.5**

Source: Analysis of Freight Analysis Framework 5.3, excluding pass-through traffic

Tonnage inbound to Oklahoma is expected to grow by 49.9 million tons between 2017 and 2045. As shown in Figure 4-13, Texas accounts for 27.8 million tons (56 percent) of inbound tonnage growth, followed by North Dakota (9.2 million tons), Colorado (3.7 million tons), and Arkansas (2.6 million tons). Tonnage declines are projected from Wyoming (due to reduced coal tonnage by rail) and Michigan (due to reduced crude oil tonnage by pipeline).

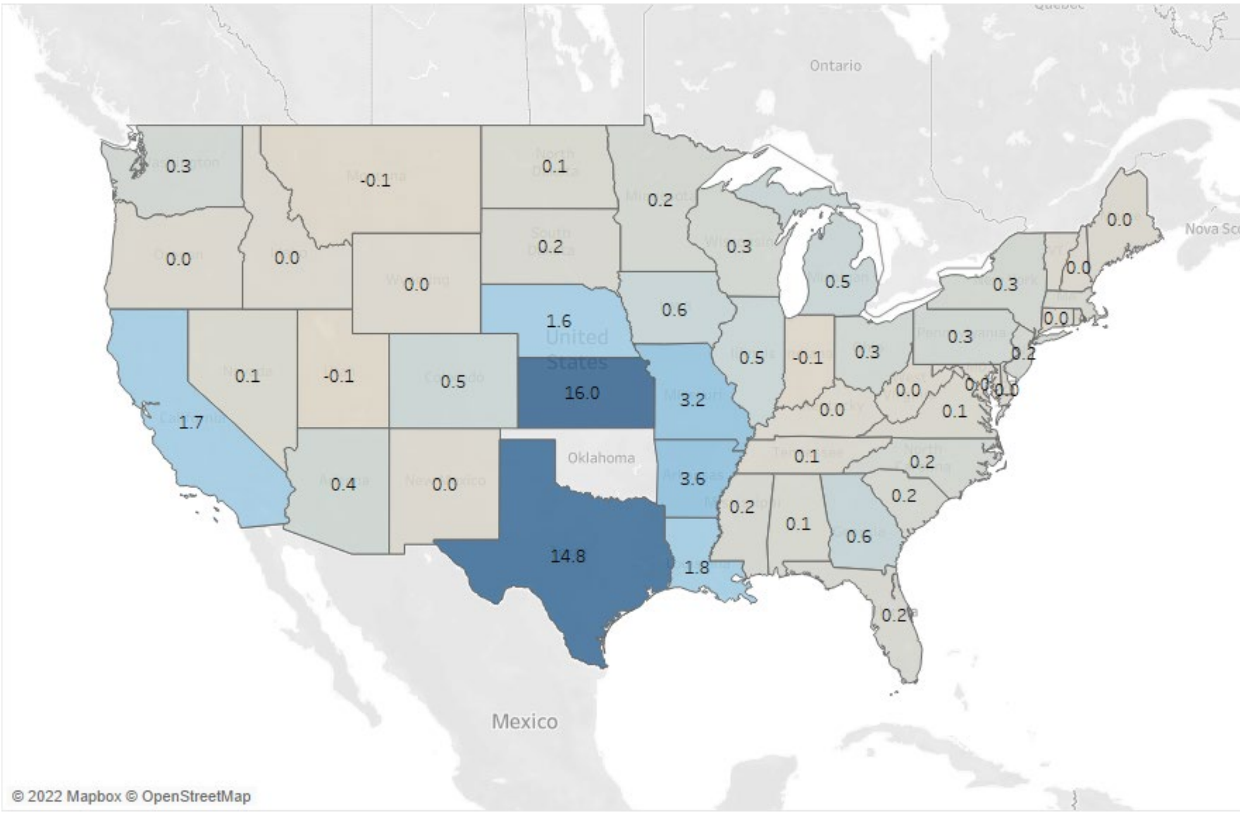
Figure 4-13. Added Inbound Tonnage by Origin State (2017 to 2045)



Source: Freight Analysis Framework 5.3. Excludes pass-through, outbound, and internal traffic.

Tonnage outbound from Oklahoma is expected to grow by 49.0 million tons between 2017 and 2045. As shown in Figure 4-14, Kansas accounts for 16.0 million tons and Texas accounts for 14.8 million tons, representing a combined 63 percent of tonnage growth. Other significant growth states include Arkansas, Missouri, Louisiana, California, and Nebraska.

Figure 4-14. Added Outbound Tonnage by Destination State (2017 to 2045)



Source: Freight Analysis Framework 5.3. Excludes pass-through, outbound, and internal traffic.

4.7 CONCLUSION

Several important trends are likely to affect the demand for and availability of future freight transportation in Oklahoma:

- At a high level, it is anticipated that energy markets will continue to remain volatile in the face of geopolitical concerns, the COVID-19 pandemic, and energy policies.
- Agriculture will continue to be a growth industry, consuming significant amounts of highway, rail, and waterway capacity. However, like the energy market, agricultural commodities will also face challenges based on labor, climate, and international demand.
- The changing retail and distribution trade environment will increase both urban and rural deliveries by truck which, together with overall growth in truck volumes, will exacerbate existing congestion. Urban and suburban communities will face development pressure from warehousing to meet short delivery expectations, as well as pressure on local streets and parking from delivery vehicles.
- Technology advances supporting trucking are expected to improve safety in the short term, but the full vehicle automation will likely remain years in the future, leaving opportunity to address labor and parking challenges in the near term.

Chapter 5 identifies specific bottlenecks and mobility issues that will prevent the smooth flow of freight. Chapter 6 identifies and prioritizes potential projects to eliminate or mitigate them.

5 Freight Bottlenecks and Mobility Issues

5.1 HIGHWAY

5.1.1 Truck Bottlenecks

For the purposes of this analysis, a bottleneck is defined as part of the transportation system that imposes disproportionately high costs in the movement of freight. A specific approach was followed to identify truck freight bottlenecks on the Oklahoma NHS. Some of the adopted bottleneck identification concepts were based on guidance recently published by FHWA.[33] This guidance stresses the importance of thinking about bottlenecks from the perspective of system users, leading to indicators that approximate user impacts and costs. The analysis used findings from National Cooperative Highway Research Program (NCHRP) Report 925[34] to estimate the costs that congestion generates for trucking companies and businesses that use trucking services. This represents an improvement over analyses that estimate costs only to trucking companies and ignore broader supply chain impacts.

The FHWA guidance also highlights the importance of delving into additional data sources to investigate potential causes of performance issues. Therefore, in addition to the performance measures highlighted here in Chapter 5, the analysis included consideration of other indicators such as crashes, pavement conditions, curves, grades, and congestion. The results of these analyses were utilized in the Plan efforts to identify potential solutions and investment priorities (see Chapter 6).

In addition to evaluating performance based on measures estimated from data, it is also important to consider experience of, and comments from, stakeholders who use the roadway network. System users can identify issues not captured by the data.

5.1.2 Mobility/System Performance

The congestion metrics used to identify bottlenecks were developed by NCHRP Report 925, which outlines an approach for quantifying recurring and non-recurring congestion using travel time data and estimating associated user costs. Distinguishing between recurring and non-recurring congestion is important because research shows that freight users are much more concerned about non-recurring congestion. Trucking companies account for recurring congestion—typical slowdowns during peak time of the day—in their delivery schedules; however, they have difficulty anticipating and managing non-recurring congestion. Moreover, most shippers and receivers place a premium on delivery schedules being met, because late shipments can disrupt production, cause stock-outs at stores, or lead to a missed intermodal transfer at an airport, seaport, or rail terminal. On-time performance, which is one of the most

[33] Federal Highway Administration. August 2015. *Freight Performance Measure Approaches for Bottlenecks, Arterial, and Linking Volumes to Congestion*. U.S. Department of Transportation, Washington, D.C.

[34] National Academies of Sciences, Engineering, and Medicine 2019. Estimating the Value of Truck Travel Time Reliability. Washington, DC: The National Academies Press.

important factors in modern-day supply chains, becomes much more difficult to achieve with high levels of non-recurring congestion.

Quantifying recurring and non-recurring congestion separately enables the full costs of congestion to be estimated. Other congestion metrics that rely on travel time indices or ratios do not distinguish between these two separate phenomena, which means that they cannot be used to estimate the costs of congestion. Many studies that seek to estimate the costs of congestion in freight transportation consider only the impacts of delays on vehicle operating costs (e.g., driver wages, fuel consumption) and do not consider the broader supply chain implications of increasing uncertainty in travel times. These broader implications, which research shows are critical for costing the full impacts of congestion, are considered by the congestion metrics used in this study.

Recurring Congestion (Delay)

Delay is a planning measure for talking about recurring congestion. Delay is calculated as the difference between travel time in average conditions and travel time under free-flow conditions. This indicator measures the additional hours that a truck spends traversing a roadway segment. This delay directly translates into additional costs such as additional driver wages, vehicle operations, and fuel consumption.

Average delay was calculated for the NHS from the National Performance Management Research Data Set (NPMRDS) for the calendar year 2021 and average annual daily truck traffic data from traffic counts in Oklahoma's federal Highway Performance Monitoring System.[35] The NPMRDS provides actual truck travel times across individual segments of the network continuously throughout the year. In NPMRDS each segment is defined by a unique Traffic Message Channel.

Non-Recurring Congestion (Reliability Index)

The reliability measure demonstrates how bad travel conditions can be on a given highway segment. Reliability is a measure of unpredictable or non-recurring congestion. It is calculated by the ratio of the worst-case travel time (95th percentile travel time) to the average travel time. This measure sums the hours of uncertainty that trucks face while traveling throughout the day. This way of measuring unreliability is superior to the often-used travel time indices or ratios because it is additive and focuses on non-recurring congestion. As the index gets higher, it indicates greater reliability problems on that segment. Thus, a larger number of trucks need to plan more time into their schedules to guarantee on-time delivery. The analysis found the worst delay and reliability problems for trucks in and around the major metropolitan areas of Oklahoma City and Tulsa, as well as on the stretch of I-35 between Oklahoma City and Dallas.

Preliminary Identification of Bottlenecks

The congestion metrics above were translated into user costs using monetization factors from NCHRP Report 925. This study conducted a stated-preference survey in the United States to

[35] The NPMRDS data was from 2021 and average annual daily traffic data was from the 2017 Highway Performance Monitoring System.

quantify how motor carriers and shippers value travel time unreliability relative to expected travel times and shipment costs. Thresholds were set for user congestion costs in order to identify areas with the worst performance in the state for trucks. These thresholds were set at the 95th percentile of user congestion costs per mile (i.e., if a segment was in the worst 5 percent in terms of user cost per mile, it was identified as a truck bottleneck location that merited further analysis).

Roads were classified as being Urban or Rural based on the distinction made in NPMRDS (originally derived from the U.S. Census Bureau). Different thresholds for the user cost metric were used to identify bottlenecks in rural areas versus urban areas. Bottlenecks in urban areas typically have different magnitude and characteristics than bottlenecks in rural areas. If the same threshold was used throughout the state, the highly congested roads in metropolitan areas would dominate the results. Further, roadway segments in the greater Oklahoma City region were grouped together due to their higher expected user costs. All other urban roadway segments in the state were grouped under the separate category of Tulsa Urban.[36]

In Urban Oklahoma City, 37 roadway segments experienced user costs higher than the threshold, totaling 14 centerline miles of roadway. In Tulsa Urban, 44 roadway segments were above the threshold, combining for 19 centerline miles of roadway. In Rural, 127 roadway segments were above the threshold, combining for 83 miles of roadway. In total, roughly 70 percent of the bottleneck distance was identified in rural areas (primarily I-35 in locations classified as rural in NPMRDS) and 30 percent in urban areas (Table 5-1).

Table 5-1. Truck Bottleneck Thresholds and Totals

Bottleneck Type	User Cost Threshold ($/mile-day)	Number of Bottleneck Segments (Traffic Message Channels)	Bottleneck Centerline Roadway Miles
Urban Oklahoma City	17,325	37	14
Tulsa Urban	7,335	44	19
Rural	7,557	127	83
TOTAL	**N/A**	**208**	**116**

Source: National Performance Management Research Data Set data and *NCHRP Report 925 – Estimating the Value of Truck Travel Time Reliability*

Stakeholder Input

Stakeholder perspective on system problems and needs was solicited early in this planning effort. This input provided insight as to the location and severity of problems from the perspective of system users. Stakeholder perceptions are useful in identifying and prioritizing system needs. At the first FAC meeting in the summer of 2022, committee members identified congestion in metropolitan areas as one of the biggest challenges for freight. This reinforces the data analysis which shows the high cost of congestion on truck travel in Oklahoma City and Tulsa.

[36] Tulsa Urban was derived by including all urban areas besides those associated with Oklahoma City. Tulsa was the only city that contained urban areas other than Oklahoma City.

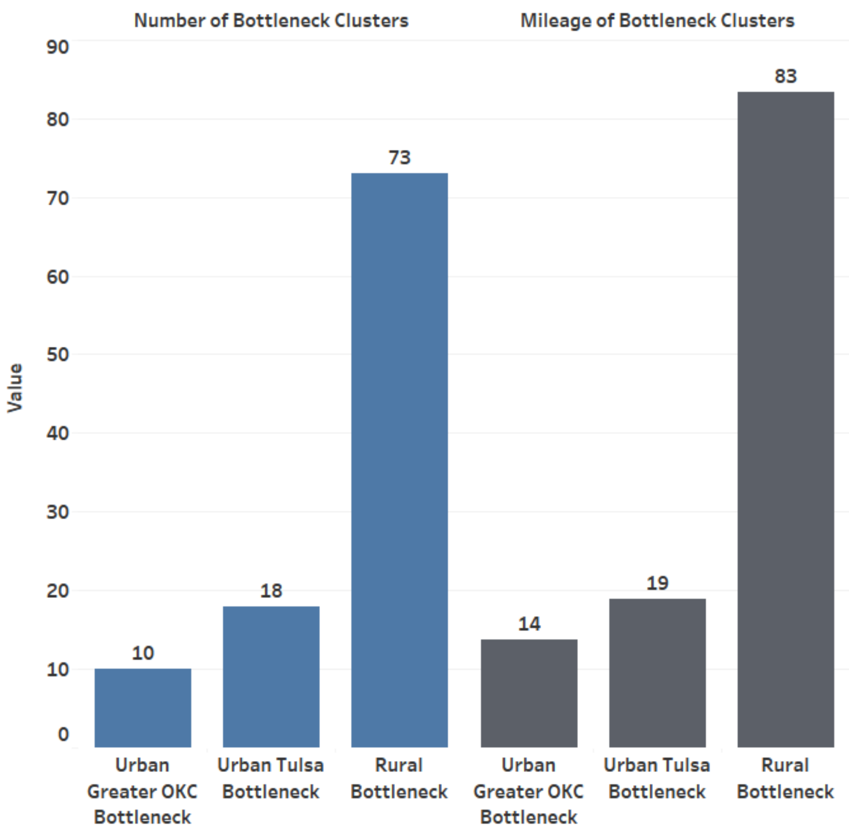
ODOT also solicited comments from the general public via a web-based survey in June and July 2022. Many respondents emphasized the large number and range of freight issues in rural areas, including congestion. This result is consistent with the data analysis that found a larger number of individual bottlenecks in rural than urban areas. One specific comment called for the widening of I-35 as it crosses the Red River.

Stakeholders were also interviewed to obtain their perspectives. Road congestion and conditions were repeated as constraints on performance, with US-69, I-35, and US-412 being mentioned as examples. These facilities also emerge in the analysis of data as further described in the next section.

Final Bottleneck Identification

A manual process was conducted to combine consecutive bottlenecks into bottleneck clusters. Especially in urban areas, where the network is segmented more finely, numerous consecutive segments were designated as bottlenecks. For simplicity and ease of interpreting the results, consecutive and near consecutive segments were combined into bottleneck clusters. In some cases, nearby roads that are not consecutive were combined into the same cluster if the underlying cause of the bottleneck was judged to be the same. As shown in Figure 5-1, this resulted in 73 bottleneck clusters in Rural, 10 in Urban Greater Oklahoma City, and 18 in Tulsa Urban areas, for a total of 101 bottleneck clusters.

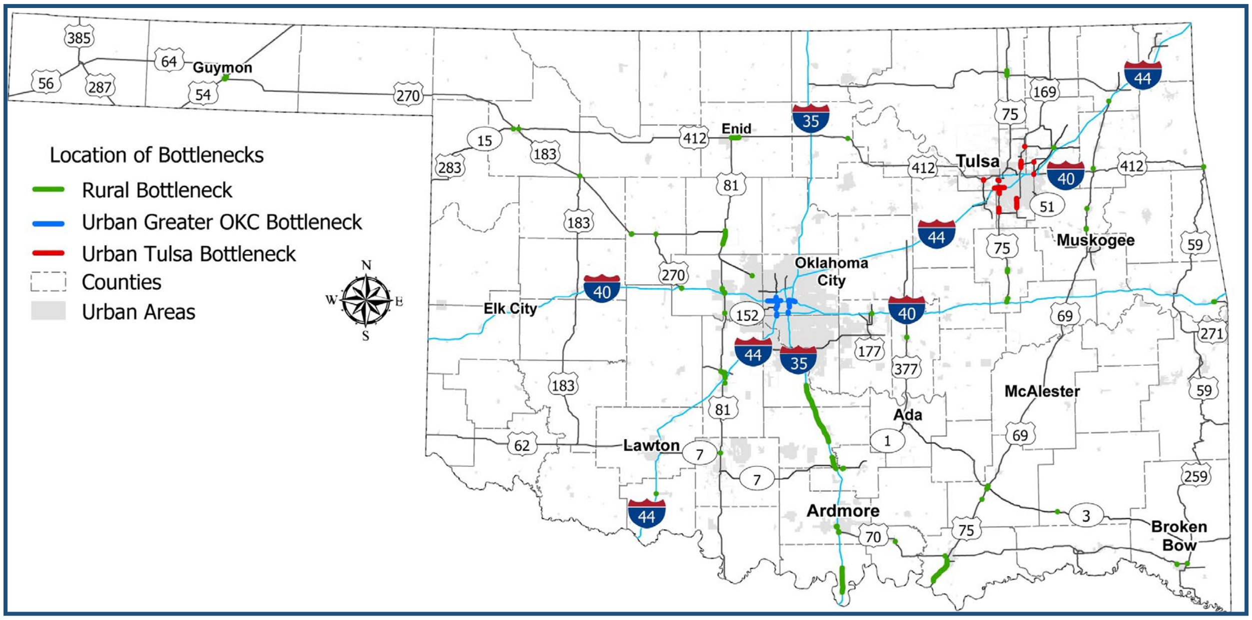
Figure 5-1. Number and Mileage of Bottleneck Clusters



Source: National Performance Management Research Data Set data and *NCHRP Report 925 – Estimating the Value of Truck Travel Time Reliability*

Figure 5-2 shows the results statewide. As can be seen, the bottlenecks tend to congregate in and around the urban areas of Oklahoma City and Tulsa, although there are many rural bottleneck locations in the southern part of the state, along I-35.

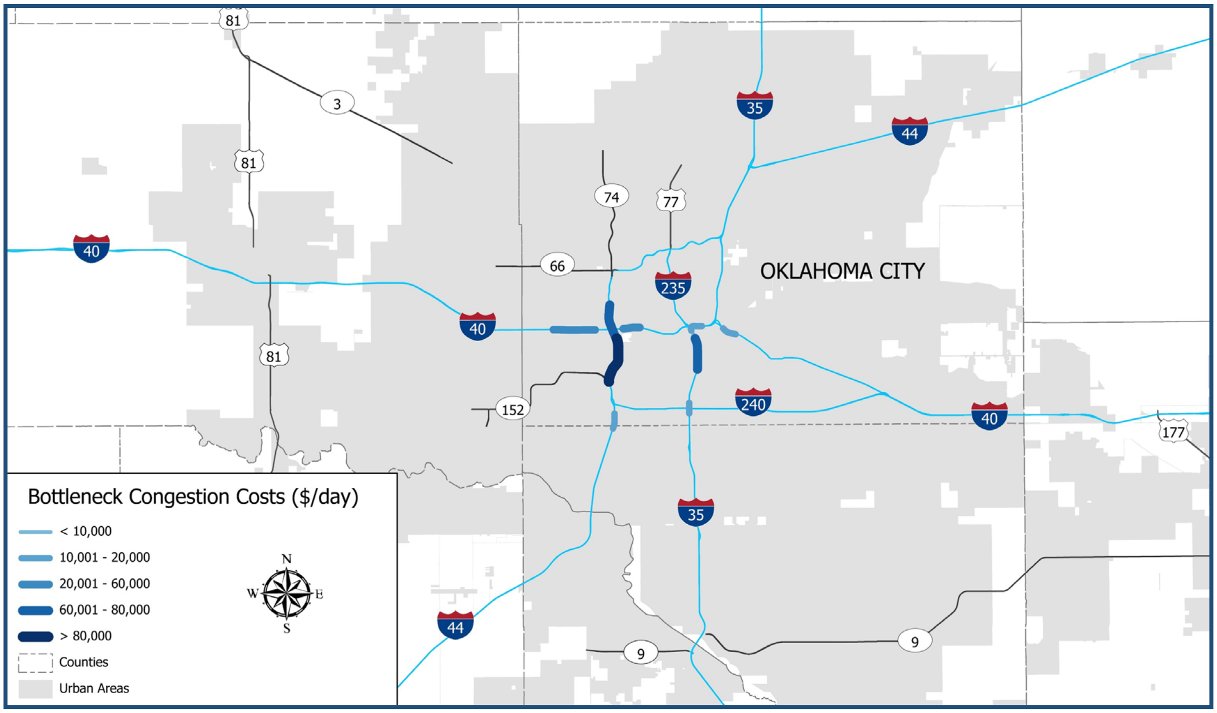
Figure 5-2. Final Bottleneck Locations – Top 5 Percent



Source: WSP analysis of Highway Performance Monitoring System and National Performance Management Research Data Set data

Figure 5-3 and Figure 5-4 show these results in more detail for Oklahoma City and Tulsa, respectively. As can be seen on Figure 5-3, in Oklahoma City much of the highway system has bottlenecks, including stretches of I-35, I-44, I-40, and US-77, especially around interchanges.

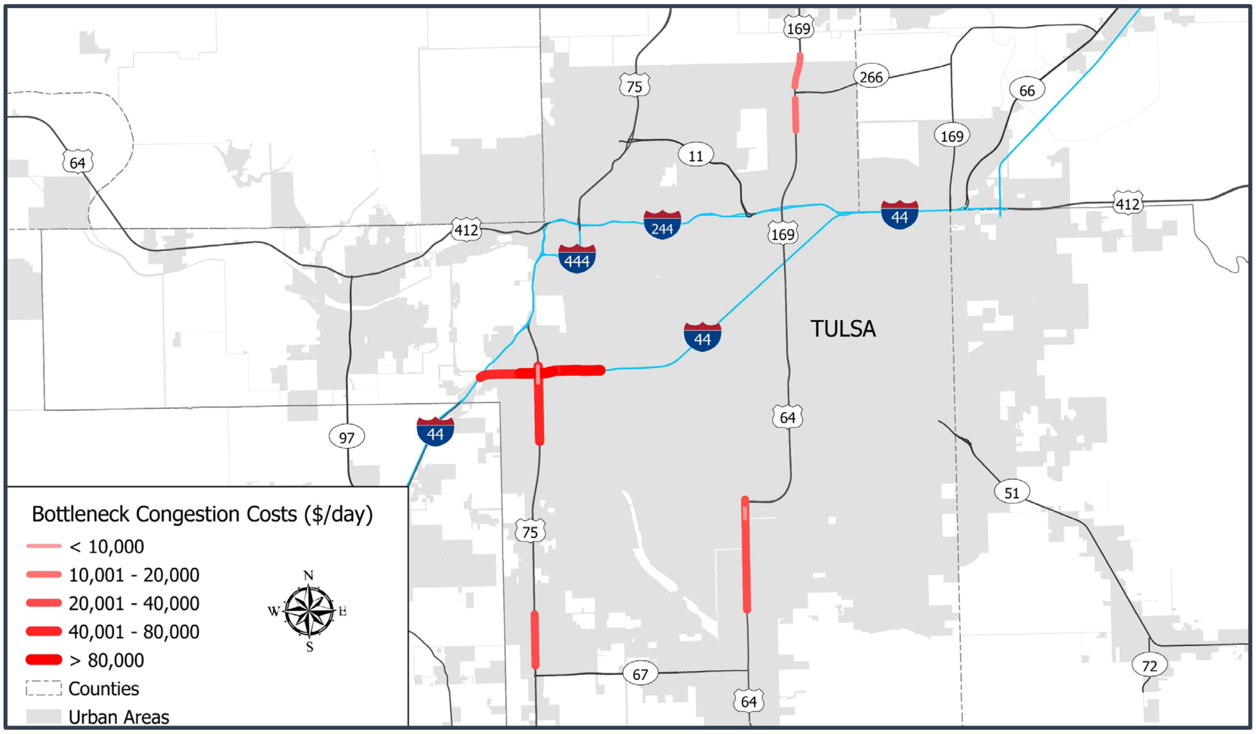
Figure 5-3. Final Bottleneck Locations, Top 5 Percent – Oklahoma City Area



Source: WSP analysis of Highway Performance Monitoring System and National Performance Management Research Data Set data

In the Tulsa area (Figure 5-4), there are several bottlenecks on I-44, US-75, US-64, US-169, and they tend to be located near interchanges as well.

Figure 5-4. Final Bottleneck Locations, Top 5 Percent – Tulsa Area



Source: WSP analysis of Highway Performance Monitoring System and National Performance Management Research Data Set data

5.1.3 Safety

In addition to presenting a safety risk, crashes on a facility can cause slowing and backups that affect all traffic. Locations of frequent crashes affect reliability, a key issue for trucks. To identify areas of safety issues, crashes were evaluated for the entire NHS network. ODOT-recorded crash incidents occurring in 2019 on the NHS were assigned to the relevant segment on the network, and the most impacted 10 percent of mileage in the state (Table 5-2) in terms of crash density (total crashes per mile) and crash rate per million VMT were identified. This amounts to approximately 390 miles of roadways, which recorded 13 crashes per mile or more and 2.1 crashes per 1M VMT or more in 2019.

Table 5-2. Mileage in the Worst 10 Percent of Crash Locations Statewide (2019)

	Crashes Per Mile	Crashes Per 1M VMT
Threshold (top 10 percent)	13.0	2.1
Miles over threshold	393	386
Percentage of total miles	10.3	10.2

Source: ODOT Traffic Engineering Division, 2022

Crashes per mile are a good indication of the potential for delays that could occur on a particular stretch of roadway. Crashes per mile tend to cluster in metropolitan areas and near the interchanges where freeways and highways intersect. For safety analysis, crashes are typically normalized by VMT. Crashes per million VMT points to locations where safety conditions exist that might result from roadway configuration or other physical conditions. In addition to urban segments in Oklahoma City and Tulsa, the top 10 percent of crashes per million VMT identified problematic stretches of highways in rural areas including segments of US-60, US-412, US-75, US-81, and State Highway (SH-)3.

5.1.4 State of Good Repair

Locations with deteriorated pavement conditions can present hazards and slow travel. The International Index ratings for 2017 through 2021 were calculated according to the federal standards in the Highway Performance Monitoring System. A small fraction of Oklahoma's NHS mileage is categorized as having "poor" pavement conditions under this federal specification. The pavement quality on these segments affects freight movement and should be considered along with other needs as part of the state's freight investment strategy.

Other factors on the transportation system, including but not limited to roadway geometry or outdated design features, may contribute to freight bottlenecks as well.

5.1.5 Freight-Related Bottlenecks on Highways

Heavy-freight traffic can also create bottlenecks that affect other highway users. To identify potential locations where delay is exacerbated by freight transportation, the study team examined locations on or near the network that are within 0.25 mile of an area with truck bottlenecks. The areas that have both freight generation and truck bottlenecks are locations where freight could be affecting other users.

The following locations are areas where truck bottlenecks are in proximity to identified freight generators:

- US-54/ US-412 (US-64) intersection – Texas County
- US-81 between SH-33 and SH-3 – Kingfisher County
- US-81 just north of the I-40 intersection – Canadian County
- US-81 at SH-33 intersection – Kingfisher County
- I-44 east of US-75 intersection – Tulsa County
- SH-7 and I-35 interchange – Murray County
- I-35 south of I-40 interchange – Oklahoma County

General traffic congestion or delay issues in these areas could be caused by freight. Solutions to these issues should consider resolution of freight conflicts as well.

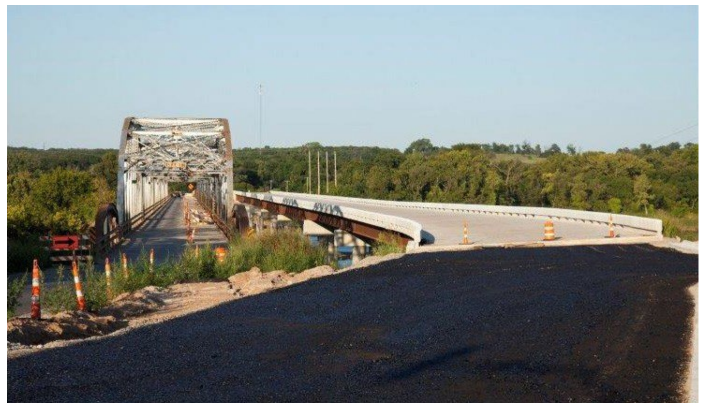
5.1.6 Heavy-Load Route Issues

Heavy-Haul Vehicles In Oklahoma

This OFTP is intended to develop an improved understanding of the impact of heavy-haul vehicles on the highway system and to identify strategies to reduce deterioration. Most heavy-haul traffic moves within established weight limits, but with payloads and gross vehicle weights at the upper limits. In Oklahoma, a vehicle that exceeds the legal statutory dimensions usually requires an OSOW permit, and associated additional fees are required to legally travel on designated highways.[37] An OSOW permit typically includes the conditions related to route specifics, dates of load travel, times of load travel, and escort vehicles. Channeling the heavy loads to fewer routes is one mechanism states use to minimize the impact of heavy loads on the highway system. Another strategy is to direct as much heavy cargo as possible to the rail and water modes. Even in the case of primary transport by rail of water however, trucks often complete the first and last moves for water and rail shipments.

Route Definition For Heavy-Haul Vehicles

Heavy-haul routes, for the purposes of this plan, are highway locations where travel by heavy commercial motor vehicles (including agriculture, energy, mining, or timber cargo) is projected to substantially deteriorate the condition of the roadways. These routes may be traversed by regulation-size vehicles at or near the gross-vehicle-weight limits carrying heavy cargo, or by OSOW vehicles, or superloads.



SH-18 at the Arkansas Red River in Pawnee/Osage Counties

Structurally deficient bridges are problematic across the country, and Oklahoma is no exception. In rural areas, the challenge of travel on inadequate bridges goes beyond truck travel and extends to agricultural equipment transport where the axle ratios are different from trucks and therefore create special needs. Fields on large farms and ranches can be separated by restricted bridges, creating additional miles to move from field to field. Slurry wagons associated with confinement livestock can be extremely heavy and present a similar challenge in rural areas.

ODOT tracks vehicle volumes by route for trucks with OSOW permits or with special superload permits. Tallies of OSOW permits have been 209,000 or more annually for the past six years.

Heavy-Haul Concerns

OSOW shipments present difficulties in managing physical infrastructure, operational processes, and policy. For shipments crossing state lines, the problems are compounded by the need to interact with neighboring states, and/or several states along an extended route.

Physical Infrastructure

OSOW shipments have an impact on physical infrastructure, increasing the need for maintenance and repair to maintain good condition. Bridge conditions are particularly

[37] ODOT has an extensive system of designated Overweight Truck permit "green" routes for approved heavy-haul and long-combination vehicle routes. See ODOT website and http://www.swpermitsok.com/ for more details. 2019 version available at https://www.odot.org/bridge/lpb/pdfs/2019_overweight_permit_truck_map.pdf

problematic given the need for out-of-route miles to work around restricted bridge locations, although ODOT has steadily expanded the system of unrestricted facilities. Superloads by their nature add clearance considerations to physical design for vertical clearance, turning radius, and other dimensional characteristics.

A related physical aspect has to do with the choice of suitable routes and interaction with other traffic. OSOW freight can impede traffic flow on high-volume corridors and create disruptions in cities and towns. This is particularly true for superloads, which move slowly and require special considerations for clearance such as navigating under power lines and traffic signals.

Policy and Operations Practice

Oklahoma carriers report concerns with the permit system as one particular barrier to efficient operations. Although much of this pertains to regular OSOW shipments, the superload operations are especially affected. While concerns include issues such as the need for individual permits for repetitive loads and for empty returns from the same two locations, the OKiePROS system cited earlier in fact has substantially simplified and expedited the permitting process for carriers.

5.2 RAIL MOBILITY ISSUES/CONCERNS IDENTIFIED

Railroad-related concerns and mobility issues can be attributed to several factors. Inadequate track and a rail yard's physical capacity can produce railroad bottlenecks, as can the crossing of two tracks. Rail bottlenecks in turn impact rail velocity. Deficient structures such as bridges can introduce speed restrictions that affect freight mobility.

These factors not only affect the mobility of rail freight but can also have an impact on highway traffic. Slow or stopped trains can interfere with motor vehicle traffic at grade crossings. Even fast-moving trains in high-frequency railroad corridors impact intersecting motor vehicular traffic.

ODOT recently updated its statewide rail plan. The 2022 SRP identified stakeholder concerns, which generally fell into the following three categories:

- Conflict with motor vehicle traffic
- Increased volumes and train lengths
- Infrastructure (bridges or track structure) unable to support current generation railcars
  - This issue generally affects short-line (Class III) railroads.
  - This issue restricts customers to using cars with 263,000-pound loading capacity, as opposed to cars with 286,000-pound capacity. This puts the customers at a commercial disadvantage.

ODOT developed a State Rail Investment Program (SRIP) to address rail investment needs, which are generally summarized in this section. Short-range projects (2022-2025) include funding sources and are listed in Table 5-2 of 2022 SRP. Long-range rail study and project needs and costs, if known, are listed in Table 5-3 at the end of this section. Long-range projects are not expected to be implemented until after 2025 due to the need for funding and/or additional assessment and planning.

5.2.1 Conflict with Motor Vehicle Traffic

The most public impact of rail movements to the general public is at highway/rail grade crossings. Crossings where vehicular traffic and rail traffic intersect creates potential for safety issues, public safety access issues, and congestion issues. Additionally, as noted in the SRIP, in some cases, rail bridges spanning roadway or highways result in clearance issues or highway traffic congestion points.

5.2.2 Increased Volumes, Capacity, and Train Lengths

Over the last several decades the rail industry has utilized many technological advances to improve efficiency. Advances in locomotive technology, more reliance on electronic communication and telemetric devices, use of distributed power, advances in braking technology, and PTC have allowed the railroads to move more freight with, more fuel efficiency than ever before. Two direct outgrowths of this improved platform are the ability to move longer unit trains, and in the PSR modelling to move longer through freight trains between major terminals. To handle longer trains, more or longer passing sidings, additional main line tracks, and/or improved interchange tracks are necessary. These types of projects are reflected in many of the projects enumerated in the SRIP.

The ability to move longer unit trains impacts many of the customer groups that railroads serve in Oklahoma. Customers dealing with origin or destination of grain, coal, aggregates, and oil products among others can benefit from economies of scale from being able to accept unit trains. To the extent that unit train customers are on a Class I railroad, there must be sufficient rail infrastructure and material handling capacity at or near the loading/unloading site to handle the volume of cars and material generated in unit train service (up to 100 to 120 cars per train, depending on commodity). In the case of customers located on a short-line (Class III) railroad, appropriate interchange facilities are an issue. In general, Oklahoma's short lines were created in the 1980s, as branch lines were spun off from Class I railroads. Since the lines were historically a contiguous part of the former owner, a location to "interchange" entire trains of traffic from the care and control of one railroad to another were not particularly robust. The use of unit trains for these commodities has grown exponentially in the past four decades and therefore the ability to hand over unit trains of traffic (loaded and empty) between railroads is a growing problem. As such there are several projects in the SRIP to improve interchanges and generally to address unit train concerns.

Increased train lengths and track capacity issues are particular concerns for the Class I railroads. A significant number of initiatives in the SRIP address capacity concerns, including adding wye[38] tracks, a bridge over the Oklahoma River, grade separating a BNSF/UP level crossing, and additional main line track.

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[38] A wye is an arrangement of railroad tracks in the form of a "Y", used for turning engines, cars, and trains.

5.2.3 Infrastructure (Bridges or Track Structure) Unable to Support Current Generation Railcars

The SRIP includes multiple projects either seeking to maintain a State Of Good Repair, or to address infrastructure to accommodate 286,000-pound railcars. When the majority of Oklahoma's short lines were created, the industry standard for branch lines were an infrastructure that could support moving 263,000-pound railcars. In the intervening years, the industry has moved toward the 286,000-pound car as the industry standard. Therefore, customers who are limited to 263,000-pound cars must pay a premium by moving additional railcars than customers with access to lines upgraded for 286,000-pound cars. While there is savings to the railroad in improved infrastructure and (initially) lower maintenance costs, a large portion of the benefit accrues to the customers themselves.

Table 5-3. Long-Range Freight Rail Studies and Projects (2026 to 2041)

Studies and Projects	Description	General Project Benefits	Estimated Capital Cost, if Known
Oklahoma Intermodal Facility	Develop a new intermodal facility in the state of Oklahoma at a location to be determined.	Enhance multimodal capacity, availability of transloading and intermodal service, and rail system access.	To be determined (TBD)
Arkansas-Oklahoma Railroad Co. Bridge Upgrades	Rehabilitate and/or replace structural components of two bridges Arkansas-Oklahoma Railroad Co. bridges in Wilburton.	Preserves state investment in the state rail network and improves freight service for shippers.	$250,000
BNGR Rail Improvements	Upgrade main line track to include 115-pound rail, tie replacement, ballast placement, and surfacing to increase operating speeds on 17 miles of track from Blackwell to OK/KS state line.	Preserves state investment in the state rail network and improves freight service for shippers.	$27,000,000
Add a Second BNSF Railway Bridge over Arkansas River in Tulsa	There is only one freight rail crossing of the Arkansas River in Tulsa.	Added capacity benefits shippers and improves efficiency.	TBD
Add a second main track on BNSF between Edmond and BNSF Flynn Yard, south of Oklahoma City	Add a second main track on BNSF between Edmond and BNSF Flynn Yard, south of Oklahoma City.	Added capacity benefits shippers and improves efficiency; improves reliability of Heartland Flyer passenger rail service.	TBD
BNSF Grade Separation of US 64/77 in Perry	No grade- separated crossings of the BNSF exist in Perry.	Public benefit - highway and safety improvement.	TBD
Siding extensions along BNSF Cherokee Subdivision	Extend sidings to accommodate longer trains and enhance capacity for meet-pass events between trains.	Added capacity benefits shippers and improves efficiency.	TBD

Studies and Projects	Description	General Project Benefits	Estimated Capital Cost, if Known
BNSF Red Rock Subdivision Double-Tracking	Add second main track to BNSF Red Rock Subdivision to alleviate rail traffic and grade crossing congestion.	Public benefits include reduced crossing delays and safety; private benefits include reduced train delays and lower cost of operations.	TBD
Grade Separate US-64 / BNSF Crossing in Enid	Construct a roadway overpass for US-64 over the BNSF in Enid.	Public benefit - highway and safety improvement.	TBD
Improve overall capacity on BNSF, UP, Arkansas-Oklahoma Railroad Co., and Stillwater Central Railroad in Oklahoma City	Improve overall capacity on all railroads in Oklahoma City.	Added capacity benefits shippers and improves operating efficiency; improves reliability of Heartland Flyer passenger rail service.	TBD
Improve overall capacity on BNSF, UP, and Grainbelt Corporationin Enid.	Improve overall capacity on all railroads in Enid; lengthen or add tracks to accommodate unit trains (typically 100 to 120 cars; up to 8,000 feet clear for each track). This will allow for the efficient interchange of unit trains between Grainbelt and its Class I partners.	Added capacity benefits shippers and improves efficiency.	TBD
Improve main line capacity on KCS Railway between Shady Point and Heavener	Improve main line capacity on KCS Railway between Shady Point and Heavener by constructing passing siding(s) or a second main track.	Added capacity benefits shippers and improves efficiency.	TBD
Bridge upgrades on Northwestern Oklahoma Railroad in Woodward	Rehabilitate and/or replace structural components of bridges to accommodate 286,000-pound rail cars.	Public benefits include reduced transit times and capacity for larger freight cars; private benefits include reduced labor costs and lower operations and maintenance costs.	$1,000,000
Upgrade 0.4 mile of track on Northwestern Oklahoma Railroad in Woodward	Perform tie replacement, ballast placement, and surfacing to increase operating speeds.	Public benefits include reduced transit times and capacity for larger freight cars; private benefits include reduced crew costs and lower operations and maintenance costs.	TBD
Stillwater Central Railroad River Bridge in Oklahoma City	Add second bridge over river in Oklahoma City to provide Stillwater Central Railroad with its own river crossing.	Added capacity benefits shippers and improves efficiency.	TBD

Studies and Projects	Description	General Project Benefits	Estimated Capital Cost, if Known
Add track capacity on Stillwater Central Railroad in Oklahoma City area	Expand number and length of tracks available in Oklahoma City area to accommodate greater volumes of traffic.	Added capacity benefits shippers and improves efficiency.	TBD
Redevelop Former Gerdau Mill Site in Sand Springs	Redevelop brownfield site for potential new customers.	Enhance rail capacity and access.	$1,000,000
Construct customer-funded transload facility on Tulsa-Sapulpa Union Railway Co in Tulsa area	Develop a new transload facility in Oklahoma.	Enhance rail capacity and access.	TBD
Construct UP Washita/ Chickasha Run-Through Terminal	Construct terminal upgrades on UP at Chickasha.	Terminal improvements benefit shippers by reducing total time; private benefits include improved safety and reduced costs.	$43,000,000
Grade Separate State Route 66 / UP Crossing in Claremore	Grade separate State Route 66 and UP crossing in Claremore.	Public benefits include reduced crossing delays and safety; private benefits include reduced train delays.	TBD
Restore out of service UP track from Shawnee to McAlester	Clear vegetation, repair washouts, replace ties, and upgrade rail and bridges as necessary to return track to service.	Public benefits through new east-west service and enhanced rail access and capacity.	$39,500,000
Grade Separate BNSF and UP Crossing in Claremore	Construct a rail overpass to grade separate the UP and BNSF main lines in Claremore.	Public benefits include reduced crossing delays and safety; private benefits include reduced train delays and enhanced capacity.	$63,700,000

Source: Oklahoma DOT, Rail Programs Division

5.3 WATER CONCERNS

5.3.1 Resolve MKARNS Maintenance Backlog

As noted in Chapter 2, while the MKARNS offers strong performance and high reliability, it also faces a significant maintenance backlog. Although Oklahoma's ports have different individual plans and needs, there is agreement that the single most important priority is to preserve the safe, reliable, and productive operation of the MKARNS itself.

"Critical Work" is defined as that work required to repair a component or system for which 1) consensus is that there is a greater than 50 percent chance that the component or system will fail within 5 years, and 2) failure means stopping or significantly affecting the ability to operate the lock or maintain navigation pool. The current total of needed expenditures to address critical backlog on the MKARNS is $301.7 million systemwide, with $160.4 million of that amount on the Oklahoma segment. Rehabilitation and repair projects for Tainter gates (radial arm floodgates used to control water flows) at each of Oklahoma's five locks and dams are among the USACE MKARNS Top 30 Critical Backlog Maintenance Items for fiscal year 2024. Rehabilitation of Tainter gates and miter gates (pairs of gates which swing out from the side walls of a lock structure to control water flows) are also needed on the Arkansas segment.

The critical backlog list includes the following projects on the Oklahoma segment of the MKARNS:

- Webbers Falls Lock and Dam (Lock 16) – dewater miter gates, rehabilitate and paint Tainter gates, lighting
- Robert S. Kerr Lock and Dam (Lock 15) – rehabilitate and paint Tainter gates, analysis and repair of Tainter gate 18, spillway bridge
- Newt Graham Lock and Dam (Lock 18) – rehabilitate and paint Tainter gates, bridge bearing pad replacement
- W. D. Mayo Lock and Dam (Lock 14) – rehabilitate and paint Tainter gates
- Choteau Lock and Dam (Lock 17) – mooring cells to extend lock wall, Stillin Basin scour repair
- Multiple locations – rehabilitate Tainter valves, procure stoplogs, security and fencing

5.3.2 Implement MKARNS Deepening

As noted in Chapter 2, plans to deepen the MKARNS to 12 feet received a significant boost from the BIL, which allocated an additional $168.5 million for the USACE Little Rock District, of which $62.7 million is for operations and maintenance to provide reliable navigation and $92.6 million is for the 12-foot channel deepening project. Estimated cost to complete the deepening project is currently $1,003,314,000.

5.3.3 Address Port-Identified Needs

Interviews with Oklahoma ports were conducted to review and update the following needs identified in the previous Oklahoma Freight Transportation Plan:

- General Port Concerns:
  - The age of the waterway, at 50 years, was a concern mentioned by all participants. The age emphasizes the need for lock and dam repairs.
  - Restoration of the channel after flood events was identified as a top priority.
  - Depth of the channel and dredging were concerns of all participants. The 9-foot depth of the channel must be maintained.
- For the Tulsa Ports:
  - It was suggested that ODOT consider funding post-flood dredging to begin closer to the ports, possibly at the state line. USACE dredging must start downstream and takes

a long time to reach the Oklahoma ports. Private dredgers could be hired and reimbursed later by federal funds.

 - The U.S. Corps of Engineers project to renovate 18 fixtures that allow locks and dams to dewater was emphasized.
 - The port has a Foreign Trade Zone with no current users and has a strong interest in attracting users who can benefit from the designation.

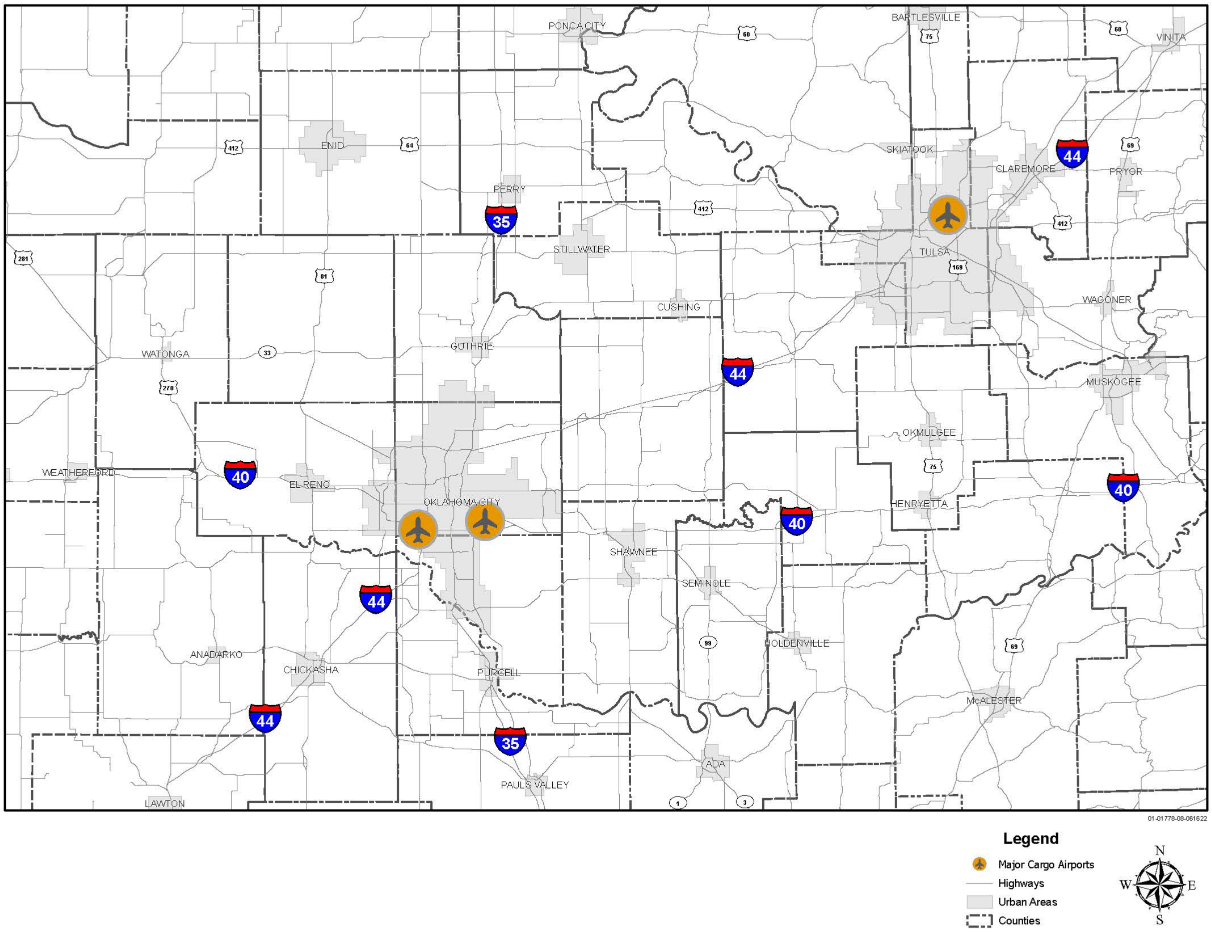
- For the Port of Muskogee:
  - After the 2019 flood, the port cannot use dockside rail at the main dock. The foundation underneath is failing.
  - Mooring modernization is needed to replace every mooring structure.
- For Oakley's Port 33:
  - Completion of a planned overpass at the intersection of Hwy 412 and N 305th East Avenue, to the west of their facility in Catoosa, was identified as a top need to help reduce accidents and congestion for trucks accessing the port.
  - Lock closures that last longer than 14 days cause significant issues.
  - Parking and mooring for barges were identified as needing funding.

5.4 AIRPORT ACCESS CONCERNS

As described in Chapter 2 of this Plan, the state has three primary commercial service airports: Lawton-Fort Sill Regional in Lawton, Will Rogers World Airport in Oklahoma City, and Tulsa International in Tulsa. These airports, shown in Figure 5-5, provide air cargo service to the state.

The truck bottlenecks identified in Section 5.1.1 were reviewed to determine whether any of them affected the airports. Will Rogers World Airport is near the interchange of I-44 and I-240, which is in proximity to a bottleneck segment (see Figure 5-3 earlier in this report). In addition, on I-44 just north of the interchange is a series of bottlenecks. Trucks accessing Tulsa International Airport could be affected by bottlenecks on US-169 north of I-244 (see Figure 5-4 earlier in this report). There are no discernible bottlenecks in the vicinity of Lawton-Fort Sill Regional Airport. The nearest bottleneck is at the intersection of US-277 and I-44 about 12 miles to the south of the airport (see Figure 5-2 earlier in this report).

Figure 5-5. Major Cargo Airports in Oklahoma



6 Moving Freight

6.1 FREIGHT FLOWS FOR 2023 THROUGH 2030

Oklahoma's total inbound, outbound, and within-state freight tonnage for all modes (Table 6-1) is projected to grow 12.2 percent between years 2023 and 2030, from 434 million tons in 2023 to 487 million tons in 2030. By tonnage, the highest growth is for pipeline (23.9 million tons), trucking (22.7 million tons), multiple modes (3.3 million tons), and rail (2.2 million tons). By percentage, the highest growth is for air (22.7 percent), other and unknown (17.4 percent), and multiple modes (17.2 percent).

Table 6-1. Oklahoma Freight Growth, 2023 through 2030 (millions of tons)

Time Period and Metric	Domestic Mode	Inbound	Outbound	Within	Total
Tonnage 2023 by Mode and Direction (millions)	Truck	44.75	48.84	118.74	**212.33**
	Pipeline	66.05	76.29	17.87	**160.21**
	Rail	9.53	6.51	19.84	**35.88**
	Multiple modes & mail	11.36	5.83	1.84	**19.04**
	Water	0.92	5.08	0.70	**6.70**
	Air (include truck-air)	0.02	0.02	0.00	**0.04**
	Other and unknown	0.00	0.02	0.00	**0.02**
	TOTAL	**132.63**	**142.60**	**158.99**	**434.22**
Tonnage 2030 by Mode and Direction (millions)	Truck	50.15	55.57	129.29	**235.02**
	Pipeline	77.57	85.77	20.76	**184.10**
	Rail	8.57	7.51	21.99	**38.07**
	Multiple modes & mail	13.09	7.12	2.09	**22.30**
	Water	0.89	6.03	0.75	**7.67**
	Air (include truck-air)	0.03	0.03	0.00	**0.05**
	Other and unknown	0.00	0.03	0.00	**0.03**
	TOTAL	**150.29**	**162.06**	**174.89**	**487.24**
Percentage Change in Tonnage by Mode and Direction between 2023 and 2030	Truck	12.1%	13.8%	8.9%	**10.7%**
	Pipeline	17.4%	12.4%	16.2%	**14.9%**
	Rail	-10.1%	15.3%	10.9%	**6.1%**
	Multiple modes & mail	15.2%	22.1%	13.6%	**17.2%**
	Water	-3.3%	18.6%	6.7%	**14.4%**
	Air (include truck-air)	26.1%	19.0%	0.0%	**22.7%**
	Other and unknown	0.0%	17.4%	0.0%	**17.4%**
	TOTAL	**13.3%**	**13.6%**	**10.0%**	**12.2%**

Source: Freight Analysis Framework 5.3

Projected growth is relatively balanced by type of flow. Inbound freight is expected to grow by 13.3 percent, outbound freight by 13.6 percent, and within-state freight by 10.0 percent. In each period, the top four tonnage commodities are projected to be petroleum and coal products, crude petroleum, gravel, and gasoline. In 2023, fuel oils is projected to rank fifth and nonmetallic mineral products sixth; this ranking is reversed in the 2030 projection.

6.2 FREIGHT POLICIES AND STRATEGIES

6.2.1 Policies and Strategies Address Plan Goals

This OFTP establishes freight policies and strategies, which incorporate and draw upon many sources. Oklahoma's LRTP 2020 through 2045 includes an extensive list of policies and strategies.

A review of the LRTP showed that its policies include sufficient coverage to address freight issues. The LRTP includes policies and strategies related to freight movement by modal system:

- Highway and Bridge
- Freight Rail
- Multimodal
- Waterways and Ports
- Airport Access and Aviation.

This OFTP is intended to draw upon, and integrate, a broad range of perspectives and opportunities. In addition to the LRTP, the 2022 SRP also identifies strategies for ODOT as it moves forward with its rail programs. ODOT recognizes that other important goals, policies, and strategies may be contained in state economic development plans, metropolitan area plans, regional/county/local documents, development plans for ports and airports, and private development plans.

These types of plans are continuously in development, and because they produce important recommendations for freight policies and strategies, ODOT will consider them as part of its larger ongoing program of freight planning. Thus, the appropriate policies, along with related strategies, were selected for use in the Plan.

Further, as part of the 2018-2022 OFTP, additional freight-focused strategies were developed. The 2020-2045 LRTP incorporated these by reference and called for their implementation under an updated strategy. It also created new freight-related strategies. Further, the 2023-2030 OFTP added and refined a few strategies to more clearly address IIJA requirements regarding reducing environmental impacts and improving resiliency. Table 6-2 summarizes each of the LRTP goal areas and freight-related strategies that were adopted. Those that were added after the 2018-2022 OFTP are marked as new or updated.

Table 6-2. Multimodal Freight-Related Strategies by Goal Areas

Goal Area	Freight-Related Strategy
Safe and Secure Travel	▪ Plan for the impact and promote the appropriate use of connected and automated vehicle technologies. ▪ Utilize data to track the volume and safety of truck, passenger vehicle, and train growth, and support necessary infrastructure improvements. ▪ Ensure sufficient truck parking and rest areas for major freight routes and activity centers by partnering with the trucking industry to facilitate that adequate truck parking is available throughout the state. **(Updated)** ▪ Improve the safety of rail-highway at-grade crossings. ▪ Evaluate the new rail crossing inventory with rail and highway traffic data and review accident exposure ratings using the FRA safety program. **(Updated)**
Infrastructure Preservation	▪ Incorporate freight considerations into all appropriate project evaluations. ▪ Incorporate resilience designs or actions in freight-supportive infrastructure during the planning and design process to address flooding and extreme weather events. **(New)** ▪ Monitor and maintain condition of state-owned freight routes. ▪ Track utilization of OSOW truck routes. ▪ Proactively disseminate advance information about highway construction activities to freight stakeholders.
Efficient Intermodal System Management and Operation	▪ Identify competitive opportunities and pursue federal grants for strategic freight projects. ▪ Provide information to the Oklahoma congressional delegation to support expansion of federal freight funding, and utilization of existing funds. ▪ Cooperate with neighboring states to develop improvement and funding concepts for multimodal corridors of strategic economic and security importance to the state, region, and nation. ▪ Pilot and implement new technologies and ITS tools. ▪ Consider pilot programs for emerging transportation technology and identify preferred implementation strategies that address interactions between new and existing technology, and the application of lessons learned to future locations. **(New)** ▪ Inventory and monitor Oklahoma's critical supply chains, and evaluate their resiliency and reliability. ▪ Periodically, perform an analysis of Oklahoma's rail network to identify future connectivity gaps based on changing freight patterns and the Oklahoma Statewide Freight and Passenger Rail Plan. **(Updated)** ▪ Collaborate with freight stakeholders and utilize latest technologies and data to address freight bottlenecks and prioritize investments to eliminate the bottlenecks. **(Updated)** ▪ Maintain coordination between government agencies and Class I railroads. **(Updated)** ▪ Continue the use of OKiePROS to provide assitance to OSOW commercial motor vehicle users for making safe and efficient route choices. **(Updated)** ▪ Pursue opportunities to partner with the private sector to provide for truck parking including sharing information on parking locations and real-time availability. **(Updated)**
Economic Vitality	▪ Ensure investment in freight facilities relied upon by industries critical to the state economy. ▪ Encourage viable economic development across the state through availability of effective freight services. ▪ Continue to seek ways to expedite project approvals to speed reaction to market shifts and attract private capital. ▪ Support public transportation options for workforce in freight-dependent industries.

Goal Area	Freight-Related Strategy
Mobility (Choice, Connectivity and Accessibility)	▪ Monitor and seek to improve the reliability, speed, and productivity of freight movement in Oklahoma. ▪ Monitor and promote opportunities for development of intermodal and multimodal facilities in Oklahoma. **(Updated)** ▪ Encourage development of multimodal networks and intermodal facilities, and assure efficient highway access to air, rail, and waterway facilities. ▪ Prepare for continued strong growth of home delivery by managing performance of highway access routes between distribution centers and delivery recipients. ▪ Support upgrades to Class III track and structures to permit use of 286,000-pound standard rail cars and larger, which in turn will support service and improve service efficiency.**(Updated)**
Environmental Responsibility	▪ Encourage expansion of alternative fueling facilities.**(Updated)** ▪ Further Oklahoma's wind energy sector in order to provide renewable power to support electrical vehicle charging and reduce emissions. **(New**) ▪ Support the availability of freight modal options that reduce environmental impacts. ▪ Prepare for future extreme weather impacts, including stormater runoff and flooding, on transportation infrastructure through site and stressor identification and risk assessment. **(New)** ▪ Develop after-action reports with clear recommendations for improvement following extreme weather and flooding/stormwaterrunoff events. **(New)** ▪ Explore opportunities with neighboring states to reduce freight emissions and associated air pollution to the state, region, and nation.**(New)** ▪ Coordinate with stakeholders to mitigate negative impacts on wildlife (including habitat) and the natural environment as freight volumes increase. **(New)**
Fiscal Responsibility	▪ Consider policies related to communications technology (e.g., SG, broadband) to support public-private implementation of emerging technologies. **(New)** ▪ Explore various alternatives for funding the state's surface transportation program, such as:secruing increased percentage of state morot vehicle revenue, increasing deisel tax, increasing freight fees, considering a VMT fee, innovative tolling, and apply road use pricing of connected automated vehicle systems. **(Updated)** ▪ Implement performance-based planning and decision-making through a data-driven approcach to project selection and prioritization for the Eight-Year Construction Work Plan tying decisions to performance targets. **(New)** ▪ Continue to work with federal and state officials to obain funding for the maintenance of existing locks and dams as well as ongoing critical needs. **(Updated)**

6.3 FREIGHT PERFORMANCE MEASURES

The FAST Act—like its predecessor legislation, Moving Ahead for Progress in the 21st Century Act (MAP-21)—emphasized the establishment of performance measures. The value of freight performance measurement is to improve Oklahoma's ability to quantify key performance dimensions in a consistent and systematic way, to identify emerging bottlenecks or deficiencies at the early stages so they can be appropriately addressed, to make project investment decisions in a data-driven manner, and—perhaps most importantly—to track its progress toward meeting its freight goals.[39] Freight performance measures must therefore be closely aligned with freight goals.

6.3.1 Performance Measurement

U.S. DOT requires collecting and reporting only one freight performance measure, which addresses reliability on the interstate system using the Truck Travel Time Reliability Index (TTTR). U.S. DOT also requires states to report other performance measures that are not freight-specific but are relevant to achieving state freight goals.

Table 6-3 illustrates the correspondence between Oklahoma freight goals and the recommended freight performance measures.

[39] For example, ODOT invested in a tool called "Decision Lens" to support the development of its Eight-Year Construction Work Plan. The Decision Lens tool may include performance criteria addressing criteria such as bridge condition, pavement condition, geometric deficiencies, crash mitigation, system utilization, and system mobility/performance. Freight performance measures may also be incorporated into the tool.

Table 6-3. Oklahoma's Freight Goals and Correspondence to Oklahoma Freight Transportation Plan Freight Performance Measures

OFTP Freight Goal Areas	Source of Measure	OFTP Freight Transportation Performance Measures
Safe and Secure Travel	OK Measure	▪ Mileage with Paved Shoulders
	U.S. DOT Measure	▪ Rail Grade-Crossing Crashes ▪ Truck Crashes
Infrastructure Preservation	U.S. DOT General Requirement	▪ Bridge Deck Condition Ratings Pavement Condition Ratings
Efficient Intermodal System Management and Operation	OK Measure	▪ Median Truck Travel Speed Truck Travel Time Index – A measure indicating how well the system performs in periods of congestion; similar to the TTTR above, but covering all of Oklahoma's NHS. ▪ Truck Delay – A measure of how congestion impacts truck travel times, which in turn impacts freight transportation costs and prices. ▪ Truck Congestion Costs – A measure of congestion costs incurred by shippers on Oklahoma's NHS indicated by monetized truck delay and monetized TTTR, as detailed in NCHRP 925.
Economic Vitality	OK Measure	▪ Highly Used Truck Mileage
Mobility: Choice, Connectivity and Accessibility	U.S. DOT Freight Requirement	▪ TTTR Index – A measure indicating how well the OK interstate highway system performs in periods of congestion—the higher the index, the greater the impact of congestion.
Environmental Responsibility	OK Measure	▪ Clean Fuel Access
Fiscal Repsonsibility		▪ Sustainably fund and efficiently deliver quality transportation projects while continuing to leverage additional resources in coordination with ODOT's partners.

6.4 IMPROVEMENT PRIORITIES

6.4.1 Project Gaps

The bottleneck analysis described in Chapter 5 identifies highways with performance issues (Figure 5-1). For a location to be identified as a bottleneck priority that would receive further consideration in the OFTP final analysis, it had to rank in the top 5 percent of way segments in terms of delay or unreliability. Therefore, these are the places on Oklahoma's state highway system that are considered the major chokepoints for truck movements.

Of the highway bottlenecks identified, 25 did not have a project associated with that location in the first five years of the Eight-Year Construction Work Plan. Some of these locations are addressed with projects that are underway, or will be addressed by projects in later years of the Eight-Year Construction Work Plan.

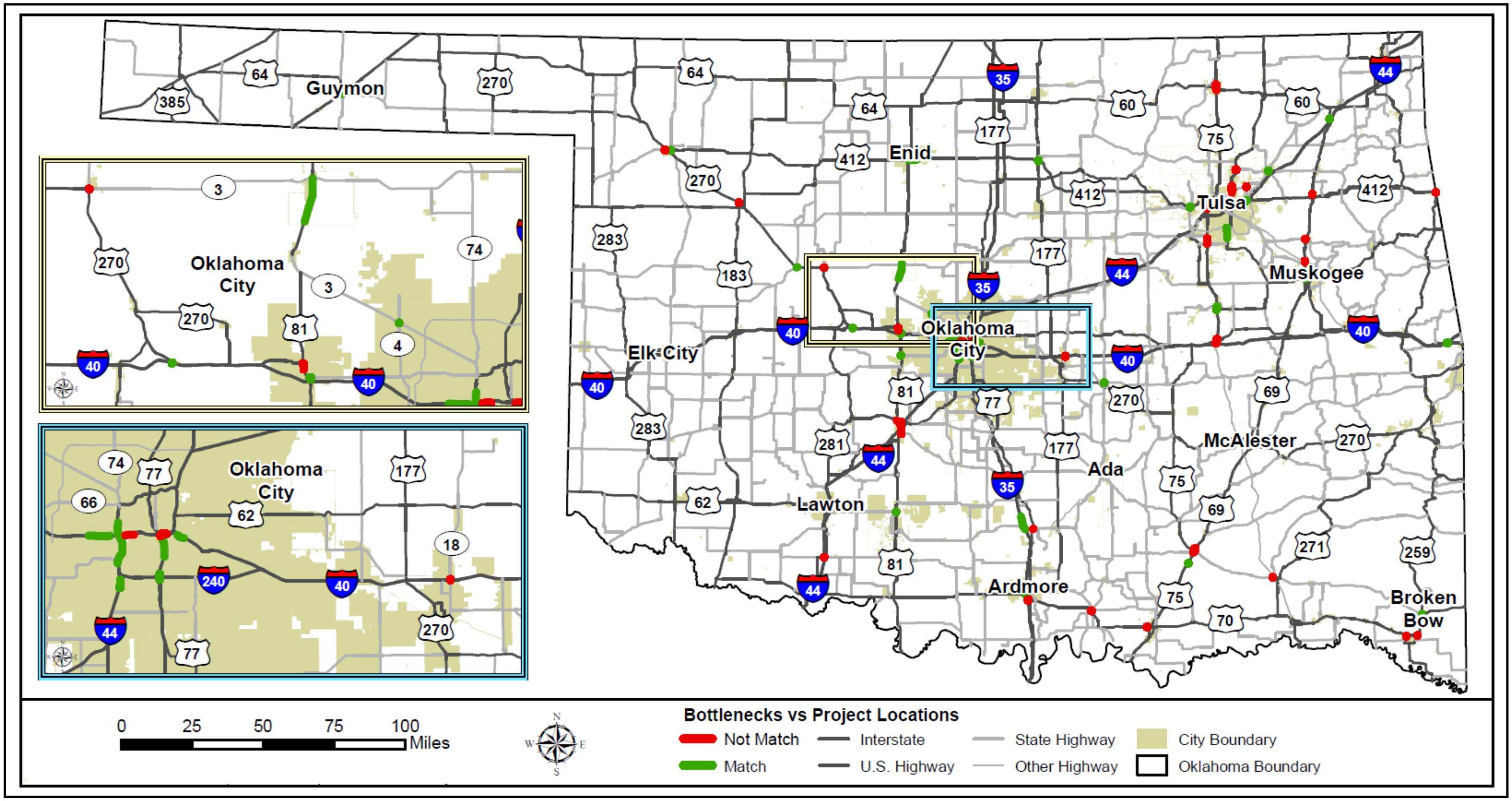
Table 6-4 corresponds with Figure 6-1 and lists the highways affected by bottleneck locations, which do not have projects in the Eight-Year Construction Work Plan. An engineering analysis is required to assess the situation and to develop appropriate responses. As noted previously, there are various possible explanations, including that solutions are too expensive or infeasible to address at this time. The determination can be made only after looking into each location individually.

Table 6-4. Bottleneck Locations without Project

Type of Highway	County	Affected Highway
Interstate	Cotton	▪ I-44 at OK-5
	Carter	▪ I-35 at US-70
	Oklahoma	▪ I-40 South Agnew Avenue (westbound) ▪ I-35 at I-40 Oklahoma River (westbound)
	Tulsa	▪ I-244 near SW Blvd
Other Highway	Atoka	▪ US-69 near OK-3
	Bryan	▪ US-70 at Durant Bypass
	Grady	▪ US-81 at W Grand Avenue (northbound) ▪ US-81 and OK-19 (northbound) ▪ US-62 at Line Creek (eastbound)
	Delaware	▪ US-412 at US-59
	McCurtain	▪ US-70 and OK-3 (eastbound)
	Pottawatomie	▪ OK-18 near I-40
	Tulsa/Rogers	▪ US-75 at W 138th Street S (northbound) ▪ US-169 at E 56th Street North (southbound) ▪ US-169 at ODOT (northbound) ▪ US-75 at W 138th Street S (southbound) ▪ OK-167 at OK-266 ▪ OK-20 at US-169
	Wagoner	▪ US-69 at OK-51, US-69 at OK-351
	Washington	▪ US-60 near Memorial Park Cemetery ▪ US-75 near Frank Phillips Boulevard
	Woodward	▪ OK-3 and Oklahoma Avenue

Source: WSP analysis 2022

Figure 6-1. Bottleneck Locations Without a Project



Source: Oklahoma Department of Transportation; WSP analysis of Highway Performance Monitoring System and National Performance Management Research Data Set data

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6.5 FREIGHT INVESTMENT ELEMENT

6.5.1 Funding for Freight Projects

Addressing the many needs on Oklahoma's transportation system requires extensive collaboration and resources from public and private partners.

Table 6-5 provides a summary of potential federal, state, and local government funding options.

Table 6-5. Potential Public-Funding Options

Federal (Discretionary Grant Programs)	Federal (Formula Funds)	State and Local
Mega Grant Program also known as National Infrastructure Project Assistance program	National Highway Performance Program	Rebuilding Oklahoma Access and Driver Safety Fund
Rebuilding American Infrastructure with Sustainability and Equity Grants	Surface Transportation Block Grants	Dedicated local funds
Infrastructure for Rebuilding America Grants	Highway Safety Improvement Program	
Rail Line Relocation and Improvement Capital Grant Program	Railway-Highway Crossings Program	
Federal-State Partnership for State of Good Repair Program	Congestion Mitigation and Air Quality Improvement	
Restoration and Enhancement Grants	Metropolitan Planning Funds	
Railroad Safety Infrastructure Improvement Grant Program	National Freight Program	
Consolidated Rail Infrastructure and Safety Improvements	Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation Program	
Federal Highway Administration Bridge Investment Program	FHWA Bridge Formula Program	
Strengthening Mobility and Revolutionizing Transportation Grant Program	FHWA Charging Infrastructure Formula Grant Program	
Rural Surface Transportation Grant Program		

Source: WSP 2022

Table 6-6 provides a summary of potential traditional and alternative financing options.

Table 6-6. Potential Alternative Financing Options

Traditional Financing	Alternative Financing
State Tax Exempt Bonds	State Infrastructure Bank
	Revenue Anticipation Notes

Source: WSP 2022

6.5.2 Freight Investment Plan Projects

National Highway Freight Program Projects

ODOT considered various factors for the allocation of federal freight formula funds for Oklahoma's freight projects including level of annual funding, corridor focus, geographic diversification, stakeholder priorities, project size, and designation of critical candidate rural freight corridors. The resulting set of 173 projects, selected eligible to be funded in part with NHFP funds, constitute Oklahoma's Eight-Year Fiscally Constrained Freight Investment Plan.

ODOT is committed to improving Oklahoma freight network, with planned projects from FY2023-FY2030 in excess of $3.5 billion. As shown in Table 6-7 and Table 6-9, FY2023 projects require total funding of $526.8 million alone.[40] To ensure sufficient funding is allocated across not only freight projects but all construction projects, ODOT intends to update the NHFP funds, and state and other federal sources for projects each year. This will allow ODOT to ensure budgets and funding splits are carefully considered as projects are submitted to FHWA for authorization, and in agreement with the rebalancing of ODOT's Eight-Year Construction Work Plan each year.

The scope, schedule and budget of projects that previously existed in the Eight-Year Construction Work Plan are re-validated every federal fiscal year with the federal fiscal year defined as beginning October 1st and ending September 30th. Any adjustments are initiated with consideration for the ongoing debt service requirements of previous projects, the ability to schedule and prepare projects for construction in the appropriate Federal-Aid funding categories, and the ability to sustain a reasonable annual Eight-Year Construction Work Plan in each district. Based on the re-validation results, executive leadership, Comptroller Division, Project Management Division and the Field District Engineers, work to fiscally constrain and balance the Eight-Year Construction Work Plan in accordance with the allocation requirements of the applicable federal funding categories.

[40] Please note, that due to rounding, some column totals may not match exactly.

Table 6-7. Eight-Year Financially Constrained Freight Investment Plan Projects

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source		
							NHFP	Other Fed	State
Beckham District 5	29526(11)	I-40: AT THE NORTH FORK OF THE RED RIVER LOCATED 2.0 MI NE OF THE US-283 JCT. (WB ONLY)	2023	C	Y	$1.09	$0.87	$0.00	$0.22
Caddo District 5	31816(04)	I-40: BEGIN AT MP 89.72 AND EXT TO MP 95.76.	2023	C	Y	$10.57	$1.00	$7.46	$2.11
Canadian District 4	31807(04)	US-81: AT SH-66 JUNCTION IN EL RENO.	2023	OI	R	$8.00	$1.00	$5.40	$1.60
Canadian District 4	34305(04)	I-40: FROM 7.5 MILES EAST OF CADDO COUNTY LINE EXTEND EAST TO I40B/SH66	2023	C	Y	$18.00	$1.00	$13.40	$3.60
Choctaw District 2	34811(04)	US-271: BEGIN AT THE STATE LINE, EXTEND NORTH 7.0 MI	2023	C	R	$8.73	$1.00	$5.98	$1.75
Cleveland District 3	35235(04)	I-35 FRONTAGE: OPERATIONAL IMPROVEMENT FROM SW 34TH STREET TO SW 19TH STREET IN MOORE	2023	C	Y	$10.00	$1.00	$7.00	$2.00
Comanche District 7	35553(04)	US-62: FROM 0.44 MIS. W. OF SH-115, EXTEND E. 7.90 MIS.	2023	C	R	$6.70	$1.00	$4.36	$1.34
Ellis District 6	29674(04)	SH-15: BEGIN APPROX 1.3 MI NE OF THE JCT US-283, EXTEND EAST APPROX 3.2 MI	2023	C	R	$7.60	$1.00	$5.08	$1.52
Garfield District 4	35671(04)	US-64/412: FROM NORTH 30TH ST IN ENID EXT EAST TO N2970 RD APPX 7 MILES WEST OF SH-74	2023	C	R	$5.00	$1.00	$3.00	$1.00
Kay District 4	35675(04)	US-60: FROM US-177 JCT EXT EAST APPROX 4.17 MILES TO PONCA CITY	2023	C	R	$3.00	$1.00	$1.40	$0.60
LeFlore District 2	17127(04)	US-59: FROM SUNSET CORNER, EXTEND WEST APPROX 5.9 MI	2023	C	R	$21.06	$1.00	$15.85	$4.21
Love District 7	33481(04)	I-35: FROM THE TEXAS S/L N. 1.0 MIS. TO THE MM 1 INTERCHANGE (TXDOT PARTICIPATION)	2023	C	Y	$34.05	$1.00	$26.24	$6.81
McClain District 3	19314(04)	I-35: AT SH-9W INTERCHANGE, 25.0 MILES NORTH OF GARVIN COUNTY LINE	2023	OI	Y	$39.00	$1.00	$30.20	$7.80
McClain District 3	35588(04)	I-35: FROM 23.0 MILES NORTH OF THE GARVIN COUNTY LINE AT SH-74, NORTH 2.7 MILES TO THE CLEVELAND COUNTY LINE	2023	C	Y	$24.00	$1.00	$18.20	$4.80
Muskogee District 1	27081(04)	US-69: BEGIN AT MCINTOSH COUNTY LINE, EXTEND NORTH 4.36 MILES	2023	C	R	$1.90	$1.00	$0.52	$0.38
Muskogee District 1	35257(04)	MKARNS: MOORING MODERNIZATION AT MULTIPLE LOCATIONS	2023	OI	M	$10.00	$0.50	$7.50	$2.00

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source		
							NHFP	Other Fed	State
Sequoyah District 1	34671(04)	US-64: OVER ARKANSAS RIVER (MONEY ONLY WITH ARDOT) DECK REPLACE PROJECT	2023	C	R	$3.86	$1.00	$2.09	$0.77
Stephens District 7	35559(04)	DUNCAN BYPASS: FROM 700' E. OF US-81, EXTEND W. & THEN N. 4.43 MIS. TO 0.50 MIS. N. OF ELK AVENUE	2023	C	R	$2.94	$1.00	$1.35	$0.59
Texas District 6	14971(42)	US-54: BEGIN APPROX 10.5 MI N OF JCT US-64 WEST, EXTEND NORTH 3.6 MILES (SURFACE FOR (35)	2023	C	R	$12.00	$1.00	$8.60	$2.40
Tulsa District 8	26301(05)	I-244: FROM I-44 NORTH 2 MI. TO US-75 AND REHAB BRIDGES OVER 48TH ST	2023	C	Y	$15.83	$1.00	$11.67	$3.17
Tulsa District 8	26301(06)	I-244: FROM US-75 SOUTH JCT. EXTEND NORTH 2.1 MI. TO ARKANSAS RIVER AND REHAB BRIDGE OVER 31ST. STREET	2023	C	Y	$22.43	$1.00	$16.95	$4.49
Tulsa District 8	33788(08)	I-44: AT THE US-75 INTERCHANGE WP 2	2023	OI	Y	$70.40	$1.00	$55.32	$14.08
Tulsa District 8	35135(04)	I-244: OVER I-444 & BNSF RR (EB)	2023	C	Y	$6.00	$1.00	$3.80	$1.20
					Subtotal 2023	**$342.17**	**$22.37**	**$251.36**	**$68.44**
Caddo District 5	31096(04)	I-40: BEGIN AT MP 86.27 AND EXT TO MP 89.72.	2024	C	Y	$7.59	$1.00	$5.07	$1.52
Cimarron District 6	31867(04)	US-56: BEGIN 4.7 MI SW OF THE JCT US-385, EXTEND NE 7.96 MILES TO 1ST ST S IN BOISE CITY	2024	C	R	$16.50	$1.00	$12.20	$3.30
Cleveland District 3	33815(04)	SH-9: OVER BISHOP CREEK, 0.8 MI WEST OF US-77	2024	C	R	$7.00	$1.00	$4.60	$1.40
Dewey District 5	17671(14)	US-270: BEGIN 8.4 MI SE OF THE SH-51 EAST JCT & EXTEND SE 5.0 MILES.	2024	C	R	$26.52	$1.00	$20.22	$5.30
LeFlore District 2	17127(28)	US-59: FROM SUNSET CORNER, EXTEND WEST APPROX 5.9 MI	2024	C	R	$38.72	$1.00	$29.98	$7.74
Major District 6	31059(04)	US-60: BEGIN 6.2 MI WEST OF THE GARFIELD C/L, EXTEND EAST 6.2 MI	2024	C	R	$15.00	$1.00	$11.00	$3.00
Mayes District 8	31091(04)	US-69: BEGIN AT MAYES/WAGONER CL AND EXTEND NORTH APPROX 6.7 MI SB	2024	C	R	$17.32	$1.00	$12.85	$3.46
McCurtain District 2	26343(04)	US-259: BEG APPROX 8.0 MILE NORTH OF TEXAS S/L & EXT NORTH APPROX 7.2 MILE	2024	C	R	$20.82	$1.00	$15.65	$4.16
McCurtain District 2	34333(04)	US-259: FROM 6.25 MI N. OF JCT SH-3, EXTEND N. 6.00 MI	2024	C	R	$35.37	$1.00	$27.30	$7.07
Oklahoma District 4	28951(04)	I-40: EB & WB BRIDGES OVER I-44 5.3 MIS. E. OF THE CANADIAN C/L ("K" INTERCHANGE).	2024	C	Y	$50.47	$1.00	$39.38	$10.09

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Other Fed	State
Oklahoma District 4	32425(05)	I-35: FRONTAGE ROAD MODIFICATIONS FROM MEMORIAL RD, EXT N. 3 MILES TO SH-66	2024	C	Y	$9.27	$1.00	$6.42	$1.85
Oklahoma District 4	32425(08)	I-35: FRONTAGE ROAD MODIFICATIONS FROM MEMORIAL RD, EXT N. 3 MILES TO SH-66 (ROADWAY PORTION)	2024	C	Y	$10.30	$1.00	$7.24	$2.06
Oklahoma District 4	29852(04)	I-40: EB & WB BRIDGES OVER PORTLAND AVE. 5.0 MIS. E. OF THE CANADIAN C/L	2024	C	Y	$20.60	$1.50	$14.98	$4.12
Pottawatomie District 3	21007(07)	I-40: FROM OKLAHOMA COUNTY LINE, EAST 2.5 MILES	2024	C	Y	$20.50	$1.00	$15.40	$4.10
Pottawatomie District 3	31872(04)	US-270: FROM 2.6 MILES SOUTH OF I-40, SOUTHEAST 2.3 MILES	2024	C	R	$18.50	$1.00	$13.80	$3.70
Rogers District 8	20899(09)	SH-66: OVER BIRD CREEK (NORTHBOUND) & ROAD UNDER, 3.68 MILES NORTH OF I-44	2024	C	R	$5.99	$1.00	$3.79	$1.20
Rogers District 8	32694(04)	US-412: FROM 1.06 MILES EAST OF SH-66, EXTEND EAST 6.44 MILES	2024	C	R	$24.67	$1.00	$18.74	$4.93
Rogers District 8	35493(04)	SH-66/I-44/US-412: (OPERATIONAL IMPROVEMENTS)	2024	OI	R	$30.01	$1.00	$23.01	$6.00
Sequoyah District 1	23107(07)	US-59 FROM US-64 NORTH 3.5 MI (INCLUDES HOG CR BR)	2024	C	R	$11.96	$1.00	$8.57	$2.39
Stephens7	33761(04)	US-81: AT THE US-81/SH 7 JUNCTION JUST S. OF MARLOW (LAWTON/DUNCAN WYE)	2024	C	R	$0.65	$0.50	$0.02	$0.13
Tulsa District 8	33788(11)	I-44: AT THE US-75 INTERCHANGE WP 5	2024	C	Y	$70.91	$1.00	$55.73	$14.18
Wagoner District 1	30648(04)	SH-51: AT MP 2.20 (91ST ST S)	2024	OI	R	$1.30	$1.00	$0.04	$0.26
					Subtotal 2024	**$459.96**	**$22.00**	**$345.97**	**$91.99**
Bryan District 2	35186(04)	US-70: RAMPS AT HILLCREST DRIVE IN DURANT, APPROX 3.0 MI EAST OF SH-78	2025	C	R	$2.72	$1.00	$1.18	$0.54
Cleveland District 3	35017(04)	I-44: AT SW 119TH STREET, 2.9 MILES NORTH OF MCCLAIN COUNTY LINE	2025	C	Y	$2.00	$1.00	$0.60	$0.40
Comanche District 7	31890(04)	SH 7: WESTBOUND BRIDGE OVER EAST CACHE CREEK 1.1 MIS. E. OF US281B	2025	C	R	$2.32	$1.00	$0.85	$0.46
Comanche District 7	35730(04)	US-62: NEW INTERCHANGE, 1.94 MIS. E. OF DEYO MISSION RD IN LAWTON	2025	OI	R	$16.00	$1.00	$11.80	$3.20
Custer District 5	31842(04)	I-40: AT EXIT 65, I-40B WEST JCT IN CLINTON.	2025	C	Y	$53.93	$1.00	$42.14	$10.79
Custer District 5	32681(04)	I-40: CABLE BARRIER FROM MP 69.07 TO MP 86.27.	2025	C	Y	$2.91	$1.00	$1.33	$0.58

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source		
							NHFP	Other Fed	State
Garvin District 3	30389(04)	I-35: FROM 23.6 MILES NORTH OF MURRAY COUNTY LINE AT SH-145, NORTH 4.3 MILES	2025	C	Y	$9.50	$1.00	$6.60	$1.90
McClain District 3	32802(04)	I-35: INTERCHANGE AT SH-74 (GRANT STREET), IN PURCELL	2025	C	Y	$31.50	$1.00	$24.20	$6.30
McClain District 3	35589(04)	I-35: FROM 18.9 MILES NORTH OF GARVIN COUNTY LINE, NORTH 4.2 MILES TO SH-74	2025	C	Y	$38.00	$1.00	$29.40	$7.60
McCurtain2	24409(08)	SH-3: FROM 17.55 MI EAST OF THE PUSHMATAHA C/L EAST 4.5 MI	2025	C	R	$9.30	$1.00	$6.44	$1.86
Muskogee District 1	27108(04)	US-69: BEGIN 0.48 MI N OF US-64 E (PEAK BLVD) & EXT N 2.5 MILES	2025	C	R	$35.00	$1.00	$27.00	$7.00
Oklahoma District 4	29843(04)	I-35:OVER WATERLOO ROAD AT THE LOGAN C/L	2025	C	Y	$35.96	$1.00	$27.77	$7.19
Oklahoma District 4	0903207	I-35 @ THE I-240 JCT (PHASE III) RECONST INTERCHG. SMC 90/10	2025	OI	Y	$27.56	$1.00	$21.05	$5.51
Oklahoma District 4	0903208	I-35 @ THE I-240 JCT (PHASE IV) RECONST INTERCHG	2025	OI	Y	$27.56	$1.00	$21.05	$5.51
Oklahoma District 4	0903206	I-35: OVER THE I-240 JCT. (PHASE II) RECONST INTERCHG.	2025	OI	Y	$38.16	$2.00	$28.53	$7.63
Pushmataha District 2	34354(04)	SH-3: FROM 0.9 MI E. OF JCT US-271, EXTEND E. 0.8 MI	2025	C	R	$4.59	$1.00	$2.67	$0.92
Texas District 6	31801(04)	US-64: OVER BEAVER RIVER, 20.0 MILES EAST OF JCT SH-95	2025	C	R	$5.00	$1.00	$3.00	$1.00
Tulsa District 8	29693(08)	I-44: NORTH & SOUTHBOUND,33RD WEST AVE, UNDER 0.6 MILES EAST OF SH-66	2025	C	Y	$2.12	$1.00	$0.70	$0.42
Tulsa District 8	35477(04)	US-169: FROM 1.6 MI NORTH OF I-44, EXTEND NORTH 4.68 MI	2025	C	R	$5.83	$1.00	$3.66	$1.17
Wagoner District 1	33460(04)	SH-51: FROM 0.23 MI S OF 81ST TO 0.1 MI S OF 111TH IN COWETA	2025	C	R	$3.00	$2.00	$0.40	$0.60
					Subtotal 2025	**$352.96**	**$22.00**	**$260.37**	**$70.59**
Atoka District 2	30410(04)	US-69: FROM 12 MI NORTH OF BRYAN C/L, EXT NORTH APPROX 2.5 MI THRU TUSHKA	2026	C	R	$23.28	$1.00	$17.62	$4.66
Beckham District 5	31692(04)	I-40: AT TURKEY CR (EAST & WEST BOUND) AND SAND CR EAST BOUND, LOCATED 16.2 & 19.9 MILES EAST OF THE TEXAS STATE LINE.	2026	C	Y	$8.16	$1.00	$5.53	$1.63
Caddo District 5	33762(04)	I-40: BEGIN AT MP 102.2 AND EXT TO MP 104.26.	2026	C	Y	$5.91	$1.00	$3.73	$1.18

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Funding Source Other Fed	Funding Source State
Cimarron6	13337(23)	US-287: BEGIN APPROX 13.28 MILES N OF VAN BUREN ST IN BOISE CITY, EXTEND NORTH APPROX 4.5 MILES	2026	C	R	$10.00	$1.00	$7.00	$2.00
Comanche District 7	34249(04)	US-62: FROM 82ND ST. IN LAWTON E. TO I-44	2026	OI	R	$3.00	$1.00	$1.40	$0.60
Dewey District 5	17671(35)	US-270: BEGIN 6.35 MILES NW OF THE SH-58 JCT (NS-243) AND EXT SE 3.25 MILES	2026	C	R	$14.39	$1.00	$10.51	$2.88
Harmon District 5	34255(04)	US-62 BEGIN 2.0 MILES WEST OF THE JACKSON C/L AND EXTEND EAST 7.0 MILES.	2026	C	R	$10.00	$1.00	$7.00	$2.00
Kay District 4	27979(04)	US-60: FROM WAVERLY ST. IN PONCA CITY, EXT E. 1.8 MILES TO THE US-177 JCT.	2026	C	R	$7.63	$1.00	$5.10	$1.53
McCurtain District 2	17427(08)	US-70: FROM 9.32 MI EAST OF BROKEN BOW EAST 2.48 MI	2026	C	R	$11.20	$1.00	$7.96	$2.24
McIntosh District 1	33467(04)	US-69: FROM 0.44 MI S OF JCT SH-150, N. 6.88 MI.	2026	C	R	$6.37	$1.00	$4.10	$1.27
Oklahoma District 4	33771(04)	I-35: SOUTHBOUND BETWEEN MEMORIAL ROAD AND NE 122ND STREET, 4 MILES NORTH OF I-44/I-35 INTERCHANGE	2026	C	Y	$6.65	$1.00	$4.32	$1.33
Okmulgee District 1	33466(04)	US-75: FROM 3 MI S. OF US-62E N. 3MI. (NB) & FROM 1 MI. S. OF US-62E N. 1 MI.(SB)	2026	C	R	$2.29	$1.00	$0.83	$0.46
Pottawatomie District 3	21007(10)	I-40: FROM 2.5 MILES EAST OF THE OKLAHOMA COUNTY LINE, EAST 2.2 MILES	2026	C	Y	$30.00	$1.00	$23.00	$6.00
Pottawatomie District 3	21007(13)	I-40: FROM 4.7 MILES EAST OF THE OKLAHOMA COUNTY LINE, EAST 2.7 MILES	2026	C	Y	$41.00	$1.00	$31.80	$8.20
Pottawatomie District 3	36182(04)	I-40: FROM 8.1 MILES EAST OF OKLAHOMA COUNTY LINE, EAST 5.0 MILES	2026	C	Y	$2.70	$1.00	$1.16	$0.54
Texas District 6	32806(04)	US-64: BEGIN AT JCT OF MAIN STREET IN GUYMON, EXTEND EAST 0.8 MILES TO JCT US-54	2026	C	R	$7.60	$1.00	$5.08	$1.52
Tulsa District 8	31078(04)	I-244: AT UTICA AND LEWIS LOCATED 0.65 AND 1.2 MILES EAST OF I-444	2026	C	Y	$4.51	$1.00	$2.61	$0.90
Tulsa District 8	31080(04)	US-64: OVER MAIN ST, 49TH W AVE, & 33RD W AVE LOCATED 0.3 MILES EAST JCT SH 97, 12.3 & 13.3 MI S-E OSAGE CO	2026	C	R	$5.22	$1.00	$3.17	$1.04
Tulsa District 8	35156(04)	US-169: UNDER E. 96TH STREET. APPROX. 5 MILES NORTH OF SH-266	2026	C	R	$10.00	$1.00	$7.00	$2.00
Wagoner District 1	32821(04)	US-69: FROM APPROX 1.45 MI N OF MUSKOGEE TURNPIKE, N 3.7 MI.	2026	C	R	$17.00	$1.00	$12.60	$3.40

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source: NHFP	Funding Source: Other Fed	Funding Source: State
Washita District 5	33311(04)	I-40: BEGIN AT MP 40.1 AND EXT TO MP 45.17. (EB LANES ONLY) INCLUDING CABLE BARRIER	2026	C	Y	$14.12	$1.00	$10.30	$2.82
Woodward District 6	33361(04)	SH-34: BEGIN AT JCT US-412, EXTEND NORTH 0.8 MI	2026	C	R	$7.00	$1.00	$4.60	$1.40
					Subtotal 2026	**$248.03**	**$22.00**	**$176.42**	**$49.61**
Blaine District 5	17671(42)	US-270; BEGIN 3.09 MILES NW OF THE SH-58 JCT AND EXT SE 3.93 MILES AND TIE TO EXISTING 4 LANE DIVIDED SEC.	2027	C	R	$19.77	$1.00	$14.82	$3.95
Bryan District 2	33871(04)	US-69: NORTHBOUND & SOUTHBOUND OVER W ARKANSAS ST., KIAMICHI R.R. & MAIN ST., 3.77 & 3.88 N JCT US-69 BUS	2027	C	R	$16.64	$1.00	$12.31	$3.33
Cimarron District 6	34367(04)	US-56: OVER THE BNSF RAILROAD, 0.2 MILES WEST OF JCT US-287	2027	C	R	$2.90	$1.00	$1.32	$0.58
Cleveland District 3	30391(04)	I-44: FROM JUST SOUTH OF 89TH STREET, NORTH TO 0.5 MI NORTH OF 89TH STREET IN OKC	2027	C	Y	$7.00	$1.00	$4.60	$1.40
Grady District 7	34262(04)	SH 4: AT FOX LANE (EW 122) 2.24 MIS. N. OF I-44	2027	OI	R	$9.22	$1.00	$6.37	$1.84
Grady District 7	35161(04)	SH-4: FROM H.E. BAILEY TPK. N. 5.26 MIS. TO SH-37	2027	C	R	$21.58	$1.00	$16.26	$4.32
Love District 7	31892(04)	I-35: SH 153 BRIDGE OVER I-35 & RECONSTRUCT INTERCHANGE 5.3 MIS. N. OF THE TEXAS STATE LINE	2027	C	Y	$12.12	$1.00	$8.69	$2.42
Love District 7	31896(07)	I-35: RECONSTRUCT TO 6 LANES FROM MM 3.2, N. 1.5 MIS. TO MM 4.7	2027	C	Y	$7.50	$1.00	$5.00	$1.50
Love District 7	35728(04)	I-35: RECONSTRUCT TO 6 LANES FROM MM 5.7, N. 2.0 MIS. TO MM 7.7	2027	C	Y	$8.00	$1.00	$5.40	$1.60
Marshall District 2	18835(09)	US-70: MADILL REALIGNMENT FROM 2.0 MI EAST & SOUTH OF SH-199, SOUTH 2.8 MI	2027	C	R	$10.00	$1.00	$7.00	$2.00
McIntosh District 1	34355(04)	I-40: FROM MP 271.6 TO MP 276.8	2027	C	Y	$2.40	$1.00	$0.92	$0.48
Muskogee District 1	34338(04)	US-64B: OVER UP R.R., APPROX. 2.25 MI S OF US-64B / US-62B JCT.	2027	C	R	$5.00	$1.00	$3.00	$1.00
Nowata District 8	33819(04)	US-169: FROM 1.9 MI S OF US-60, N TO US-60	2027	C	R	$5.50	$1.00	$3.40	$1.10
Okfuskee District 3	31869(04)	I-40: FROM 13.9 MILES EAST OF SEMINOLE COUNTY LINE AT CLEARVIEW RD, EAST 4.8 MILES TO US-75S	2027	C	Y	$38.00	$1.00	$29.40	$7.60

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Other Fed	State
Oklahoma District 4	26422(05)	I-40: FROM MILE MARKER 171 EAST TO MILE MARKER 173.	2027	C	Y	$32.60	$1.00	$25.08	$6.52
Oklahoma District 4	29846(04)	I-40: EB & WB BRIDGES OVER SUNNYLANE 1.9 MIS. E. OF I-35	2027	C	Y	$10.00	$1.00	$7.00	$2.00
Oklahoma District 4	33354(04)	I-44/SH-74/SH-66 INTERCHANGE OPERATIONAL IMPROVEMENTS	2027	OI	R	$18.50	$1.00	$13.80	$3.70
Okmulgee District 1	34343(04)	US-75: FROM US-62 N 1.02 MI TO SH-56 JCT.	2027	C	R	$8.00	$1.00	$5.40	$1.60
Payne District 4	34979(04)	I-35: FROM THE NORTH END OF THE CIMARRON RIVER BRIDGE NORTH OF GUTHRIE EXT 5 MILES TO MULHALL ROAD.	2027	C	Y	$5.00	$1.00	$3.00	$1.00
Tulsa District 8	20931(04)	US-169: INTERCHANGE AT BROKEN ARROW EXPRESSWAY(SELECT MOVEMENTS)	2027	OI	R	$31.00	$1.00	$23.80	$6.20
Tulsa District 8	33788(10)	I-44: AT THE US-75 INTERCHANGE WP 4	2027	C	Y	$20.00	$1.00	$15.00	$4.00
Tulsa District 8	35115(04)	US-169: FROM 51ST STREET EXT. NORTH 3.64 MILES	2027	C	R	$30.00	$1.00	$23.00	$6.00
					Subtotal 2027	**$320.72**	**$22.00**	**$234.58**	**$64.14**
Adair District 1	33461(04)	US-59: FR APPROX 200' N OF SHELL BRANCH CRK, N APPROX 4.8 MI TO WESTVILLE	2028	C	R	$11.50	$1.00	$8.20	$2.30
Beckham District 5	34256(04)	I-40: BEGIN AT MP 25.1 AND EXT TO MP 32.6.	2028	C	Y	$16.02	$1.00	$11.81	$3.20
Choctaw District 2	31854(04)	US-70: BEGIN JCT SH-209 EXTEND EAST 5.76 MILES TO MCCURTAIN COUNTY LINE	2028	C	R	$20.00	$1.00	$15.00	$4.00
Cimarron District 6	36222(04)	US-287: BEGIN 7.94 MI SE OF JCT US-64 (US-412), EXTEND NW 7.0 MI	2028	C	R	$7.50	$1.00	$5.00	$1.50
Cleveland District 3	32758(04)	SH-9: FROM 12.4 MILES EAST OF US-77, EAST 4.6 MILES TO PECAN CREEK BRIDGE	2028	C	R	$16.00	$1.00	$11.80	$3.20
Craig District 8	28901(07)	US-60: BEGIN 7.48 MILES EAST OF NOWATA C/L EXTEND EAST 4.5 MI TO JCT SH 66	2028	C	R	$8.89	$1.00	$6.11	$1.78
Creek District 8	35113(04)	US-75A: FROM 5.17 MILES NORTH TO THE OKMULGEE CL, EXT. NORTH 6.30 MILES TO SH-33	2028	C	R	$18.00	$1.00	$13.40	$3.60
Custer District 5	30352(04)	I-40: BEGIN AT MP 65.65 AND EXT TO MP 69.07	2028	C	Y	$7.60	$1.00	$5.08	$1.52
Harmon District 5	34236(04)	US-62: AT THE EAST FORK OF SANDY CREEK LOCATED 2.9 M EAST OF SH-30.	2028	C	R	$3.02	$1.00	$1.42	$0.60

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Funding Source Other Fed	Funding Source State
Kingfisher District 4	34306(04)	SH-3: FROM THE KINGFISHER C/L APPX 10 MILES WEST OF KINGFISHER, EXT EAST 8 MI TO N2820 RD APPX 1 MI WEST OF KINGFISHER CEMETERY.	2028	C	R	$6.00	$1.00	$3.80	$1.20
Major District 6	35083(04)	US-60: BEGIN APPROX 0.5 MILES WEST OF JCT SH-58, EXTEND EAST APPROX 1.0 MI	2028	OI	R	$1.00	$0.80	$0.00	$0.20
Oklahoma District 4	29143(04)	I-40: SCOTT STREET OVER EB & WB I-40 1.1 MIS. E. OF I-35	2028	C	Y	$5.00	$1.00	$3.00	$1.00
Oklahoma District 4	30444(04)	I-35: NB AND SB AT THE I-40/I-35 JCT	2028	C	Y	$9.00	$1.00	$6.20	$1.80
Oklahoma District 4	35123(04)	I-35: FROM I40/35 JCT, EXT SOUTH APPX 6 MILES TO SE 89TH STREET (CLEV. CL)	2028	C	Y	$7.00	$1.00	$4.60	$1.40
Oklahoma District 4	35193(04)	I-40: EB & WB OVER SE 29TH IN MWC	2028	C	Y	$6.00	$1.00	$3.80	$1.20
Pittsburg District 2	30397(04)	US-69: OVER DANCING RABBIT CREEK, APPROX. 0.2 MI NORTH OF INDIAN NATION TNP	2028	C	R	$3.91	$1.00	$2.13	$0.78
Pittsburg District 2	34368(04)	US-69: FROM 0.45 MI N. OF JCT US-69B, EXTEND N. 1.6 MI	2028	C	R	$12.00	$1.00	$8.60	$2.40
Pottawatomie 3	23288(08)	SH-9: FROM 17.2 MILES EAST OF US-77, EAST 5.5 MILES TO SH-102	2028	C	R	$24.50	$1.00	$18.60	$4.90
Pushmataha District 2	33874(04)	SH-3: FROM JCT. US-271, EXT. EAST APPROX 7.5 MI WITH EXCEPTION OF JP 34354(04)	2028	C	R	$20.00	$1.00	$15.00	$4.00
Seminole District 3	23289(04)	SH-99: FROM 3.1 MILES SOUTH OF US-270, SOUTH 4.1 MILES	2028	C	R	$28.00	$1.00	$21.40	$5.60
Sequoyah District 1	33456(04)	I-40: FROM 0.15 MI. E OF MP 299 TO 0.35 MI. E OF DWIGHT MISSION RD.	2028	C	Y	$20.00	$1.00	$15.00	$4.00
Wagoner District 1	34345(04)	SH-72: FROM 0.3 MI N OF SH-51B JCT. IN COWETA, N 0.4 MI	2028	C	R	$2.00	$1.00	$0.60	$0.40
					Subtotal 2028	**$252.93**	**$21.80**	**$180.55**	**$50.59**
Atoka District 2	35200(04)	US-69: FROM 6.8 MI N. OF JCT. SH-7W., EXTEND N. 1.85 MI THRU STRINGTOWN	2029	C	R	$11.00	$1.00	$7.80	$2.20
Beckham District 5	35582(04)	I-40 FROM MP 0.00 TO MP 7.82 INCLUDES BRIDGE WORK.	2029	C	Y	$15.00	$1.00	$11.00	$3.00
Carter District 7	35695(04)	I-35: FROM 0.31 MIS. N. OF US-70W, EXTEND N. 7.45 MIS.	2029	C	Y	$3.50	$1.00	$1.80	$0.70
Carter District 7	35696(04)	I-35: FROM 7.76 MIS. N. OF US-70W, EXTEND N. 7.00 MIS.	2029	C	Y	$3.40	$1.00	$1.72	$0.68

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Funding Source Other Fed	Funding Source State
Choctaw District 2	35009(04)	US-271: OVER THE RED RIVER & CO RD AT THE OK/TX STATELINE	2029	C	R	$25.00	$1.00	$19.00	$5.00
Ellis District 6	35745(04)	US-60: BEGIN 2.0 MI EAST OF THE TEXAS S/L, EXTEND EAST 4.88 MI TO THE JCT OF US-283	2029	C	R	$10.00	$1.00	$7.00	$2.00
Garfield District 4	35671(06)	US-64: FROM JCT OF SH-74 EXT EAST APPX 7.0 MI TO THE NOBLE C/L - N3110 RD	2029	C	R	$4.00	$1.00	$2.20	$0.80
Garvin District 3	31043(04)	I-35: FROM 20.2 MILES NORTH OF MURRAY COUNTY LINE AT THE WASHITA RIVER, NORTH 3.5 MILES TO SH-145	2029	C	Y	$15.00	$1.00	$11.00	$3.00
Murray District 7	33744(04)	I-35: FROM MM 45.9 N. TO MM 52.46	2029	C	Y	$13.12	$2.00	$8.50	$2.62
Oklahoma District 4	20330(07)	I-35: FROM FORT SMITH JCT, EXTEND NORTH 4.5 MI TO I-44 (ULTIMATE CONFIG)	2029	C	Y	$15.00	$1.00	$11.00	$3.00
Oklahoma District 4	28951(08)	I-40: OVER I-44 5.3 MIS. E. OF THE CANADIAN C/L ("K" INTERCHANGE ULTIMATE).	2029	C	Y	$18.00	$1.00	$13.40	$3.60
Oklahoma District 4	30444(08)	I-35: NB AND SB AT THE I-40/I-35 JCT - BETWEEN FORT SMITH AND DALLAS JCTS	2029	C	Y	$4.00	$1.00	$2.20	$0.80
Pottawatomie District 3	23288(04)	SH-9: FROM 5.3 MILES EAST OF CLEVELAND COUNTY LINE AT SH-102, EAST 5.5 MILES	2029	C	R	$20.50	$1.00	$15.40	$4.10
Seminole District 3	23289(13)	SH-99: FROM 7.2 MILES SOUTH OF US-270, SOUTH 4.0 MILES (NEW PARALLEL LANES & RESURFACE EXISTING)	2029	C	R	$15.00	$1.00	$11.00	$3.00
Sequoyah District 1	17670(07)	I-40: I-40/US-59 INTERCHANGE IN SALLISAW	2029	OI	R	$14.00	$1.00	$10.20	$2.80
Sequoyah District 1	35781(04)	I-40: CONCRETE PATCHING, FROM APPROX 1.4 MI W OF US-64B, EXTEND E TO MM-325	2029	C	Y	$6.00	$1.00	$3.80	$1.20
Tulsa District 8	35494(04)	US-75: FROM INDEPENDENCE APPROX. 0.5 MILES NORTH OF I-244 JCT. EXTEND NORTH APPROX. 5.4 MILES TO 56TH STREET	2029	C	R	$45.00	$1.00	$35.00	$9.00
Tulsa District 8	35499(04)	US-169: AT 86TH STREET 9.6 MILES NORTH OF I-44	2029	C	R	$10.00	$1.00	$7.00	$2.00
Tulsa District 8	35500(04)	US-169: AT 106TH STREET, 12.3 MILES NORTH OF I-44	2029	OI	R	$10.00	$1.00	$7.00	$2.00
Tulsa District 8	36321(04)	I-244:TISDALE EXPY UNDER	2029	C	Y	$2.00	$1.00	$0.60	$0.40
Washita District 5	16063(31)	US-183 BEGIN 0.2 MILE NORTH OF SH-9E, EXT NORTH TO SH-55. (RECONSTRUCT TO 4-LN DIVIDED)	2029	C	R	$20.00	$1.00	$15.00	$4.00

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Funding Source Other Fed	Funding Source State
					Subtotal 2029	**$279.52**	**$22.00**	**$201.62**	**$55.90**
Adair District 1	34383(04)	US-59: FROM SALEM RD.4.8 MI SOUTH OF SH-100, EXTEND N 4.75 MI	2030	C	R	$11.00	$1.00	$7.80	$2.20
Atoka District 2	31858(04)	US-75: BEGIN 2.18 MILES WEST OF US-69, EXTEND NORTHWEST TO COAL C/L	2030	C	R	$8.00	$1.00	$5.40	$1.60
Choctaw District 2	31853(04)	US-70: BEGIN 11.5 MI EAST OF THE BRYAN C/L, EXTEND EAST 0.3 MI	2030	C	R	$5.00	$1.00	$3.00	$1.00
Cimarron District 6	36221(04)	US-287: BEGIN 14.94 MI SE OF JCT US-64 (US-412), EXTEND NW 7.00 MI	2030	C	R	$7.50	$1.00	$5.00	$1.50
Craig District 8	36276(04)	SH-2: FROM APPROX 2 MILES NORTH OF US-60 EXTEND NORTH 8 MILES.	2030	C	R	$15.50	$1.00	$11.40	$3.10
Dewey District 5	35711(04)	US-183, BEGIN 7.75 MILES SOUTH OF US-270 AND EXT NORTH 7.75 MILES TO US-270	2030	C	R	$17.50	$1.00	$13.00	$3.50
Garvin District 7	33744(05)	I-35: FROM MM 52.46 N. TO MM 59.85	2030	C	Y	$12.90	$1.00	$9.32	$2.58
Grady District 7	35701(04)	US-81: FROM 1ST ST. IN POCASSET, EXTEND N. 6.70 MIS. (IMPROVE DRAINAGE & PASSING OPPORTUNITIES)	2030	C	R	$4.50	$1.00	$2.60	$0.90
Love District 7	35729(04)	I-35: RECONSTRUCT TO 6 LANES FROM MM 8.3, N. 3.0 MIS. TO MM 11.3	2030	C	Y	$15.00	$2.00	$10.00	$3.00
McClain District 3	36185(04)	I-35: FROM 16.8 MILES NORTH OF GARVIN COUNTY LINE, NORTH 2.0 MILES	2030	C	Y	$22.00	$1.00	$16.60	$4.40
Oklahoma District 4	36294(04)	SH-152: FROM COUNCIL RD; EXTEND EAST TO TPK INTERCHANGE IN OKC	2030	C	R	$4.00	$1.00	$2.20	$0.80
Oklahoma4	31787(04)	I-44: RECONSTRUCTION OF I-44 BETWEEN MAY AVE AND I-235 IN OKLAHOMA CITY	2030	C	Y	$10.00	$1.00	$7.00	$2.00
Okmulgee District 1	35848(04)	I-40: FROM APPROX 0.5 MI W OF INDIAN NATION TURNPIKE, EXTEND E 6.0 MI TO MCINTOSH C/L	2030	C	Y	$4.00	$1.00	$2.20	$0.80
Pottawatomie District 3	35637(04)	I-40: AT THE INTERCHANGE OF US-177, WEST OF SHAWNEE	2030	OI	R	$20.00	$1.00	$15.00	$4.00
Pushmataha District 2	33875(04)	SH-3: FROM APPROX 7.5 MI EAST OF JCT US-271, EXT EAST APPROX 8.0 MI WITH EXCEPTION OF JP 28007(07)	2030	C	R	$24.00	$1.00	$18.20	$4.80
Rogers District 8	35028(04)	SH-66: FROM 3 MI E OF SH-266 EXTEND E 4.52 MI	2030	C	R	$25.50	$1.00	$19.40	$5.10
Tulsa District 8	35462(04)	US-75: AT 96TH STREET NORTH 10.3 MILES NORTH OF I-244	2030	C	R	$5.00	$1.00	$3.00	$1.00

County / ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source		
							NHFP	Other Fed	State
Tulsa District 8	35463(04)	US-75: AT 106TH STREET NORTH, 4 MILES SOUTH OF SH-20 JCT.	2030	OI	R	$10.00	$1.00	$7.00	$2.00
Tulsa District 8	35464(04)	US-75: AT 126TH STREET NORTH, 2 MILES SOUTH OF SH-20 JCT.	2030	C	R	$5.00	$1.00	$3.00	$1.00
Tulsa District 8	36266(04)	US-169: FROM MEMORIAL DR. EXTEND NORTH 2.5 MILES	2030	C	R	$21.50	$1.00	$16.20	$4.30
Wagoner District 1	36243(04)	US-69: FROM SH-51B, EXTEND N APPROX 2.3 MI.	2030	C	R	$7.00	$1.00	$4.60	$1.40
					Subtotal 2030	**$254.90**	**$22.00**	**$181.92**	**$50.98**
					GRAND TOTAL	**$2,511.20**	**$176.17**	**$1,832.78**	**$502.24**

*Y indicates Yes, on NHFN; R indicates Recommended for NHFN; M indicates Marine Highway

**Plan Cost Est. ($58M) + FASTLANE grant ($62M) = Total project cost of $120M Project Types: Capacity (C), Operational Improvements (OI)

Table 6-8 illustrates Oklahoma's planned use of NHFP funds against annual apportionment.

Table 6-8. Financial Constraint Summary: Planned Obligation of Annual Apportionment of National Highway Freight Program Funds, 2023–2030

Year	Apportioned NHFP Funds (millions$)	Obligated or Planned Obligation NHFP Funds (millions$)	Balance NHFP Funds (millions$)
2023	22.43	22.37	0.06
2024	22.88	22.00	0.88
2025	23.34	22.00	1.34
2026	23.81	22.00	1.81
2027	23.81	22.00	1.81
2028	23.81	21.80	2.01
2029	23.81	22.00	1.81
2030	23.81	22.00	1.81
TOTAL	**187.70**	**176.17**	**11.53**

Source: FY 2022-2026 Estimated Apportionments under the IIJA, August 18, 2021.[41]
Note: Years 2027-2030 assumed to be level with FY 2026.

Highway Freight Mobility Projects

Additional Support by Traditional Federal and State Programs

In addition to projects funded in part by NHFP funds, other highway mobility projects that serve freight appear in the Eight-Year Construction Work Plan. These projects are being funded from traditional highway sources, with 80 percent from the federal government and 20 percent from the state. These 160 projects represent an additional $1.18 billion investment in highway projects that support freight over the next eight years, as displayed in Table 6-9. Combined with the 173 projects that will receive NHFP funds, the total freight-supportive highway investment in Oklahoma over the next eight years is $3.70 billion.

[41] https://policy.transportation.org/wp-content/uploads/sites/59/2021/11/IIJA-Highway-Apportionment-Estimates-August-2021.pdf

Table 6-9. Eight-Year Highway Freight Investment Projects Funded with Traditional Federal and State Funds

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source		
							NHFP	Other Federal	State
Adair District 1	30570(04)	US-59: FROM APPROX 0.35 MILES SOUTH OF SH-51 JCT., EXTEND NORTH 6.70 MILES	2023	C	R	$14.80	$–	$11.84	$2.96
Choctaw District 2	30394(04)	US-271: OVER KRR RAILROAD AND COUNTY ROAD APPROXIMATELY 2.38 MILES NORTH OF TEXAS STATE LINE	2023	C	R	$16.87	$–	$13.50	$3.37
Choctaw District 2	34812(04)	US-271: BEGIN 7.0 MI NORTH OF STATE LINE, EXTEND NORTH 2.13 MI	2023	C	R	$4.16	$–	$3.33	$0.83
Creek District 8	33826(04)	SH-97: FROM 91ST STREET TO 51ST STREET (SAFETY IMPROVEMENTS)	2023	C	R	$3.50	$–	$2.80	$0.70
Custer District 5	31696(04)	US-183: AT I-40, LOCATED 10.7 MILES EAST OF THE WASHITA COUNTY LINE. (N & S BOUND BRIDGES)	2023	C	Y	$3.81	$–	$3.04	$0.76
Garfield District 4	35671(05)	US-64/412: FROM N2970 RD APPX 7 MI WEST OF ENID, EXT EAST APPX 7 MILES TO SH-74	2023	C	R	$5.00	$–	$4.00	$1.00
McCurtain District 2	24219(04)	SH-3: FROM JCT US-259 EXTEND WEST 5.09 MILES	2023	C	R	$12.72	$–	$10.18	$2.54
McCurtain District 2	35574(04)	US-70: FROM 5.5 MI NORTH JCT US-259, EXTEND NORTH 2.3 MI TO JCT SH-3	2023	C	R	$2.06	$–	$1.65	$0.41
Muskogee District 1	32102(04)	I-40: FROM MP 288.44 TO MP 292.58	2023	C	Y	$3.59	$–	$2.87	$0.72
Oklahoma District 4	36349(04)	SH-66 BEGINING AT REDMON AVE. EXT W. TWO BLOCKS TO ASBURY DR. IN BETHANY	2023	C	R	$1.20	$–	$0.96	$0.24
Pawnee District 8	31076(04)	US-64: AT KEYSTONE RD, LOCATED 19.5 MILES EAST OF SH-99	2023	C	R	$0.85	$–	$0.68	$0.17
Pittsburg District 2	35594(04)	US-69: FROM APPROX 1.0 MI NORTH OF JCT US-69B, EXTEND NORTH APPROX 1.0 MI	2023	C	R	$3.00	$–	$2.40	$0.60
Pontotoc District 3	31878(04)	SH-1: OVER SH-19, 1.0 MILE NORTH OF SH-3	2023	C	R	$3.65	$–	$2.92	$0.73
Pottawatomie District 3	32255(04)	KICKAPOO STREET (US-270B) FROM KICKAPOO SPUR SOUTH 1.6 MILES TO SH-18 (RW AND UT BY THE CITY OF SHAWNEE)	2023	C	R	$15.00	$–	$12.00	$3.00
Pottawatomie District 3	33850(04)	KICKAPOO STREET (US-270B) FROM KICKAPOO SPUR SOUTH 1.6 MILES TO SH-18 - HAZ-MAT REMEDIATION FOR 32255(04)	2023	C	R	$0.10	$–	$0.08	$0.02
Texas District 6	30402(04)	US-54: BEGIN AT 5TH ST, EXTEND NE 2.47 MILES TO HURLIMAN ST. IN GUYMON	2023	C	R	$16.00	$–	$12.80	$3.20
Tulsa District 8	30367(04)	I-244:2ND STREET OVER I-244 & BNSF RR, 5.1 MILES NORTH I-44	2023	C	Y	$7.89	$–	$6.31	$1.58
Tulsa District 8	30368(04)	US-64: OVER 25TH WEST AVE NORTH AND SOUTHBOUND, 13.8 MILES SE OF OSAGE CO.	2023	C	R	$1.43	$–	$1.14	$0.29
Tulsa District 8	31084(04)	US-75: REHAB BRIDGE OVER BIRD CREEK OVERFLOW LOCATED 0.4 MI N OF 56 ST	2023	C	R	$3.08	$–	$2.46	$0.62

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source		
							NHFP	Other Federal	State
Tulsa District 8	32706(04)	I-244: W-N RAMP TO SH-11, 5.54 MILES EAST OF JCT I-444	2023	C	Y	$2.43	$–	$1.94	$0.49
Tulsa District 8	33788(09)	I-44: AT THE US-75 INTERCHANGE WP 3	2023	OI	Y	$54.80	$–	$43.84	$10.96
Tulsa District 8	36325(04)	I-244: APROX. 2 MILES NORTH OF THE I-244/I-44 JCT.	2023	OI	Y	$1.00	$–	$0.80	$0.20
Wagoner District 1	31209(04)	US-69: OVER UP R.R.(NB), 0.7 MI. & 1.5 MI. NORTH OF SH-51 JCT.	2023	C	R	$7.78	$–	$6.23	$1.56
					Subtotal 2023	**$184.72**	**$0.00**	**$147.77**	**$36.94**
Cleveland District 3	29106(05)	I-35: AT INDIAN HILLS ROAD, 7.4 MILES NORTH OF MCCLAIN C/L	2024	C	Y	$20.00	$–	$16.00	$4.00
Craig District 8	31962(04)	US-69: FROM 2.75 MILES NORTH OF MAYES C/L NORTH 1.72 MILES	2024	C	R	$4.91	$–	$3.93	$0.98
Custer District 5	35434(04)	BRIDGE PAINT PROJECT	2024	C	Y	$0.53	$–	$0.42	$0.11
Rogers District 8	35510(07)	US-412: AT 4170 RD	2024	OI	R	$1.00	$–	$0.80	$0.20
Seminole District 3	35656(04)	SH-99: FROM 1.0 MILES SOUTH OF SH-9, NORTH 3.1 MILES	2024	C	R	$1.40	$–	$1.12	$0.28
Sequoyah District 1	34671(07)	US-64: OVER ARKANSAS RIVER (MONEY ONLY WITH ARDOT) JOINT PAINT/SEAL PROJECT	2024	C	R	$1.83	$–	$1.47	$0.37
Tulsa District 8	34436(04)	US-169: FROM EAST 66TH STREET NORTH 2 MILES TO 86TH STREET	2024	C	R	$8.17	$–	$6.54	$1.63
					Subtotal 2024	**$37.84**	**$0.00**	**$30.28**	**$7.57**
Beckham District 5	35435(04)	BRIDGE PAINT PROJECTS	2025	C	Y	$0.82	$–	$0.65	$0.16
Cleveland District 3	35018(04)	SH-37: OVER I-44, 1.9 MILES NORTH OF THE MCCLAIN COUNTY LINE	2025	C	Y	$2.00	$–	$1.60	$0.40
Mayes District 8	31963(04)	US-69: PAVEMENT REHABILITATION FROM SH-20 EXTEND NORTH 8 MILES	2025	C	R	$16.55	$–	$13.24	$3.31
Okfuskee District 3	31946(04)	I-40: OVER NORTH CANADIAN RIVER, 2.4 MILES EAST OF SEMINOLE COUNTY LINE (EASTBOUND AND WESTBOUND BRIDGES)	2025	C	Y	$3.00	$–	$2.40	$0.60
Okmulgee District 1	30571(04)	US-75: US-75 AT PRESTON RD. INTERSECTION, 7.00 MILES NORTH OF US-62 EAST JCT.	2025	OI	R	$9.00	$–	$7.20	$1.80
Pontotoc District 3	35652(04)	SH-1: FROM THE JUNCTION OF SH-3, EAST 3.8 MI.	2025	C	R	$1.50	$–	$1.20	$0.30
Pottawatomie District 3	35623(04)	I-40: WESTBOUND BRIDGE OVER BNSF RAILROAD, 12.9 MILES EAST OF OKLAHOMA COUNTY LINE	2025	C	Y	$0.85	$–	$0.68	$0.17
Pottawatomie District 3	35625(04)	I-40: EASTBOUND BRIDGE OVER BNSF RAILROAD, 12.9 MILES EAST OF OKLAHOMA COUNTY LINE	2025	C	Y	$0.85	$–	$0.68	$0.17

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source		
							NHFP	Other Federal	State
Rogers District 8	31093(04)	US-412: AT 265TH E AVE, APPROX. 2.8 MILES EAST OF I-44 JCT	2025	OI	R	$10.00	$–	$8.00	$2.00
Rogers District 8	32700(04)	SH-66: AT DENBO ST., 1.5 MILES N US-412	2025	OI	R	$1.03	$–	$0.82	$0.21
Rogers District 8	36369(04)	US-412: AT 289TH E AVE. APPROX. 4.3 MILES EAST OF I-44 JCT.	2025	C	R	$5.00	$–	$4.00	$1.00
Tulsa District 8	30374(04)	US-75: OVER 81ST STREET SOUTH, NORTHBOUND AND SOUTHBOUND, 7 MILES NORTH OF JCT. US-75/SH-67	2025	C	R	$19.22	$–	$15.38	$3.84
Tulsa District 8	34225(04)	US-75: FROM SH-20 EXTEND NORTH 3.45 MILES	2025	C	R	$11.34	$–	$9.07	$2.27
Wagoner District 1	32817(04)	SH-51: SH-51 @ ONETA RD. CONTRIBUTION TO LOCAL GOV PROJECT 24347(07)	2025	C	R	$0.35	$–	$0.28	$0.07
Washington District 8	31965(04)	US-60: FROM SH-123 E 3.71 MILES	2025	C	R	$16.27	$–	$13.02	$3.25
					Subtotal 2025	**$97.78**	**$0.00**	**$78.22**	**$19.56**
Atoka District 2	35732(04)	US-69: FROM 14.5 MI NORTH OF BRYAN C/L, EXTEND NORTH APPROX 1.6 MI	2026	C	R	$5.00	$–	$4.00	$1.00
Beckham District 5	31693(04)	I-40: AT US-283 LOCATED 13.4 MILES EAST OF THE SH-30 JCT.	2026	C	Y	$6.17	$–	$4.94	$1.23
Canadian District 4	27959(04)	US-281 SPUR: OVER I-40 4.1 MIS. E. OF THE CADDO C/L	2026	C	R	$4.40	$–	$3.52	$0.88
Cleveland District 3	20266(14)	SH-9: FROM 7.7 MILES EAST OF US-77, EAST 4.6 MILES	2026	C	R	$24.60	$–	$19.68	$4.92
Craig District 8	28901(04)	US-60: BEGIN 3.03 MILES EAST OF NOWATA C/L EXTEND EAST 4.45 MI	2026	C	R	$7.38	$–	$5.91	$1.48
Craig District 8	32693(04)	US-69: SB FROM 8.0 MILES N OF SH-20, EXTEND N 8.0 MILES	2026	C	R	$19.02	$–	$15.22	$3.80
Creek District 8	24425(04)	US-75A: APPROX. 0.34 MI. NORTH OF THE OKMULGEE C/L NORTH APPROX 5.5 MILES, TO KIEFER	2026	C	R	$9.96	$–	$7.97	$1.99
Kingfisher District 4	29849(04)	US-81: NB & SB BRIDGES OVER THE UP RAILROAD 5.3 MIS. N. OF SH-33	2026	C	R	$9.81	$–	$7.85	$1.96
McCurtain District 2	17427(21)	US-70: FROM 15.11 MI EAST OF BROKEN BOW EAST 0.59 MI	2026	C	R	$5.00	$–	$4.00	$1.00
McCurtain District 2	17427(15)	US-70: FROM 11.97 MI EAST OF BROKEN BOW EAST 3.14 MI	2026	C	R	$14.91	$–	$11.93	$2.98
Oklahoma District 4	30637(04)	I-44: OVER THE UPRR, 0.7 MILES NORTH OF I-40	2026	C	Y	$16.35	$–	$13.08	$3.27
Pittsburg District 2	28948(04)	US-69: BEGIN APPROX 2.5 MILES SOUTH OF INDIAN NATION TURNPIKE AND EXTEND NORTH APPROX 2.1 MILES	2026	C	R	$18.85	$–	$15.08	$3.77

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source		
							NHFP	Other Federal	State
Texas District 6	32806(08)	UPRR CONCRETE SURFACE, DOT 596139E, MILEPOST 472.86	2026	OI	R	$0.06	$–	$0.05	$0.01
Tulsa District 8	30602(04)	US-64: OVER 177TH WEST AVE. EAST AND WESTBOUND, 3.6 MILES SE C/L	2026	C	R	$1.15	$–	$0.92	$0.23
Tulsa District 8	31082(04)	I-444: AT DENVER AVENUE, LOCATED 0.7 MI E OF I-244	2026	C	Y	$2.58	$–	$2.06	$0.52
Tulsa District 8	31098(04)	SH-20: AT 145TH 0.5 MILES EAST OF US-169	2026	OI	R	$1.39	$–	$1.11	$0.28
Tulsa District 8	31958(04)	SH-11: OVER MEMORIAL DR. 4.44 MILES SE US-75	2026	C	R	$2.59	$–	$2.07	$0.52
Tulsa District 8	31960(04)	US-64: OVER QUANAH AVENUE, 14.5 MILES SE OSAGE C/L	2026	C	R	$1.09	$–	$0.87	$0.22
Tulsa District 8	31961(04)	SH-51: AT PEORIA AVE OVER SH-51, 0.4 MILES E OF I-444	2026	C	R	$2.12	$–	$1.70	$0.42
Tulsa District 8	32704(04)	SH-51: OVER 21ST STREET, 1.8 MILES EAST OF PEORIA AVE.	2026	C	R	$1.83	$–	$1.47	$0.37
Wagoner District 1	33806(04)	SH-51: FROM 0.45 MI. NORTH OF E. 111TH ST. ALONG SH-51, EXTEND NE 0.85 MI. TO INTERCHANGE OVER THE MUSKOGEE TURNPIKE (OTA LET)	2026	OI	R	$1.00	$–	$0.80	$0.20
Wagoner District 1	34753(04)	US-69: BRIDGES OVER VERDIGRIS RIVER AND NB COAL CREEK	2026	C	R	$1.13	$–	$0.91	$0.23
Woodward District 6	33361(08)	BNSF RAILROAD SURFACE, DOT 014439M, MP 387.77	2026	OI	R	$0.11	$–	$0.09	$0.02
					Subtotal 2026	**$156.50**	**$0.00**	**$125.20**	**$31.30**
Beckham District 5	33311(07)	I-40: BEGIN MP 40.1 AND EXT TO MP 45.17 (WB LANES ONLY), INCLUDING CABLE BARRIER.	2027	C	Y	$20.00	$–	$16.00	$4.00
Blaine District 5	17671(43)	US-270 RAILROAD PROJECT, C&M FOR GNBC RAILROAD FOR SIGNAL/SURFACE DOT 671. LOCATED 0.3 MILE SE OF THE DEWEY C/L. RR PROJECT FOR 17671(42).	2027	C	R	$0.35	$–	$0.28	$0.07
Caddo District 5	32682(04)	I-40: BEGIN AT MP 95.76 AND EXT TO MP 102.2	2027	C	Y	$12.30	$–	$9.84	$2.46
Craig District 8	33828(04)	US-60: FROM 0.67 MILES EAST OF SH-2 EXTENDING EAST 7.23 MILES.	2027	C	R	$16.50	$–	$13.20	$3.30
Garfield District 4	32688(04)	US-412: FROM GARLAND, EXTEND EAST 6.0 MILES TO THE US-64 JUNCTION	2027	C	R	$7.00	$–	$5.60	$1.40
Kingfisher District 4	33770(04)	US-81: FROM 0.5 MILES NORTH OF THE CANADIAN COUNTY LINE, EXTEND NORTH 4.7 MILES	2027	C	R	$10.00	$–	$8.00	$2.00
Mayes District 8	35051(04)	US-69: AIRPORT RD & MAIN ST	2027	OI	R	$0.50	$–	$0.40	$0.10

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Other Federal	State
McIntosh District 1	32822(04)	US-69: FROM MCINTOSH/MUSKOGEE C/L, S. 2.5 MI.	2027	C	R	$6.44	$–	$5.15	$1.29
Noble District 4	35621(04)	I-35: OVER BNSF RR APPROX 3.3 MILES SOUTH OF PERRY	2027	C	Y	$1.50	$–	$1.20	$0.30
Noble District 4	35622(04)	I-35: OVER BNSF APPROX 1 MILE SOUTH OF PERRY	2027	C	Y	$1.50	$–	$1.20	$0.30
Oklahoma District 4	29850(04)	I-40: EB & WB BRIDGES OVER MACARTHUR BLVD. 3.0 MIS. E. OF THE CANADIAN C/L	2027	C	Y	$10.00	$–	$8.00	$2.00
Oklahoma District 4	29851(04)	I-40: EB & WB BRIDGES OVER MERIDIAN AVE. 4.0 MIS. E. OF THE CANADIAN C/L	2027	C	Y	$10.00	$–	$8.00	$2.00
Oklahoma District 4	31013(06)	I-240: DIAMOND GRINDING FROM 0.15 MILES EAST OF I-35, EXTEND EAST 5.75 MILES TO THE EAST SIDE OF AIR DEPOT	2027	C	Y	$4.00	$–	$3.20	$0.80
Oklahoma District 4	35627(04)	I-35: OVER COFFEE CREEK APPROX. 3.0 MILES NORTH OF SH-66	2027	C	Y	$1.50	$–	$1.20	$0.30
Oklahoma District 4	35628(04)	I-35: OVER SORGHUM MILL RD APPROX 4.0 MILES NORTH OF SH-66	2027	C	Y	$1.50	$–	$1.20	$0.30
Oklahoma District 4	35629(04)	I-240: OVER EASTERN AVE. APPROX. 1.0 MILE EAST OF I-35	2027	C	Y	$3.00	$–	$2.40	$0.60
Rogers District 8	35092(04)	SH-266/SH-167: INTERSECTION IMPROVEMENTS	2027	OI	R	$1.00	$–	$0.80	$0.20
Sequoyah District 1	31222(04)	I-40: OVER US-64, 9.10 MI. & OVER OLD US-64 (SEQUOYAH ST.), 15.0 MI E OF US-59 JCT.	2027	C	Y	$10.82	$–	$8.66	$2.16
Sequoyah District 1	32106(04)	I-40: ACCESS IMPROVEMENTS AT I-40/US-64 JCT. (MP 325)	2027	C	Y	$4.50	$–	$3.60	$0.90
Tulsa District 8	28896(04)	US-64: FROM SOUTH 161ST STREET EXTEND SE 1.85 MILES TO MINGO ROAD	2027	C	R	$11.20	$–	$8.96	$2.24
Tulsa District 8	30366(04)	US-75: OVER I-244 & RR, 2.2 MILES NORTH OF I-44	2027	C	Y	$2.00	$–	$1.60	$0.40
Tulsa District 8	32705(04)	I-444: AT 12TH STREET, 0.5 MILES EAST OF JCT. I-244	2027	C	Y	$2.10	$–	$1.68	$0.42
Tulsa District 8	33839(04)	I-444: UNDER BOULDER AVE., 1.02 MILES EAST OF I-244	2027	C	Y	$2.53	$–	$2.02	$0.51
Tulsa District 8	35513(04)	US-64: FROM SOUTH MINGO ROAD EXTEND EAST APPROX. 6.39 MILES TO WAGONER C/L	2027	C	R	$19.00	$–	$15.20	$3.80
Wagoner District 1	21951(04)	US-69: OVER THE VERDIGRIS RIVER/NAVIGATION CHANNEL, 4.9 MI. N. OF THE MUSKOGEE C/L	2027	C	R	$2.98	$–	$2.39	$0.60
					Subtotal 2027	**$162.23**	**$0.00**	**$129.78**	**$32.45**
Canadian District 4	32689(04)	I-40: COUNTRY CLUB ROAD OVER I-40, 2 MILES WEST OF US-81	2028	C	Y	$9.10	$–	$7.28	$1.82
Canadian District 4	34831(04)	SH-3: FROM THE CANADIAN/KINGFISHER CL EXTEND SE TO RADIO ROAD	2028	C	R	$8.50	$–	$6.80	$1.70

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Other Federal	State
Harmon District 5	34969(04)	US-62: AT THE WEST FORK OF SANDY CREEK, LOCATED 0.3 M EAST OF THE TEXAS STATE LINE.	2028	C	R	$2.50	$–	$2.00	$0.50
Kay District 4	24432(08)	I-35: FROM 0.50 MILES NORTH OF FORK ROAD, EXTEND NORTH APPROX. 5.145 MILES TO THE KANSAS STATE LINE	2028	C	Y	$32.00	$–	$25.60	$6.40
Kingfisher District 4	34982(04)	SH-33: FROM 8 MILES EAST OF KINGFISHER/BLAINE C/L, EXTEND EAST APPROX. 7.2 MILES TO SH-81	2028	C	R	$12.00	$–	$9.60	$2.40
Logan District 4	30446(04)	I-35 FROM 3.0 MILES NORTH OF US-77, NORTH 2.2 MILES IN GUTHRIE	2028	C	Y	$9.00	$–	$7.20	$1.80
Logan District 4	35854(04)	I-35: FROM 1 MILE SOUTH OF 77 JCT (E CAMP RD), EXT N APPX 7.3 MILES TO EAST CR 076 APPX 1 MILE N OF SH-33 IN GUTHRIE	2028	C	Y	$5.00	$–	$4.00	$1.00
Logan District 4	35854(05)	I-35: FROM APPX 6 MILE NORTH OF 77 JCT (E CRD 076), EXT N APPX 6 MILES TO THE CIMARRON RIVER BRIDGE N OF GUTHRIE	2028	C	Y	$5.00	$–	$4.00	$1.00
McCurtain District 2	35471(04)	US-259: FROM 0.34 MI NORTH OF JCT SH-3, EXTEND NORTH APPROX 5.9 MI	2028	C	R	$20.00	$–	$16.00	$4.00
Noble District 4	35124(04)	I-35: FROM MM 179, EXTEND NORTH TO MM 185	2028	C	Y	$4.00	$–	$3.20	$0.80
Oklahoma District 4	33774(04)	I-35: FROM SH-66, EXTEND NORTH 5.28 MILES TO THE LOGAN COUNTY LINE	2028	C	Y	$16.00	$–	$12.80	$3.20
Oklahoma District 4	35122(04)	I-240: FROM 0.21 MILES EAST OF I-44, EXT EAST 3.32 MI EAST TO BRIDGE OVER SANTA FE BOTH DIRECTIONS.	2028	C	Y	$3.75	$–	$3.00	$0.75
Oklahoma District 4	35749(04)	I-40: COUNCIL ROAD OVER APPROX 1.5 MILES EAST OF CANADIAN C/L	2028	C	Y	$4.00	$–	$3.20	$0.80
Okmulgee District 1	35847(04)	US-75: FROM 1.50 MI N OF SH-56 LOOP, EXTEND N 5.4 MI (NB)	2028	C	R	$6.00	$–	$4.80	$1.20
Osage District 8	34826(04)	US-60: BEGIN 13.86 MILES EAST OF SH-18, EXTEND EAST 4.90 MILES	2028	C	R	$6.50	$–	$5.20	$1.30
Pawnee District 8	35548(04)	US-64: UNDER 296TH W. AVE, 17.5 MILES EAST OF SH-99	2028	C	R	$1.50	$–	$1.20	$0.30
Payne District 4	31020(04)	I-35: NB AND SB BRIDGES OVER THE CIMARRON RIVER AT THE LOGAN/PAYNE CL	2028	C	Y	$5.00	$–	$4.00	$1.00
Rogers District 8	33849(04)	SH-66: SH-66 NB AND SB OVER VERDIGRIS RIVER, 4.17 MILES NORTH OF I-44 JCT	2028	C	R	$20.00	$–	$16.00	$4.00
Rogers District 8	35549(04)	SH-88: AT OOLOGAH DAM SPILLWAY 7.1 MI N JCT SH-20	2028	C	R	$1.50	$–	$1.20	$0.30
Tulsa District 8	34224(04)	SH-20: EAST FROM SH-11 TO 0.09 MILES EAST OF US-75	2028	C	R	$18.32	$–	$14.65	$3.66
Tulsa District 8	35550(04)	I-244: UNDER 41ST STREET & S.W. BLVD. 1.6 MILES NORTH OF I-44	2028	C	Y	$1.50	$–	$1.20	$0.30

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Funding Source Other Federal	Funding Source State
Tulsa District 8	35552(04)	I-444: UNDER BOULDER AVE. 1.02 MILES EAST OF I-244	2028	C	Y	$1.50	$–	$1.20	$0.30
Tulsa District 8	35780(04)	SH-11: FROM ERIE AVE. EXTEND EAST TO I-244	2028	C	R	$30.00	$–	$24.00	$6.00
					Subtotal 2028	**$222.67**	**$0.00**	**$178.13**	**$44.53**
Bryan District 2	33873(04)	US-70: OVER LAKE TEXOMA (ROOSEVELT BRIDGE) (NOT FULLY FUNDED)	2029	C	R	$15.00	$–	$12.00	$3.00
Canadian District 4	35794(04)	I-40: FROM MACARTHUR AVE EXTEND WEST TO MORGAN ROAD (ADD ACCEL/DECEL LANES)	2029	C	Y	$10.00	$–	$8.00	$2.00
Harmon District 5	35560(04)	US-62, BEGIN 1.0 M EAST OF SH-30 & EXT EAST 7.1 MILES.	2029	C	R	$10.65	$–	$8.52	$2.13
Kay District 4	24432(05)	I-35: FROM THE SALT FORK RIVER, EXTEND NORTH APPROX. 6.0 MILES TO JUST NORTH OF HUBBARD ROAD	2029	C	Y	$32.00	$–	$25.60	$6.40
Kingfisher District 4	35676(04)	US-81: FROM THE CIMARRON RIVER S OF DOVER-EXT SOUTH APPX 5.5 MI TO AIRPORT RD APPX 0.2 NORTH OF KINGFISHER	2029	C	R	$3.00	$–	$2.40	$0.60
LeFlore District 2	35882(04)	US-00: AT PLEASANT VALLEY ROAD, APPROX 0.6 MI NORTH OF JCT US-59 (POTEAU BYPASS)	2029	C	R	$0.10	$–	$0.08	$0.02
McCurtain District 2	35883(04)	US-70: AT JCT US-259 IN IDABEL	2029	C	R	$0.10	$–	$0.08	$0.02
Muskogee District 1	34334(04)	I-40: OVER ARKANSAS RIVER, BEGIN MP 290, E 1.0 MI	2029	C	Y	$35.00	$–	$28.00	$7.00
Oklahoma District 4	32882(15)	SH-152: EB & WB SH-152 FROM RR CROSSING 2600' EAST OF COUNCIL TO MERIDIAN INCLUDES INTERCHANGES AT MERIDIAN AND MACARTHUR. (PHASE 5)	2029	C	R	$12.00	$–	$9.60	$2.40
Oklahoma District 4	32882(17)	I-44: FROM JUST NORTH OF SE 29TH STREET EXT SOUTH APPX 2 MILES TO SE 59TH (PHASE 2).	2029	C	Y	$12.00	$–	$9.60	$2.40
Oklahoma District 4	32882(18)	I-44: WB I-44 FROM 51ST TO 1500' NORTH OF 74TH, EB I-44 FROM 700' SOUTH OF 44TH TO 74TH (PHASE 3)	2029	C	Y	$12.00	$–	$9.60	$2.40
Oklahoma District 4	32882(21)	I-44: EB BETWEEN I-240 AND SH-152 INCLUDES RAMPS AT 59TH AND 74TH (PHASE 4)	2029	C	Y	$10.00	$–	$8.00	$2.00
Oklahoma District 4	35791(04)	I-44: FROM NE 10TH STREET, APPX 1 MI NORTH OF I-40, EXT NORTH TO NE 23RD ST IN OKC	2029	C	Y	$10.00	$–	$8.00	$2.00
Okmulgee District 1	35846(04)	US-75: OVER OKMULGEE CREEK, 2.27 MI N OF US-62 JCT.	2029	C	R	$1.70	$–	$1.36	$0.34
Pottawatomie District 3	34323(04)	US-270: FROM THE JUNCTION OF US-177, EAST 6.7 MILES	2029	C	R	$3.00	$–	$2.40	$0.60
Tulsa District 8	35468(04)	US-64: FROM 111TTH STREET SOUTH TO 131ST STREET (INTERIM IMPROVEMENTS)	2029	C	R	$10.00	$–	$8.00	$2.00

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Funding Source Other Federal	Funding Source State
Tulsa District 8	35470(04)	SH-67: FROM US-75 EXTEND EAST TO US-64	2029	OI	R	$3.00	$–	$2.40	$0.60
Tulsa District 8	36323(04)	US-75: AT BIRD CREEK AND BIRD CREEK OVERFLOW AND ROAD UNDER	2029	C	R	$4.50	$–	$3.60	$0.90
				Subtotal 2029		**$184.05**	**$0.00**	**$147.24**	**$36.81**
Atoka District 2	36282(04)	US-69 NORTHBOUND: BEGIN APPROXIMATELY 14.3 MILES NORTH OF JUNCTION US-70, EXTEND NORTH APPROXIMATELY 7.5 MILES	2030	C	R	$7.50	$–	$6.00	$1.50
Beckham District 5	36140(04)	I-40 SOUTH FRONTAGE ROAD OVER TIMBER CREEK AND OVERFLOW, 2.7 & 2.8 MILES EAST OF EAST I-40B JCT IN SAYRE.	2030	C	Y	$2.50	$–	$2.00	$0.50
Bryan District 2	36281(04)	US-69 NORTHBOUND: BEGIN APPROXIMATELY 6.8 MILES NORTH OF JUNCTION US-70, EXTEND NORTH APPROXIMATELY 7.5 MILES	2030	C	R	$7.50	$–	$6.00	$1.50
Caddo District 5	36142(04)	I-40 SOUTH FRONTAGE ROAD OVER UNNAMED CR, 1.3 MILES E OF THE CUSTER C/L.	2030	C	Y	$1.90	$–	$1.52	$0.38
Canadian District 4	34304(04)	I-40: FROM CADDO CL EAST 7.5 MILES; EB & WB	2030	C	Y	$14.00	$–	$11.20	$2.80
Canadian District 4	36293(04)	US-81: AT THE INTERSECTION OF SH-152 IN UNION CITY	2030	OI	R	$4.00	$–	$3.20	$0.80
Canadian District 4	36302(04)	US-81: FROM JCT OF I-40; EXTEND SOUTH APPROX 5 MILES TO SW 29TH	2030	C	R	$5.00	$–	$4.00	$1.00
Canadian District 4	36350(04)	I-40B: FROM JCT OF US-81/I-40B (ELM ST.) EXT N. TO WADE ST. THEN W. TO ELLISON ST.	2030	C	R	$1.00	$–	$0.80	$0.20
Canadian District 4	36391(04)	SH-81: FROM ELM STREET IN EL RENO EXT NORTH TO RR OVERPASS	2030	C	R	$1.00	$–	$0.80	$0.20
Custer District 5	36143(04)	I-40 S FRONTAGE ROAD OVER BEAR CR, 3.7 MILES EAST OF THE I-40B EAST JCT IN CLINTON.	2030	C	Y	$2.80	$–	$2.24	$0.56
Custer District 5	36144(04)	I-40 N FRONTAGE ROAD OVER UNNAMED CR, 0.4 MILE WEST OF SH-54.	2030	C	Y	$1.30	$–	$1.04	$0.26
Garfield District 4	36253(04)	US-60/412: OVER UNNAMED CREEK; APPROX. 4.5 MILES EAST OF THE MAJOR COUNTY LINE.	2030	C	R	$0.50	$–	$0.40	$0.10
Garfield District 4	36315(05)	US-81: FROM LUCIEN RD.; EXT NORTH TO ASPHALT/CONCRETE INTERFACE SOUTH OF SOUTHGATE DR IN ENID	2030	C	R	$6.00	$–	$4.80	$1.20
Garfield District 4	36316(04)	US-81: FROM APPROX 5.5 MILES NORTH OF SH-51 (LUCIEN RD); EXTEND NORTH TO ASPHALT/CONCRETE INTERFACE SOUTH OF SOUTHGATE DR IN ENID	2030	C	R	$6.00	$–	$4.80	$1.20
Grady District 7	35703(04)	US-81: AT COUNTY ROAD 1280, APPROX. 2.0 MIS. S. OF POCASSET ADD LT. TURN LANE	2030	C	R	$0.32	$–	$0.26	$0.06
Kay District 4	36249(04)	US-60: OVER DUCK CREEK; APPROX. 3.3 MILES EAST OF US-177	2030	C	R	$2.00	$–	$1.60	$0.40

County / District ODOT District	Job Piece No.	Project Description	Plan Year	Type of Project	NHFN*	Plan Cost Est. (M$)	Funding Source NHFP	Other Federal	State
Kay District 4	36300(04)	I-35: FROM MM224 TO MM230	2030	C	Y	$12.00	$–	$9.60	$2.40
Kay District 4	24226(04)	I-35: FROM JUST NORTH OF HUBBARD RD, EXTEND NORTH APPROX. 4.75 MILES TO JUST NORTH OF ADOBE RD	2030	C	Y	$25.00	$–	$20.00	$5.00
Kingfisher District 4	36315(04)	US-81: FROM APPROX 1.1 MILES N OF SH-51; EXTEND NORTH 8 MILES TO LUCIEN RD.	2030	C	R	$6.00	$–	$4.80	$1.20
Oklahoma District 4	29871(04)	I-35: FROM THE I-44 JCT., EXT N. 4.3 MIS. TO THE KILPATRICK TURNPIKE	2030	C	Y	$7.00	$–	$5.60	$1.40
Oklahoma District 4	36255(04)	I44: UNDER SW 44TH (SOUTHBOUND); APPOX. 1.7 MILES NORTH OF I-240	2030	C	Y	$1.50	$–	$1.20	$0.30
Oklahoma District 4	36256(04)	I-240: UNDER DOUGLAS BLVD; APPROX 7 MILES EAST OF JCT OF I-35	2030	C	Y	$2.00	$–	$1.60	$0.40
Oklahoma District 4	36257(04)	I-240: UNDER HIWASSEE ROAD; APPROX 11.2 MILES EAST OF JCT OF I-35	2030	C	Y	$1.00	$–	$0.80	$0.20
Oklahoma District 4	36299(04)	SH-74: FROM JCT OF SH-66 IN OKC; EXTEND NORTH 8 MILES TO MEMORIAL RD	2030	C	R	$10.00	$–	$8.00	$2.00
Washita District 5	36145(04)	I-40 N FRONTAGE ROAD OVER TURKEY CR, 6.5 MILES EAST OF THE BECKHAM C/L.	2030	C	Y	$2.20	$–	$1.76	$0.44
Washita District 5	36146(04)	I-40 S FRONTAGE ROAD OVER CLINTON LAKE, 8.1 MILES EAST OF THE BECKHAM C/L.	2030	C	Y	$2.60	$–	$2.08	$0.52
					Subtotal 2030	**$132.62**	**$0.00**	**$106.10**	**$26.52**
					GRAND TOTAL	**$1,178.41**	**$0.00**	**$942.72**	**$235.68**

*Y indicates Yes, on the NHFN; R indicates Recommended for NHFN
Project Types: Capacity (C), Operational Improvements (OI)

WATERWAY FREIGHT MOBILITY PROJECTS

Turning to investments in other parts of the Oklahoma multimodal freight system, Table 6-10 lists freight mobility projects scheduled on the MKARNS system at the time of this Plan's development.

Table 6-10. Waterway Freight Mobility Projects, Federal Fiscal Year 2023 through 2030

County ODOT Division	Owner/ Operator	Project Description	Year of Planned Expenditure	Est. Cost. Mill $	Funding Sources
	USACE	50' Stoplog Purchase	2022 to 2024	$10.0	USACE
Wagoner	USACE	Repair Tainter Valves at Newt Graham L&D	2023	$2.5	USACE
Sequoyah & Le Flore	USACE	Repair Tainter Valves at W.D. Mayo L&D	2023	$2.5	USACE
Sequoyah & Le Flore	USACE	Repair Tainter Gates at Robert S. Kerr L&D	2023	$6.5	USACE
Wagoner	USACE	Upgrade Tainter Gate Remote System Chouteau L&D	2023	$0.25	USACE
Wagoner	USACE	Upgrade Tainter Gate Remote System Chouteau L&D	2023	$0.25	USACE
Sequoyah & Le Flore	USACE	Repair Tainter Gates at WD Mayo L&D	2023	$6.8	USACE
N.A.	USACE	Cofferbox Construction	2023	$3.0	USACE
N.A.	USACE	12' Channel	2023	$92.0	USACE with SWL
Wagoner	USACE	Repair Tainter Gates at Newt Graham L&D	2023 to 2025	$15.0	USACE
Muskogee	USACE	Repair Tainter Gates at Webber Falls L&D	2023 to 2030	$42.0	USACE
	USACE	Embankment Repairs Multiple Locations	2023 to 2030	$14.0	USACE
Muskogee	USACE	Webber Falls L&D Dewater Pintleball Preparation	2024	$0.70	USACE
Muskogee	USACE	Stilling Basin Repairs Webber Falls	2024	$13.0	USACE
Muskogee	USACE	Webber Falls L&D Dewater Pintleball Replacement	2025	$0.9	USACE

Source: U.S. Army Corps of Engineers, Tulsa District, September 2022.

RAILROAD FREIGHT MOBILITY PROJECTS

Table 6-11 lists freight mobility projects planned for railroads in Oklahoma at the time of Plan development. Further information is available in the 2022 SRP.

FREIGHT TRANSPORTATION PROVIDED BY MULTIPLE MODES

The freight investment captured by the projects listed in the four previous tables represents approximately $3.98 billion to be spent during the eight years of the OFTP. This includes rail at over $71 million, waterways at $209 million, and highways at $3.70 billion. The highway program includes $176.0 million NHFP, $2.77 billion federal formula funds, and $735.9 million in state funds.

Table 6-11. Short-Range Freight Rail Mobility Projects, Federal Fiscal Year 2022 through 2026

Studies and Projects	Description	General Project Benefits	Estimated Capital Cost (if known)	Funding Source(s)
Highway-Rail Grade Crossing State Action Plan (SAP)	ODOT will prepare a State Highway-Rail Grade Crossing Action Plan. Each state is required to prepare and submit an SAP to the FRA no later than February 14, 2022, per the Final Rule issued by FRA on December 14, 2020.	The purpose of the SAP is to detail the state's current efforts relating to highway-rail grade-crossing safety, identify recent accident/incident trends, and specify actions that can be taken to help mitigate risk at highway-rail grade crossings.	TBD	State Sources
Rural Industrial Park Rail Switching Enhancement Project	The City of Tulsa-Rogers County Port Authority will be awarded $6,189,327 to upgrade an industrial park in Inola, Oklahoma with new structures and rail, and construct a three-mile rail spur connecting to the freight mainline. The project includes adding new drop-pull tracks, installing power switches, building a new northbound wye track, constructing a new clear track loop, and safety improvements at three at-grade crossings.	Enhance operating capacity, efficiency, and safety to provide rail access to new shippers.	$15,000,000	INFRA 2020
Port of Muskogee Rail Access	The project will construct rail and road access improvements at the Port of Muskogee including track upgrades, expansion, and realignment to meet current Class I railroad safety standards; State Highway 16 highway-rail grade-crossing modernization; and approximately 9,700 feet of additional track to expand the capacity of the existing marshalling yard. Received BUILD I grant for $5,789,210.	Enhance operating capacity, efficiency, and safety and improves rail service for shippers.	$11,578,420	BUILD 2018

Studies and Projects	Description	General Project Benefits	Estimated Capital Cost (if known)	Funding Source(s)
AOK Shawnee Subdivision Upgrade	Perform tie replacement, ballast placement, and surfacing to improve 35 miles AOK of track in Oklahoma and Pottawatomie Counties.	Enhance operating capacity, efficiency, and safety and improves rail service for shippers.	$1,500,000	State and Local Sources
BNSF rail bridges over Interstate 240 north of Flynn Yard (Oklahoma City)	Replace BNSF bridges over Interstate 240 to improve horizontal and vertical clearances and allow for potential capacity expansions of both interstate and railroad.	Enhanced rail capacity and a public benefit highway improvement.	TBD	Federal, State, and Local Sources
Replace GNBC bridge over North Canadian River between Southard and Eagle City	Replace 756-foot timber trestle over North Canadian River.	Public benefits include reduced transit times and capacity for larger freight cars; private benefits include reduced labor costs and lower operations and maintenance costs.	$4,200,000	TIGER 2017
GNBC Okeene Passing Siding	Construct a passing siding at Okeene to allow for meets of opposing trains.	Public benefits include reduced transit times and capacity for larger freight cars; private benefits include reduced crew costs and lower maintenance costs.	$1,100,000	TIGER 2017
Track rehab on Kiamichi Railroad Company (KRR) Paris Subdivision (Hugo, Oklahoma to Paris, Texas)	Perform tie replacement, ballast placement, and surfacing to increase operating speeds.	Public benefits include reduced transit times and greater reliability for shippers; private benefits include reduced labor costs and lower operations and maintenance costs.	$2,200,000	CRISI 2020
Upgrade rail for new customer in Durant on KRR	Upgrade track to include 115 lb. rail, tie replacement, ballast placement, and surfacing to increase operating speeds.	Public benefits include reduced transit times and capacity for larger freight cars; private benefits include reduced labor costs and lower operations and maintenance costs.	$3,100,000	CRISI 2020
Upgrade structures on KRR to 286,000 lbs. capacity	Rehabilitate and/or replace structural components of bridges to accommodate 286,000 lb. rail cars.	Public benefits include reduced transit times and capacity for larger freight cars; private benefits include reduced labor costs and lower operations and maintenance costs.	$1,700,000	CRISI 2020

Studies and Projects	Description	General Project Benefits	Estimated Capital Cost (if known)	Funding Source(s)
Upgrade rail on Ashdown Subdivision – Hugo, Oklahoma, to Ashdown, Arkansas	Upgrade main line track to include 115 lb. rail, tie replacement, ballast placement, and surfacing to increase operating speeds.	Public benefits include reduced transit times and capacity for larger freight cars; private benefits include reduced labor costs and lower operations and maintenance costs.	$13,000,000	CRISI 2020
Build wye to add north access from Port of Muskogee to Union Pacific Railroad	Construct new wye track to allow service to Port from the north.	Improved rail access for competitive shipping rates and more efficient operations.	$1,100,000	BUILD 2019
Construct new track to extend south to Industrial Park	Construct new track to the south to facilitate improved rail access for Port of Muskogee.	Improved rail access for more efficient operations.	$5,000,000	BUILD 2019
Capacity Upgrades at Port of Muskogee	Expand storage yard capacity and construct a third track to provide greater flexibility to rail customers at the Port.	Added capacity benefits shippers and improves efficiency.	TBD	BUILD 2019
Grade Separate State Highway 16 Crossing at Port of Muskogee	Construct a roadway overpass for State Highway 16 over the lead tracks at the Port of Muskogee.	Public benefit - highway and safety improvement.	TBD	BUILD 2019
Tie replacement on South Kansas Oklahoma Railroad	Perform tie replacement, ballast placement, and surfacing to increase operating speeds.	Public benefits include reduced transit times and greater reliability for shippers; private benefits include reduced labor costs and lower operations and maintenance costs.	$9,800,000	CRISI 2019
State Highway 37 Grade Separation with BNSF in Moore	Construct a roadway overpass for State Highway 37 over the BNSF in Moore.	Public benefit - highway and safety improvement.	TBD	RAISE 2021
Perform bridge and track maintenance throughout Tulsa Supulpa Union Railway Company system	Perform tie replacement, ballast placement, and surfacing to increase operating speeds. Upgrade bridges to accommodate 286,000 lb. rail cars.	Public benefits include reduced transit times and greater reliability for shippers; private benefits include reduced crew costs and lower operations and maintenance costs.	$2,000,000	Local Sources
Add storage track capacity throughout Tulsa Supulpa Union Railway Company system	Expand storage yard capacity to provide greater flexibility to rail customers.	Added capacity benefits shippers and improves efficiency.	$250,000	Local Sources

Source: ODOT, Rail Programs Division

Note: Please see Chapter 5, Table 5-3, for the long-range freight-rail project list.

6.6 Network Designations

6.6.1 National Highway Freight Network

The Oklahoma freight network consists of the state's transportation corridors and assets designated as parts of the NHFN and NMFN. The FAST Act directs the FHWA to establish the NHFN, which replaced the Primary Freight Network and the Freight Network; both were created by MAP-21. The NHFN has the following components:[42]

- The **Primary Highway Freight System (PHFS[43])** is a network of highways identified as the most critical highway portions of the U.S. freight transportation system determined by measurable and objective national data. Across the nation, the network consists of 41,518 centerlines miles, including 37,436 centerline miles of interstate and 4,082 centerline miles of non-interstate roads. In Oklahoma, 787 roadway miles are part of the PHFS, with an additional 14.6 miles of intermodal connectors. The PHFS in Oklahoma includes I-40, I-35, I-44 (partial), I-240 (partial), I-244 (partial), US-412, and SH-364 (Creek Turnpike).
- **Non-PFHS interstates** consist of the remaining portion of interstate highways not included in the PHFS. These routes provide important continuity and access to freight transportation facilities. These portions amount to an estimated 9,511 centerline miles of interstate nationwide, and will fluctuate with additions and deletions to the interstate highway system. In Oklahoma, these portions amount to an estimated 156 miles and include I-44 (partial), I-235, I-240 (partial), I-244 (partial), and I-444.
- **Critical Rural Freight Corridors (CRFCs)** are public roads not in an urbanized area which provide access and connection for the PHFS and the interstates with other important ports, public transportation facilities, or other intermodal freight facilities.
- **Critical Urban Freight Corridors (CUFCs)** are public roads in urbanized areas that provide access and connection for the PHFS and the interstates with other ports, public transportation facilities, or other intermodal transportation facilities.

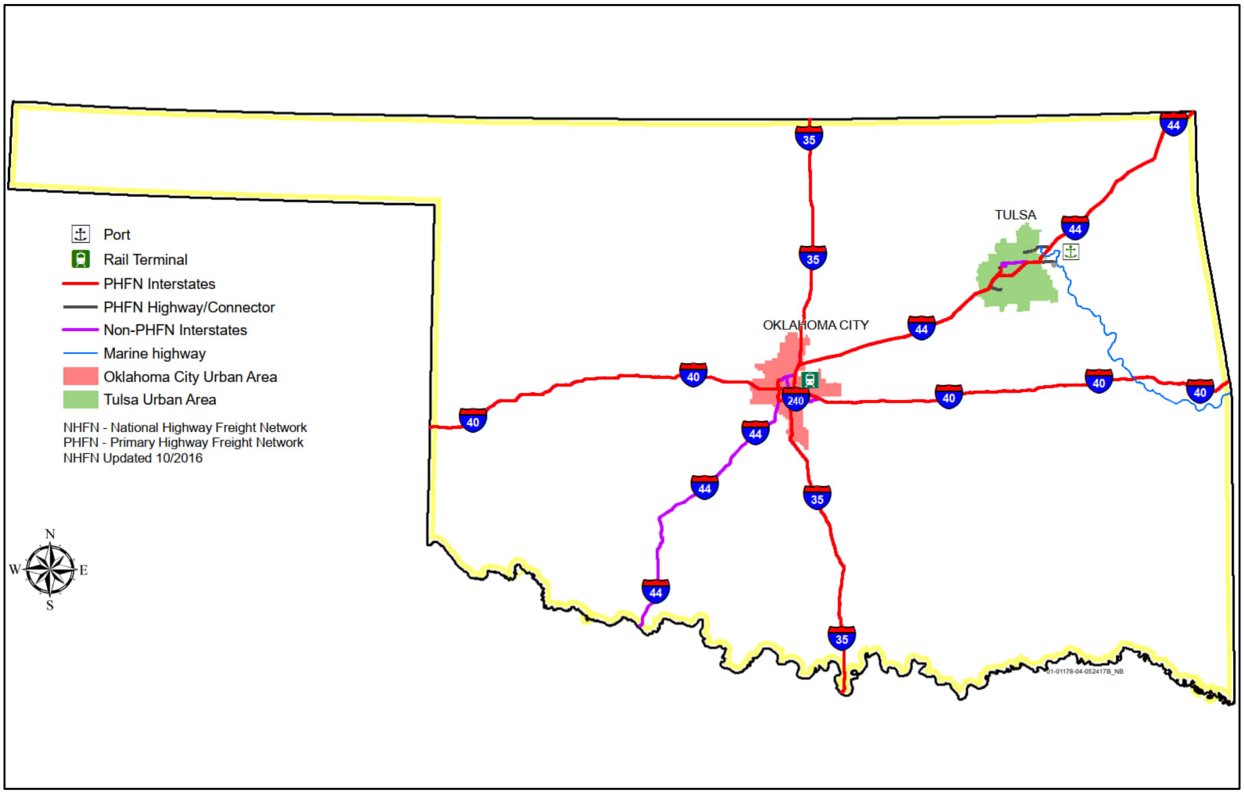
The FAST Act initially designated the PHFS as the network identified by MAP-21 for the highway primary freight network. In October 2015, after a solicitation of comments, the FHWA confirmed the initial PHFS. The PHFS can be re-designated by the FHWA every five years to reflect changes in freight patterns, including emerging and critical commerce corridors. In addition to the PHFS, the FAST Act included all segments of the interstate system (that were not part of PHFS) in the NHFN. As of 2022, the FHWA is redesignating the PHFS to conform to the requirements of the FAST Act, which requires the agency to update the PHFS every 5 years.

The NHFN also includes 14.6 miles of intermodal connectors in Oklahoma. Prior to designation of CRFCs and CUFCs, the NHFN consists of the PHFS and other interstate portions not on the PHFS. Thus, the starting point for the NHFN in Oklahoma (Figure 6-2) is the interstate system,

[42] https://ops.fhwa.dot.gov/freight/infrastructure/nfn/
[43] The terms network and system are used interchangeably when referring to the primary highway freight network/system or the national highway freight.

approximately 11 additional highway miles in the Tulsa area; the BNSF terminal line and the Williams Pipeline station in Tulsa; and road connectors to Port 33 and the Tulsa Port of Catoosa. The assumption is that these NHFN elements are the most critical components of a continuous and accessible state freight transportation system.

Figure 6-2. Oklahoma National Highway Freight Network



Source: Federal Highway Administration; Oklahoma DOT

As shown in Table 6-12, the NHFN amounts to 996 miles in Oklahoma prior to the designation of CRFCs and CUFCs. PHFS routes or connectors comprise 840 miles; the remaining 156 miles are Oklahoma interstate miles that are not part of the PHFS. I-40 represents the longest part of the network followed by I-35.

Table 6-12. Oklahoma National Highway Freight Network Mileage Distribution

	Route	Start Point	End Point	Miles
Primary Highway Freight System (PHFS)	Creek Turnpike/ SH-364	I-44	US-75	5.16
	I-240	I-44	I-35	4.51
	I-244	OK3R (BNSF RR in Tulsa)	I-44	3.62
	I-35	TX/OK Line	OK/KS Line	273.77
	I-40	TX/OK Line	I-35	151.94
	I-40	I-35	OK/AR Line	177.91
	I-44	I-240	4.68 miles north of I-40	8.79
	I-44	I-35	OK/MO Line	194.00
	US-412	SH-6P/near Oakley's Port 33	I-44	5.33
			Subtotal	**825.03**
	Facility ID	**Facility Name**	**Facility Description**	**Miles**
PHFS Intermodal Connectors	OK2L, Tulsa Co. pipeline	Williams Pipeline Station	21st St (33rd W Avenue east to BNSF Terminal at 23 Street)	1.27
	OK2R, Tulsa Co. railroad	BNSF Railroad	From SW Blvd. and I-244 north to BNSF Terminal; (parallel to SW Boulevard)	0.26
	OK5P/ SH-266, Rogers Co. port connector road	Port of Catoosa	SH-266 (from US-169 to I-44/W. Rogers Turnpike)	11.49
	OK6P/ SH-412P, Wagoner Co. port connector road	Oakley's Port 33	From location 0.25 mile south of US-412 on N/S 415, and approximately 5 miles east of W. Rogers Turnpike, then east 1.1 miles on SH-412P to port and river	1.57
			Subtotal	**14.59**
			PHFS Total	**839.62**
	Route	**Start Point**	**End Point**	**Miles**
Interstate Not On PHFS	I-235	I-40	I-44	5.33
	I-240	I-35	I-40	11.92
	I-244	S 21st St	I-44	12.68
	I-44	TX/OK Line	I-240	116.34
	I-44	0.35 mile south of SH-66	I-35	6.85
	I-444	I-244 (south)	I-244 (north)	2.85
			Non-PHFS Total	**155.97**
			ALL	**995.59**

Source: Oklahoma Department of Transportation

The principal significance of the NHFN is that it determines eligibility for use of apportioned funds under the NHFP (also referred to as “freight formula funds”), which total $110 million in Oklahoma over the five years of the IIJA. It also determines eligibility for highway projects under several federal grant programs authorized under IIJA and listed in Table 6-5, such as Mega grants, Infrastructure for Rebuilding America (INFRA) grants, and Rural grants.

As a part of this OFTP’s development, there was a recognition that several highways or rail lines in Oklahoma that are important to freight movement will not be included in the National Highway/Multimodal Freight Network due to the limited mileage allocated to the state. Thus, a number of freight facilities at the state level could be viewed as essential to the goods movement process, even if they are not officially designated as a critical freight corridor or of the national networks.

NATIONAL MULTIMODAL FREIGHT NETWORK

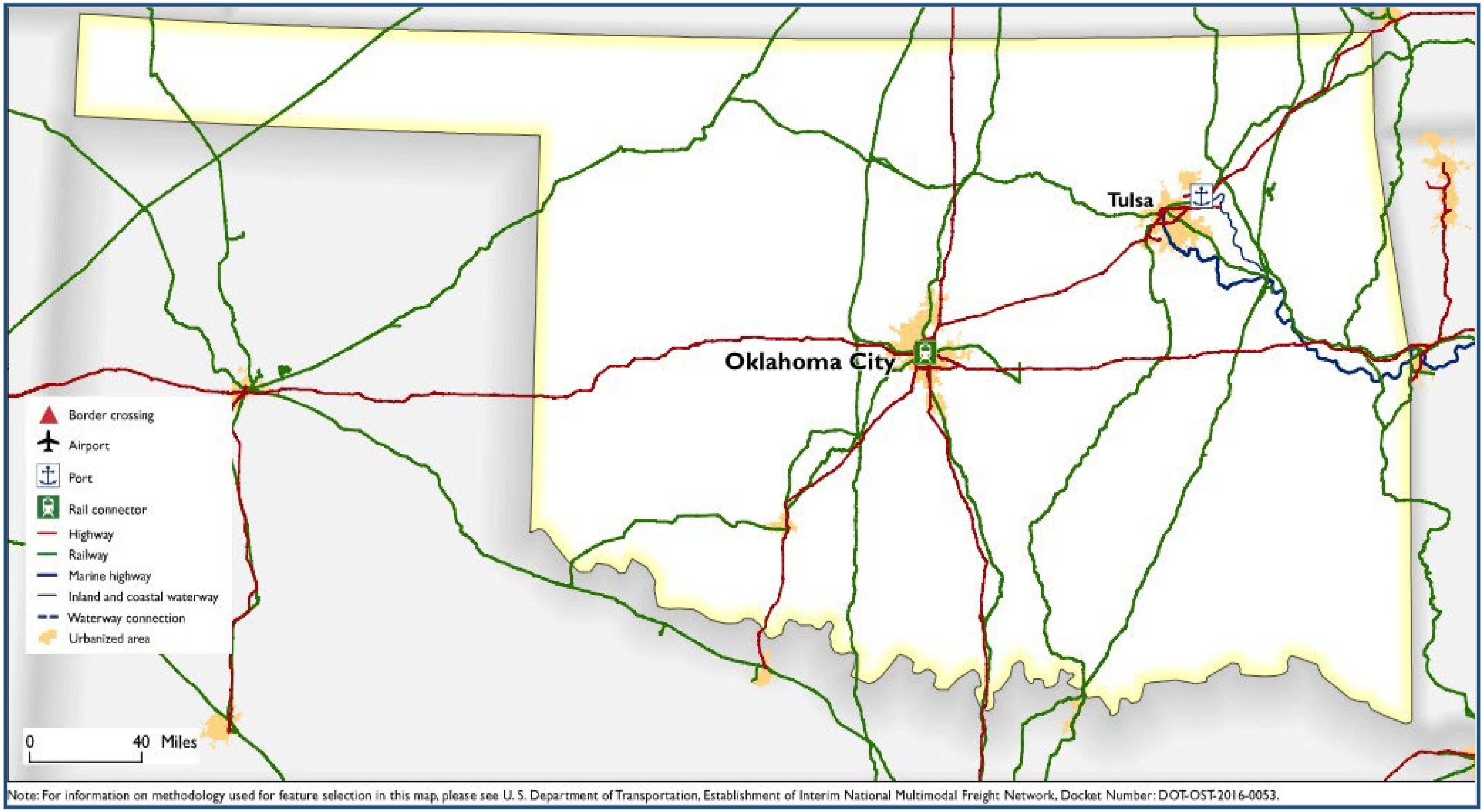
The FAST Act also directed ODOT to establish an NMFN to:

- Assist states in directing resources toward improved system performance for efficient movement of freight.
- Inform freight transportation planning.
- Assist in prioritizing federal investment.
- Assess and support federal investment to achieve national multimodal freight policy goals.

Figure 6-3 shows the interim NMFN (established in 2019) for Oklahoma. In addition to the highways and intermodal connectors included in NHFN, the interim NMFN also includes over 2,000 miles of railroad, 205 navigable river miles, and the Port of Catoosa. [44] The railroad component of the network includes the routes of all the Class I operators in the state: BNSF, KCS, and UP.

[44] https://www.transportation.gov/freight/INMFNTables

Figure 6-3. Oklahoma Interim National Multimodal Freight Network



Source: U.S. Department of Transportation[45]

[45] https://www.transportation.gov/freight/INMFNTables

6.6.2 Rural Freight Corridors

The final elements of the NHFN have been left to the discretion of the states: the CRFCs and the CUFCs. These are limited as to centerline miles; the limits in Oklahoma are 600 rural miles and 150 urban miles. Candidate highways are identified in this document.

Rural freight corridors are called out for specific attention in the FAST Act. The concept "critical rural freight corridor" is reserved for specific designation of a limited number of rural miles in each state that are important to freight mobility. Following the adoption of this OFTP, the recommended CRFCs that are approved will join the rural interstates, urban interstates, the PHFS, and the updated CUFCs in Oklahoma's portion of the NHFN.

DEFINITION OF CRITICAL RURAL FREIGHT CORRIDORS

The FAST Act made provisions for expanding the NHFN beyond the interstate highway system by designating two other components: the CRFC and the CUFC subsystems. CRFCs are principal arterials located outside of the U.S. Census Bureau-designated urbanized areas.[46] To qualify as a CRFC, the roadway must meet one or more of the following criteria:

- High-volume or high percentage truck traffic
- Access to energy, agriculture or other production areas
- Connection to interstates and ports.

FHWA also encouraged states to consider connector routes from high-volume freight corridors to key rural freight facilities, including manufacturing centers, agricultural processing centers, farms, intermodal, and military facilities.

Figure 6-4 shows Oklahoma corridors that carry a high volume of truck traffic.[47]

Figure 6-5 shows the rural highway routes with average daily combination vehicle truck counts equal to or exceeding the 25 percent minimum, described in FHWA guidance.

Like many states, Oklahoma employed a process of identifying "candidate" rural corridors; the final determination as to requesting designation as CRFCs was made following an identification of projects most suitable for freight formula funds. The locations of those projects directed the final recommendation for naming CRFCs.

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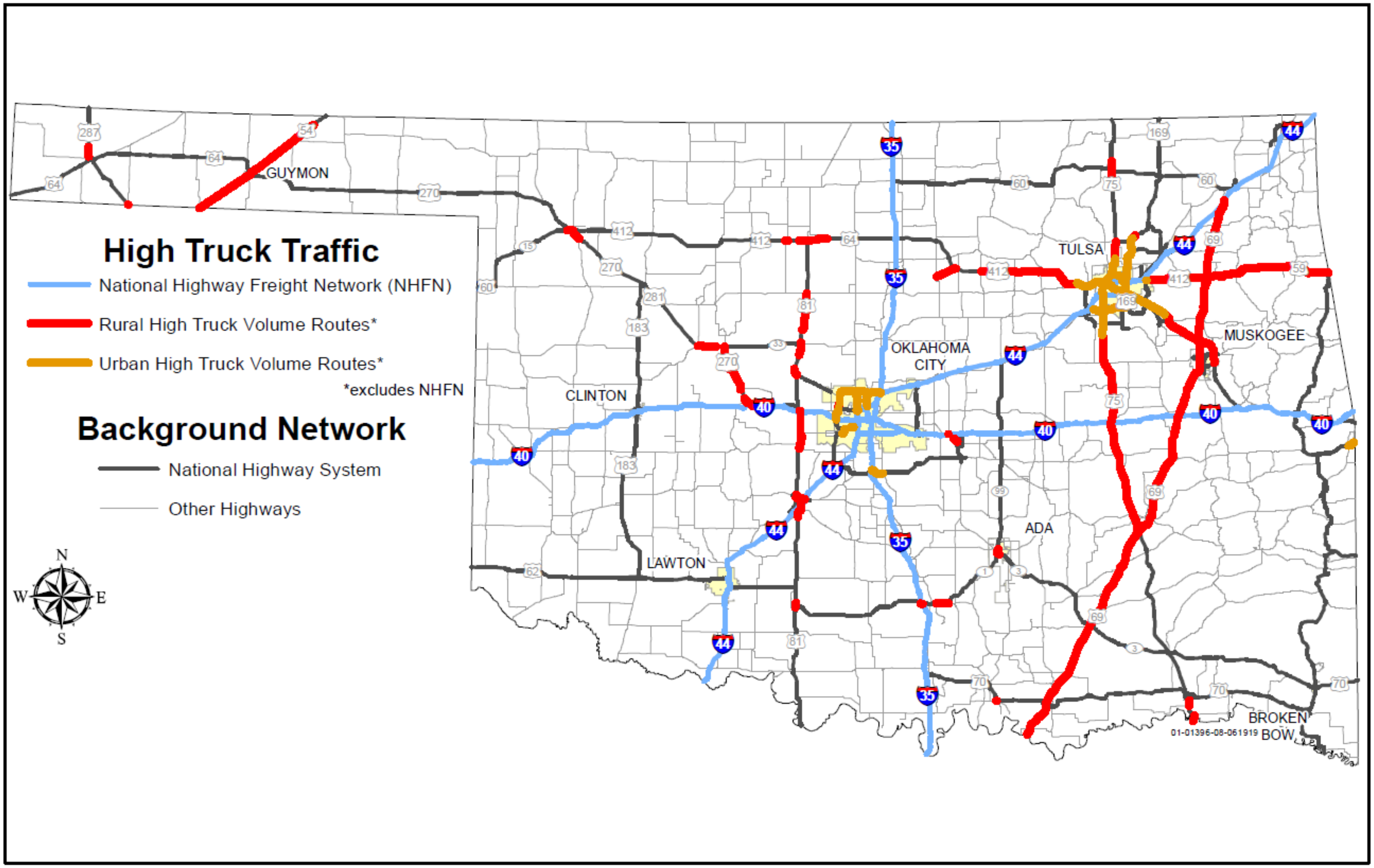
[46] The U.S. Census Bureau defines urbanized areas as having a population of 50,000 or more people in the most recent decennial census. [2010 Census Urban and Rural Classification and Urban Area Criteria]

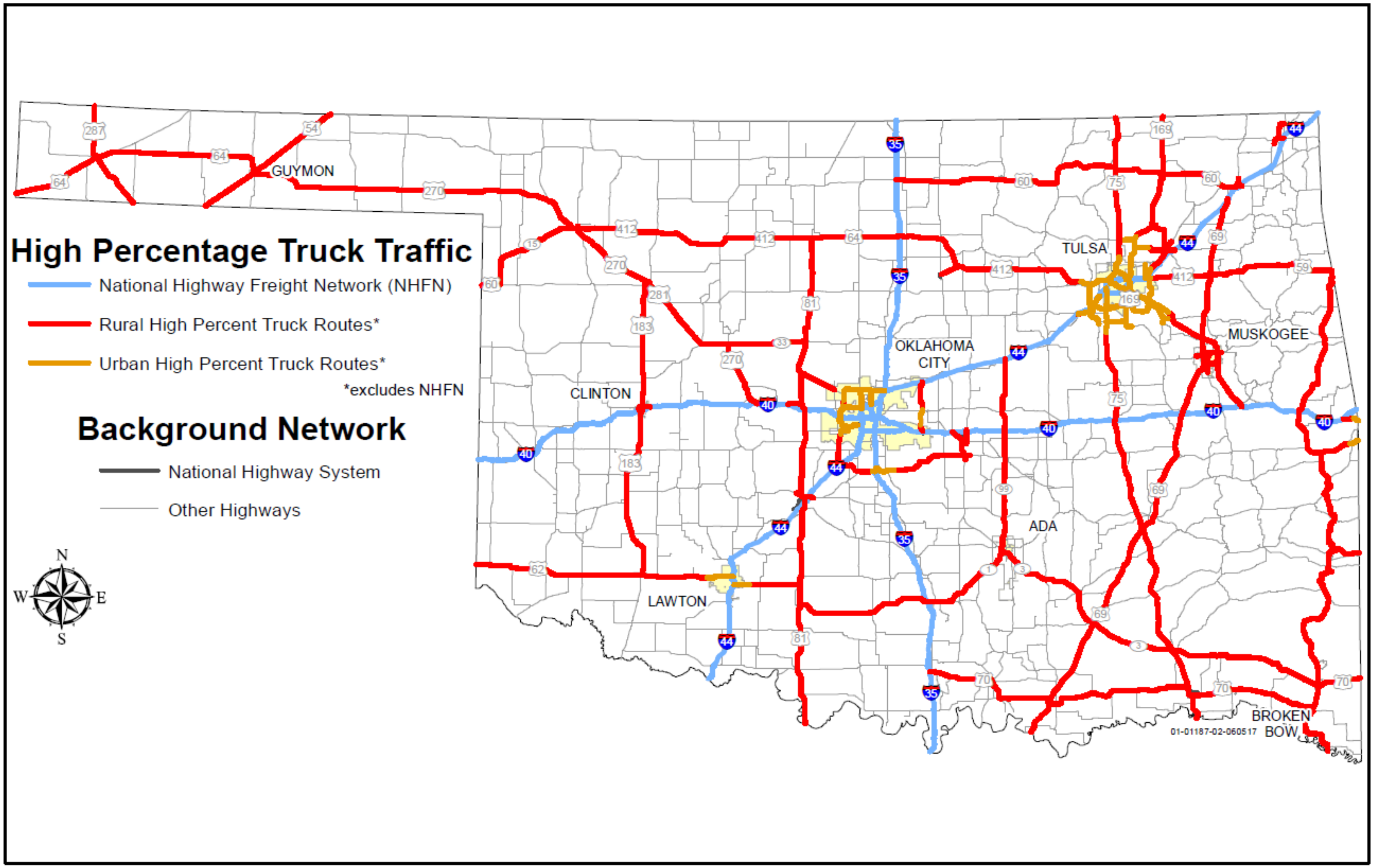
[47] The high truck volume map shows highway segments with high combination (tractor-trailer) vehicle volumes, where "high" is defined as 1,280 combination vehicle average annual daily truck traffic (AADTT) per highway segment. The 1,280 combination vehicle AADTT threshold was selected as the high truck count reference point because highway segments having 1,280 AADTT represented the highest 25 percent segment AADTT..

Figure 6-4. High Truck Traffic Volume



Source: Oklahoma Department of Transportation, WSP analysis

Figure 6-5. High Percentage Truck Traffic



Source: Oklahoma Department of Transportation, WSP analysis

IDENTIFICATION OF OKLAHOMA RURAL FREIGHT CORRIDOR CANDIDATES

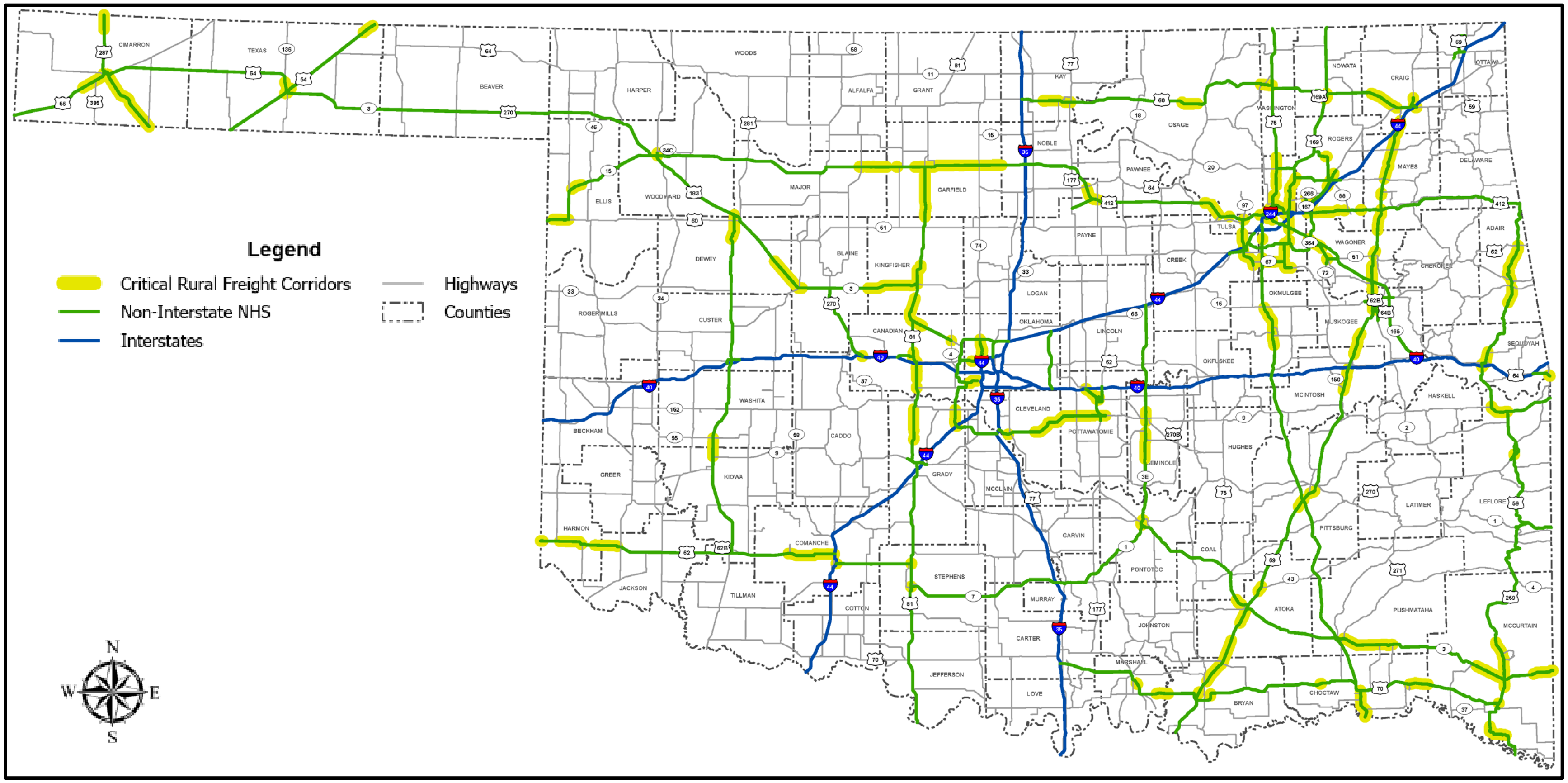
To identify eligible highway segments that would be candidates for inclusion in the Oklahoma CRFC, as a part of this OFTP's process, ODOT employed a methodology that considered the FAST Act criteria as described above for CRFCs. The methodology also recognized projects slated for the Eight-Year Construction Work Plan, identifying rural highway sites where improvement projects have been defined or are needed.

ODOT's initial review of possible CRFCs found that the Eight-Year Construction Work Plan has more projects than can be accommodated by the CRFC designated highways. However, the FAST Act allows initially identified CRFCs to be modified as conditions warrant.

Looking at locations where proposed freight mobility projects coincide with high percentage truck traffic provided a mechanism to narrow the list to projects where funding was most needed. In doing so, candidate CRFCs were those eligible highways where freight mobility improvements requiring funding (Table 6-13) were identified. Additionally, highways experiencing high truck volumes or high truck percentages were considered.

Following the selection of projects for NHFP funding, recommendations for CRFCs (Figure 6-6 and Table 6-13) were made accordingly. ODOT certified and FHWA subsequently verified these CRFCs. Each of these facilities is a principal arterial carrying a high-volume and/or high percentage of truck traffic. The highways also provide connectivity to highway, rail, and/or waterway freight facilities; and each highway is vital to improving the efficient movement of freight in the state. This OFTP recommends that the CRFC designation change as funds are used and needs are met.

Figure 6-6. Critical Rural Freight Corridors



Note: Total CRFC Mileage: 566.37 Miles

Table 6-13. Critical Rural Freight Corridors

County	Route No.	Start Point	End Point	Length (miles)
Adair/Sequoyah	US-59	0.04MI South of JCT US-59 and US- 62	0.30MI South of JCT US- 59 and I-40	20.91
Atoka	US-75	Atoka/Coal CL	2.17MI West of JCT US-75 and US-69	2.18
Atoka/Bryan	US-69	0.64MI South of JCT US-69 and SH-3	1.86MI North of JCT US-69 and US-70	19.91
Canadian	US-281	0.2MI North of JCT US-281 and I-40	JCT US-281 and I-40	0.2
Choctaw	US-271	JCT US-271 and US-70	Oklahoma/Texas State Line	9.12
Cimarron	US-287	Oklahoma/Colorado State Line	Oklahoma/Texas State Line	28.24
Cimarron	US-412	JCT US-412 and US-287	4.62MI West of JCT US-412 and US-385	8.36
Cleveland	SH-9	0.79MI West of JCT SH-9 and US-77	0.89MI West of JCT SH-9 and US-77	0.1
Comanche	SH-7	0.1MI East of JCT SH-7 and I-44	JCT SH-7 and I-44	0.1
Comanche/Jackson/ Harmon	US-62	0.08MI West of JCT US-62 and I-44	Oklahoma/Texas State Line	28.47
Craig	US-60	Jct US-60 and SH-66	3.03MI East of Craig/Nowata CL	9.12
Craig	US-60	0.7MI East of JCT US-60 and I-44	0.68MI East of JCT US-60 and SH-2	1.21
Craig	SH-2	2.32MI North of JCT SH-2 and US-60	2MI North of JCT SH-2 and US-60	0.32
Craig/Mayes/Wagoner/ Muskogee/McIntosh	US-69	0.65mi North of JCT US-69 and I-44	.45 mi South of JCT US-69 and SH- 150	47.84
Creek	US-75	JCT US-75 and SH-33	1MI South of JCT US-75 and SH-67	6.31
Creek	SH-97	Creek/Tulsa CL	1.28MI North of JCT SH-97 and I-44	3.21
Ellis	US-60	JCT US-60 and US-283	2.0MI East of Oklahoma/Texas SL	4.77
Ellis	SH-152	3.4MI West of JCT SH-15and SH-46	1.3MI East of JCT SH-15 and US-283	3.2
Garfield/Kingfisher/ Canadian/Grady	US-81	2.3MI South of JCT US- 81 and US- 412	6.9 MI North of JCT US-81 and US-62	40.33
Garfield/Major	US-412	Garfield/Noble CL	0.5MI West of JCT US-412 and SH-58	34.43
Grady	SH-4	JCT SH-4 and SH-37	JCT SH-4 and I-44	5.21
Kingfisher/Blaine/Dewey	US-270/ SH-3	0.63MI West of JCT SH-3 and US-81	8.08MI West of Dewey and Blaine CL	27.31
Kingfisher/Canadian	SH-3	4.59MI North of JCT SH-3 and SH-33	JCT SH-3 and SH-4	11.24
LeFlore	US-59	0.41MI North of JCT US-59 and SH-9	JCT US-59 and US-276	5.9
LeFlore	US-271	0.62MI North of JCT US-271 and US-59	0.52MI North JCT US-271 and US-59	0.1
McCurtain	US-259	12.27MI North of JCT US-259 and US-70	7.83MI North of Oklahoma/Texas SL	19.12
McCurtain/Choctaw/Bryan	US-70	Oklahoma/Arkansas State Line	5.55MI East of JCT US-70 and US-69	16.91

County	Route No.	Start Point	End Point	Length (miles)
McCurtain/Pushmataha	SH-3	2.30MI South of JCT SH-3 and US-70	At the JCT of SH-e and US-271	27.2
Muskogee	US-64B	2.02MI South of JCT US-64B and US-62B	0.27MI North of JCT US-64B and SH-165	0.47
Nowata	US-169	JCT US-169 and US-60	0.31MI North of JCT US-169 and US-169A	1.89
Oklahoma	SH-74	JCT SH-74 and John Kilpatrick Turnpike	0.33MI South of JCT SH-74 and I-44	7.84
Oklahoma	SH-152	1.24MI West of JCT SH-152 and I-44	2.61MI East of Oklahoma/Canadian CL	2.85
Oklahoma	SH-66	2.81MI West of JCT SH-66 and SH-74	2.29MI East of Oklahoma/Canadian CL	0.26
Okmulgee	US-75	0.2MI South of JCT US-75 and SH-16	2.9MI South of JCT US-75 and US-62	9.53
Osage/Kay	US-60	2.61MI West of JCT US-60 and SH-11	6.85MI East of JCT US-60 and I-35	14.83
Pittsburg/Atoka	US-69	1.75MI South of JCT US-69 and US-270	1.62MI South of JCT US-69 and SH-43	5.64
Porawatomie/Cleveland	SH-9	1.63MI East of JCT SH-9 and US- 177	7.6MI East of JCT US-77 and SH-9	21.81
Pottawatomie	US-177	JCT US-177 and I-40	0.99MI North of JCT US-177 and SH-18	2.8
Pottawatomie	US-270B	1MI East of JCT of US-270B and US-177	JCT of US-270B and SH-3E	0.87
Rogers	US-412	0.65MI West of Rogers/Mayes CL	JCT of US-412 and I-44	14.43
Rogers	SH-66	1.9MI North of JCT SH-66 and SH-20	JCT SH-66 and I-44	5.47
Rogers	SH-88	6.92MI North of JCT SH-88 and SH-20	4.72MI East of JCT SH-88 and US-169	0.39
Rogers	SH-167	JCT SH-167 and SH-266	0.1MI South of JCT 167 and SH-266	0.1
Seminole/Pontotoc	US-377	2.04MI North of JCT US-377 and SH-9	JCT US-377 and SH-1	12.93
Stephens	US-81	0.16MI North of JCT US-81 and SH-7	0.04MI South of JCT US-81 and SH-7	0.2
Stephens	SH-7	0.13MI East of JCT SH-7 and US-81	JCT SH-7 and US-81	0.13
Texas	US-54	0.67MI South of Oklahoma/Kansas SL	0.42MI West of JCT US-54 and US-64	6.28
Texas	US-64	1.08MI South of JCT US-412 and SH-136	2.04MI North of JCT US-64 and US-412	0.44
Tulsa	US-75	0.48MI South of WaSH-ington/Tulsa CL	0.44MI North of JCT US-75 and I-244	10.89
Tulsa	US-169	0.79MI South of JCT US-169 and SH-20	0.14MI South of JCT US-169 and I-244	7.33
Tulsa	SH-67	JCT SH-67 and US-64	JCT SH-67 and US-75	7.01
Tulsa	US-169	0.22MI North of JCT US-169 and I-44	JCT US-169 and US-64	5.88
Tulsa	US-64	1.56MI South of JCT US-64 and US-169	5.36MI West of Tulsa/Wagoner CL	4.83
Tulsa	SH-11	JCT SH-11 and I-244	1.88MI East of JCT SH-11 and US-75	3.54
Tulsa	US-64	3.54MI West of JCT US-64 and I-44	JCT US-64 and US-75	0.4
Tulsa	US-75	2.71MI South of JCT US-75 and I-44	0.83 MI North of JCT US-75 and SH-67	0.77
Tulsa/Pawnee/Payne/ Noble	US-412	0.16MI West of JCT US-412 and I-244	0.50 South of JCT US-412 and US-64 in Noble County	15.68
Wagoner	SH-51	0.64MI West of JCT SH-51 and SH-364	4.36MI West of JCT SH-51 and SH-364	5

County	Route No.	Start Point	End Point	Length (miles)
Wagoner	SH-72	0.09MI South of JCT SH-72 and SH-51	0.30MI North of JCT SH-72 and US-51B	0.41
Woodward	SH-34	0.69MI South of JCT SH-34 and SH-34C	JCT of SH-34 and US-412	0.8
Woodward/Major/Dewey/ Washita/Kiowa	US-183	0.56MI North of the Woodward/Dewey CL	0.24MI North of JCT US-183 and SH-9	13.35
			TOTAL	**566.37**

Source: Oklahoma Department of Transportation

6.6.3 Critical Urban Freight Corridors

Urban freight corridors are also identified in the FAST Act as locations that merit specific attention. The term "critical urban freight corridor" is reserved for designation for a limited number of miles in urban areas that are important to freight mobility. Following the adoption of this OFTP, the recommended CUFCs that are approved will join the rural interstates, the CRFCs, urban interstates, and the PHFS in being Oklahoma's portion of the NHFN. Projects on these corridors will be eligible for freight formula funds or for federal competitive freight grant proposals.

DEFINITION OF URBAN FREIGHT CORRIDORS

The FAST Act provides guidance for selecting CUFCs in an urbanized area. To identify the corridors in an urbanized area with a population of 500,000 or more individuals, the MPO, in consultation with the state, may designate a CUFC. In an urbanized area with a population between 50,000 and 500,000 individuals, the state, in consultation with the MPO, may designate a CUFC.

A public road designated as a CUFC must be in an urbanized area. It must meet one or more of several criteria related to providing a key role in movement of freight, including connections to key freight facilities. FHWA encourages consideration be given to first- or last-mile connector routes from high-volume freight corridors to freight-intensive land and key urban freight facilities, including ports, rail terminals, and other industrial-zoned land.

OKLAHOMA URBAN FREIGHT CORRIDOR CANDIDATES

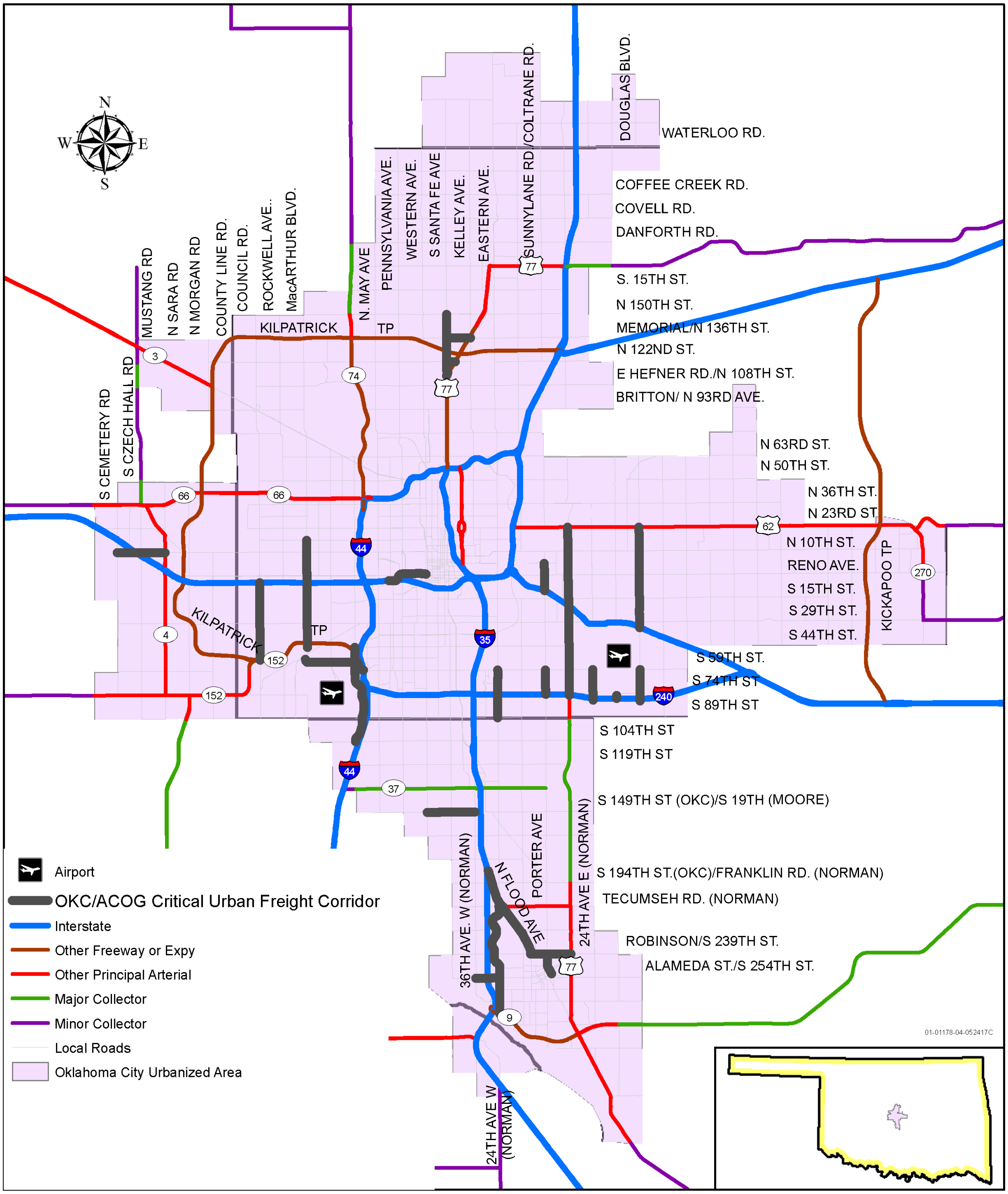
The MPOs—in consultation with ODOT—identified the proposed streets and highways to include as CUFCs for the Oklahoma City and Tulsa metropolitan areas. ODOT certified and FHWA subsequently verified the recommended CUFCs.

Oklahoma City Area

In consultation with local communities and ODOT, the Association of Central Oklahoma Governments, the MPO for the Oklahoma City metropolitan area, developed a list of proposed CUFCs (Figure 6-7 and Table 6-14) for the Oklahoma City urbanized area.

Several criteria were used to score and rank each corridor. These included items such as inclusion in a master transportation plan, functional classification, average annual daily traffic, connectivity with highways and other modes, and proximity to freight reliant industries. While scores were used to narrow the corridor list initially, consideration was also given to local government priorities. Local entities were advised to rank corridors based on interstate and multimodal connections, high freight traffic, pavement condition, and overall project priorities.

Figure 6-7. Critical Urban Freight Corridors: Oklahoma City Association of Central Oklahoma Governments Area



Source: ODOT, 2022

Table 6-14. Critical Urban Freight Corridors: Association of Central Oklahoma Governments/Oklahoma City Area

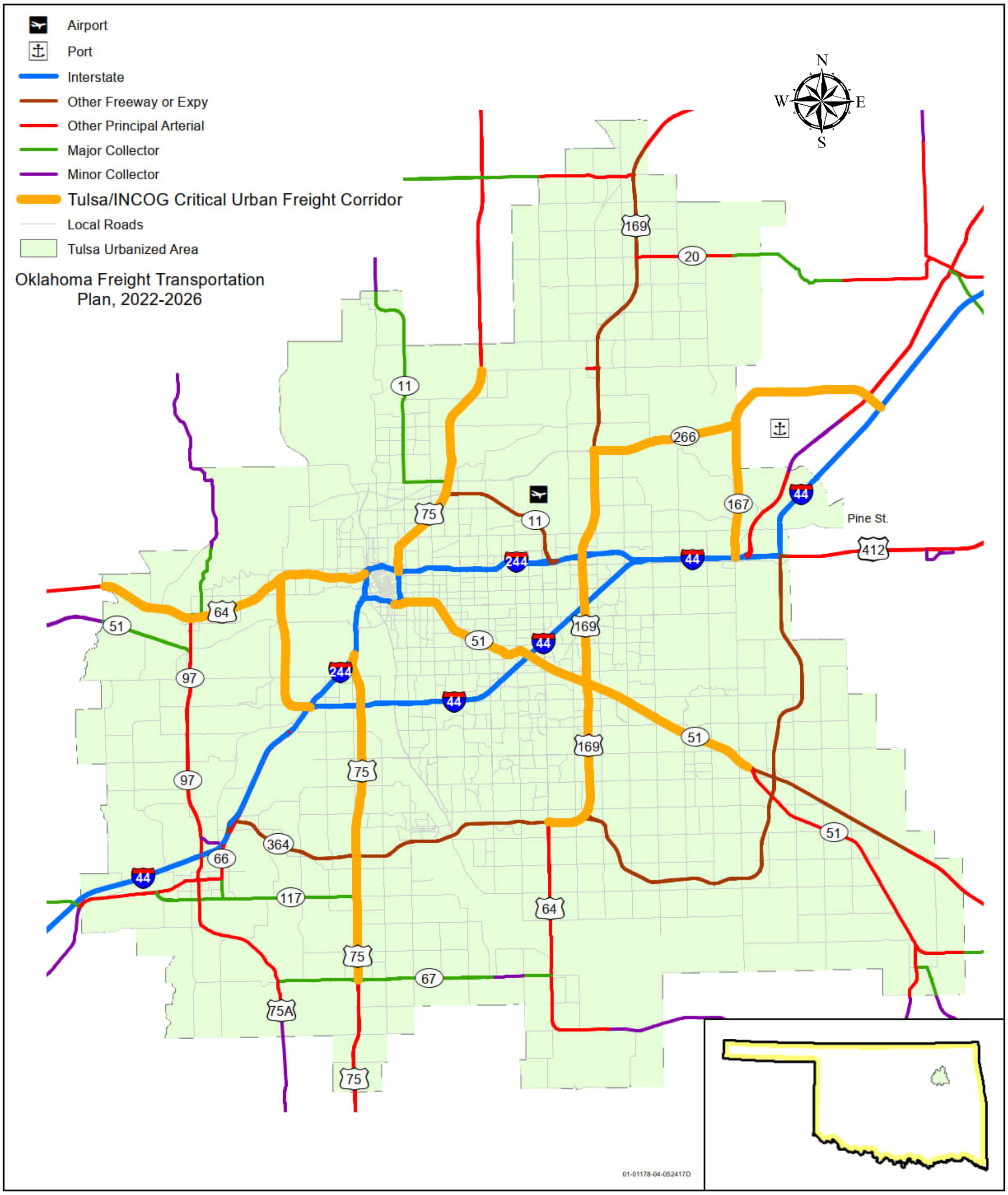
Entity		Location	From	To	Length in Miles
Existing	Del City	Sunnylane Road	N. 4th Street	I-40	1.14
	Midwest City	Douglas Boulevard	US-62 (N. 23rd Street)	I-40	4.22
	Moore	S. 149th Street (S. 19th Street)	Telephone Road	Eastern Avenue	2.01
	Norman	Flood Avenue	I-35	S. 239th Street (Robinson Street)	4.01
	Norman	Eastern Avenue (24th Avenue SW)	S. 209th Street (Tecumseh Road)	SH-9	4.85
	Oklahoma City	MacArthur Boulevard	N. 16th Street	S. 44th Street	4.51
	Oklahoma City	N. 122nd Street	Santa Fe Avenue	I-235/SH-77	0.35
	Oklahoma City	Santa Fe Avenue	N. 150th Street	N. 114th Street	2.64
	Oklahoma City	Reno Avenue	Morgan Road	Western Avenue	8.96
	Oklahoma City	Memorial Road	Santa Fe Avenue	Kelley Avenue	1.00
	Oklahoma City	Council Road	I-40	SH-152	3.27
	Oklahoma City	N. 36th Street	Santa Fe Avenue	Lincoln Boulevard	0.51
	Oklahoma City	Reno Avenue	I-235	Eastern Ave	1.15
	Yukon	N. 10th Street	Cemetery Road (Garth Brooks Blvd)	Mustang Road	2.00
				Total - Existing	**40.63**
New Additions	Midwest City	Sooner Rd.	NE 23rd St.	I-240	7.05
	Norman	Main St.	24th Ave. W	36th Ave. W	1.00
	Norman	Robinson St.	Flood Ave.	12th Ave. NE	1.69
	Norman	Porter Ave.	Robinson St.	Eufaula Ave.	0.87
	Oklahoma City	S Air Depot	I-240	SE 59th St.	1.29
	Oklahoma City	S Midwest Blvd.	I-240	Tinker Gate	0.12
	Oklahoma City	S Douglas Blvd.	I-240	SE 59th St.	1.33
	Oklahoma City	S Portland Ave.	SW 44th	SW 104th St.	4.18
	Oklahoma City	S 54th St./S 59th St.	I-44	S MacArthur Blvd.	2.70
	Oklahoma City	S Sunnylane Rd.	SE 59th St.	I-240	1.03
	Oklahoma City	S Eastern Ave.	SE 59th St.	SE 89th St.	2.00
	Oklahoma City	OKC Boulevard	Western Ave.	I-40	1.71
				Total - New Additions	**24.96**
Removals	Oklahoma City	N. 36th Street	Santa Fe Avenue	Lincoln Boulevard	0.51
	Oklahoma City	Reno Avenue	Morgan Road	Western Avenue	8.96
	Oklahoma City	Reno Avenue	I-235	Eastern Ave	1.15
				Total - Removals	**10.62**
				TOTAL	**54.97**

Source: Association of Central Oklahoma Governments

Tulsa Area

The Indian Nations Council of Governments—the MPO for the Tulsa metropolitan area—formed a technical working group comprising representatives of member governments. The working group identified CUFC segments based on high-growth freight corridors, travel times, target miles for the MPO, and projects in the ODOT Eight-Year Construction Work Plan. Figure 6-8 and Table 6-15 show the proposed CUFCs for the Tulsa area.

Figure 6-8. Critical Urban Freight Corridors: Tulsa Indian Nations Council of Governments Area



Source: ODOT, 2022

Table 6-15. Critical Urban Freight Corridors: Indian Nations Council of Governments/Tulsa Area

Entity		Location	From	To	Length in Miles
Existing	Rogers County	SH-167	SH-364/Creek Turnpike	I-244	4.85
	Tulsa County	SH-51/US-64	IDL/US-75	US-169	8.05
	Tulsa County	US-169	US-64/ Memorial Drive	Pine St.	11.73
	Tulsa County	US-75	SH-364/Creek Turnpike	I-244	7.38
				Total - Existing	**32.01**
New Additions	Rogers County	SH-266 - Port Road	US-169	SH-167	5.28
	Rogers County	SH-266	SH-167	I-44 (Will Rogers Tpk)	6.21
	Tulsa County	US-169 N	I-244	SH-266/Port Road	3.88
	Tulsa County	SH-51 - BA Expressway	US-169	Muskogee Tpk	6.63
	Tulsa County	US-75 South	Creek Tpk	SH-67	4.51
	Tulsa County	US-75 North	I-244	76th St North (Cherokee Industrial Park)	8.43
	Tulsa County	US-64	Sandsprings Expressway – I-244	161st West Ave	10.25
	Tulsa County	Gilcrease Tpk	I-44	US-412	5.41
				Total - New Additions	**50.61**
				TOTAL	**82.62**

Source: Indian Nations Council of Governments

6.7 FREIGHT FUNDING PARTNERSHIPS

In addition to the freight formula funding available through the FAST Act, ODOT should continue to pursue other revenue sources. Federal grants are a key component of alternative revenue sources available to ODOT. ODOT has submitted or intends to submit applications for the following projects for federal grants in 2022 (https://oklahoma.gov/odot/progress-and-performance/federal-grant-awards.html):

- **Rebuilding American Infrastructure with Sustainability and Equity (RAISE)**
  - Multiple Counties – MKARNS Mooring Modernization Project
  - Cleveland County – SH-37 BNSF Grade Separation and Multimodal Improvements (Awarded)
  - Tulsa County – Reconnecting Neighborhoods in West Tulsa: W. 51st Street Extension (Awarded)
- **Multimodal Project Discretionary Grants (MPDG) - National Infrastructure Project Assistance (Mega) & Infrastructure for Rebuilding America (INFRA)**
  - Tulsa County – Enhancing Safety and Mobility in West Tulsa: I-44 and US-75 Corridor Improvements
  - Oklahoma County – Priority Improvements on the I-35 Corridor
  - Rogers Count – US-412 Priority Improvements for Interstate Designation

- **Multimodal Project Discretionary Grants (MPDG) – Rural Surface Transportation Grant (Rural)**
  - Multiple Counties – At-Grade Safety Improvements to Reestablish the Heartland Flyer Northern Extension
  - Grady County – US-81 Realignment
  - Multiple Counties – Safety Improvements for Oklahoma Rural Roads
- **Port Infrastructure Development Program (PIPD)**
  - Multiple Counties – MKARNS Mooring Modernization Project
- **Bridge Investment Program (BIP)**
  - Oklahoma County – "Crossroads of America" Bridges on I-40 over I-44 and Portland
  - Sequoyah & Muskogee Counties – SH-100 Over the Arkansas River
  - McClain County – I-35 over DH-74 in Purcell

    Bryan County – US-69 Bridge Replacement in Durant
- **Railroad Crossing Elimination (RCE)**
  - BNSF railroad and SH-7 in Davis

ODOT has a number of freight projects included in the *Eight-Year Fiscally Constrained Freight Investment Plan* that should compete well for future federal discretionary grant funding. Private- and or public-funding partnerships will be critical to the success of these applications.

7 Conclusion and Next Steps

7.1 CONCLUSION

The Oklahoma freight transportation system serves the people of the state by delivering the necessities of everyday life, including food, fuel, clothing, medicine, building materials, and equipment needed for communication, transportation, sporting, and a multitude of other purposes. The system serves the businesses of Oklahoma by ensuring their supply lines and giving them access to markets near and far, thus contributing to employment for people and prosperity for the state. To residents, these fundamental functions are largely invisible because they perform well, and their vital importance attracts attention only because of disruptive events. Even so, the quality of performance must be sustained at a favorable cost so that Oklahoma is an affordable place to live and a competitive place for businesses to locate.

Good performance is reliable, productive, safe, and secure; it is generated daily through freight operations and longer term through capital investments and policies in the public and private sectors. A high-quality transportation system benefits from multiple modes of transportation because modal options keep competition sharp, thus contributing to lower costs. A variety of modes accommodate a range of shipments whose volume, time commitments, and physical characteristics are quite diverse. The Oklahoma multimodal freight system does all these things. Moreover, it performs these functions for people well beyond its borders through the large quantity of goods that pass through Oklahoma on its highways, railroads, and waterways.

This is the second comprehensive freight plan ODOT has issued. This Plan sets forth the following:

- A vision and goals
- Strategies and policies to achieve the goals
- Measures to track achievement
- Investments selected because they support the goals

ODOT has identified investments for priority multimodal freight projects to be funded by traditional means that go beyond the $114.5 million five-year federal allocation from the IIJA. They are part of a statewide investment program totaling more than $3.5 billion over the next eight years. ODOT also has defined a set of significant freight bottlenecks for potential investment in future editions of its Eight-Year Construction Work Plan.

The development of this Plan and identification of priority investments, including those addressing freight bottlenecks, represent ODOT's commitment to freight transportation institutionalized in several important ways:

- Through performance measures monitor progress toward freight goals.
- Through incorporation of freight elements in the tools for project prioritization, using the process adopted and documented through this Plan, ODOT will ensure that the influence

of investments on freight transportation is accounted for, and the Eight-Year Construction Work Plan is a vehicle for promoting that investment. This has the effect of *mainstreaming* freight, meaning freight is treated as an everyday focus in transportation management instead of something unusual or ancillary.

- Through continued outreach to the FAC, ODOT will
  - Remain abreast of developments in industry and retain direct input on multimodal concerns.
  - Communicate performance to stakeholders and incorporate substantiated responses.
  - Solicit stakeholder views on freight projects in the process of updating the Statewide Transportation Improvement Program.
- Through pursuit of federal competitive grants that emphasize freight and are typically opened for annual bids, ODOT may augment its resources for freight investment and cultivate a platform for public-private partnerships.
- Through ongoing coordination with MPOs in their freight planning, particularly in respect to bottlenecks that tend to concentrate in metropolitan areas.
- Through ongoing coordination with adjoining states who also develop multimodal freight plans, ODOT can align selected investments with neighbors to improve performance contiguously along freight corridors.

In keeping with the IIJA, ODOT will update its freight plan on a four-year cycle. The methods outlined above will enable the next update to be the culmination of continuing efforts instead of a periodic revisiting of freight requirements. In other words, the aforementioned steps represent the institutionalization of the management of freight in the ordinary way that ODOT does business. The stakeholders in freight transportation are the residents and industries ODOT supplies and supports. These people and entities are the ones who will benefit from ODOT's commitment and its steady dedication to the vision and goals articulated in this Plan.

7.2 NEXT STEPS

This Plan was developed in consultation with the Oklahoma FAC, as recommended by the IIJA. Thereafter:

- The Freight Investment Plan will be executed and funds expended according to federal regulations.
- The CUFCs and CRFCs defined in this Plan will become part of the NHFN following FHWA verification, and projects on these facilities will be eligible for grant applications under the INFRA program.
- Freight bottlenecks not yet addressed by projects will be evaluated for future editions of the Eight-Year Construction Work Plan.
- The institutionalization of freight management at ODOT will proceed as described above.
- This Plan will be posted on the ODOT website and made available to stakeholders around the state and to interested parties elsewhere.






Oklahoma Freight Transportation Plan | October 2022
Appendix A – Glossary
2023-2030

OKLAHOMA
Transportation

Appendix A Glossary

Term	Definition
Eight-Year Construction Work Plan	a plan administered by ODOT that guides the scheduling and conducting of the complex engineering, environmental, and right-of-way activities necessary to complete construction projects in a timely fashion. The first four years of the Eight-Year Construction Work Plan are represented in the Statewide Transportation Improvement Program.
Air Force Base (AFB)	an installation of the U.S. Air Force that facilitates and supports the operation of military aircraft for purposes of national defense
Alternative Fuel Corridors	a highway segment designated by the Federal Highway Administration as part of an interstate network of stations that will fuel vehicles powered by clean and domestically produced alternative fuels
Americas Commercial Transportation Research Co.	a U.S. publisher of commercial vehicle industry data, market analysis, and forecasting services
Association of Central Oklahoma Governments	the regional, intergovernmental planning association for the Central Oklahoma region and the Metropolitan Planning Organization for the Greater Oklahoma City region
Automated/autonomous vehicle technology	vehicle designed to travel between destinations without a human operator. To qualify as fully autonomous, a vehicle must be able to navigate without human intervention to a predetermined destination over roads that have not been adapted for its use.
Average Annual Daily Traffic	the total volume of vehicle traffic of a highway or road for a year divided by 365 days
Average Annual Daily Truck Traffic (AADTT)	the total volume of truck traffic on a highway segment for one year, divided by the number of days in the year.
Barge	the cargo-carrying vehicle that inland water carriers primarily use. Basic barges have open tops, but there are covered barges for both dry and liquid cargoes.
Bakken Region	the region underlain by the Bakken Formation, a 200,000-square mile geological unit in North Dakota and Montana in the United States, and Saskatchewan and Manitoba in Canada
Bottleneck	a section of a highway or rail network that experiences operational congestion
Bulk Cargo	cargo that is transported unpackaged in large quantities as a liquid or in granular, particulate form, as a mass of relatively small solids, such as petroleum/crude oil, grain, coal, or gravel
BNSF Railway	one of the largest freight railroads in North America, primarily serving the United States west of the Mississippi River
Capacity	physical facilities, personnel, and processes available to meet the product of service needs of the customers. Capacity generally refers to maximum output of transportation network or facility.
Carload	unit of rail freight equivalent to one freight car
Carrier	a firm that transports goods or people via land, sea, or air
Class I Railroad	classification of railroad having annual operating revenues of $447,621,226 (current dollars) or more
Class II Railroad	classification of railroad having annual operating revenues less than $447,621,226 but more than $35,809,698 (current dollars)
Class III Railroad	classification of railroad having annual operating revenues of $35,809,698 (current dollars) or less

Term	Definition
Combination Vehicle	standard 5-axle semi trailer-truck with a trailer on tractor (see Long-Combination Vehicle)
Commodity	synonym for type of good (e.g., coal, grain, iron, metallic minerals)
Connected Vehicle (CV)	technologies that allow vehicles to communicate with one another, with infrastructure, and with other equipment, objects or persons
Container	a large metal box of a standard design and size used for the transportation of goods by road, rail, sea, or air
Containerized Cargo	cargo transported in containers that can be transferred easily from one transportation mode to another
Critical Rural Freight Corridors (CRFC)	public roads not in an urbanized area that provide access and connection to the Primary Highway Freight System and the interstate system providing access to freight generators
Critical Urban Freight Corridors (CUFC)	public roads in urbanized areas that provide access and connection to the Primary Highway Freight System and the interstate with other ports, public transportation facilities, or other intermodal transportation facilities
Decision Lens	integrated planning software developed to modernize government prioritization, planning, and funding processes, and may include performance criteria such as bridge condition, pavement condition, geometric deficiencies, crash mitigation, system utilization, system mobility/performance, and freight performance measures
Distribution Center	facility that holds inventory from manufacturing for distribution to stores or smaller local warehouses; can perform consolidation, warehousing, packaging, decomposition and other functions linked with handling freight
Dynamic Message Signs (DMS)	large, electronic signs that overhang or appear along major highways. The signs are typically used to display information about traffic conditions, travel times, construction, and road incidents.
Economies of Scale	factors that cause the average cost of producing goods or services to fall as the volume of its output increases. Hence it might cost $3,000 to produce 100 copies of a magazine but only $4,000 to produce 1,000 copies. The average cost in this case falls from $30 to $4 a copy because the main elements of cost in producing a magazine (editorial and design) are unrelated to the number of magazines produced. Similarly, it is less expensive to run one freight train with 150 cars than two trains of 75 cars each.
Federal Highway Administration (FHWA)	an agency within the U.S. Department of Transportation that supports state and local governments in the design, construction, and maintenance of the nation's highway system (Federal Aid Highway Program) and various federally and tribal owned lands (Federal Lands Highway Program)
Federal Railroad Administration (FRA)	An agency within the U.S. Department of Transportation purposed to promulgate and enforce rail safety regulations, administer railroad financial assistance programs, conduct research and development in support of improved railroad safety and national rail transportation policy, and consolidate government support of rail transportation activities
Freight Advisory Committee (FAC)	a group of major stakeholders that have been chosen by ODOT to represent freight stakeholders in various sectors, and will serve to advise ODOT on freight-related priorities, issues, projects, and funding
Fiscally Constrained	for transportation plans, the total estimated costs of projects included in a plan cannot exceed estimated revenues and the estimated cost of constructing, operating, and maintaining the total transportation system over the period of the plan

Term	Definition
Fixing America's Surface Transportation Act (FAST Act)	authorized $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs
Foreign Trade Zone	secure areas under U.S. Customs and Border Protection (CBP) supervision that are generally considered outside CBP territory upon activation, located in or near CBP ports of entry, and are the U.S. version of what are known internationally as free-trade zones
Freight Analysis Framework (FAF) 5.3	database produced through a partnership between Bureau of Transportation Statistics and Federal Highway Administration that integrates data from different sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation
Gross Domestic Product (GDP)	sum of all goods and services produced within the U.S. borders calculated quarterly by the U.S. Department of Commerce
Gross Vehicle Weight	combined weight of a vehicle and its freight
Geotab	a privately held company that provides telematics hardware technology (In-Vehicle Monitoring Systems), which it presents as "Internet of Things" devices
Grainbelt Corporation Railroad (GNBC)	a wholly owned affiliate of Farmrail Corporation formed in 1987 to purchase from Burlington Northern and operate 178 miles of rail line linking Enid and Frederick, Oklahoma
Greenhouse Gas (GHG)	any gas that can absorb infrared radiation emitted from Earth's surface and reradiate it back to Earth's surface, thus contributing to the greenhouse effect
Hazardous Material	a substance or material that the U.S. Department of Transportation has determined to be capable of posing a risk to health, safety, and property when stored or transported in commerce
Highway Performance Monitoring System	a national level highway information system that includes data on the extent, condition, performance, use, and operating characteristics of U.S. highways
Hours of Service (HOS)	amount of time a driver is allowed to work without rest
Hub/Freight Hub	a facility where cargo is exchanged between vehicles or between transport modes
Indian Nations Council of Governments	a voluntary association of local and tribal governments in the Tulsa metropolitan area in northeast Oklahoma comprising Creek, Osage, Rogers, Tulsa, and Wagoner Counties
Infrastructure Investment and Jobs Act (IIJA)	authorized $550 billion over fiscal years 2022 through 2026 for highways, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs
Infrastructure for Rebuilding America (INFRA) Program	provides dedicated, discretionary funding for projects that address critical issues facing our nation's highways and bridges. INFRA grants create opportunities for all levels of government and the private sector to fund infrastructure, using innovative approaches to improve the necessary processes for building significant projects, and increasing accountability for the projects that are built.
Intelligent Transportation System (ITS)	a system that collects, stores, processes and distributes information relating to the movement of people and goods
International Roughness Index	a scale for roughness based on the simulated response of a generic motor vehicle to road surface irregularities

Term	Definition
Intermodal	the transportation of freight in an intermodal container or vehicle, using multiple modes of transportation (rail, barge, and truck), without any handling of the freight itself when transferring modes
Intermodal Connectors	highways that provide access between major intermodal facilities and the other four subsystems making up the National Highway System
Intermodal terminal	a facility for the transfer of containers between railroad and truck
Inventory	number of units and/or value of the stock of good a company holds
Kansas City Southern Railway Company (KCS)	the smallest Class I railroad and a primarily north-south, 3,500 route-mile rail line linking the central United States to Mexico across 10 states in the central and southern United States
Kiamichi Railroad Company (KRR)	a 264-mile, Class III short-line railroad in Oklahoma, Arkansas, and Texas owned by Genessee & Wyoming, Inc.
Land Mobile Radio	terrestrially based wireless commonly used for critical communications by public safety organizations such as police, firefighters, and other emergency response organizations
Last Mile	describes movement of goods from a transportation hub to the final delivery destination
Level of Service	qualitative measure of a road's operating conditions
Lock	device used for raising and lowering boats, ships, and other watercraft between stretches of water of different levels on river and canal
Logistics	all activities involved in transporting goods to customers
LongCombination Vehicle	commonly defined as a tractor-trailer with two or more trailers that can carry more than 80,000 pounds of gross vehicle weight
Long Range Transportation Plan (LRTP)	document produced by regional or statewide agency serving as the vision for the region's or state's transportation systems and services. In metropolitan areas, the plan typically indicates all the transportation improvements scheduled for funding over the next 20 years, and is sometimes known as the Metropolitan Transportation Plan.
Moving Ahead for Progress in the 21st Century Act (MAP-21)	an act that authorized in 2012 over $105 billion in federal funding for surface transportation programs for fiscal years 2013 and 2014 and was extended until the signing of the FAST Act in December 2015.
McAlester Army Ammunition Plant (MCAAP)	a weapons manufacturing facility and Defense Ammunition Center for the U.S. Department of Defense near McAlester, Oklahoma
McClellan-Kerr Arkansas River Navigation System (MKARNS)	the 445-mile navigation channel that begins at the confluence of the White and Mississippi Rivers and proceeds one-half mile upstream on the White River to the Montgomery Point Lock and Dam. From there, the channel proceeds 9 miles upstream on the White River to the manmade Arkansas Post Canal, and then 9 miles through the canal to the Arkansas River. The MKARNS crosses Arkansas into Oklahoma until it reaches the confluence of the Arkansas and Verdigris Rivers where the navigation channel follows the Verdigris River terminating 51 miles upstream at the Port of Catoosa, near Tulsa.
Metropolitan Planning Organization (MPO)	regional policy-setting body, required in urbanized areas with populations over 50,000, and designated by local officials and the governor of the state; responsible in cooperation with the state and other transportation providers for carrying out the metropolitan transportation planning requirements of federal highway and transit legislation
MetroQuest	the online engagement platform that is designed for transportation planning
Mobility	the ease with which people or goods move from place to place
Multimodal	transportation of freight using several modes

Term	Definition
Multimodal Project Discretionary Grants (MPDG)	grants that provide federal financial assistance to highway and bridge, intercity passenger rail, railway-highway grade and separation, wildlife crossing, public transportation, marine highway, and freight and multimodal projects, or groups of such projects, of national or regional significance, as well as to projects to improve and expand the surface transportation infrastructure in rural areas
National Cooperative Highway Research Program (NCHRP)	a national research program carried out through the collaborative efforts of the Federal Highway Administration; the National Academy of Sciences, Engineering, and Medicine; and the American Association of State Highway and Transportation Officials
National Electric Vehicle Infrastructure (NEVI)	a federal program that will provide $5 billion in formula funding to state governments to build out charging infrastructure along highway corridors by 2030—filling gaps in rural, disadvantaged, and hard-to-reach locations to instill public confidence in charging; Oklahoma's Deployment Plan was approved in September 2022 and funds became available for Fiscal Year 2022
National Highway Freight Network (NHFN)	mandated by the Fixing America's Surface Transportation Act (FAST Act) to strategically direct federal resources and policies toward improved performance of highway portions of the U.S. freight transportation system, including the Primary Highway Freight System (PHFS) plus remaining interstates not on the PHFS
National Highway Freight Program (NHFP)	a federal program to improve the efficient movement of freight on the National Highway Freight Network and support several goals pertaining to benefits from the improved efficacy of the U.S. freight transportation system
National Highway System (NHS)	roadway system established by Congress that consists of roads important to the national economy, defense, and mobility. The NHS includes the following subsystems of roadways: interstates, some principal arterials, the Strategic Highway Network, and Intermodal Connectors. The MAP-21 legislation made some significant changes to the NHS.
National Multimodal Freight Network (NMFN)	proposed national freight network that includes all modes
National Performance Management Research Data Set (NPMRDS)	a Federal Highway Administration database that contains location information collected in 5-minute intervals for road segments on the National Highway System. The data can be used to estimate speed for roadway segments. (NPMRDS is sometimes referred to as National Travel Time Data.)
National Travel Time Data	see National Performance Management Research Data Set
Oklahoma Permitting and Routing Optimization System (OkiePROS)	a system of the Oklahoma Department of Public Security to assist users of oversize/overweight commercial motor vehicles in making safe and efficient route choices
Oklahoma Turnpike Authority (OTA)	an instrument of the State of Oklahoma created by statute for the purpose of constructing, operating, and maintaining the Oklahoma Turnpike System
Oversize/Overweight Loads (OSOW)	loads that exceed the standard or ordinary legal size and/or weight limits for a specified portion of road, highway, or other transport infrastructure, such as air freight or water freight
Owner/Operator	trucking operation in which the owner of the truck is also the driver
Performance Measures	metrics used to track results that serve and can serve as a basis for comparing progress against a target or other objective

Term	Definition
Port of Entry	a location at the Oklahoma state border where commercial vehicles undergo electronic processing for a number of items, including but not limited to driver credentials, weight, tax and fee status, and safety inspection. At the national level, a Port of Entry usually means a place where foreign goods may be cleared through customs.
Positive Train Control (PTC)	systems with integrated command, control, communications, and information systems for controlling train movements with safety, security, precision, and efficiency
Precision Scheduled Railroading (PSR)	a service model adopted by North American Class I railroads with the goal of keeping cars moving, reducing dwell, and operating a balanced network, which in turn yields more reliable service
Primary Highway Freight System (PHFS)	network of highways identified as the most critical highway portions of the U.S. freight transportation system determined by measurable and objective national data. The network consists of 41,518 centerlines miles, including 37,436 centerline miles of interstate and 4,082 centerline miles of non-interstate roads.
Regional Railroad	see Class II railroad
Reliability	the degree of travel time certainty and predictability on the transportation system
Road Weather Information System (RWIS)	a system consisting of Environmental Sensor Stations (ESS) in the field, a communication system for data transfer, and central systems to collect field data from numerous ESSs, which measure atmospheric, pavement and/or water level conditions
Shipper	party that tenders goods for transportation
Short-Line Railroad	see Class III railroad
South Kansas Oklahoma Railroad	a short-line railroad owned by WATCO, Inc., operating over 511 miles rail lines in Kansas, Oklahoma, and Missouri
State Action Plan (SAP)	specifically, the Highway-Rail Grade Crossing SAP, intended to detail the state's current efforts relating to highway-rail grade-crossing safety, to identify recent accident/incident trends, and to specify actions that can be taken to help mitigate risk at highway-rail grade crossings
State Rail Plan (SRP)	Oklahoma Statewide Freight and Passenger Rail Plan—ODOT's long-range planning document for Oklahoma's freight and passenger rail systems
State Rail Investment Program (SRIP)	a program developed by ODOT to address rail investment needs, including short-range projects with funding sources, and long-range rail study and project needs and costs, if known
State of Good Repair	the condition in which a capital asset is able to operate at a full level of performance
Strategic Highway Network (STRAHNET)	critical to the Department of Defense's domestic operations. STRAHNET is a 62,000-mile system of roads deemed necessary for emergency mobilization and peacetime movement of heavy armor, fuel, ammunition, repair parts, other commodities to support U.S. military operations. STRAHNET facilities are also on the National Highway System. Strategic highway network connectors are highways that provide access between major military installations and highways that are part of the STRAHNET.
Statewide Transportation Improvement Program	a federally required, staged, multi-year, statewide intermodal program of transportation projects, consistent with the statewide transportation plan and planning processes as well as metropolitan plans, transportation improvement programs, and planning processes

Term	Definition
Street	public thoroughfare especially in a city, town, or village that includes all areas within the right-of-way (such as sidewalks and tree belts) and sometimes further distinguished as being wider than an alley or lane but narrower than an avenue or boulevard
Superload	in Oklahoma, a load or vehicle that is 16 feet wide by 21 feet high and 180,000 pounds or more
Supply Chain	system of organizations, people, activities, information, and resources involved in moving a product or service from supplier to customer
Tainter Gate	radial arm floodgates used to control water flows in surface waters for flood control and navigation
Team Track	track designated for multiple customer use to load or unload shipments when direct rail service is unavailable
Texas Transportation Institute	an organization of the Texas A&M University system that conducts research in transportation engineering, planning, economics and policy, and transportation-related landscape architecture, environmental sciences, data sciences, and social sciences
Ton-mile	measure of output for freight transportation to capture the shipment weight and the distance traveled
Train Speed	measures the line-haul movement between terminals. The average speed is calculated by dividing train-miles by total hours operated, excluding yard and local trains, passenger trains, maintenance of way trains, and terminal time.
Transit Time	elapsed time between a shipment's pickup and delivery
Transloading	transferring bulk shipments from one mode to another
Transportation System Management and Operations (TSMO)	strategies that focus on operational improvements that can maintain and even restore the performance of the existing transportation system before extra capacity is needed
Traverse Wind Project	the Traverse Wind Energy Center, a 999-megawatt wind energy facility near Weatherford, Oklahoma
Truck Platooning	coordinated operation of two or more trucks via cooperative adaptive cruise control, which allows a lead truck wirelessly connected to trucks that follow to send messages affecting throttle, brakes, and brake lights
Truck Travel Time Reliability (TTTR)	the consistency or dependability in travel times, as measured from day-to-day and/or across different times of the day
Tulsa-Sapulpa Union Railway Company	a 10-mile, short-line, Class III railroad that operates freight service from Tulsa to Sapulpa, Oklahoma
Unit Train	train that handles a single commodity type that remains as a unit between origin and destination
Union Pacific Railroad (UP)	one of the largest freight railroads in North America, primarily serving the United States west of the Mississippi River
U.S. Army Corps of Engineers (USACE)	a combatant arm and technical service of the U.S. Army that engages in planning, construction and maintenance of civil works, construction and maintenance of military facilities, and environmental sustainability and ecosystem restoration in coastal areas and inland waterways
U.S. Energy Information Administration (EIA)	a U.S. Department of Energy agency that collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment
Vehicle-Miles Traveled (VMT)	unit for measuring vehicle travel distances; number of miles traveled nationally by vehicles for a period of one year
Vehicle-to-vehicle	technologies that allow vehicles to communicate with each other

Term	Definition
Vehicle-to-infrastructure	technologies that allow vehicles to communicate with infrastructure
Vehicle-to-everything	technologies that allow vehicles to communicate with other equipment, objects or persons
Warehouse	storage facility for products prior to shipment (at origin) or prior to delivery (at destination)

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Appendix B – Selection of Analysis Years for Data Analysis
2023–2030

Contents

Appendix B Selection of Analysis Years for Data Analysis

This appendix outlines the data source and year(s) selected for each of the major new data analyses performed as part of this Plan update.

B.1 COMMODITY FLOW

The Plan includes evaluations of freight tonnage and value derived from the US Department of Transportation's FAF version 5.3, which has a base year of 2017 and updated/forecasted years through 2050. Two forecast periods were evaluated.

B.1.1 Short-Term

For the short-term analysis, FAF projections years 2023-2030 were compared (see Chapter 6). This represents the eight-year period, consistent with IIJA freight plan horizon requirements.

B.1.2 Long-Term

For the long-term analysis, FAF base year 2017 and FAF forecast year 2045 were compared (see Chapter 4). For consistency with other state planning documents, the year 2045 was chosen as the end year for the analysis. While state freight plans should generally prefer the most recent available data where possible, in this case 2017 was chosen as the start year for two reasons:

1. As the base year for FAF and its key data sources such as the US Census Commodity Flow Survey, 2017 has the least amount of projection and adjustment.
2. Subsequent FAF years showed considerable variation:
   - Solid growth 2018 and 2019
   - Rapid decline in 2020
   - Recovery (but not to 2017 levels) in 2022

   Given these variations, year 2017 tonnage is extremely close to the average of all years between 2017 and 2022, deviating by only 2.2 million tons—meaning that of all the years in this period, 2017 is the most representative of "average" Oklahoma conditions and the most solid basis for long-term freight forecasting.

Table B-1 FAF 5.3 Oklahoma Tonnage (millions)

Year	Within	Outbound	Inbound	Total
2017	158.0	148.0	129.5	435.5
2018	161.5	158.6	133.2	453.3
2019	166.1	165.5	138.3	469.9
2020	152.9	132.1	122.6	407.6
2021	(not available)			
2022	155.3	136.6	130.1	421.9
Average	**158.8**	**148.2**	**130.7**	**437.7**
2017 vs Average	**(0.8)**	**(0.1)**	**(1.3)**	**(2.2)**

Source: USDOT FAF 5.3 Summaries

B.2 HIGHWAY BOTTLENECKS

The Plan includes evaluations of bottleneck locations across the state, derived from network system performance data from the U.S. DOT's NPMRDS speed data for Oklahoma roadways on the NHS. The data had a base year of 2021, which is the latest year with full-year data available.

B.3 TRUCK PARKING

The Plan includes evaluations of designated parking demand for trucks at truck stops and rest areas across the state. To better understand truck parking demand in the state, GPS data was acquired from Geotab, a telematics data provider, showing a sample of truck operations in Oklahoma. The parking facilities identified in the Truck Parking Inventory were georeferenced to isolate the trucking activity in the Geotab dataset using these facilities. Geotab data was collected for the three whole months of February 2021, April 2021, and October 2021 in order to analyze a representative sample of trucking activity across the whole year.